Environmental Noise & Vibration Assessment

Palomino Place Project

Davis, California

BAC Job # 2022-135

Prepared For:

Palomino Place

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Introduction & Project Description

Palomino Place, LLC (Applicant) plans to develop a mixed-use development called Palomino Place (Project). The infill project is located on the north side of Covell Boulevard within the existing boundaries of the Wildhorse Ranch Planned Development in the City of Davis, California. Figure 1 shows the location of the project site.

The Project site encompasses approximately 25 gross acres, of which approximately 15.2 acres are proposed for housing with the remaining acreage to be developed with community-serving uses, stormwater features, and open space. The community-serving uses will consist of a USA pentathlon training facility and a swimming pool complex. The project site plan showing the locations of proposed residential uses, the pentathlon training facility and the pool complex is shown on Figure 2. Additional discussion of the community-serving uses is provided below.

USA Pentathlon Training Facility

A parcel has been designated for a world-class, Olympic quality Pentathlon training facility. The modern Pentathlon competition is an Olympic event that comprises five different events, including freestyle swimming (200m), obstacle course, fencing, and a combined event of laser pistol shooting interspersed with five 600-meter cross country runs. It is important to note that the Palomino Place proposed facility will only use lasers for the target pistol shooting portion of the competition and that these activities will not generate noise. The facility will include workout and locker room facilities in addition to training spaces/facilities for fencing and laser pistol events. In addition, a cross country trail will be included and a swimming pool complex will be constructed adjacent to the training facility.

Swimming Pool Complex

The Palomino Place Project proposes to donate property for a training pool in the northern portion of the parcel, immediately adjacent to the Pentathlon facility. The Palomino Place facility would be a dedicated pool complex specifically for community programing of all ages, including coach led lap swimming, youth groups, senior-focused programs, and other niche groups. The aquatic complex would serve a variety of groups during the year based around seasonal programming.

Legend

- Project Boundary (Approximate)
- Ambient Noise & Vibration Measurement Sites

N

Scale (Feet)

0 150 300

Palomino Place

Davis, California

Project Area

Figure 1

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Legend

- Project Boundary (Approximate)
- Swimming Pool & Pentathlon Training Facility Area
- Obstacle Course Location
- Recommended 6' Traffic Noise Barriers
- Recommended 6' Traffic Noise Barriers (if Needed for Apartments)
- Recommended 8' Pool Wood Fence Noise Barrier

N

Scale (Feet)

0 100 200

Palomino Place

Davis, California

Site Plan

Figure 2

BOLLARD Acoustical Consultants

Objectives of the Noise and Vibration Evaluation

Bollard Acoustical Consultants, Inc. (BAC) was retained by the project applicant to prepare this noise and vibration evaluation for the project. The specific objectives of this evaluation are as follows:

- To provide background information pertaining to the effects of noise & vibration.
- To identify existing sensitive land uses in the project area vicinity.
- To quantify existing ambient noise and vibration levels at those nearest noise-sensitive land uses to the project site.
- To identify appropriate standards of significance for the assessment of project noise and vibration impacts, including City of Davis standards and standards from other jurisdictions and agencies where appropriate.
- To predict project-related noise & vibration levels at off-site sensitive areas, and to compare those levels against the standards of significance per California Environmental Quality Act (CEQA) guidelines.
- To evaluate consistency of the sensitive land uses proposed within the project area with the applicable City of Davis General Plan noise and vibration standards.
- To recommend mitigation, as necessary, to ensure compliance with the applicable project noise & vibration standards.
- To summarize the results of this analysis into a report for eventual use in the development of the project environmental documents.

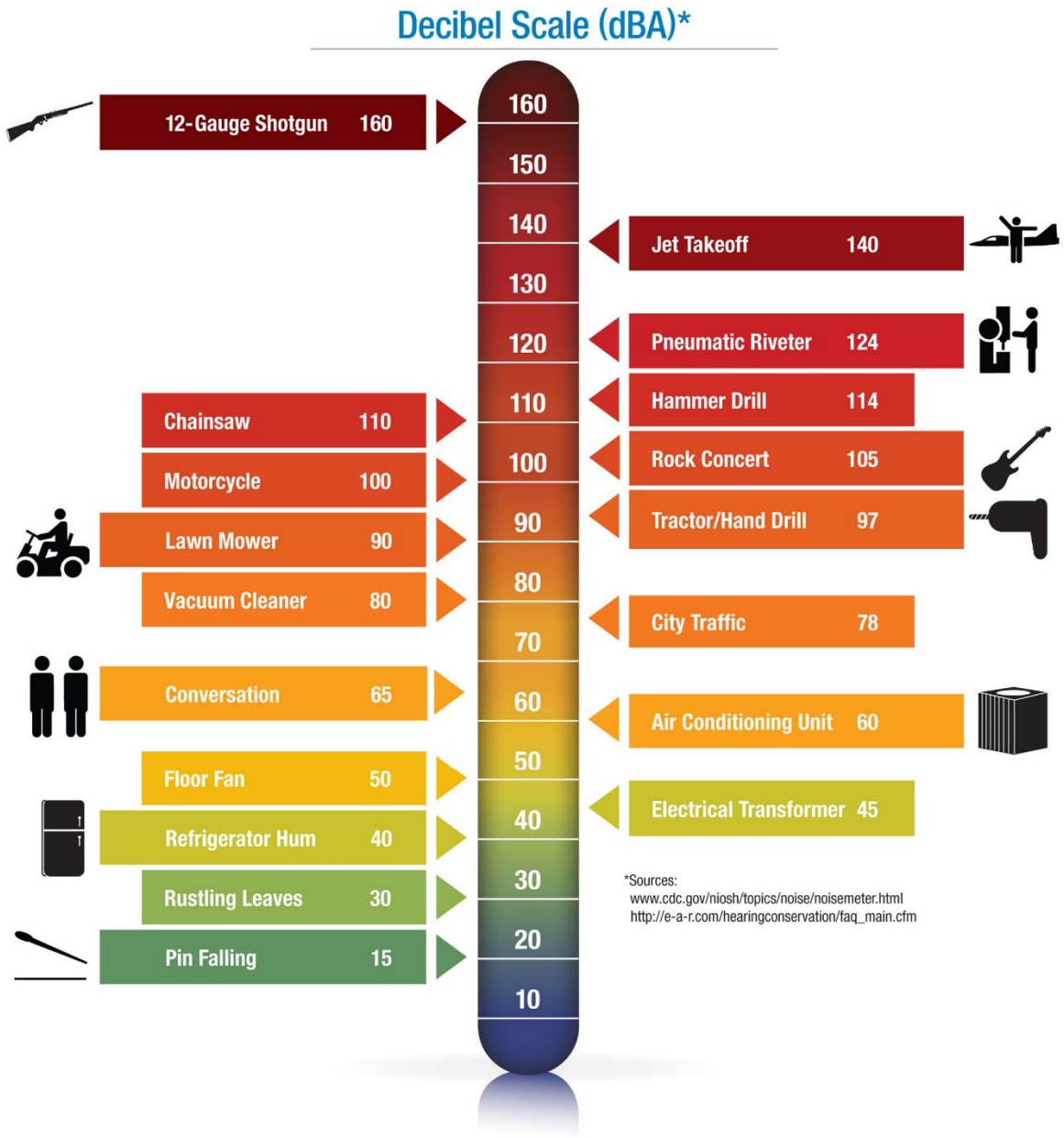
Noise Fundamentals & Terminology

General

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are designated as sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or Hertz (Hz). Definitions of acoustical terminology are provided in Appendix A.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 Micropascals of pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. Noise levels associated with common noise sources are provided in Figure 3.

Figure 3
Noise Levels Associated with Common Noise Sources



A-Weighting and Noise Metrics

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by filtering the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}). The L_{eq} is the foundation of the day-night average noise descriptor, DNL (or DNL), and shows very good correlation with community response to noise. DNL is based on the average noise level over a 24-hour day, with a +10-decibel weighting applied to noise occurring during nighttime (10:00 PM to 7:00 AM) hours. The nighttime penalty is based on the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

The City of Davis General Plan utilizes DNL for the assessment of noise generated by traffic noise sources. For non-transportation noise sources, the Davis Municipal Code utilizes both average (L_{eq}) and single-event maximum (L_{max}) noise standards.

In addition to applying the applicable City noise standards to this Project, the California Environmental Quality Act (CEQA) requires that noise impacts be assessed relative to ambient noise levels that are present without the project. As a result, ambient noise surveys were conducted, and comparisons of Project to No-Project noise levels were used to assess noise impacts. Specifically, in additional to evaluating changes in traffic noise levels in terms of DNL, single-event maximum (L_{max}) noise levels and hourly average (L_{eq}) noise levels were compared for non-transportation noise sources, both with and without the project.

It should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered unacceptable according to CEQA. Because every physical process creates noise, whether by the addition of a single vehicle on a roadway, or by a tractor in an agricultural field, the use of audibility alone as significance criteria would be unworkable. Under CEQA, a significant impact may occur when there is a substantial increase in noise levels, not simply an audible change. The discussion of what constitutes a substantial change in noise environments, both existing and cumulative, is provided in the Regulatory Setting section of this report.

Effects of Noise on People

The effects of noise on people can be divided into three categories:

1. Subjective effects of annoyance, nuisance, dissatisfaction;
2. Interference with activities such as speech, sleep, and learning; and
3. Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the third category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Noise Attenuation over Distance

Stationary "point" sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of approximately 6+ dBA per doubling of distance from the source, depending upon environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noises, such as a large industrial facility, spread over many acres or a street with moving vehicles (a "line" or "moving point" source), would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling distance from the source (also dependent upon environmental conditions - Caltrans, 2013). Noise from large construction sites (with heavy equipment moving dirt and trucks entering and exiting the site daily) would have characteristics of both "point" and "line" sources, so attenuation would generally range between 4.5 and 7.5 dBA per doubling of distance. Atmospheric absorption of sound varies depending on temperature and relative humidity, as well as the frequency content of the noise source. In general, "average day" atmospheric conditions result in attenuation at a rate of approximately 1.5 dB per thousand feet of distance (SAE ARP 866A, 1975).

Vibration Fundamentals & Terminology

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, while vibration is usually associated with transmission through the ground or structures. As with noise, vibration consists of an amplitude and frequency. A person's response to vibration will depend on their individual sensitivity as well as the amplitude and frequency of the source.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration in terms of velocity in inches per second peak particle velocity (IPS, PPV) or root-mean-square (VdB, RMS). Standards pertaining to perception as well as damage to structures have been developed for vibration in terms of peak particle velocity as well as RMS velocities. In terms of RMS velocities, vibration levels below approximately 65 VdB are typically considered to be below the threshold of perception (FTA 2018).

As vibrations travel outward from the source, they excite the particles of rock and soil through which they pass and cause them to oscillate. Differences in subsurface geologic conditions and distance from the source of vibration will result in different vibration levels characterized by different frequencies and intensities. In all cases, vibration amplitudes will decrease with increasing distance.

According to the Transportation and Construction-Induced Vibration Guidance Manual (Caltrans, April 2020), operation of construction equipment and construction techniques generate ground vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage. Ground vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities. However, traffic, rarely generates vibration amplitudes high enough to cause structural damage or annoyance.

Existing Ambient Noise Environment

Existing Land Uses in the Project Vicinity

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to these activities.

The nearest sensitive receptors to the project area consist primarily of residential uses to the north, east and south. To the east the existing land uses are open space or agricultural in nature. Figure 1 illustrates the relationship of the project area to existing residential developments.

Existing Noise Sources Affecting the Project Vicinity

The ambient noise environment in the immediate project vicinity is defined primarily by traffic on East Covell Boulevard and to a lesser extent by traffic on neighborhood streets and intermittent agricultural activities on the farmland to the east of the project site.

Existing Overall Ambient Noise Environment within the Plan area Vicinity

To quantify existing ambient noise environment within the Plan area and project vicinity, BAC conducted long-term (continuous) ambient noise level measurements at the three (3) locations identified on Figure 1 from September 7th to 10th , 2022. Photographs of the noise survey locations are provided in Appendix B.

Larson Davis Laboratories (LDL) precision (Type 1) integrating sound level meters were used to complete the noise level measurements. The meters were calibrated immediately before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4). The results of the long-term ambient noise survey are summarized in Table 1. The complete survey results are presented in tabular and graphical formats in Appendices C and D, respectively.

Table 1
Summary of Long-Term Ambient Noise Level Measurement Results[1]

Site[2]	Date	DNL	Average Measured Hourly Noise Levels (dBA)			
			Daytime[3]		Nighttime[4]	
			L_{max}	L_{50}	L_{max}	L_{50}
1	Wednesday, September 7, 2022	59	72	54	71	43
	Thursday, September 8, 2022	59	73	53	70	43
	Friday, September 9, 2022	59	75	54	70	44
	Saturday, September 10, 2022	59	74	54	69	43
	Sunday, September 11, 2022	57	75	52	66	38
	Average	**58**	**74**	**53**	**69**	**42**
2	Wednesday, September 7, 2022	48	55	42	53	39
	Thursday, September 8, 2022	57	58	40	54	40
	Friday, September 9, 2022	49	59	40	54	40
	Saturday, September 10, 2022	50	63	44	55	41
	Sunday, September 11, 2022	47	56	39	53	37
	Average	**50**	**58**	**41**	**54**	**39**
3	Wednesday, September 7, 2022	50	56	45	53	41
	Thursday, September 8, 2022	49	55	41	54	41
	Friday, September 9, 2022	50	59	39	57	41
	Saturday, September 10, 2022	51	60	47	56	43
	Sunday, September 11, 2022	47	58	39	52	39
	Average	**49**	**58**	**42**	**54**	**41**

[1] Detailed summaries of the noise monitoring results are provided in Appendices C *& D.
[2] Long-term ambient noise monitoring locations are identified on Figure 1.
[3] Daytime hours: 7:00 AM to 10:00 PM
[4] Nighttime hours: 10:00 PM to 7:00 AM
Source: Bollard Acoustical Consultants, Inc. (2022)

Existing Traffic Noise Levels Along the Local Roadway Network

To predict traffic noise levels along existing roadway networks with multiple segments, modelling is commonly used rather than monitoring. The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to quantify existing traffic noise levels at the existing sensitive land uses nearest to the project area roadway network. The Model was also used to quantify the distances to the 60, 65 and 70 dB DNL traffic noise contours for these roadways. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop DNL values from L_{eq} values.

Existing Traffic data in the form of peak hour intersection turning movements were provided by the project transportation consultant. Those data were converted to Average Daily Traffic (ADT) segment volumes by multiplying the average of the AM and PM movements by a factor of 10. Other inputs were obtained from BAC observations and noise measurement data. The existing traffic noise levels at the distances representing the nearest sensitive land uses to the project area roadways and distances from the centerlines of selected roadways to the 60 dB, 65 dB and 70 dB DNL contours are summarized in Table 2. The Table 2 data includes offsets where appropriate to account for the presence of existing traffic noise barriers. Appendix E contains the FHWA Model inputs for existing conditions.

Table 2
Existing Traffic Noise Levels at Nearest Receptors and Distances to DNL Contours

#	Roadway	From	DNL at Nearest Sensitive Receptor	Distance to Contour (ft)		
				70 dB DNL	65 dB DNL	60 dB DNL
1	W Covell Blvd	West of F St.	67	42	90	194
2	E Covell Blvd	F St. to J St.	67	47	101	219
3	E Covell Blvd	J St. to L St.	63	45	98	211
4	E Covell Blvd	L St. to Pole Line Rd	65	44	95	205
5	E Covell Blvd	Pole Line Rd to Birch Ln	60	18	39	85
6	E Covell Blvd	East of Brich Ln	64	35	76	163
7	E Covell Blvd	West of Wright Blvd	60	16	34	73
8	E Covell Blvd	Wright Blvd to Monarch Ln	60	16	35	74
9	E Covell Blvd	Monarch Ln to Alhambra Dr	62	19	42	89
10	E Covell Blvd	Alhambra Dr to Harper Jr H.S.	60	17	37	81
11	Mace Blvd	Harper Jr H.S. to Alhambra Dr	61	38	83	179
12	Mace Blvd	Alhambra Dr to 2nd St.	64	46	99	214
13	Mace Blvd	2nd St. to Chiles Rd	66	51	110	236
14	Mace Blvd	Chiles Rd to Cowell Blvd	63	33	71	152
15	Mace Blvd	South of Cowell Blvd	63	22	47	102
16	F Street	North of E Covell Blvd	62	18	39	84
17	F Street	South of E Covell Blvd	59	19	40	86
18	Cannery Ave	North of E Covell Blvd	53	8	17	37
19	J Street	South of E Covell Blvd	59	13	27	59
20	Pole Line Rd	North of E Covell Blvd	64	42	91	195
21	Pole Line Rd	South of E Covell Blvd	61	20	43	92
22	Birch Ln	South of E Covell Blvd	57	6	12	26
23	Wright Blvd	North of E Covell Blvd	54	9	20	43
24	Monarch Ln	South of E Covell Blvd	53	4	9	20
25	Alhambra Dr	South of E Covell Blvd	54	5	10	21
26	Alhambra Dr	West of Mace Blvd	56	6	13	29
27	Route 32A	East of Mace Blvd	60	22	48	104
28	2nd Street	West of Mace Blvd	65	30	65	141
29	Chiles Rd	East of Mace Blvd	62	27	59	127
30	Chiles Rd	West of Mace Blvd	64	38	82	177
31	Cowell Blvd	East of Mace Blvd	58	11	23	50
32	Cowell Blvd	West of Mace Blvd	60	10	22	48

Source: FHWA-RD-77-108 with inputs from project traffic impact study. Appendix F contains FHWA model inputs.

Existing Ambient Vibration Environment

During site visits conducted by BAC staff, vibration levels within the Plan area were subjectively evaluated as being below the threshold of perception. Nonetheless, to generally quantify existing vibration levels at representative locations within the project site, BAC conducted short-term vibration measurements at the same three (3) locations monitored for ambient noise (See Figure 1).

A Larson-Davis Laboratories Model LxT precision integrating sound level meter equipped with a vibration transducer was used to complete the measurements. The system was calibrated in the field prior to use to ensure the accuracy of the measurements. The ambient vibration monitoring results are summarized in Table 3.

