



KUNZMAN ASSOCIATES, INC.

TERRACINA

NOISE IMPACT ANALYSIS

May 28, 2013



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Terracina

Noise Impact Analysis

This report was prepared for the Terracina project located in the City of Lake Elsinore. The proposed development is proposed to construct 468 single-family detached residential dwelling units (Option A), or 448 single-family detached residential dwelling units and 51 multi-family attached residential dwelling units (Option B).

This report contains documentation of existing noise levels as well as analysis of the impacts that may result with project implementation. Each of these topics is contained in a separate section of the report. In this way, information on any particular aspect of the study can be easily located by the reader.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with terms unique to acoustics, a definition of terms has been provided in Section II.

I. Introduction and Setting

A. Purpose and Objectives

This study was performed to address the possibility of significant impacts due to noise. The objectives of the study include:

- documentation of existing noise conditions;
- discussion of noise modeling methodology and procedures;
- analysis of noise and vibration generated by the construction of the project;
- analysis of the effect of buildout traffic noise on the proposed project;
- analysis of noise affecting nearby sensitive receptors due to increased traffic generated by the project; and
- recommendations for mitigation measures.

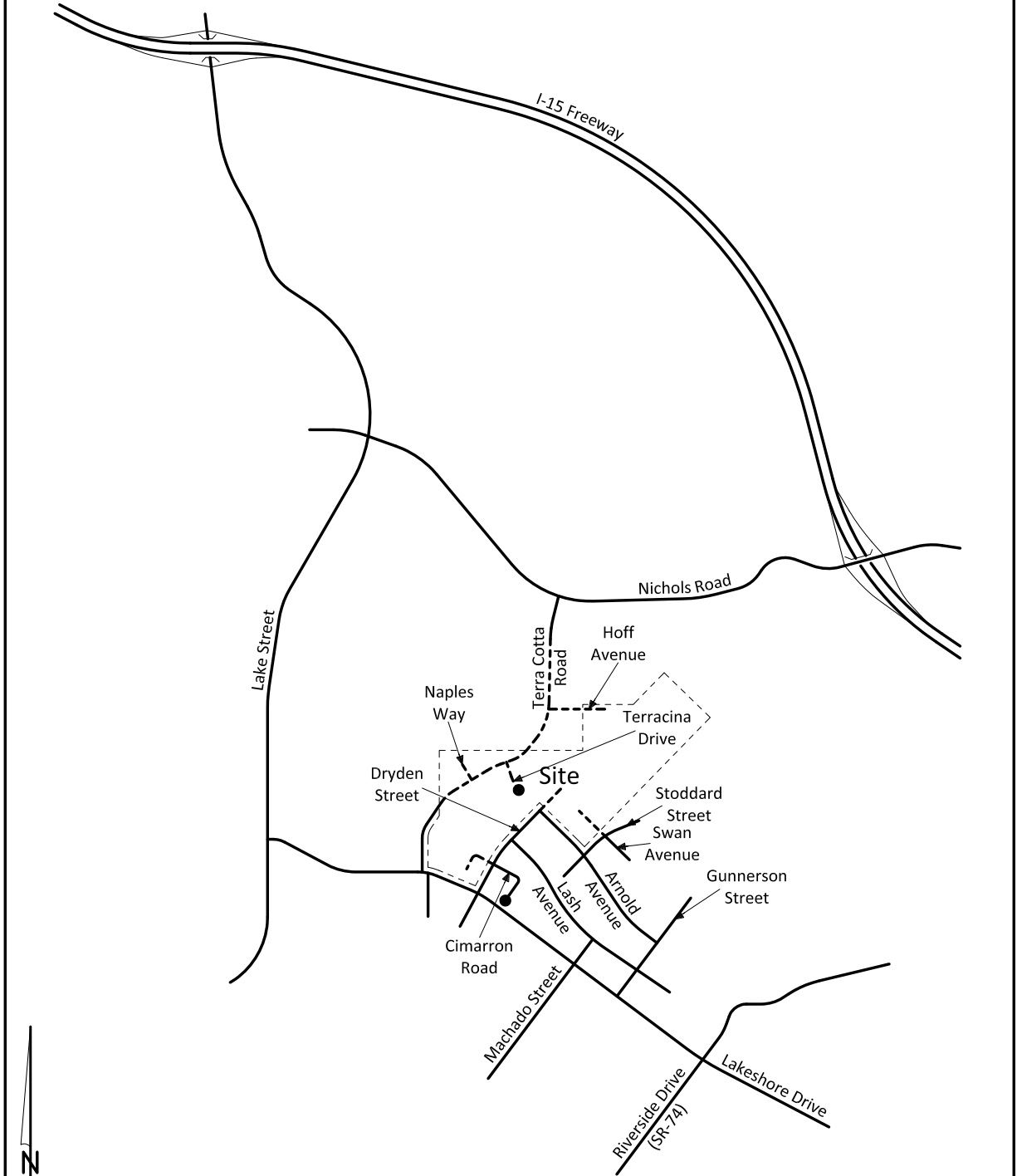
B. Project Location

The project is located north and northwest of Lakeshore Drive, generally east of Terra Cotta Road, northeast of Arnold Road, and northwest of Stoddard Street in the City of Lake Elsinore. A vicinity map showing the project location is provided on Figure 1.

C. Project Description

There are two alternatives for the approximately 151 acre project site. Option A proposes to develop the site with 468 single-family detached residential dwelling units. Option B proposes to develop the site with 448 single-family detached residential dwelling units and 51 multi-family attached residential dwelling units. The project site will have access to Terra Cotta Road, Dryden Street, Stoddard Street, and Dolbeer Street (to be constructed as part of the project). Site plans for Options A and B are provided on Figures 2 and 3, respectively.

Figure 1
Project Location Map



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Figure 2
Option A Site Plan



Figure 3
Option B Site Plan

The map illustrates the Option B site plan, featuring various land use designations and topographical features. Key elements include:

- Land Use Designations:**
 - LMOP (Low-Medium Open Space):** Shaded in light green, covering large portions of the central and right-hand side of the plan.
 - LMOP Planning Area 1, 2, 3, 4, 5, 6:** Specific sub-designations within the LMOP areas, each with associated acreage and notes (e.g., "28.4 acres reserved", "13.0 acres reserved", "13.0 acres reserved", "13.0 acres reserved", "13.0 acres reserved").
 - Natural Open Space:** Shaded in dark green, located along the western and southern boundaries.
 - Open Space:** Shaded in yellow, located in the upper right portion of the plan.
- Topography:** Contour lines are drawn across the map to indicate elevation changes.
- Streets:** Labeled streets include Kings Highway, Hoff Avenue, Pierce Street, Orey Avenue, Dolbeer Street, Wind Street, Stephens Street, Lash Street, Chubb Road, and Lakeshore Drive.
- Other Features:** A north arrow is located in the bottom left corner, pointing upwards. The text "NTS" (Not To Scale) is also present.

II. Definition of Terms

Sound is a pressure wave created by a moving or vibrating source that travels through an elastic medium such as air. Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in extreme circumstances, hearing impairment.

Commonly used noise terms are presented in Table 1. The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the “A-weighted” noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dBA or dB(A).

Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease. Figure 4 shows the relationship of various noise levels to commonly experienced noise events.

Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq} , or the equivalent noise level for that period of time. For example, $L_{eq(3)}$ would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

Noise standards for land use compatibility are stated in terms of the Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (L_{dn}). CNEL is a 24-hour weighted average measure of community noise. CNEL is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours. L_{dn} is a very similar 24-hour average measure that weights only the nighttime hours.

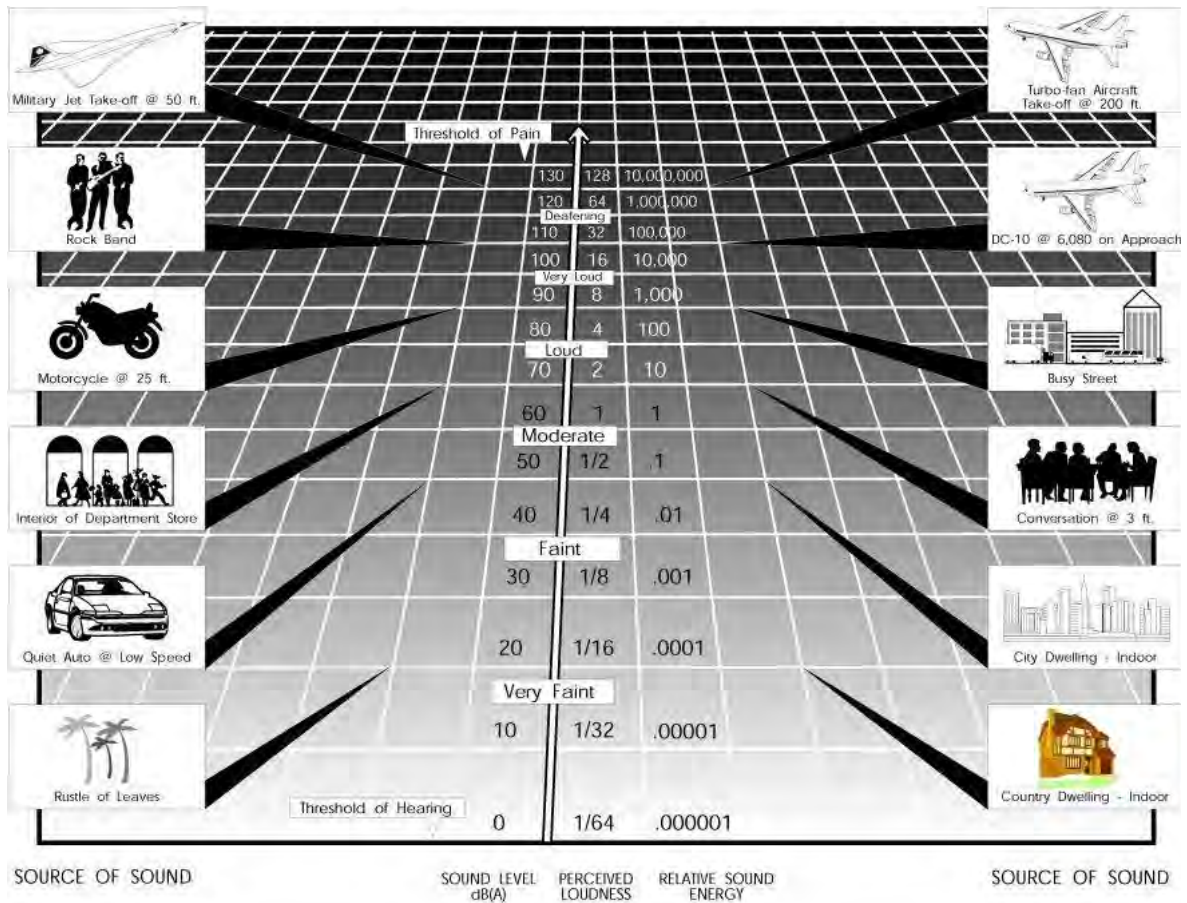
It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by the California Department of Transportation’s Traffic Noise Analysis Protocol for New Highway and Reconstruction Projects.

Table 1**Definitions of Acoustical Terms¹**

Term	Definition
Decibel, dB	A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hertz	In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear.
Root Mean Square (RMS)	A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.
Fast/Slow Meter Response	The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.
L_{02} , L_{08} , L_{50} , L_{90}	The A-weighted noise levels that are equaled or exceeded by a fluctuating sound level, 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	A level of steady state sound that in a stated time period, and a stated location, has the same A-weighted sound energy as the time-varying sound.
L_{max} , L_{min}	L_{max} is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. L_{min} is the minimum level.
Ambient Noise Level	The all-encompassing noise environment associated with a given environment, at a specified time, usually a composite of sound from many sources, at many directions, near and far, in which usually no particular sound is dominant.
Offensive/ Offending/ Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.

¹ Adapted from: Cyril M. Harris; Handbook of Acoustical Measurement and Noise Control 1991.

Figure 4
Common Noise Sources and Noise Levels



Source: County of Riverside General Plan Noise Element

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III. Existing Noise Environment

A. Noise Sources

Primary noise sources in the project area consist of vehicular traffic on adjacent roadways, dogs barking, and landscaping equipment.

B. Sensitive Noise Receptors

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, and residential uses make up the majority of these areas. The project site is adjacent to several existing single-family residential neighborhoods to the south, east, and west. There are also two rural residential parcels bordering the site to the northeast.

C. Noise Measurement

An American National Standards Institute (ANSI Section S1.4 1979, Type 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels on April 26, 2013. Four 15-minute noise measurements were taken between 2:45 PM and 4:00 PM. Noise measurement locations are shown on Figure 5. Correlating ambient noise levels are presented in Table 2 and measurement output data is included within Appendix A.

Table 2
Ambient Noise Levels¹

Name	Time Period	Measurement Period	Description	Existing Ambient Noise Levels (dBA)					
				L _{eq}	L _{max}	L ₂	L ₈	L ₂₅	L ₅₀
M1	2:45-3:00 PM	15 min	300' SE of Building at 28936 Carson Avenue	51.9	70.5	63.3	54.9	48.2	43.3
M2	3:10-3:25 PM	15 min	50' from eastern edge of Terra Cotta Road, 250' NE of intersection with Harrison Avenue	56.1	77.6	66.1	57.0	51.1	47.9
M3	3:30-3:45 PM	15 min	100' from northern edge of Lakeshore Drive, approx. 100 feet west of Dryden Street	67.1	84.5	77.9	70.5	63.1	58.1
M4	3:50-4:05 PM	15 min	60' north of Stoddard Street and Swan Avenue intersection	46.8	52.6	52.6	52.4	45.6	45.5

Figure 5
Noise Measurement Locations



Legend

⊗ = Measurement Location



IV. Analytical Methodology and Model Parameters

A. Noise Modeling and Input

1. Road Construction Noise Model (RCNM)

A worst-case construction noise scenario was modeled using the Federal Highway Administration's Roadway Construction Noise Model (RCNM). Modeling parameters and output are provided in Appendix B. RCNM utilizes standard noise emission levels for many different types of equipment and includes utilization percentage, impact, and shielding parameters.

2. SoundPLAN

Buildout noise levels along Lakeshore Drive and Terra Cotta Road were modeled using SoundPLAN. This software utilizes the algorithms found in the Federal Highway Administration's (FHWA) Traffic Noise Model. The model takes into account the existing topography and buildings. Buildout traffic volumes were obtained from the City of Lake Elsinore General Plan EIR and the County of Riverside's General Plan Circulation Element. Level of Service C (LOS C) conditions were modeled for each roadway type. In these conditions, the most traffic passes at the highest speed.

The City of Lake Elsinore does not have vehicle mix or Day/Evening/Night (D/E/N) splits that are published for use in acoustical studies. Vehicle mix was obtained from traffic counts or from the Riverside County Department of Industrial Hygiene's recommendations for noise modeling. Road segments were assigned D/E/N splits recommended by Riverside County. Roadway parameters including vehicle speed and mix utilized for this analysis are presented in Table 3.

3. Federal Highway Administration (FHWA) Traffic Noise Prediction Model

Existing and Existing Plus Project noise levels along acoustically significant area roadways were modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. This model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Adjustments are then made to the REMEL to account for: total average daily trips (ADT), roadway classification, width, speed and truck mix, roadway grade and site conditions (hard or soft ground surface). Surfaces adjacent to all modeled roadways were assumed to have a "hard site" to predict worst-case, conservative noise levels. A hard site, such as pavement, is highly reflective and does not attenuate noise as quickly as grass or other soft sites. Possible reductions in noise levels due to intervening topography and vegetation were not accounted for in the analysis. Existing traffic volumes were obtained from the project traffic study (Kunzman Associates, Inc., 2013). Vehicle mix and D/E/N split were obtained from the Riverside County Department of Industrial Hygiene's recommendations for noise modeling and are shown in Table 3.

