Environmental Noise Assessment

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APPENDIX

ENVIRONMENTAL NOISE ASSESSMENT

MERIDIAN VILLAGE
HOLLISTER, CALIFORNIA

WJVA Report No. 24-16

PREPARED FOR

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1. INTRODUCTION

Project Description:

Subdivision

The Meridian Village project includes subdividing the 12.75-acre parcel into five lots, with a total of 219 residential units (90 apartments and 129 condominiums), and five parcels for public and private streets. The project site plan is provided as Figure 1. The proposed square footage and use on each lot are provided below:

- Lot 1 - 89,104 square feet with five apartment buildings, each building consisting of 18 units for a total of 90 apartment units, as well as a 16,170 square foot recreation center and private park area; and

- Lots 2 through 5 would be developed with 3-, 4-, 5-, and 6-unit townhome-style buildings for a total of 129 condominium units. The square footages on each lot are as follows:

- Lot 2 - 40,058 square feet;

- Lot 3 - 85,861 square feet;

- Lot 4 - 89,205 square feet; and

- Lot 5 - 50,163 square feet.

Access and Parking

The project site will involve two access points. The primary access point (proposed Vintage Way) will be from Meridian Street to the north, and the secondary access point will be an extension of the existing Athena Way from the west. The proposed Vintage Way will be a public street for the first 40 feet and a private street the remaining 26 feet. The proposed extension of Athena Way will be public along with the propose Colette Way. The following proposed internal streets will be private: Sarwat Way, Baltz Way, and Soneya Way.

The public street portion of the proposed Vintage Way will consist of a 30-foot emergency vehicle access easement, which will also be used as an ingress/egress and public utilities easement. The proposed project will provide a total of 665 parking spaces (149 spaces for the apartments and 516 spaces for the condominiums) and 16 bicycle parking spaces.

Tree Removal and Replacement

There are two existing trees on the project site that will be removed and replaced with more than 30 native trees (plan set, Sheet L-2).

Utilities

The project will connect into the existing water, sanitary sewer system, and storm drain system located on Meridian Street. Street lighting will also be placed throughout the project site. Stormwater will be treated within the four drainage management areas and direct stormwater

towards each management area's stormwater control measure located along the western side of the project site.

Environmental Noise Assessment:

This environmental noise assessment has been prepared to determine if significant noise impacts will be produced by the project and to describe mitigation measures for noise if significant impacts are determined. The environmental noise assessment, prepared by WJV Acoustics, Inc. (WJVA), is based upon the project site plan dated January 2024, project-related traffic data provided by Hexagon Transportation Consultants and a project site visit on March 20 and 21, 2024. Revisions to the site plan, project-related traffic data or other project-related information available to WJVA at the time the analysis was prepared may require a reevaluation of the findings and/or recommendations of the report.

Appendix A provides definitions of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported in this analysis are A-weighted sound pressure levels in decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighted sound levels, as they correlate well with public reaction to noise.

2. THRESHOLDS OF SIGNIFICANCE

The CEQA Guidelines apply the following questions for the assessment of significant noise impacts for a project:

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

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

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

a. Noise Level Standards

City of Hollister

The Health and Safety Element of the Hollister General Plan (adopted December 2005) provides Goals and Policies relevant to the project.

Goals:

- **HS3** *Achieve noise levels consistent with acceptable standards and reduce or eliminate objectionable noise sources.*

Policies:

- **HS3.1** ***Protection of Residential Areas from Unacceptable Noise Levels****: Protect the noise environment in existing residential areas, requiring the evaluation of mitigation measures for projects under the following circumstances: (a) the project would cause the L_{dn} to increase 3 dB(A) or more; (b) any increase would result in an L_{dn} greater than 60 dB(A); (c) the L_{dn} already exceeds 60 dB(A); and (d) the project has the potential to generate significant adverse community response.*

- **HS3.2** ***Noise Source Control:*** *Work with property owners to control noise at its source, maintaining existing noise levels and ensuring that noise levels do not exceed acceptable noise standards as established in the Noise and Land Use Compatibility Guidelines.*

- **HS3.4** ***Vehicle Noise:*** *Strive to reduce traffic noise levels, especially as they impact residential areas, and continue enforcement of vehicle noise standards through noise readings and enforcement actions. In particular, strive to minimize truck traffic in residential areas and ensure enforcement of Vehicle Code provisions which prohibit*

alteration of vehicular exhaust systems in a way that increases noise emissions.

- ***HS3.6 Noise Standards Enforcement:*** *Administer the policies identified in the Noise Element and comply with State requirements for certain other noise control programs through specific local enforcement programs.*

The General Plan establishes land use compatibility criteria in terms of the Day-Night Average Level (DNL or L_{dn}). The L_{dn} is the time-weighted energy average noise level for a 24-hour day, with a 10 dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The L_{dn} represents cumulative exposure to noise over an extended period of time and is therefore calculated based upon *annual average* conditions.

The exterior noise exposure criterion of the health and safety element is 60 dB L_{dn} within outdoor activity areas of residential land uses. Outdoor activity areas generally include backyards of single-family residences, individual patios or decks of multi-family developments and common outdoor recreation areas of multi-family developments. The intent of the exterior noise level requirement is to provide an acceptable noise environment for outdoor activities and recreation.

The health and safety element also requires that interior noise levels attributable to exterior sources not exceed 45 dB L_{dn}. This standard is consistent with interior noise level criteria applied by the State of California and the U.S. Department of Housing and Urban Development (HUD). The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

Additionally, The City of Hollister Municipal Code (Section 8.28.020) provides further exterior noise limits applicable to the project. The Municipal Code states that a violation occurs when a noise level in residential districts exceeds 55 dBA during daylight hours and 50 dBA after sunset, measured at the property line of the complaining party or inside an affected multiple dwelling unit.

