NOISE IMPACT ANALYSIS

POLYTECHNIC HIGH SCHOOL TRANSFORMATION PROJECT

LONG BEACH UNIFIED SCHOOL DISTRICT

Lead Agency:

Long Beach Unified School District
Facilities and Planning Branch
2425 Webster Avenue
Long Beach, CA 90810

Prepared by:

Vista Environmental
1021 Didrickson Way
Laguna Beach, California 92651
949 510 5355
Greg Tonkovich, INCE

Project No. 23028

February 20, 2025

TABLE OF CONTENTS

TABLE OF CONTENTS CONTINUED

APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ANSI	American National Standards Institute
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
City	City of Long Beach
CMU	Concrete Masonry Unit
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	A-weighted decibels
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
EPA	Environmental Protection Agency
FTES	Full Time Equivalent Students
HVAC	Heating Ventilation & Air Conditioning System
Hz	Hertz
Ldn	Day-night average noise level
Leq	Equivalent sound level
Lmax	Maximum noise level
ONAC	Federal Office of Noise Abatement and Control
OSHA	Occupational Safety and Health Administration
PPV	Peak particle velocity
RMS	Root mean square
SEL	Single Event Level or Sound Exposure Level
STC	Sound Transmission Class
VdB	Vibration velocity level in decibels

1.0 INTRODUCTION

1.1 Purpose of Analysis and Study Objectives

This Noise Impact Analysis has been prepared to determine the noise impacts associated with the proposed Polytechnic High School Transformation project (proposed project). The following is provided in this report:

- A description of the study area and the proposed project;
- Information regarding the fundamentals of noise;
- Information regarding the fundamentals of vibration;
- A description of the local noise guidelines and standards;
- An evaluation of the current noise environment;
- An analysis of the potential short-term construction-related noise impacts from the proposed project; and,
- An analysis of long-term operations-related noise impacts from the proposed project.

1.2 Site Location and Study Area

Polytechnic High School (Poly High School or School) is an existing 26-acre school site located at 1600 Atlantic Avenue in the City of Long Beach (City). The School accommodates high school students (9-12). Poly High School currently consists of 401,436 square feet of permanent buildings and 9,600 square feet of portable buildings. The project site is bounded by Jackrabbit Lane, multi-family housing, hotel and commercial uses to the north, Martin Luther King Jr Avenue, multi-family housing, commercial uses and public community uses to the east, 15th Street and a mixture of single-family and multi-family housing to the south, and Atlantic Avenue, multi-family housing and Theodore Roosevelt Elementary School to the west. The project study area is shown in Figure 1.

Sensitive Receptors in Project Vicinity

The nearest sensitive receptors to the project site are patrons and staff at a hotel that is located as near as 10 feet from the area to be disturbed on the north side of the project site. There are also multi-family homes located as near as 60 feet to the north of the area to be disturbed. In addition, there is a church located on the east side of Martin Luther King Jr Avenue that is as near as 90 feet east of the area to be disturbed, there are multi-family homes located on the south side of 15th Street that are as near as 65 feet south of the area to be disturbed, and there are multi-family homes located on the west side of Atlantic Avenue that are as near as 140 feet west of the area to be disturbed.

1.3 Proposed Project Description

The Proposed Project consists of three parts that are described below and includes: (1) New Career Technical Education (CTE) Classroom Building; (2) HVAC Modernization; and (3) Poly Transformation that are described below along with the New and Replaced Hardscape areas. The proposed Final Master Site Plan is shown in Figure 2 and Table A provides a summary of the proposed improvements.

Table A – Summary of Proposed Improvements

Building No.	Building Name	Area to be Demolished (sq ft)	New/Remodeled Area (sq ft)
New CTE Classroom Building Project			
900	CTE Classroom	--	65,421
HVAC Modernization Project			
25	Band Room		1,690
100	Admin/Classroom		13,346
200	Auditorium		7,826
250	Science Building		9,562
300	Classroom Building		9,856
400	Classroom Building		9,140
500	Cafeteria Building		9,216
600	Library Building		7,633
Poly Transformation Project			
Buildings to be Demolished			
150	Language Building	17,496	
550	Classroom Building	4,320	
700	Medical Occupation Building	14,390	
750	Applied Sales	1,381	
800	Attendance Office/Career Center	23,659	
850	Bookroom/Playhouse	17,013	
950	ROTC	5,890	
1000/1100/1200	Gyms/Locker Rooms/Pool	79,482	
901, 903, 905, 907, 909,911, 915, 917	Classroom Portables Buildings	8,640	
Proposed New Buildings			
150	Performing Arts		7,550
700	Student Services		28,480
800	Gymnasium		99,830
850	Pool Building		4,040
1000	Classroom		40,635
	Total Building Space	**172,271**	**314,225**
New Pool with Bleachers			2,800 (Bleachers) 12,900 (Pool)
Hardscapes			
Existing hardscapes/hardcourts to be removed		110,008	
New hardscapes/hardcourts			52,577
Disturbed Hardscapes along Jackrabbit Lane		109,017	109,017
	Total Hardscapes	**219,025**	**161,594**

Source: LBUSD.

New CTE Classroom Building

The new CTE Classroom Building project consists of development of a 65,421 square foot building that is three stories tall as well as associated utility upgrades and hardscape improvements that would be located on the south side of the Campus at the existing location of the softball field.

HVAC Modernization

The HVAC Modernization project consists of providing HVAC, utilities upgrades, interior and exterior upgrades, technology upgrades, campus wide fire alarm upgrades, security cameras, ADA upgrades to parking and path of travel, flat work, and seismic upgrades as needed to the following buildings:

- Building 25 – existing building total square footage is 6,759 sq. ft. of which approximately 1,690 sq. ft. will be disturbed.
- Building 100 – existing building total square footage is 36,070 sq. ft. of which approximately 13,346 sq. ft. will be disturbed.
- Building 200 – existing building total square footage is 23,714 sq. ft. of which approximately 7,826 sq. ft. will be disturbed.
- Building 250 – existing building total square footage is 59,763 sq. ft. of which approximately 9,562 sq. ft. will be disturbed.
- Building 300 – existing building total square footage is 25,348 sq. ft. of which approximately 9,856 sq. ft. will be disturbed.
- Building 400 – existing building total square footage is 24,702 sq. ft. of which approximately 9,140 sq. ft. will be disturbed.
- Building 500 – existing building total square footage is 23,630 sq. ft. of which approximately 9,216 sq. ft. will be disturbed.
- Building 600 – existing building total square footage is 24,624 sq. ft. of which approximately 7,633 sq. ft. will be disturbed.