Table 3

Roadway Modeling Parameters

Roadway	Segment	Vehicle Speed (mph)	Vehicle Mix ¹ (%)		
			Autos	Medium Trucks	Heavy Trucks
I-15 Freeway	North of Lake Street	70	89.50	0.85	9.65
	South of Nichols Road	70	89.50	0.85	9.65
Arnold Avenue	Stoddard Street to Gunnerson Street	25	97.40	1.84	0.74
Dryden Street	Lakeshore Drive to Cimmaron Road	25	97.40	1.84	0.74
	Cimmaron Road to Arnold Avenue	25	97.40	1.84	0.74
Grand Avenue	South of Lakeshore Drive	45	92.00	3.00	5.00
Gunnerson Street	Arnold Avenue to Lakeshore Drive	25	97.40	1.84	0.74
Hoff Avenue	East of Terra Cotta Road	35	97.40	1.84	0.74
Lake Street	North of Nichols Road	50	92.00	3.00	5.00
Lakeshore Drive	Lake Street to Terra Cotta Road	45	92.00	3.00	5.00
	Terra Cotta Road to Dryden Street	45	92.00	3.00	5.00
	Dryden Street to Machado Street	45	92.00	3.00	5.00
	Machado Street to Gunnerson Street	40	92.00	3.00	5.00
	Gunnerson Street to Riverside Drive	40	92.00	3.00	5.00
	East of Riverside Drive	40	92.00	3.00	5.00
Machado Street	South of Lakeshore Drive	40	97.40	1.84	0.74
Nichols Road	Terra Cotta Road to I-15 Freeway	50	92.00	3.00	5.00
Riverside Drive (SR-74)	North of Lakeshore Drive	40	92.00	3.00	5.00
	South of Lakeshore Drive	40	92.00	3.00	5.00
Terra Cotta Road	Lakeshore Drive to Naples Way	45	97.40	1.84	0.74
	Terracina Drive to Hoff Avenue	45	97.40	1.84	0.74
	Hoff Avenue to Nichols Road	45	97.40	1.84	0.74

¹ Mix was obtained from County of Riverside published recommendations.

V. Applicable Standards

A. State of California

Title 24, California Building Code

Title 24, Chapter 12 provides standards to protect occupants of hotels, motels, dormitories, apartment houses and dwellings other than detached single-family dwellings from excessive noise. Sections applicable to the proposed project are presented below.

1207.7 Airborne sound insulation. All such acoustically rated separating wall and floor-ceiling assemblies shall provide airborne sound insulation equal to that required to meet a sound transmission class (STC) rating of 50 based on laboratory tests as defined in ASTM E 90 and E 413.

1207.11.2 Allowable interior noise levels. Interior noise levels attributable to exterior sources shall not exceed 45 db in any habitable room. The noise metric shall be either the day-night average sound level (Ldn) or the community noise equivalent level (CNEL), consistent with the noise element of the local general plan.

Note: Ldn is the preferred metric for implementing these standards. Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance with this section. Future noise levels shall be predicted for a period of at least 10 years from the time of building permit application.

1207.11.3 Airport noise sources. Residential structures to be located where the annual Ldn or CNEL (as defined in Title 21, Division 2.5, Chapter 6, Article 1, Section 5001, California Code of Regulations) exceeds 60 db shall require an acoustical analysis showing that the proposed design will achieve prescribed allowable interior level. For public-use airports or heliports, the Ldn or CNEL shall be determined from the airport land-use plan prepared by the county wherein the airport is located. For military bases, the Ldn shall be determined from the facility Air Installation Compatible Use Zone (AICUZ) plan. For all other airports or heliports, or public-use airports or heliports for which a land-use plan has not been developed, the Ldn or CNEL shall be determined from the noise element of the general plan of the local jurisdiction.

When aircraft noise is not the only significant source, noise levels from all sources shall be added to determine the composite site noise level.

B. City of Lake Elsinore

General Plan

The Public Safety And Welfare Element of the City of Lake Elsinore General includes the following goal regarding community noise:

- Maintain an environment for all City residents and visitors free of unhealthy, obtrusive, or otherwise excessive noise.

In order to implement this goal, the City of Lake Elsinore has adopted a slightly modified version of the Noise and Land Use Compatibility Guidelines from the State of California. As shown in Table 4, residential land uses are considered to be "Clearly Compatible" in areas with ambient noise levels of up to 60 dBA Ldn, (assuming that any buildings involved are of normal conventional construction) and "Normally Compatible"¹ up to 70 dBA Ldn. A 65 dBA Ldn exterior level is the threshold where noise begins to substantially interfere with enjoyment of any outdoor recreational amenity such as a yard, patio, spa/pool, etc. A level up to 65 dB Ldn exterior, and 45 dB CNEL interior would therefore be the appropriate noise standard for the proposed single family homes.

Municipal Code

Noises crossing boundaries between land uses are regulated by Section 17.176.060 of the Lake Elsinore Municipal Code. These noise standards are expressed in terms of a mean (50th percentile) noise level, which is the noise level allowed for up to 30 minutes. Some short-term noise levels may exceed the 50th percentile standard, up to a maximum of 20 dB above the allowable mean. This code is not intended to apply to construction activities but to neighbor to neighbor noise and will apply to each of the residential lots proposed by the project.

Section 17.176.080 of the City of Lake Elsinore Municipal Code prohibits the operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between weekday hours of 7:00 PM and 7:00 AM, or at any time on weekends or holidays, such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance issued by the City. Further, where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in Table 5.

Increases in Ambient Noise Levels

Appendix G of the California Environmental Quality Act Guidelines establish thresholds for noise impact analysis. Two of these standards apply to what is referred to as a "substantial increase" in ambient noise levels. Neither the Guidelines nor the City of Lake Elsinore establish what is considered to be a "substantial increase". Therefore, for purposes of this analysis, project-generated traffic noise impacts would be considered significant if the project increases noise levels at a noise sensitive land use by 3 dBA Ldn and if: (1) the existing noise levels already exceed the 65 dBA Ldn residential standard, or (2) the project increases noise levels from below the 65 dBA Ldn standard to above 65 dBA Ldn.

¹ "Normally Compatible" means that any new construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.

Table 4

Noise and Land Use Compatibility Matrix

Land Use Categories		Day-Night Noise Level (dBA L _{dn})						
Categories	Uses	< 55	60	65	70	75	80	>
Residential	Single Family, Duplex, Multiple Family	A	A	B	B	C	D	D
	Mobile Homes	A	A	B	C	C	D	D
Commercial - Regional District	Hotels, Motels, Transient Lodging	A	A	B	B	C	C	D
Commercial - Regional Village - District Special	Commercial, Retail, Bank, Restaurant, Movie Theatre	A	A	A	A	B	B	C
Commercial Industrial Institutional	Office Building, Research and Development, Professional Offices, City Office Building	A	A	A	B	B	C	D
Commercial - Regional	Amphitheatre, Concert Hall	B	B	C	C	D	D	D
Institutional - Civic Center	Auditorium, Meeting Hall							
Commercial - Recreation	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial - General, Special Industrial Institutional	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional General	Hospital, Church, Library, Schools, Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
	Golf Course, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

Zone A Clearly Compatible	Specified land uses is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation or requirements.
Zone B Normally Compatible	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.
Zone C Normally Incompatible	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D Clearly Incompatible	New construction or development should generally not be undertaken.

Source: City of Lake Elsinore General Plan Public Safety and Welfare Element.

Table 5

Maximum Construction Noise Level Limits for Residential Properties¹

	Mobile Equipment ¹			Stationary Equipment ²		
	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas Residential/ Commercial	Type I Areas Single-Family Residential	Type II Areas Multifamily Residential	Type III Areas Residential/ Commercial
Time Period						
Daily, except Sundays and Legal Holidays 7:00 AM to 7:00 PM	75 dBA	80 dBA	85 dBA	60 dBA	65 dBA	70 dBA
Daily, 7:00 PM to 7:00 AM and all day Sunday and Legal Holidays	60 dBA	65 dBA	70 dBA	50 dBA	55 dBA	60 dBA

¹ Nonscheduled, intermittent, short-term operation (less than 10 days) of mobile equipment.

² Repetitively scheduled and relatively long-term operation (period of 10 days or more) of stationary equipment.

VI. Impact Analysis

A. Construction Noise Impacts

1. Construction Noise

Construction noise varies depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work. Typical noise sources and noise levels associated with construction activities are shown in Table 6.

The initial phase of construction would involve mass grading of the site, along with site development activities. This includes construction of internal roadways which involves fine grading, trenching, and paving activities. Following site preparation activities, the project would include construction of buildings. Construction of the buildings would require the following phases: site development, building construction, architectural coatings application, and paving associated with buildings. Mass site grading is expected to produce the highest construction noise levels. Grading of the site is estimated to require several graders, dozers, excavators, scrapers, and pickup trucks.

A drop-off rate of 6 dBA per doubling of distance from the construction noise sources was utilized to calculate noise levels at nearby sensitive receptors associated with a worst-case construction scenario. Maximum noise levels were calculated utilizing the Road Construction Noise Model (RCNM) provided by the FHWA. Unmitigated noise levels could reach a maximum noise level of up to 85.0 dBA L_{max} at 50 feet, which is the closest to the nearest sensitive receptor the loudest piece of equipment (a grader) is likely be working for any length of time. Noise levels will lower substantially as construction moves away from the property line. The maximum noise level would be 79.0 dBA L_{max} at 100 feet, 65.0 dBA L_{max} at 500 feet, and 59.0 dBA L_{max} at 1,000 feet.

2. Consistency with Applicable Standards

City of Lake Elsinore General Plan

The City's General Plan does not contain any specific language pertaining to construction.

City of Lake Elsinore Municipal Code

Section 17.176.080 of the City of Lake Elsinore Municipal Code restricts construction which creates a noise disturbance across a residential or commercial real property line at night and on weekends or holidays. The code also sets a maximum allowed construction noise level of 75 dBA L_{max} in single-family residential areas between 7:00 AM and 7:00 PM. The code also sets a limit of 60 dBA L_{max} in those same areas to apply between the hours of 7:00 PM and 7:00 AM. The anticipated distances to the 60 and 75 dBA L_{max} project construction noise contours were calculated using RCNM. Without

mitigation, sensitive receptors up to 160 feet from the property line (approximately 40 homes) could experience noise levels over 75 dBA L_{max} . Construction noise levels at these receptors would exceed City of Lake Elsinore standards during the day (7:00 AM to 7:00 PM). Unmitigated noise levels could also reach 60 dBA L_{max} up to 890 feet from the property line, which encompasses much of the surrounding neighborhoods. Construction noise levels at sensitive receptors within this area would exceed City of Lake Elsinore standards at night (7:00 PM to 7:00 AM) and on weekends and holidays. With the implementation of construction mitigation measures found in Section VII, construction noise levels would comply with the City of Lake Elsinore Municipal Code.

Temporary Increases in Ambient Noise Levels

With the implementation of construction mitigation measures found in Section VII, including temporary noise barriers, the increase in ambient noise levels would be minimized.

B. Traffic Noise Impacts to the Proposed Project

1. Buildout Traffic Noise Impacts

Buildout noise levels along Lakeshore Drive and Terra Cotta Road were modeled using SoundPLAN, which utilizes the algorithms found in the Federal Highway Administration's (FHWA) Traffic Noise Model. Unmitigated buildout traffic noise levels could reach up to 71.2 dBA Ldn at the first floor (exterior) of proposed sensitive receptors along Lakeshore Drive and up to 73.1 dBA Ldn at second story (exterior) receptors. Unmitigated buildout traffic noise levels at proposed sensitive receptors along Terra Cotta Road could reach up to 70.5 dBA Ldn at first floor (exterior) receptors and up to 69.3 dBA Ldn at those on the second floor (exterior). Unmitigated buildout traffic noise levels for selected representative sensitive receptors along Lakeshore Drive and Terra Cotta Road are shown on Figures 6 and 7, and the unmitigated noise level contours are shown on Figures 8 and 9.

2. Consistency with Applicable Standards

Title 24, California Building Code

Title 24 of the California Building Code applies to the multi-family dwelling units proposed in Option B of the project.

Buildout traffic noise levels along Lakeshore Drive and Terra Cotta Road are expected to reach up to 73.1 dBA Ldn at proposed sensitive receptors. Mitigation will be required in order to achieve interior noise levels of 45 dBA Ldn.

Section 1207.7 requires separating wall and floor-ceiling assemblies in multi-family development to provide a sound transmission class (STC) rating of 50. Compliance with this standard helps to ensure that interior noise levels do not exceed the prescribed level.

Section 1207.11.2 limits interior noise levels attributable to exterior sources to 45 dBA L_{dn}/L_{dn} in any habitable room. The implementation of mitigation measures provided in Section VII, including the recommended barriers and enhanced second story construction methods will ensure that interior noise levels do not exceed these standards.

Section 1207.11.3, which limits aircraft noise, does not apply to the proposed project because it is not located within the 60 dBA L_{dn} contour of the nearest airport.

City of Lake Elsinore General Plan

Because buildout traffic noise levels will exceed 65 dBA L_{dn} at proposed sensitive receptors along both Lakeshore Drive and Terra Cotta Road, mitigation will be required in order to achieve outdoor use area noise levels of 65 dBA L_{dn} . A six foot barrier was modeled along Lakeshore Drive (Lots 5-16) and the northwest side of Terra Cotta Road (Lots 431-441 and 459-468, or entire frontage of Village 6) using SoundPLAN. A five foot barrier was also modeled along the southeast side of Terra Cotta Road (Lots 66-72). Construction of these barriers would reduce exterior noise levels at first floor sensitive receptors to below 65 dBA L_{dn} . Mitigated buildout traffic noise levels for selected representative sensitive receptors are shown on Figures 10 and 11; mitigated noise level contours are shown on Figures 12 and 13.

It is not feasible to construct a barrier high enough to reduce noise at second story sensitive receptors to acceptable levels. Therefore, enhanced building construction methods and materials must be employed to achieve acceptable interior noise levels. These methods include (but are not limited to) providing mechanical ventilation, using double paned glass, baffling exterior vents, and utilizing construction materials with a Sound Transmission Class (STC) of 30 or greater. These methods are shown as Mitigation Methods 1 through 6 in Table 7.

C. Off-Site Traffic Noise Impacts

1. Off-Site Traffic Noise Impacts

The FHWA Traffic Noise Prediction Model - FHWA-RD-77-108 was used to model Existing and Existing Plus Project noise levels were modeled for each roadway segment analyzed in the traffic study prepared for the proposed project (Kunzman Associates, Inc., 2013). As they are the most conservative and represent a worst case, traffic volumes for Option A were utilized. Project generated increases in ambient noise levels along affected road segments were then calculated. Modeling output is included in this report as Appendix C.

The Existing traffic noise modeling resulted in noise levels ranging between 51.1 and 76.9 dBA L_{dn} at nearby sensitive receptors located near roadways. The results of the existing traffic noise model are shown in Table 8.

Representative ambient noise measurements taken along road segments were used in Table 8 to represent existing traffic noise along roadways that either have nominal existing traffic volumes or have not yet been built.

The Existing Plus Project traffic noise model resulted in noise levels ranging from 51.3 to 76.9 dBA Ldn at nearby sensitive receptors. Several road segments had noise levels which is due to The results of the Existing Plus Project traffic noise model are also shown in Table 8.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase or decrease of 10 dBA sounds twice or half as loud. For example, doubling the traffic on a highway would result in an increase of 3 dB. Conversely, reducing traffic by one half would reduce the noise level by 3 dB (Caltrans 2009).

For purposes of this study, roadway noise impacts would be considered significant if the project increases noise levels for a noise sensitive land use by 3 dBA Ldn and if: (1) the existing noise levels already exceed the 65 dBA Ldn residential standard, or (2) the project increases noise levels from below the 65 dBA Ldn standard to above 65 dBA Ldn.

2. Consistency with Applicable Standards

City of Lake Elsinore General Plan Noise Element

Noise levels along project area roadways are projected to increase from 0.0 to 4.8 dBA with the completion and operation of the proposed project. The largest increase, along Terra Cotta Road between Lakeshore Drive and Naples Way, will be 4.8 dBA Ldn, which falls below the level of increase that is considered to be readily perceptible (5 dB). Further, noise levels at the sensitive receptor closest to this segment will not exceed 65 dBA Ldn. Therefore, project related traffic noise will not result in a significant impact.

E. Vibration Impacts

1. Construction Related Vibration

Construction of the proposed project and passing haul trucks will both generate ground-borne vibration noise that may be perceptible at the nearest sensitive receptor.

Ground-borne vibration is an oscillatory motion that is often described by the average amplitude of its velocity in inches per second or more specifically, peak particle velocity. Ground-borne vibration is much less common than airborne noise; the ambient peak particle velocity of a residential area is commonly .0003 inches per second or less, well below the threshold of human perception of .0059 inches per second. Nonetheless, human reactions to vibration are highly subjective, and even levels below the threshold can cause minor annoyances like rattling of dishes, doors, or fixtures. Typical human response to vibration is given in Table 9.

Table 10 shows the peak particle velocities of some common construction equipment and haul trucks (loaded trucks). The most vibration-causing piece of equipment that will likely be used on-site is the vibratory roller. This machine can cause vibration strong enough to annoy people over 100 feet away. Due to the proximity of adjacent single-family detached residential dwelling units, project construction activities may result in ground borne vibration that is annoying but would only occur during site grading and preparation activities. Construction vibration will not result in any structural damage.

