APPENDIX D

Noise and Vibration Assessment

Noise and Vibration Assessment

603 Sutter Street Development

Folsom, California

BAC Job # 2021-020

Prepared For:

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Prepared By:

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Acoustical Consultants

CEQA Checklist

NOISE AND VIBRATION **– Would the Project Result in:**	**NA – Not Applicable**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			**X**		
b) Generation of excessive groundborne vibration or groundborne noise levels?			**X**		
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?					**X**

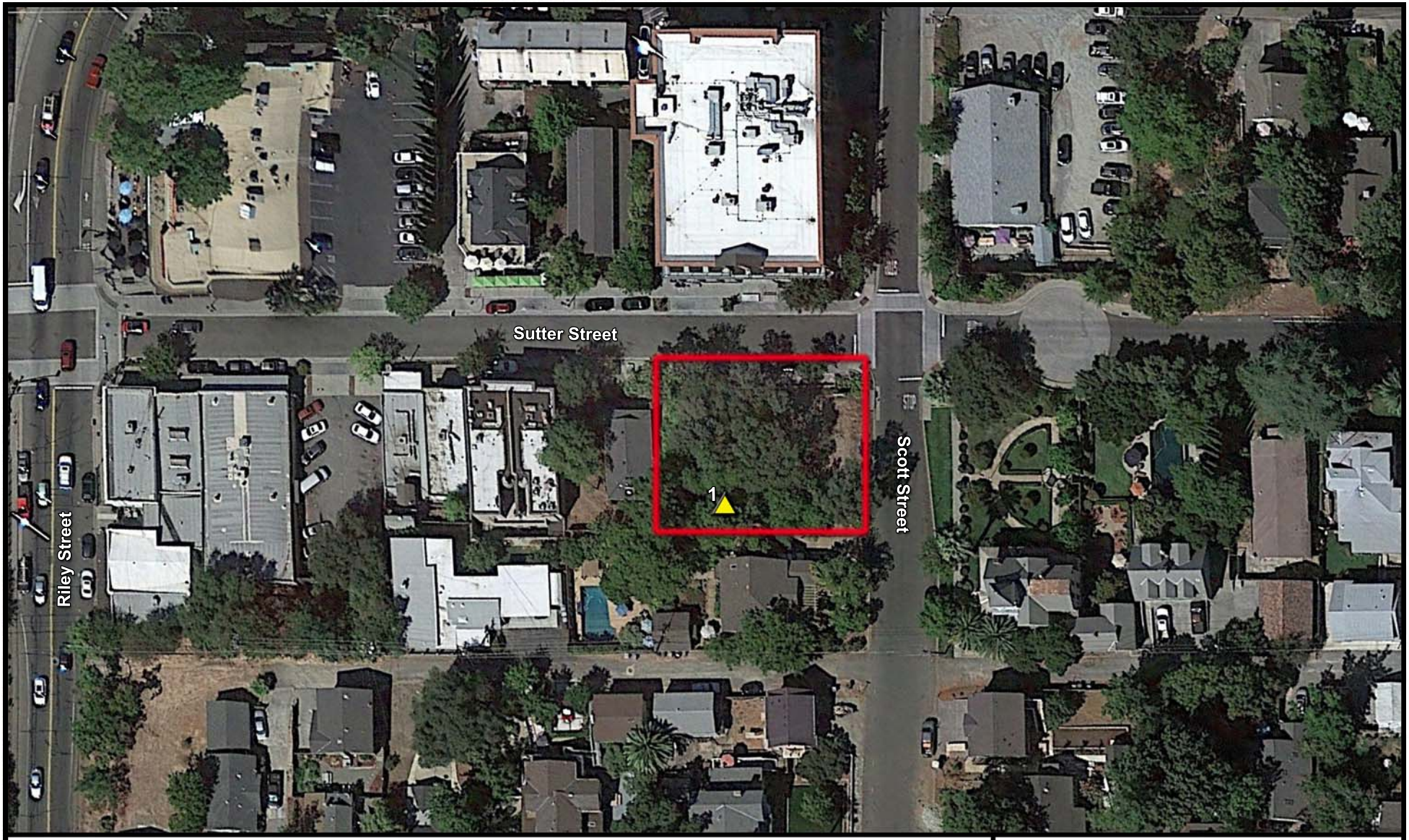
Introduction

The proposed Sutter Street Commercial Building (Project) is located at 603 Sutter Street on the southwest corner of the intersection of Sutter Street and Scott Street in the City of Folsom. The project site consists of an undeveloped rectangular plot of land with a measured area of 0.17 acres (7,400 square feet).

Surrounding land uses to the project include Sutter Street to the north with the Folsom Electric and Lighting Company Building directly across the Street. To the east is a commercial zoned lot with two residential structures (Cohn Mansion). The south side of the property backs up to a residence on Scott Street that is commercially zoned and sits directly across from the Cohn Mansion. To the west is the original historic library that is now Studio 605 Salon.

The project applicant plans to develop a three-story mixed-use building (retail/restaurant/office) totaling 12,183 square feet of useable area on an undeveloped site. An outdoor dining patio with a capacity of 20+ persons would be located on the proposed building's first floor, adjacent to the Sutter Street/Scott Street intersection. The building would feature a deck on the northwest corner of floor 2 fronting on Sutter Street. A third floor balcony would be anchored to the northwest corner of the building. Walkways from this balcony would wrap around the Sutter Street and a portion of the Scott Street elevations of the building. There would be no roof deck. The project location is shown on Figure 1. The project floor plans are presented in Figures 2 and 3.

The City of Folsom has requested a noise study to determine potential noise and vibration impacts associated with project construction and ongoing operations. In response to that request, Bollard Acoustical Consultants, Inc. (BAC) was retained to prepare this evaluation. Specifically, the purposes of this study are to quantify noise and vibration generated by the project, to compare those levels against applicable standards and, if necessary, to develop mitigation measures as appropriate.



Legend

Project Border (Approximate)

Long-Term Noise Measurement Location

N

Scale (feet)