Poly Transformation

The Poly Transformation project consists of demolishing Buildings 150, 550, 700, 800, 850, 950 (ROTC), 1000/1100/1200 (Gymnasium/Locker Rooms/Pool), and Portables (901, 903, 905, 907, 909,911, 915, 917) and construction of the following structures:

- Performing Arts Classroom Building – 1 story, total square footage is 7,550
- Student Services Building – 2 stories, total square footage is 28,480 (1st floor=14,480 sq. ft., 2nd floor=14,000 sq. ft.)
- Gymnasium Building – 2 stories, total square footage is 99,830 (1st floor=54,830 sq. ft., 2nd floor=45,000 sq. ft.)
- Pool Building – 1 story, total square footage is 4,040
- Classroom Building – 2 stories, total square footage is 40,635 (1st floor=21,720 sq. ft., 2nd floor=18,645 sq. ft.)
- New pool with new bleachers – Total pool square footage is 12,900, total bleacher square footage is 2,800.

New and Replaced Hardscape

The new and replaced hardscaped areas will include the following:

- Existing hardscape/hardcourts to be replaced 110,008 sq. ft.
- New hardscape/new hardcourts 52,577 sq. ft.
- Existing hardscape to be disturbed and put back along jackrabbit lane 109,017 sq. ft.

1.4 Standard Noise Regulatory Conditions

The proposed project will be required to comply with the following regulatory conditions from the City of Long Beach and State of California.

City of Long Beach Municipal Code

The following lists the noise and vibration regulations from the Municipal Code that are applicable, but not limited to the proposed project.

- Section 8.80.160 Exterior Noise Standards at Nearby Residential Uses
- Section 8.80.202 Construction activities
- Section 8.80.200(G) Vibration

State of California Rules

The following lists the State of California noise regulations that are applicable, but not limited to the proposed project.

- California Vehicle Code Section 2700-27207 – On Road Vehicle Noise Limits
- California Vehicle Code Section 38365-38350 – Off-Road Vehicle Noise Limits

1.5 Summary of Analysis Results

The following is a summary of the proposed project's impacts with regard to the State CEQA Guidelines noise checklist questions.

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?

Less than significant impact.

Generation of excessive groundborne vibration or groundborne noise levels?

Potentially significant impact. Mitigation Measure 1 is provided to reduce impacts to less than significant levels.

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?

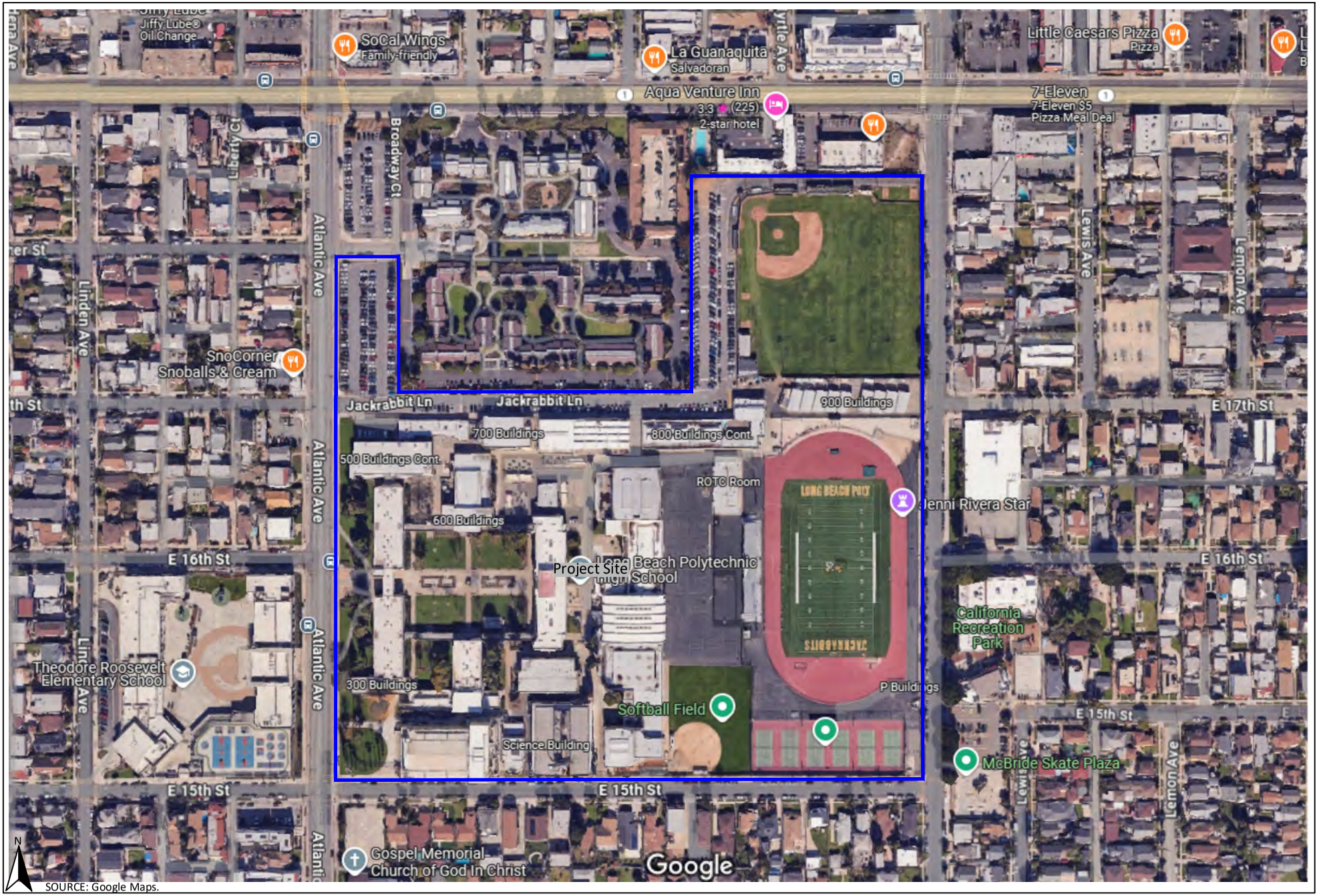
Less than significant impact.

1.6 Mitigation Measures for the Proposed Project

This analysis found that through adherence to the noise and vibration regulations detailed in Section 1.4 above and through implementation of the following mitigation all noise and vibration impacts would be reduced to less than significant levels.