Table 3
Summary of Ambient Vibration Monitoring Results – September 12, 2022

Site[1]	Time	Average Measured Vibration Level, VdB
1	12:07 PM	45
2	12:35 PM	34
3	1:00 PM	32

[1]Vibration measurement sites are the same sites used for the ambient noise surveys shown in Figure 1.
Source: Bollard Acoustical Consultants, Inc. (2022)

The Table 3 data indicate that measured average vibration levels at the project area were below the 65 VdB threshold of perception, which is consistent with the BAC staff observations.

Criteria for Acceptable Noise and Vibration Exposure

Federal

There are no federal noise or vibration criteria which would be directly applicable to this project. However, because the City of Davis General Plan does not currently have a policy for assessing noise impacts associated with increases in ambient noise levels from project-generated noise sources, or a policy identifying acceptable levels of vibration, the following federal recommendations are provided.

Federal Interagency Commission on Noise (FICON)

FICON has developed a graduated scale for use in the assessment of project-related noise level increases. The criteria shown in Table 4 was developed by FICON as a means of developing thresholds for impact identification for project-related noise level increases. The FICON standards have been used extensively in recent years in the preparation of the noise sections of Environmental Impact Reports that have been certified in many California cities and counties.

The use of the FICON standards is considered conservative relative to thresholds used by other agencies in the State of California. For example, the California Department of Transportation (Caltrans) requires a project-related traffic noise level increase of 12 dB for a finding of significance, and the California Energy Commission (CEC) considers project-related noise level increases between 5 to 10 dB significant, depending on local factors. Therefore, the use of the FICON standards, which set the threshold for finding of significant noise impacts as low as 1.5 dB, provides a very conservative approach to impact assessment for this project.

Table 4
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (DNL)	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60 to 65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more[1]

Source: Federal Interagency Committee on Noise (FICON)

1. It should be noted that FICONs Federal Agency Review of Selected Airport Noise Analysis Issues (1992) report does not identify a 1.5 dBA increase as a threshold of significance, but rather, an increase that warrants further analysis. However, for purposes of this analysis, a 1.5 dB threshold is utilized to assess the significance of project-related noise increases at sensitive locations currently exposed to ambient noise environments exceeding 65 dB DNL.

Based on the FICON research, as shown in Table 4, a 5 dB increase in noise levels due to a project is required for a finding of significant noise impact where ambient noise levels without the project are less than 60 dB DNL. Where pre-project ambient conditions are between 60 and 65 dB DNL, a 3 dB increase is applied as the standard of significance. Finally, in areas already exposed to higher noise levels, specifically pre-project noise levels in excess of 65 dB DNL, a 1.5 dB increase is considered by FICON as the threshold of significance. It should be noted that the use of these thresholds is consistent with City of Davis General Plan Noise Element Policy NO-9, which applies to capacity enhancing roadway improvement projects.

Federal Transit Administration

City of Davis does not currently have adopted standards for groundborne vibration. As a result, the vibration impact criteria developed by the Federal Transit Administration (FTA) were applied to the project. The FTA criteria applicable to damage and annoyance from vibration typically associated with construction activities are presented in Tables 5 and 6.

Table 5
FTA Criteria for Assessing Vibration Damage to Structures

Building Category	Level, VdB[1]
I. Reinforced-concrete, steel or timber (no plaster)	102
II. Engineered concrete and masonry (no plaster)	98
III. Non-engineered timber and masonry buildings	94
IV. Buildings extremely susceptible to vibration damage	90

1. RMS velocity in decibels (VdB) re 1 micro-inch/second

Source: Federal Transit Administration (FTA) Noise and Vibration Manual, Table 12-3

Table 6
Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Impact Levels (VdB)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior ops.	65[d]	65[d]	65[d]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Vibration levels are measured in or near the vibration-sensitive use.
a. "Frequent Events" is defined as more than 70 vibration events of the same source per day.
b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
c. "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.
d. This criterion limit is based on levels that are acceptable for most moderately-sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels.

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

State of California

California Environmental Quality Act (CEQA)

The State of California has established regulatory criteria that are applicable to this assessment. Specifically, Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. The CEQA criteria are presented in the Standards of Significance section of this report.

Local

City of Davis General Plan Noise Element

The City of Davis General Plan, Chapter 21: Noise, Table 20, requires that interior noise exposure from exterior noise sources within residential dwellings not exceed 45 dB DNL (or CNEL), regardless of exterior noise exposure. This standard is increased to 55 dB DNL or less for office (commercial) uses.

Chapter 21, Table 19 of the City of Davis General Plan establishes an exterior noise level criterion of less than 60 dB DNL (or CNEL) within outdoor activity areas of residential land uses. This standard is adjusted to a level less than 65 dB DNL for commercial uses. These are considered to be the Normally Acceptable criteria, and may be adjusted upward (60-70 dB DNL for residential, 65-75 dB DNL for office/professional) based on compliance with the interior noise criterion and the City's discretion. Furthermore, Policy NOISE 1.2 of the City of Davis General Plan discourages the construction of sound walls whenever there are alternative mitigation measures feasible.

Davis Municipal Code

The Davis Municipal Code establishes noise level limits that would be applicable to on-site project-generated noise sources which would affect existing or proposed sensitive receptors. Municipal Code Section 24.02.020 (Noise Limits), states that no person shall produce, suffer, or allow to be produced on any public or private property, sounds at a level in excess of those enumerated in Table 7, when measured at its property plane or, if on any street or highway measured at the property plane of the nearest property.

Table 7
Davis Municipal Code Exterior Noise Standards

Land Use	Time Period	Maximum Noise Level (dBA)
Residential	9:00 p.m. to 7:00 a.m.	50
	7:00 a.m. to 9:00 p.m.	55
Commercial/Industrial/Core Commercial	10:00 p.m. to 7:00 a.m.	55
	7:00 a.m. to 10:00 p.m.	60
High noise traffic corridor	Anytime	65

As noted in Table 7 above, Section 24 of the City of Davis Municipal Code establishes a maximum noise level standard of 55 dB during the hours of 7:00 AM to 9:00 PM, and 50 dB during the hours of 9:00 PM to 7:00 AM. Section 24.02.030 increases these limits by 20 dBA. Therefore, it is interpreted that the City's maximum noise limit is 75 dBA L_{max} for the hours of 7:00 AM to 9:00 PM and 70 dBA L_{max} during the house of 9:00 PM to 7:00 AM.

Section 24.02.040 of the Davis Municipal Code contains special provisions which apply to noise generated by construction-related activities. The pertinent components of that section are reproduced below.

> (a) Power tools. The operation of power tools for noncommercial purposes shall be exempt from the provisions of Sections 24.02.020(a), (b), (c) and 24.02.030, between the hours of 8:00 a.m. and 8:00 p.m.; provided, that such operations shall be subject to the provisions of Section 24.05.010. For purposes of this section, a noncommercial use shall be a use for which a business license is not required pursuant to Chapter 19.
>
> (b) Construction and landscape maintenance equipment. Notwithstanding any other provision of this chapter, between the hours of 7:00 a.m. and 7:00 p.m. on Mondays through Fridays, and between the hours of 8:00 a.m. and 8:00 p.m. on Saturdays and Sundays, construction, alteration, repair or maintenance activities which are authorized by valid city permit or business license, or carried out by employees of contractors of the city shall be allowed if they meet at least one of the following noise limitations:
>
> > (1) No individual piece of equipment shall produce a noise level exceeding eighty-three dBA at a distance of twenty-five feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty feet from the equipment as possible.

(2) The noise level at any point outside of the property plane of the project shall not exceed eighty-six dBA.

(3) The provisions of subdivisions (1) and (2) of this subsection shall not be applicable to impact tools and equipment; provided, that such impact tools and equipment shall have intake and exhaust mufflers recommended by manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation, and that pavement breakers and jack-hammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers thereof and approved by the director of public works as best accomplishing maximum noise attenuation. In the absence of manufacturer's recommendations, the director of public works may prescribe such means of accomplishing maximum noise attenuation as he or she may determine to be in the public interest.

Construction projects located more than two hundred feet from existing homes may request a special use permit to begin work at 6:00 a.m. on weekdays from June 15th until September 1st. No percussion type tools (such as ramsets or jackhammers) can be used before 7:00 a.m. The permit shall be revoked if any noise complaint is received by the police department.

Impacts and Mitigation Measures

Thresholds of Significance

Appendix G of the CEQA Guidelines asks whether the project would result in any of the following to determine whether a significant noise or vibration impact would occur:

- 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 other applicable standards of other agencies; or
- Generation of excessive groundborne vibration or groundborne noise levels; or
- 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.

For this assessment, noise impacts are identified as significant if the project would result in substantial increases in off-site traffic noise levels at existing noise-sensitive land uses, if on-site activities would result in exceedance of the Davis Municipal Code standards at existing residential uses located in the immediate project vicinity, or if future East Covell Boulevard traffic noise levels would exceed 60 dB DNL at the outdoor activity areas of residences within the Palomino Place development proposed adjacent to that roadway or 45 dB DNL at the interior areas of those same residences.

Vibration impacts are identified as significant if project construction would result in exceedance of the Federal criteria for damage to structures provided in Table 5 or if ongoing on-site activities would generate vibration levels exceeding the Federal vibration criteria for annoyance shown in Table 6.

Because the project is not located in the vicinity of an airport, the third CEQA criteria would not be applicable to this project.

Noise Impacts Associated with Project-Generated Increases in Off-Site Traffic

With development of the project, traffic volumes on the local roadway network will increase. Those increases in daily traffic volumes will result in a corresponding increase in traffic noise levels at existing sensitive uses located along those roadways. Impacts 1 & 2 evaluate increases in off-site traffic noise levels which would result from the project.

Impact 1: Increases in Existing/Baseline Traffic Noise Levels due to the Project

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to quantify increases in existing traffic noise levels at the existing sensitive land uses nearest to the project area roadway network. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop DNL values from L_{eq} values.

Traffic data in the form of peak hour intersection turning movements were provided by the project transportation consultant. Those data were converted to Average Daily Traffic (ADT) segment volumes by multiplying the average of the AM and PM movements by a factor of 10. Other inputs were obtained from BAC observations and noise measurement data.

The existing and existing plus project traffic noise levels at the distances representing the nearest sensitive land uses to the project area roadways are summarized in Table 8. Table 8 also shows the thresholds for determination of a significant traffic noise increase, whether the roadway segment contains sensitive uses, and whether or not significant noise impacts are identified for each segment.

The data in Table 8 indicate that project-generated traffic noise level increases would result in significant noise impacts at existing sensitive receptors located along the project area roadway network. As a result, this impact is identified as being ***less than significant***.

Mitigation for Impact 1: ***None Required***

Table 8
Predicted Traffic Noise Level Increases at Existing Sensitive Receptors – Existing vs. Existing Plus Project Conditions
Palomino Place Development - Davis California

#	Roadway	Segment Description	Predicted DNL, dBA			Significance Threshold[1]	Threshold Exceeded?	Sensitive Receptors Present?[2]	Significant Impact Identified?[3]
			Existing	Existing + Project	Increase				
1	W Covell Blvd	West of F Street	66.6	66.8	0.2	1.5	No	**Yes**	No
2	E Covell Blvd	F Street to J Street	66.5	66.7	0.2	1.5	No	**Yes**	No
3	E Covell Blvd	J Street to L Street	62.7	62.9	0.2	3.0	No	**Yes**	No
4	E Covell Blvd	L Street to Pole Line Rd	64.7	65.0	0.3	3.0	No	No	No
5	E Covell Blvd	Pole Line Rd to Birch Ln	60.0	60.5	0.5	3.0	No	**Yes**	No
6	E Covell Blvd	East of Brich Ln	64.2	64.7	0.5	3.0	No	**Yes**	No
7	E Covell Blvd	West of Wright Blvd	60.3	60.8	0.5	3.0	No	**Yes**	No
8	E Covell Blvd	Wright Blvd to Monarch Ln	60.4	60.9	0.5	3.0	No	**Yes**	No
9	E Covell Blvd	Monarch Ln to Alhambra Dr	61.6	61.9	0.3	3.0	No	**Yes**	No
10	E Covell Blvd	Alhambra Dr to Harper Jr H.S.	60.5	60.8	0.3	3.0	No	**Yes**	No
11	Mace Blvd	Harper Jr H.S. to Alhambra Dr	61.1	61.4	0.3	3.0	No	**Yes**	No
12	Mace Blvd	Alhambra Dr to 2nd Street	63.8	64.0	0.2	3.0	No	**Yes**	No
13	Mace Blvd	2nd Street to Chiles Rd	65.6	65.7	0.1	1.5	No	**Yes**	No
14	Mace Blvd	Chiles Rd to Cowell Blvd	62.7	62.8	0.1	3.0	No	No	No
15	Mace Blvd	South of Cowell Blvd	62.9	62.9	0.0	3.0	No	**Yes**	No
16	F Street	North of E Covell Blvd	61.7	61.7	0.0	3.0	No	**Yes**	No
17	F Street	South of E Covell Blvd	59.0	59.1	0.1	5.0	No	**Yes**	No
18	Cannery Ave	North of E Covell Blvd	53.5	53.5	0.0	5.0	No	No	No
19	J Street	South of E Covell Blvd	59.4	59.5	0.1	5.0	No	**Yes**	No
20	Pole Line Rd	North of E Covell Blvd	64.4	64.4	0.0	3.0	No	**Yes**	No
21	Pole Line Rd	South of E Covell Blvd	60.5	60.7	0.2	3.0	No	**Yes**	No
22	Birch Ln	South of E Covell Blvd	57.3	57.3	0.0	5.0	No	**Yes**	No
23	Wright Blvd	North of E Covell Blvd	53.8	53.9	0.1	5.0	No	**Yes**	No
24	Monarch Ln	South of E Covell Blvd	52.9	53.2	0.3	5.0	No	**Yes**	No
25	Alhambra Dr	South of E Covell Blvd	54.4	54.5	0.1	5.0	No	**Yes**	No
26	Alhambra Dr	West of Mace Blvd	55.7	55.7	0.0	5.0	No	**Yes**	No
27	Route 32A	East of Mace Blvd	60.3	60.3	0.0	3.0	No	No	No
28	2nd Street	West of Mace Blvd	65.0	65.1	0.1	3.0	No	No	No
29	Chiles Rd	East of Mace Blvd	61.6	61.6	0.0	3.0	No	No	No
30	Chiles Rd	West of Mace Blvd	63.7	63.8	0.1	3.0	No	No	No
31	Cowell Blvd	East of Mace Blvd	58.3	58.3	0.0	5.0	No	**Yes**	No
32	Cowell Blvd	West of Mace Blvd	59.7	59.9	0.2	5.0	No	**Yes**	No

Notes:

1. Significance threshold derived from Table 4.
2. Sensitive receptors were considered to be residences of all densities, schools, & transient lodging facilities.
3. A significant impact is identified only along segments where the project-related traffic noise level increase would exceed the significance threshold AND where sensitive receptors are present along the roadway segment.

Source: FHWA-RD-77-108 with inputs from project traffic impact study. Appendix D contains FHWA Model inputs.

Impact 2: Increases in Cumulative Traffic Noise Levels due to the Project

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to quantify increases in future (cumulative) traffic noise levels at the nearest existing sensitive land uses to the project area roadway network. This analysis first assesses whether a cumulative roadway noise impact would occur by comparing the cumulative with project conditions to existing conditions. If a cumulative roadway noise impact is identified, it is further evaluated to assess whether the proposed project would make a cumulatively considerable contribution to the cumulative impact. This process is completed through a comparison of the roadway noise associated with the cumulative with project scenario against the cumulative no-project scenario. Appendix F contains the FHWA Model inputs for cumulative and cumulative plus project conditions.

Table 9 compares the cumulative with project traffic noise levels against existing no project traffic noise levels and includes a determination regarding whether the corresponding increase in traffic noise exposure over time an identified cumulative noise impact is considerable. Table 10 compares cumulative with project against cumulative no-project conditions to determine if the project's contribution to the cumulative noise environment is considerable.

Based on the analysis presented above, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the project (existing vs. cumulative with project conditions) are identified as ***less than significant***.

Mitigation for Impact 2: ***None Required***

Table 9
Predicted Traffic Noise Level Increases at Existing Sensitive Receptors – Existing vs. Cumulative Plus Project Conditions
Palomino Place Development - Davis California

#	Roadway	Segment Description	Predicted DNL, dBA			Significance Threshold[1]	Threshold Exceeded?	Sensitive Receptors Present?[2]	Significant Cumulative Impact Identified?[3]
			Existing	Cumulative + Project	Increase				
1	W Covell Blvd	West of F Street	66.6	67.4	0.8	1.5	No	**Yes**	No
2	E Covell Blvd	F Street to J Street	66.5	67.2	0.7	1.5	No	**Yes**	No
3	E Covell Blvd	J Street to L Street	62.7	63.5	0.8	3.0	No	**Yes**	No
4	E Covell Blvd	L Street to Pole Line Rd	64.7	65.4	0.7	3.0	No	No	No
5	E Covell Blvd	Pole Line Rd to Birch Ln	60.0	60.8	0.8	3.0	No	**Yes**	No
6	E Covell Blvd	East of Brich Ln	64.2	65.0	0.8	3.0	No	**Yes**	No
7	E Covell Blvd	West of Wright Blvd	60.3	61.1	0.8	3.0	No	**Yes**	No
8	E Covell Blvd	Wright Blvd to Monarch Ln	60.4	61.3	0.9	3.0	No	**Yes**	No
9	E Covell Blvd	Monarch Ln to Alhambra Dr	61.6	62.2	0.6	3.0	No	**Yes**	No
10	E Covell Blvd	Alhambra Dr to Harper Jr H.S.	60.5	61.2	0.7	3.0	No	**Yes**	No
11	Mace Blvd	Harper Jr H.S. to Alhambra Dr	61.1	61.8	0.7	3.0	No	**Yes**	No
12	Mace Blvd	Alhambra Dr to 2nd Street	63.8	64.8	1.0	3.0	No	**Yes**	No
13	Mace Blvd	2nd Street to Chiles Rd	65.6	66.8	1.2	1.5	No	**Yes**	No
14	Mace Blvd	Chiles Rd to Cowell Blvd	62.7	63.7	1.0	3.0	No	No	No
15	Mace Blvd	South of Cowell Blvd	62.9	63.4	0.5	3.0	No	**Yes**	No
16	F Street	North of E Covell Blvd	61.7	62.2	0.5	3.0	No	**Yes**	No
17	F Street	South of E Covell Blvd	59.0	59.6	0.6	5.0	No	**Yes**	No
18	Cannery Ave	North of E Covell Blvd	53.5	56.4	2.9	5.0	No	No	No
19	J Street	South of E Covell Blvd	59.4	60.8	1.4	5.0	No	**Yes**	No
20	Pole Line Rd	North of E Covell Blvd	64.4	64.6	0.2	3.0	No	**Yes**	No
21	Pole Line Rd	South of E Covell Blvd	60.5	60.8	0.3	3.0	No	**Yes**	No
22	Birch Ln	South of E Covell Blvd	57.3	58.1	0.8	5.0	No	**Yes**	No
23	Wright Blvd	North of E Covell Blvd	53.8	54.4	0.6	5.0	No	**Yes**	No
24	Monarch Ln	South of E Covell Blvd	52.9	54.1	1.2	5.0	No	**Yes**	No
25	Alhambra Dr	South of E Covell Blvd	54.4	54.9	0.5	5.0	No	**Yes**	No
26	Alhambra Dr	West of Mace Blvd	55.7	57.6	1.9	5.0	No	**Yes**	No
27	Route 32A	East of Mace Blvd	60.3	60.9	0.6	3.0	No	No	No
28	2nd Street	West of Mace Blvd	65.0	66.4	1.4	3.0	No	No	No
29	Chiles Rd	East of Mace Blvd	61.6	62.9	1.3	3.0	No	No	No
30	Chiles Rd	West of Mace Blvd	63.7	64.7	1.0	3.0	No	No	No
31	Cowell Blvd	East of Mace Blvd	58.3	58.8	0.5	5.0	No	**Yes**	No
32	Cowell Blvd	West of Mace Blvd	59.7	62.0	2.3	5.0	No	**Yes**	No

Notes:
1. Significance threshold derived from Table 4.
2. Sensitive receptors were considered to be residences of all densities, schools, & transient lodging facilities.
3. A significant impact is identified only along segments where the project-related traffic noise level increase would exceed the significance threshold AND where sensitive receptors are present along the roadway segment.