Based on Caltrans data, haul trucks would not be anticipated to exceed 0.10 in/sec peak particle velocity (ppv) at 10 feet (Caltrans 2002). Predicted vibration levels at the nearest offsite structures, which are located in excess of 25 feet from the traveled roadway segments, would not be anticipated to exceed even the most conservative threshold of 0.2 inch/second ppv.

2. Consistency with Applicable Standards

City of Lake Elsinore

The City of Lake Elsinore does not have standards or guidelines regarding ground-borne vibration. Vibration impacts will be reduced through implementation of construction mitigation measures provided in Section VII. Project construction will not result in any structural damage.

Table 6

Typical Construction Equipment Noise Levels¹

Type of Equipment	Range of Maximum Sound Levels Measured (dBA at 50 ft.)	Suggested Maximum Sound Levels for Analysis (dBA at 50 ft.)
Rock Drills	83-99	96
Jack Hammers	75-85	82
Pneumatic Tools	78-88	85
Pumps	74-84	80
Dozers	77-90	85
Scrapers	83-91	87
Haul Trucks	83-94	88
Cranes	79-86	82
Portable Generators	71-87	80
Rollers	75-82	80
Tractors	77-82	80
Front-End Loaders	77-90	86
Hydraulic Backhoe	81-90	86
Hydraulic Excavators	81-90	86
Graders	79-89	86
Air Compressors	76-89	86
Trucks	81-87	86

¹ Source: Bolt, Beranek & Newman; Noise Control for Buildings and Manufacturing Plants, 1987.

Table 7

Typical Noise Attenuation Methods to Insulate the Noise Receiver¹

Noise Level Reduction	Typical Mitigation Methods
15-20 dBA	1. Air conditioning or mechanical ventilation. 2. Double-paned glass. 3. Solid core doors with weather stripping and seals.
20-25 dBA	<i>Mitigation 1, 2, and 3 plus</i> 4. Stucco or brick veneer exterior walls or wood siding w/one-half inch thick fiberboard underlayer. 5. Glass portions of windows/doors not to exceed 20 percent. 6. Exterior vents facing noise source shall be baffled.
25-30 dBA	<i>Mitigation 1 through 6 plus</i> 7. Interior sheetrock of exterior wall attached to studs by resilient channels or double walls. 8. Window assemblies, doors, wall construction materials, and insulation shall have a lab-tested STC rating of 30 or greater.

¹ Source: City of San Diego General Plan, March 2008

Table 8

FHWA-RD-77-108 Traffic Noise Model Results

Roadway	Segment	Distance from roadway centerline to receiver (ft)	Modeled Noise Levels (dBA CNEL)				
			Existing		Increase	Exceeds Standards	Substantial Increase
			Existing	Plus Project			
I-15 Freeway	North of Lake Street	850	71.5	71.5	0.0	YES	NO
	South of Nichols Road	230	76.9	76.9	0.0	YES	NO
Arnold Avenue	Stoddard Street to Gunnerson Street	37	51.1	51.3	+ 0.1	NO	NO
Dryden Street	Lakeshore Drive to Cimmaron Road	35	59.1	59.1	0.0	NO	NO
	Cimmaron Road to Arnold Avenue	35	59.0	59.0	+ 0.1	NO	NO
Grand Avenue	South of Lakeshore Drive	60	51.1	51.3	+ 0.1	NO	NO
Gunnerson Street	Arnold Avenue to Lakeshore Drive	40	59.0 *	62.1	+ 3.0	NO	YES
Hoff Avenue	East of Terra Cotta Road	60	59.0 *	59.2	+ 0.2	NO	NO
Lake Street	North of Nichols Road	60	69.4	69.6	+ 0.2	YES	NO
Lakeshore Drive	Lake Street to Terra Cotta Road	55	68.4	68.4	0.0	YES	NO
	Terra Cotta Road to Dryden Street	55	68.9	69.0	+ 0.0	YES	NO
	Dryden Street to Machado Street	45	70.1	70.2	+ 0.1	YES	NO
	Machado Street to Gunnerson Street	40	71.1	71.1	+ 0.1	YES	NO
	Gunnerson Street to Riverside Drive	50	70.1	70.1	+ 0.1	YES	NO
	East of Riverside Drive	40	70.0	70.0	0.0	YES	NO
Machado Street	South of Lakeshore Drive	45	63.6	63.7	+ 0.1	NO	NO
Nichols Road	Terra Cotta Road to I-15 Freeway	860	54.3	54.6	+ 0.3	NO	NO
Riverside Drive (SR-74)	North of Lakeshore Drive	65	70.1	70.2	0.0	YES	NO
	South of Lakeshore Drive	55	71.3	71.3	0.0	YES	NO
Terra Cotta Road	Lakeshore Drive to Naples Way	40	50.7	55.6	+ 4.8	NO	YES
	Terracina Drive to Hoff Avenue	200	59.0 *	59.8	+ 0.7	NO	NO
	Hoff Avenue to Nichols Road	380	59.0 *	59.4	+ 0.4	NO	NO

* Road segment has nominal existing traffic or is not built. Existing noise levels were assumed to be equal to ambient noise levels at the nearest measured location.

Table 9

Human Reaction to Typical Vibration Levels¹

Vibration Level Peak Particle Velocity in inches/second	Human Reaction
0.0059-0.0188	Threshold of perception, possibly of intrusion
0.0787	Vibrations readily perceptible
0.0984	Continuous vibration begins to annoy people
0.1968	Vibrations annoying to people in buildings
0.3937-0.5905	Vibrations considered unpleasant when continuously subjected and unacceptable by some walking on bridges.

¹ Source: Bolt, Beranek & Newman; Noise Control for Buildings and Manufacturing Plants, 1987.

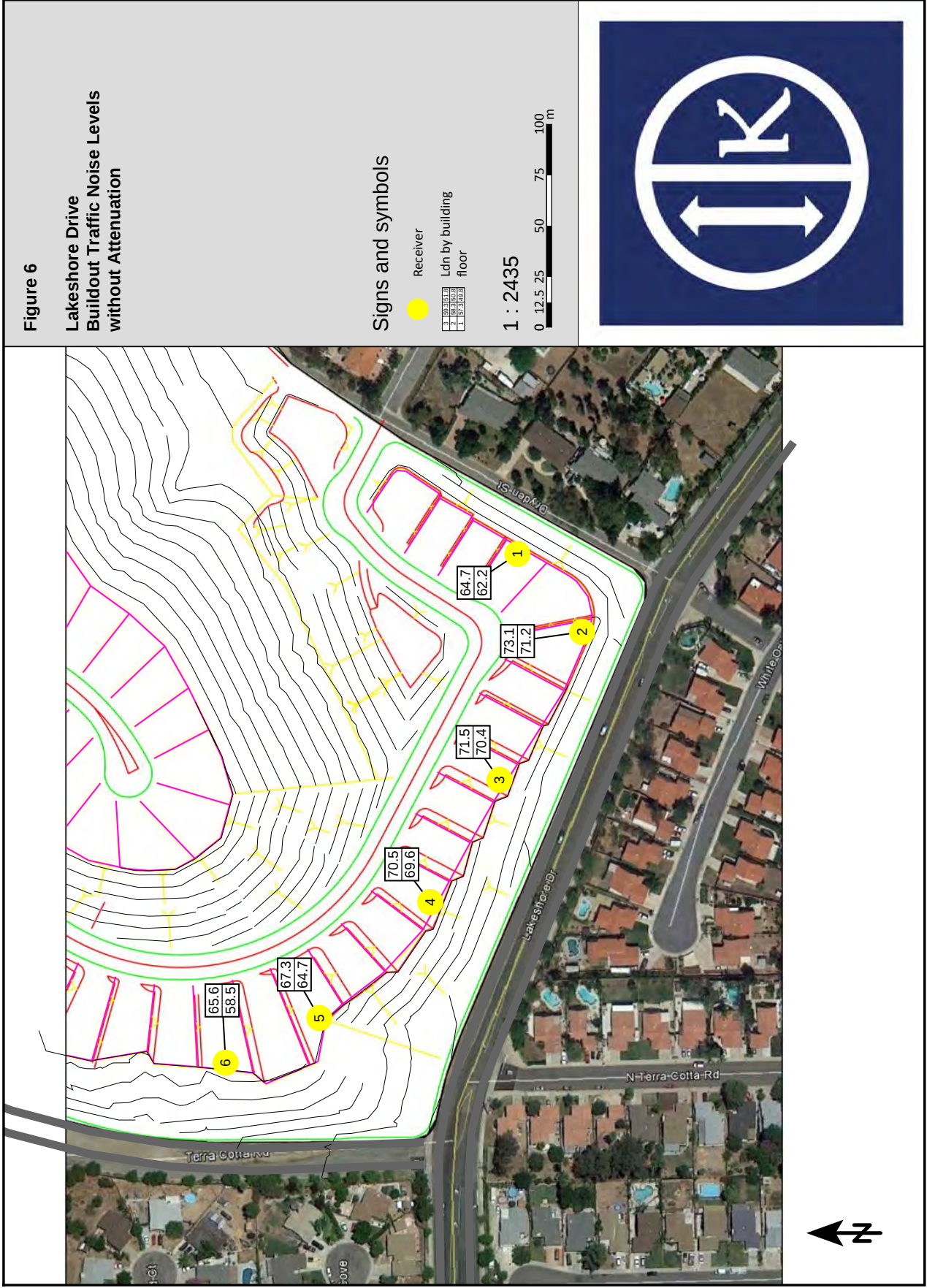
Table 10

Construction Equipment Vibration Source Levels¹

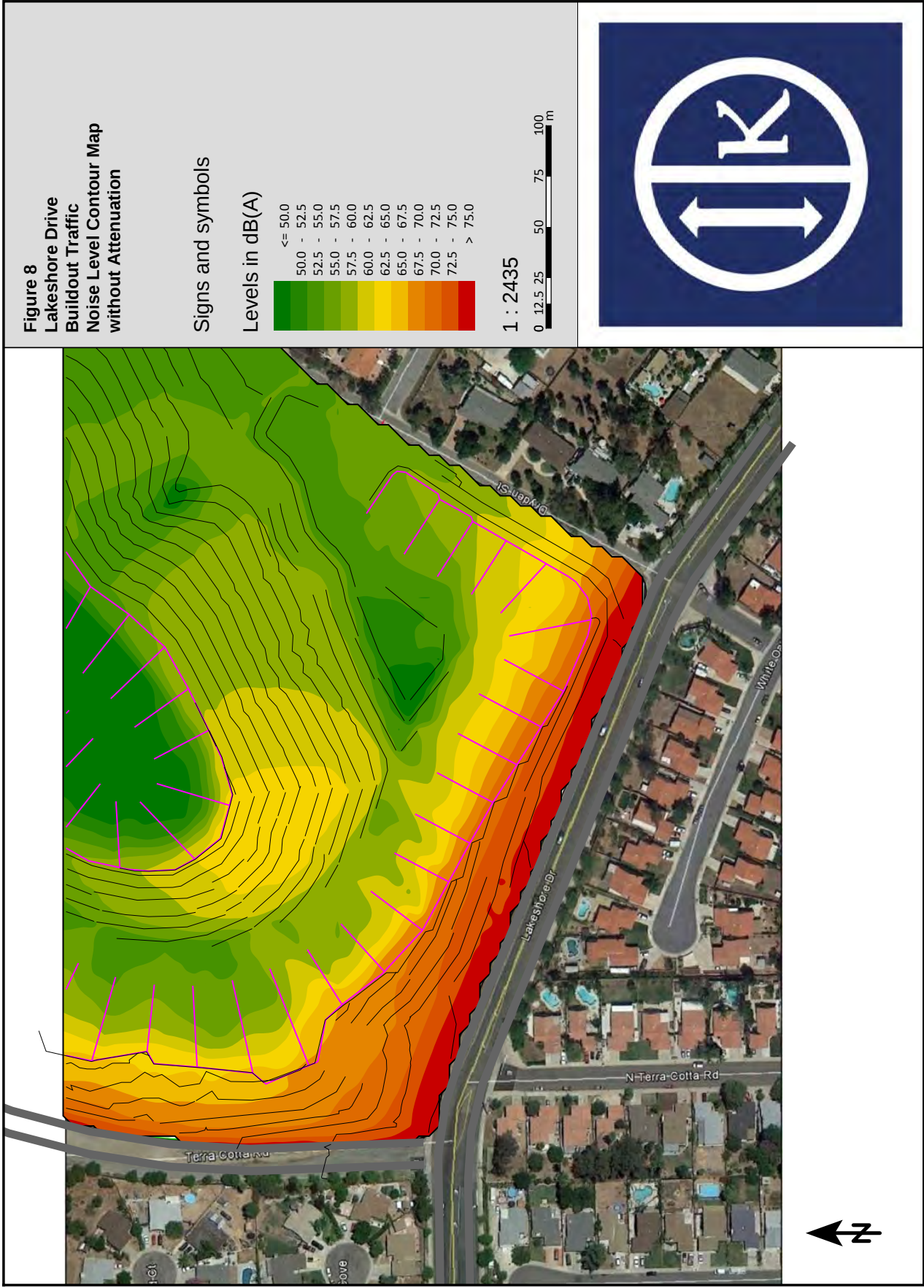
Equipment	Peak Partical Velocity in inches per second ²		
	at 25 ft.	at 50 ft.	at 100 ft.
Clam Shovel Drop (slurry wall)	0.202	0.071	0.025
Vibratory Roller	0.210	0.074	0.026
Hoe Ram	0.089	0.031	0.011
Large Bulldozer	0.089	0.031	0.011
Caisson Drilling	0.089	0.031	0.011
Loaded Trucks	0.076	0.027	0.010
Jackhammer	0.035	0.012	0.004
Small Bulldozer	0.003	0.001	0.0004

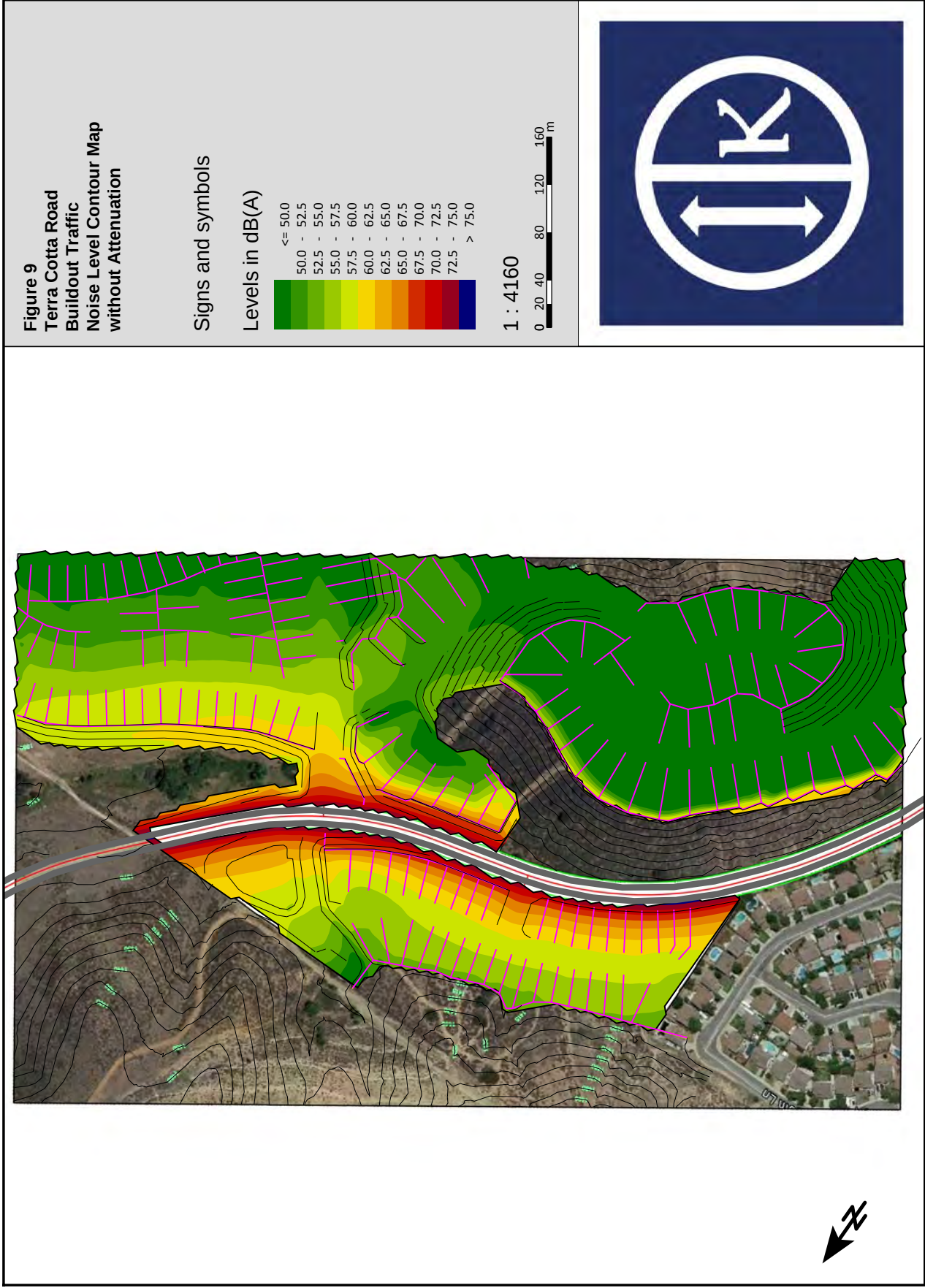
¹ Source: Federal Transit Administration: Transit Noise and Vibration Impact Assessment, 2006.