Mitigation Measure 1:

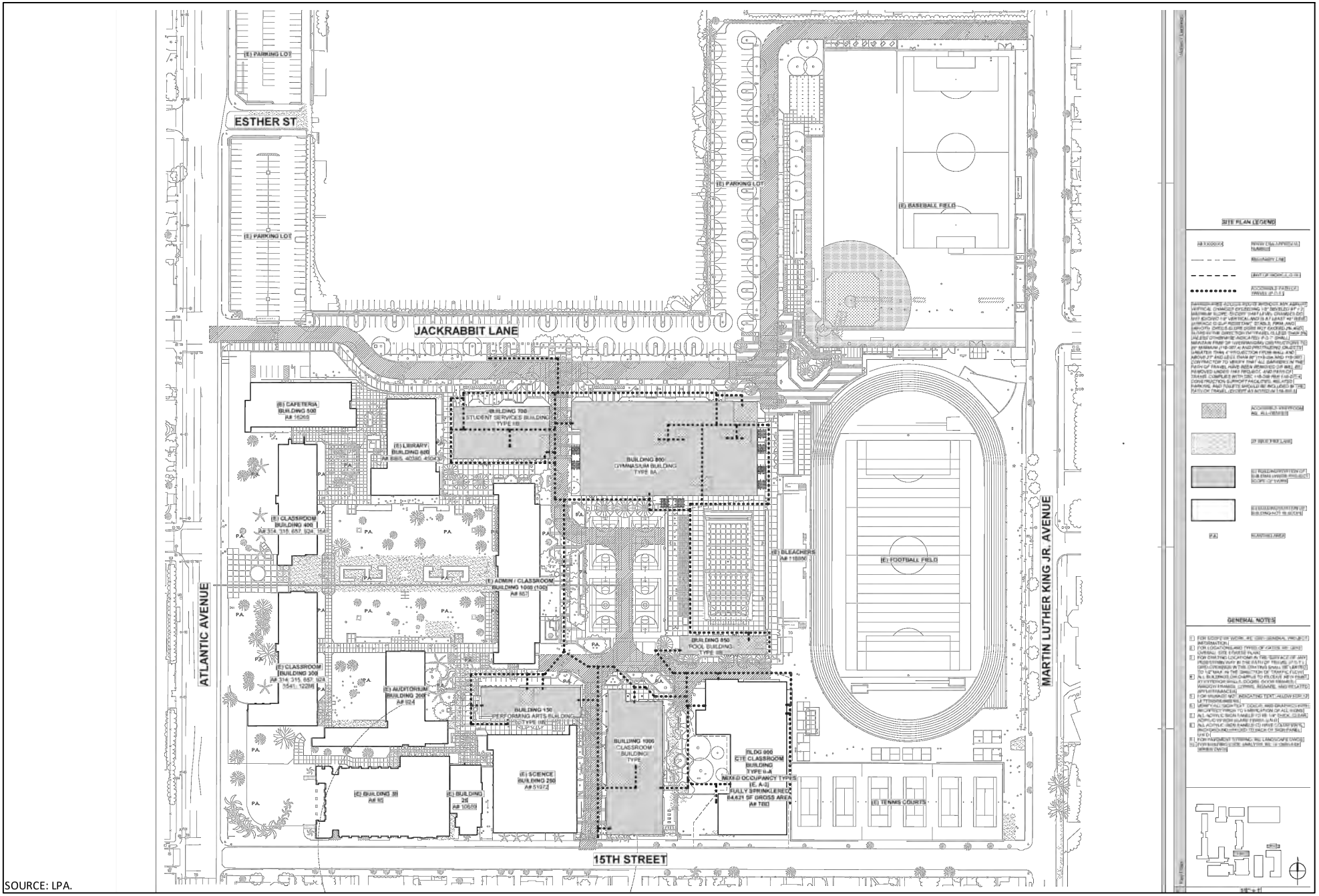
The project applicant shall require that the paving contractor either operate vibratory rollers in static mode or limit the amplitude level of vibratory rollers to the lowest setting when operating within 20 feet of any offsite structure.



SOURCE: Google Maps.

VISTA ENVIRONMENTAL

Figure 1
Project Location Map



SOURCE: LPA.

VISTA ENVIRONMENTAL

Figure 2
Proposed Site Plan

2.0 NOISE FUNDAMENTALS

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear.

2.1 Noise Descriptors

Noise Equivalent sound levels are not measured directly, but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The peak traffic hour Leq is the noise metric used by California Department of Transportation (Caltrans) for all traffic noise impact analyses.

The Day-Night Average Level (Ldn) is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of ten decibels to sound levels at night between 10 p.m. and 7 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn, except that it has another addition of 4.77 decibels to sound levels during the evening hours between 7 p.m. and 10 p.m. These additions are made to the sound levels at these time periods because during the evening and nighttime hours, when compared to daytime hours, there is a decrease in the ambient noise levels, which creates an increased sensitivity to sounds. For this reason, the sound appears louder in the evening and nighttime hours and is weighted accordingly. The City of Long Beach relies on the CNEL noise standard to assess transportation-related impacts on noise sensitive land uses.

2.2 Tone Noise

A pure tone noise is a noise produced at a single frequency and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less

2.3 Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound

from point sources, such as air conditioning condensers, radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

2.4 Ground Absorption

The sound drop-off rate is highly dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in traffic noise models, soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis.

3.0 GROUND-BORNE VIBRATION FUNDAMENTALS

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

3.1 Vibration Descriptors

There are several different methods that are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Due to the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels and is denoted as (L_v) and is based on the rms velocity amplitude. A commonly used abbreviation is "VdB", which in this text, is when L_v is based on the reference quantity of 1 micro inch per second.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration.

3.3 Vibration Propagation

The propagation of ground-borne vibration is not as simple to model as airborne noise. This is due to the fact that noise in the air travels through a relatively uniform median, while ground-borne vibrations travel through the earth which may contain significant geological differences. There are three main types of vibration propagation; surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 REGULATORY SETTING

The project site is located in the City of Long Beach. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA). Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being sited adjacent to a highway or, alternately that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Although the proposed project is not under the jurisdiction of the FTA, the *Transit Noise and Vibration Impact Assessment Manual* (FTA Manual), prepared by the FTA, September 2018, is a guidance document from a government agency that provides specific guidance for construction noise and is referenced in the *City of Long Beach General Plan Noise Element*, June 2023, which details that the federal standards may be used when local criteria are not established. The FTA recommends developing construction noise criteria on a project-specific basis that utilizes local noise ordinances if possible. However, local noise ordinances usually relates to nuisance and hours of allowed activity and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the noise impacts of a construction project. Project construction noise criteria should take into account the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land uses. The FTA standards are based on extensive studies by the FTA and other governmental agencies on the human effects and reaction to noise and a summary of the FTA findings for a general construction noise assessment are provided below in Table B.

Table B – FTA General Assessment Construction Noise Criteria

Land Use	Day (dBA $Leq_{(1\text{-hour})}$)	Night (dBA $Leq_{(1\text{-hour})}$)
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: Federal Transit Administration, 2018.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Noise Standards

California Department of Health Services Office of Noise Control

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the "Land Use Compatibility for Community Noise Environments Matrix," which allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise. The Land Use Compatibility Matrix that was adopted by the City is shown in Figure 4.