Source: FHWA-RD-77-108 with inputs from project traffic impact study. Appendix F contains FHWA Model inputs.

Table 10
Predicted Traffic Noise Level Increases at Existing Sensitive Receptors – Cumulative No-Project vs. Cumulative + Project Conditions
Palomino Place Development - Davis California

#	Roadway	Segment Description	Predicted DNL, dBA			Significance Threshold[1]	Threshold Exceeded?	Project's Contribution to Cumulative Condition Considerable?[3]
			Cumulative No-Project	Cumulative + Project	Increase			
1	W Covell Blvd	West of F Street	67.2	67.4	0.2	1.5	No	No
2	E Covell Blvd	F Street to J Street	67.1	67.2	0.1	1.5	No	No
3	E Covell Blvd	J Street to L Street	63.2	63.5	0.3	3.0	No	No
4	E Covell Blvd	L Street to Pole Line Rd	65.1	65.4	0.3	1.5	No	No
5	E Covell Blvd	Pole Line Rd to Birch Ln	60.4	60.8	0.4	3.0	No	No
6	E Covell Blvd	East of Brich Ln	64.6	65.0	0.4	3.0	No	No
7	E Covell Blvd	West of Wright Blvd	60.6	61.1	0.5	3.0	No	No
8	E Covell Blvd	Wright Blvd to Monarch Ln	60.8	61.3	0.5	3.0	No	No
9	E Covell Blvd	Monarch Ln to Alhambra Dr	62.0	62.2	0.2	3.0	No	No
10	E Covell Blvd	Alhambra Dr to Harper Jr H.S.	60.9	61.2	0.3	3.0	No	No
11	Mace Blvd	Harper Jr H.S. to Alhambra Dr	61.5	61.8	0.3	3.0	No	No
12	Mace Blvd	Alhambra Dr to 2nd Street	64.6	64.8	0.2	3.0	No	No
13	Mace Blvd	2nd Street to Chiles Rd	66.7	66.8	0.1	1.5	No	No
14	Mace Blvd	Chiles Rd to Cowell Blvd	63.6	63.7	0.1	3.0	No	No
15	Mace Blvd	South of Cowell Blvd	63.4	63.4	0.0	3.0	No	No
16	F Street	North of E Covell Blvd	62.2	62.2	0.0	3.0	No	No
17	F Street	South of E Covell Blvd	59.5	59.6	0.1	5.0	No	No
18	Cannery Ave	North of E Covell Blvd	56.4	56.4	0.0	5.0	No	No
19	J Street	South of E Covell Blvd	60.7	60.8	0.1	3.0	No	No
20	Pole Line Rd	North of E Covell Blvd	64.6	64.6	0.0	3.0	No	No
21	Pole Line Rd	South of E Covell Blvd	60.7	60.8	0.1	3.0	No	No
22	Birch Ln	South of E Covell Blvd	58.0	58.1	0.1	5.0	No	No
23	Wright Blvd	North of E Covell Blvd	54.3	54.4	0.1	5.0	No	No
24	Monarch Ln	South of E Covell Blvd	53.9	54.1	0.2	5.0	No	No
25	Alhambra Dr	South of E Covell Blvd	54.8	54.9	0.1	5.0	No	No
26	Alhambra Dr	West of Mace Blvd	57.6	57.6	0.0	5.0	No	No
27	Route 32A	East of Mace Blvd	60.8	60.9	0.1	3.0	No	No
28	2nd Street	West of Mace Blvd	66.3	66.4	0.1	1.5	No	No
29	Chiles Rd	East of Mace Blvd	62.9	62.9	0.0	3.0	No	No
30	Chiles Rd	West of Mace Blvd	64.7	64.7	0.0	3.0	No	No
31	Cowell Blvd	East of Mace Blvd	58.8	58.8	0.0	5.0	No	No
32	Cowell Blvd	West of Mace Blvd	61.9	62.0	0.1	3.0	No	No

Notes:

1. Significance threshold derived from Table 4.
2. Sensitive receptors were considered to be residences of all densities, schools, & transient lodging facilities.
3. A significant impact is identified only along segments where the project-related traffic noise level increase would exceed the significance threshold AND where sensitive receptors are present along the roadway segment.

Noise Impacts from Community-Serving Uses at Existing Off-Site Sensitive Uses

As discussed previously, the project proposes community-serving uses in the form of a pentathlon training facility and a swimming pool complex. Noise generated by activities occurring within the pentathlon training facility (fencing, laser pistol training, locker rooms, etc.), is expected to be contained within the building. Use of the outdoor obstacle course equipment will be limited to 7 am to 9 pm, and would not generate noise appreciably greater than typical park equipment. As a result, this aspect of the project is considered to be acoustically benign. Nonetheless, noise from the obstacle course is evaluated below. The swimming pool complex proposes 1 pool and associated equipment. The center of the pool facility will be set back approximately 400 feet from the nearest existing residences located on the south side of Covell Boulevard, and approximately 500 feet from the nearest existing residents to the west. Impact 3 evaluates the noise-generating potential of the swimming pool complex and obstacle course.

Impact 3: Swimming Pool Complex and Obstacle Course Noise at Existing Sensitive Uses

Swimming Pool Activities

Swimming activities (lap swimming, training, water aerobics, etc.), by themselves do not generate appreciable noise levels. As a result, noise will be generated at the pool facility primarily by spectators during swim events and by the proposed public address system. Given the limited parking proposed at the community-serving area of the project site (55 spaces), significant crowd sizes at the pool complex are not anticipated. Conservatively assuming a crowd size of 60 persons speaking & cheering at varying vocal levels (casual to loud), during swimming events the predicted average and maximum noise levels at a distance of 400 to 500 feet from the nearest residences computes to less than 40 dBA Leq and 50 dBA L_{max} (after consideration of noise attenuation provided by intervening buildings to the west and the existing sound wall located on the south side of Covell Boulevard to the south. These predicted levels would be satisfactory relative to the City of Davis daytime and nighttime Municipal Code standards. In terms of General Plan compliance, swimming pool generated noise levels would be well below 50 dBA DNL at the nearest noise-sensitive receptors to the project site. This level is well below the the General Plan 60 dB DNL exterior noise standard applicable at residential uses.

According to the project applicant, outdoor speaker usage is not anticipated except potentially during national (annual) or world cup events which would occur a maximum of once per year. The noise generation of public address systems is highly variable, depending the location, number, orientation, and power settings of the speakers. Because the specific design of the P/A system has yet to be completed, it is not possible to precisely predict the noise generation of the P/A system at the nearest existing residences to the north and northwest. Nonetheless, due to the distance and shielding of existing residences relative to the proposed pool area, as well as the infrequent use of outdoor speakers, ***this impact is considered less-than significant***.

Obstacle Course Activities

Obstacle course activities will include running, jumping, climbing, and maneuvering through a series of strength and endurance-related obstacles. The obstacle course is located in the southeast corner of the project, adjacent to Covel Boulevard and existing agricultural land to the east. The noise generation of these activities is expected to be comparable to noise generated by equipment found in neighborhood parks and gyms, and are not anticipated to generate appreciable noise levels beyond the immediate obstacle course area.

Activities at the obstacle course will consist primarily of training, but infrequent competitions may be held at the site. Noise will be generated at the obstacle course primarily by athletes and spectators during training and competition events, and a small public address system may be used during competitions. Given the limited parking proposed at the community-serving area of the project site, significant crowd sizes at the obstacle course component of the project are not anticipated. Conservatively assuming a crowd size of 60 persons speaking & cheering at varying vocal levels (casual to loud), during obstacle course events (similar to swimming events), the predicted average and maximum noise levels at a distance of 300 feet from the effective noise center of the obstacle course to the nearest residences to the south computes to less than 40 dBA Leq and 45 dBA L_{max} (after consideration of noise attenuation provided by the existing sound wall located on the south side of Covell Boulevard. These predicted levels would be satisfactory relative to the City of Davis daytime and nighttime Municipal Code standards. In terms of General Plan compliance, obstacle course generated noise levels would be well below 50 dBA DNL at the nearest noise-sensitive receptors to the project site. This level is well below the the General Plan 60 dB DNL exterior noise standard applicable at residential uses. As a result, ***this impact is considered less-than significant***.

Mitigation for Impact 3: ***None Required***

Noise Impacts Associated with Project On-Site Construction Activities

Impact 4: On-Site Construction Noise Levels at Existing Sensitive Uses

During project construction, heavy equipment would be used for grading excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project work area would also vary depending on the proximity of equipment activities to that point.

Table 11 includes the range of maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet. Not all of these construction activities would be required of this project. The Table 11 data also include predicted maximum equipment noise levels at the boundary of the nearest sensitive use located approximately 25 feet away, which assume a standard spherical spreading loss of 6 dB per doubling of distance.

Table 11
Construction Equipment Reference Noise Levels and Predicted Noise Levels at 25 Feet

Equipment Description	Maximum Noise Level at 50 Feet (dBA)	Predicted Maximum Noise Level at 25 feet (dBA)
Air compressor	80	86
Backhoe	80	86
Ballast equalizer	82	88
Ballast tamper	83	89
Compactor	82	88
Concrete mixer	85	91
Concrete pump	82	88
Concrete vibrator	76	82
Crane, mobile	83	89
Dozer	85	91
Generator	82	91
Grader	85	88
Impact wrench	85	91
Loader	80	91
Paver	85	86
Pneumatic tool	85	91
Pump	77	91
Saw	76	83
Scarifier	83	82
Scraper	85	89
Shovel	82	91
Spike driver	77	88
Tie cutter	84	83
Tie handler	80	90
Tie inserter	85	86
Truck	84	91

Source: Federal Transit Administration Noise and Vibration Impact Assessment Manual, Table 7-1 (2018)

Based on the equipment noise levels in Table 11, worst-case on-site project construction equipment maximum noise levels at the nearest existing residential uses located 25 feet away are expected to range from approximately 82 to 91 dB. Average noise levels at the nearest residences to the project are projected using the FHWA Roadway Construction Noise Model (RCNM) to be 85 dBA Leq or less. Although average noise levels would be satisfactory relative to City Code section 24.02.040.b.2 (86 dBA beyond property plane), worst-case maximum noise levels generated during project construction would substantially exceed baseline ambient conditions at the nearest existing residences. As a result, ***this impact is considered potentially significant***.

Mitigation for Impact 4:

MM-1: The following measures shall be incorporated into the project on-site construction operations:

- Noise-generating construction activities shall occur pursuant to the hours and days outlined in the City of Davis Municipal Code.

- All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
- All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
- Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from existing noise-sensitive uses.
- Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.

Although the mitigation measures cited above would decrease the potential for adverse public reaction to noise generated during construction activities, it cannot be determined with certainty that these measures would reduce construction-related noise levels to both a state of compliance with City Code requirements and to levels which do not substantially exceed existing ambient conditions. In addition, given the height of heavy earthmoving equipment, the use of temporary construction barriers would not appreciably reduce construction noise at the nearest residences, and is considered infeasible as a mitigation measure. As a result, this impact is considered **significant and unavoidable**.

Significance of Impact 4 after Mitigation: ***Significant and Unavoidable***

Vibration Impacts Associated with Project Activities

Impact 5: Vibration Generated by Project Construction and On-Site Operations

During project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest identified existing structures (newer engineered residences which are not highly susceptible to damage by vibration) are located approximately 25 feet from where construction activities would occur within the Plan area.

Table 12 includes the range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The Table 12 data also include predicted equipment vibration levels at a distance of 100 feet from proposed construction activities.

Table 12
Vibration Source Levels for Construction Equipment

Equipment	Maximum Vibration Level at 25 feet, VdB (rms)	Predicted Maximum Vibration Level at 100 feet, VdB (rms)
Vibratory Roller	94	76
Hoe Ram	87	69
Large bulldozer	87	69
Loaded trucks	86	68
Jackhammer	79	61
Small bulldozer	58	40

[1] PPV = Peak Particle Velocity

Source: 2018 FTA Transit Noise and Vibration Impact Assessment Manual and BAC calculations

As shown in Table 12, vibration levels generated from on-site construction activities are predicted to be below thresholds for damage to engineered residential structures (98 VdB) at a distance of 25 feet from those activities. In addition, construction-related vibration levels are generally predicted to be below levels considered to be annoying (75 VdB) at a distance of 100 feet from the construction activity.

The project proposes a mixed-use community containing residential and community-serving amenities. It is the experience of BAC these uses do not typically have equipment that generates appreciable off-site vibration. Because vibration levels due to both project construction and activities related to proposed developments within the Plan area are expected to be satisfactory relative to the applicable vibration criteria for damage to structures and annoyance, this impact is considered to be ***less than significant***.

Mitigation for Impact 5: ***None Required***

Noise Impacts Upon Sensitive Uses Proposed within the Project Site

The California Supreme Court issued an opinion in *California Building Industry Association v. Bay Area Air Quality Management District (2015)* holding that CEQA is primarily concerned with the impacts of a project *on* the environment and generally does not require agencies to analyze the impact of existing of future conditions on a project's future users or residents. Nevertheless, City of Davis has General Plan policies that address existing/future conditions affecting future uses of the proposed Plan area. As a result, noise impacts upon the project are evaluated for General Plan consistency in the following section.

Impact 6: Future Traffic Noise Levels within Backyard Areas of Residences Proposed Adjacent to East Covell Boulevard

As indicated by Figure 2, the project proposes residential uses adjacent to East Covell Boulevard. The proposed residential uses consist of single-family residences in the southwest corner of the site and an apartment building in the south-central portion of the site, as indicated in Figure 2. The FHWA Model was used with *future-plus-project* traffic data to predict future East Covell Boulevard traffic noise levels at those proposed residences. The results of the FHWA analysis, which are provided in Appendix G-1, indicate that future traffic noise levels at the single family residences proposed adjacent to East Covell Boulevard will be 66 DNL within backyards. At this time, the location of outdoor activity areas associated with the apartment use is unknown. As a result, a specific evaluation of potential impacts at that area cannot be completed until more detailed plans for the apartment building have been prepared. Nonetheless, because future traffic noise levels at the backyard areas of the single-family residences and apartment site are predicted to exceed the City's 60 dB DNL exterior noise standard, ***this impact is considered significant***.

Mitigation for Impact 6:

To ensure satisfaction with the applicable City of Davis General Plan exterior noise standards within the backyard areas of the residences proposed adjacent to East Covell Boulevard, the following specific noise mitigation measure should be implemented:

MM-2: A solid noise barrier measuring 6-feet in height relative to proposed backyard elevations shall be constructed along the southern property line of the cottage lots proposed adjacent to East Covell Boulevard. The barrier shall be wrapped to the north along the project site access road a distance of 50 feet. Appendix G-2 shows the results of the noise barrier calculations. Figure 2 shows the approximate location of the required barrier.

MM-3: If the outdoor use area of the proposed apartment building will be located between the apartment building and Covell Boulevard a solid noise barrier measuring 6-feet in height relative to the elevation of the outdoor use area shall be constructed at the location shown on Figure 2.

Significance of Impact 6 after Mitigation: ***Less than Significant***

Impact 7: Future Traffic Noise Levels within Interior Areas of Residences Proposed Adjacent to East Covell Boulevard

As indicated by Appendix G-1, future traffic noise levels at the building facades of the residences proposed adjacent to East Covell Boulevard will be approximately 66 DNL. Because standard residential construction in accordance with building code requirements provides at least 25 dBA of exterior to interior traffic noise attenuation, future interior noise levels within these residences will be approximately 41 dB DNL or less. Because the predicted interior noise levels satisfy the City of Davis 45 dB DNL interior noise standard, ***this impact is considered less than significant***.

Mitigation for Impact 7: ***None Required***

Impact 8: Swimming Pool Complex Noise at Proposed Residences Located Within the Proposed Development

As noted previously, swimming activities (lap swimming, training, water aerobics, etc.), by themselves do not generate appreciable noise levels. As a result, noise will be generated at the pool facility primarily by spectators during swim events and by the proposed public address system. Given the proximity of the nearest proposed residences within the Palomino Place development to the pool, the potential exists for pool activities to generate noise levels exceeding City of Davis noise standards at those nearest residences. As a result, ***this impact is considered potentially significant***.

Mitigation for Impact 8:

To reduce the potential for exceedance of the applicable City of Davis General Plan and Noise Ordinance standards at nearby residences within the Palomino Place development during pool usage, and to reduce the potential for annoyance associated with late night or early morning aquatic center activities (should nighttime activities occur), the following specific noise mitigation measures should be implemented:

MM-4: An 8-foot tall upgraded acoustic wood fence barrier shall be constructed along the northern border of the pool area as indicated in Figure 2. The fence shall incorporate double wood fence slats with 100% overlap. The fence slats shall be offset 50% relative to the adjacent slat so that no gaps between slats will occur over time. The slats shall be screwed to the wood framing members, not nailed or stapled.