0 30 60

603 Sutter Street
Folsom, California

Project Area

Figure 1

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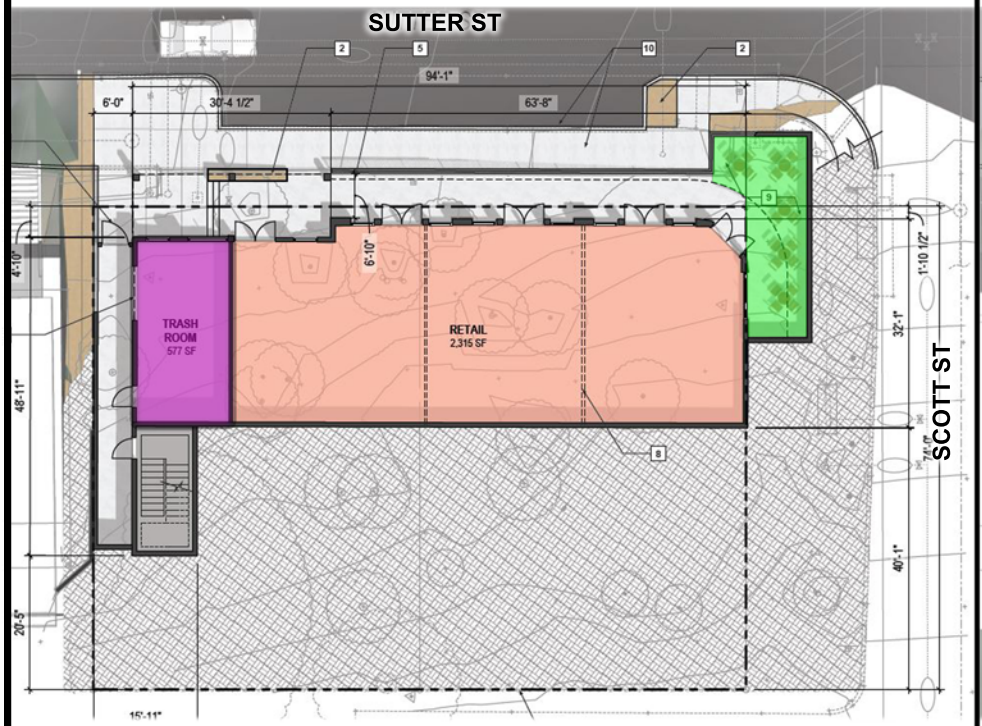
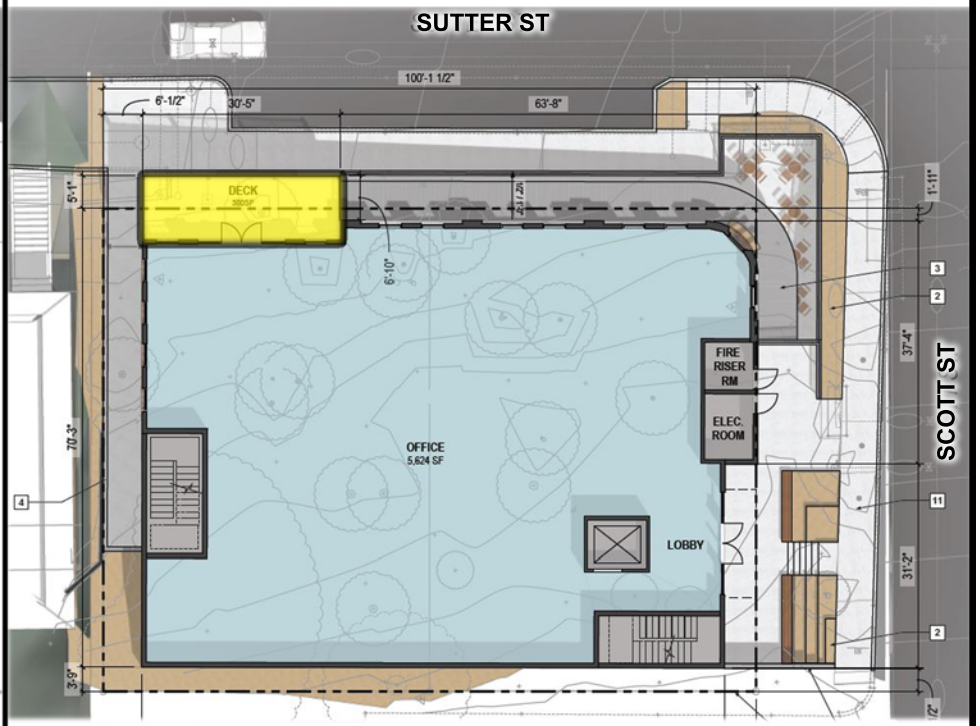


Floor Plan - Level 1



Floor Plan - Level 2

Legend

- Trash Room
- Ground Level Outdoor Dining Area
- Second Floor Deck Area

N

Scale (feet)

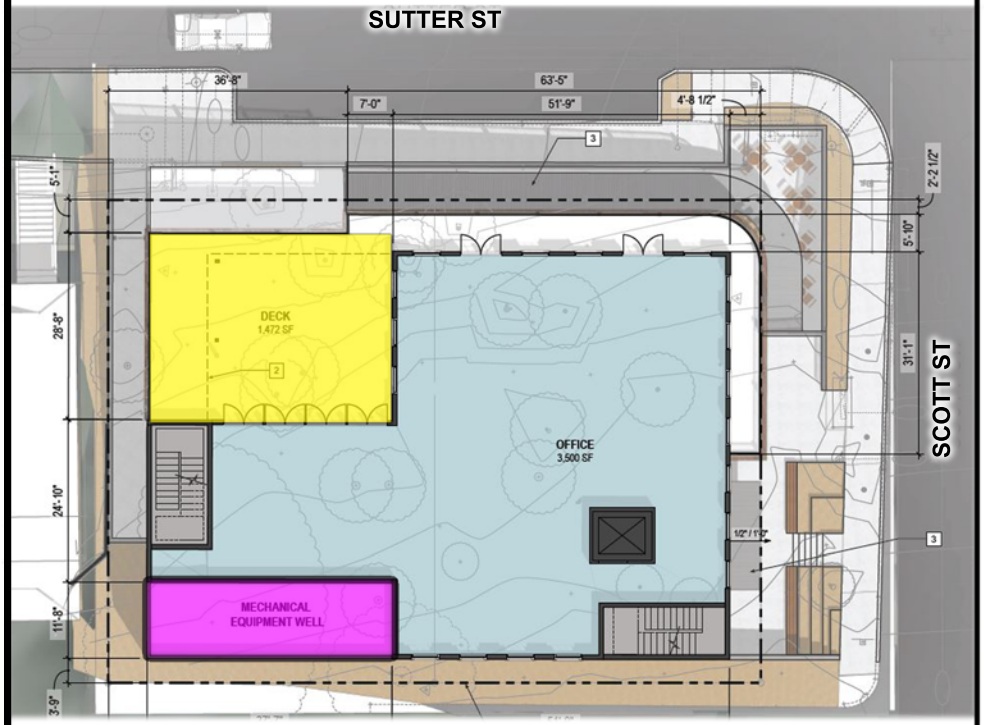
0 10 20

603 Sutter Street
Folsom, California

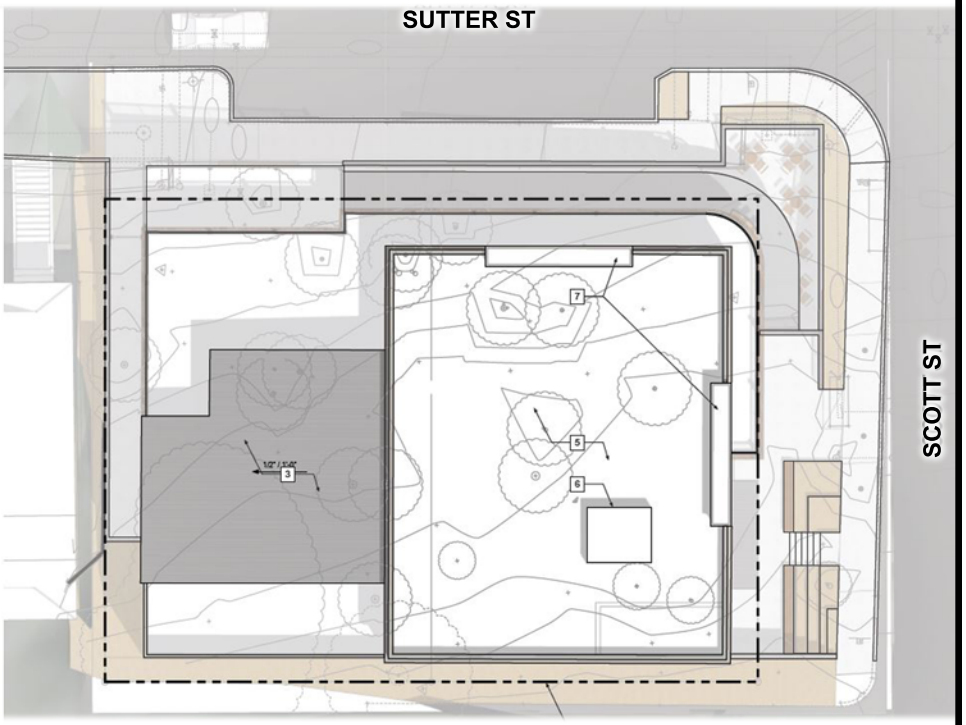
Site Plan Levels 1 & 2

Figure 2

BOLLARD Acoustical



Floor Plan - Level 3



Roof Plan - No Proposed Outdoor Area

Legend

- Mechanical Equipment Well
- Third Floor Deck Area

N

Scale (feet)

0 10 20

603 Sutter Street
Folsom, California

Site Plan Level 3 & Roof

Figure 3

BOLLARD Acoustical

Noise & Vibration Fundamentals

Noise

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 used in this report are provided in Appendix A.