State of California

There are no state noise standards that are applicable to the project.

Federal Noise Standards

There are no federal noise standards that are applicable to the project.

b. Construction Noise and Vibration

Policy HS3.3 (Construction Noise) of The City of Hollister Noise Element of the General Plan states *"Regulate construction activity to reduce noise between 7:00 p.m. and 7:00 a.m.".*

There are no City of Hollister Vibration level standards. Some guidance is provided by the Caltrans Transportation and Construction Vibration Guidance Manual. The Manual provides guidance for determining annoyance potential criteria and damage potential threshold criteria. These criteria are provided below in Table I and Table II, and are presented in terms of peak particle velocity (PPV) in inches per second (in/sec).

TABLE I

GUIDELINE VIBRATION ANNOYANCE POTENTIAL CRITERIA

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.1
Severe	2.0	0.4

Source: Caltrans

TABLE II

GUIDELINE VIBRATION DAMAGE POTENTIAL THRESHOLD CRITERIA

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile, historic buildings, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans

3. SETTING

The proposed project site is a 12.75-acre parcel located in the City of Hollister. The project site is currently undeveloped vacant land. The project site is generally bordered by Meridian Street and residential land uses to the north, State Route 25 (Pinnacles National Park Way) and residential land uses to the east, commercial/industrial uses to the south (Hollister Collision Center, Guerra Nut Shelling), and residential land uses to the west.

a. Background Noise Level Measurements

Existing sources of noise impacting the project site include vehicle traffic along Meridian Street and SR 25, noise associated with commercial/industrial land uses to the south, noise associated with residential activities (landscaping activities, construction activities, barking dogs, human voices, etc.) and occasional aircraft overflights.

Measurements of existing ambient noise levels in the project vicinity were conducted on March 20-21, 2024. Long-term (24-hour) ambient noise level measurements were conducted at two (2) locations (sites LT-1 and LT-2). Site LT1 was located at the current eastern terminus of Athena Way, in the vicinity of existing residential land uses bordering the project site to the west. Site LT-1 was predominantly exposed to noise associated with residential land uses as well as vehicle traffic along Meridian Street. Site LT-2 was located in the vicinity of the Guerra Nut Shelling facility, located near the southern portion of the project site. Site LT-2 was predominantly exposed to noise associated with activities at the Guerra Nut Shelling facility and distant traffic sources. The locations of the long-term ambient noise monitoring sites are provided on Figure 2.

Additionally, short-term (15-minute) ambient noise level measurements were conducted at four (4) locations (Sites ST-1 through ST-4). Two (2) individual measurements were taken at each of the four short-term sites to quantify ambient noise levels in the morning and afternoon hours. The locations of the noise monitoring sites are shown on Figure 2.

Noise monitoring equipment consisted of Larson-Davis Laboratories Model LDL-820 sound level analyzers equipped with B&K Type 4176 1/2" microphones. The equipment complies with the specifications of the American National Standards Institute (ANSI) for Type I (Precision) sound level meters. The meters were calibrated with a B&K Type 4230 acoustic calibrator to ensure the accuracy of the measurements.

Measured hourly energy average noise levels (L_{eq}) at site LT-1 ranged from a low of 42.2 dB between 3:00 a.m. and 4:00 a.m. to a high of 51.3 dB between 5:00 p.m. and 6:00 p.m. Hourly maximum (L_{max}) noise levels at site LT-1 ranged from 56.2 to 81.0 dB. Residual noise levels at the monitoring site, as defined by the L_{90}, ranged from 37.1 to 45.1 dB. The L_{90} is a statistical descriptor that defines the noise level exceeded 90% of the time during each hour of the sample period. The L_{90} is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources. The measured L_{dn} value at site LT-1 during the 24-hour noise measurement period was 52.4 dB.

Figure 3 graphically depicts hourly variations in ambient noise levels at long-term ambient noise monitoring site LT-1. Figure 4 provides a photograph of long-term ambient noise monitoring site LT-1.

Measured hourly energy average noise levels (L_{eq}) at site LT-2 ranged from a low of 46.5 dB between 4:00 a.m. and 5:00 a.m. to a high of 52.0 dB between 5:00 p.m. and 6:00 p.m. Hourly maximum (L_{max}) noise levels at site LT-2 ranged from 56.4 to 76.8 dB. Residual noise levels at the monitoring site, as defined by the L_{90}, ranged from 44.9 to 47.0 dB. The measured L_{dn} value at site LT-2 during the 24-hour noise measurement period was 55.3 dB. Figure 5 graphically depicts hourly variations in ambient noise levels at long-term ambient noise monitoring site LT-2. Figure 6 provides a photograph of long-term ambient noise monitoring site LT-2.

The short-term site noise measurement data included energy average (L_{eq}) maximum (L_{max}) as well as five individual statistical parameters. Observations were made of the dominant noise sources affecting the measurements. The statistical parameters describe the percent of time a noise level was exceeded during the measurement period. For instance, the L_{90} describes the noise level exceeded 90 percent of the time during the measurement period, and is generally considered to represent the residual (or background) noise level in the absence of identifiable single noise events from traffic, aircraft and other local noise sources. Table III summarizes short-term noise measurement results.