MM-5: During swimming pool activities, verbal instruction by coaches and instructors shall be monitored and limited such that sound levels do not exceed standards contained within the City of Davis Noise Ordinance at nearby residential property lines to the west or north.

MM-6: Individual training involving lap-swimming activities can occur during late night or early morning hours provided such activities do not generate excessive noise

levels at the residential property lines of Lots 14 and 15 to the west and Lot 37 to the north (See Figure 2 for lot locations).

MM-7: If a public address system (P/A) is installed at the swimming pool complex it must be designed and controlled such that sound levels do not exceed City of Davis Noise Ordinance standards at the residential property lines and shall be strictly limited to hours during which compliance with the City of Davis Noise Ordinance can be achieved.

MM-8: Disclosure statements shall be provided to all prospective residents of the development located within 200 feet of the pool area notifying them of the potential for elevated noise levels during organized events held at the pool.

Significance of Impact 8 after Mitigation: ***Less than Significant***

Appendix A
Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

Decibel or dB Fundamental unit of sound. A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.

IIC Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.

L_{dn} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{eq} Equivalent or energy-averaged sound level.

L_{max} The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.

RT_{60} The time it takes reverberant sound to decay by 60 dB once the source has been removed.

STC Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.

Legend

- A — Noise Monitoring Equipment at Site 1
- B — Vibration Monitoring Equipment at Site 1
- C — Noise Monitoring Equipment at Site 2
- D — Noise & Vibration Monitoring Equipment at Site 3
- Microphone

Palomino Place

Davis, California

Noise & Vibration Survey Locations

Appendix B

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Appendix C-1
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Wednesday, September 7, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	47	65	39	37
1:00 AM	54	86	40	37
2:00 AM	50	84	40	37
3:00 AM	46	65	40	38
4:00 AM	48	65	41	39
5:00 AM	53	70	46	42
6:00 AM	55	71	51	45
7:00 AM	58	69	56	49
8:00 AM	58	74	57	49
9:00 AM	57	72	55	48
10:00 AM	57	67	54	46
11:00 AM	57	80	54	46
12:00 PM	58	78	55	47
1:00 PM	57	72	55	46
2:00 PM	57	71	55	44
3:00 PM	58	75	56	48
4:00 PM	57	72	56	47
5:00 PM	57	75	56	48
6:00 PM	56	71	54	45
7:00 PM	55	69	53	44
8:00 PM	54	69	51	45
9:00 PM	53	67	49	42
10:00 PM	52	69	44	40
11:00 PM	49	66	42	40

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	58	53	57	55	46	51
Lmax (Maximum)	80	67	72	86	65	71
L50 (Median)	57	49	54	51	39	43
L90 (Background)	49	42	46	45	37	39

Computed DNL, dB	59
% Daytime Energy	85%
% Nighttime Energy	15%

GPS Coordinates	38°33'50.16"N
	121°42'53.80"W

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Appendix C-2
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Thursday, September 8, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	48	70	41	39
1:00 AM	46	69	40	37
2:00 AM	43	62	37	36
3:00 AM	46	65	41	37
4:00 AM	49	64	46	43
5:00 AM	52	66	46	43
6:00 AM	55	74	51	44
7:00 AM	57	76	55	48
8:00 AM	57	69	56	48
9:00 AM	56	71	53	44
10:00 AM	57	77	53	44
11:00 AM	56	75	54	46
12:00 PM	55	72	53	45
1:00 PM	55	71	52	43
2:00 PM	55	80	53	46
3:00 PM	56	75	54	46
4:00 PM	57	74	55	44
5:00 PM	57	74	56	47
6:00 PM	57	77	55	47
7:00 PM	55	67	53	45
8:00 PM	54	66	52	44
9:00 PM	53	70	49	42
10:00 PM	54	82	44	39
11:00 PM	50	74	41	38

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	57	53	56	55	43	51
Lmax (Maximum)	80	66	73	82	62	70
L50 (Median)	56	49	53	51	37	43
L90 (Background)	48	42	45	44	36	39

Computed DNL, dB	59
% Daytime Energy	84%
% Nighttime Energy	16%

GPS Coordinates	38°33'50.16"N
	121°42'53.80"W

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Appendix C-3
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Friday, September 9, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	48	74	40	37
1:00 AM	47	76	41	39
2:00 AM	45	64	39	37
3:00 AM	47	69	43	37
4:00 AM	49	69	42	39
5:00 AM	51	68	43	39
6:00 AM	55	70	50	43
7:00 AM	56	69	54	47
8:00 AM	61	88	56	49
9:00 AM	56	70	53	45
10:00 AM	55	74	53	43
11:00 AM	55	70	53	44
12:00 PM	56	68	53	43
1:00 PM	61	90	54	45
2:00 PM	56	70	54	45
3:00 PM	59	88	55	47
4:00 PM	57	70	55	46
5:00 PM	57	71	55	45
6:00 PM	56	72	54	46
7:00 PM	56	81	53	45
8:00 PM	54	67	51	45
9:00 PM	54	72	51	46
10:00 PM	53	78	48	43
11:00 PM	51	67	47	43

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	61	54	57	55	45	51
Lmax (Maximum)	90	67	75	78	64	70
L50 (Median)	56	51	54	50	39	44
L90 (Background)	49	43	45	43	37	40

Computed DNL, dB	59
% Daytime Energy	88%
% Nighttime Energy	12%

GPS Coordinates	38°33'50.16"N
	121°42'53.80"W

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Appendix C-4
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Saturday, September 10, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	50	70	44	41
1:00 AM	46	63	41	37
2:00 AM	47	67	42	39
3:00 AM	45	63	39	37
4:00 AM	48	69	43	40
5:00 AM	49	71	43	40
6:00 AM	55	83	46	42
7:00 AM	55	75	51	46
8:00 AM	58	73	54	48
9:00 AM	57	74	54	47
10:00 AM	57	75	56	48
11:00 AM	58	77	55	48
12:00 PM	59	82	56	47
1:00 PM	58	78	56	48
2:00 PM	58	77	56	49
3:00 PM	58	72	56	49
4:00 PM	57	69	55	48
5:00 PM	56	75	55	46
6:00 PM	57	78	54	45
7:00 PM	55	72	53	45
8:00 PM	54	74	51	44
9:00 PM	54	65	51	44
10:00 PM	52	70	47	41
11:00 PM	51	67	44	39

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	59	54	57	55	45	50
Lmax (Maximum)	82	65	74	83	63	69
L50 (Median)	56	51	54	47	39	43
L90 (Background)	49	44	47	42	37	40

Computed DNL, dB	59
% Daytime Energy	88%
% Nighttime Energy	12%

GPS Coordinates	38°33'50.16"N
	121°42'53.80"W

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Appendix C-5
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Sunday, September 11, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	48	67	41	37
1:00 AM	45	60	37	33
2:00 AM	44	61	36	33
3:00 AM	51	82	36	33
4:00 AM	44	69	36	33
5:00 AM	44	61	35	32
6:00 AM	48	66	40	34
7:00 AM	51	63	45	36
8:00 AM	52	73	48	38
9:00 AM	55	73	52	42
10:00 AM	54	75	52	43
11:00 AM	55	71	52	44
12:00 PM	58	80	54	44
1:00 PM	56	68	54	45
2:00 PM	60	89	54	44
3:00 PM	59	89	54	43
4:00 PM	56	73	54	44
5:00 PM	56	73	53	43
6:00 PM	55	67	52	42
7:00 PM	55	72	52	44
8:00 PM	56	83	50	44
9:00 PM	53	69	47	42
10:00 PM	51	64	42	36
11:00 PM	47	63	38	35

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	60	51	56	51	44	47
Lmax (Maximum)	89	63	75	82	60	66
L50 (Median)	54	45	52	42	35	38
L90 (Background)	45	36	43	37	32	34

Computed DNL, dB	57
% Daytime Energy	92%
% Nighttime Energy	8%

GPS Coordinates	38°33'50.16"N
	121°42'53.80"W

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Appendix C-6
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Wednesday, September 7, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	38	55	36	34
1:00 AM	40	59	38	35
2:00 AM	39	49	39	37
3:00 AM	35	56	33	31
4:00 AM	38	48	37	32
5:00 AM	42	54	42	39
6:00 AM	46	55	45	43
7:00 AM	48	65	47	45
8:00 AM	47	54	47	45
9:00 AM	46	65	44	42
10:00 AM	43	54	43	41
11:00 AM	45	62	43	41
12:00 PM	44	61	43	40
1:00 PM	42	55	41	40
2:00 PM	41	50	41	39
3:00 PM	42	52	42	40
4:00 PM	41	53	40	38
5:00 PM	39	48	39	38
6:00 PM	40	51	40	39
7:00 PM	42	50	42	40
8:00 PM	43	54	42	41
9:00 PM	42	51	42	40
10:00 PM	41	49	41	39
11:00 PM	40	55	39	35

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	48	39	44	46	35	41
Lmax (Maximum)	65	48	55	59	48	53
L50 (Median)	47	39	42	45	33	39
L90 (Background)	45	38	41	43	31	36

Computed DNL, dB	48
% Daytime Energy	77%
% Nighttime Energy	23%

GPS Coordinates	38°34'0.97"N
	121°42'58.79"W

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Appendix C-7
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Thursday, September 8, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	37	52	35	32
1:00 AM	39	55	38	34
2:00 AM	35	47	34	32
3:00 AM	41	57	39	34
4:00 AM	46	52	46	44
5:00 AM	45	62	44	42
6:00 AM	43	53	42	40
7:00 AM	42	57	41	39
8:00 AM	42	55	41	38
9:00 AM	42	55	41	39
10:00 AM	46	66	39	37
11:00 AM	40	55	38	35
12:00 PM	70	85	38	37
1:00 PM	37	55	36	31
2:00 PM	38	51	37	35
3:00 PM	39	51	38	37
4:00 PM	39	48	39	37
5:00 PM	43	66	40	39
6:00 PM	43	54	42	41
7:00 PM	43	58	42	41
8:00 PM	43	55	43	41
9:00 PM	45	65	43	42
10:00 PM	42	55	42	40
11:00 PM	39	51	37	34

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	70	37	59	46	35	42
Lmax (Maximum)	85	48	58	62	47	54
L50 (Median)	43	36	40	46	34	40
L90 (Background)	42	31	38	44	32	37

Computed DNL, dB	57
% Daytime Energy	99%
% Nighttime Energy	1%

GPS Coordinates	38°34'0.97"N
	121°42'58.79"W

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Appendix C-8
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Friday, September 9, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	38	52	38	34
1:00 AM	39	55	39	35
2:00 AM	38	51	37	35
3:00 AM	42	49	41	35
4:00 AM	42	58	40	38
5:00 AM	40	51	40	37
6:00 AM	46	57	43	41
7:00 AM	45	55	44	42
8:00 AM	43	60	40	37
9:00 AM	43	57	41	40
10:00 AM	42	62	40	38
11:00 AM	43	64	38	33
12:00 PM	38	54	37	31
1:00 PM	41	61	37	31
2:00 PM	39	64	37	36
3:00 PM	39	58	37	36
4:00 PM	37	55	37	35
5:00 PM	46	73	41	34
6:00 PM	43	56	42	40
7:00 PM	42	59	42	40
8:00 PM	44	54	43	42
9:00 PM	46	55	46	44
10:00 PM	44	60	43	42
11:00 PM	45	57	44	42

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	46	37	43	46	38	42
Lmax (Maximum)	73	54	59	60	49	54
L50 (Median)	46	37	40	44	37	40
L90 (Background)	44	31	37	42	34	38

Computed DNL, dB	49
% Daytime Energy	65%
% Nighttime Energy	35%

GPS Coordinates	38°34'0.97"N
	121°42'58.79"W

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Appendix C-9
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Saturday, September 10, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	44	64	43	41
1:00 AM	40	54	38	34
2:00 AM	42	52	42	39
3:00 AM	39	49	38	35
4:00 AM	43	53	42	40
5:00 AM	42	52	42	40
6:00 AM	43	53	43	41
7:00 AM	46	62	45	42
8:00 AM	46	60	46	45
9:00 AM	46	60	45	43
10:00 AM	45	55	44	42
11:00 AM	47	60	45	42
12:00 PM	50	75	43	40
1:00 PM	44	56	44	40
2:00 PM	51	74	46	44
3:00 PM	48	72	46	43
4:00 PM	49	77	45	42
5:00 PM	43	56	42	40
6:00 PM	40	66	39	37
7:00 PM	43	58	42	40
8:00 PM	44	55	43	41
9:00 PM	44	54	44	42
10:00 PM	41	54	41	38
11:00 PM	45	60	42	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	51	40	47	45	39	42
Lmax (Maximum)	77	54	63	64	49	55
L50 (Median)	46	39	44	43	38	41
L90 (Background)	45	37	42	41	34	38

Computed DNL, dB	50
% Daytime Energy	81%
% Nighttime Energy	19%

GPS Coordinates	38°34'0.97"N
	121°42'58.79"W

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Appendix C-10
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Sunday, September 11, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	42	54	41	38
1:00 AM	36	48	35	30
2:00 AM	35	47	33	30
3:00 AM	38	58	35	32
4:00 AM	38	49	35	32
5:00 AM	38	47	38	32
6:00 AM	41	58	39	36
7:00 AM	40	54	37	32
8:00 AM	39	56	37	33
9:00 AM	39	58	38	37
10:00 AM	39	59	38	36
11:00 AM	39	52	38	36
12:00 PM	41	57	36	33
1:00 PM	41	57	38	35
2:00 PM	38	52	37	34
3:00 PM	42	62	40	38
4:00 PM	42	58	41	39
5:00 PM	42	55	42	39
6:00 PM	42	55	42	40
7:00 PM	53	68	42	39
8:00 PM	44	53	44	43
9:00 PM	44	53	44	42
10:00 PM	40	59	39	37
11:00 PM	37	54	35	32

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53	38	44	42	35	39
Lmax (Maximum)	68	52	56	59	47	53
L50 (Median)	44	36	39	41	33	37
L90 (Background)	43	32	37	38	30	33

Computed DNL, dB	47
% Daytime Energy	85%
% Nighttime Energy	15%

GPS Coordinates	38°34'0.97"N
	121°42'58.79"W

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Appendix C-11
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Wednesday, September 7, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	43	55	43	39
1:00 AM	42	66	41	36
2:00 AM	40	49	39	35
3:00 AM	39	48	36	32
4:00 AM	40	47	39	35
5:00 AM	44	54	43	40
6:00 AM	46	53	46	44
7:00 AM	47	61	47	45
8:00 AM	48	57	48	47
9:00 AM	46	63	46	43
10:00 AM	46	57	46	43
11:00 AM	47	59	46	44
12:00 PM	47	56	47	44
1:00 PM	45	53	45	43
2:00 PM	46	57	45	41
3:00 PM	47	57	46	44
4:00 PM	45	50	44	43
5:00 PM	44	58	44	43
6:00 PM	44	62	44	40
7:00 PM	45	54	45	41
8:00 PM	45	51	45	42
9:00 PM	44	50	43	41
10:00 PM	42	50	43	37
11:00 PM	42	50	43	36

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	48	44	46	46	39	43
Lmax (Maximum)	63	50	56	66	47	53
L50 (Median)	48	43	45	46	36	41
L90 (Background)	47	40	43	44	32	37

Computed DNL, dB	50
% Daytime Energy	79%
% Nighttime Energy	21%

GPS Coordinates	38°34'7.06"N
	121°42'52.38"W

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Appendix C-12
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Thursday, September 8, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	42	52	40	37
1:00 AM	41	52	39	34
2:00 AM	39	47	35	32
3:00 AM	40	52	40	34
4:00 AM	45	55	45	43
5:00 AM	45	53	45	43
6:00 AM	45	60	43	40
7:00 AM	44	60	41	38
8:00 AM	39	57	37	35
9:00 AM	38	58	35	31
10:00 AM	40	52	37	34
11:00 AM	40	51	37	30
12:00 PM	40	48	41	31
1:00 PM	42	58	43	33
2:00 PM	42	49	42	33
3:00 PM	43	59	43	42
4:00 PM	43	59	43	42
5:00 PM	43	52	43	43
6:00 PM	45	63	45	42
7:00 PM	45	54	45	42
8:00 PM	44	51	45	41
9:00 PM	45	62	44	42
10:00 PM	43	60	43	40
11:00 PM	42	50	43	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	45	38	43	45	39	43
Lmax (Maximum)	63	48	55	60	47	54
L50 (Median)	45	35	41	45	35	41
L90 (Background)	43	30	37	43	32	38

Computed DNL, dB	49
% Daytime Energy	61%
% Nighttime Energy	39%

GPS Coordinates	38°34'7.06"N
	121°42'52.38"W

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Appendix C-13
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Friday, September 9, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	42	64	41	36
1:00 AM	41	56	39	37
2:00 AM	40	50	37	36
3:00 AM	41	48	41	37
4:00 AM	42	55	40	38
5:00 AM	40	59	37	34
6:00 AM	46	67	44	40
7:00 AM	44	62	43	40
8:00 AM	40	59	37	34
9:00 AM	39	56	37	33
10:00 AM	40	66	35	32
11:00 AM	40	68	33	30
12:00 PM	38	49	37	34
1:00 PM	37	63	32	30
2:00 PM	38	45	38	35
3:00 PM	38	56	38	33
4:00 PM	38	57	37	31
5:00 PM	50	70	41	38
6:00 PM	46	66	46	45
7:00 PM	45	59	45	44
8:00 PM	45	50	46	43
9:00 PM	48	58	47	46
10:00 PM	46	57	45	42
11:00 PM	45	56	45	42

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	50	37	44	46	40	43
Lmax (Maximum)	70	45	59	67	48	57
L50 (Median)	47	32	39	45	37	41
L90 (Background)	46	30	37	42	34	38

Computed DNL, dB	50
% Daytime Energy	66%
% Nighttime Energy	34%

GPS Coordinates	38°34'7.06"N
	121°42'52.38"W

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Appendix C-14
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Saturday, September 10, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	44	60	44	42
1:00 AM	42	53	41	36
2:00 AM	45	55	44	39
3:00 AM	40	50	40	36
4:00 AM	47	60	44	40
5:00 AM	44	55	43	41
6:00 AM	44	58	44	42
7:00 AM	46	56	46	43
8:00 AM	48	65	47	46
9:00 AM	46	57	46	44
10:00 AM	48	60	46	44
11:00 AM	49	63	47	45
12:00 PM	51	73	47	44
1:00 PM	49	59	47	44
2:00 PM	52	66	51	47
3:00 PM	53	65	51	47
4:00 PM	51	61	49	46
5:00 PM	47	58	46	42
6:00 PM	43	54	42	40
7:00 PM	45	53	45	42
8:00 PM	46	54	45	44
9:00 PM	45	54	45	43
10:00 PM	43	55	43	41
11:00 PM	43	57	43	39