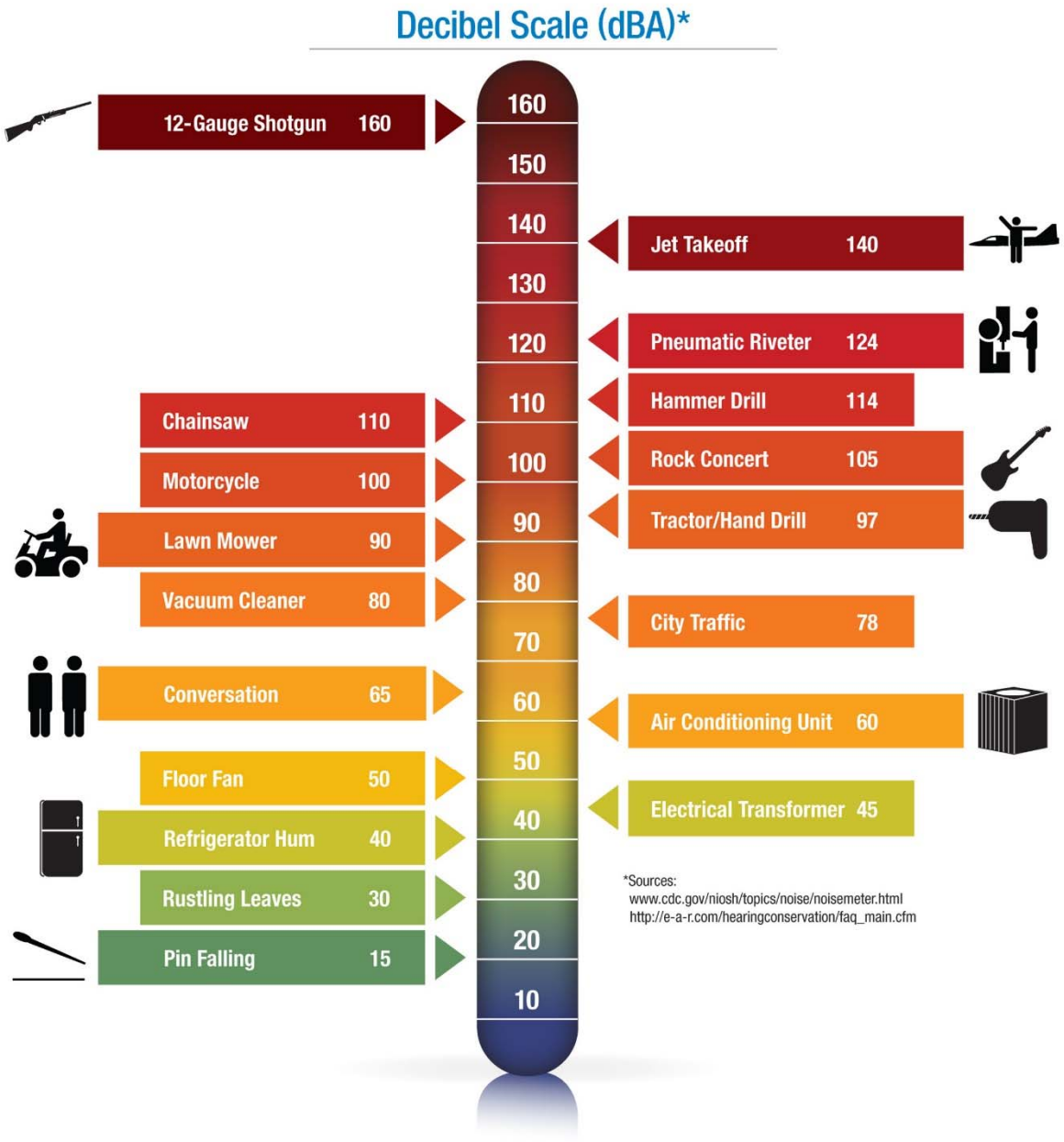
Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared 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 4.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level, frequency content, ambient noise conditions, and whether the noise source is steady-state or time-varying. 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 described in this report are 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 Hourly L_{eq} (equivalent sound level over a 60 minute period) is the foundation of the Day/Night Average Level (L_{dn}) and shows very good correlation with community response to noise. The L_{dn} is based on the average sound level over a 24-hour day, with +10 decibel weightings (penalties) applied to sounds during nighttime hours (10 p.m. - 7 a.m.). The nighttime penalties are based on the fact that those periods are more noise-sensitive than daytime hours.

Noise standards presented in terms of L_{dn} are used in the City of Folsom to evaluate the noise generation of transportation noise sources (i.e. traffic, railroad & aircraft noise). For non-transportation noise sources, such as those associated with the proposed project, the City's General Plan noise standards are expressed in terms of hourly average noise levels (L_{eq}) and instantaneous maximum noise levels (L_{max}). The City of Folsom General Plan noise standards are presented in detail in a later section of this report.

Figure 4
Noise Levels Associated with Common Noise Sources



Vibration

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 of pressure waves 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, among other factors.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to express vibration levels in terms of velocity either in inches-per-second (ips) or root-mean-square (RMS), as VdB. 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.

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. Vibration amplitudes decrease with increasing distance and can be felt well below levels that produce damage to structures.

Criteria for Acceptable Noise and Vibration Exposure

Federal

The City of Folsom does not have a specific policy for assessing noise impacts associated with increases in ambient noise levels resulting from project-generated sources. However, the criteria shown in Table 1 was developed by the Federal Interagency Commission on Noise (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 California Environmental Quality Act (CEQA) documents that have been certified in California cities and counties.

The use of the FICON standards are 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.

Table 1
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (L_{dn} or CNEL)	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

Source: Federal Interagency Committee on Noise (FICON)

Based on the FICON research, as shown in Table 1, 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. Where pre-project ambient conditions are between 60 and 65 dB, 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, a 1.5 dB increase is considered by FICON as the threshold of significance.

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. According to Appendix

G of the CEQA guidelines, the project would result in a significant noise or vibration impact if the following were to occur:

A. Generation of 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 in other applicable local, state, or federal standards?

B. Generation of excessive groundborne vibration or groundborne noise levels?

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

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 the use of audibility alone as significance criteria would be unworkable. CEQA requires a substantial increase in ambient noise levels before noise impacts are identified, not simply an audible change.

City of Folsom General Plan - Transportation Noise Sources

The City of Folsom General Plan Noise Element establishes an exterior noise level standard of 60 dB L_{dn} at outdoor activity areas of residential land uses exposed to transportation noise sources (i.e., traffic). The intent of this standard is to provide an acceptable exterior noise environment for outdoor activities. In addition, the City of Folsom utilizes an interior noise level standard of 45 dB L_{dn} or less within noise-sensitive project dwellings. The intent of this interior noise limit is to provide a suitable environment for indoor communication and sleep.

City of Folsom General Plan – Non-Transportation Noise Sources

The Noise Element of the City of Folsom General Plan and the Folsom Municipal Code establish acceptable noise level criteria for non-transportation noise sources (i.e., parks, schools, commercial activities). Table 2 (Table SN-2 of the General Plan provides the City's noise level performance criteria which are applicable to non-transportation noise sources. The Table 2 standards are provided in terms of hourly levels and include adjustments for the time of day the noise occurs, the duration of intrusive sound, and the characteristics of the noise (impulsive, tonal, speech or music, etc.).

Table 2
Noise Level Standards from Stationary Sources

	Exterior Noise Level Standard (dB)	
Noise Level Descriptor	**Daytime (7 am – 10 pm)**	**Nighttime (10 pm – 7 am)**
Hourly Leq, dB	55	45
Maximum Level, dB	70	65

Source: Table SN-2 of the Folsom 2035 General Plan Safety and Noise Element

City of Folsom General Plan – Vibration

Policy SN 6.1.8 of the Folsom General Plan pertains to vibration. That policy states that construction projects and new development anticipated to generate a significant amount of vibration are required to ensure acceptable interior vibration levels at nearby noise-sensitive uses based on Federal Transit Administration criteria as shown in Table SN-3 of the Safety element. The Table SN-3 vibration standard for residences exposed to frequent vibration events is 72 VdB.