TABLE III

SUMMARY OF SHORT-TERM NOISE MEASUREMENT DATA
MERIDIAN VILLAGE, HOLLISTER
MARCH 20 & 21, 2024

Site	Time	A-Weighted Decibels, dBA							Sources
		L_{eq}	L_{max}	L_2	L_8	L_{25}	L_{50}	L_{90}	
ST-1	9:00 a.m.	49.6	62.1	57.2	42.0	47.0	46.1	43.3	TR, L, C, V
ST-1	3:45 p.m.	50.6	65.1	57.4	51.1	46.0	45.2	43.6	TR, AC, D
ST-2	9:25 a.m.	67.6	81.1	74.8	70.0	66.2	62.8	56.4	TR
ST-2	4:10 p.m.	68.4	83.0	75.2	70.8	64.6	62.0	55.5	TR
ST-3	9:50 a.m.	48.6	66.6	58.2	51.8	46.4	43.8	42.7	TR, CO
ST-3	4:30 p.m.	50.9	67.4	60.1	52.4	48.0	46.0	44.3	TR, CO
ST-4	10:10 a.m.	63.1	70.4	68.9	62.1	59.4	59.0	53.7	TR
ST-4	4:50 p.m.	65.0	72.8	70.2	63.5	60.6	59.8	54.0	TR

TR: Traffic AC: Aircraft L: Landscaping Activities C: Construction Activities V: Voices B: Birds D: Barking Dogs CO: Commercial Activities

Source: WJV Acoustics, Inc.

4. PROJECT-RELATED NOISE LEVELS

a. Project-Related Increases in Traffic Noise Exposure at Existing Receptors

WJVA utilized the FHWA Traffic Noise Model to quantify expected project-related increases in traffic noise exposure along roadways in the project vicinity. The FHWA Model is a standard analytical method used by state and local agencies for roadway traffic noise prediction. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within ±1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Average Daily Traffic (ADT) volumes for the analyzed receptor locations were provided by the project traffic engineer, Hexagon Transportation Consultants. Truck percentages and the day/night distribution of traffic were estimated by WJVA, based upon previous studies conducted in the project vicinity since project-specific data were not available from government sources. The Noise modeling assumptions used to calculate project traffic noise are provided as Appendix C.

Traffic noise exposure levels for Existing, Existing Plus Project, Cumulative No Project and Cumulative Plus Project traffic scenarios were calculated based upon the FHWA Model and the above-described model inputs and assumptions. Project-related significant impacts would occur if an increase in traffic noise associated with the project would result in noise levels exceeding the City's applicable noise level standards at the location(s) of sensitive receptors. For the purpose of this analysis a significant impact was also assumed to occur if traffic noise levels were to increase by 3 dB at sensitive receptor locations where noise levels already exceed the City's applicable noise level standards (without the project), as 3 dB generally represents the threshold of perception in change for the human ear.

The City's exterior noise level standard for residential land uses is 60 dB L_{dn}. Traffic noise was modeled at eight (8) receptor locations. The eight modeled receptors are located at roadway setback distances representative of the sensitive receptors (residences) along each analyzed roadway segment. The receptor locations are described below and provided graphically on Figure 7.

- R-1: Approximately 140 feet from the centerline of 4th Street.
- R-2: Approximately 120 feet from the centerline of Recht Street
- R-3: Approximately 65 feet from the centerline of Meridian Street.
- R-4: Approximately 110 feet from the centerline of Recht Street.
- R-5: Approximately 65 feet from the centerline of Vintage Way.
- R-6: Approximately 85 feet from the centerline of SR 25.
- R-7: Approximately 60 feet from the centerline of Meridian Street.
- R-8: Approximately 80 feet from the centerline of SR 25.

Existing Conditions

Table IV provides Existing traffic noise exposure levels at the eight analyzed representative receptor locations, and also provides what the project contribution would be to Existing Plus Project conditions.

TABLE IV

PROJECT CONTRIBUTION TO FUTURE TRAFFIC NOISE, dB, L_{dn}
MERIDIAN VILLAGE, HOLLISTER
EXISTING TRAFFIC CONDITIONS

Modeled Receptor	Existing Conditions Without Project Contribution	Existing Conditions Plus Project	Project Contribution	Significant Impact?
R-1	55	55	0	No
R-2	45	45	0	No
R-3	60	60	0	No
R-4	45	46	+1	No
R-5	50	50	0	No
R-6	66	66	0	No
R-7	59	60	+1	No
R-8	67	67	0	No

Source: WJV Acoustics, Inc.
Hexagon Transportation Consultants

Table V provides Cumulative (future) traffic noise exposure levels at the eight analyzed representative receptor locations, and also provides what the project contribution would be to Cumulative Plus Project conditions.

TABLE V

PROJECT CONTRIBUTION TO FUTURE TRAFFIC NOISE, dB, L_{dn}
MERIDIAN VILLAGE, HOLLISTER
CUMULATIVE TRAFFIC CONDITIONS

Modeled Receptor	Cumulative Conditions Without Project Contribution	Cumulative Conditions Plus Project	Project Contribution	Significant Impact?
R-1	56	56	0	No
R-2	45	45	0	No
R-3	61	61	0	No
R-4	45	46	+1	No
R-5	50	50	0	No
R-6	66	66	0	No
R-7	59	59	0	No
R-8	67	68	+1	No

Source: WJV Acoustics, Inc.
Hexagon Transportation Consultants

Reference to Table IV and Table V indicates that the project's contribution to Existing and Cumulative traffic noise exposure levels at the eight modeled representative receptor locations would not result in traffic noise exposure levels to exceed 60 dB L_{dn} at any receptor location, or result in an increase of 3 dB or more at receptor locations where traffic noise exposure would already be expected to exceed 60 dB L_{dn} without the project. As such, the project would not result in a traffic noise impact at any existing sensitive receptor locations in the vicinity of the project.

b. Noise Exposure at Proposed (On-Site) Receptors

The project includes the development of 219 new multi-family residential units. The City of Hollister General Plan Noise Element establishes an exterior noise level standard of 60 dB L_{dn} for outdoor activity areas of residential uses. Outdoor activity areas generally include backyards of single-family residences and individual patios or decks and common outdoor activity areas of multi-family developments. The noise element also requires that interior noise levels attributable to exterior noise sources not exceed 45 dB L_{dn}.