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53	43	49	47	40	44
Lmax (Maximum)	73	53	60	60	50	56
L50 (Median)	51	42	47	44	40	43
L90 (Background)	47	40	44	42	36	40

Computed DNL, dB	51
% Daytime Energy	83%
% Nighttime Energy	17%

GPS Coordinates	38°34'7.06"N
	121°42'52.38"W

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Appendix C-15
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Sunday, September 11, 2022

Hour	Leq	Lmax	L50	L90
12:00 AM	44	52	43	41
1:00 AM	39	46	38	34
2:00 AM	37	47	37	33
3:00 AM	39	57	37	34
4:00 AM	40	52	38	35
5:00 AM	41	51	41	36
6:00 AM	43	57	42	39
7:00 AM	42	69	40	33
8:00 AM	39	60	35	32
9:00 AM	37	59	35	31
10:00 AM	34	54	32	29
11:00 AM	39	58	34	31
12:00 PM	40	56	35	32
1:00 PM	39	63	36	34
2:00 PM	42	65	41	37
3:00 PM	42	61	41	37
4:00 PM	41	49	40	38
5:00 PM	42	51	41	38
6:00 PM	42	56	41	40
7:00 PM	44	65	43	40
8:00 PM	44	51	44	43
9:00 PM	43	53	43	41
10:00 PM	40	49	39	36
11:00 PM	39	59	38	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	44	34	41	44	37	41
Lmax (Maximum)	69	49	58	59	46	52
L50 (Median)	44	32	39	43	37	39
L90 (Background)	43	29	36	41	33	36

Computed DNL, dB	47
% Daytime Energy	66%
% Nighttime Energy	34%

GPS Coordinates	38°34'7.06"N
	121°42'52.38"W

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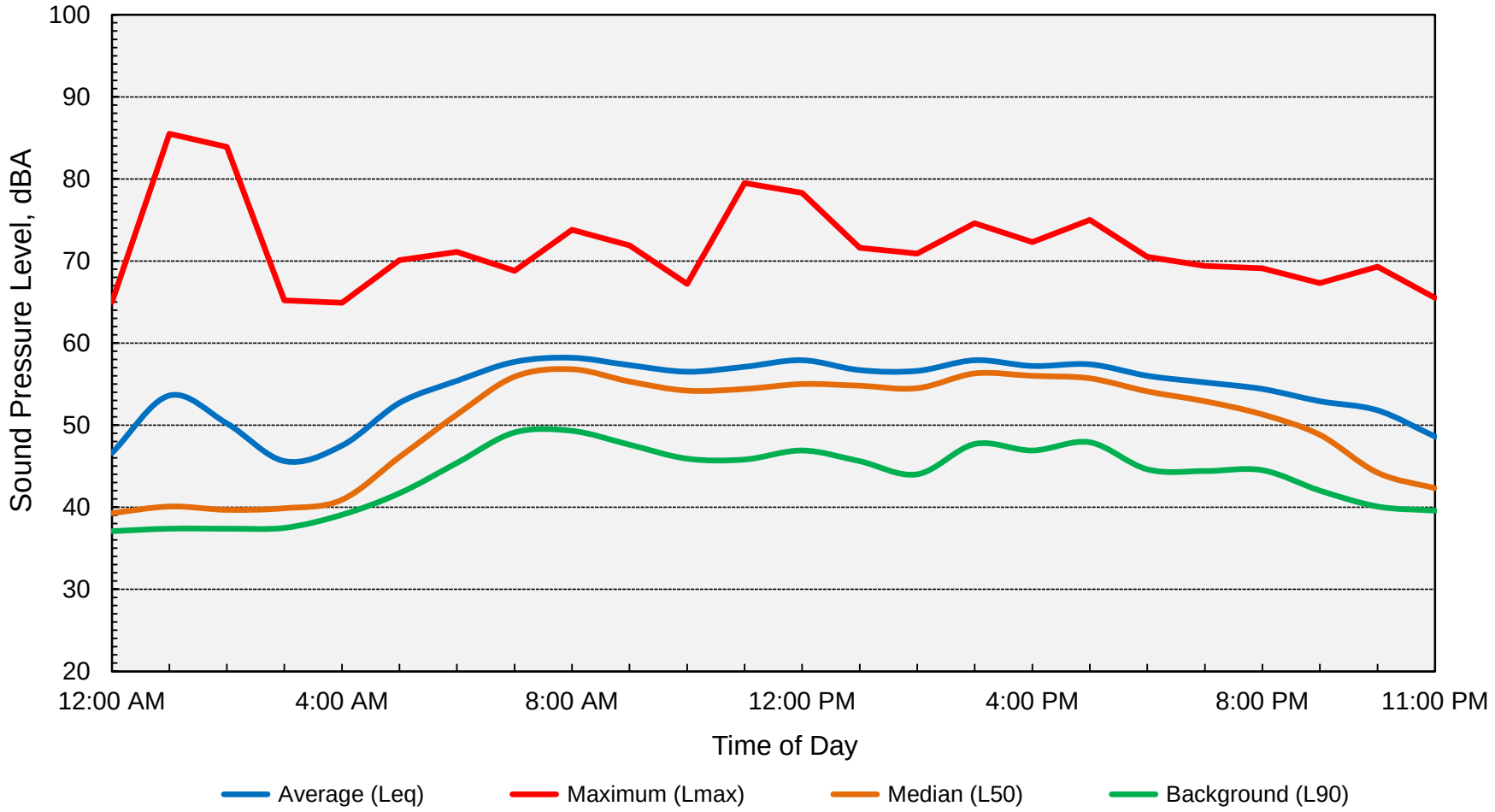
Appendix D-1
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Wednesday, September 7, 2022



Computed DNL = 59 dB

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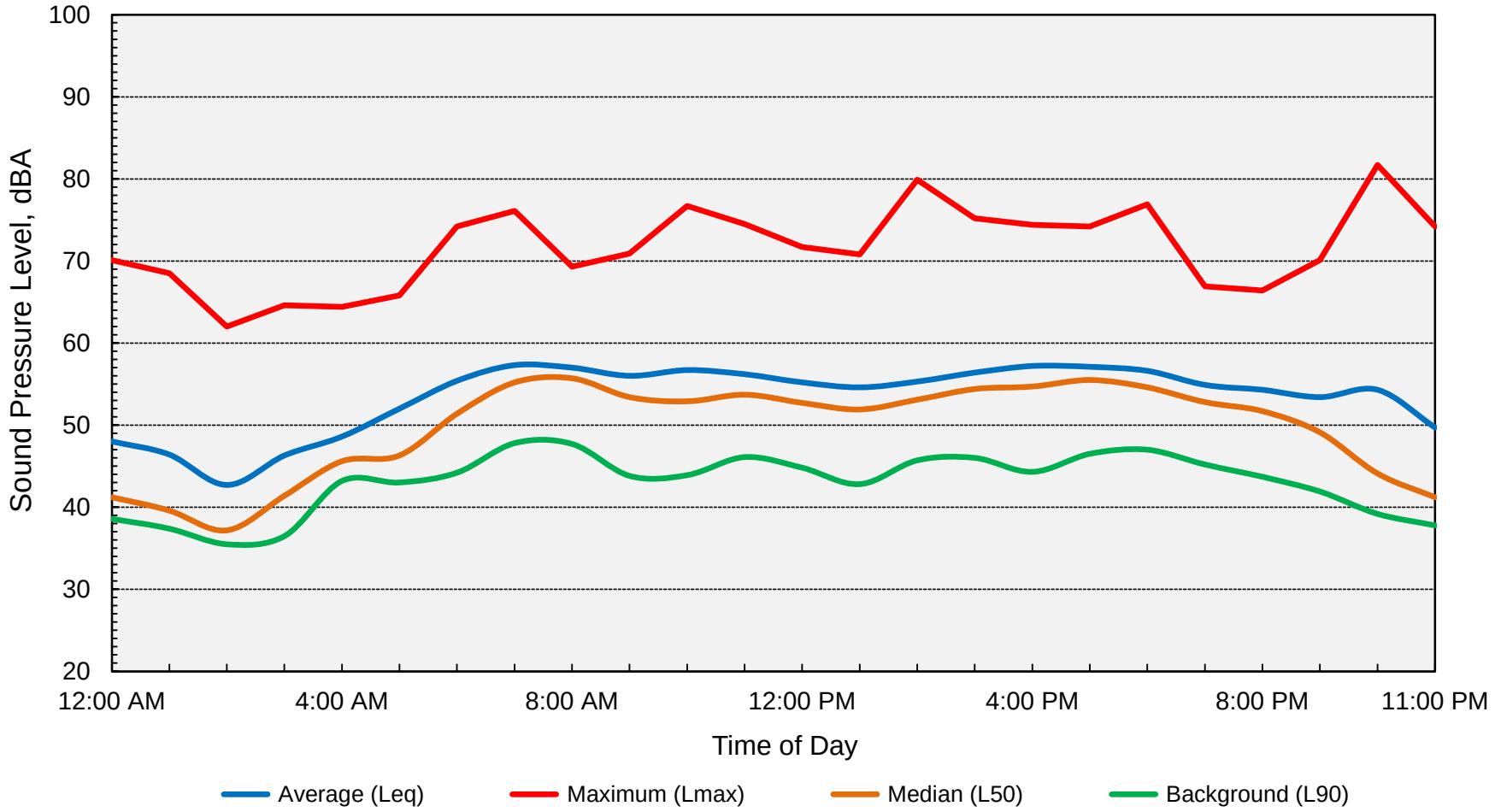
Appendix D-2
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Thursday, September 8, 2022



Computed DNL = 59 dB

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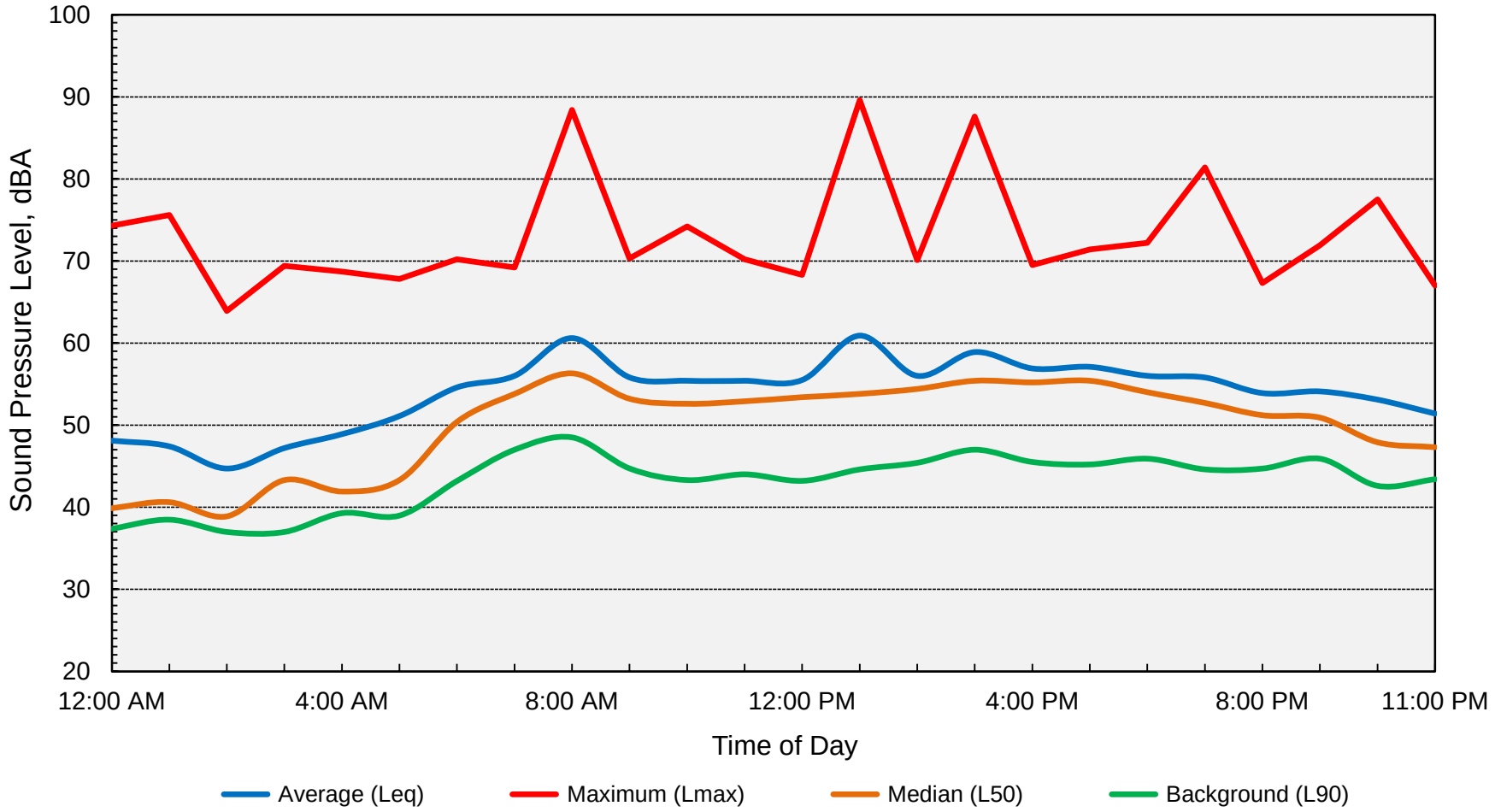
Appendix D-3
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Friday, September 9, 2022



Computed DNL = 59 dB

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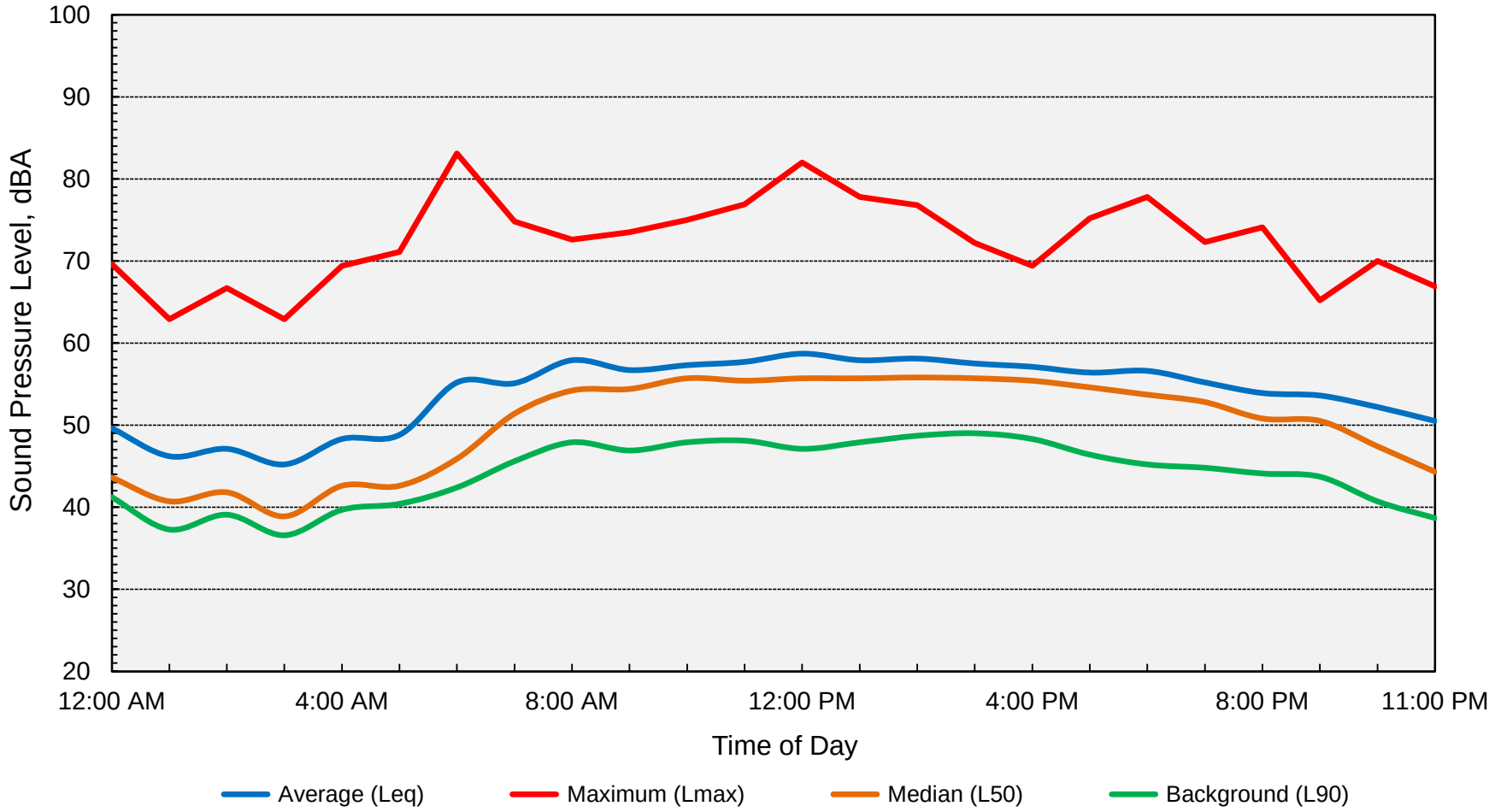
Appendix D-4
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Saturday, September 10, 2022