² Bold values are considered annoying to people.









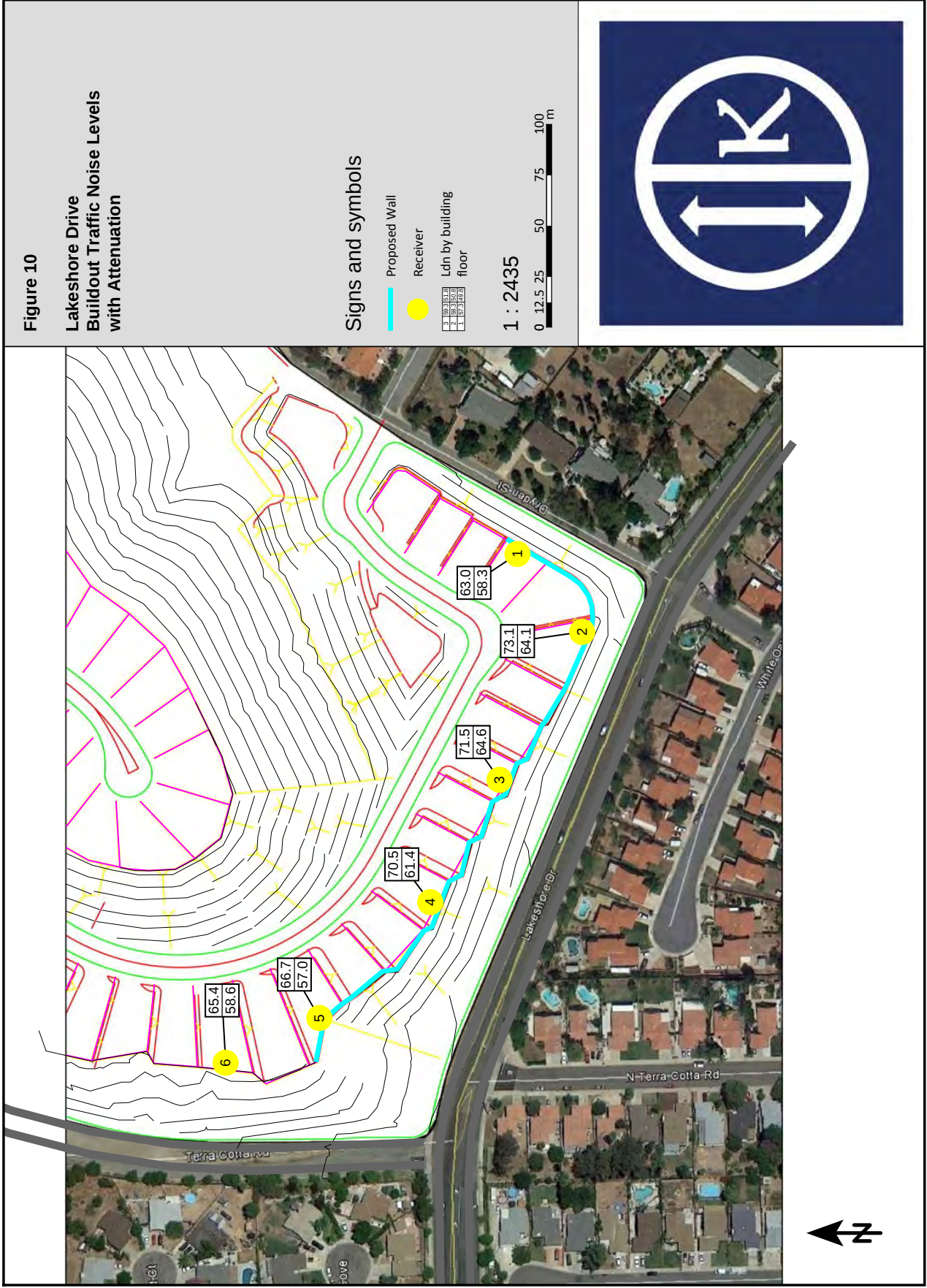


Figure 11
Terra Cotta Road
Buildout Traffic Noise Levels
with Attenuation

Signs and symbols

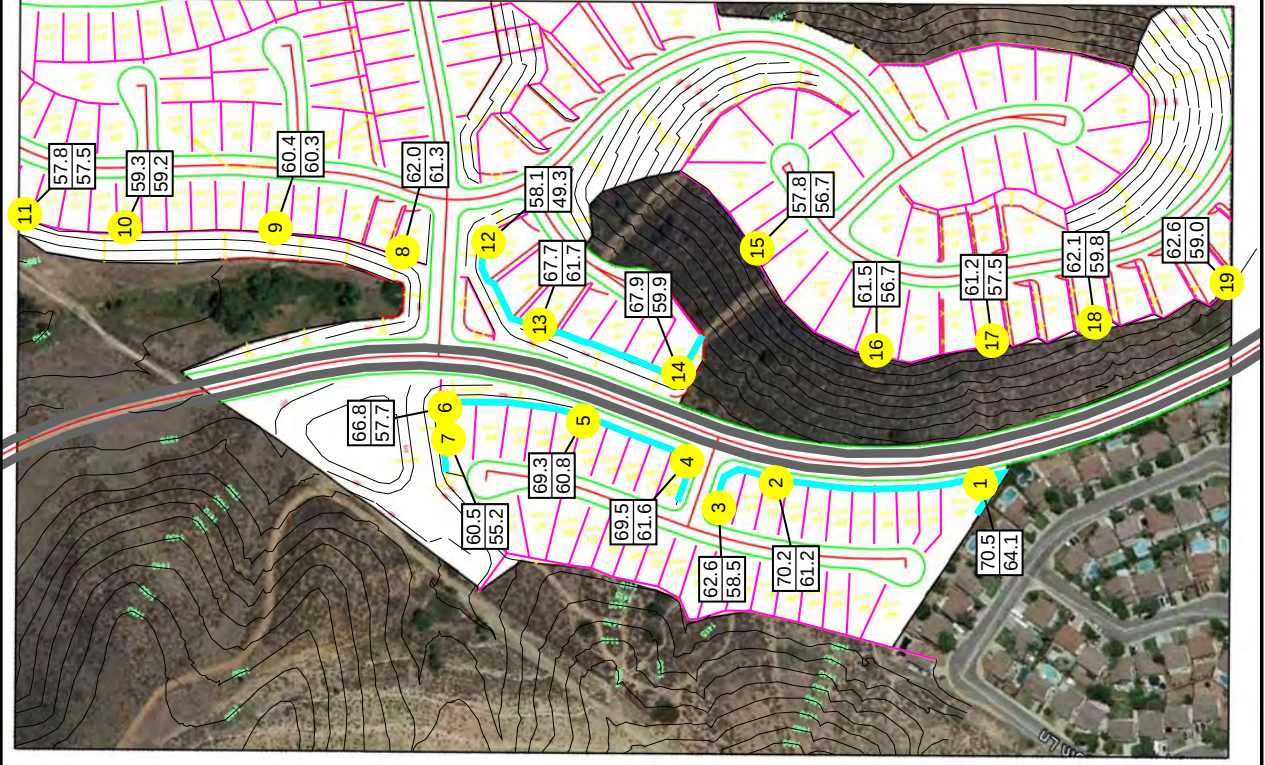
Proposed Wall

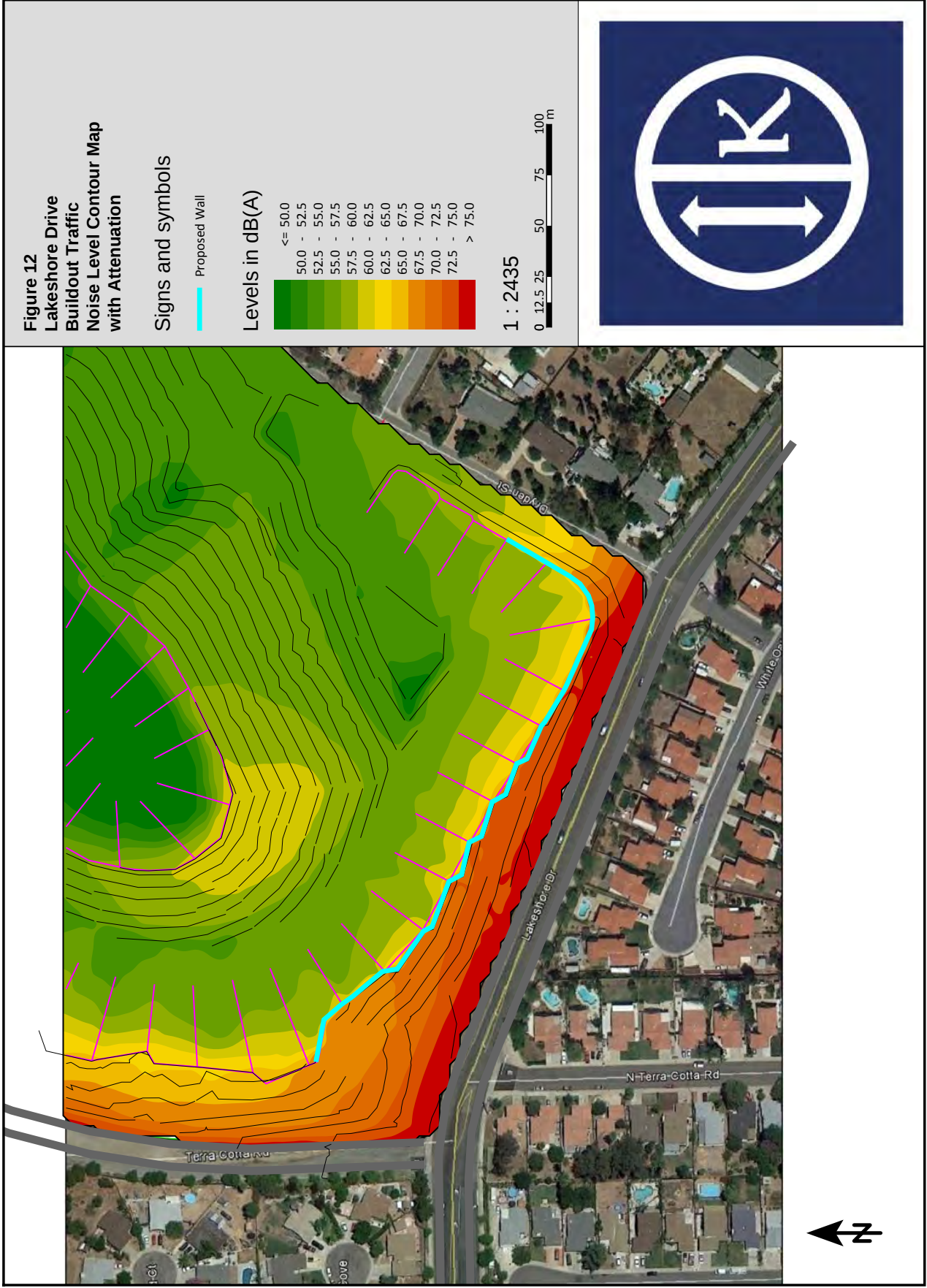
Receiver

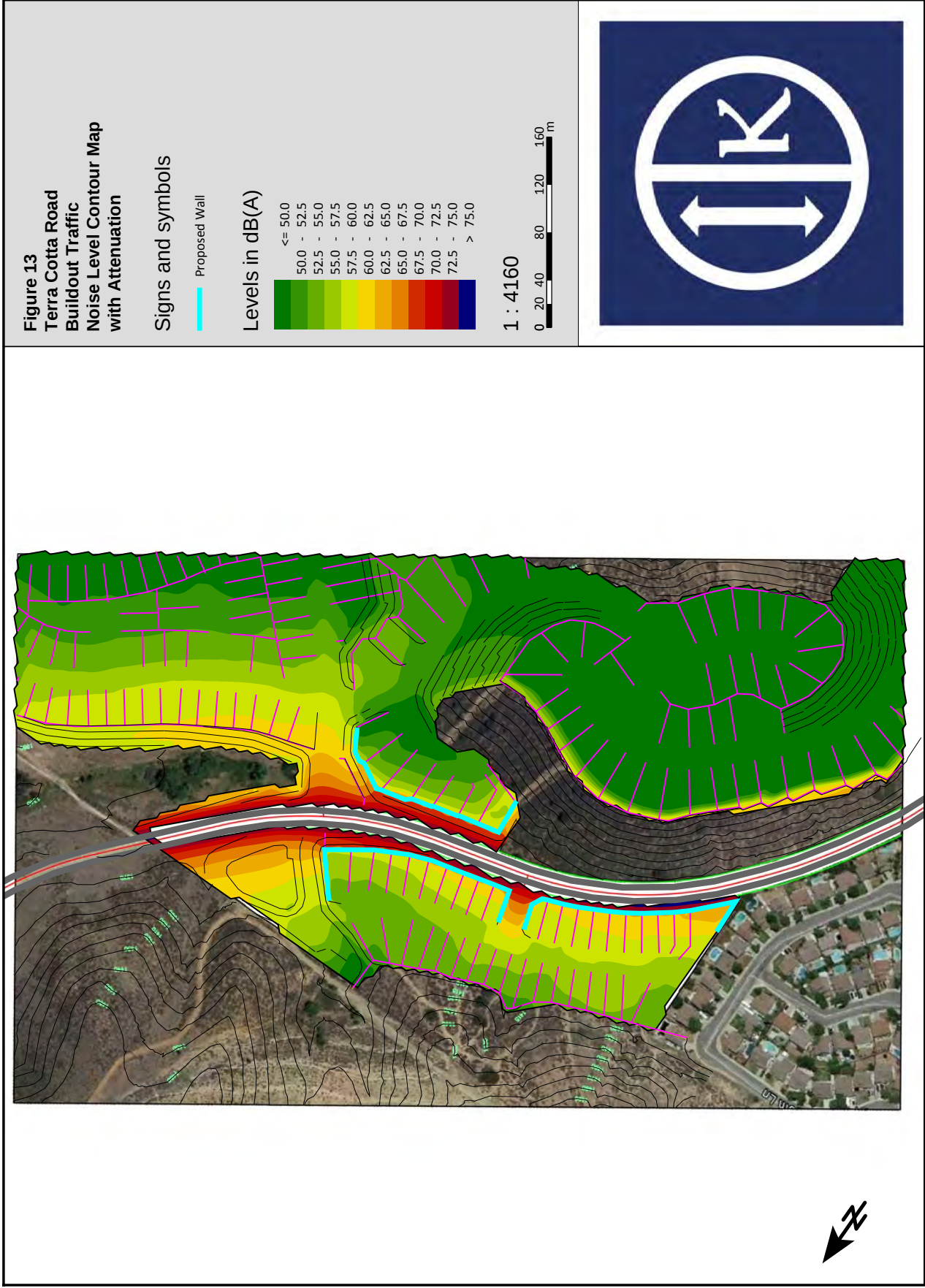
Ldn by building floor

1 : 4160

0 20 40 80 120 160 m







VII. Mitigation Measures

A. Traffic Measures

1. Mitigation is required in order to achieve exterior noise levels of 65 dBA Ldn at several proposed sensitive receptors adjacent to Lakeshore Drive and Terra Cotta Road. This mitigation can be provided by constructing a five foot barrier along the property lines of Lots 66-72 and a six foot high barrier at the property lines of Lots 5-16, 431-441, and 459-468. If Village 6 is constructed with multi-family residential dwelling units as proposed in Option B, then a six foot barrier will still be necessary along its entire frontage with Terra Cotta Road. Barriers may be constructed of any material weighing at least 4 pounds per square foot. They must also descend all the way to the ground and contain no holes or openings. Barriers shall wrap around to protect the side yards of lots adjacent to intersections. The recommended barrier configurations are shown on Figures 12 and 13.
2. As it is usually not aesthetically desirable to construct barriers high enough to reduce interior noise levels at second story sensitive receptors, enhanced building construction methods and materials must be employed to attenuate the approximately 20-28 dB required to achieve acceptable interior noise levels. These methods are shown as Mitigation Methods 1 through 6 in Table 7.