Project Site Traffic Noise Exposure-
The proposed project includes sensitive receptors (residential land uses) that could be impacted by traffic noise exposure adjacent to Meridian Street and SR 25. WJVA used the above-described FHWA traffic noise model and traffic noise modeling assumptions to determine the distances from the center of Meridian Street and SR 25 to the 60 dB L_{dn} and the 65 dB L_{dn} noise exposure contours. Table VI provides the distances from the center of Meridian Street and SR 25 to the 60 dB L_{dn} and the 65 dB L_{dn} noise exposure contours. Table VI provides the contour distances for Cumulative Plus Project conditions as they represent a worst-case assessment of noise exposure at proposed sensitive receptor locations.

TABLE VI

DISTANCES TO TRAFFIC NOISE CONTOURS
MERIDIAN VILLAGE, HOLLISTER
CUMULATIVE PLUS PROJECT CONDITIONS

Roadway Segment (At Project Site Frontage)	Distance (feet) From Roadway Centerline to 60 dB L_{dn} Contour	Distance (feet) From Roadway Centerline to 65 dB L_{dn} Contour
Meridian Street	148	69
SR 25	242	112

Source: WJV Acoustics, Inc.

As described in Table VI, a traffic noise impact would be expected to occur if outdoor activity areas were to be located within approximately 148 feet from the centerline of Meridian Street or within approximately 242 feet from the centerline of State Route 25. Based upon a review of the project site plan, the closest proposed residential land uses (and associated outdoor activity areas) would be located at setback distances from Meridian Street and SR 25 of approximately 350 feet and 300 feet, respectively. As such, a traffic noise impact would not be expected to result from the development of the project.

Traffic Noise Exposure Levels at Closest Proposed Residential Land Uses:

- Meridian Street: 54 dB L_{dn}
- State Route 25: 59 dB L_{dn}

Nut Shelling Facility-
The Guerra Nut Shelling Facility is 100 feet south of the closest proposed residential land uses. Noise levels measured at ambient site LT-2 reflect the noise levels generally produced by the facility. Site LT-2 was located approximately 60 feet from the nut shelling facility. 24-hour noise exposure levels at site LT-2 were measured to be approximately 55 dB Ldn. Such levels do not exceed the City of Hollister 60 dB L_{dn} compatibility noise level standard for new residential land uses.

It should be noted, WJVA staff spoke with staff at the Guerra Nut Shelling facility regarding typical facility activities and hours of operations. Per Guerra staff, the shelling facility typically operates 24-hours per day, seven days per week, with the exception of Saturday afternoon through Sunday evening, during which operations typically cease. During the March 20 ambient noise survey period, the facility was in constant operation. Guerra staff indicated that during the peak harvest season (generally early October through early November) activities would be expected to increase with product truck deliveries arriving on site as early as approximately 4:00 a.m.

Truck deliveries would typically occur at distance of 300 feet or greater from the proposed residential land uses. WJVA has conducted measurements of the noise levels produced by slowly moving trucks for a number of studies. Such truck movements would be expected to produce noise levels in the range of 65 to 71 dBA at a distance of 100 feet. The range in measured truck noise levels is due to differences in the size of trucks, their speed of movement and whether they have refrigeration units in operation during the pass-by. Such levels would be in the range of approximately 56 to 62 at a distance of 300 feet. However, noise associated with truck movements would be intermittent.

Compliance with exterior noise standards typically focus on “annual average conditions.” Based upon the ambient noise levels measured at ambient site LT-2 and the distance from the closest proposed residential units to the nut shelling facility, noise levels would be expected to be below 51 dB L_{dn} at the closest proposed residential land uses to the nut shelling facility. Noise levels during peak months would be higher, but would not be expected to exceed 60 dB L_{dn} at the closest proposed residential land uses to the nut shelling facility.

Hollister Municipal Airport-
The project site is located approximately 2.5 miles south of the Hollister Municipal Airport. WJVA reviewed the Hollister Municipal Airport Land Use Compatibility Plan. While the project site is located within the Airport Influence Area, it is not located within any of the airport noise contours. The Land Use Compatibility Plan establishes noise impact zones based upon the 55 dB to 70 dB+ noise contours. The acceptability of various land use types located within these noise contours is defined within the Land Use Compatibility Plan. The project site is not located within any airport noise contours and therefore would be considered wholly compatible from an airport noise perspective.

Interior Noise Exposure-

The City of Hollister interior noise level standard is 45 dB L_{dn}. The worst-case noise exposure within the proposed residential development would be approximately 59 dB L_{dn} (Cumulative Conditions). This means that the proposed residential construction must be capable of providing a minimum outdoor-to-indoor noise level reduction (NLR) of approximately 14 dB (59-45=14).

A specific analysis of interior noise levels was not performed. However, it may be assumed that residential construction methods complying with current building code requirements will reduce exterior noise levels by approximately 25 dB if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB L_{dn} interior standard at all proposed lots. Requiring that it be possible for windows and doors to remain closed for sound insulation means that air conditioning or mechanical ventilation will be required.

c. Noise and Vibration from Construction

Construction noise would occur at various locations within the project site through the buildout period. Existing sensitive receptors could be located as close as 50-100 feet from construction activities. Table VII provides typical construction-related noise levels at distances of 25, 50, 100 feet, and 200 feet.