California Noise Insulation Standards

Title 24, Chapter 1, Article 4 of the California Administrative Code (California Noise Insulation Standards) requires noise insulation in new hotels, motels, apartment houses, and dwellings (other than single-family detached housing) that provides an annual average noise level of no more than 45 dBA CNEL. When such structures are located within a 60-dBA CNEL (or greater) noise contour, an acoustical analysis is required to ensure that interior levels do not exceed the 45-dBA CNEL annual threshold. In addition, Title 21, Chapter 6, Article 1 of the California Administrative Code requires that all habitable rooms, hospitals, convalescent homes, and places of worship shall have an interior CNEL of 45 dB or less due to aircraft noise.

Government Code Section 65302

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable.

California Vehicle Code Section 27200-27207 – On-Road Vehicle Noise

California Vehicle Code Section 27200-27207 provides noise limits for vehicles operated in California. For vehicles over 10,000 pounds noise is limited to 88 dB for vehicles manufactured before 1973, 86 dB for vehicles manufactured before 1975, 83 dB for vehicles manufactured before 1988, and 80 dB for vehicles manufactured after 1987. All measurements are based at 50 feet from the vehicle.

Table N-2: Land Use Compatibility Guidelines for Noise Exposure

Land Use Type	Community Noise Exposure L_{dn} or CNEL, dB						
	55	60	65	70	75	80	85
Residential - Low Density Single Family Duplex, Mobile Homes							
Residential - Multi-Family							
Transient Lodging - Hotels, Motels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings - Business, Commercial & Professional							
Industrial, Manufacturing, Utilities, Agriculture							

Normally Acceptable	*Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.*
Conditionally Acceptable	*New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.*
Normally Unacceptable	*New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.*
Clearly Unacceptable	*New construction or development should generally not be undertaken.*

Source: California Office of Planning and Research, General Plan Guidelines (2017), Appendix D.

SOURCE: City of Long Beach General Plan Noise Element, June 2023.

VISTA ENVIRONMENTAL

Figure 3
City of Long Beach Land Use Compatibility Matrix

California Vehicle Section 38365-38380 – Off-Road Vehicle Noise

California Vehicle Code Section 38365-38380 provides noise limits for off-highway motor vehicles operated in California. 92 dBA for vehicles manufactured before 1973, 88 dBA for vehicles manufactured before 1975, 86 dBA for vehicles manufactured before 1986, and 82 dBA for vehicles manufactured after December 31, 1985. All measurements are based at 50 feet from the vehicle.

Vibration Standards

Title 14 of the California Administrative Code Section 15000 requires that all state and local agencies implement the California Environmental Quality Act (CEQA) Guidelines, which requires the analysis of exposure of persons to excessive groundborne vibration. However, no statute has been adopted by the state that quantifies the level at which excessive groundborne vibration occurs.

Caltrans issued the *Transportation and Construction Vibration Guidance Manual*, April 2020. The Manual provides practical guidance to Caltrans engineers, planners, and consultants who must address vibration issues associated with the construction, operation, and maintenance of Caltrans projects. However, this manual is also used as a reference point by many lead agencies and CEQA practitioners throughout California, as it provides numeric thresholds for vibration impacts. Thresholds are established for continuous (construction-related) and transient (transportation-related) sources of vibration, which found that the human response becomes distinctly perceptible at 0.25 inch per second PPV for transient sources and 0.04 inch per second PPV for continuous sources.

4.3 Local Regulations

The *City of Long Beach General Plan Noise Element*, June 2023 and Municipal Code establishes the following applicable policies related to noise and vibration.

City of Long Beach General Plan Noise Element

Strategy No. 1 Apply site planning and other design strategies to reduce noise impacts, especially within the Founding and Contemporary Neighborhoods, Multifamily Residential—Low and Moderate, and Neighborhood-Serving Centers and Corridors – Low and Moderate PlaceTypes.

Policy N 1-1 Integrate noise considerations into the land use planning process in order to prevent new land use noise conflicts.

Policy N 1-2 Require noise attenuation measures to be incorporated into all development and redevelopment of sensitive receptor uses, including residential, health care facilities, schools, libraries, senior facilities, and churches in close proximity to existing or known planned rail lines.

Policy N 1-3 Ensure development and redevelopment is considerate of the natural shape and contours of a site in order to reduce noise impacts.

Policy N 1-4 Encourage developer or landowners to incorporate noise reduction features in the site planning process.

Policy N 1-5 Incorporate urban design strategies such as courtyards, paseos, alleys, plazas and open space areas to provide a buffer to noise sensitive uses.

Policy N 1-6 Ensure that project site design and function minimize the potential adverse impacts of noise.

Policy N 1-7 Encourage educational facilities to locate playgrounds, sports fields, and other outdoor activity areas away from residential areas.

Policy N 1-8 Require new development to provide facilities which support the use of multimodal transportation, including, walking, bicycling, carpooling and transit.

Policy N 1-9 Utilize noise barriers after all practical design-related noise measures have been integrated into the project. In instances where sound walls are necessary, they should be incorporated into the architectural and site character of the development and pedestrian access should be integrated.

Strategy No. 4 Protect and buffer noise sensitive areas and uses through effective building design and material selection.

Policy N 4-1 Encourage developers to utilize noise absorbing materials.

Policy N 4-5 Encourage building design that incorporates varying and/or angled wall articulation to disperse noise.

Policy N 4-6 Promote building design best practices such as staggering wall studs to minimize transmission of noise between rooms.

Policy N 4-7 Consider use of decorative walls and/or dense landscaping to further buffer noise between uses.

Strategy No. 6 Minimize vehicular traffic noise in residential areas and near noise-sensitive land uses.

Policy N 6-1 Ensure noise-compatible land uses along existing and future roadways, highways, and freeways.

Policy N 6-2 Use the "Land Use Compatibility Guidelines" and established Noise Standards or other measures that are acceptable to the City, to guide land use and zoning reclassification, subdivision, conditional use and use variance determinations and environmental assessment considerations, especially relative to sensitive uses, as defined by this chapter within a line-of-sight of freeways, major highways, or truck haul routes.

Policy N 6-4 Work toward understanding and reducing traffic noise in residential neighborhoods with a focus on analyzing the effects of traffic noise exposure throughout the City.

Policy N 6-6 For future noise sensitive land uses proposed within the 65 dBA Ldn noise contours, a qualified acoustical consultant shall conduct a noise analysis to determine appropriate measures are implemented to meet the necessary exterior and interior noise standards.