Table 7-5 of the Federal Transit Administration's publication, *Transit Noise and Vibration Impact Assessment Manual*, contains criteria for assessing damage to structures from vibration. That table is reproduced below as Table 3.

Table 3
FTA Vibration Damage Criteria

Building/ Structural Category	**Approximate L_V***
Reinforced-concrete, steel or timber (no plaster)	102
Engineered concrete and masonry (no plaster)	98
Non-engineered timber and masonry buildings	94
Buildings extremely susceptible to vibration damage	90

*RMS velocity in decibels, VdB re I micro-in/sec

City of Folsom Municipal Code

Chapter 8.42 of the Folsom Municipal Code (FMC) pertains to noise control. The Noise Ordinance is incorporated into this report by reference. The exterior noise level standards are provided in Table 8.43.040 of the FMC. The standards are expressed in terms of maximum noise levels and L_n metrics, with the "n" representing the percentage of the hour in which the noise source in

question is present. Essentially, the FMC allows higher noise levels provided those levels are present for shorter durations of an hour.

The maximum noise level standards of the FMC are identical to those contained in the General Plan Safety Element, with both utilizing daytime and nighttime maximum noise level thresholds of 70 and 65 dB L_{max}, respectively. The median (L_{50}) noise metric contained in the FMC represents the level of should which shall not be exceeded if the sound is present for 30 or more minutes per hour. For typical urban settings such as the project site, median levels tend to be slightly lower than average noise levels. So, despite the fact that the Safety Element L_{eq} standard is 5 dB higher than the FMC median standard, the two are essentially equivalent in many cases. As a result, this analysis focuses on assessing compliance with the City's General Plan Safety Element standards provided in Table 2 with respect to ongoing operational noise generated by the project.

Section 8.42.060 C of the Noise Ordinance exempts construction noise from the provisions of the Code, provided such activities do not take place before 7:00 a.m. or after 6:00 p.m. on any day except Monday through Friday, or before 8:00 a.m. or after 5:00 p.m. on Saturday or Sunday.

Section 8.42.060 G exempts noise sources associated with the collection of waste or garbage from property devoted to commercial and industrial uses.

Existing Ambient Noise Environment

The noise environment in the vicinity of the project site consists primarily of Sutter Street and Scott Street traffic noise and, to a lesser extent, Riley Street traffic noise. Lesser sources of noise in the project area include those arising from typical urban activities, including those associated with nearby commercial uses. There are no industrial noise sources located in the vicinity of the proposed project, and there are no airports located within two miles of project site. Persons and activities potentially sensitive to noise in the project vicinity include residents of homes to the south of the project site.

To quantify background noise levels at the project site and nearest residential receivers, BAC staff conducted long-term (96-hour) ambient noise level measurements at one location at the site from February 5th to February 8th, 2021. The noise measurement location is shown in Figure 1. Appendix B contains photographs of the noise monitoring location.

A Larson-Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used to complete the noise level measurements. The meter was calibrated before use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

A summary of the ambient noise level measurement survey is provided below in Table 4. The detailed noise level measurement results are provided in tabular and graphical form in Appendices C and D, respectively.

Table 4
Summary of Ambient Noise Monitoring Results – February 5-8, 2021
603 Sutter Street Commercial Development – Folsom, California

	Measured Noise Levels (dB)						
	Daytime			Nighttime			
Date[1]	L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}	L_{dn}
2/5/21	54	52	71	47	45	61	56
2/6/21	54	51	73	47	44	62	56
2/7/21	50	48	66	45	42	61	53
2/8/21	52	50	70	46	43	58	54

Notes:

[1] Noise level measurement location is depicted in Figure 1.

Source: Bollard Acoustical Consultants, Inc. 2021

The Table 4 data indicate that existing ambient noise conditions in the immediate vicinity of the nearest residence to the south are in the range of the City's exterior noise level standards shown in Table 2, and below the City's 60 dB L_{dn} exterior noise standard for residential uses. As a result, provided the noise generation of ongoing project operations does not exceed the Table 2 standards at nearby sensitive land uses, the project would not result in a substantial increase in ambient noise levels in the immediate project vicinity.

Project Noise Impacts and Mitigation Measures

The proposed project would generate noise initially during construction and operationally upon completion of project construction. Each of these sources are evaluated below.

Impact 1: Construction Noise

As noted above, the City's Noise Ordinance (8.42.060.C) states that noise sources associated with construction, provided such activities do not take place before 7 a.m. or after 6 p.m. on any day except Saturday or Sunday, or before 8 a.m. or after 5 p.m. on Saturday or Sunday, shall be exempt from the provisions of the Noise Ordinance.

Noise generated during construction would vary, depending on the construction phase and the type and amount of equipment used at the construction site. Noise would be generated by trucks delivering and recovering materials at the site, grading and paving equipment, saws, hammers, the radios and voices of workers, and other typical provisions necessary to construct a medium sized commercial project. Construction activities that would generate noise include site grading, excavation, placement of fill, hauling and deliveries, foundation work, and to a lesser extent framing, and exterior and interior finishing. The highest noise levels would be generated during grading and leveling of the site, with lower noise levels occurring during building construction and finishing.

The noise generation of various construction activities is provided in Table 5. Not all of the equipment listed in Table 5 would be required for this project construction but Table 5 generally illustrates that maximum noise levels ranging from 70 to 90 dBA can be expected at a distance of 50 feet from the operating equipment.

Table 5
Typical Construction Equipment Noise

Equipment Description	Maximum Noise Level at 50 feet, dBA
Auger drill rig	85
Backhoe	80
Bar bender	80
Boring jack power unit	80
Chain saw	85
Compactor (ground)	80
Compressor (air)	80
Concrete batch plant	83
Concrete mixer truck	85
Concrete pump truck	82
Concrete saw	90
Crane (mobile or stationary)	85
Dozer	85
Dump truck	84
Excavator	85
Flatbed truck	84
Front end loader	80
Generator (25 kilovoltamperes [kVA] or less)	70
Generator (more than 25 kVA)	82
Grader	85
Hydra break ram	90
Jackhammer	85
Mounted impact hammer (hoe ram)	90
Paver	85
Pickup truck	55
Pneumatic tools	85
Pumps	77
Rock drill	85
Scraper	85
Soil mix drill rig	80
Tractor	84
Vacuum street sweeper	80
Vibratory concrete mixer	80
Welder/Torch	73

Source: Federal Highway Administration, Roadway Construction Noise Model User's Guide, (2006).

Although construction activities would be temporary in nature, project construction could result in short-term increases in ambient noise levels at the nearest residences, primarily during site clearing and grading, which could result in annoyance. Due to the required construction hours, impacts related to sleep disturbance are not anticipated. In addition, exposure of persons in the project vicinity to levels of construction noise which could cause damage to hearing is also not expected. Although the construction noise generation of this project would be generally comparable to other commercial construction projects, due to the potential for annoyance during

the construction period, ***this impact is considered significant*** and the following noise mitigation measure is recommended.

MM-1. Due to the proximity of sensitive receptors to the project site, all construction activities shall be required to comply with the following:

1. Construction Hours/Scheduling: Project construction shall be limited to the hours of 7 a.m. to 6 p.m. on any day except Saturday or Sunday, and between 8 a.m. and 5 p.m. on Saturday or Sunday. Delivery of materials or equipment to and from the site and truck traffic arriving or departing the site are restricted to the same hours specified above.

2. Construction Equipment Mufflers and Maintenance: All construction equipment powered by internal combustion engines shall be properly muffled and maintained.

3. Idling Prohibitions: All equipment and vehicles shall be turned off when not in use. Unnecessary idling of internal combustion engines shall be prohibited.

4. Equipment Location and Shielding: All stationary noise-generating construction equipment, such as air compressors, shall be located as far as practical from the adjacent homes.

5. Staging and Equipment Storage: The equipment storage location shall be sited as far as possible from nearby sensitive receptors.

6. Quiet Equipment Selection: Select quiet equipment, particularly air compressors, whenever possible. Motorized equipment shall be outfitted with proper mufflers in good working order.