TABLE VII

TYPICAL CONSTRUCTION EQUIPMENT MAXIMUM NOISE LEVELS, dBA

Type of Equipment	25 Ft.	50 Ft.	100 Ft.	200 Ft.
Concrete Saw	96	90	84	78
Crane	87	81	75	69
Excavator	87	81	75	69
Front End Loader	85	79	73	67
Jackhammer	95	89	83	77
Paver	83	77	71	65
Pneumatic Tools	91	85	79	73
Dozer	87	81	76	70
Rollers	86	80	74	68
Trucks	92	86	80	72
Pumps	86	80	74	68
Scrapers	93	87	81	75
Portable Generators	87	81	74	68
Backhoe	92	86	80	74
Grader	92	86	80	74

Source: FHWA

Noise Control for Buildings and Manufacturing Plants, Bolt, Beranek & Newman, 1987

The dominant sources of man-made vibration are sonic booms, blasting, pile driving, pavement breaking, demolition, diesel locomotives, and rail-car coupling. None of these activities are anticipated to occur with construction or operation of the proposed project. Vibration from construction activities could be detected at the closest sensitive land uses, especially during movements by heavy equipment or loaded trucks and during some paving activities.

Typical vibration levels at distances of 25, 100 feet and 300 feet are summarized by Table VIII. These levels would not be expected to exceed any significant threshold levels for damage, as provided above in Table II.

TABLE VIII

TYPICAL VIBRATION LEVELS DURING CONSTRUCTION

	PPV (in/sec)		
Equipment	**@ 25´**	**@ 100´**	**@ 300´**
Bulldozer (Large)	0.089	0.019	0.006
Bulldozer (Small)	0.003	0.0006	0.0002
Loaded Truck	0.076	0.017	0.005
Jackhammer	0.035	0.008	0.002
Vibratory Roller	0.210	0.046	0.013
Caisson Drilling	0.089	0.019	0.006

Source: *Caltrans*

Construction noise is not usually considered to be a significant impact if construction is limited to the daytime hours and construction equipment is adequately maintained and muffled. Extraordinary noise-producing activities (e.g., pile driving) are not anticipated. The City of Hollister Noise Element of the General Plan states *"Regulate construction activity to reduce noise between 7:00 p.m. and 7:00 a.m."*

5. IMPACT SUMMARY

- Project-related noise levels (project-related increases in traffic noise exposure) resulting from the proposed residential development are not expected to result in an exceedance of any applicable City of Hollister noise level standards at any nearby existing sensitive receptor locations.

- The proposed 219-unit multi-family residential development will comply with all City of Hollister exterior and interior noise level standards, provided the following measures are incorporated into project design:

  Mechanical ventilation or air conditioning must be provided for all homes so that windows and doors can remain closed for sound insulation purposes.