A. Construction Measures

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards. The contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.
2. The contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.
3. Temporary noise barriers that provide at least 10 dBA in attenuation, must be installed when project construction occurs within 160 feet of an existing residential property line. Any such barriers should break the line of sight from noise generators to sensitive receptors. They should also be constructed as close to the sensitive receptor as possible to achieve the greatest attenuation effect and have no gaps or openings.
4. Because City standards would be exceeded at sensitive receptors up to 890' from the property line, no construction should be performed at night (7:00 PM to 7:00 AM) Mondays through Fridays, and not at all on weekends or holidays.
5. During construction, the developer shall require that all contractors turn off all construction equipment and delivery vehicles when not in use and prohibit idling in excess of 3 minutes.

6. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (7:00 AM to 7:00 PM). To the extent feasible, haul routes should not pass sensitive land uses or residential dwellings.
7. For the duration of construction activities, the construction manager shall serve as the contact person should noise levels become disruptive to local residents. A sign should be posted at the project site with the contact phone number.

VIII. References

Bolt, Baranek, and Newman

- 1971 Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances

California Department of Transportation (Caltrans)

- 2004 Transportation and Construction-Induced Vibration Guidance Manual
2009 Technical Noise Supplement. Division of Environmental Analysis

Federal Transit Administration

- 2006 Transit Noise and Vibration Impact Assessment

Harris, Cyril M.

- 1991 Handbook of Acoustical Measurement and Noise Control

Kunzman Associates, Inc.

- 2013 Terracina Traffic Impact Analysis (Revised)

Lake Elsinore, City of

- 2011 General Plan
2011 General Plan Final Program EIR
1994 Municipal Code – Chapter 17.176, Noise Control

Riverside, County of

- 2003 General Plan Circulation Element
2009 Requirements for determining and mitigating traffic noise impacts to residential structures. Department of Health – Office of Industrial Hygiene

Appendices

Appendix A – Noise Measurement Data Sheets

Appendix B – RCNM Noise Modeling Sheets

Appendix C – SoundPLAN Output

APPENDIX A

Noise Measurement Data Sheets

Summary

Filename	LxT_Data.048
Serial Number	3099
Model	LxT1
Firmware Version	2.112

User

Location

Job Description

Note

Measurement Description

Start	25/04/2013 14:45:53
-------	---------------------

Stop	25/04/2013 15:00:53
------	---------------------

Duration	0:15:00.0
----------	-----------

Run Time	0:15:00.0
----------	-----------

Pause	0:00:00.0
-------	-----------

Pre Calibration	25/04/2013 14:41:53
-----------------	---------------------

Post Calibration	None
------------------	------

Calibration Deviation	---
-----------------------	-----

Overall Settings

RMS Weight	A Weighting
------------	-------------

Peak Weight	Z Weighting
-------------	-------------

Detector	Slow
----------	------

Preamp	PRMLxT1L
--------	----------

Integration Method	Exponential
--------------------	-------------

Overload	121.6 dB
----------	----------

	A	C	Z
Under Range Peak	77.8	74.8	79.8 dB

Under Range Limit	25.1	25.2	30.0 dB
-------------------	-------------	------	---------

Noise Floor	15.9	16.0	20.9 dB
-------------	------	------	---------

Results

LASeq	51.9 dB
-------	---------

LASE	81.4 dB
------	---------

EAS	15.367 $\mu\text{Pa}^2\text{h}$
-----	---------------------------------

EAS8	491.739 $\mu\text{Pa}^2\text{h}$
------	----------------------------------

EAS40	2.459 mPa^2h
-------	------------------------------

LZpeak (max)	25/04/2013 14:51:00	112.8 dB
--------------	---------------------	----------

LASmax	25/04/2013 14:53:00	70.5 dB
--------	---------------------	---------

LASmin	25/04/2013 14:58:43	34.9 dB
--------	---------------------	---------

SEA	-99.9 dB
-----	----------

LAS > 65.0 dB (Exceedence Counts / Duration)	2	13.1 s
--	---	--------

LAS > 60.0 dB (Exceedence Counts / Duration)	8	33.4 s
--	---	--------

LZpeak > 110.0 dB (Exceedence Counts / Duration)	2	1.2 s
--	---	-------

LZpeak > 90.0 dB (Exceedence Counts / Duration)	142	267.0 s
---	-----	---------

LZpeak > 70.0 dB (Exceedence Counts / Duration)	78	818.1 s
---	----	---------

LCSeq	72.6 dB
LASeq	51.9 dB
LCSeq - LASeq	20.8 dB
LAeq	59.1 dB
LAeq	51.9 dB
LAeq - LAeq	7.3 dB
# Overloads	0
Overload Duration	0.0 s

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exch. Rate	5	5 dB
Threshold	None	None dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results

Dose	0.0	0.0 %
Projected Dose	0.3	0.3 %
TWA (Projected)	48.6	48.6 dB
TWA (t)	23.6	23.6 dB
Lep (t)	36.8	36.8 dB

Statistics

LAS1.67	63.3 dB
LAS8.33	54.9 dB
LAS25.00	48.2 dB
LAS50.00	43.3 dB
LAS66.67	41.1 dB
LAS90.00	38.3 dB

Calibration History

Preamp	Date	dB re. 1V/Pa
Direct	01/01/2007 0:21:41	-24.8
PRMLxT1L	25/04/2013 14:41:41	-27.8
PRMLxT1L	16/04/2013 14:05:30	-27.8
PRMLxT1L	10/04/2013 11:40:35	-27.7
PRMLxT1L	14/03/2013 12:02:04	-27.7
PRMLxT1L	08/01/2013 12:07:37	-27.7
PRMLxT1L	06/12/2012 15:09:54	-27.8
PRMLxT1L	13/11/2012 12:49:31	-27.5
PRMLxT1L	01/11/2012 11:27:50	-27.7
PRMLxT1L	11/10/2012 11:15:29	-27.6
PRMLxT1L	31/07/2012 16:12:16	-27.4
PRMLxT1L	30/07/2012 9:39:49	-27.3

Summary

Filename	LxT_Data.049
Serial Number	3099
Model	LxT1
Firmware Version	2.112

User

Location

Job Description

Note

Measurement Description

Start	25/04/2013 15:10:28
-------	---------------------

Stop	25/04/2013 15:25:28
------	---------------------

Duration	0:15:00.0
----------	-----------

Run Time	0:15:00.0
----------	-----------

Pause	0:00:00.0
-------	-----------

Pre Calibration	25/04/2013 14:41:41
-----------------	---------------------

Post Calibration	None
------------------	------

Calibration Deviation	---
-----------------------	-----

Overall Settings

RMS Weight	A Weighting
------------	-------------

Peak Weight	Z Weighting
-------------	-------------

Detector	Slow
----------	------

Preamp	PRMLxT1L
--------	----------

Integration Method	Exponential
--------------------	-------------

Overload	121.6 dB
----------	----------

	A	C	Z
Under Range Peak	77.8	74.8	79.8 dB

Under Range Limit	25.1	25.2	30.0 dB
-------------------	------	------	---------

Noise Floor	15.9	16.0	20.9 dB
-------------	------	------	---------

Results

LASeq	56.1 dB
-------	---------

LASE	85.6 dB
------	---------

EAS	40.568 $\mu\text{Pa}^2\text{h}$
-----	---------------------------------

EAS8	1.298 mPa^2h
------	------------------------------

EAS40	6.491 mPa^2h
-------	------------------------------

LZpeak (max)	25/04/2013 15:22:33	110.0 dB
--------------	---------------------	----------

LASmax	25/04/2013 15:12:22	77.6 dB
--------	---------------------	---------

LASmin	25/04/2013 15:24:47	34.3 dB
--------	---------------------	---------

SEA	-99.9 dB
-----	----------

LAS > 65.0 dB (Exceedence Counts / Duration)	5	22.4 s
--	---	--------

LAS > 60.0 dB (Exceedence Counts / Duration)	13	54.3 s
--	----	--------

LZpeak > 110.0 dB (Exceedence Counts / Duration)	1	1.0 s
--	---	-------

LZpeak > 90.0 dB (Exceedence Counts / Duration)	171	318.2 s
---	-----	---------

LZpeak > 70.0 dB (Exceedence Counts / Duration)	14	897.0 s
---	----	---------

LCSeq	73.7 dB
LASeq	56.1 dB
LCSeq - LASeq	17.6 dB
LAeq	60.2 dB
LAeq	56.1 dB
LAeq - LAeq	4.1 dB
# Overloads	0
Overload Duration	0.0 s

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exch. Rate	5	5 dB
Threshold	None	None dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results

Dose	0.0	0.0 %
Projected Dose	0.5	0.5 %
TWA (Projected)	52.0	52.0 dB
TWA (t)	27.0	27.0 dB
Lep (t)	41.0	41.0 dB

Statistics

LAS1.67	66.1 dB
LAS8.33	57.0 dB
LAS25.00	51.1 dB
LAS50.00	47.9 dB
LAS66.67	45.3 dB
LAS90.00	39.6 dB

Calibration History

Preamp	Date	dB re. 1V/Pa
Direct	01/01/2007 0:21:41	-24.8
PRMLxT1L	25/04/2013 14:41:41	-27.8
PRMLxT1L	16/04/2013 14:05:30	-27.8
PRMLxT1L	10/04/2013 11:40:35	-27.7
PRMLxT1L	14/03/2013 12:02:04	-27.7
PRMLxT1L	08/01/2013 12:07:37	-27.7
PRMLxT1L	06/12/2012 15:09:54	-27.8
PRMLxT1L	13/11/2012 12:49:31	-27.5
PRMLxT1L	01/11/2012 11:27:50	-27.7
PRMLxT1L	11/10/2012 11:15:29	-27.6
PRMLxT1L	31/07/2012 16:12:16	-27.4
PRMLxT1L	30/07/2012 9:39:49	-27.3

Record #	Date	Time	Duration	Run Time	Pause	LASeq	LASE	LASmin
1	25/04/2013	15:10:28	00:15:00.0	00:15:00.0	00:00:00.0	56.1	85.6	34.3

Time	LASmax	Time	LZpeak (max)	Time	SPL 1 Count	Duration	SPL 2 Count	Duration
15:24:47	77.6	15:12:22	110.0	15:22:33	5	22.4	13	54.3

Peak 1 Count	Duration	Peak 2 Count	Duration	Peak 3 Count	Duration	TWA(Projected) 0	TWA(Projected) 1	LAS1.67
1	1.0	171	318.2	14	897.0	52.0	52.0	66.1

LAS8.33	LAS25.00	LAS50.00	LAS66.67	LAS90.00	SEA	LCSeq	LASEq	LCSeq - LASEq
57.0	51.1	47.9	45.3	39.6	-99.9	73.7	56.1	17.6

LALeq	LALeq	LALeq-LAeq	# Overloads	Duration
60.2	56.1	4.1	0	0.0

Summary

Filename	LxT_Data.050
Serial Number	3099
Model	LxT1
Firmware Version	2.112

User

Location

Job Description

Note

Measurement Description

Start	25/04/2013 15:29:27
-------	---------------------

Stop	25/04/2013 15:44:27
------	---------------------

Duration	0:15:00.0
----------	-----------

Run Time	0:15:00.0
----------	-----------

Pause	0:00:00.0
-------	-----------

Pre Calibration	25/04/2013 14:41:41
-----------------	---------------------

Post Calibration	None
------------------	------

Calibration Deviation	---
-----------------------	-----

Overall Settings

RMS Weight	A Weighting
------------	-------------

Peak Weight	Z Weighting
-------------	-------------

Detector	Slow
----------	------

Preamp	PRMLxT1L
--------	----------

Integration Method	Exponential
--------------------	-------------

Overload	121.6 dB
----------	----------

	A	C	Z
Under Range Peak	77.8	74.8	79.8 dB

Under Range Limit	25.1	25.2	30.0 dB
-------------------	-------------	------	---------

Noise Floor	15.9	16.0	20.9 dB
-------------	------	------	---------

Results

LASeq	67.1 dB
-------	---------

LASE	96.7 dB
------	---------

EAS	517.243 $\mu\text{Pa}^2\text{h}$
-----	----------------------------------

EAS8	16.552 mPa^2h
------	-------------------------------

EAS40	82.759 mPa^2h
-------	-------------------------------

LZpeak (max)	25/04/2013 15:32:07	122.1 dB
--------------	---------------------	----------

LASmax	25/04/2013 15:32:08	84.5 dB
--------	---------------------	---------

LASmin	25/04/2013 15:37:52	46.0 dB
--------	---------------------	---------

SEA	134.8 dB
-----	----------

LAS > 65.0 dB (Exceedence Counts / Duration)	23	198.9 s
--	----	---------

LAS > 60.0 dB (Exceedence Counts / Duration)	36	396.1 s
--	----	---------

LZpeak > 110.0 dB (Exceedence Counts / Duration)	43	62.2 s
--	----	--------

LZpeak > 90.0 dB (Exceedence Counts / Duration)	139	712.3 s
---	-----	---------

LZpeak > 70.0 dB (Exceedence Counts / Duration)	1	899.9 s
---	---	---------

LCSeq	87.4 dB
LASeq	67.1 dB
LCSeq - LASeq	20.2 dB
LAeq	71.9 dB
LAeq	67.1 dB
LAeq - LAeq	4.8 dB
# Overloads	1
Overload Duration	2.0 s

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exch. Rate	5	5 dB
Threshold	None	None dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results

Dose	0.1	0.1 %
Projected Dose	2.7	2.7 %
TWA (Projected)	63.9	63.9 dB
TWA (t)	38.9	38.9 dB
Lep (t)	52.1	52.1 dB

Statistics

LAS1.67	77.9 dB
LAS8.33	70.5 dB
LAS25.00	63.1 dB
LAS50.00	58.1 dB
LAS66.67	56.5 dB
LAS90.00	53.1 dB

Calibration History

Preamp	Date	dB re. 1V/Pa
Direct	01/01/2007 0:21:41	-24.8
PRMLxT1L	25/04/2013 14:41:41	-27.8
PRMLxT1L	16/04/2013 14:05:30	-27.8
PRMLxT1L	10/04/2013 11:40:35	-27.7
PRMLxT1L	14/03/2013 12:02:04	-27.7
PRMLxT1L	08/01/2013 12:07:37	-27.7
PRMLxT1L	06/12/2012 15:09:54	-27.8
PRMLxT1L	13/11/2012 12:49:31	-27.5
PRMLxT1L	01/11/2012 11:27:50	-27.7
PRMLxT1L	11/10/2012 11:15:29	-27.6
PRMLxT1L	31/07/2012 16:12:16	-27.4
PRMLxT1L	30/07/2012 9:39:49	-27.3

Record #	Date	Time	Duration	Run Time	Pause	LASeq	LASE	LASmin
1	25/04/2013	15:29:27	00:15:00.0	00:15:00.0	00:00:00.0	67.1	96.7	46.0

Time	LASmax	Time	LZpeak (max)	Time	SPL 1 Count	Duration	SPL 2 Count	Duration
15:37:52	84.5	15:32:08	122.1	15:32:07	23	198.9	36	396.1

Peak 1 Count	Duration	Peak 2 Count	Duration	Peak 3 Count	Duration	TWA(Projected) 0	TWA(Projected) 1	LAS1.67
43	62.2	139	712.3	1	899.9	63.9	63.9	77.9

LAS8.33	LAS25.00	LAS50.00	LAS66.67	LAS90.00	SEA	LCSeq	LASEq	LCSeq - LASEq
70.5	63.1	58.1	56.5	53.1	134.8	87.4	67.1	20.2

LAleq	LAeq	LAleq-LAeq	# Overloads	Duration
71.9	67.1	4.8	1	2.0

Summary

Filename	LxT_Data.051
Serial Number	3099
Model	LxT1
Firmware Version	2.112
User	
Location	
Job Description	
Note	
Measurement Description	
Start	25/04/2013 15:51:26
Stop	25/04/2013 14:06:26
Duration	0:15:00.0
Run Time	0:00:00.8
Pause	0:14:59.2
Pre Calibration	25/04/2013 14:41:41
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	Z Weighting		
Detector	Slow		
Preamp	PRMLxT1L		
Integration Method	Exponential		
Overload	121.6 dB		
	A	C	Z
Under Range Peak	77.8	74.8	79.8 dB
Under Range Limit	25.1	25.2	30.0 dB
Noise Floor	15.9	16.0	20.9 dB

