



APPENDIX D

Noise Study

NOISE TECHNICAL STUDY

FOR THE

PUBLIC STORAGE JEFFERSON REPLACEMENT PROJECT

PREPARED BY:



Westlake Village Office
860 Hampshire Road, Suite P
Westlake Village, CA 91361

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Table of Contents

Section	Page
Executive Summary	1
Project Description	3
Noise Descriptors.....	6
Existing Conditions.....	11
Methodology	18
Thresholds of Significance	22
Mitigation Measures.....	25
Noise Analysis.....	27
Cumulative Noise.....	32
Certification	33

Attachments

- A Noise Monitoring Data Sheets
- B Construction Noise Worksheet
- C Construction Vibration Worksheet

Figures

Figure		Page
1	Regional Location Map.....	4
2	Project Site Location	5
3	Common Noise Levels.....	9
4	Noise Attenuation by Barriers	10
5	Noise Monitoring Location (Site 1).....	13
6	Noise Monitoring Location (Site 2).....	14
7	Noise Monitoring Location (Site 3).....	15
8	Noise Monitoring Location (Site 4).....	16
9	Noise Monitoring Location (Site 5).....	17

Tables

Table		Page
1	Noise Descriptors	7
2	Ambient Noise Measurements	11
3	Typical Maximum Noise Levels for Project Construction Equipment	19
4	Construction Maximum Noise Estimates	28
5	On-Site Construction Vibration Impacts	31

EXECUTIVE SUMMARY

The purpose of this noise analysis is to provide an assessment of the impacts resulting from the Public Storage Jefferson Replacement Project (Project) and to identify any measures that may be necessary to reduce potentially significant impacts.

On-Site Construction Noise

Construction noise levels would be reduced with the implementation of mitigation measures (MMs). Mitigation includes methodology from the City of Los Angeles *Construction Noise and Vibration: Updates to Thresholds and Methodology*,¹ including compliance with the daytime construction noise thresholds which limits construction activities to occur from 7:00 AM to 7:00 PM Monday through Friday, and from 8:00 AM to 6:00 PM on Saturdays. Modeled construction noise levels with implementation of MMs would reduce noise levels to acceptable limits. Noise reduction measures include, but are not limited to, optimal muffler systems, dampening materials, sound aprons, temporary barriers, and limiting simultaneous operations. As such, on-site construction noise impacts would not be considered significant.

Off-Site Construction Noise

Construction of the Project would require worker, haul, and vendor truck trips to and from the site to work on the site, export soil, and deliver supplies to the site. Trucks traveling to and from the Project Site would be required to travel along a haul route approved by the City. At the maximum, approximately 58 hauling trips per day would take place during the demolition phase. Haul truck traffic would take the most direct route along Jefferson Boulevard and Centinela Avenue to the CA 90 Freeway. The noise level increases from truck trips would be below the significance threshold of 5 dBA above ambient. As such, off-site construction noise impacts would not be considered significant.

Operational Noise

All Project mechanical equipment would be required to be designed with appropriate noise-control devices—such as sound attenuators, acoustics louvers, or sound screens/parapet walls—to comply with noise-limitation requirements provided in Section 112.02 of the LAMC, which prohibits equipment from causing more than a 5 dBA increase in the ambient noise level.

¹ City of Los Angeles, Department of City Planning. Updated Construction Noise and Vibration Thresholds. *Construction Noise and Vibration: Proposed Updates to Thresholds and Methodology*. Accessed September 2025. <https://planning.lacity.gov/odocument/fba26ae5-ca95-48c3-aace-ae3bf0cb43b1/Construction%20Noise%20and%20Vibration%20-%20Proposed%20Updates%20to%20Thresholds%20and%20Methodology%20%20Attachments.pdf>

Construction Vibration

The forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold of 0.5 PPV inches per second (ips) for newer residential structures. As such, vibration impacts would not be considered significant.

PROJECT DESCRIPTION

The address associated with the Project Site is 5741 W. Jefferson Boulevard and 3336, 3348 and 3352 S. La Cienega Place. The Project Site is located within the West Adams - Baldwin Hills - Leimert Community Plan Area of the City of Los Angeles (City). The Project Site is approximately 100 feet north of the Los Angeles County Metropolitan Transportation Authority E (Expo) Line, which runs in an east-west direction, and 0.6 miles south of the Santa Monica Freeway (I-10), which runs in an east-west direction, as shown in **Figure 1: Regional Location Map**. The Project Site is bordered by West Jefferson Boulevard to the south and La Cienega Place to the west, as shown in **Figure 2: Project Site Location**.

The Project Site consists of one lot (Assessor Parcel Number 4205-033-014) and is approximately 90,958 square feet (2.09 gross acres) in size. Currently, the Project Site contains an existing 82,051 square-foot self-storage facility and surface parking lot. The Project would remove the existing self-storage facility and construct a new 303,453 square-foot mixed-used retail and self-storage facility. The Project includes garage parking with a total of 63 automobile parking spaces, 33 long-term bicycle parking spaces, and 33 short-term bicycle parking spaces. Upon completion, the Project Site would include a total of approximately 6,720 square feet of retail use and 296,733 square feet of self-storage uses.

The Project would be approximately 86 feet in height, with limited exceptions of up to 10' for mechanical equipment, stairways, and elevator tower structures. The Project would be designed in conformance with the scale, massing, and character of the surrounding development. The building would be a unique design for Public Storage, characterized by a modern architectural style and would feature signage, lighting, and landscaping providing pedestrian amenities and an enhanced streetscape. Building materials would include metal paneling in horizontal and vertical bands of orange, gray and tan; concrete masonry block; and glass.

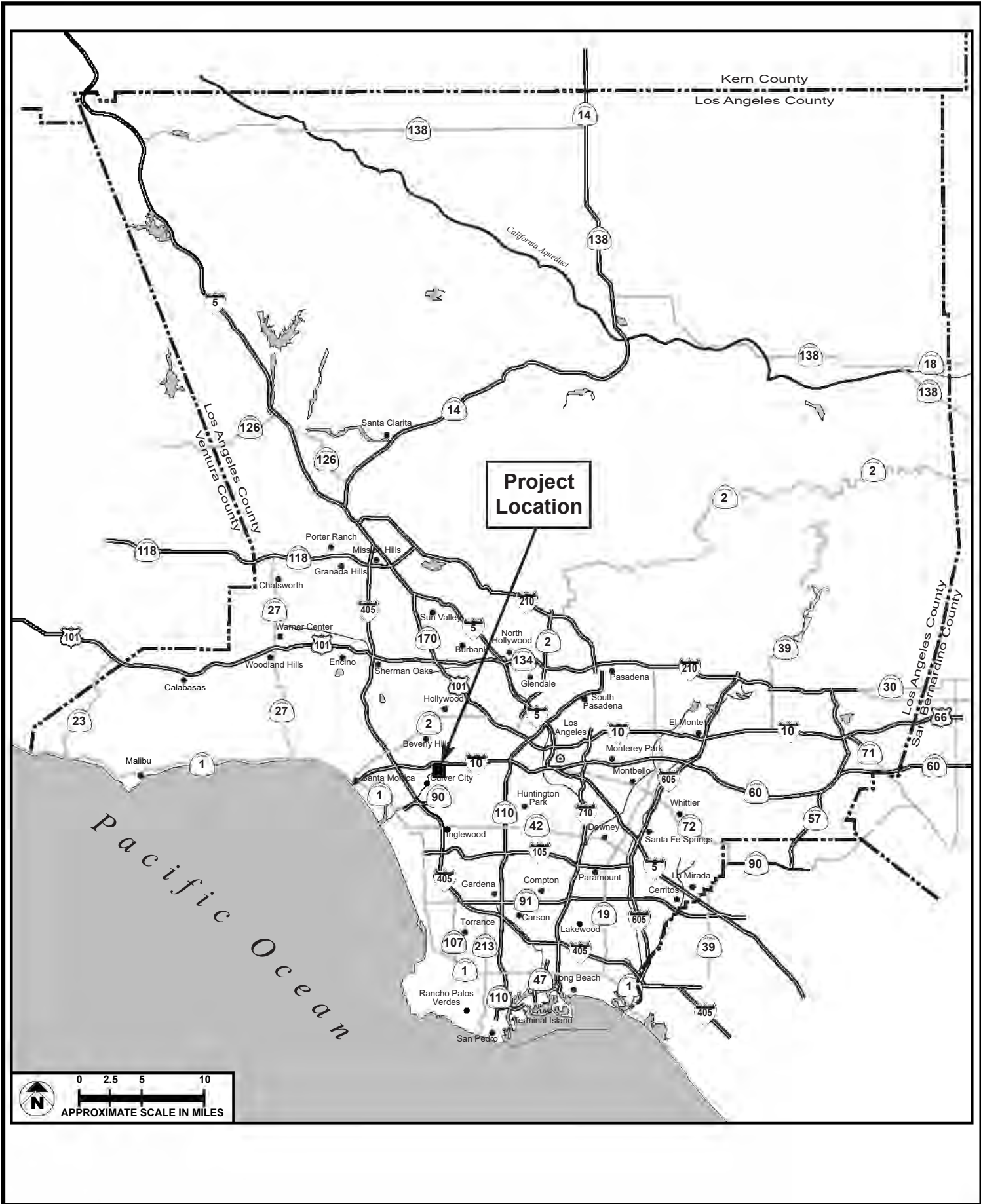


FIGURE 1



SOURCE: Google Earth - 2021

FIGURE 2

NOISE DESCRIPTORS

Fundamentals of Sound

Because the human ear does not respond uniformly to sounds at all frequencies, sound-pressure level alone is not a reliable indicator of loudness. For example, the human ear is less sensitive to low and high frequencies than to the medium frequencies that more closely correspond to human speech. In response to the sensitivity of the human ear to certain sound frequencies, the A-weighted noise level, referenced in units of dBA, was developed to better correspond with people’s subjective judgment of sound levels. To support assessing a community reaction to noise, scales have been developed that average sound-pressure levels over time and quantify the result in terms of a single numerical descriptor. Several scales have been developed that address community noise levels. The equivalent sound level (Leq) is the average A-weighted sound level measured over a given time interval. Leq can be measured over any period but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.