7. At least 5 days prior to the initiation of grubbing or other ground disturbing construction operations, the project applicant, and successor in interest, or the general contractor in charge shall provide a notice of the initiation of construction to all parcels located within 250 feet of the project site. Such notice shall contain an outline of construction activities, their duration, and contact information for a person designated.

Significance after mitigation: ***Less than Significant***

Impact 2: Project-Related Traffic Noise Increases

According to the Traffic Impact Analysis (TIA) prepared for the project by Kimley Horn, the project would generate approximately 38 trips occurring during the peak hour. Existing (2019) peak hour traffic volumes on Sutter and Scott Street are reported in the TIA to be 345 and 105 vehicles, respectively. To compute the increase in traffic noise levels resulting from the project, the following formula is used:

$$\text{Noise Increase} = 10 * \text{Log}_{10} [\ (\text{existing} + \text{project volume}) / (\text{existing volume})]$$

Using the above described formula, the project-related increases in traffic noise levels along Sutter and Scott Streets would be 0.5 dB L_{eq} and 1.3 dB L_{eq}, respectively, assuming all the project peak hour traffic were to utilize both roads.

With respect to daily (not peak hour), traffic noise level increases due to the project, the TIA projects that the project would generate approximately 418 daily trips. Existing traffic volumes on these roadways are estimated by the City of Folsom to be approximately 2,100-4,500 ADT on Sutter Street and 1,400 – 2,800 ADT on Scott Street. Based on a conservative assumption that existing traffic volumes are at the lower end of the ranges cited above, the predicted project-related increases in traffic noise levels along Sutter and Scott Streets would be 0.8 dB and 1.1 dB L_{dn}, respectively, assuming all the project daily traffic were to utilize both roads.

The project-related traffic noise level increases cited above, which are based on conservative assumptions, would likely be imperceptible at the nearest residences to the project site and would be well below the significance criteria cited in Table 1. As a result, this impact is considered ***less than significant.***

Impact 3: Outdoor Dining and Deck Noise

As indicated on Figures 2 and 3, the project proposes 3 distinct exterior areas where people could congregate. One location is the ground floor (level 1) outdoor dining area shown on Figure 2. The second is a small deck area on level 2, also shown on Figure 2. The third location is a larger deck area associated with the proposed office space on level 3, as shown on Figure 3. No outdoor use space is proposed on the roof of the building.

There will be no outdoor speakers installed in any of these areas and no live or recorded music will be performed or played at any of the outdoor spaces. As a result, the only noise source associated with these outdoor spaces would be people conversing. A typical person speaking in a normal voice generates an average noise level of approximately 57 dBA at a reference distance of 3 feet. Conservatively assuming 20 persons were speaking simultaneously within each outdoor space, a reference sound level of 70 dBA L_{eq} and 75 dBA L_{max} would be generated at the 3 foot reference distance.

The distance from the proposed outdoor spaces to the nearest existing residences vary. In addition, shielding provided by intervening structures between the proposed outdoor spaces of the project and the nearest residences similarly varies, with the 2nd and 3rd level decks being completely shielded from view of the residences to the south and east.

The proposed ground level dining area is located approximately 100 feet from the closest residential receptor to the southeast. At that distance, and assuming no shielding by intervening structures whatsoever, the predicted average and maximum noise levels would be 40 dB L_{eq} and 45 dB L_{max}, respectively. Due to the considerable shielding of the 2nd and 3rd level decks from the nearest residences, noise generated during outdoor conversations at those locations would be considerably lower. Because the predicted sound originating from the outdoor spaces of the project would be well below the Table 2 noise standards of the City of Folsom General Plan, and

well below measured existing ambient noise levels at the nearest residences, this impact is considered ***less than significant***.

Impact 4: Mechanical Equipment Noise

As indicated on Figure 3, the mechanical equipment associated with heating, ventilating and air conditioning, as well as any mechanical equipment associated with a future restaurant use on the project site, would be located within an enclosed mechanical equipment well which would contain the noise. As a result, project mechanical equipment noise is not predicted to exceed the applicable City of Folsom noise standards or substantially exceed existing ambient noise levels in the immediate project vicinity. As a result, this impact is considered ***less than significant.***

Impact 5: Garbage Collection Noise

As indicated on Figure 2, the trash room is located on the ground level at the northwestern corner of the proposed building. The proposed trash collection area and proposed roll-up door is shielded from view of the nearest residences in the project area by the proposed project building and other existing structures in the project vicinity.

Solid waste and organic waste removal services would be provided by the City of Folsom (solid waste) and a private hauler (organic waste). Organic waste would be placed in a separate bin from that used for solid waste. Depending upon the volume of waste generated by the restaurant, commercial, and office uses, trash and organic waste pickup could occur several times per week. During waste removal, noise would be generated by vehicle engines, collection operations, and backup alarms. Each collection event would last 15 minutes or less. Collection times could vary throughout the day, but would tend to occur most often during morning hours.

As a matter of public health, safety and convenience, the City has exempted garbage collection generated by commercial uses from meeting Noise Ordinance standards. While early morning collection (typically used to prevent conflicts between large garbage collection vehicles and other activities) may introduce a source of noise that is irritating to some, the City has determined that it is within the public interest to collect garbage regularly and at times that inconvenience the smallest group of residents possible. Thus, for purposes of CEQA, the City has exempted garbage collection and noise generated by such activities.

As noted above, Section 8.42.060 G of the Noise Ordinance exempts noise sources associated with the collection of waste or garbage from property devoted to commercial or industrial uses. As set forth in the Project Description of this Initial Study, the project site is zoned for commercial uses (as are the adjoining residences), and the proposed 603 Sutter Street Commercial Building project would house commercial activities, including a restaurant, retailing, and offices. Thus, waste and garbage pickup would be exempt from Noise Ordinance requirements. In addition, due to the substantial shielding of the garbage collection area from the nearest residences, excessive noise levels during regular garbage collection operations is not anticipated. In light of the exemption and project design which would substantially reduce noise levels at the nearest residences, this impact is considered ***less than significant.***

Impact 6: Construction Vibration

As an undeveloped project site located within an existing commercial and residential area, there are no existing sources of vibration or groundborne noise on the project site or in the project vicinity. 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. Because of the shallow depth to bedrock across much of the site, the leveling of the building pad would require ripping by heavy equipment, but the need for blasting is uncertain.

The geotechnical study prepared for the project listed blasting as one of the methods that could be needed to extract ground rock from the site prior to leveling and foundation development. However, because of the small size of the site, the adjacency of residences and historic structures (which may be unstable) nearby public utilities, and the lack of a regulatory program to manage blasting within the City, impacts related to blasting at the site are ***considered potentially significant***.

The range of vibration source levels for construction equipment commonly used in similar projects (not including blasting) are shown in Table 6. The vibration levels depicted in Table 6 are representative of measurements at a distance of 25 feet from the equipment source, which represents the approximate distances to the nearest existing structures to the project site.

Table 6
Vibration Source Levels for Construction Equipment

Equipment	Approximate RMS L_V[1] at 25 feet
Large bulldozer	87
Loaded trucks	86
Jackhammer	79
Small bulldozer	58

Notes:
[1] RMS velocity in decibels (VdB) re 1 micro-inch/second
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual (2018)

As indicated in Table 3, a vibration level of 90 VdB is required before the onset of damage would occur to buildings which are extremely susceptible to vibration damage. Because vibration levels generated by the type of construction equipment which will be required for this project is not anticipated to exceed 90 VdB at the nearest structures, no damage to nearby buildings is anticipated to result from project vibration.

Although vibration levels generated by the project are not anticipated to exceed thresholds for damage to structures, due to the historic significance of the nearby structure to the west and the potential for discernible vibration levels within residences during certain site grading activities, ***this impact is considered significant,***

MM-2. Due to the proximity of sensitive receptors and structures to the project site, all construction activities shall be required to comply with the following:

1. Prior to the removal of any bedrock, the project applicant, any successor in interest, or the project contractor shall prepare a bedrock removal plan for review and approval by the City.