Results

LASeq	46.8 dB	
LASE	45.9 dB	
EAS	0.004 $\mu\text{Pa}^2\text{h}$	
EAS8	154.253 $\mu\text{Pa}^2\text{h}$	
EAS40	771.265 $\mu\text{Pa}^2\text{h}$	
LZpeak (max)	25/04/2013 15:51:26	85.0 dB
LASmax	25/04/2013 15:51:26	52.6 dB
LASmin	25/04/2013 15:51:26	44.5 dB
SEA	-99.9 dB	
LAS > 65.0 dB (Exceedence Counts / Duration)	0	0.0 s
LAS > 60.0 dB (Exceedence Counts / Duration)	0	0.0 s
LZpeak > 110.0 dB (Exceedence Counts / Duration)	0	0.0 s
LZpeak > 90.0 dB (Exceedence Counts / Duration)	0	0.0 s
LZpeak > 70.0 dB (Exceedence Counts / Duration)	1	0.8 s

LCSeq	68.7 dB
LASeq	46.8 dB
LCSeq - LASeq	21.8 dB
LAeq	58.5 dB
LAeq	45.5 dB
LAeq - LAeq	13.0 dB
# Overloads	0
Overload Duration	0.0 s

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exch. Rate	5	5 dB
Threshold	None	None dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results

Dose	0.0	0.0 %
Projected Dose	0.2	0.2 %
TWA (Projected)	46.5	46.5 dB
TWA (t)	-29.2	-29.2 dB
Lep (t)	1.3	1.3 dB

Statistics

LAS1.67	52.6 dB
LAS8.33	52.4 dB
LAS25.00	45.6 dB
LAS50.00	45.5 dB
LAS66.67	45.3 dB
LAS90.00	44.6 dB

Calibration History

Preamp	Date	dB re. 1V/Pa
Direct	01/01/2007 0:21:41	-24.8
PRMLxT1L	25/04/2013 14:41:41	-27.8
PRMLxT1L	16/04/2013 14:05:30	-27.8
PRMLxT1L	10/04/2013 11:40:35	-27.7
PRMLxT1L	14/03/2013 12:02:04	-27.7
PRMLxT1L	08/01/2013 12:07:37	-27.7
PRMLxT1L	06/12/2012 15:09:54	-27.8
PRMLxT1L	13/11/2012 12:49:31	-27.5
PRMLxT1L	01/11/2012 11:27:50	-27.7
PRMLxT1L	11/10/2012 11:15:29	-27.6
PRMLxT1L	31/07/2012 16:12:16	-27.4
PRMLxT1L	30/07/2012 9:39:49	-27.3

Record #	Date	Time	Duration	Run Time	Pause	LASeq	LASE	LASmin
1	25/04/2013	15:51:26	00:15:00.0	00:00:00.8	00:14:59.2	46.8	45.9	44.5

Time	LASmax	Time	LZpeak (max)	Time	SPL 1 Count	Duration	SPL 2 Count	Duration
15:51:26	52.6	15:51:26	85.0	15:51:26	0	0.0	0	0.0

Peak 1 Count	Duration	Peak 2 Count	Duration	Peak 3 Count	Duration	TWA(Projected) 0	TWA(Projected) 1	LAS1.67
0	0.0	0	0.0	1	0.8	46.5	46.5	52.6

LAS8.33	LAS25.00	LAS50.00	LAS66.67	LAS90.00	SEA	LCSeq	LASEq	LCSeq - LASEq
52.4	45.6	45.5	45.3	44.6	-99.9	68.7	46.8	21.8

LAleq	LAeq	LAleq-LAeq	# Overloads	Duration
58.5	45.5	13.0	0	0.0

APPENDIX B

RCNM Noise Modeling Sheets

Terracina Construction - Lmax
Roadway Construction Noise Model (RCNM), Version 1.1

Report date:
Case Description:

05/10/2013
Boomtown Construction Lmax

**** Receptor #1 ****

Description	Land Use	Baselines (dBA)	
		Daytime	Night
75 dBA	Residential	59.0	59.0

Equipment

Description	Impact Device	Usage (%)	Spec		Receptor Distance (feet)	Estimated Shielding (dBA)
			Lmax (dBA)	Actual Lmax (dBA)		
Grader	No	40	85.0	77.6	158.0	0.0
Backhoe	No	40		81.7	158.0	0.0
Dozer	No	40		80.7	158.0	0.0
Excavator	No	40		75.0	158.0	0.0
Pickup Truck	No	40				

Results

Noise Limit Exceedance (dBA)				Noise Limits (dBA)																			
				Calculated (dBA)				Day				Evening				Night				Day			

		Terracina Construction - Lmax					
Total		75.0	74.3	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA)	
		Daytime	Evening
60 dBA	Residential	59.0	59.0

Equipment

Description	Impact Device	Usage (%)	Spec		Receptor Distance (feet)	Estimated Shielding (dBA)
			Lmax (dBA)	Actual Lmax (dBA)		
Grader	No	40	85.0	77.6	890.0	0.0
Backhoe	No	40		81.7	890.0	0.0
Dozer	No	40		80.7	890.0	0.0
Excavator	No	40		75.0	890.0	0.0
Pickup Truck	No	40				

Results

Noise Limit Exceedance (dBA)

Noise Limits (dBA)

		Calculated (dBA)		Day		Evening		Night		Day	
Evening		Night		Lmax		Lmax		Lmax		Lmax	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader	N/A		60.0		N/A		N/A		N/A		N/A
Backhoe	N/A		52.6		N/A		N/A		N/A		N/A
Dozer	N/A		56.7		N/A		N/A		N/A		N/A
Excavator	N/A		55.7		N/A		N/A		N/A		N/A
Pickup Truck	N/A		50.0		N/A		N/A		N/A		N/A
Total	N/A		60.0		N/A		N/A		N/A		N/A
N/A	N/A										

Terracina Construction - Lmax

**** Receptor #3 ****

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
Closest Sensitive Receptor	Residential	59.0	59.0	59.0

Equipment

Description	Impact Device	Usage (%)	Spec		Receptor Distance (feet)	Estimated Shielding (dBA)
			Lmax (dBA)	Actual Lmax (dBA)		
Grader	No	40	85.0	77.6	50.0	0.0
Backhoe	No	40		81.7	50.0	0.0
Dozer	No	40		80.7	50.0	0.0
Excavator	No	40		75.0	50.0	0.0
Pickup Truck	No	40				

Results

Noise Limit Exceedance (dBA)

Noise Limits (dBA)

Equipment	Evening		Night		Day		Evening		Night		Day	
	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #4 ****

Terracina Construction - Lmax

Description	Land Use	Daytime	Baselines (dBA)		Receptor Distance (feet)	Estimated Shielding (dBA)
			Evening	Night		
100'	Residential	59.0	59.0	59.0		
Equipment						
Description	Impact Device	Usage (%)	Spec		Receptor Distance (feet)	Estimated Shielding (dBA)
			Lmax (dBA)	Actual Lmax (dBA)		
Grader	No	40	85.0		100.0	0.0
Backhoe	No	40		77.6	100.0	0.0
Dozer	No	40		81.7	100.0	0.0
Excavator	No	40		80.7	100.0	0.0
Pickup Truck	No	40		75.0	100.0	0.0

Results

Noise Limit Exceedance (dBA)			Noise Limits (dBA)					
			Day		Night		Day	
			Calculated (dBA)					
			Evening		Night		Day	
			Night					
Equipment	Lmax	Leq	Lmax		Lmax		Lmax	
			Leq	Leq	Leq	Leq	Leq	Leq
Grader	N/A	N/A	79.0	75.0	N/A	N/A	N/A	N/A
Backhoe	N/A	N/A	71.5	67.6	N/A	N/A	N/A	N/A
Dozer	N/A	N/A	75.6	71.7	N/A	N/A	N/A	N/A
Excavator	N/A	N/A	74.7	70.7	N/A	N/A	N/A	N/A
Pickup Truck	N/A	N/A	69.0	65.0	N/A	N/A	N/A	N/A
Total			79.0	78.3	N/A	N/A	N/A	N/A
N/A	N/A	N/A						

**** Receptor #5 ****

Baselines (dBA)

Terracina Construction - Lmax

Description	Land Use	Daytime	Evening	Night
500'	Residential	59.0	59.0	59.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		500.0	0.0
Backhoe	No	40		77.6	500.0	0.0
Dozer	No	40		81.7	500.0	0.0
Excavator	No	40		80.7	500.0	0.0
Pickup Truck	No	40		75.0	500.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Evening		Night		Day		Evening		Night		Day	
Calculated (dBA)		Calculated (dBA)		Calculated (dBA)		Calculated (dBA)		Calculated (dBA)		Calculated (dBA)	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader	N/A	N/A	65.0	61.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	N/A	N/A	57.6	53.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	N/A	N/A	61.7	57.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	N/A	N/A	60.7	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Pickup Truck	N/A	N/A	55.0	51.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	N/A	N/A	65.0	64.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #6 ****

Description	Land Use	Daytime	Evening	Night

1000'	Residential	Terracina Construction - Lmax				
		59.0	59.0	59.0	59.0	Lmax
Equipment						
Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		1000.0	0.0
Backhoe	No	40		77.6	1000.0	0.0
Dozer	No	40		81.7	1000.0	0.0
Excavator	No	40		80.7	1000.0	0.0
Pickup Truck	No	40		75.0	1000.0	0.0
Results						
Noise Limit Exceedance (dBA)			Noise Limits (dBA)			
-----			-----			
Evening			Day		Night	
-----			-----		-----	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq
-----	-----	-----	-----	-----	-----	-----
Grader	N/A	59.0	55.0	N/A	N/A	N/A
Backhoe	N/A	51.5	47.6	N/A	N/A	N/A
Dozer	N/A	55.6	51.7	N/A	N/A	N/A
Excavator	N/A	54.7	50.7	N/A	N/A	N/A
Pickup Truck	N/A	49.0	45.0	N/A	N/A	N/A
N/A	N/A	Total	58.3	N/A	N/A	N/A
N/A	N/A	N/A		N/A	N/A	N/A

APPENDIX C

**FHWA Traffic Noise Prediction Model –
FHWA-RD-77-108 Output**

Noise Analysis for Terracina
Existing Traffic Noise - Arnold Ave, Stoddard St to Gunnerson St
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME		ADT SPEED DISTANCE	#VALUE!	
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS			H.TRUCKS
INPUT PARAMETERS											
Vehicles per hour	6.13	0.07	0.03	1.14	0.00	0.00	0.85	0.08	0.03		0.32
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00		
NOISE CALCULATIONS											
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05		
ADJUSTMENTS											
Flow	2.13	-17.08	-21.03	-5.19	-30.88	-34.84	-6.47	-16.90	-20.86		
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31		
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00		
LEQ	34.93	25.44	26.70	27.61	11.64	12.90	26.33	25.61	26.88		

Noise Analysis for Terracina											
Existing Plus Project Traffic Noise - Arnold Ave, Stoddard St to Gummerson St											
Closest Sensitive Receptor											
	DAYTIME			EVENING			NIGHTTIME			ADT SPEED	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		
INPUT PARAMETERS											
Vehicles per hour	16.58	0.13	0.03	3.08	0.01	0.00	2.29	0.14	0.03	% A	0.32
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	13.81
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% DAY	10.27
										1.25	48.00
										% EVENING	0.60
										% NIGHT	2.00
										% DAY	50.00
										% EVENING	0.62
										% NIGHT	0.13
										% DAY	2.00
										% EVENING	0.01
										% NIGHT	0.14
NOISE CALCULATIONS											
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05	% HT	48.00
ADJUSTMENTS											
Flow	6.45	-14.49	-21.03	-0.86	-28.29	-34.84	-2.15	-14.31	-20.86		
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	41.48
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	39.78
LEQ	39.25	28.03	26.70	31.93	14.22	12.90	30.65	28.20	26.88	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	

Noise Analysis for Terracina
Existing Traffic Noise - Dryden St, Cimmaron Rd to Arnold Ave
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		
INPUT PARAMETERS											
Vehicles per hour	12.26	0.15	0.06	2.28	0.01	0.00	1.69	0.15	0.06	% A	0.32
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43
										1.84 % DAY	48.00
										% EVENING	2.00
										% NIGHT	0.04
										% DAY	50.00
										% EVENING	0.92
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	0.01
											0.37
NOISE CALCULATIONS											
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05	% HT	0.74
ADJUSTMENTS											
Flow	5.14	-14.07	-18.02	-2.17	-27.87	-31.83	-3.46	-13.89	-17.85		
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	41.47
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	38.95
LEQ	37.94	28.45	29.71	30.62	14.65	15.91	29.34	28.63	29.89	Day hour	89.00
										Absorptive?	no
DAY LEQ		38.95		EVENING LEQ	30.87		NIGHT LEQ	34.09		Use hour?	no
										GRADE dB	0.00
											TO TURN ON, COPY K2 TO J2
											TO TURN OFF, ENTER ADTS IN J2

Noise Analysis for Terracina
Existing Plus Project Traffic Noise - Dryden St, Cimmaron Rd to Arnold Ave
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME		ADT	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS		

INPUT PARAMETERS										
Vehicles per hour	24.73	0.23	0.06	4.59	0.01	0.00	3.41	0.24	0.06	% A
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	% DAY
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% EVENING
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% NIGHT
										1.42
										% DAY
										% EVENING
										% NIGHT
										50.00
										0.71
										0.18
										2.00
										% EVENING
										% NIGHT
										50.00
NOISE CALCULATIONS										
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05	% HT
ADJUSTMENTS										
Flow	8.19	-12.18	-18.02	0.87	-25.98	-31.83	-0.41	-12.01	-17.85	LEFT
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	RIGHT
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ
LEQ	40.98	30.33	29.71	33.67	16.53	15.91	32.38	30.51	29.89	Day hour
										Absorptive?
DAY LEQ	41.63			EVENING LEQ			NIGHT LEQ	35.83		Use hour?
CNEL				43.54						GRADE dB
										0.00
										TO TURN ON, COPY K2 TO J2
										TO TURN OFF, ENTER ADTS IN J2

INPUT PARAMETERS															ADT		#VALUE!							
AUTOS		M.TRUCKS		H.TRUCKS		AUTOS		EVENING		NIGHTTIME		H.TRUCKS		ADT		SPEED		DISTANCE						
DAYTIME																								
M.TRUCKS																								
Vehicles per hour	18.39	0.22	0.09	3.41	0.01	0.00	2.54	0.23	0.09	0.32														
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	% A	97.40	% DAY	75.54	73.58					
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% EVENING		% NIGHT	14.02	13.66					
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	1.84	% DAY	48.00	10.11					
															% EVENING		% NIGHT	2.00	0.88					
															% HT	0.74	% DAY	50.00	0.04					
															% EVENING		% NIGHT	48.00	0.92					
															% DAY		% EVENING	2.00	0.36					
															% NIGHT		% DAY	50.00	0.01					
																		50.00	0.37					
NOISE CALCULATIONS																								
Reference levels		65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05	74.83	80.05	80.05	80.05	% HT		% DAY	0.74	0.36					
																	% EVENING	2.00	0.01					
																	% NIGHT	50.00	0.37					
ADJUSTMENTS																								
Flow	6.90	-12.31	-16.26	-0.41	-26.11	-30.06	-1.70	-12.13	-16.09															
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	LEFT	-90.00								
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00								
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	43.23								
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	40.71								
LEQ	39.70	30.21	31.47	32.38	16.41	17.67	31.10	30.39	31.65											Day hour		89.00		
															Absorptive?	no	TO TURN ON, COPY K2 TO J2							
															Use hour?	no	TO TURN OFF, ENTER ADTS IN J2							
															GRADE dB	0.00								
DAY LEQ		40.71	EVENING LEQ		32.63	NIGHT LEQ		35.85																
CNEL																								