Policy N 6-9 Encourage site planning and building design measures that minimize the effects of traffic noise in residential zones.

Strategy No. 7 Promote multimodal mobility to reduce noise generated from vehicular traffic.

Policy N 7-1 Encourage the use of active transportation modes (walking, bicycling), micro-mobility (electric vehicles) and transit as stipulated in the Mobility Element to minimize traffic noise in the City.

Strategy No. 10 While the operations of airports and airport related uses are noisy by nature, the adverse effects of aircraft-related noise should be minimized.

Policy N 10-1 Ensure that new development can be made compatible with the noise environment by using noise/land use compatibility standards and the airport noise contour maps as guides to future planning and development decisions.

Strategy No. 12 Minimize construction noise and vibration levels in residential areas and in other locations near noise-sensitive uses where possible.

Policy N 12-1 Reduce construction, maintenance, and nuisance noise at the source, when possible, to reduce noise conflicts.

Policy N 12-2 Limit the allowable hours for construction activities and maintenance operations near sensitive uses.

Policy N 12-3 As part of the City's Municipal Code, establish noise levels standards based on PlaceType and time of day, to which construction noise shall conform.

Policy N 12-4 Encourage off-site fabrication to reduce needed onsite construction activities and corresponding noise levels and duration.

Policy N 12-5 Encourage the following construction best practices:

- Schedule high-noise and vibration-producing activities to a shorter window of time during the day outside early morning hours to minimize disruption to sensitive uses.
- Grading and construction contractors should use equipment that generates lower noise and vibration levels, such as rubber-tired equipment rather than metal-tracked equipment.
- Construction haul truck and materials delivery traffic should avoid residential areas whenever feasible.
- The construction contractor should place noise- and vibration-generating construction equipment and locate construction staging areas away from sensitive uses whenever feasible.
- The construction contractor should use on-site electrical sources to power equipment rather than diesel generators where feasible.
- All residential units located within 500 ft of a construction site should be sent a notice regarding the construction schedule. A sign legible at a distance of 50 ft should also be posted at the construction site. All notices and the signs should indicate the dates and durations of construction activities, as well as provide a telephone number for a "noise disturbance coordinator."

- A "noise disturbance coordinator" should be established. The disturbance coordinator should be responsible for responding to any local complaints about construction noise. The disturbance coordinator should determine the cause of the noise complaint (e.g., starting too early, bad muffler) and should be required to implement reasonable measures to reduce noise levels.

City of Long Beach Municipal Code

The City's Municipal Code identifies standards for noise intrusion from non-transportation sources within various Noise Districts. The proposed project is located in District One. Table C summarizes the applicable standards in Noise District One.

Table C – City of Long Beach Municipal Code Exterior Noise Standards

Noise level that may not be exceeded for more than…	Daytime[a] 7 a.m. – 10 p.m.	Nighttime[a] 10 p.m. – 7 a.m.
30 minutes in any hour	50 dB(A)	45 dB(A)
15 minutes in any hour	55 dB(A)	50 dB(A)
5 minutes in any hour	60 dB(A)	55 dB(A)
1 minute in any hour	65 dB(A)	60 dB(A)
Any time	70 dB(A)	65 dB(A)

Notes:

a) In the event that the alleged offensive noise contains a steady audible tone such as a whine, screech, or hum, or is a repetitive noise such as hammering or riveting or contains music or speech conveying informational content, the specified noise limits are reduced by 5 dB(A).

Source: City of Long Beach Municipal Code Chapter 8.80.160.

Section 8.80.202 of the City's Noise Ordinance regulates noise from construction activities. These regulations limit the permissible hours of construction to between 7:00 a.m. and 7:00 p.m. on weekdays or federal holidays and between 9:00 a.m. and 6:00 p.m. on Saturdays. Construction is generally prohibited on Sundays. The Noise Ordinance also limits hours of operation for mechanically powered tools (e.g., saws, sanders, drills, grinders, lawnmowers, and garden tools) from 7:00 a.m. to 10:00 p.m. Leaf blowers have more stringent standards and can only be used between 8:00 a.m. and 8:00 p.m. on weekdays, 9:00 a.m. and 5:00 p.m. on Saturdays, and 11:00 a.m. and 5:00 p.m. on Sundays.

The Noise Ordinance also provides standards for vibration (Section 8.80.200(G)). It is a violation to operate or permit the operation of any device that creates vibration that is above the vibration perception threshold of an individual at or beyond the property boundary of the source. The Noise Ordinance defines the perception threshold as 0.001 g's in the frequency range of 0-30 hertz and 0.003 g's in the frequency range between 30 and 100 hertz. It should be noted that this perception threshold is only applicable to vibration caused during the operation of the proposed project.

5.0 EXISTING NOISE CONDITIONS

To determine the existing noise levels, noise measurements have been taken in the vicinity of the project site. The field survey noted that noise within the proposed project area is generally characterized by vehicle traffic on Atlantic Street that is adjacent to the west side of the School, Martin Luther King Jr Avenue that is adjacent to the east side of the School and 15th Street that is adjacent to the south side of the School.

5.1 Noise Measurements taken in Project Vicinity

The following describes the measurement procedures, measurement locations, and noise measurement results of the noise measurements taken in the project vicinity.

Noise Measurement Equipment

The noise measurements were taken using a Larson-Davis Model 831 Type 1 precision sound level meter programmed in "slow" mode to record noise levels in "A" weighted form as well as the frequency spectrum of the noise broken down into 1/3 octaves. The sound level meter and microphone were mounted on a tripod five feet above the ground and were equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. The accuracy of the calibrator is maintained through a program established through the manufacturer and is traceable to the National Bureau of Standards. The noise level measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (ANSI S1.4-2014 standard).

Noise Measurement Locations

The noise monitoring locations were selected in order to obtain noise levels in the vicinity of the project site. Descriptions of the noise monitoring sites are provided below in Table C and are shown in Figure 4. Appendix A includes a photo index of the study area and noise level measurement locations.

Noise Measurement Timing and Climate

The noise measurements were recorded between 1:38 p.m. and 3:25 p.m. on Tuesday, May 14, 2024. During the noise measurements, the sky was partly cloudy, the temperature was 70 degrees Fahrenheit, the humidity was 56 percent, barometric pressure was 29.83 inches of mercury, and the wind was blowing at an average rate of four miles per hour.