Table 1: Noise Descriptors identifies various noise descriptors developed to measure sound levels over different periods of time.

A doubling of sound energy results in a 3 dBA increase in sound, which means that a doubling of sound wave energy (e.g., doubling the volume of traffic on a roadway) would result in a barely perceptible change in sound level. In general, changes in a noise level of less than 3 dBA are not noticed by the human ear.² Changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. An increase of greater than 5 dBA is readily noticeable, while the human ear perceives a 10 dBA increase in sound level to be a doubling of sound volume.

2 US Department of Transportation, Federal Highway Administration (USDOT FHWA), Techniques for Reviewing Noise Analyses and Associated Noise Reports, June 2018, https://www.fhwa.dot.gov/Environment/noise/resources/reviewing_noise_analysis/. Accessed June 2023.

**TABLE 1
NOISE DESCRIPTORS**

Term	Definition
Decibel (dB)	The unit for measuring the volume of sound equal to 10 times the logarithm (base 10) of the ratio of the pressure of a measure sound to a reference pressure.
A-weighted decibel (dBA)	A sound measurement scale that adjusts the pressure of individual frequencies according to human sensitivities. The scale accounts for the fact that the region of highest sensitivity for the human ear is between 2,000 and 4,000 cycles per second (hertz).
Hertz (Hz)	The frequency of the pressure vibration, which is measured in cycles per second.
Kilo hertz (kHz)	One thousand cycles per second.
Equivalent sound level (Leq)	The sound level containing the same total energy as a time varying signal over a given time period. The Leq is the value that expresses the time averaged total energy of a fluctuating sound level. Leq can be measured over any time period, but is typically measured for 1-minute, 15-minute, 1-hour, or 24-hour periods.
Community noise equivalent level (CNEL)	A rating of community noise exposure to all sources of sound that differentiates between daytime, evening, and nighttime noise exposure. These adjustments add 5 dBA for the evening, 7:00 PM to 10:00 PM, and add 10 dBA for the night, 10:00 PM to 7:00 AM. The 5- and 10-dB penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The logarithmic effect of adding these penalties to the 1-hour Leq measurements typically results in a CNEL measurement that is within approximately 3 dBA of the peak-hour Leq ^a
Nighttime (L _{night})	L _{night} is the average noise exposure during the hourly periods from 10:00 PM to 7:00 AM.
Sound pressure level	The sound pressure is the force of sound on a surface area perpendicular to the direction of the sound. The sound pressure level is expressed in dB.
Ambient noise	The level of noise that is all encompassing within a given environment, being usually a composite of sounds from many and varied sources near to and far from the observer. No specific source is identified in the ambient environment.

^a California Department of Transportation, Technical Noise Supplement; A Technical Supplement to the Traffic Noise Analysis Protocol, (Sacramento, California: November 2009), pp. N51-N54.

Noise sources can generally be categorized in two types: (1) point sources, such as stationary equipment; and (2) line sources, such as a roadway. Sound generated by a point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor at acoustically hard sites, and at a rate of 7.5 dBA at acoustically soft sites.³ A hard or reflective site consists of asphalt, concrete, or very hard-packed soil, which does not provide any excess ground-effect attenuation. An acoustically soft or absorptive site is characteristic of normal earth and most ground

3 US Department of Transportation, Federal Highway Administration (USDOT FHWA), Techniques for Reviewing Noise Analyses and Associated Noise Reports, June 2018, https://www.fhwa.dot.gov/Environment/noise/resources/reviewing_noise_analysis/. Accessed June 2023.

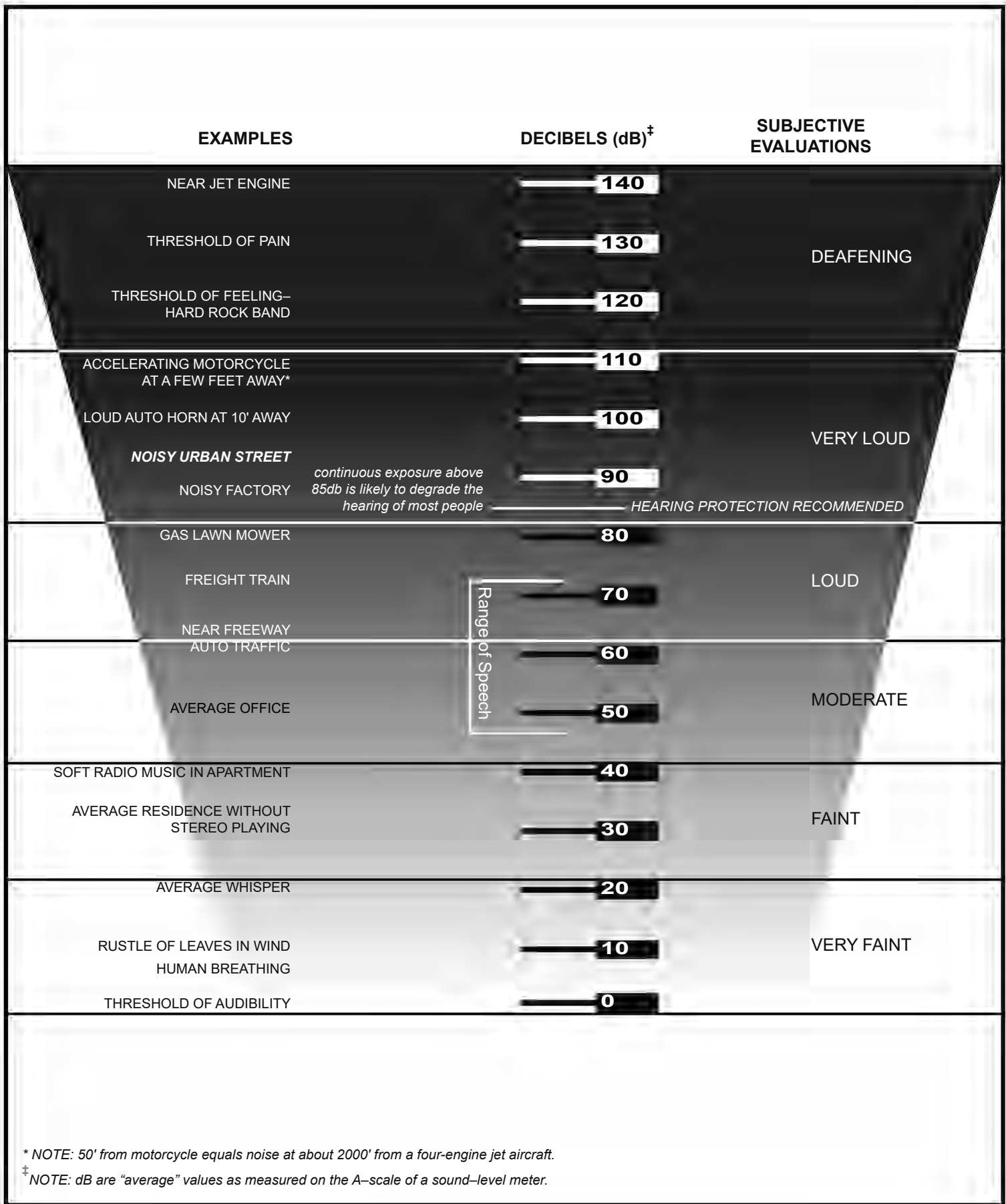
with vegetation. As an example, a 60-dBA noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dBA at 100 feet from the source and 48 dBA at 200 feet from the source. Noise from the same point source at an acoustically soft site would be 52.5 dBA at 100 feet and 45 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3 dBA and 4.5 dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively.⁴ Noise levels generated by a variety of activities are shown in **Figure 3: Common Noise Levels**. Man-made or natural barriers can also attenuate sound levels, as illustrated in **Figure 4: Noise Attenuation by Barriers**.

Fundamentals of Vibration

Vibration is commonly defined as an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The peak particle velocity (PPV) or root-mean-square (RMS) velocity is typically used to describe vibration amplitudes. PPV is defined as the maximum instantaneous peak of the vibration signal, while RMS is defined as the square root of the average of the squared amplitude of the signal. PPV is typically used for evaluating potential building damage, whereas RMS is typically more suitable for evaluating human response to ground-borne vibration. The RMS vibration velocity level can be presented in inches per second (ips) or in VdB (a decibel unit referenced to 1 microinch per second). Commonly, ground-borne vibration generated by man-made activities (i.e., road traffic, construction) attenuates rapidly with distance from the source of the vibration.