	DAYTIME			EVENING			NIGHTTIME		ADT SPEED DISTANCE	#VALUE!	
	AUTOS	M.TRUCKS	H.I.TRUCKS	AUTOS	M.TRUCKS	H.I.TRUCKS	M.TRUCKS	H.TRUCKS			
INPUT PARAMETERS											
Vehicles per hour	36.21	0.34	0.09	6.72	0.01	0.00	5.00	0.36	0.09	% A	0.32
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	% EVENING	75.54 14.02 10.24
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02 10.24
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% DAY	48.00 2.00 0.19
NOISE CALCULATIONS											
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05	% EVENING	50.00 48.00 2.00 50.00
ADJUSTMENTS											
Flow	9.84	-10.42	-16.26	2.53	-24.22	-30.06	1.24	-10.24	-16.09	% NIGHT	0.73 0.18 0.01 0.19
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	% DAY	50.00 48.00 2.00 50.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% NIGHT	0.73 0.18 0.01 0.19
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% DAY	50.00 48.00 2.00 50.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% NIGHT	0.73 0.18 0.01 0.19
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	% DAY	50.00 48.00 2.00 50.00
LEQ	42.64	32.09	31.47	35.32	18.29	17.67	34.04	32.27	31.65	% NIGHT	0.73 0.18 0.01 0.19
										% DAY	50.00 48.00 2.00 50.00
										% NIGHT	0.73 0.18 0.01 0.19
										% DAY	50.00 48.00 2.00 50.00
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										% NIGHT	0.73 0.18 0.01 0.19
										% DAY	50.00 48.00 2.00 50.00
										% NIGHT	0.73 0.18 0.01 0.19
										% DAY	50.00 48.00 2.00 50.00

Noise Analysis for Terracina
Existing Traffic Noise - Grand Avenue, South of Lakeshore Dr
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		

INPUT PARAMETERS											
Vehicles per hour	344.59	7.14	11.90	63.95	0.30	0.50	47.58	7.44	12.40	% A	0.32
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	50.00
										% DAY	1.50
										% EVENING	2.40
										% NIGHT	2.00
										% DAY	0.10
										% EVENING	50.00
										% NIGHT	2.50
NOISE CALCULATIONS											
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05	% HT	
ADJUSTMENTS											
Flow	19.63	2.79	5.01	12.31	-11.01	-8.79	11.03	2.97	5.19		
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	60.69
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	55.98
LEQ	52.42	45.31	52.74	45.11	31.50	38.94	43.82	45.48	52.92	Day hour	89.00
										Absorptive?	no
DAY LEQ		55.98		EVENING LEQ	46.20		NIGHT LEQ			Use hour?	no
CNEL			60.69							GRADE dB	0.00
											TO TURN ON, COPY K2 TO J2
											TO TURN OFF, ENTER ADTS IN J2

	DAYTIME			EVENING			NIGHTTIME		ADT			#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	DISTANCE	35.00
												285.00
INPUT PARAMETERS												
Vehicles per hour	355.67	7.22	11.90	66.01	0.30	0.50	49.11	7.52	12.40	% A		92.20 % DAY % EVENING
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00			75.54 14.02 12.93
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% MT		10.43 48.00 1.41
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00			2.95 % DAY % EVENING
												2.00 % NIGHT
NOISE CALCULATIONS												
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	65.11	74.83	80.05	% HT		50.00 48.00 2.33 2.00 50.00 2.00 50.00
												1.47 4.85 % DAY % EVENING % NIGHT
ADJUSTMENTS												
Flow	19.76	2.84	5.01	12.45	-10.96	-8.79	11.16	3.02	5.19			
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	LEFT		-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT		90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL		60.72
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ		56.05
LEQ	52.56	45.35	52.74	45.25	31.55	38.94	43.96	45.53	52.92	Day hour		89.00
										Absorptive?		no
										Use hour?		no
										GRADE dB		0.00
TO TURN ON, COPY K2 TO J2 TO TURN OFF, ENTER ADTS IN J2												

	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	EVENING M.TRUCKS	H.TRUCKS	AUTOS	NIGHTTIME M.TRUCKS	H.TRUCKS	ADT SPEED DISTANCE	#VALUE!
INPUT PARAMETERS											
Vehicles per hour	10.27	0.12	0.05	1.91	0.01	0.00	1.42	0.13	0.05	% A	0.32
Speed in MPH	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43
										% DAY	48.00
										% EVENING	0.88
										% NIGHT	2.00
										% HT	50.00
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	50.00
NOISE CALCULATIONS											
Reference levels	65.11	74.83	80.05	65.11	74.83	80.05	85.11	74.83	80.05		
ADJUSTMENTS											
Flow	4.37	-14.84	-18.79	-2.95	-28.64	-32.60	-4.23	-14.66	-13.62		
Distance	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	-7.31	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Gade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	40.70
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	38.18
LEQ	37.17	27.68	28.94	29.85	13.88	15.14	28.57	27.86	29.12	Day hour	89.00
										Absorbitive?	no
DAY LEQ		38.18		EVENING LEQ	30.10		NIGHT LEQ	33.31		Use hour?	no
CNEL			40.70							GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	

[illegible]

[illegible]

Noise Analysis for Terracina											
Existing Plus Project Traffic Noise - I-15 Freeway, North of Lake Street											
Closest Sensitive Receptor											
	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		
INPUT PARAMETERS											
Vehicles per hour	3372.67	20.38	227.74	625.96	0.85	9.49	465.67	21.23	237.23	% A	0.32
Speed in MPH	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	% EVENING	75.54 14.02
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	10.43 9.35
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	48.00 0.41
										% EVENING	2.00 0.02
										% NIGHT	50.00 0.43
NOISE CALCULATIONS											
Reference levels	76.79	82.53	85.83	76.79	82.53	85.83	76.79	82.53	85.83	% HT	9.52 48.00
										% EVENING	2.00 0.19
										% NIGHT	50.00 4.76
ADJUSTMENTS											
Flow	26.52	4.34	14.82	19.21	-9.47	1.02	17.92	4.51	14.99		
Distance	-12.37	-12.37	-12.37	-12.37	-12.37	-12.37	-12.37	-12.37	-12.37	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	71.48
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.88
LEQ	65.94	49.50	63.27	58.62	35.69	49.47	57.34	49.67	63.45	Day hour	89.00
										Absorptive?	no
DAY LEQ	67.88	67.88		EVENING LEQ	59.14	NIGHT LEQ		64.54		Use hour?	no
CNEL			71.48							GRADE dB	0.00
											TO TURN ON, COPY K2 TO J2
											TO TURN OFF, ENTER ADTS IN J2

[illegible]

	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE			#VALUE!			
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS				% A	% DAY	% EVENING	% NIGHT
0.32																
INPUT PARAMETERS																
Vehicles per hour	3161.60	19.09	214.23	586.78	0.80	8.93	436.53	19.89	223.16					89.59	75.54	67.68
Speed in MPH	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00	70.00					14.02	12.56
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00					10.43	9.56
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00				0.85	48.00	0.41
															2.00	0.02
															50.00	0.43
NOISE CALCULATIONS																
Reference levels	76.79	82.53	85.83	76.79	82.53	85.83	76.79	82.53	85.83					9.55	48.00	4.59
															2.00	0.19
															50.00	4.78
ADJUSTMENTS																
Flow	26.24	4.05	14.55	18.93	-9.75	0.75	17.64	4.23	14.73					-90.00		
Distance	-6.70	-6.70	-6.70	-6.70	-6.70	-6.70	-6.70	-6.70	-6.70					90.00		
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					76.89		
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00					73.28		
LEQ	71.33	54.89	68.68	64.02	41.09	54.88	62.74	55.07	68.86					89.00		
DAY LEQ		73.28		EVENING LEQ	64.54	NIGHT LEQ		69.95						no	TO TURN ON, COPY K2 TO J2	
CNEL			76.89											no	TO TURN OFF, ENTER ADTS IN J2	

Noise Analysis for Terracina
Existing Traffic Noise - Lake St. North of Nichols Rd
Closest Sensitive Receptor

INPUT PARAMETERS										ADT SPEED DISTANCE		#VALUE!	
DAYTIME				EVENING				NIGHTTIME					
AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS					
Vehicles per hour	7.26	12.10	65.03	0.30	0.50	48.38	7.56	12.60	% A		0.32	% DAY	75.54
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00				% EVENING	14.02
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% MT			% NIGHT	10.43
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00				% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
NOISE CALCULATIONS													
Reference levels	71.12	83.02	71.12	78.79	83.02	71.12	78.79	83.02	% HT			% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
ADJUSTMENTS													
Flow	18.15	1.31	10.84	-12.49	-10.27	9.55	1.49	3.71	LEFT			% DAY	48.00
Distance	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	RIGHT			% EVENING	2.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				% NIGHT	50.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				% DAY	48.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL			% EVENING	2.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ			% NIGHT	50.00
LEQ	63.41	54.25	56.09	40.44	46.89	54.81	54.42	60.87	Day hour			% DAY	48.00
									Absorbitive?			% EVENING	2.00
									Use hour?			% NIGHT	50.00
									GRADE dB			% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
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												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00
												% EVENING	2.00
												% NIGHT	50.00
												% DAY	48.00

Noise Analysis for Terracina
Existing Plus Project Traffic Noise - Lake St, North of Nichols Rd
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME			ADT	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		

INPUT PARAMETERS											
Vehicles per hour	398.98	7.58	12.10	74.05	0.32	0.50	55.09	7.90	12.60	% A	0.32
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	% EVENING	75.54 70.10
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02 13.01
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43 9.68
NOISE CALCULATIONS											
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02	% HT	48.00 1.39
ADJUSTMENTS											
Flow	18.71	1.50	3.53	11.40	-12.30	-10.27	10.12	1.68	3.71		2.00 0.06
Distance	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	69.61
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.96
LEQ	63.97	54.43	60.69	56.66	40.63	46.89	55.37	54.61	60.87	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	
										0.00	

Noise Analysis for Terracina
Existing Traffic Noise - Lakeshore Dr., Dryden St to Machado St
Closest Sensitive Receptor

	AUTOS	M-TRUCKS	H-TRUCKS	AUTOS	EVENING M-TRUCKS	H-TRUCKS	AUTOS	NIGHTTIME M-TRUCKS	H-TRUCKS	ADT SPEED DISTANCE	#VALUE!
INPUT PARAMETERS											
Vehicles per hour	356.17	7.38	12.30	66.10	0.31	0.51	49.18	7.69	12.81	% A	0.32
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43
										% DAY	9.00
										% EVENING	48.00
										% NIGHT	2.00
										% DAY	0.06
										% NIGHT	1.44
										% DAY	0.06
										% EVENING	2.00
										% NIGHT	50.00
										% DAY	1.50
										% EVENING	48.00
										% NIGHT	2.40
										% DAY	0.10
										% EVENING	2.00
										% NIGHT	50.00
											2.50
ADJUSTMENTS											
Flow	18.68	1.84	4.06	11.36	-11.96	-9.74	10.08	2.02	4.24		
Distance	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	70.05
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.96
LEQ	63.41	54.85	61.59	56.10	41.05	47.79	54.81	55.03	61.77	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	
DAY LEQ		65.96		EVENING LEQ	56.81		NIGHT LEQ	63.27		GRADE dB	0.00
CNEL			70.05								

	DAYTIME			EVENING			NIGHTTIME			ADT		#VALUE!	
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	DISTANCE		
INPUT PARAMETERS													
Vehicles per hour	387.39	7.58	12.30	71.90	0.32	0.51	53.49	7.90	12.81	% A		0.32	
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00			75.54	
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00			14.02	
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT		10.43	
												48.00	
												1.37	
												2.00	
												0.06	
												1.42	
												2.22	
												0.09	
												50.00	
												2.31	
NOISE CALCULATIONS													
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT		4.62	
												% DAY	
												% EVENING	
												% NIGHT	
ADJUSTMENTS													
Flow	19.04	1.96	4.06	11.73	-11.84	-9.74	10.44	2.14	4.24				
Distance	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	LEFT		-90.00	
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT		90.00	
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL		70.16	
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ		66.17	
LEQ	63.78	54.97	61.59	56.46	41.17	47.79	55.18	55.15	61.77	Day hour		89.00	
										Absorptive?		no	
										Use hour?		no	
										GRADE dB		0.00	

INPUT PARAMETERS											
DAYTIME			EVENING			NIGHTTIME			ADT		
AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	DISTANCE	
										40.00	40.00
									% A	92.00	% DAY
										% EVENING	
									% MT	3.00	% DAY
										% EVENING	
									% HT	5.00	% DAY
										% EVENING	
										% NIGHT	
NOISE CALCULATIONS											
Reference levels											
										50.00	1.50
										48.00	2.40
										2.00	0.10
										50.00	2.50
ADJUSTMENTS											
Flow											
									LEFT	-90.00	
									RIGHT	90.00	
									CNEL	69.97	
									DAY LEQ	65.58	
LEQ											
									Day hour	89.00	
TO TURN ON, COPY K2 TO J2											
DAY LEQ											
									Absorptive?	no	
TO TURN OFF, ENTER ADTS IN J2											
CNEL											
									Use hour?	no	
									GRADE dB	0.00	

Noise Analysis for Terracina												
Existing Plus Project Traffic Noise - Lakeshore Dr, East of Riverside Dr												
Closest Sensitive Receptor												
	DAYTIME			EVENING			NIGHTTIME			ADT	#VALUE!	
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS			
INPUT PARAMETERS												
Vehicles per hour	374.71	7.66	12.70	69.55	0.32	0.53	51.74	7.98	13.23	% A	0.32	69.59
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	% EVENING	92.12	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT		14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	2.96	10.43
										% DAY		48.00
										% EVENING		2.00
										% NIGHT		0.06
										% DAY	4.91	50.00
										% EVENING		1.48
										% NIGHT		2.36
										% DAY		48.00
										% EVENING		2.00
										% NIGHT		0.10
												2.46
NOISE CALCULATIONS												
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT		
ADJUSTMENTS												
Flow	19.41	2.52	4.71	12.10	-11.29	-9.09	10.81	2.69	4.89			
Distance	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	LEFT	-90.00	
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00	
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	69.99	
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.62	
LEQ	62.67	54.73	61.77	55.36	40.93	47.97	54.07	54.90	61.95	Day hour	89.00	
										Absorptive?	no	TO TURN ON, COPY K2 TO J2
DAY LEQ	65.62	65.62		EVENING LEQ	56.21		NIGHT LEQ	63.28		Use hour?	no	TO TURN OFF, ENTER ADTS IN J2
CNEL			69.99							GRADE dB	0.00	

[illegible]

Noise Analysis for Terracina												
Existing Plus Project Traffic Noise - Lakeshore Dr, Gummerson St to Riverside Dr												
Closest Sensitive Receptor												
	DAYTIME			EVENING			NIGHTTIME			ADT	#VALUE!	
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS			
INPUT PARAMETERS												
Vehicles per hour	503.82	9.94	16.20	93.51	0.41	0.68	69.56	10.35	16.88	% A	0.32	75.54
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	% EVENING		14.02
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT		10.43
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	2.87	48.00
										% EVENING		2.00
										% NIGHT		50.00
										% DAY	4.68	48.00
										% EVENING		2.00
										% NIGHT		50.00
NOISE CALCULATIONS												
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT		
ADJUSTMENTS												
Flow	20.70	3.65	5.77	13.38	-10.15	-8.03	12.10	3.82	5.95			
Distance	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	-0.07	LEFT	-90.00	
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00	
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	70.14	
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.83	
LEQ	62.99	54.89	61.86	55.67	41.09	48.06	54.39	55.07	62.04	Day hour	89.00	
										Absorptive?	no	TO TURN ON, COPY K2 TO J2
DAY LEQ	65.83			EVENING LEQ	56.49		NIGHT LEQ	63.41		Use hour?	no	TO TURN OFF, ENTER ADTS IN J2
CNEL			70.14							GRADE dB	0.00	

Noise Analysis for Terracina
Existing Traffic Noise - Lakeshore Dr, Lake St to Terra Cotta Rd
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE	#VALUE!
	AUTOS	M.TRUCKS		H.TRUCKS	AUTOS	M.TRUCKS		H.TRUCKS			
INPUT PARAMETERS											
Vehicles per hour	295.36	6.12	10.20	54.82	0.26	0.43	40.78	6.38	10.63	% A	0.32
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% DAY	10.43
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	0.06
										% DAY	1.50
										% EVENING	50.00
										% NIGHT	2.40
										% DAY	2.00
										% EVENING	0.10
										% NIGHT	2.50
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	
ADJUSTMENTS											
Flow	17.87	1.03	3.25	10.55	-12.77	-10.55	9.27	1.21	3.43		
Distance	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.37
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	64.27
LEQ	61.73	53.17	59.91	54.41	39.37	46.10	53.13	53.35	60.08	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	