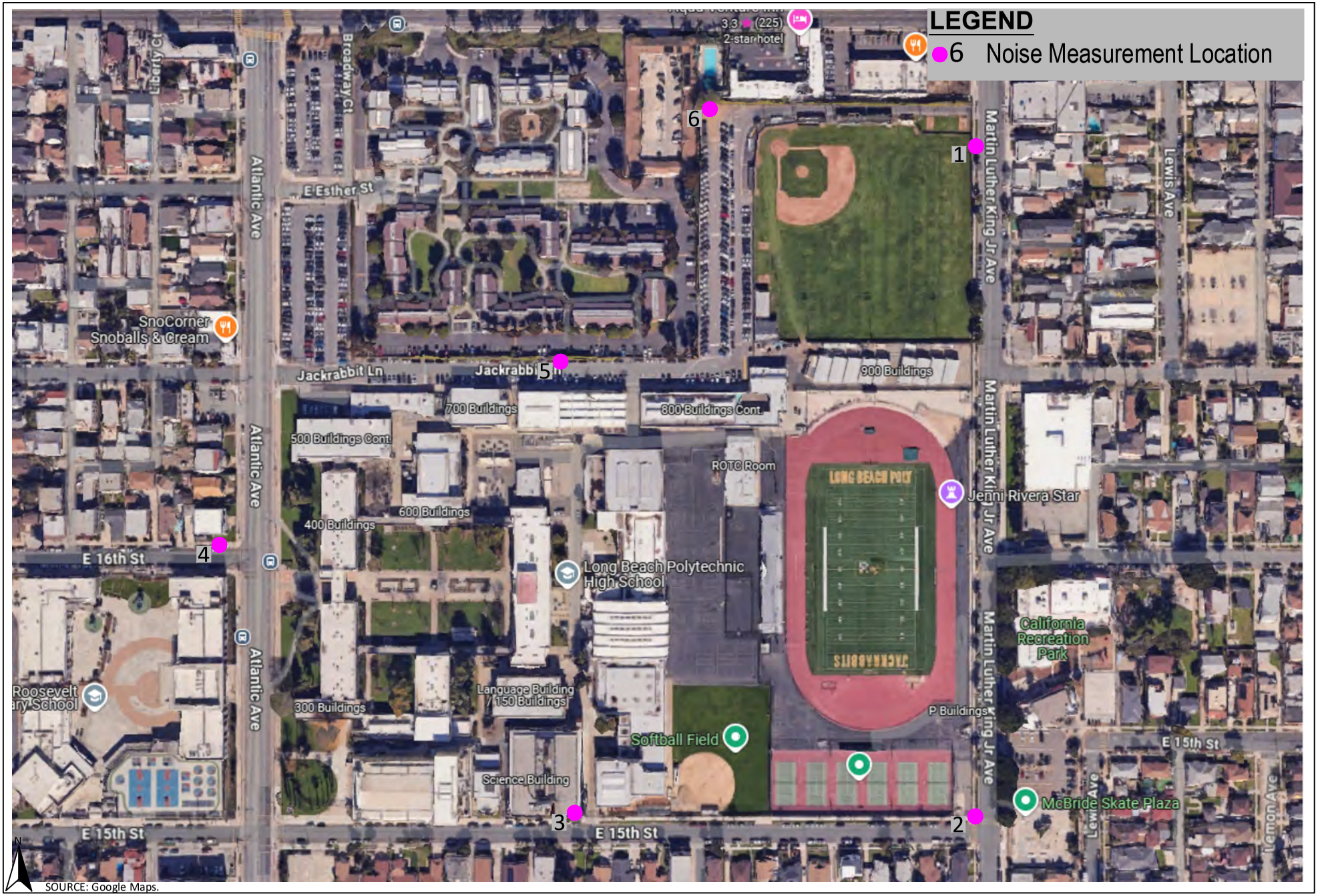
Noise Measurement Results

The results of the noise level measurements are presented in Table D and the noise monitoring data printouts are included in Appendix B.

Table D – Existing (Ambient) Noise Measurement Results

Site No.	Description	Primary Noise Source	Start Time of Measurement	Measured Noise Level	
				dBA Leq	dBA Lmax
1	Located near the northeast corner of the School, approximately 25 feet west of Martin Luther King Jr Avenue centerline and 70 feet south of Jackrabbit Lane centerline.	Vehicles on Martin Luther King Jr Avenue	1:38 p.m.	61.6	74.0
2	Located near the southeast corner of the School, approximately 22 feet west of Martin Luther King Jr Avenue centerline and 35 feet north of E 15th Street centerline.	Vehicles on Martin Luther King Jr Avenue	1:56 p.m.	62.9	76.9
3	Located on the south side of the School, near the southeast corner of Building 250 and approximately 30 feet north of E 15th Street centerline.	Vehicles on E 15th Street	2:14 p.m.	61.5	85.0
4	Located west of the main entrance of the School, approximately 22 feet north of E 16th Street centerline and 65 feet west of Atlantic Avenue centerline.	Vehicles on Atlantic Avenue	2:32 p.m.	64.0	79.9
5	Located on the north side of Building 800, approximately 12 feet north of Jackrabbit Lane centerline	Vehicles on Jackrabbit Lane	2:51 p.m.	58.2	77.1
6	Located near the northwest corner of the School, approximately 105 feet west of the Baseball Field	Vehicles in the School Parking Lot	3:10 p.m.	52.9	73.0

Notes: Noise measurements taken with a Larson-Davis Model 831 Type 1 precision sound level meter on Tuesday, May 14, 2024.



SOURCE: Google Maps.

VISTA ENVIRONMENTAL

Figure 4
Field Noise Monitoring Locations

6.0 MODELING PARAMETERS AND ASSUMPTIONS

6.1 Construction Noise

The noise impacts from construction of the proposed project have been analyzed through use of the FHWA's Roadway Construction Noise Model (RCNM). The FHWA compiled noise measurement data regarding the noise generating characteristics of several different types of construction equipment used during the Central Artery/Tunnel project in Boston. Table E below provides a list of the construction equipment anticipated to be used for each phase of construction as detailed in the *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Polytechnic High School Transformation Project* (Air Quality Analysis), prepared by Vista Environmental, February 20, 2025.

Table E – Construction Equipment Noise Emissions and Usage Factors

Equipment Description	Number of Equipment	Acoustical Use Factor[1] (percent)	Spec 721.560 Lmax at 50 feet[2] (dBA, slow[3])	Actual Measured Lmax at 50 feet[4] (dBA, slow[3])
Demolition				
Concrete/Industrial Saw	1	20	90	90
Excavator	3	40	85	81
Rubber Tired Dozer	2	40	85	82
Site Preparation				
Rubber Tired Dozers	3	40	85	82
Backhoe	1	40	80	78
Front End Loader	1	40	80	79
Tractors	2	40	84	N/A
Grading				
Excavators	2	40	85	81
Grader	1	40	85	83
Rubber Tired Dozer	1	40	85	82
Scrapers	2	40	85	84
Front End Loader	1	40	80	79
Tractor	1	40	84	N/A
Building Construction				
Crane	1	16	85	81
Forklift (Gradall)	3	40	85	83
Generator	1	50	82	81
Backhoe	1	40	80	78
Front End Loader	1	40	80	79
Tractor	1	40	84	N/A
Welder	1	40	73	74
Paving				
Pavers	2	50	85	77
Paving Equipment	2	50	85	77
Rollers	2	20	85	80
Architectural Coating				
Air Compressor	1	40	80	78

Notes:

[1] Acoustical use factor is the percentage of time each piece of equipment is operational during a typical workday.
[2] Spec 721.560 is the equipment noise level utilized by the RCNM program.
[3] The "slow" response averages sound levels over 1-second increments. A "fast" response averages sound levels over 0.125-second increments.
[4] Actual Measured is the average noise level measured of each piece of equipment during the Central Artery/Tunnel project in Boston, Massachusetts primarily during the 1990s.
Source: Federal Highway Administration, 2006.