The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings such as the operation of mechanical equipment, the movement of people, or the slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration from traffic is barely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

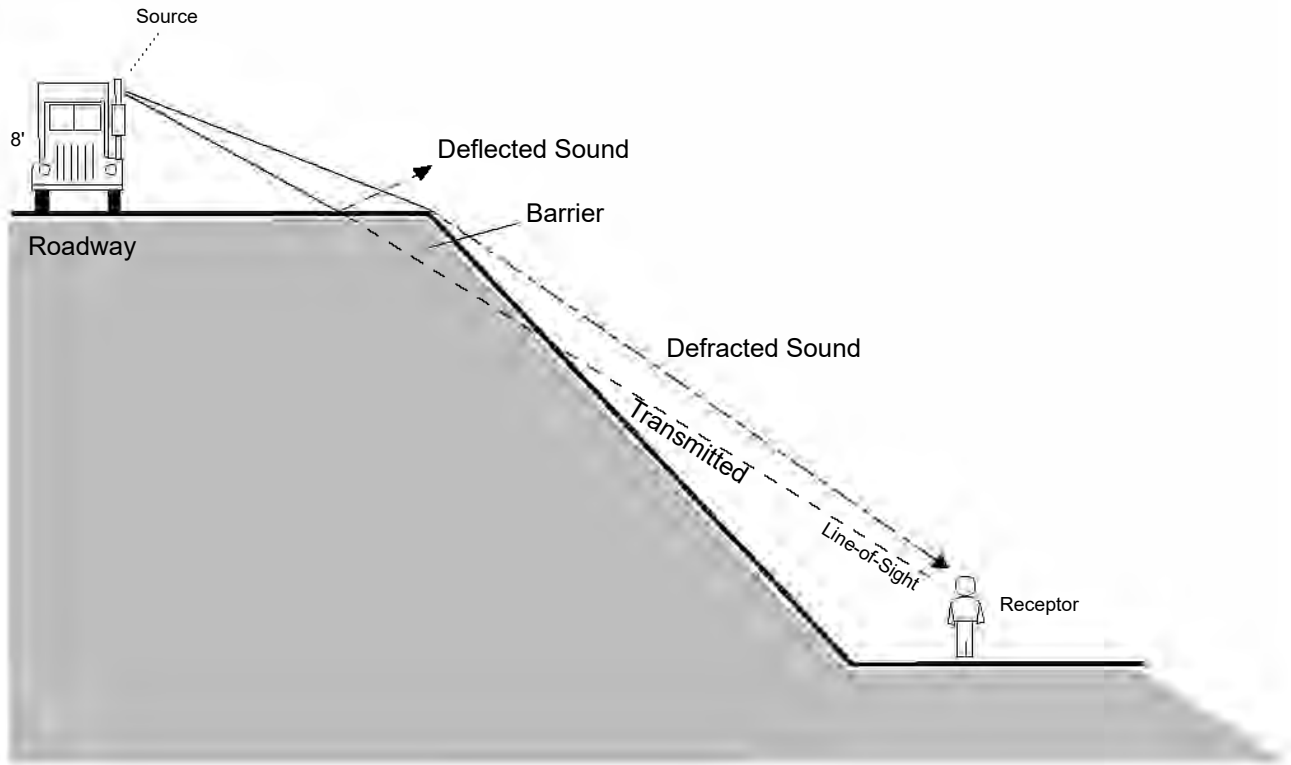
4 US Department of Transportation, Federal Highway Administration (USDOT FHWA), Techniques for Reviewing Noise Analyses and Associated Noise Reports, June 2018, https://www.fhwa.dot.gov/Environment/noise/resources/reviewing_noise_analysis/. Accessed June 2023.



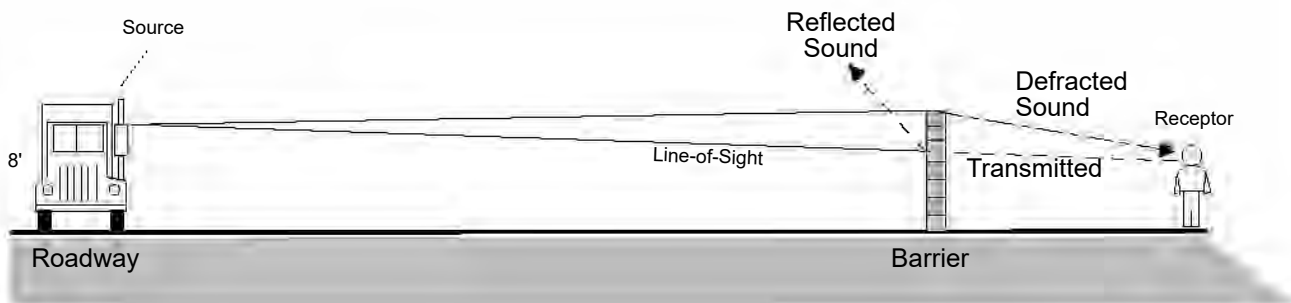
* NOTE: 50' from motorcycle equals noise at about 2000' from a four-engine jet aircraft.

‡ NOTE: dB are "average" values as measured on the A-scale of a sound-level meter.

FIGURE 3



"Barrier Effect" Resulting from Differences in Elevation.



"Barrier Effect" Resulting from Typical Soundwall.

FIGURE 4

EXISTING CONDITIONS

Ambient Noise Levels

Short-term sound monitoring was conducted at five (5) locations to measure the ambient sound environment in the Project vicinity. Measurements were taken over 15-minute intervals at each location between the hours of 11:34 AM and 1:21 PM on February 2, 2022. **Table 2: Ambient Noise Measurements. Figures 3-7: Noise Monitoring Locations** depicts locations where ambient noise measurements were conducted. As shown in **Table 2**, ambient noise levels ranged from a low of 56.7 dBA (Leq-15 minute) west of the Project Site across Ballona Creek (Site 3) to a high of 71.7 dBA (Leq-15 minute) southwest of the Project Site along Jefferson Boulevard (Site 2).

Location Number/Description	Nearest Use	Time Period	Noise Source	dBA Leq
1 Southeast portion of the Project Site along Jefferson Boulevard	Commercial/ Residential	11:34 AM-11:49 AM	Vehicle traffic and construction activities along Jefferson Boulevard	71.5
2 Southwest of the Project Site along Jefferson Boulevard	Commercial /Office	11:54 AM-12:09 PM	Vehicle traffic and construction activities along Jefferson Boulevard	71.7
3 West of the Project Site across Ballona Creek	School/ Residential	12:16 PM-12:31 PM	Construction activities along Jefferson Boulevard	56.7
4 East of the Project Site along Jefferson Boulevard	Residential	12:40 PM-12:55 PM	Vehicle traffic along Jefferson Boulevard	64.0
5 East of the Project Site along La Cienega Boulevard	Residential	1:06 PM-1:21 PM	Vehicle traffic along La Cienega Boulevard	71.3

*Source: Refer to Attachment A for noise monitoring data sheets.
Notes: dBA = A-weighted decibels; Leq = average equivalent sound level.*

Sensitive Uses

The Project Site is predominantly surrounded by commercial, industrial, and residential uses. An overview of the surrounding land uses relative to the noise monitoring locations provided in **Table 2** above is provided:

- **Site 1:** Located at the southeast corner of the Project Site along Jefferson Boulevard. Sensitive receptors include multi-family residential uses east of the site.
- **Site 3:** Located west of the Project Site across Ballona Creek. Sensitive receptors include a school and residential uses.
- **Site 4:** Located east of the Project Site along Jefferson Boulevard. Sensitive receptors include residential uses along Jefferson Boulevard.

- Site 5: Located east of the Project Site along La Cienega Boulevard. Sensitive receptors include multi-family residential uses along La Cienega Boulevard.

Vibration Conditions

Based on field observations, the primary source of existing ground-borne vibration in the vicinity of the Project Site is vehicle traffic on local roadways. According to the Federal Transit Administration,⁵ typical road traffic-induced vibration levels are unlikely to be perceptible by people. Trucks and buses typically generate ground-borne vibration velocity levels of approximately 63 VdB (at a 50-foot distance), and these levels could reach 72 VdB when trucks and buses pass over bumps in the road. A vibration level of 72 VdB is above the 65 VdB level of perceptibility.

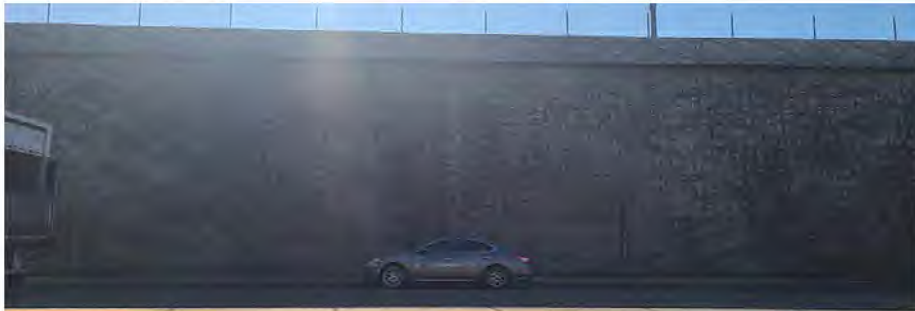
⁵ Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, FTA report no. 0123 (September 2018), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed August 2023.