Noise Analysis for Terracina
Existing Plus Project Traffic Noise - Lakeshore Dr, Lake St to Terra Cotta Rd
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		

INPUT PARAMETERS											
Vehicles per hour	306.44	6.20	10.20	56.87	0.26	0.43	42.31	6.46	10.63	% A	0.32
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	% EVENING	75.54 69.67
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02 12.93
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43 9.62
										% DAY	48.00 1.41
										% EVENING	2.94 2.00 0.06
										% NIGHT	50.00 1.47
										% DAY	48.00 2.32
										% EVENING	2.00 0.10
										% NIGHT	50.00 2.42

NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	4.83

ADJUSTMENTS											
Flow	18.03	1.09	3.25	10.71	-12.72	-10.55	9.43	1.26	3.43	LEFT	-90.00
Distance	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	RIGHT	90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.41
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	64.37

LEQ	61.89	53.22	59.91	54.57	39.42	46.10	53.29	53.40	60.08	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	
										0.00	

Noise Analysis for Terracina												
Existing Traffic Noise - Lakeshore Dr, Machado St to Gunnerson St												
Closest Sensitive Receptor												
	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE	#VALUE!	
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS			
INPUT PARAMETERS												
Vehicles per hour	474.89	9.84	16.40	88.14	0.41	0.68	65.57	10.25	17.08	% A	92.00	% DAY
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00			% EVENING
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00			% NIGHT
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3.00	% DAY
												% EVENING
												% NIGHT
NOISE CALCULATIONS												
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	5.00	% DAY
												% EVENING
												% NIGHT
ADJUSTMENTS												
Flow	20.44	3.60	5.82	13.13	-10.20	-7.98	11.84	3.78	6.00			
Distance	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	LEFT	-90.00	
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00	
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	71.08	
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	66.69	
LEQ	63.70	55.82	62.88	56.38	42.01	49.08	55.10	55.99	63.06	Day hour	89.00	
										Absorptive?	no	TO TURN ON, COPY K2 TO J2
DAY LEQ		66.69		EVENING LEQ	57.26		NIGHT LEQ	64.38		Use hour?	no	TO TURN OFF, ENTER ADTS IN J2
CNEL			71.08							GRADE dB	0.00	

Noise Analysis for Terracina
Existing Plus Project Traffic Noise - Lakeshore Dr, Machado St to Gunnerson St
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME			ADT	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		

INPUT PARAMETERS											
Vehicles per hour	499.16	10.00	16.40	92.64	0.42	0.68	68.92	10.42	17.08	% A	0.32
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	% EVENING	75.54 69.74
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02 12.94
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43 9.63
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	48.00 1.40
ADJUSTMENTS											
Flow	20.66	3.67	5.82	13.34	-10.13	-7.98	12.06	3.85	6.00	% EVENING	2.00 0.06
Distance	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	% NIGHT	50.00 1.46
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% DAY	48.00 2.29
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% EVENING	2.00 0.10
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% NIGHT	50.00 2.39
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	LEFT	-90.00
LEQ	63.91	55.89	62.88	56.60	42.08	49.08	55.32	56.06	63.06	RIGHT	90.00
DAY LEQ	66.81			EVENING LEQ	57.44		NIGHT LEQ			CNEL	71.14
CNEL				71.14						DAY LEQ	66.81
										Day hour	89.00
										Absorptive?	no
										Use hour?	no
										GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	

Closest Sensitive Receptor

INPUT PARAMETERS														ADT		#VALUE!				
DAYTIME				EVENING				NIGHTTIME		SPEED		DISTANCE								
AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	% A	% DAY	% EVENING	% DAY	% EVENING							
335.90	6.96	11.60	62.34	0.29	0.48	46.38	7.25	12.08		92.00	14.02	75.54	10.43	69.50	12.90					
45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00												
-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% MT	3.00	48.00	2.00	2.00	9.90	1.44					
90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00												
0.32																				
NOISE CALCULATIONS																				
69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.00	48.00	50.00	48.00	1.50	0.10					
ADJUSTMENTS																				
18.42	1.59	3.81	11.11	-12.21	-10.00	9.83	1.77	3.98												
-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	LEFT	-90.00	90.00	2.00	2.00							
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT											
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00												
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.93	64.83									
-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ											
LEQ														Day hour	89.00	89.00	89.00	89.00		
62.28	53.73	60.46	54.97	39.92	46.66	53.69	53.90	60.64	Absorptive?	no	no	no	no	TO TURN ON, COPY K2 TO J2						
DAY LEQ														Use hour?	no	no	no	no	TO TURN OFF, ENTER ADTS IN J2	
CNEL														GRADE dB	0.00	0.00	0.00	0.00		
														68.93						

[illegible]

	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	EVENING M.TRUCKS	H.TRUCKS	AUTOS	NIGHTTIME M.TRUCKS	H.TRUCKS	ADT SPEED DISTANCE	#VALUE!
INPUT PARAMETERS											
Vehicles per hour	257.52	3.09	1.24	47.79	0.13	0.05	35.56	3.22	1.30	% A	0.32
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	18.43
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	50.00
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	50.00
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	0.74
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	50.00
ADJUSTMENTS											
Flow	17.78	-1.43	-5.38	10.47	-15.23	-19.18	9.18	-1.25	-5.20		
Distance	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	63.58
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	61.36
LEQ	60.53	50.28	51.17	53.21	36.47	37.36	51.93	50.45	51.34	Day hour	89.00
										Absorptive?	no
DAY LEQ		61.36		EVENING LEQ			NIGHT LEQ			Use hour?	no
										TO TURN ON, COPY K2 TO J2	
CNEL			63.58							TO TURN OFF, ENTER ADTS IN J2	0.00

Noise Analysis for Terracina											
Existing Plus Project Traffic Noise - Machado St, South of Lakeshore Dr											
Closest Sensitive Receptor											
	DAYTIME			EVENING			NIGHTTIME			ADT	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		
INPUT PARAMETERS											
Vehicles per hour	264.47	3.13	1.24	49.09	0.13	0.05	36.52	3.26	1.30	% A	0.32
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	% EVENING	75.54 73.61
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02 13.66
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% DAY	10.43 10.16
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% EVENING	48.00 0.87
ADJUSTMENTS											
Flow	17.90	-1.37	-5.38	10.58	-15.17	-19.18	9.30	-1.19	-5.20	% NIGHT	2.00 0.04
Distance	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	% DAY	50.00 0.91
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% EVENING	48.00 0.35
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% NIGHT	2.00 0.01
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	% DAY	50.00 0.36
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	% EVENING	2.00 0.01
LEQ	60.64	50.33	51.17	53.33	36.53	37.36	52.05	50.51	51.34	% NIGHT	50.00 0.36
ADJUSTMENTS											
DAY LEQ	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	LEFT	-90.00
CNEL	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	RIGHT	90.00
ADJUSTMENTS											
DAY LEQ	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	CNEL	63.66
CNEL	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	DAY LEQ	61.46
ADJUSTMENTS											
DAY LEQ	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	Day hour	89.00
CNEL	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	Absorptive?	no
ADJUSTMENTS											
DAY LEQ	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	61.46	Use hour?	no
CNEL	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	63.66	GRADE dB	0.00

TO TURN ON, COPY K2 TO J2
TO TURN OFF, ENTER ADTS IN J2

	DAYTIME			EVENING			NIGHTTIME			ADT		#VALUE!		
	AUTOS	M.TRUCKS	H-TRUCKS	AUTOS	M.TRUCKS	H-TRUCKS	AUTOS	M.TRUCKS	H-TRUCKS	SPEED	DISTANCE	5300.00	50.00	860.00
INPUT PARAMETERS														
Vehicles per hour	153.47	3.18	5.30	28.48	0.13	0.22	21.19	3.31	5.52	% A		92.00	% DAY	0.32
Speed in MPH	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00				% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00				% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT		3.00	% DAY	10.43
													% EVENING	48.00
													% NIGHT	2.00
													% DAY	0.06
													% EVENING	50.00
													% NIGHT	1.50
NOISE CALCULATIONS														
Reference levels	71.12	78.79	83.02	71.12	78.79	83.02	71.12	78.79	83.02	% HT		5.00	% DAY	48.00
													% EVENING	2.40
													% NIGHT	0.10
														50.00
ADJUSTMENTS														2.50
Flow	14.56	-2.27	-0.05	7.25	-16.07	-13.85	5.97	-2.09	0.12			-90.00		
Distance	-12.43	-12.43	-12.43	-12.43	-12.43	-12.43	-12.43	-12.43	-12.43	LEFT				
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT		90.00		
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL		54.27		
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ		50.45		
LEQ	48.26	39.10	45.54	40.95	25.29	31.74	39.66	39.27	45.72	Day hour		89.00		
										Absorptive?		no	TO TURN ON, COPY K2 TO J2	
DAY LEQ		50.45		EVENING LEQ	41.54		NIGHT LEQ	47.41		Use hour?		no	TO TURN OFF, ENTER ADTS IN J2	
CNEL			54.27							GRADE dB		0.00		

[illegible]

INPUT PARAMETERS										ADT		#VALUE!	
										SPEED	DISTANCE	40.00	65.00
										% A	% DAY	92.00	0.32
										% EVENING	% NIGHT	75.54	69.50
										% MT	% DAY	10.43	12.90
										% EVENING	% NIGHT	48.00	9.94
										% DAY	% EVENING	2.00	1.44
										% NIGHT	% DAY	50.00	1.50
										% HT	% DAY	48.00	2.40
										% EVENING	% NIGHT	2.00	0.10
										% DAY	% NIGHT	50.00	2.50
NOISE CALCULATIONS													
Reference levels													
ADJUSTMENTS													
Flow													
Distance													
Finite Roadway													
Barrier													
Grade													
Constant													
LEQ													
DAY LEQ													
CNEL													

[illegible]

	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	EVENING M.TRUCKS	H.TRUCKS	AUTOS	NIGHTTIME M.TRUCKS	H.TRUCKS	ADT SPEED DISTANCE	#VALUE!
INPUT PARAMETERS											
Vehicles per hour	680.49	14.10	23.50	126.30	0.59	0.98	93.96	14.69	24.48	% A	0.32
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	0.06
										% DAY	1.44
										% EVENING	2.00
										% NIGHT	0.06
										% DAY	1.50
										% EVENING	50.00
										% NIGHT	48.00
										% DAY	2.40
										% EVENING	0.10
										% NIGHT	2.00
										% DAY	0.10
										% EVENING	2.00
										% NIGHT	50.00
										% DAY	2.50
ADJUSTMENTS											
Flow	22.00	5.17	7.38	14.69	-8.64	-6.42	13.40	5.34	7.56		
Distance	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	71.26
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	66.87
LEQ	63.88	55.99	63.06	56.56	42.19	49.26	55.28	56.17	63.24	Day hour	89.00
DAY LEQ				EVENING LEQ			NIGHT LEQ			Absorptive?	no
										Use hour?	no
CNEL			71.26							GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	

Noise Analysis for Terracina											
Existing Plus Project Traffic Noise - Riverside Dr, South of Lakeshore Dr											
Closest Sensitive Receptor											
	DAYTIME			EVENING			NIGHTTIME			ADT	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		
INPUT PARAMETERS											
Vehicles per hour	694.37	14.20	23.50	128.87	0.59	0.98	95.87	14.79	24.48	% A	0.32
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	% EVENING	75.54 69.59
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02 12.92
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43 9.61
										% DAY	2.97 2.97
										% EVENING	48.00 1.42
										% NIGHT	2.00 0.06
										% NIGHT	50.00 1.48
										% DAY	48.00 2.36
										% EVENING	2.00 0.10
										% NIGHT	50.00 2.45
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	
ADJUSTMENTS											
Flow	22.09	5.20	7.38	14.78	-8.61	-6.42	13.49	5.37	7.56		
Distance	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	-0.48	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	71.28
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	66.92
LEQ	63.97	56.03	63.06	56.65	42.22	49.26	55.37	56.20	63.24	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	
										0.00	
CNEL			71.28								

Noise Analysis for Terracina
Existing Plus Project Traffic Noise - Terra Cotta Rd, Hoff Ave to Nichols Rd
Closest Sensitive Receptor

	DAYTIME			EVENING			NIGHTTIME			ADT	#VALUE!
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS		
INPUT PARAMETERS											
Vehicles per hour	89.15	0.60	0.01	16.55	0.02	0.00	12.31	0.62	0.02	% A	0.32
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43
										% DAY	48.00
										% EVENING	2.00
										% NIGHT	50.00
										% DAY	0.52
										% EVENING	0.01
										% NIGHT	2.00
										% DAY	0.00
										% NIGHT	50.00
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	48.00
ADJUSTMENTS											
Flow	12.66	-9.08	-25.14	5.35	-22.88	-38.94	4.06	-8.90	-24.96	LEFT	-90.00
Distance	-8.88	-8.88	-8.88	-8.88	-8.88	-8.88	-8.88	-8.88	-8.88	RIGHT	90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	49.28
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	48.33
LEQ	48.13	34.66	23.13	40.82	20.86	9.33	39.53	34.84	23.31	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										GRADE dB	0.00
										TO TURN ON, COPY K2 TO J2	
										TO TURN OFF, ENTER ADTS IN J2	

Noise Analysis for Terracina

Existing Traffic Noise - Terra Cotta Rd, Lakeshore Dr to Naples Way

Closest Sensitive Receptor

INPUT PARAMETERS												ADT		#VALUE!			
												SPEED		45.00			
												DISTANCE		40.00			
												% A		97.40	% DAY	75.54	73.58
															% EVENING	14.02	13.06
															% NIGHT	10.43	10.43
												% MT		1.84	% DAY	48.00	0.88
															% EVENING	2.00	0.04
															% NIGHT	50.00	0.92
												% HT		0.74	% DAY	48.00	0.36
															% EVENING	2.00	0.01
															% NIGHT	50.00	0.37
NOISE CALCULATIONS																	
Reference levels																	
ADJUSTMENTS																	
Flow																	
Distance																	
Finite Roadway												LEFT					
Barrier												RIGHT					
Grade																	
Constant												CNEL					
												DAY LEQ					
LEQ												Day hour					
												Absorptive?					
DAY LEQ												Use hour?					
CNEL												GRADE dB					
												89.00					
												no					
												no					
												TO TURN ON, COPY K2 TO J2					
												TO TURN OFF, ENTER ADTS IN J2					
												0.00					

INPUT PARAMETERS							
	DAYTIME		EVENING		NIGHTTIME		ADT SPEED DISTANCE
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	
Vehicles per hour	36.30	0.29	0.04	6.74	0.01	0.30	0.05
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00
NOISE CALCULATIONS							
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	
ADJUSTMENTS							
Flow	8.76	-12.21	-20.36	1.45	-26.01	0.16	-20.19
Distance	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00
LEQ	54.00	41.31	37.68	46.69	27.51	41.49	37.85
DAY LEQ		54.33		EVENING LEQ	46.76	NIGHT LEQ	
CNEL			55.56				

INPUT PARAMETERS											
	DAYTIME			EVENING			NIGHTTIME			ADT SPEED DISTANCE	#VALUE!
	AUTOS	M. TRUCKS	H. TRUCKS	AUTOS	M. TRUCKS	H. TRUCKS	AUTOS	M. TRUCKS	H. TRUCKS		
Vehicles per hour	56.93	0.68	0.27	10.57	0.03	0.01	7.86	0.71	0.29	% A	0.32
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	% EVENING	75.54
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	% NIGHT	14.02
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	10.43
										% DAY	1.84
										% EVENING	48.00
										% NIGHT	2.00
										% DAY	0.04
										% EVENING	50.00
										% NIGHT	0.92
										% DAY	48.00
										% EVENING	0.36
										% NIGHT	2.00
										% DAY	0.01
										% EVENING	50.00
										% NIGHT	0.37
ADJUSTMENTS											
Flow	10.72	-8.49	-12.45	3.40	-22.29	-26.25	2.12	-8.31	-12.27		
Distance	-6.09	-6.09	-6.09	-6.09	-6.09	-6.09	-6.09	-6.09	-6.09	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	51.65
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	49.66
LEQ	48.97	38.04	38.60	41.66	24.24	24.80	40.37	38.22	38.78	Day hour	89.00
										Absorptive?	no
										Use hour?	no
										GRADE dB	0.00
DAY LEQ		49.66		EVENING LEQ			NIGHT LEQ			TO TURN ON, COPY K2 TO J2	
CNEL			51.65							TO TURN OFF, ENTER ADTS IN J2	



KUNZMAN ASSOCIATES, INC.

OVER 35 YEARS OF EXCELLENT SERVICE

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