Table E also shows the associated measured noise emissions for each piece of equipment from the RCNM model and measured percentage of typical equipment use per day. Construction noise impacts to the nearby sensitive receptors have been calculated according to the equipment noise levels and usage factors listed in Table E and through use of the RCNM. For each phase of construction, all construction equipment was analyzed based on being placed in the middle of the nearest building area (structure, road or parking lot area) to be demolished or constructed, which is based on the analysis methodology detailed in FTA Manual for a General Assessment. However, in order to provide a conservative analysis, all equipment was analyzed, instead of just the two nosiest pieces of equipment as detailed in the FTA Manual. The RCNM model printouts are provided in Appendix C.

6.2 Vibration

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings in the vicinity of the construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels to slight damage at the highest levels. Table F gives approximate vibration levels for particular construction activities. The data in Table F provides a reasonable estimate for a wide range of soil conditions.

Table F – Vibration Source Levels for Construction Equipment

Equipment		Peak Particle Velocity (inches/second)	Approximate Vibration Level (L_v)at 25 feet
Pile driver (impact)	Upper range	1.518	112
	typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drill		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, 2020.

The construction-related vibration impacts have been calculated through the vibration levels shown above in Table F and through typical vibration propagation rates. The equipment assumptions were based on the equipment lists provided above in Table E.

7.0 IMPACT ANALYSIS

7.1 CEQA Thresholds of Significance

Consistent with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to 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; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

7.2 Generation of Noise Levels in Excess of Standards

The proposed project would not generate 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. The following section calculates the potential noise emissions associated with the temporary construction activities and long-term operations of the proposed project and compares the noise levels to the City standards.

Construction-Related Noise

The construction activities for the proposed project are anticipated to include demolition of the existing gymnasium and outdoor paved area, site preparation and grading that includes deep soil cement mixing on approximately 2.5 acres, building construction of a new gymnasium and aquatics facility, paving of the pool deck and flat work, and application of architectural coatings. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities.

Section 8.80.202 of the City's Noise Ordinance restricts construction activities from occurring between the hours of 7:00 p.m. and 7:00 a.m. on weekdays, between 6:00 p.m. and 9:00 a.m. on Saturdays, or anytime on Sundays or federal holidays. Through adherence to the construction-related noise requirements provided in the City's Noise Ordinance, construction-related noise levels would not exceed any noise standards established in the General Plan or Noise Ordinance. However, as detailed above in Section 4.1, the General Plan Noise Element details that the federal standards may be used when local criteria are not established. As such, the FTA construction noise level standard of 90 dBA at the nearby homes and daycare facility have been utilized in this analysis.

The nearest sensitive receptors to the project site are patrons and staff at a hotel that is located as near as 10 feet from the area to be disturbed on the north side of the project site. There are also multi-family homes located as near as 60 feet to the north of the area to be disturbed. In addition, there is a church located on the east side of Martin Luther King Jr Avenue that is as near as 90 feet east of the area to be disturbed, there are multi-family homes located on the south side of 15th Street that are as near as 65 feet

south of the area to be disturbed, and there are multi-family homes located on the west side of Atlantic Avenue that are as near as 140 feet west of the area to be disturbed.

Construction noise levels to the nearby sensitive receptors have been calculated through use of the RCNM and the parameters and assumptions detailed in Section 6.1 of this report including Table E – Construction Equipment Noise Emissions and Usage Factors. The results are shown below in Table G and the RCNM printouts are provided in Appendix C.

Table G – Construction Noise Levels at the Nearby Sensitive Receptors

	Construction Noise Level (dBA Leq) at:				
Construction Phase	**Hotel to North[1]**	**Multi-Family Homes to North[2]**	**Church to East[3]**	**Multi-Family Homes to South[4]**	**Multi-Family Homes to West[5]**
Demolition	73	77	72	78	71
Site Preparation	73	77	72	77	71
Grading	74	78	73	79	73
Building Construction	74	78	73	78	72
Paving	68	72	67	73	66
Painting	60	64	59	65	58
FTA Construction Noise Threshold[6]	**100**	**90**	**100**	**90**	**90**
Exceed Thresholds?	**No**	**No**	**No**	**No**	**No**

[1] The hotel to the north is located as near as 235 feet from the center of the north parking lot.
[2] The multi-family homes to the north are located as near as 85 feet from center of Jackrabbit Road improvements. 5 dB of shielding was added to account for the existing 6 foot high cmu wall located on the north property line.
[3] The church to the east is located as near as 265 feet from center of the north section of Jackrabbit Road improvements.
[4] The multi-family homes to the south are located as near as 140 feet from the center of the CTE Classrooms improvements.
[5] The multi-family homes to the west are located as near as 290 feet from the west section of Jackrabbit Road improvements.
[6] The FTA Construction noise thresholds are detailed above in Table B.
Source: RCNM, Federal Highway Administration, 2006

Table G shows that the greatest noise impacts would occur during the grading phase, with noise levels as high as 79 dBA Leq at the nearest multi-family homes to the north. All calculated construction noise levels shown in Table G are within the FTA daytime construction noise standard of 90 dBA for residential uses and 100 dBA for commercial uses. Therefore, through adherence to allowable construction times provided in Section 8.80.202 of the Municipal Code, the construction activities for the proposed project would not create a substantial temporary increase in ambient noise levels that are in excess of applicable noise standards. Impacts would be less than significant.

Operational-Related Noise

The proposed project consists of the demolition and reconstruction of structures and aquatic center on campus that would not result in an increase in student enrollment nor would it result in a new use on campus. As such, no offsite roadway noise impacts are anticipated to be created from operation of the proposed project. In addition, even though the proposed project includes demolition and replacement of the onsite roadway (Jackrabbit Lane) and the north parking lots, the locations and level of use on the onsite roadways and parking lots will not change and no new onsite vehicle noise impacts are anticipated to be created from operation of the proposed project.