North



West



South



East



SOURCE: Google Earth - 2022

FIGURE 5



North



West



South



East



SOURCE: Google Earth - 2022

FIGURE 6



North



West



South



East

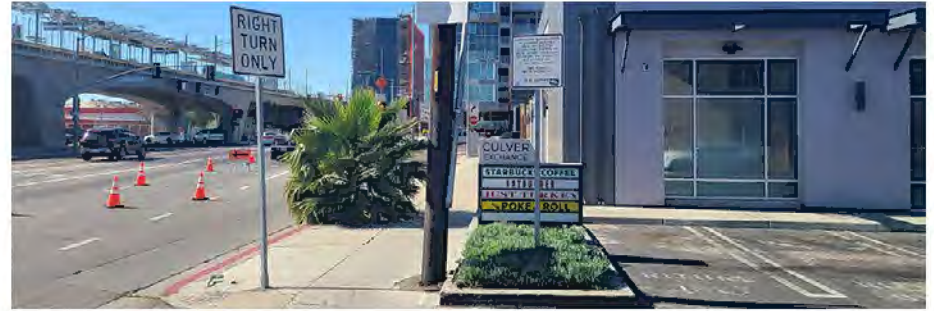


SOURCE: Google Earth - 2022

FIGURE 7



North



West



South



East



SOURCE: Google Earth - 2022

FIGURE 8



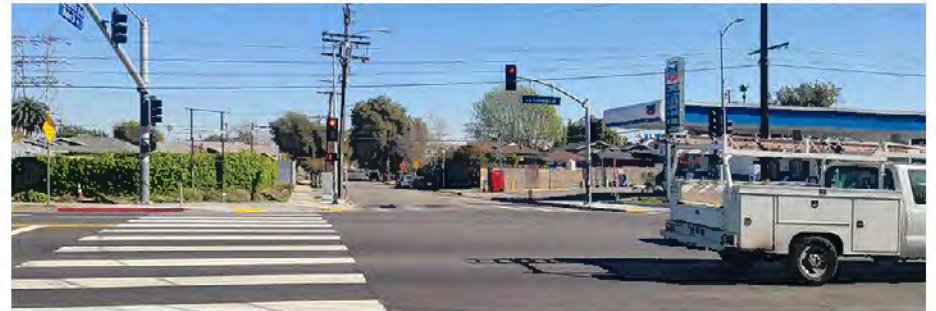
North



West



South



East



SOURCE: Google Earth - 2022

FIGURE 9

Ambient Noise Measurements

Noise-level monitoring was conducted by Meridian Consultants on February 2, 2022, at five locations within the Project area vicinity, as shown in **Figure 3** through **7**. Noise-level monitoring was conducted for 15-minute intervals at each location using a Larson Davis Model 831 sound-level meter. This meter satisfies the American National Standards Institute (ANSI) standard for general environmental noise measurement instrumentation. The ANSI specifies several types of sound-level meters according to their precision. Types 1, 2, and 3 are referred to as “precision,” “general-purpose,” and “survey” meters, respectively. Most measurements carefully taken with a Type 1 sound-level meter will have a margin of error not exceeding 1 dB.

The Larson Davis Model 831 is a Type 1 precision sound-level meter. This meter meets all requirements of ANSI S1.4-1983 and ANSI1.43-1997 Type 1 standards, as well as International Electrotechnical Commission (IEC) IEC61672-1 Ed. 1.0, IEC60651 Ed 1.2, and IEC60804 Type 1, Group X standards. The sound-level meter was located approximately 5 feet above ground and was covered with a Larson Davis windscreen. The sound-level meter was field calibrated with an external calibrator prior to operation.

Construction

Future dates represent approximations based on the general Project timeline and are subject to change pending unpredictable circumstances that may arise. As such, for purposes of this analysis, project construction is assumed to begin in 2027 and is expected to last approximately 16 months (refer to Air Quality Study Table 11). Construction would occur over five phases: (1) demolition; (2) grading; (3) building construction; (4) paving; and (5) architectural coating.

Each phase of construction would result in varying levels of intensity and a number of construction personnel. The construction workforce would consist of approximately 13 worker trips per day and approximately 58 hauling trips per day during demolition; approximately 10 worker trips per day during grading; approximately 135 worker trips per day and approximately 53 vendor trips per day during building construction; approximately 15 worker trips per day during paving; and approximately 27 worker trips per day during architectural coating.

On-Site Construction Equipment

Construction activities typically generate noise from the operation of equipment within the Project Site that is required for the construction of various facilities. Noise impacts from on-site construction equipment as well as the on-site staging of construction trucks were evaluated by determining the noise levels generated by different types of construction activity and calculating the construction-related noise level at nearby noise-sensitive receptor locations. Actual construction noise levels would vary, depending upon the equipment type, model, the type of work activity being performed, and the condition of the equipment.

In order to calculate construction noise levels, hourly activity or utilization factors (i.e., the percentage of normal construction activity that would occur, or construction equipment that would be active, during each hour of the day) are estimated based on the temporal characteristics of other previous and current construction projects. The hourly activity factors express the percentage of time that construction activities would emit average noise levels. Typical noise levels for each type of construction equipment were obtained from the FHWA Roadway Construction Noise Model.⁶

An inventory of construction equipment, including the number and types of equipment, which would be operating simultaneously within the Project Site was identified for each phase/component of construction and shown in **Table 3: Construction Equipment by Phase**. It is highly unlikely that all pieces of construction equipment identified in **Table 3** would operate simultaneously in any specific location during construction because equipment is generally operated only when needed and space constraints limit the equipment that can be used at any one time in a specific location. Therefore, this modeling is considered a conservative approach to calculate the maximum noise levels that would be generated.

TABLE 3 CONSTRUCTION EQUIPMENT BY PHASE					
Construction Phase	Equipment Type	Quantity	Usage Hours (per day)	Noise Level at 25 feet (dBA Leq-1hour)	Calculated Average Noise Level (dBA Leq-1hour)
Demolition	Concrete/Industrial Saws	1	8	88.6	93.4
	Rubber Tired Dozers	1	8	83.7	
	Tractors/Loaders/Backhoes	3	8	90.8	
Grading	Graders	1	8	87.0	90.6
	Rubber Tired Dozers	1	8	83.7	
	Tractors/Loaders/Backhoes	1	7	86.0	
Building Construction	Cranes	1	8	78.6	94.0
	Forklifts	2	7	91.0	
	Generator Sets	1	8	83.6	
	Tractors/Loaders/Backhoes	2	7	89.1	
	Welders	3	8	80.8	
Paving	Cement and Mortar Mixers	1	8	80.8	89.5
	Pavers	1	8	80.2	
	Paving Equipment	1	8	80.2	
	Rollers	2	8	82.0	
Architectural Coating	Tractors/Loaders/Backhoes	1	8	86.0	79.7
	Air Compressors	1	6	79.7	

Source: FHWA Roadway Construction Noise Model (RCNM) version 1.1
Refer to **Appendix B** for construction noise worksheets.

6 U.S. Department of Transportation, FHWA Roadway Construction Noise Model Final Report, January 2006, accessed August 2023, https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf

Construction noise levels have been calculated at each of the analyzed sensitive receptors as follows: (1) construction noise levels generated during each of the five construction phases; and (2) construction noise levels during those periods when the three construction phases could potentially occur concurrently.

Noise levels generated by on-site construction equipment can be reduced via specific noise control measures including the following: (1) muffler requirements; (2) equipment modifications that reduce noise levels; and (3) maintenance and operational requirements. These noise control measures can be used separately or in combination in order to reduce the noise levels generated by on-site construction equipment.

Most on-site construction-related noise originates from equipment powered by either gasoline or diesel engines. A large part of the noise emitted is due to the intake and exhaust portions of the engine cycle. Reducing noise from this source can be achieved via muffler systems. This noise control strategy would include the replacement of worn mufflers and retrofitting on-site construction equipment where mufflers are not in use. Using muffler systems on on-site construction equipment reduces construction noise levels by 10 dBA or more.⁷

Another effective method of diminishing noise levels associated with individual pieces of construction equipment is by modifying the equipment. Modifications such as the dampening of metal surfaces is effective in reducing on-site construction equipment noise levels. These modifications are typically done by the manufacturer or with factory assistance. Noise reductions of up to 5 dBA are achieved using dampening materials.⁸

Additionally, faulty or damaged mufflers, loose engine parts, rattling screws, bolts, or metal plates all contribute to increasing the noise level of on-site construction equipment. By regularly inspecting on-site construction equipment for these conditions and adjusting the equipment as necessary can also reduce noise levels generated by on-site construction equipment.

Off-Site Construction Noise

The analysis of off-site construction traffic noise impacts focuses on: (1) identifying major roadways that may be used for construction worker commute routes or truck haul routes; (2) identifying the nature and location of noise-sensitive receptors along those routes; and (3) evaluating the traffic characteristics along those routes, specifically as related to existing traffic volumes.

7 FHWA, Special Report—Measurement, Prediction, and Mitigation, updated June 2017, https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm, Accessed August 2023.

8 FHWA, Special Report—Measurement, Prediction, and Mitigation, updated June 2017, accessed August 2023, https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm.

Construction Equipment Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. While ground vibrations from construction activities do not often reach the levels that can damage structures, fragile buildings must receive special consideration.

Impacts due to construction activities were evaluated by identifying vibration sources (i.e., construction equipment), measuring the distance between vibration sources and surrounding structure locations, and making a significance determination.

For quantitative construction vibration assessments related to building damage and human annoyance, vibration source levels for construction equipment are taken from the FTA *Transit Noise and Vibration Impact Assessment Manual*.⁹ Building damage would be assessed for each piece of equipment individually and assessed in terms of peak particle velocity.

The vibration source levels for various types of equipment are based on data provided by the FTA.

⁹ FTA, *Transit Noise and Vibration Impact Assessment Manual*, September 2018, accessed August 2023, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, a project would have a potentially significant impact related to noise and groundborne vibration if it would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
- Generation of excessive groundborne vibration or groundborne noise levels?

Appendix G of the State CEQA Guidelines also includes:

- 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?

The Project Site is not located within an airport land use plan and is not located within two miles of public airport or public use airport or within the vicinity of a private airstrips. As such, the Project would result in no impacts to this screening criteria and no further analyses of this topic is necessary.

CONSTRUCTION NOISE

In August 2024, Department of City Planning released their updates to the construction noise and vibration thresholds. The thresholds are suited to the generally urban nature of the City, while still recognizing the importance of human health, including sleep disruption. Separate thresholds have been established for daytime and nighttime construction noise and vibration.