FIGURE 1: PROJECT SITE PLAN

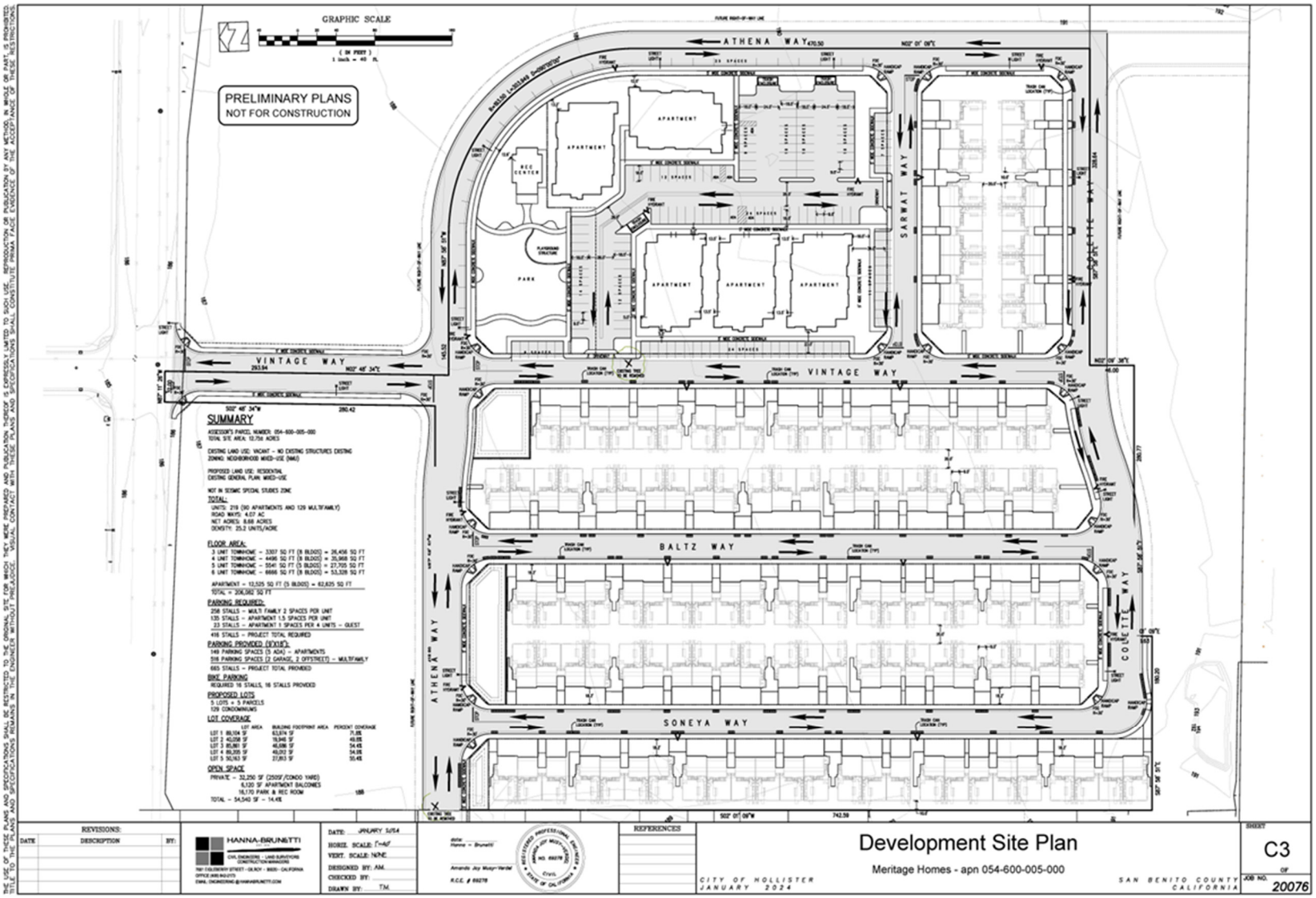


FIGURE 2: PROJECT VICINITY AND AMBIENT NOISE MONITORING SITES

FIGURE 3: HOURLY NOISE LEVELS AT LONG-TERM AMBIENT NOISE MONITORING SITE LT-1

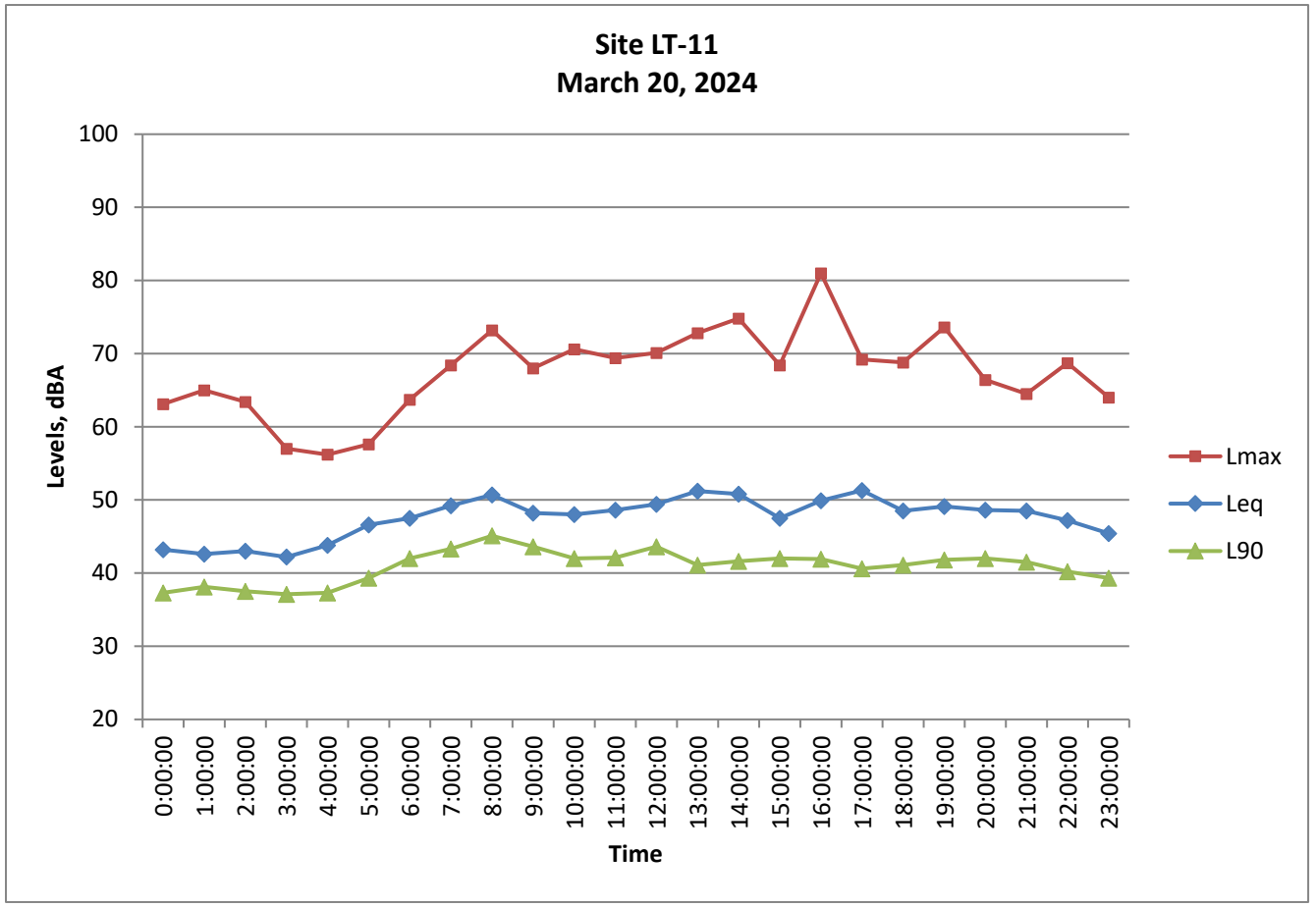


FIGURE 4: AMBIENT NOISE MONITORING SITE LT-1

FIGURE 5: HOURLY NOISE LEVELS AT LONG-TERM AMBIENT NOISE MONITORING SITE LT-2