2. No removal activity shall occur prior to City approval. The bedrock removal plan shall be prepared by a licensed geologist, engineer, or equivalent accredited professional, and will include at least the following components:

   - The location, volume, and type of bedrock to be removed
   - Removal procedures to be used, both primarily and as options if necessary
   - The expected duration of removal activities
   - Type of equipment to be used
   - Any types of chemical or other materials to be used, including any storage and safety requirements
   - Requirements for personal safety and the protection of private and public property
   - A program to notify all parcels within 250 feet of the project site.

3. No blasting shall be permitted on the site.

Significance after mitigation: ***Less than Significant***

Conclusions

This analysis concludes that, with the recommended mitigation measures, noise and vibration generated from the proposed project would not result in any adverse noise or vibration impacts at the nearest sensitive receptors to the project site.

This concludes BAC's noise and vibration assessment for the proposed 603 Sutter Street Commercial Building. Please contact BAC at (916) 663-0500 or paulb@bacnoise.com with any questions regarding this report.

References

CEQA Checklist
http://califaep.org/docs/2019-Appendix_G_Checklist.pdf

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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.

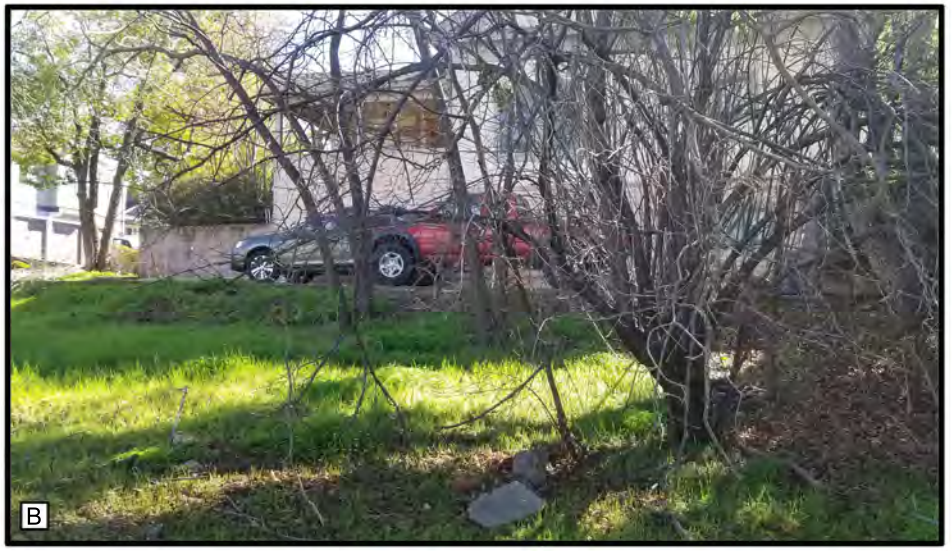
Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

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 Long-term Noise Measurement Site
- B Noise Measurement Site Facing Residential Use to the South
- C Project Site Facing Commercial Use to the West

603 Sutter Street
Folsom, California

Photographs of Long-Term
Noise Survey Location

Appendix B

BOLLARD Acoustical

Appendix C-1
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Friday, February 5, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	43	60	42	37
1:00 AM	43	55	42	36
2:00 AM	42	54	40	36
3:00 AM	43	58	42	36
4:00 AM	45	60	43	37
5:00 AM	50	64	48	44
6:00 AM	51	65	50	47
7:00 AM	54	74	52	49
8:00 AM	53	72	52	50
9:00 AM	52	73	50	47
10:00 AM	54	65	53	49
11:00 AM	54	68	50	47
12:00 PM	54	71	50	47
1:00 PM	55	77	51	48
2:00 PM	55	77	51	47
3:00 PM	54	70	51	48
4:00 PM	54	70	53	50
5:00 PM	55	66	54	51
6:00 PM	55	65	54	51
7:00 PM	55	73	53	50
8:00 PM	52	64	51	48
9:00 PM	52	73	50	47
10:00 PM	50	65	48	45
11:00 PM	48	64	46	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)	55	52	54	51	42	47
Lmax (Maximum)	77	64	71	65	54	61
L50 (Median)	54	50	52	50	40	45
L90 (Background)	51	47	49	47	36	40

Computed DNL, dB	56
% Daytime Energy	89%
% Nighttime Energy	11%

GPS Coordinates	38°40'41.36"N
	121°10'30.65"W

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Appendix C-2
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Saturday, February 6, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	46	66	44	39
1:00 AM	45	61	43	39
2:00 AM	42	57	40	36
3:00 AM	43	54	42	36
4:00 AM	44	59	43	38
5:00 AM	47	62	46	42
6:00 AM	49	60	48	45
7:00 AM	52	68	51	48
8:00 AM	53	73	51	48
9:00 AM	52	74	50	47
10:00 AM	51	69	49	46
11:00 AM	58	86	51	48
12:00 PM	54	74	51	48
1:00 PM	53	72	51	48
2:00 PM	55	77	51	48
3:00 PM	55	73	51	48
4:00 PM	53	75	50	48
5:00 PM	57	86	52	49
6:00 PM	53	66	53	50
7:00 PM	52	65	52	50
8:00 PM	53	66	52	49
9:00 PM	51	68	50	47
10:00 PM	52	73	48	44
11:00 PM	47	61	45	41

	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	51	54	52	42	47
Lmax (Maximum)	86	65	73	73	54	62
L50 (Median)	53	49	51	48	40	44
L90 (Background)	50	46	48	45	36	40

Computed DNL, dB	56
% Daytime Energy	89%
% Nighttime Energy	11%

GPS Coordinates	38°40'41.36"N
	121°10'30.65"W

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Appendix C-3
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Sunday, February 7, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	45	66	42	38
1:00 AM	45	70	42	37
2:00 AM	41	52	39	35
3:00 AM	43	54	42	38
4:00 AM	42	54	41	38
5:00 AM	45	61	43	38
6:00 AM	48	71	45	42
7:00 AM	48	58	47	44
8:00 AM	49	63	48	46
9:00 AM	50	70	48	45
10:00 AM	50	68	48	44
11:00 AM	50	69	48	45
12:00 PM	51	70	49	46
1:00 PM	51	70	49	46
2:00 PM	52	78	50	46
3:00 PM	49	61	48	45
4:00 PM	52	72	48	44
5:00 PM	48	63	47	44
6:00 PM	48	63	47	44
7:00 PM	51	64	50	47
8:00 PM	51	63	50	46
9:00 PM	48	59	47	44
10:00 PM	46	61	45	41
11:00 PM	44	59	43	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)	52	48	50	48	41	45
Lmax (Maximum)	78	58	66	71	52	61
L50 (Median)	50	47	48	45	39	42
L90 (Background)	47	44	45	42	35	38

Computed DNL, dB	53
% Daytime Energy	85%
% Nighttime Energy	15%

GPS Coordinates	38°40'41.36"N
	121°10'30.65"W

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Appendix C-4
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Monday, February 8, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	44	56	43	38
1:00 AM	44	62	42	37
2:00 AM	41	53	39	35
3:00 AM	43	54	42	36
4:00 AM	45	64	43	36
5:00 AM	49	59	48	44
6:00 AM	50	64	50	46
7:00 AM	54	75	53	49
8:00 AM	51	63	51	48
9:00 AM	51	68	50	47
10:00 AM	52	65	50	47
11:00 AM	52	68	50	47
12:00 PM	53	78	49	46
1:00 PM	53	69	50	47
2:00 PM	53	77	50	46
3:00 PM	56	75	51	47
4:00 PM	53	68	52	48
5:00 PM	54	76	51	48
6:00 PM	51	64	50	46
7:00 PM	49	61	48	45
8:00 PM	49	70	47	43
9:00 PM	47	66	45	41
10:00 PM	44	58	41	37
11:00 PM	42	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)	56	47	52	50	41	46
Lmax (Maximum)	78	61	70	64	53	58
L50 (Median)	53	45	50	50	39	43
L90 (Background)	49	41	46	46	35	38