The construction noise thresholds are focused on impacts to sensitive uses. The Noise Element defines noise-sensitive land uses as single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodging, and other residential uses; places of assembly including churches or houses of worship; hospitals; libraries; schools; auditoriums, concert halls; outdoor theaters; nature and wildlife preserves; and parks.

Generally, there are commonly two types of noise standards, as follows:

- Relative or “increase” standards - these are quantified thresholds, expressed as an allowable increase in decibels, attributed to the construction noise contribution, over the pre-existing outdoor ambient sound level at a receptor.
- Absolute or “fixed” standards - these are quantified thresholds that represent a fixed noise limit and take into account a potential impact that is independent of the pre-existing outdoor ambient sound level at a receptor.

Increase Over Ambient

- For construction activities that occur between 7:00 AM and 7:00 PM Monday through Friday, and between 8:00 AM and 6:00 PM on Saturdays, no daytime numerical threshold above ambient noise levels are identified. The City does not consider increases in daytime ambient noise levels resulting from construction activities as constituting significant environmental effects. Instead, the City utilizes an absolute noise exposure level over an extended period for evaluating potential noise impacts during daytime hours, as this metric better reflects potential health impacts due to construction noise.
- For construction activities that occur between 7:00 PM and 7:00 AM Monday through Friday, and between 6:00 PM and 8:00 AM on Saturdays, and anytime on Sundays or national holidays, noise levels at sensitive uses would not exceed 5 dBA above the ambient noise level at the receptor.

Absolute Threshold

- On- and off-site construction noise during daytime hours (7:00 AM and 7:00 PM Monday through Friday, and 8:00 AM to 6:00 PM on Saturdays) would be limited to a maximum 80 dBA Leq (8-hour) absolute threshold at sensitive uses (at the property line with outdoor uses or at the exterior of the building), including outdoor public recreational areas.
 - This threshold applies to residential uses (at the property line with outdoor uses or at the exterior of the building); including expansive upper-level deck/open spaces areas that provide for the recreational use of residents. Examples include large patios or decks that are the primary outdoor use area in an apartment complex. However, this standard does not apply to private residential balconies which may or may not extend past the exterior of a building.
- For construction activities that occur between 7:00 PM and 7:00 AM Monday through Friday, and between 6:00 PM and 8:00 AM on Saturdays, and anytime on Sundays or national holidays, the maximum exterior noise level at sensitive uses where sleep is expected may not exceed the following:
 - 55 dBA Leq for sensitive uses within older buildings that would have operable windows that may be open.
 - 65 dBA Leq for sensitive uses with windows closed that are not operable are single-glazed.
 - 70 dBA Leq for sensitive uses that have newer construction (i.e., the structures have been designed to ensure that an interior 45 dBA is obtained with double-paned windows).

Construction Vibration

The following thresholds apply to both on- and off-site construction activities associated with a project:

Human Annoyance

- **Daytime Construction Activities:** No numerical threshold.

- **Nighttime Construction Activities:** Maximum 0.80 VdB at the exterior of a vibration sensitive use building.¹⁰

Building Damage

- Construction activities shall not exceed the following building damage thresholds for the identified structures:
- Fragile Buildings: 0.1 PPV
- Historic Buildings: 0.25 PPV
- Older Residential Structures:¹¹ 0.3 PPV
- New Residential Structures:¹² 0.5 PPV
- Modern Industrial/Commercial Buildings:⁴⁵ 0.5 PPV

10 Vibration Sensitive Uses for Human Annoyance include single-family and multi-unit dwellings, long-term care facilities (including convalescent and retirement facilities), dormitories, motels, hotels, transient lodging, and other residential uses; places of assembly including churches or houses of worship; hospitals; libraries; schools; auditoriums; concert halls; outdoor theaters; nature and wildlife preserves; outdoor public recreational areas; parks; and recording studios.

11 The Department of City Planning for the purposes of this threshold defines Older Residential Structures as residential buildings which are 50 or more years in age.

12 The Department of City Planning for the purposes of these thresholds defines New Residential Structures and Modern Industrial/Commercial Buildings as buildings which are less than 50 years in age.

MITIGATION MEASURES

The following mitigation measure has been identified to reduce potential noise impacts to a less than significant level due to pile driving activities that could occur on site during construction of the proposed Project.

NOI-1: Noise and Vibration Standards – Construction Noise

Noise Shielding and Muffling

a. Applicability Threshold

Any Project whose earthwork or construction activities involve the use of construction equipment and require a permit from LADBS.

b. Standard

Power construction equipment (including combustion engines), fixed or mobile, shall be equipped with noise shielding and muffling devices consistent with manufacturers' standards or the Best Available Control Technology. All equipment shall be properly maintained, and the Applicant or Owner shall require any construction contractor to keep documentation on-site during any earthwork or construction activities demonstrating that the equipment has been maintained in accordance with manufacturer's specifications.

Enclosure or Screening of Outdoor Mechanical Equipment

a. Applicability Threshold

Any Project whose earthwork or construction activities involve the use of construction equipment and require a permit from LADBS.

b. Standard

All outdoor mechanical equipment (e.g., generators, compressors) shall be enclosed or visually screened. The equipment enclosure or screen shall be impermeable (i.e., solid material with minimum weight of 2 pounds per square feet) and break the line of sight between the equipment and any off-site Noise-Sensitive Uses.

Location of Construction Staging Areas

a. Applicability Threshold

Any Project whose earthwork or construction activities involve the use of construction equipment and require a permit from LADBS.

b. Standard

Construction staging areas shall be located as far from Noise-Sensitive Uses as reasonably possible and technically feasible in consideration of site boundaries, topography, intervening roads and uses, and operational constraints. The burden of proving what constitutes 'as far as possible' shall be upon the Applicant or Owner, in consideration of the above factors.

Temporary Walls

a. Applicability Threshold

Any Project whose earthwork and construction activities involve the use of construction equipment and require a permit from LADBS; and whose construction activities are located within a line of sight to and within 500 feet of Noise-Sensitive Uses, with the exception of Projects limited to the construction of 2,000 square feet or less of floor area dedicated to residential uses.

b. Standard

Noise barriers, such as temporary walls (minimum ½-inch thick plywood) or sound blankets (minimum STC 25 rating), that are a minimum of eight feet tall, shall be erected between construction activities and Noise-Sensitive Uses as reasonably possible and technically feasible in consideration of site boundaries, topography, intervening roads and uses, and operational constraints. The burden of proving that compliance is technically infeasible shall be upon the Applicant or Owner. Technical infeasibility shall mean that noise barriers cannot be located between construction activities and Noise-Sensitive Uses due to site boundaries, topography, intervening roads and uses, and/or operational constraints

MM NOI-2:

Installation of Piles

If piles are installed during construction of the Project, piles shall not be driven. All piles shall be installed using quiet pile driving systems, including press pile or hydraulic drilling systems, that include silencing kits, sound insulation systems or equivalent capable of limiting vibration levels to 72 VdB and any increase in temporary noise levels to not greater than 5 dBA above ambient noise levels.

Construction

On-Site Construction Noise

Noise from Project construction activities would be affected by the amount of construction equipment, the location of this equipment, the timing and duration of construction activities, and the relative distance to noise-sensitive receptors. Construction activities that would occur during the construction phases would generate both steady-state and episodic noise that would be heard both on and off the Project Site. Each phase involves the use of different types of construction equipment and, therefore, has its own distinct noise characteristics. The Project would be constructed using typical construction techniques; no blasting or impact pile driving would be required.

The construction equipment reference noise levels provided in **Table 3** above, are based on measured noise data compiled by the FHWA and would occur when equipment is operating under full power conditions. However, equipment used on construction sites typically operate at less than full power. The acoustical usage factor is the percentage of time that each type of construction equipment is anticipated to be in full power operation during a typical construction day. These values are estimates and will vary based on the actual construction process and schedule.

Construction equipment operates at its noisiest levels for certain percentages of time during operation. It is important to note, equipment would operate at different percentages over the course of an hour.¹³ During a construction day, the highest noise levels would be generated when multiple pieces of construction equipment are operated concurrently.

To characterize construction-period noise levels, the average (hourly Leq) noise level associated with each construction stage was calculated based on the quantity, type, and usage factors for each type of equipment that would be used during each construction stage. These noise levels are typically associated with multiple pieces of equipment operating simultaneously.

The estimated construction noise levels were calculated for a scenario in which a reasonable number of construction equipment was assumed to be operating simultaneously, given the physical size of the Project Site and logistical limitations, and with the noise equipment located at the construction area nearest to the affected receptors to present a conservative impact analysis. This is considered a worst-case evaluation because construction of the Project would typically use fewer pieces of equipment simultaneously at any given time and, as such, would likely generate lower noise levels than reported herein.

13 Federal Highway Administration, *Traffic Noise Model (2006)*.

Separate forecasts of construction noise levels from on-site construction at each of the noise monitoring sites within the immediate vicinity were completed. The forecast noise levels at the nearest sensitive uses to the Project Site from construction activity are shown in **Table 4: Construction Maximum Noise Estimates**. As shown, average noise levels during construction would result in a maximum increases of 9.9 dBA (Leq-1hour) above the significance threshold at the multi-family residential uses to the east (Site 1) without implementation of technically feasible noise reduction measure as mentioned in Section 112.05 of the City’s Municipal Code.