Computed DNL = 59 dB

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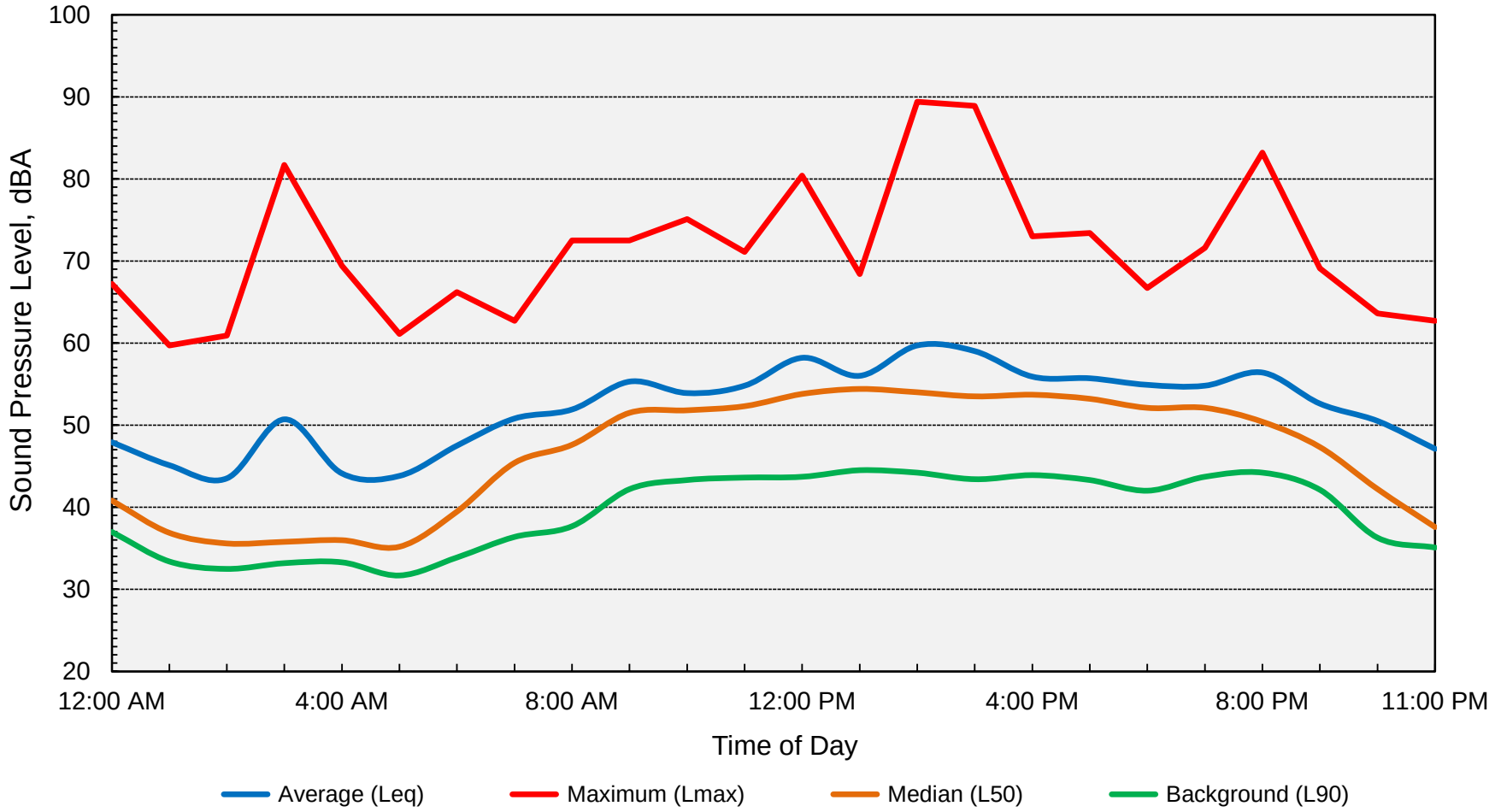
Appendix D-5
Long-Term Ambient Noise Monitoring Results - Site 1
Palomino Place - Davis, California
Sunday, September 11, 2022



Computed DNL = 57 dB

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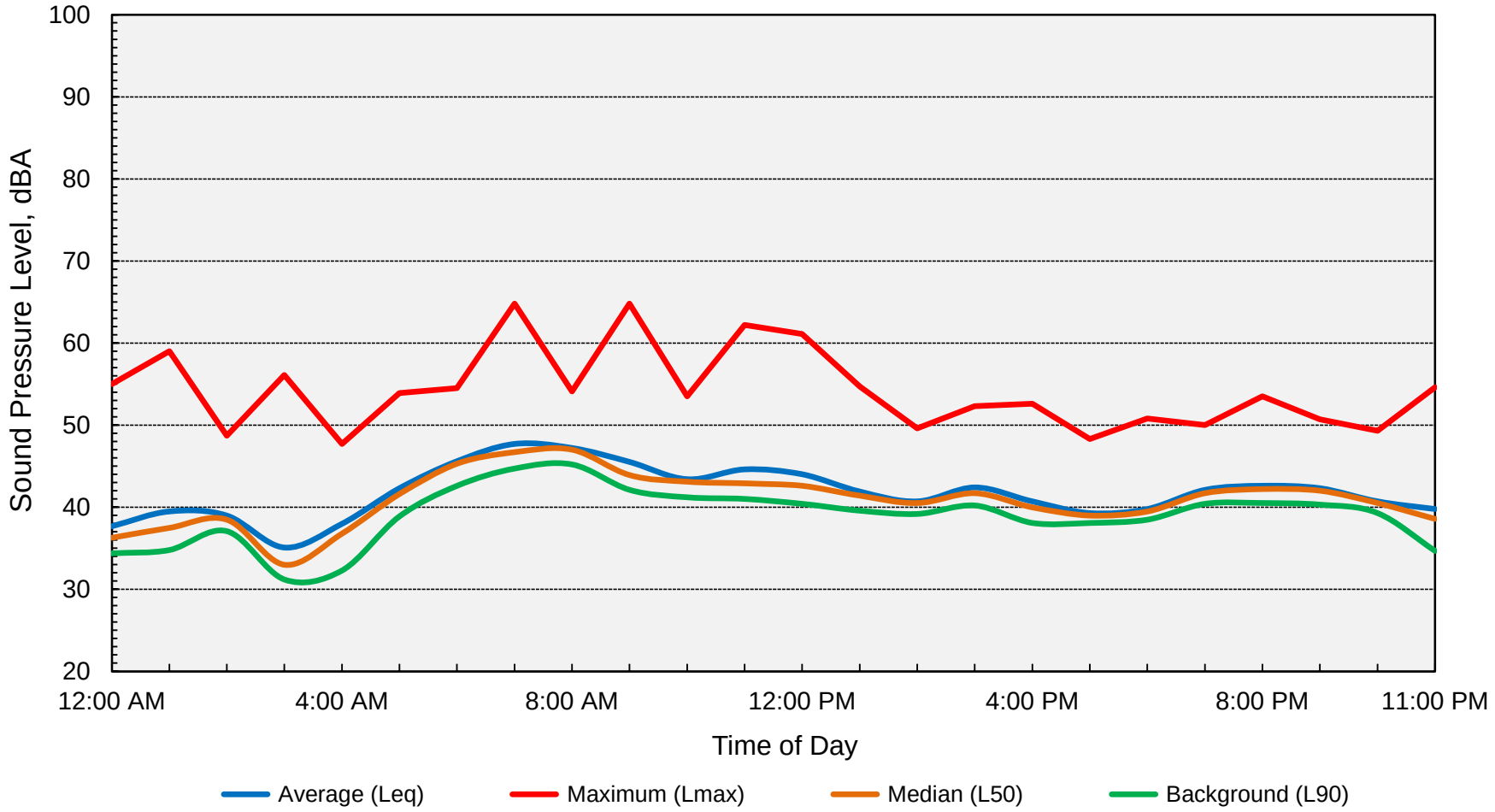
Appendix D-6
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Wednesday, September 7, 2022



Computed DNL = 48 dB

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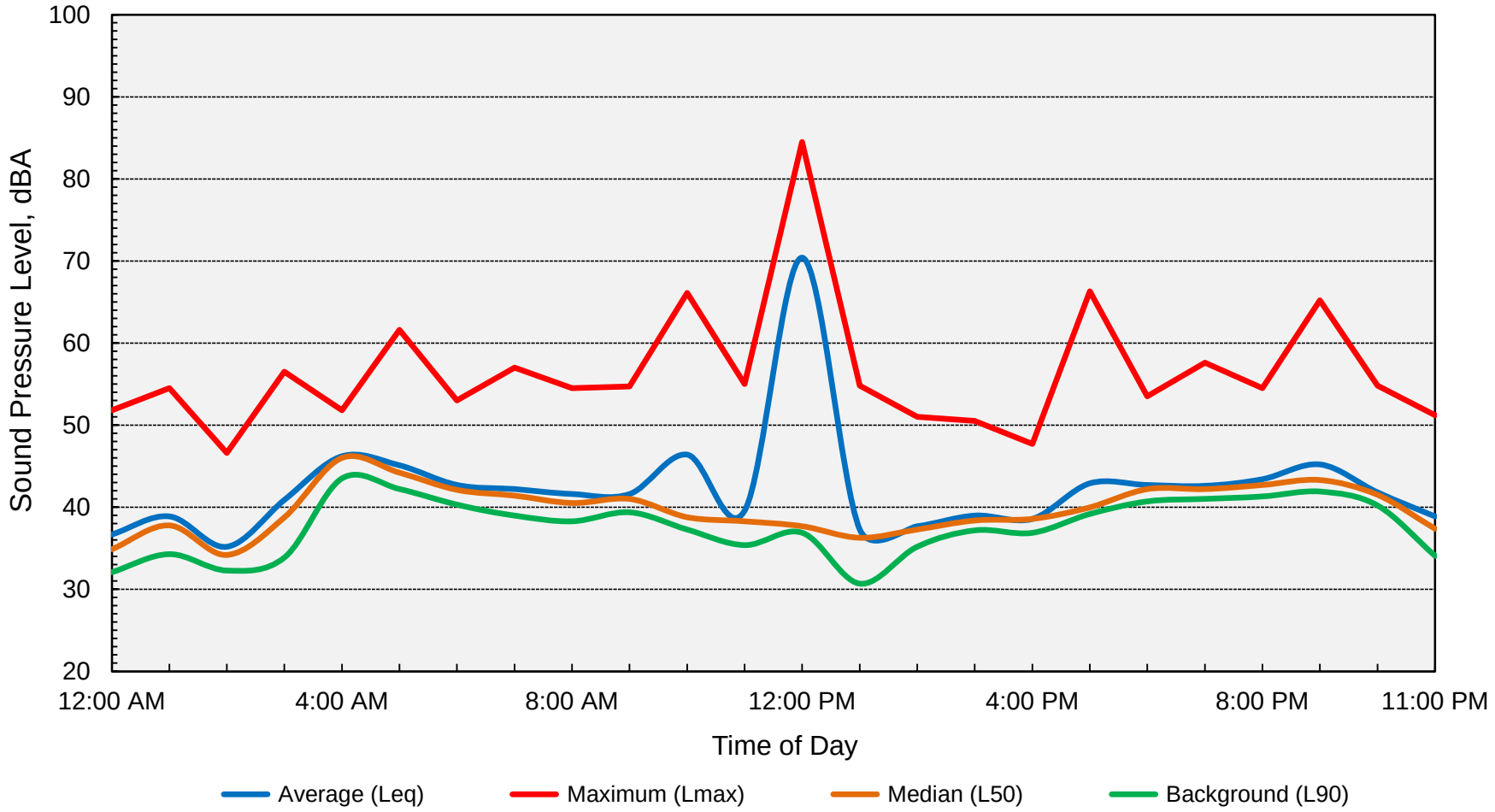
Appendix D-7
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Thursday, September 8, 2022



Computed DNL = 57 dB

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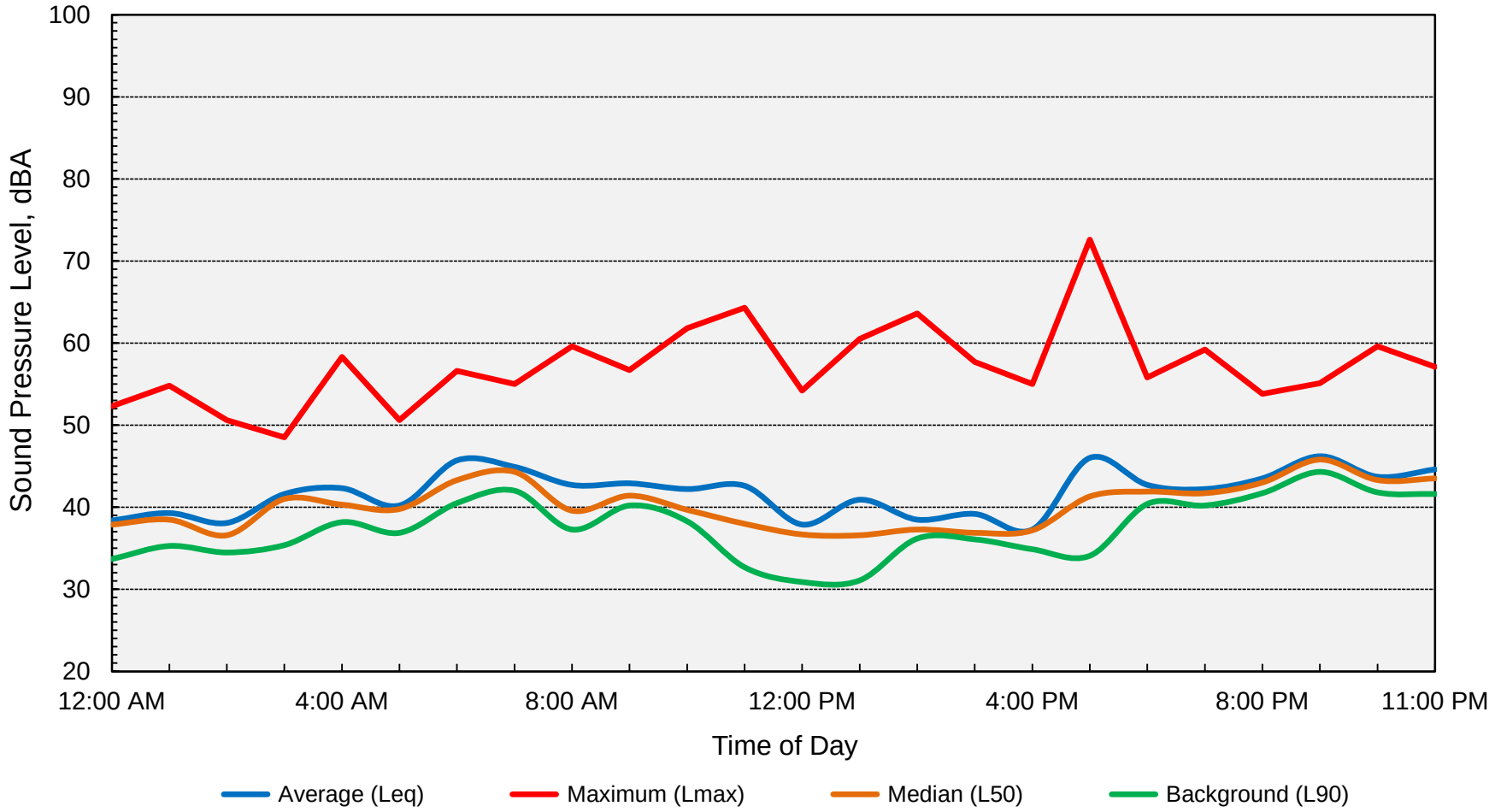
Appendix D-8
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Friday, September 9, 2022



Computed DNL = 49 dB

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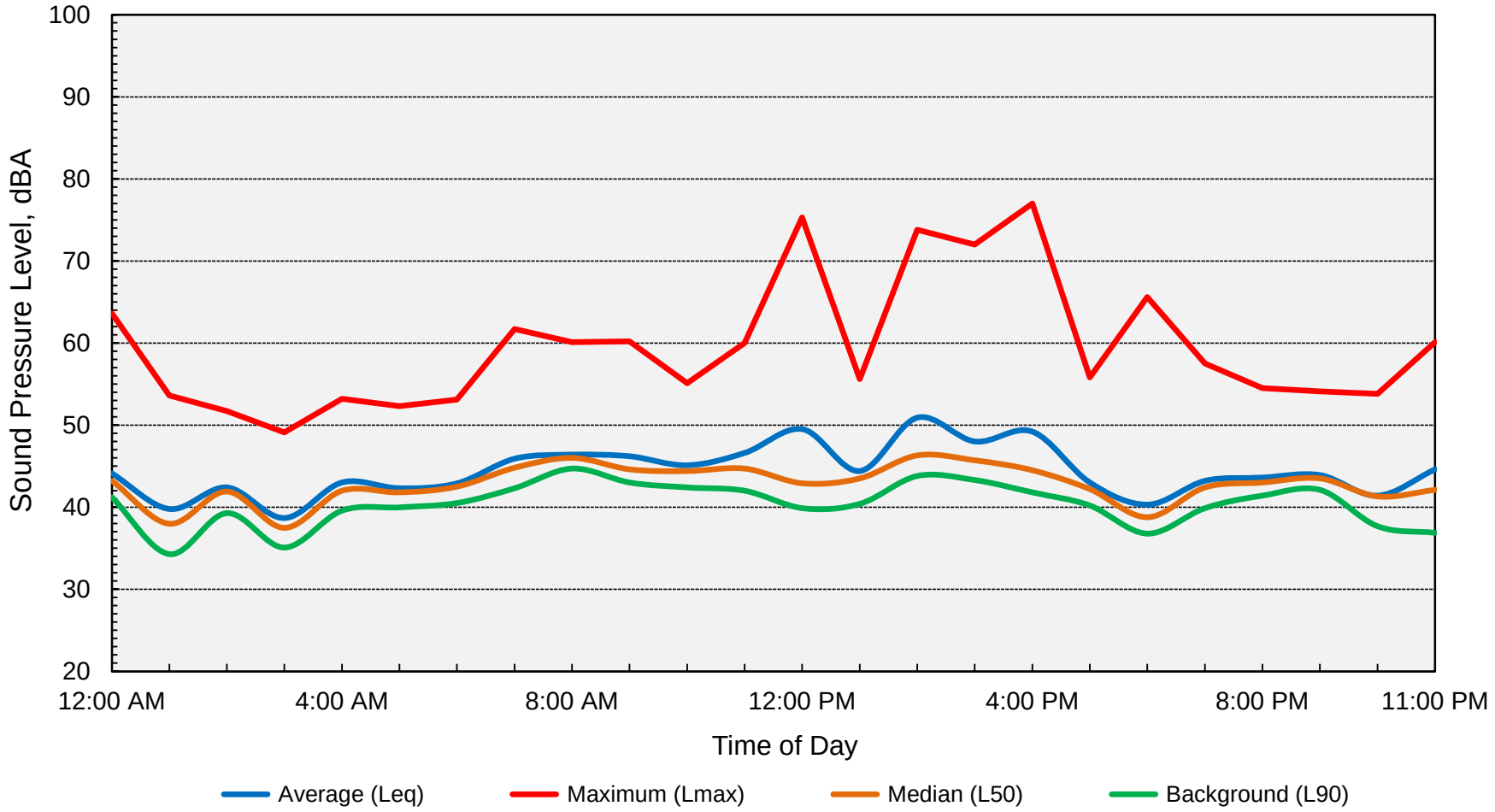
Appendix D-9
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Saturday, September 10, 2022