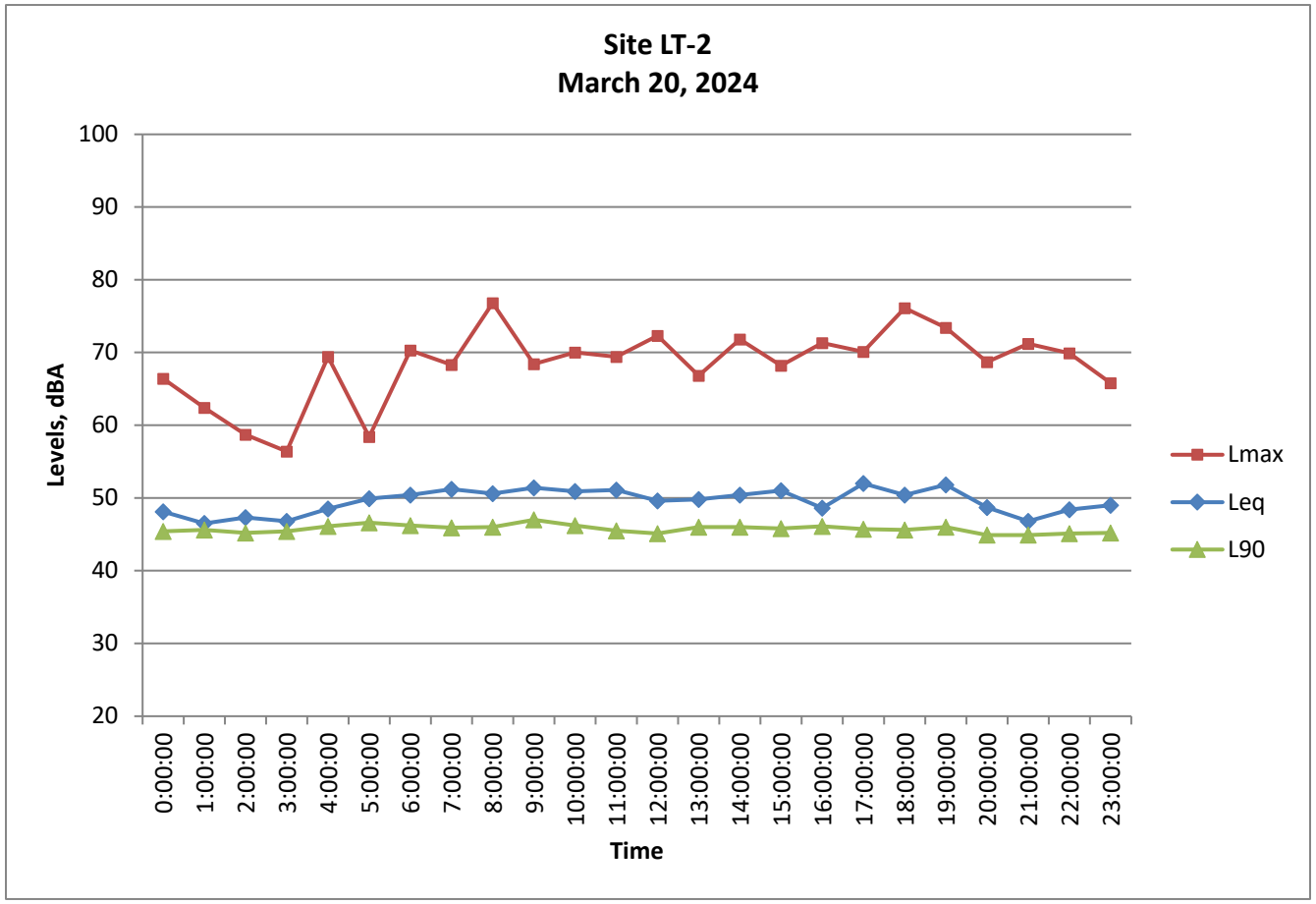


FIGURE 6: AMBIENT NOISE MONITORING SITE LT-2

FIGURE 7: MODELED TRAFFIC NOISE RECEPTORS

APPENDIX A-1

ACOUSTICAL TERMINOLOGY

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

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DNL/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). For example, L_{10} equals the level exceeded 10 percent of the time.