**TABLE 4
CONSTRUCTION MAXIMUM NOISE ESTIMATES**

Noise Monitoring Site	Calculated Noise Level (Leq-1hour) by Construction Phase					Significance Threshold (dBA)	Maximum Noise Increase over Significance Threshold without Noise Reduction Measures
	Demolition	Grading	Building Construction	Paving	Architectural Coating		
Site 1	89.3	86.5	89.9	85.4	75.6	80.0	+9.9
Site 2	71.8	69.0	72.4	67.9	58.1	80.0	0.0
Site 3	62.6	59.8	63.2	58.8	49.0	80.0	0.0
Site 4	61.6	58.8	62.2	57.7	47.9	80.0	0.0
Site 5	54.4	51.6	55.0	50.6	40.8	80.0	0.0

Source: FHWA, RCNM, version. 1.1.

Refer to **Attachment B** for Construction Noise Worksheets

As mentioned previously, in devising construction noise control strategies, important options include controlling the noise at the source. Source control requirements provide added benefits in promoting technological advances in the development of quieter equipment. Source control techniques can include: (1) muffler requirements, (2) maintenance and operational requirements, and (3) equipment emission level requirements. These control techniques can be used separately or in combination in order to achieve the desired results. Most control noise originates from equipment powered by either gasoline or diesel engines. A large part of the noise emitted is due to the intake and exhaust portions of the engine cycle. A remedy for controlling much of the engine noise is by adhering to the **Mitigation Measures NOI-1** and **NOI-2**. More specifically, **Mitigation Measure NOI-1** would lead to replacement of worn mufflers and to retrofitting where mufflers are not in use. Using optimal muffler systems on all equipment would reduce construction noise levels by 10 dBA or more.¹⁴

Other effective methods of diminishing the noise impacts associated with individual pieces of construction equipment is to employ less noisy machinery. This is accomplished by specifying the quietest available equipment. Modifications such as dampening of metal surfaces or a redesign of a particular

14 FHWA. “Special Report—Measurement, Prediction, and Mitigation.” June 28, 2017. Accessed September 2024. https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm.

piece of equipment is effective in reduction noise due to vibration. These modifications are typically conducted by the manufacturer or with factory assistance. The reduction is controlled by the imposed limits on the technical capabilities of the manufacturer or the equipment user. Noise reductions of up to 5 dBA can be achieved using dampening materials.¹⁵ Additionally, shields such as sound skins may achieve reductions of 20 dBA at high frequencies and 10 dBA in the middle frequency range. Sound aprons may achieve noise reductions of up to 10 dBA.¹⁶ Sound aprons are typically designed from absorptive mats and are draped on the frames attached to the equipment. This material can be constructed from polyvinyl chloride (PVC) layers, lead-filled fabric, or rubber. These aprons are most useful when equipment only needs partial shielding or has to be regularly moved.

Additionally, a temporary barrier breaking the line of sight between the construction equipment and exterior use areas of noise sensitive receivers can achieve a 5 dBA reduction. Limiting the number of noise-generating, heavy-duty construction equipment to two (2) pieces operating simultaneously would reduce construction noise levels by approximately 1.5 dBA.

With implementation of **Mitigation Measure NOI-1**, which includes a minimum reduction of 10 dBA or more with optimal muffler systems, a minimum reduction of 5 dBA for dampening materials, a minimum reduction of 10 dBA for sound aprons, and a minimum reduction of 1.5 dBA for limiting operating equipment simultaneously, construction noise levels would be reduced by a minimum of 31.5 dBA (Leq 1-hour). Moreover, the Project would be required to comply with Section 41.40 of the LAMC by ensuring construction activities would only occur between the hours of 7:00 AM and 9:00 PM Monday through Friday, and 8:00 AM to 6:00 PM on Saturday and national holidays, with no construction permitted on Sunday. Compliance with the aforementioned practices would ensure construction noise levels would be below the significance threshold; thus, construction noise levels would not be considered significant.

Temporary shoring may be required during construction of the Project. If shoring is required, a sheet or soldier pile wall may be installed. Piles are typically driven, drilled or pressed. Driving piles can result in noise and vibration levels that may be significant. Alternative installation systems, such as press pile or hydraulic drilling systems, result in less substantial noise and vibration levels. If piles are installed, **Mitigation Measure NOI-2** would require that piles be installed using quiet pile driving systems, including press pile or hydraulic drilling systems capable of limiting any temporary increases in noise during construction to no greater than 5 dBA above ambient noise levels to ensure noise impacts during construction would be less than significant.

Off-Site Construction Noise

Construction of the Project would require worker, haul, and vendor truck trips to and from the site to work on the site, export demolition debris, and deliver supplies to the site. Trucks traveling to and from

15 FHWA. "Special Report—Measurement, Prediction, and Mitigation." June 28, 2017.

16 FHWA. "Special Report—Measurement, Prediction, and Mitigation." June 28, 2017.

the Project Site would be required to travel along a haul route approved by the City. At the maximum approximately 58 hauling trips per day would take place during the demolition phase. Haul truck traffic would take the most direct route to the freeway ramp.

Noise associated with construction trips were estimated using the Caltrans FHWA Traffic Noise Model based on the maximum number of worker and hauling trips in a day. Project haul truck trips which includes medium- and heavy-duty trucks would generate noise levels of approximately 54.9 dBA and 59.7 dBA, respectively, measured at the nearest sensitive receptors along the haul route. As shown in **Table 2**, existing noise levels ranged from 56.7 dBA to 71.7 dBA. The noise level increases from truck trips would be below the significance threshold of 5 dBA. As such, off-site construction noise impacts would not be considered significant.

Construction Vibration

Vibration impacts for on -site construction were estimated in **Table 5: On-Site Construction Vibration Impacts**. As shown in **Table 5**, the forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold at the nearby multi-family residential uses. Due to the distance of the Project-identified sensitive receptors, changes in elevations, and intervening structures, such as buildings and walls, on-site construction vibration would not result in a significant vibration impact with regard to building damage. Impacts related to building damage from on-site construction vibration would not be considered significant.

**TABLE 5
ON-SITE CONSTRUCTION VIBRATION IMPACTS**

Site	Nearest Off-Site Building Structures	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from the Project Construction Equipment				Significance Threshold (PPV ips)
		Vibratory Roller	Loaded Trucks	Jackhammer	Small bulldozer	
<i>FTA Reference Vibration Levels at 25 Feet</i>		<i>0.210</i>	<i>0.076</i>	<i>0.035</i>	<i>0.003</i>	
Site 1	Multi-family residential uses along Jefferson Boulevard	0.104	0.038	0.017	0.001	0.5
Site 2	Commercial/Office uses along Jefferson Boulevard	0.005	0.002	0.001	0.000	0.5
Site 3	School and residential uses along Roberts Avenue	0.002	0.001	0.000	0.000	0.5
Site 4	Residential uses along Jefferson Boulevard	0.001	0.000	0.000	0.000	0.5
Site 5	Multi-family residential uses along La Cienega Boulevard	0.001	0.001	0.000	0.000	0.5

Source: US Department of Transportation, Federal Transportation Authority, Transit Noise and Vibration Impact Assessment Refer to Attachment C for construction vibration worksheets.

Operation

Fixed Mechanical Equipment Noise

The Project would introduce various stationary noise sources, including heating, ventilation, and air conditioning systems, which would be located either on the roof, the side of a structure, or on the ground. All Project mechanical equipment would be required to be designed with appropriate noise-control devices—such as sound attenuators, acoustics louvers, or sound screens/parapet walls—to comply with noise-limitation requirements provided in Section 112.02 of the LAMC, which prohibits equipment from causing more than a 5 dBA increase in the ambient noise level. Therefore, operation of mechanical equipment associated with the Project would not exceed the City’s threshold of significance.

CUMULATIVE NOISE


For purposes of this analysis, the potential development of the related projects will be considered to contribute to cumulative noise impacts. Noise, by definition, is a localized phenomenon and drastically reduces as distance from the source increases. As a result, only related projects and growth within 500 feet of the Project Site would contribute to cumulative noise impacts. However, at this time, no related projects or projects within 500 feet have been identified. Cumulative construction-noise impacts have the potential to occur when multiple construction projects in the local area generate noise within the same time frame. It is expected that, as with the Project, the related projects would implement noise reduction techniques such as mufflers, shields, sound barriers, which would minimize any noise-related nuisances during construction. In addition, distance attenuation and intervening structures would further reduce construction noise levels and not result in noticeable increases. Therefore, the combined construction-noise impacts of the Project and related projects within 500 feet would not cause a significant cumulative impact.

With regard to stationary sources, cumulative significant noise impacts may result from cumulative development. Stationary sources of noise that could be introduced in the area by cumulative projects could include mechanical equipment, loading docks, and parking lots. Given that these projects would be required to adhere to the City's noise standards, all stationary sources would be required to have shielding or other noise-abatement measures so as not to cause a substantial increase in ambient noise levels. Moreover, due to distance, it is unlikely that noise from multiple cumulative projects would interact to create a significant combined noise impact. As such, it is not anticipated that a significant cumulative increase in permanent ambient noise levels would occur.

CERTIFICATION

The contents of this noise study represent an accurate depiction of the noise environment and impacts associated with the proposed Public Storage Jefferson Replacement Project. The information contained in this noise study is based on the best available information at the time of preparation. If you have any questions, please contact me directly at (818) 415-7274.