Computed DNL = 50 dB

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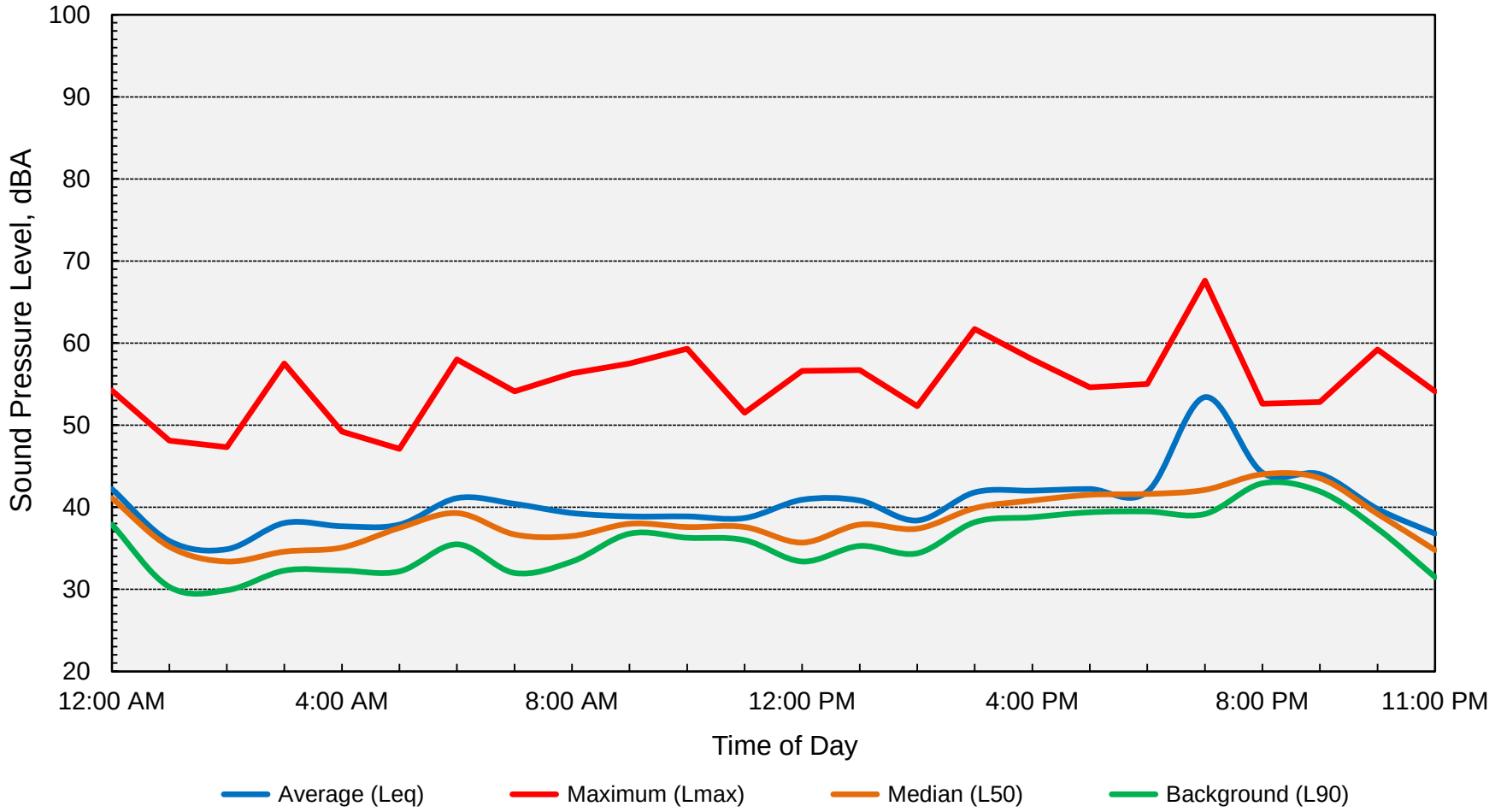
Appendix D-10
Long-Term Ambient Noise Monitoring Results - Site 2
Palomino Place - Davis, California
Sunday, September 11, 2022



Computed DNL = 47 dB

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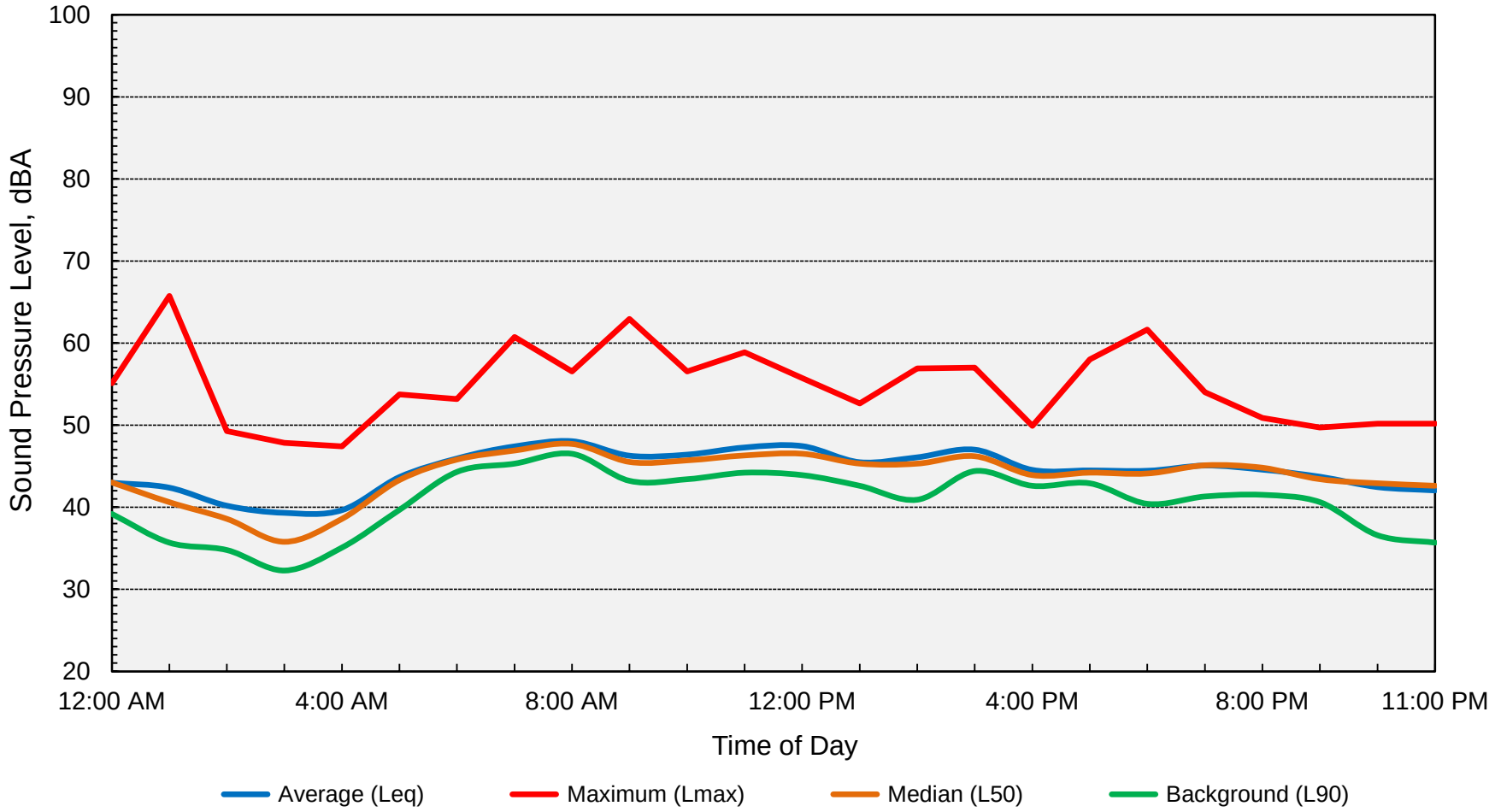
Appendix D-11
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Wednesday, September 7, 2022



Computed DNL = 50 dB

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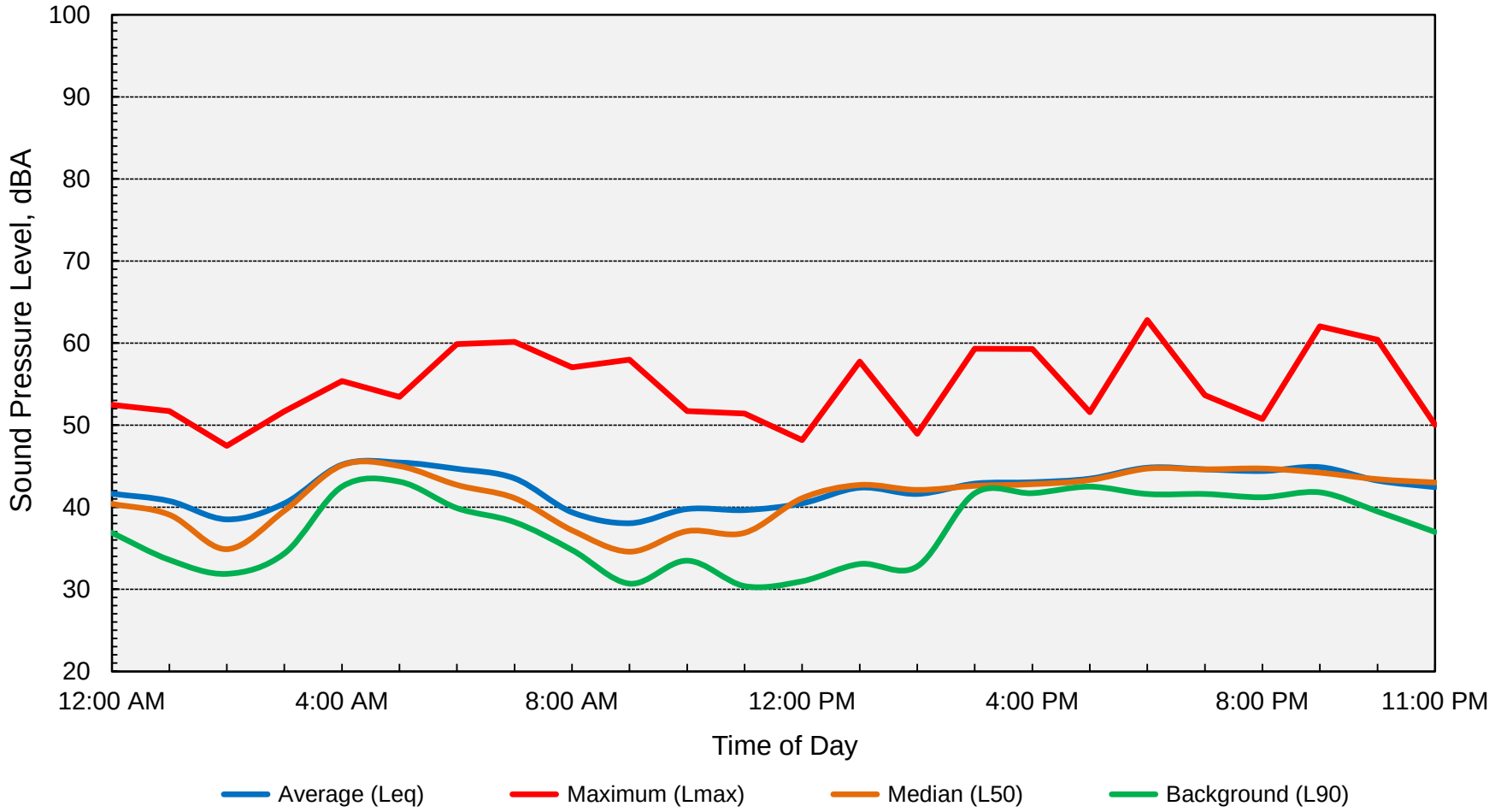
Appendix D-12
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Thursday, September 8, 2022



Computed DNL = 49 dB

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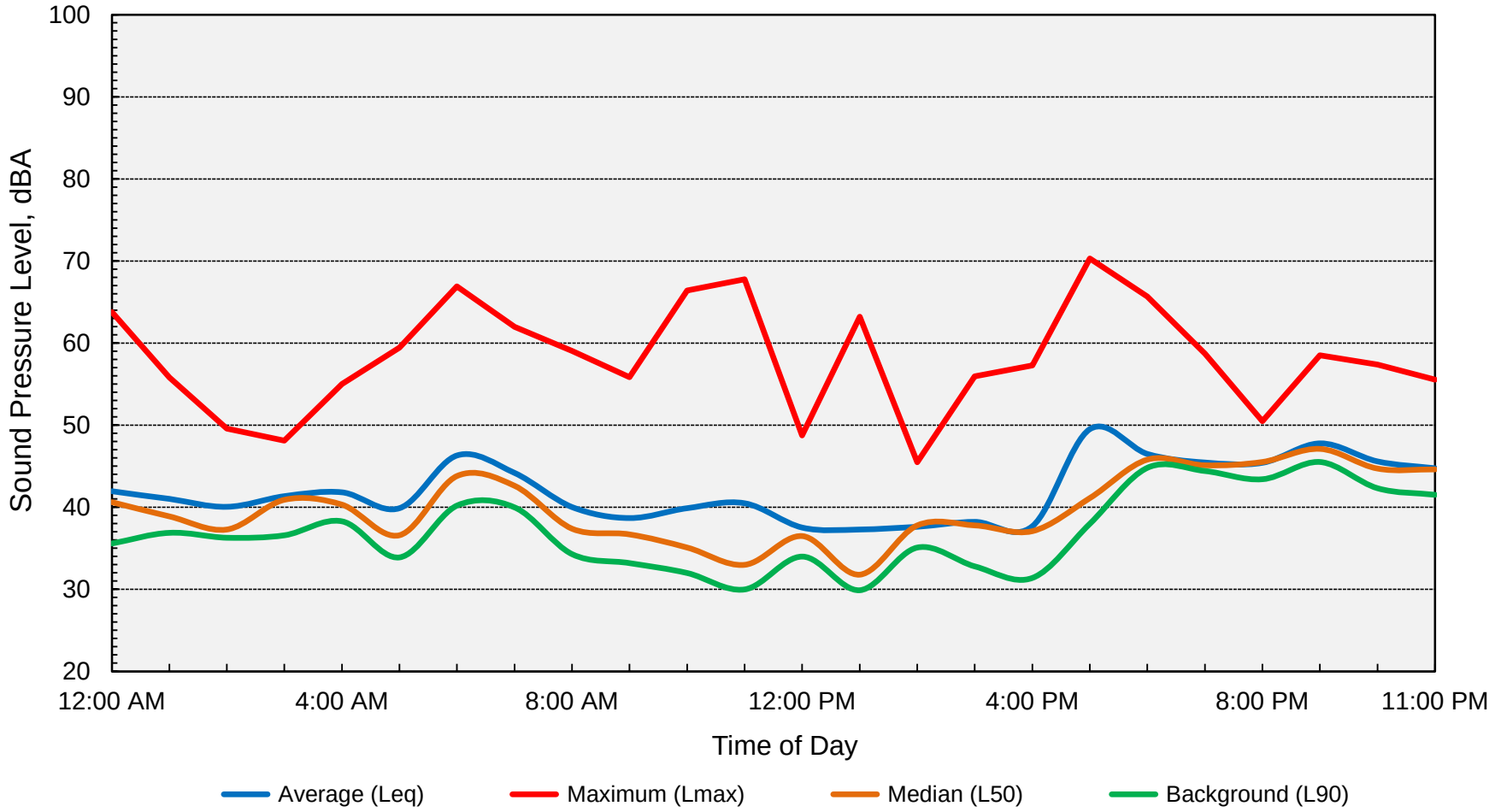
Appendix D-13
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Friday, September 9, 2022



Computed DNL = 50 dB

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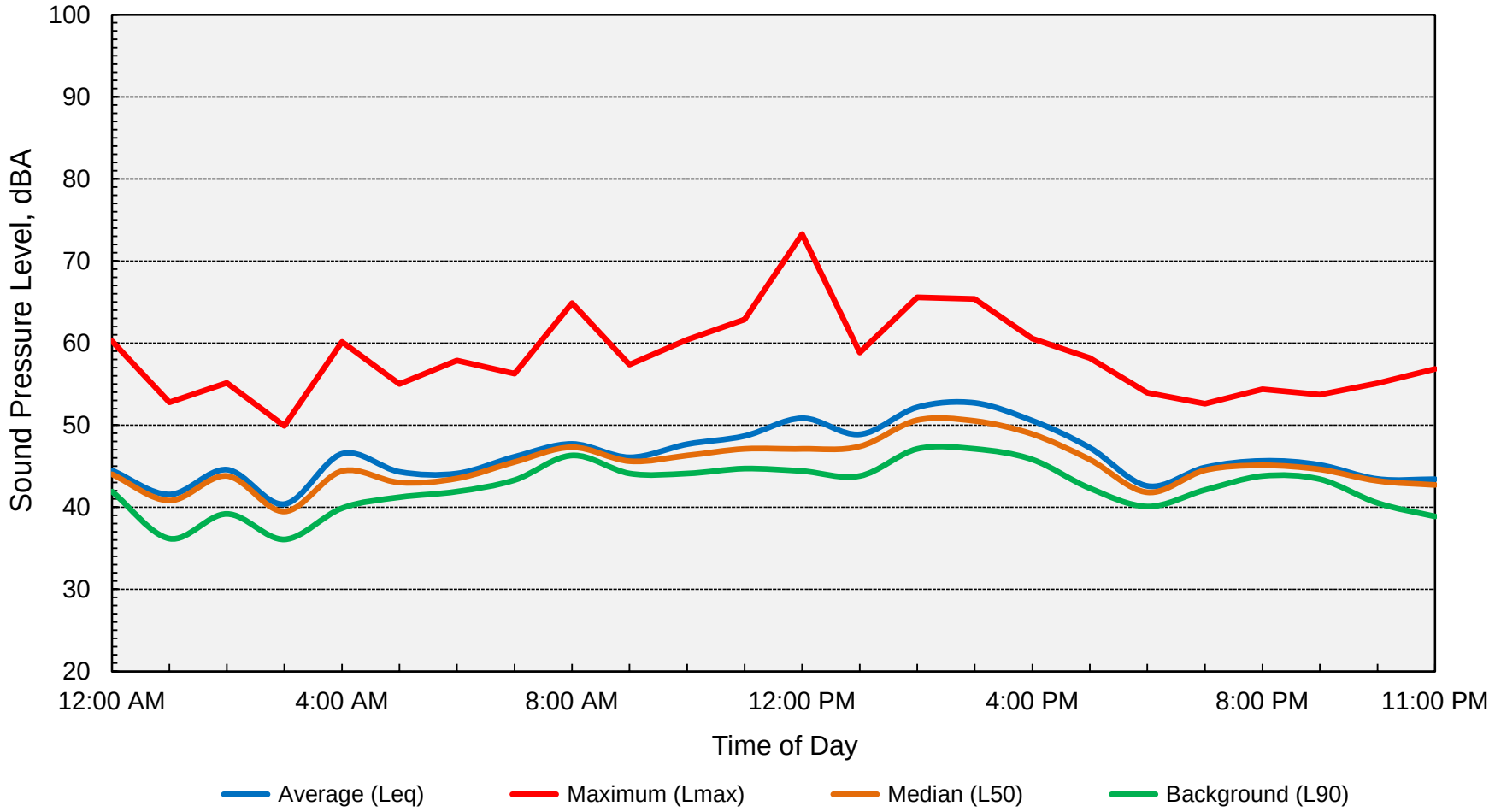
Appendix D-14
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Saturday, September 10, 2022