Computed DNL, dB	54
% Daytime Energy	88%
% Nighttime Energy	12%

GPS Coordinates	38°40'41.36"N
	121°10'30.65"W

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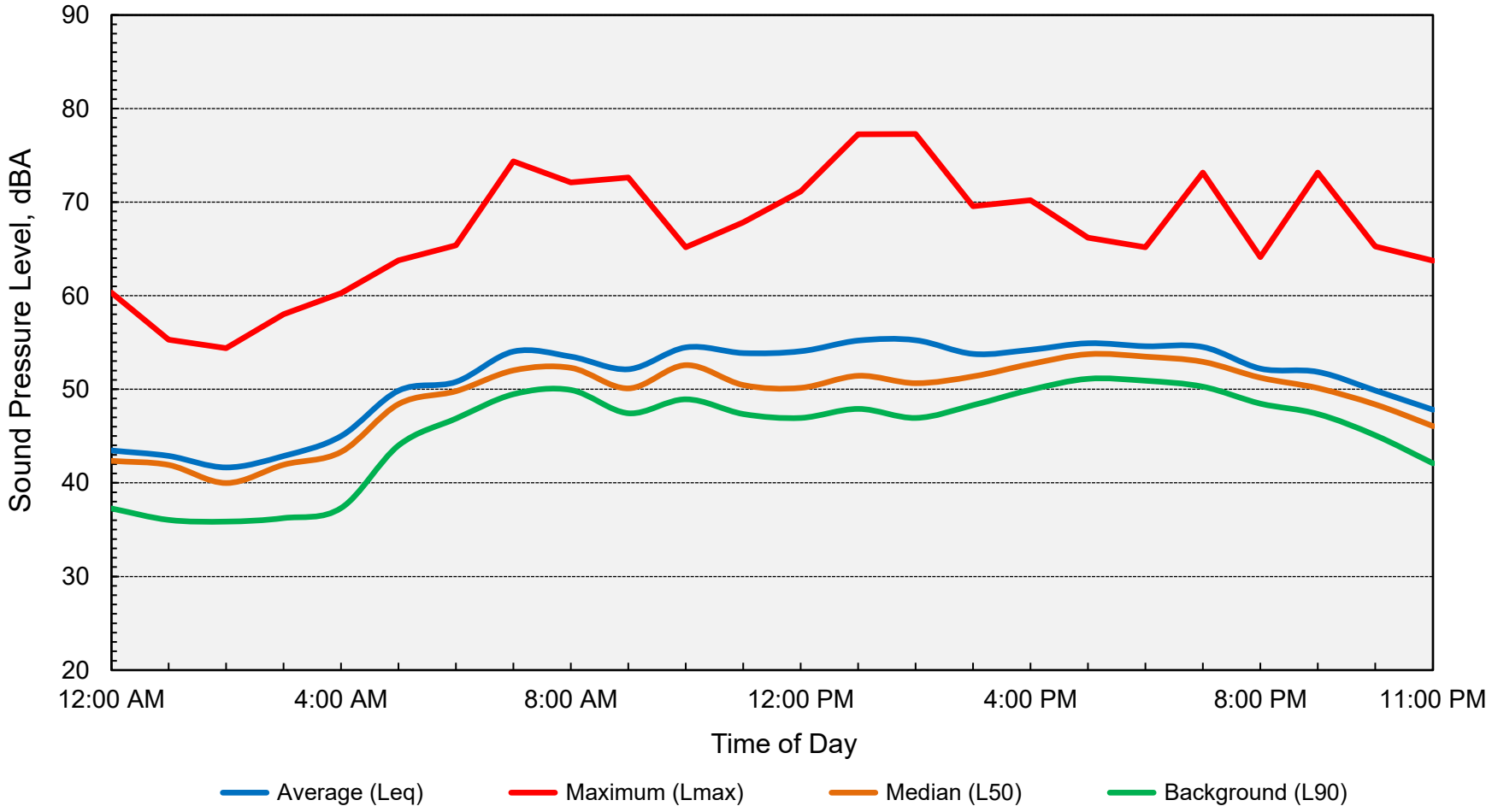
Appendix D-1
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Friday, February 5, 2021



Computed DNL = 56 dB

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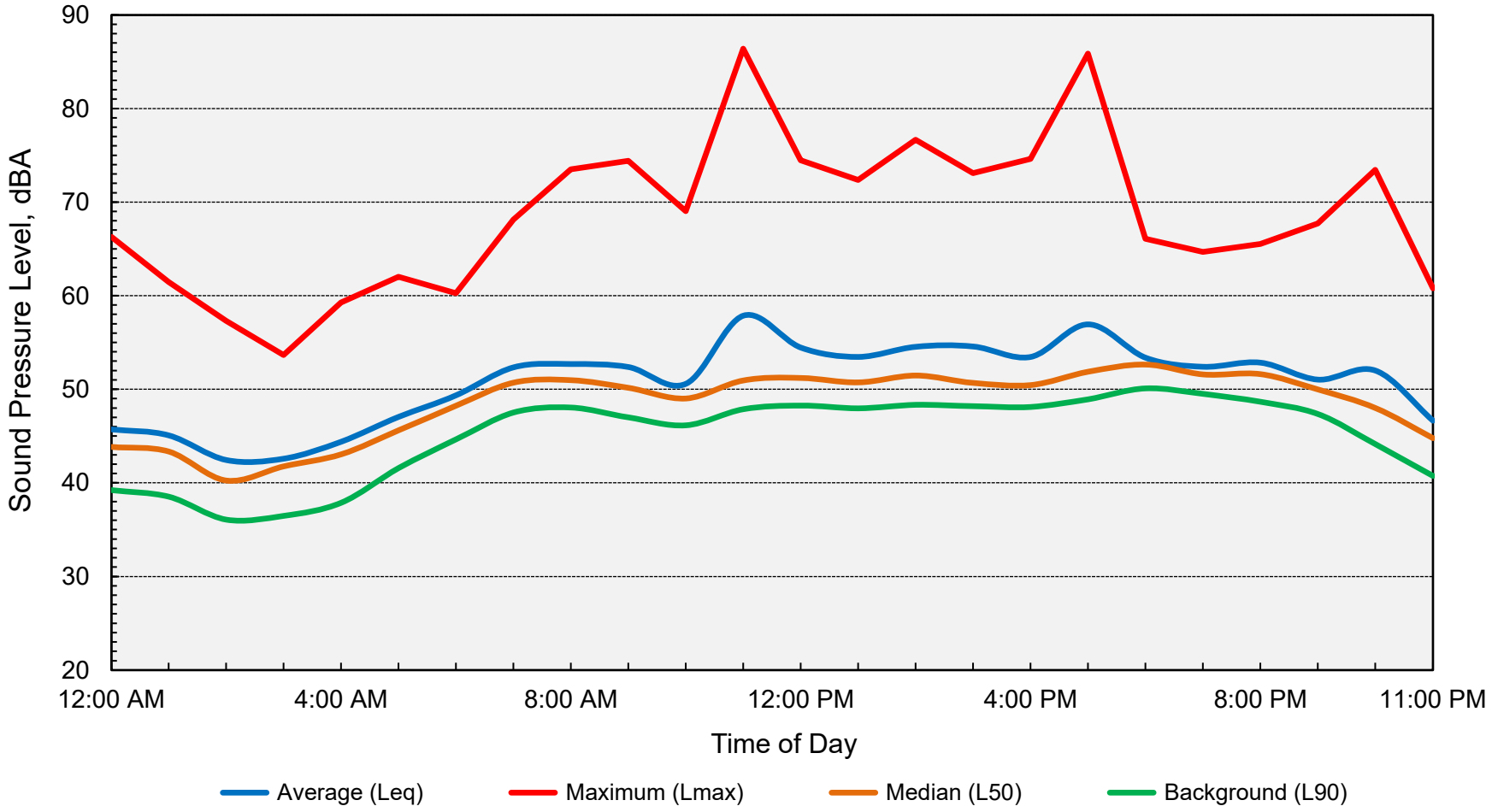
Appendix D-2
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Saturday, February 6, 2021