Christ Kirikian, INCE Associate
Principal | Director of Air Quality & Acoustics
ckirikian@meridianconsultantsllc.com



APPENDIX A

Noise Monitoring Data Sheets

Monitoring Location: Site 1
Monitoring Date: 2/2/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
11:34:44	72.9	81.6	59.8
11:35:44	71.6	78.9	59.6
11:36:44	71.4	77.2	56.4
11:37:44	70.6	77.9	54.8
11:38:44	70.9	75.7	55.0
11:39:44	70.1	78.5	56.2
11:40:44	72.4	77.6	58.1
11:41:44	67.9	75.9	55.9
11:42:44	71.6	75.8	61.5
11:43:44	68.9	75.2	57.3
11:44:44	72.1	77.6	61.2
11:45:44	70.6	74.1	62.0
11:46:44	71.0	74.8	61.1
11:47:44	76.8	85.1	56.6
11:48:44	70.3	79.4	59.4
11:49:44	59.1	60.2	58.7

15-minute LAeq

71.5

Monitoring Location: Site 2
Monitoring Date: 2/2/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
11:54:06	71.6	78.7	63.9
11:55:06	70.3	77.2	63.7
11:56:06	70.3	76.2	61.8
11:57:06	71.5	79.2	65.9
11:58:06	70.8	75.9	66.5
11:59:06	71.1	75.1	63.6
12:00:06	75.8	86.4	64.9
12:01:06	71.9	78.1	61.0
12:02:06	76.9	88.0	61.3
12:03:06	70.4	73.7	63.2
12:04:06	67.0	73.2	61.7
12:05:06	70.9	75.9	65.3
12:06:06	68.7	74.4	60.5
12:07:06	68.6	73.7	64.6
12:08:06	71.6	79.5	63.9
12:09:06	65.9	66.2	65.5

15-minute LAeq

71.7

Monitoring Location: Site 3
Monitoring Date: 2/2/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
12:16:57	53.6	61.7	48.3
12:17:57	55.4	61.0	49.0
12:18:57	53.0	62.2	48.3
12:19:57	55.7	65.9	48.8
12:20:57	54.9	66.0	46.4
12:21:57	52.5	60.9	48.9
12:22:57	58.5	67.1	49.7
12:23:57	65.3	75.0	48.1
12:24:57	52.8	63.9	48.9
12:25:57	54.0	66.3	47.8
12:26:57	51.3	59.0	48.3
12:27:57	54.9	60.2	48.5
12:28:57	54.9	67.3	46.8
12:29:57	53.9	62.9	47.8
12:30:57	51.6	59.7	47.7
12:31:57	50.7	52.1	50.0

15-minute LAeq

56.7

Monitoring Location: Site 4

Monitoring Date: 2/2/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
12:40:49	63.5	74.6	56.6
12:41:49	68.0	79.3	53.7
12:42:49	62.2	68.8	54.5
12:43:49	64.3	71.1	55.2
12:44:49	59.8	66.5	56.5
12:45:49	63.2	67.1	54.4
12:46:49	65.3	73.4	55.6
12:47:49	66.0	71.5	61.0
12:48:49	64.4	72.4	56.9
12:49:49	60.9	65.3	55.9
12:50:49	63.1	68.2	52.7
12:51:49	63.9	69.5	57.9
12:52:49	62.1	67.3	56.4
12:53:49	65.7	73.8	59.2
12:54:49	63.2	73.5	57.7
12:55:49	58.8	60.1	59.0

15-minute LAeq

64.0


Monitoring Location: Site 5
Monitoring Date: 2/2/2022

Monitoring Period

Time	LAeq	LASmax	LASmin
13:06:25	63.3	72.6	56.9
13:07:25	64.6	69.4	56.7
13:08:25	67.5	73.0	58.3
13:09:25	81.7	96.8	63.8
13:10:25	62.3	70.6	54.5
13:11:25	72.0	84.1	61.4
13:12:25	68.0	81.7	59.2
13:13:25	66.0	75.3	54.5
13:14:25	63.9	68.0	55.8
13:15:25	63.6	70.6	52.5
13:16:25	64.4	70.1	56.5
13:17:25	66.1	69.1	61.5
13:18:25	59.0	66.3	54.2
13:19:25	66.4	76.7	54.8
13:20:25	68.5	79.7	58.7
13:21:25	67.7	69.7	63.9

15-minute LAeq

71.3



APPENDIX B

Construction Noise Worksheets



Demolition

Roadway Construction Noise Model (RCNM), Version 1.1

Report dat #####
Case Descr Demolition

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 1	Residential	71.5	71.5	71.5

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	40	0
Dozer	No	40		81.7	40	0
Tractor	No	40	84		40	0
Tractor	No	40	84		40	0
Tractor	No	40	84		40	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)							
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Concrete Saw	91.5	84.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	91.5	89.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 2	Commercial	71.7	71.7	71.7

Impact	Equipment			
	Spec Lmax	Actual Lmax	Receptor Distance	Estimated Shielding

Tractor	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	64.8	62.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 4	Residential	64	64	64

Equipment

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Concrete Saw	No	20		89.6	970	0
Dozer	No	40		81.7	970	0
Tractor	No	40	84		970	0
Tractor	No	40	84		970	0
Tractor	No	40	84		970	0

Results

Equipment	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	Day		Evening		Night		Day		Evening		Night			
	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	63.8	56.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	55.9	51.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	63.8	61.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 5	Residential	71.3	71.3	71.3

Equipment

Spec	Actual	Receptor	Estimated
------	--------	----------	-----------

Dozer	87.7	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	95.6	93.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.



Grading

Roadway Construction Noise Model (RCNM), Version 1.1

Report dat #####

Case Descr Grading

---- Receptor #1 ----

		Baselines (dBA)		
Descriptor	Land Use	Daytime	Evening	Night
Site 1	Residential	71.5	71.5	71.5

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Grader	No	40	85		40	0
Dozer	No	40		81.7	40	0
Tractor	No	40	84		40	0

Results

Equipment	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	Day		Evening		Night		Day		Evening		Night			
	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	86.9		83	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9		82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.9	86.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

		Baselines (dBA)		
Descriptor	Land Use	Daytime	Evening	Night
Site 2	Commercial	71.7	71.7	71.7

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Grader	No	40	85		300	0
Dozer	No	40		81.7	300	0
Tractor	No	40	84		300	0

		Results														
		Calculated (dBA)			Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
					Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Grader		69.4	65.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dozer		66.1	62.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Tractor		68.4	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Total	69.4	69	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptor	Land Use	Daytime	Evening	Night
Site 3	Residential	56.7	56.7	56.7

		Equipment				
		Spec	Actual	Receptor	Estimated	
		Lmax	Lmax	Distance	Shielding	
Description	Impact Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Grader	No	40	85	485	5	
Dozer	No	40		81.7	485	5
Tractor	No	40	84	485	5	

		Results														
		Calculated (dBA)			Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
					Day		Evening		Night		Day		Evening		Night	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Grader		60.3	56.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Dozer		56.9	53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Tractor		59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	Total	60.3	59.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Descriptor	Land Use	Daytime	Evening	Night
Site 4	Residential	64	64	64

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Grader	No	40	85		970	0
Dozer	No	40		81.7	970	0
Tractor	No	40	84		970	0

Equipment	Results													
	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Grader	59.2	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	55.9	51.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.2	58.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Baselines (dBA)		Daytime	Evening	Night
Description	Land Use			
Site 5	Residential	71.3	71.3	71.3

Description	Impact Device	Usage(%)	Equipment Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Grader	No	40	85		700	10
Dozer	No	40		81.7	700	10
Tractor	No	40	84		700	10

Equipment	Results													
	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Grader	52.1	48.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	48.7	44.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	51.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	52.1	51.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Description	Land Use	Baselines (dBA)		
		Daytime	Evening	Night
25 feet	Residential	75	75	75

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		25	0
Dozer	No	40		81.7	25	0
Tractor	No	40	84		25	0

Equipment	Results													
	Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Grader	91	87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	87.7	83.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	91	90.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.



Building Construction

Roadway Construction Noise Model (RCNM), Version 1.1

Report date #####

Case Description Building Construction

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 1	Residential	71.5	71.5	71.5

Equipment

Description	Impact Device	Usage (%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Crane	No	16		80.6	40	0
All Other Equipment >	No	50	85		40	0
All Other Equipment >	No	50	85		40	0
Generator	No	50		80.6	40	0
Tractor	No	40	84		40	0
Tractor	No	40	84		40	0
Welder / Torch	No	40		74	40	0
Welder / Torch	No	40		74	40	0
Welder / Torch	No	40		74	40	0

Results

Equipment	Calculated (dBA)			Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	Day		Night	Day		Evening		Night		Day		Evening		Night	
	*Lmax	Leq		Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	82.5	74.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	86.9	83.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	86.9	83.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	82.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	75.9	72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	75.9	72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	75.9	72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.9	89.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Baselines (dBA)				
Description	Land Use	Daytime	Evening	Night
Site 2	Commercial	71.7	71.7	71.7

Description	Impact Device	Usage(%)	Equipment			
			Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	300	0
All Other Equipment >	No	50	85		300	0
All Other Equipment >	No	50	85		300	0
Generator	No	50		80.6	300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Welder / Torch	No	40		74	300	0
Welder / Torch	No	40		74	300	0
Welder / Torch	No	40		74	300	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
Crane	65	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	69.4	66.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	69.4	66.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	65.1	62.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	68.4	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	68.4	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	58.4	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	58.4	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	58.4	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.4	72.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Baselines (dBA)				
Description	Land Use	Daytime	Evening	Night
Site 3	Residential	56.7	56.7	56.7

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Crane	No	16		80.6	485	5
All Other Equipment > No		50	85		485	5
All Other Equipment > No		50	85		485	5
Generator	No	50		80.6	485	5
Tractor	No	40	84		485	5
Tractor	No	40	84		485	5
Welder / Torch	No	40		74	485	5
Welder / Torch	No	40		74	485	5
Welder / Torch	No	40		74	485	5