A-2

ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

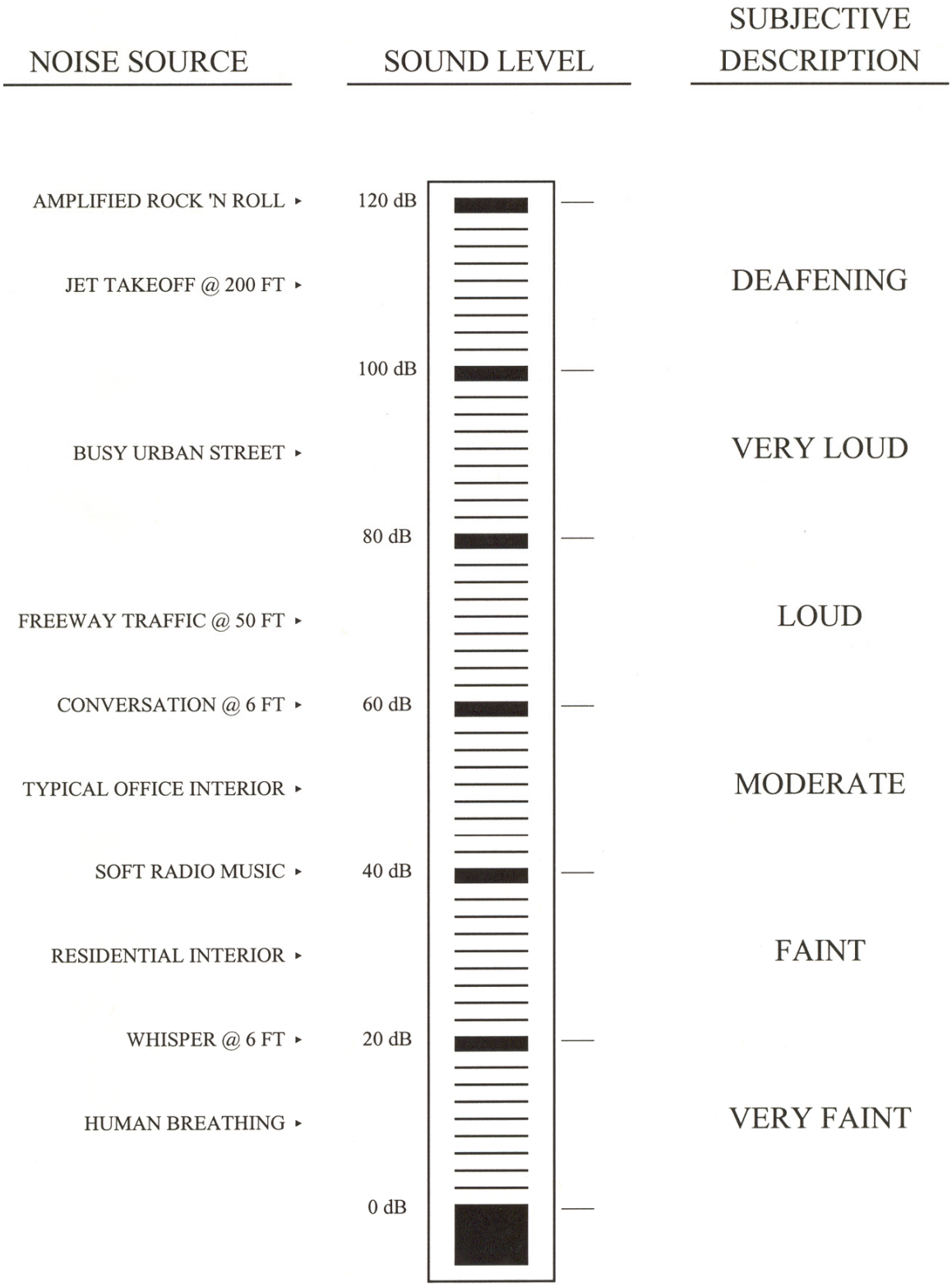
NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of Anoise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

SOUND TRANSMISSION CLASS (STC): The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B
EXAMPLES OF SOUND LEVELS



APPENDIX C

TRAFFIC NOISE MODELING CALCULATIONS

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
June 7, 2024

Project #:	24-16
Description:	Existing
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB) 60 65 70 75

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	4th St	R-1	9330	90		10	2	1	30	140	
2	Recht St	R-2	700	90		10	2	1	30	120	
3	Meridan St	R-3	8820	90		10	2	1	30	65	
4	Recht St	R-4	580	90		10	2	1	30	110	
5	Vintage Wy	R-5	810	90		10	2	1	30	65	
6	SR 25	R-6	18730	90		10	2	1	45	85	
7	Meridan St	R-7	6890	90		10	2	1	30	60	
8	SR 25	R-8	23920	90		10	2	1	45	80	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
June 7, 2024

Project #:	24-16
Description:	Existing + Project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB)	60	65	70	75					

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	4th St	R-1	9660	90		10	2	1	30	140	
2	Recht St	R-2	700	90		10	2	1	30	120	
3	Meridan St	R-3	9210	90		10	2	1	30	65	
4	Recht St	R-4	720	90		10	2	1	30	110	
5	Vintage Wy	R-5	810	90		10	2	1	30	65	
6	SR 25	R-6	19450	90		10	2	1	45	85	
7	Meridan St	R-7	7130	90		10	2	1	30	60	
8	SR 25	R-8	24080	90		10	2	1	45	80	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
June 7, 2024

Project #:	24-16
Description:	Cumulative No Project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB) 60 65 70 75

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	4th St	R-1	10860	90		10	2	1	30	140	
2	Recht St	R-2	700	90		10	2	1	30	120	
3	Meridan St	R-3	10050	90		10	2	1	30	65	
4	Recht St	R-4	650	90		10	2	1	30	110	
5	Vintage Wy	R-5	810	90		10	2	1	30	65	
6	SR 25	R-6	20130	90		10	2	1	45	85	
7	Meridan St	R-7	6700	90		10	2	1	30	60	
8	SR 25	R-8	25320	90		10	2	1	45	80	

WJV Acoustics, Inc
FHWA-RD-77-108
Calculation Sheets
June 7, 2024

Project #:	24-16
Description:	Cumulative + Project
Ldn/Cnel:	Ldn
Site Type:	Soft

Contour Levels (dB) 60 65 70 75

Segment	Roadway Name	Segment Description	ADT	%Day	%Evening	%Night	%Med	%Heavy	Speed	Distance	Offset
1	4th St	R-1	11190	90		10	2	1	30	140	
2	Recht St	R-2	700	90		10	2	1	30	120	
3	Meridan St	R-3	10440	90		10	2	1	30	65	
4	Recht St	R-4	790	90		10	2	1	30	110	
5	Vintage Wy	R-5	810	90		10	2	1	30	65	
6	SR 25	R-6	20850	90		10	2	1	45	85	
7	Meridan St	R-7	6720	90		10	2	1	30	60	
8	SR 25	R-8	27170	90		10	2	1	45	80	