Computed DNL = 51 dB

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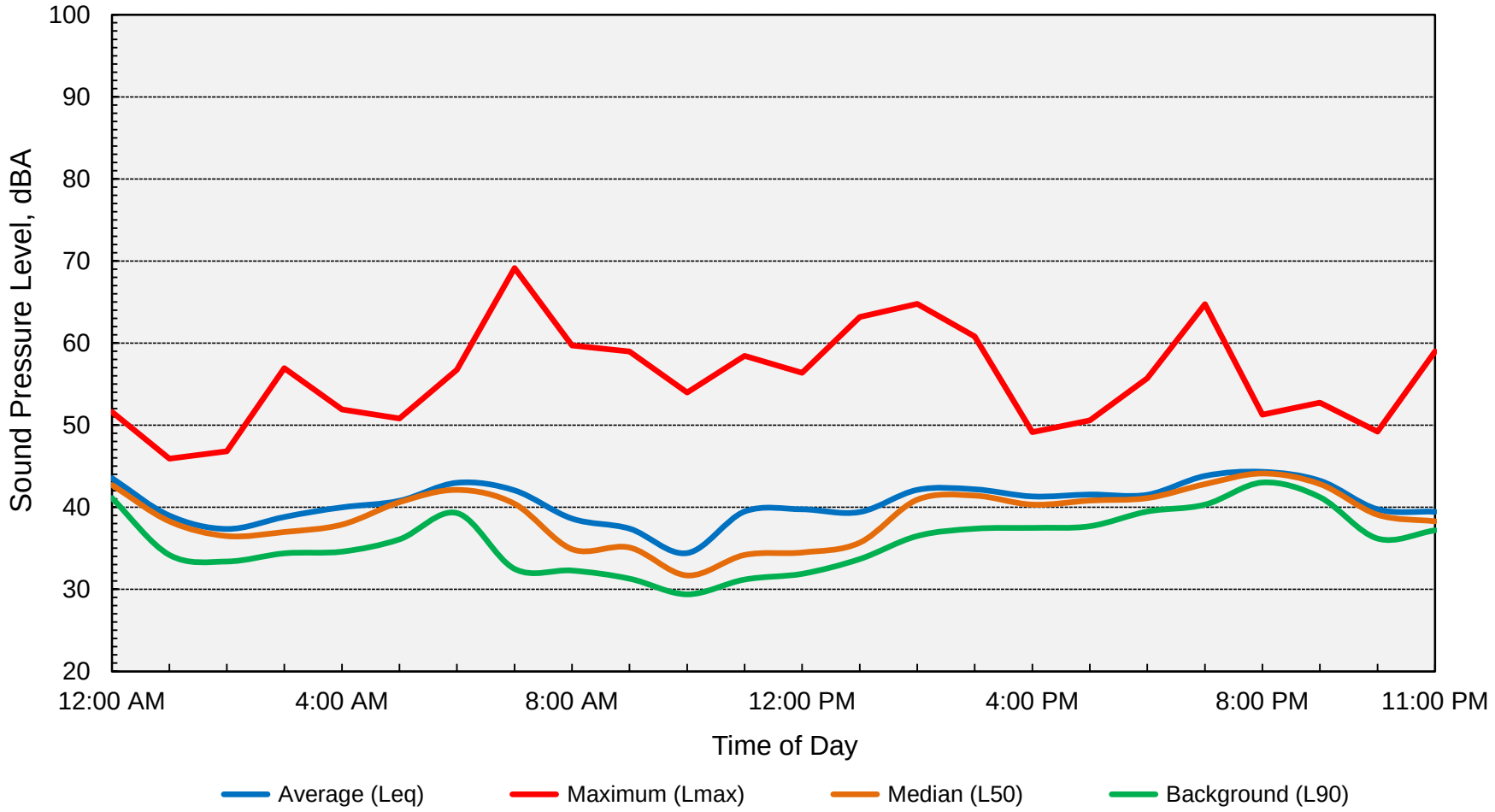
Appendix D-15
Long-Term Ambient Noise Monitoring Results - Site 3
Palomino Place - Davis, California
Sunday, September 11, 2022



Computed DNL = 47 dB

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Appendix E-1 (Sheet 1 of 2)

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2022-135
Description: Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Dist. to Receptor	Offset (dB)
1	W Covell Blvd	West of F Street	16065	80	0	20	2	1	40	70	0
2	E Covell Blvd	F Street to J Street	19270	80	0	20	2	1	40	80	0
3	E Covell Blvd	J Street to L Street	18275	80	0	20	2	1	40	140	0
4	E Covell Blvd	L Street to Pole Line Rd	17530	80	0	20	2	1	40	100	0
5	E Covell Blvd	Pole Line Rd to Birch Ln	14755	80	0	20	2	1	40	85	-5
6	E Covell Blvd	East of Brich Ln	14225	84	0	16	2	1	40	85	0
7	E Covell Blvd	West of Wright Blvd	13530	84	0	16	2	1	40	70	-5
8	E Covell Blvd	Wright Blvd to Monarch Ln	13885	84	0	16	2	1	40	70	-5
9	E Covell Blvd	Monarch Ln to Alhambra Dr	13765	84	0	16	2	1	45	70	-5
10	E Covell Blvd	Alhambra Dr to Harper Jr H.S.	11805	84	0	16	2	1	45	75	-5
11	Mace Blvd	Harper Jr H.S. to Alhambra Dr	12285	84	0	16	2	1	45	150	0
12	Mace Blvd	Alhambra Dr to 2nd Street	16130	84	0	16	2	1	45	120	0
13	Mace Blvd	2nd Street to Chiles Rd	21630	80	0	20	2	1	40	100	0
14	Mace Blvd	Chiles Rd to Cowell Blvd	11170	80	0	20	2	1	40	100	0
15	Mace Blvd	South of Cowell Blvd	6140	80	0	20	2	1	40	65	0
16	F Street	North of E Covell Blvd	6310	80	0	20	2	1	35	65	0
17	F Street	South of E Covell Blvd	8305	80	0	20	2	1	30	100	0
18	Cannery Ave	North of E Covell Blvd	2310	80	0	20	2	1	30	100	0
19	J Street	South of E Covell Blvd	3685	80	0	20	2	1	35	65	0
20	Pole Line Rd	North of E Covell Blvd	12220	80	0	20	2	1	45	100	0
21	Pole Line Rd	South of E Covell Blvd	9175	80	0	20	2	1	30	85	0
22	Birch Ln	South of E Covell Blvd	1620	84	0	16	2	1	30	40	0
23	Wright Blvd	North of E Covell Blvd	3335	84	0	16	2	1	30	110	0
24	Monarch Ln	South of E Covell Blvd	1080	84	0	16	2	1	30	60	0
25	Alhambra Dr	South of E Covell Blvd	2865	84	0	16	2	1	35	50	-5

Appendix E-2 (Sheet 2 of 2)

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2022-135
Description: Existing
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Dist. to Receptor	Offset (dB)
26	W Covell Blvd	West of F Street	4515	80	0	20	2	1	40	70	0
27	E Covell Blvd	F Street to J Street	2305	80	0	20	2	1	40	80	0
28	E Covell Blvd	J Street to L Street	9970	80	0	20	2	1	40	140	0
29	E Covell Blvd	L Street to Pole Line Rd	8575	80	0	20	2	1	40	100	0
30	E Covell Blvd	Pole Line Rd to Birch Ln	10560	80	0	20	2	1	40	85	-5
31	E Covell Blvd	East of Brich Ln	3710	84	0	16	2	1	40	85	0
32	E Covell Blvd	West of Wright Blvd	3465	84	0	16	2	1	40	70	-5

Appendix F-1

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2022-135
Description: Cumulative No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Dist. to Receptor	Offset (dB)
1	W Covell Blvd	West of F Street	18475	80	0	20	2	1	40	70	0
2	E Covell Blvd	F Street to J Street	21725	80	0	20	2	1	40	80	0
3	E Covell Blvd	J Street to L Street	20850	80	0	20	2	1	40	140	0
4	E Covell Blvd	L Street to Pole Line Rd	19300	80	0	20	2	1	40	100	0
5	E Covell Blvd	Pole Line Rd to Birch Ln	16025	80	0	20	2	1	40	85	-5
6	E Covell Blvd	East of Brich Ln	15475	84	0	16	2	1	40	85	0
7	E Covell Blvd	West of Wright Blvd	14700	84	0	16	2	1	40	70	-5
8	E Covell Blvd	Wright Blvd to Monarch Ln	15250	84	0	16	2	1	40	70	-5
9	E Covell Blvd	Monarch Ln to Alhambra Dr	15025	84	0	16	2	1	45	70	-5
10	E Covell Blvd	Alhambra Dr to Harper Jr H.S.	13000	84	0	16	2	1	45	75	-5
11	Mace Blvd	Harper Jr H.S. to Alhambra Dr	13500	84	0	16	2	1	45	150	0
12	Mace Blvd	Alhambra Dr to 2nd Street	19700	84	0	16	2	1	45	120	0
13	Mace Blvd	2nd Street to Chiles Rd	27750	80	0	20	2	1	40	100	0
14	Mace Blvd	Chiles Rd to Cowell Blvd	13650	80	0	20	2	1	40	100	0
15	Mace Blvd	South of Cowell Blvd	6800	80	0	20	2	1	40	65	0
16	F Street	North of E Covell Blvd	7100	80	0	20	2	1	35	65	0
17	F Street	South of E Covell Blvd	9250	80	0	20	2	1	30	100	0
18	Cannery Ave	North of E Covell Blvd	4550	80	0	20	2	1	30	100	0
19	J Street	South of E Covell Blvd	5000	80	0	20	2	1	35	65	0
20	Pole Line Rd	North of E Covell Blvd	13000	80	0	20	2	1	45	100	0
21	Pole Line Rd	South of E Covell Blvd	9550	80	0	20	2	1	30	85	0
22	Birch Ln	South of E Covell Blvd	1925	84	0	16	2	1	30	40	0
23	Wright Blvd	North of E Covell Blvd	3750	84	0	16	2	1	30	110	0
24	Monarch Ln	South of E Covell Blvd	1350	84	0	16	2	1	30	60	0
25	Alhambra Dr	South of E Covell Blvd	3175	84	0	16	2	1	35	50	-5

Appendix F-2

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2022-135
Description: Cumulative No Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Dist. to Receptor	Offset (dB)
26	Alhambra Dr	West of Mace Blvd	6950	84	0	16	2	1	35	55	-5
27	Route 32A	East of Mace Blvd	2625	80	0	20	2	1	60	100	0
28	2nd Street	West of Mace Blvd	13475	80	0	20	2	1	40	65	0
29	Chiles Rd	East of Mace Blvd	11500	80	0	20	2	1	40	100	0
30	Chiles Rd	West of Mace Blvd	13250	80	0	20	2	1	45	100	0
31	Cowell Blvd	East of Mace Blvd	4100	80	0	20	2	1	30	65	0
32	Cowell Blvd	West of Mace Blvd	5750	80	0	20	2	1	30	50	0

Appendix F-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2022-135
Description: Cumulative + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Dist. to Receptor	Offset (dB)
1	W Covell Blvd	West of F Street	19105	80	0	20	2	1	40	70	0
2	E Covell Blvd	F Street to J Street	22625	80	0	20	2	1	40	80	0
3	E Covell Blvd	J Street to L Street	21900	80	0	20	2	1	40	140	0
4	E Covell Blvd	L Street to Pole Line Rd	20555	80	0	20	2	1	40	100	0
5	E Covell Blvd	Pole Line Rd to Birch Ln	17690	80	0	20	2	1	40	85	-5
6	E Covell Blvd	East of Brich Ln	17150	84	0	16	2	1	40	85	0
7	E Covell Blvd	West of Wright Blvd	16380	84	0	16	2	1	40	70	-5
8	E Covell Blvd	Wright Blvd to Monarch Ln	16945	84	0	16	2	1	40	70	-5
9	E Covell Blvd	Monarch Ln to Alhambra Dr	15945	84	0	16	2	1	45	70	-5
10	E Covell Blvd	Alhambra Dr to Harper Jr H.S.	13830	84	0	16	2	1	45	75	-5
11	Mace Blvd	Harper Jr H.S. to Alhambra Dr	14325	84	0	16	2	1	45	150	0
12	Mace Blvd	Alhambra Dr to 2nd Street	20510	84	0	16	2	1	45	120	0
13	Mace Blvd	2nd Street to Chiles Rd	28330	80	0	20	2	1	40	100	0
14	Mace Blvd	Chiles Rd to Cowell Blvd	13835	80	0	20	2	1	40	100	0
15	Mace Blvd	South of Cowell Blvd	6820	80	0	20	2	1	40	65	0
16	F Street	North of E Covell Blvd	7145	80	0	20	2	1	35	65	0
17	F Street	South of E Covell Blvd	9475	80	0	20	2	1	30	100	0
18	Cannery Ave	North of E Covell Blvd	4570	80	0	20	2	1	30	100	0
19	J Street	South of E Covell Blvd	5130	80	0	20	2	1	35	65	0
20	Pole Line Rd	North of E Covell Blvd	13050	80	0	20	2	1	45	100	0
21	Pole Line Rd	South of E Covell Blvd	9905	80	0	20	2	1	30	85	0
22	Birch Ln	South of E Covell Blvd	1935	84	0	16	2	1	30	40	0
23	Wright Blvd	North of E Covell Blvd	3765	84	0	16	2	1	30	110	0
24	Monarch Ln	South of E Covell Blvd	1435	84	0	16	2	1	30	60	0
25	Alhambra Dr	South of E Covell Blvd	3265	84	0	16	2	1	35	50	-5

Appendix F-4

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 2022-135
Description: Cumulative + Project
Ldn/CNEL: Ldn
Hard/Soft: Soft

Segment	Roadway Name	Segment Description	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Dist. to Receptor	Offset (dB)
26	Alhambra Dr	West of Mace Blvd	6965	84	0	16	2	1	35	55	-5
27	Route 32A	East of Mace Blvd	2640	80	0	20	2	1	60	100	0
28	2nd Street	West of Mace Blvd	13690	80	0	20	2	1	40	65	0
29	Chiles Rd	East of Mace Blvd	11585	80	0	20	2	1	40	100	0
30	Chiles Rd	West of Mace Blvd	13370	80	0	20	2	1	45	100	0
31	Cowell Blvd	East of Mace Blvd	4120	80	0	20	2	1	30	65	0
32	Cowell Blvd	West of Mace Blvd	5895	80	0	20	2	1	30	50	0

Appendix G-1

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Prediction Worksheet

Project Information:

Job Number: 2022-135
Project Name: Palomino Place
Roadway Name: E Covell Blvd

Traffic Data:

Year:	Cumulative
Average Daily Traffic Volume:	15,945
Percent Daytime Traffic:	84
Percent Nighttime Traffic:	16
Percent Medium Trucks (2 axle):	2
Percent Heavy Trucks (3+ axle):	1
Assumed Vehicle Speed (mph):	45
Intervening Ground Type (hard/soft):	**Soft**

Traffic Noise Levels:

				----------L_{dn}, dB----------			
Location	**Description**	**Distance**	**Offset (dB)**	**Autos**	**Medium Trucks**	**Heavy Trucks**	**Total**
1	Nearest Backyards	85	0	65	56	58	66
2	Nearest 1st-Floor Facades	90	0	64	56	57	66
3	Nearest 2nd-Floor Facades	130	3	65	56	58	66

Traffic Noise Contours (No Calibration Offset):

L_{dn} Contour, dB	Distance from Centerline, (ft)
75	21
70	46
65	99
60	213

Notes: Average Daily Traffic Volume from Project traffic study.

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Appendix G-2

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2022-135
Project Name: Palomino Place
Roadway Name: E Covell Blvd
Location(s): Nearest Backyards

Noise Level Data:

Year: Cumulative
Auto L_{dn}, dB: 65
Medium Truck L_{dn}, dB: 56
Heavy Truck L_{dn}, dB: 58

Site Geometry:

Receiver Description: Nearest Backyards
Centerline to Barrier Distance (C_1): 75
Barrier to Receiver Distance (C_2): 10
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 0
Receiver Elevation[1]: 5
Base of Barrier Elevation: 0
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height[2] (ft)	L_{dn}, dB				Barrier Breaks Line of Sight to…		
		Autos	Medium Trucks	Heavy Trucks	Total	Autos?	Medium Trucks?	Heavy Trucks?
6	6	59	50	52	**60**	Yes	Yes	Yes
7	7	57	49	51	**58**	Yes	Yes	Yes
8	8	55	47	50	**57**	Yes	Yes	Yes
9	9	54	46	48	**56**	Yes	Yes	Yes
10	10	53	45	47	**55**	Yes	Yes	Yes
11	11	52	44	46	**54**	Yes	Yes	Yes
12	12	51	43	45	**53**	Yes	Yes	Yes
13	13	51	42	44	**52**	Yes	Yes	Yes
14	14	50	42	44	**51**	Yes	Yes	Yes

Notes: 1.Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s)

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