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	55.8	47.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	55.9	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	49.3	45.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	49.3	45.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	49.3	45.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.3	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Baselines (dBA)		Daytime	Evening	Night
Site 4	Residential	64	64	64

Description	Impact Device	Usage(%)	Equipment		Receptor Distance (feet)	Estimated Shielding (dBA)
			Spec Lmax (dBA)	Actual Lmax (dBA)		
Crane	No	16		80.6	970	0

All Other Equipment > No		50	85	970	0	
All Other Equipment > No		50	85	970	0	
Generator	No	50		80.6	970	0
Tractor	No	40	84	970	0	
Tractor	No	40	84	970	0	
Welder / Torch	No	40		74	970	0
Welder / Torch	No	40		74	970	0
Welder / Torch	No	40		74	970	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	54.8	46.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	59.2	56.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	59.2	56.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	54.9	51.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	48.2	44.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	48.2	44.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	48.2	44.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.2	62.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 5	Residential	71.3	71.3	71.3

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Crane	No	16		80.6	700	10
All Other Equipment > No		50	85		700	10
All Other Equipment > No		50	85		700	10
Generator	No	50		80.6	700	10
Tractor	No	40	84		700	10
Tractor	No	40	84		700	10

Welder / Torch	No	40	74	700	10
Welder / Torch	No	40	74	700	10
Welder / Torch	No	40	74	700	10

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	47.6	39.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	52.1	49.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	52.1	49.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	47.7	44.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	51.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	51.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	41.1	37.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	41.1	37.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	41.1	37.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	52.1	55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
25 feet	Residential	75	75	75

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Crane	No	16		80.6	25	0
All Other Equipment >	No	50	85		25	0
All Other Equipment >	No	50	85		25	0
Generator	No	50		80.6	25	0
Tractor	No	40	84		25	0
Tractor	No	40	84		25	0
Welder / Torch	No	40		74	25	0
Welder / Torch	No	40		74	25	0
Welder / Torch	No	40		74	25	0

Results

Equipment	Calculated (dBA)			Noise Limits (dBA)						Noise Limit Exceedance (dBA)				
	*Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Crane	86.6	78.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	91	88	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
All Other Equipment >	91	88	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	86.7	83.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	80	76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	80	76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	80	76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	91	94	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.



Paving

Roadway Construction Noise Model (RCNM), Version 1.1

Report dat #####

Case Descr Paving

---- Receptor #1 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 1	Residential	71.5	71.5	71.5

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	40	0
Paver	No	50		77.2	40	0
Paver	No	50		77.2	40	0
Roller	No	20		80	40	0
Roller	No	20		80	40	0
Tractor	No	40	84		40	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)							
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck	82.5	74.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	86.9	83.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	86.9	83.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	82.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	85.9	82	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.9	89.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 2	Commercial	71.7	71.7	71.7

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	300	0
Paver	No	50		77.2	300	0
Paver	No	50		77.2	300	0
Roller	No	20		80	300	0
Roller	No	20		80	300	0
Tractor	No	40	84		300	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)						
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night		
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Concrete Mixer Truck	65	57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	69.4	66.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	69.4	66.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	65.1	62.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	68.4	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	68.4	64.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	69.4	72.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Baselines (dBA)

Descriptor	Land Use	Daytime	Evening	Night
Site 3	Residential	56.7	56.7	56.7

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	485	5
Paver	No	50		77.2	485	5
Paver	No	50		77.2	485	5
Roller	No	20		80	485	5
Roller	No	20		80	485	5
Tractor	No	40	84		485	5

Results

Equipment	Calculated (dBA)			Noise Limits (dBA)					Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day	Leq	Evening		Night		Leq	Day		Evening		Night
			Lmax		Lmax	Leq	Lmax	Leq		Lmax	Leq	Lmax	Leq	Lmax
Concrete Mixer Truck	55.8	47.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	60.3	57.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	55.9	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	59.3	55.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.3	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Baselines (dBA)		Daytime	Evening	Night
Site 4	Residential	64	64	64

Description	Impact Device	Usage(%)	Equipment			
			Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	970	0
Paver	No	50		77.2	970	0
Paver	No	50		77.2	970	0
Roller	No	20		80	970	0
Roller	No	20		80	970	0
Tractor	No	40	84		970	0

Equipment	Calculated (dBA)			Noise Limits (dBA)					Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day	Leq	Evening		Night		Leq	Day		Evening		Night
			Lmax		Lmax	Leq	Lmax	Leq		Lmax	Leq	Lmax	Leq	Lmax
Concrete Mixer Truck	54.8	46.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	59.2	56.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	59.2	56.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	54.9	51.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	58.2	54.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.2	62.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 5	Residential	71.3	71.3	71.3

		Equipment				
Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	700	10
Paver	No	50		77.2	700	10
Paver	No	50		77.2	700	10
Roller	No	20		80	700	10
Roller	No	20		80	700	10
Tractor	No	40	84		700	10

Results

Equipment	Calculated (dBA)			Noise Limits (dBA)				Noise Limit Exceedance (dBA)						
	*Lmax	Leq	Day	Evening		Night		Day		Evening		Night		
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq		
Concrete Mixer Truck	45.9	41.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	44.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	44.3	41.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	47.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	47.1	40.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	51.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	51.1	50.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
25 feet	Residential	75	75	75

		Equipment				
Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	25	0

Paver	No	50		77.2	25	0
Paver	No	50		77.2	25	0
Roller	No	20		80	25	0
Roller	No	20		80	25	0
Tractor	No	40	84		25	0

Results

Equipment	Calculated (dBA)			Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Lmax	Day		Evening		Night		Day		Evening		Night	
				Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Concrete Mixer Truck	84.8	80.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	83.2	80.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	83.2	80.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	86	79	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	86	79	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	90	86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	90	89.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.



Architectural Coating

Total 62.1 58.1 N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 3	Residential	56.7	56.7	56.7

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Compressor (air)	No	40		77.7	485	5

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)						
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night		
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	
Compressor (air)	55.8	47.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	60.3	63.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site 4	Residential	64	64	64

Equipment

Description	Impact Device	Usage(%)	Spec	Actual	Receptor	Estimated
			Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Compressor (air)	No	40		77.7	970	0

Results

Equipment	Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	*Lmax	Leq	Day		Evening		Night		Day		Evening		Night	
			Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	54.8	46.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	59.2	62.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Site 5	Residential	71.3	71.3	71.3

		Equipment					
Description	Impact	Device	Usage(%)	Spec	Actual	Receptor	Estimated
				Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Compressor (air)	No		40		77.7	700	10

		Results													
		Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
		Day		Evening		Night		Day		Evening		Night			
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		45.9	41.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total		51.1	50.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.


---- Receptor #6 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
25 feet	Residential	75	75	75

		Equipment					
Description	Impact	Device	Usage(%)	Spec	Actual	Receptor	Estimated
				Lmax (dBA)	Lmax (dBA)	Distance (feet)	Shielding (dBA)
Compressor (air)	No		40		77.7	25	0

		Results													
		Calculated (dBA)				Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
		Day		Evening		Night		Day		Evening		Night			
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		83.7	79.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total		83.7	79.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.



APPENDIX C

Construction Vibration Worksheets



Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance ^a	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	40	0.044	0.011	81
Jackhammer		1	0.035	40	0.017	0.004	73
Large bulldozer		1	0.089	40	0.044	0.011	81
Loaded trucks		1	0.076	40	0.038	0.009	79
Pile Drive (impact)		1	0.644	40	0.318	0.080	98
Vibratory Roller		1	0.210	40	0.104	0.026	88
Small bulldozer		1	0.003	40	0.001	0.000	51

* Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment

**Jefferson Public Storage
Construction Vibration Model
Site 2**

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance ^a	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	300	0.002	0.001	55
Jackhammer		1	0.035	300	0.001	0.000	46
Large bulldozer		1	0.089	300	0.002	0.001	55
Loaded trucks		1	0.076	300	0.002	0.000	53
Pile Drive (impact)		1	0.644	300	0.015	0.004	72
Vibratory Roller		1	0.210	300	0.005	0.001	62
Small bulldozer		1	0.003	300	0.000	0.000	25

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance ^a	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	485	0.001	0.000	48
Jackhammer		1	0.035	485	0.000	0.000	40
Large bulldozer		1	0.089	485	0.001	0.000	48
Loaded trucks		1	0.076	485	0.001	0.000	47
Pile Drive (impact)		1	0.644	485	0.008	0.002	66
Vibratory Roller		1	0.210	485	0.002	0.001	56
Small bulldozer		1	0.003	485	0.000	0.000	19

* Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment

**Jefferson Public Storage
Construction Vibration Model
Site 4**

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance ^a	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	970	0.000	0.000	39
Jackhammer		1	0.035	970	0.000	0.000	31
Large bulldozer		1	0.089	970	0.000	0.000	39
Loaded trucks		1	0.076	970	0.000	0.000	38
Pile Drive (impact)		1	0.644	970	0.003	0.001	56
Vibratory Roller		1	0.210	970	0.001	0.000	47
Small bulldozer		1	0.003	970	0.000	0.000	10

*** Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment**

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance ^a	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	700	0.001	0.000	44
Jackhammer		1	0.035	700	0.000	0.000	35
Large bulldozer		1	0.089	700	0.001	0.000	44
Loaded trucks		1	0.076	700	0.001	0.000	42
Pile Drive (impact)		1	0.644	700	0.004	0.001	61
Vibratory Roller		1	0.210	700	0.001	0.000	51
Small bulldozer		1	0.003	700	0.000	0.000	14

* Suggested Vibration Thresholds per the Federal Transit Administration, United States Department of Transportation, Transit Noise and Vibration Impact Assessment