Computed DNL = 56 dB

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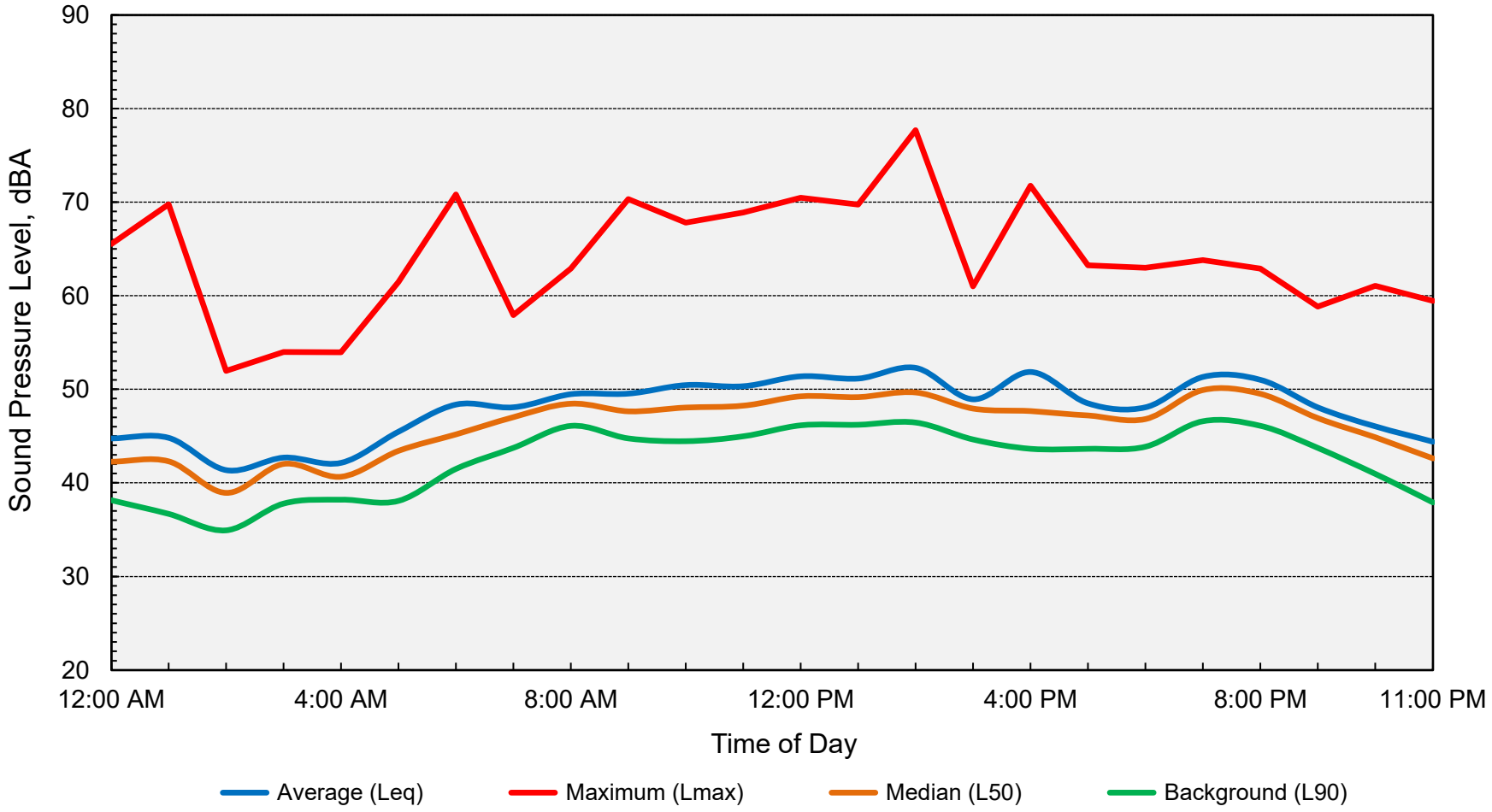
Appendix D-3
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Sunday, February 7, 2021



Computed DNL = 53 dB

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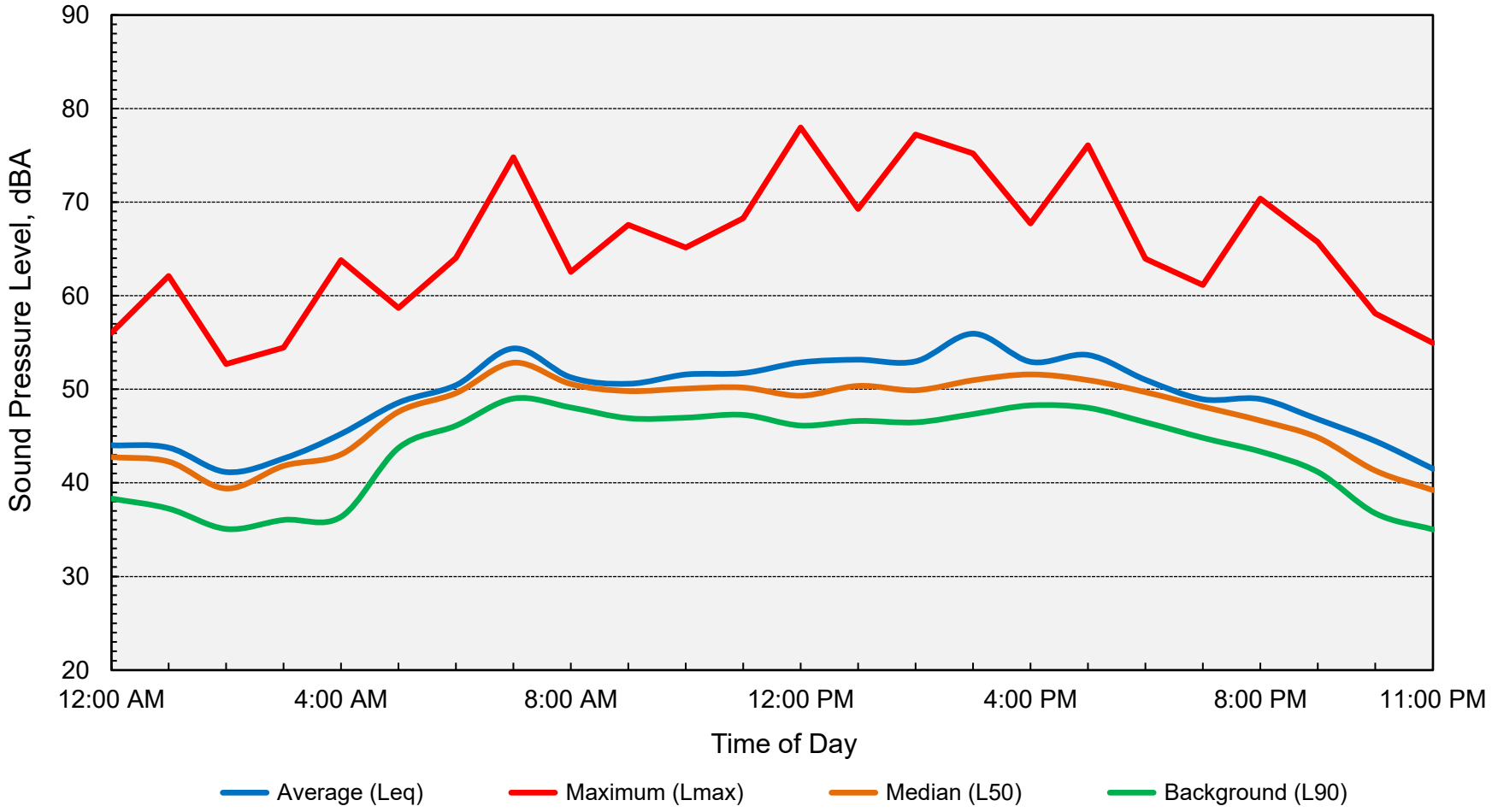
Appendix D-4
Ambient Noise Monitoring Results
603 Sutter Street - Folsom, California
Monday, February 8, 2021



Computed DNL = 54 dB

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