Potential new onsite sources that may be created from operation of the proposed project include the new outdoor aquatic center and new HVAC units on the rooftops of the new structures. It is anticipated that all of the new structures would be constructed to meet the most current Title 24 building efficiency and insulation standards that require the roof and walls to have enhanced insulation, which results in enhanced noise reduction. As such, the interior activities that would occur in the new structures are not anticipated to be audible outside of the structures. Section 8.80.160 of the Municipal Code limits onsite noise sources at the property lines of the nearby homes to 50 dBA between 7 a.m. and 10 p.m. and 45 dBA between 10 p.m. and 7 a.m..

In order to determine the noise impacts from the operation of pool activities and rooftop mechanical equipment, reference noise measurements for similar operations were taken of each source and are shown in Table H and the reference noise measurement printouts are provided in Appendix D. In order to account for the noise reduction provided by the proposed and existing structures on all sides of the new aquatic center and the parapet walls that will shield all new rooftop HVAC units, the noise barrier attenuation algorithm from the *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (TeNS), prepared by Caltrans, September 2013, was utilized and the noise barrier reduction calculation spreadsheets are also provided in Appendix D.

Table H – Operational Noise Levels at the Nearby Sensitive Receptors

	Calculated Noise Levels (dBA Leq) at[1]:				
Noise Source	**Hotel to North**	**Multi-Family Homes to North**	**Church to East**	**Multi-Family Homes to South**	**Multi-Family Homes to West**
Pool Activities[2]	25	31	25	31	27
Rooftop Equipment[3]	21	26	20	30	23
Combined Noise Level	**27**	**32**	**26**	**33**	**28**
City Noise Standards (day/night)	50/45	50/45	50/45	50/45	50/45
Exceed Standards (day/night)?	No/No	No/No	No/No	No/No	No/No

Notes:
[1] The reference noise measurements printouts and barrier noise reduction calculations are provided in Appendix D.
[2] The pool activities were based on a noise measurement of 71.8 dBA Leq at 30 feet from Long Beach Community College Liberal Arts Campus pool hosting a swim meet.
[3] The rooftop equipment was based on a noise measurement of 65.1 dBA Leq at 6 feet from an operational rooftop HVAC unit.
Source: Noise calculation methodology from Caltrans, 2013 (see Appendix D).

Table H shows that the proposed project's worst-case (i.e., during a swim meet) operational noise from the simultaneous operation of all new noise sources on the project site would create a noise level as high as 33 dBA Leq at the multi-family homes to the south. The calculated operational noise levels shown in Table H would all be within both the City's daytime noise standards of 50 dBA between 7 a.m. and 10 p.m. and the City's nighttime noise standard of 45 dBA between 10 p.m. and 7 a.m.. Therefore, the operational activities for the proposed project would not create a substantial long-term increase in ambient noise levels that are in excess of applicable noise standards. Impacts would be less than significant.

Level of Significance

Less than significant impact.

7.3 Generation of Excessive Groundborne Vibration

The proposed project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. The following section analyzes the potential vibration impacts associated with the construction and operations of the proposed project.

Construction-Related Vibration Impacts

The construction activities for the proposed project are anticipated to include demolition and reconstruction of structures and aquatic center on campus. Vibration impacts from construction activities associated with the proposed project would typically be created from the operation of heavy off-road equipment. The nearest offsite vibration sensitive receptor is the hotel that is located as near as 10 feet from the area to be disturbed on the north side of the project site.

Section 8.80.200(G) of the City's Municipal Code limits vibration impacts to the nearby single-family homes to 0.001 g's in the frequency range of 0 to 30 hertz and 0.003 g's in the frequency range of 30 to 100 hertz. The acceleration of gravity (g), which is 32.2 feet per second can be converted into peak particle velocity by multiplying 0.001 g's by 32.2 and then converting to inch per second, which results in a threshold of 0.386 inch per second PPV.

A list of known vibration producing construction equipment is provided above in Table F. From the equipment listed in Table F, it is anticipated that the type of equipment that would created the highest vibration during demolition and grading activities would be from a large bulldozer that creates a vibration level of 0.089 inch per second PPV at 25 feet and during paving activities would be from a vibratory roller that creates a vibration level of 0.21 inch per second PPV at 25 feet.

Based on typical vibration propagation rates, the vibration levels at the nearest offsite structure (10 feet away) would be 0.14 inch per second PPV for the large bulldozer and 0.58 inch per second PPV for the vibratory roller. The vibration level created from the large bulldozer would be below the 0.386 inch per second PPV threshold detailed above, however the vibratory roller would exceed the City's vibration threshold. This would be considered a significant impact.

Mitigation Measure 1 is provided that would require that the paving contractor either operate vibratory rollers in static mode or limit the amplitude level of vibratory rollers to the lowest setting when operating within 20 feet of any offsite structure. According to Pavement Interactive, the vibration level created from the lowest amplitude setting is half of the vibration level created from the highest amplitude setting[1]. As such, implementation of Mitigation Measure 1, would reduce the vibration level at the nearest offsite structure to 0.29 inch per second PPV from a vibratory roller operating 10 feet away, which is below the City's 0.386 inch per second PPV threshold. Therefore, with implementation of Mitigation Measure 1, a less than significant vibration impact is anticipated from construction of the proposed project.

Operations-Related Vibration Impacts

The proposed project would consist of the development and operation of a demolition and reconstruction of structures and aquatic center on campus. The on-going operation of the proposed project would not

1 Obtained from: https://pavementinteractive.org/reference-desk/construction/compaction/compaction-equipment/

include the operation of any known vibration sources. Therefore, a less than significant vibration impact is anticipated from the operation of the proposed project.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

Mitigation Measure 1:

The project applicant shall require that the paving contractor either operate vibratory rollers in static mode or limit the amplitude level of vibratory rollers to the lowest setting when operating within 20 feet of any offsite structure.

Level of Significance after Mitigation

Less than significant impact.

7.4 Aircraft Noise

The proposed project would not expose people residing or working in the project area to excessive noise levels from aircraft. The nearest airport is Long Beach Airport that is located approximately 2.1 miles northeast of the project site. The project site is located outside of the 60 dBA CNEL noise contours of Long Beach Airport. A less than significant impact would occur from aircraft noise.

Level of Significance

Less than significant impact.

8.0 REFERENCES

California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analytics Protocol*, September 2013.

California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, April 2020.

City of Long Beach, *City of Long Beach General Plan Noise Element*, June, 2023.

City of Long Beach, *A Codification of the General Ordinances of Long Beach, California*, November 22, 2023.

Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* September 2018.

U.S. Department of Transportation, *FHWA Roadway Construction Noise Model User's Guide,* January, 2006.

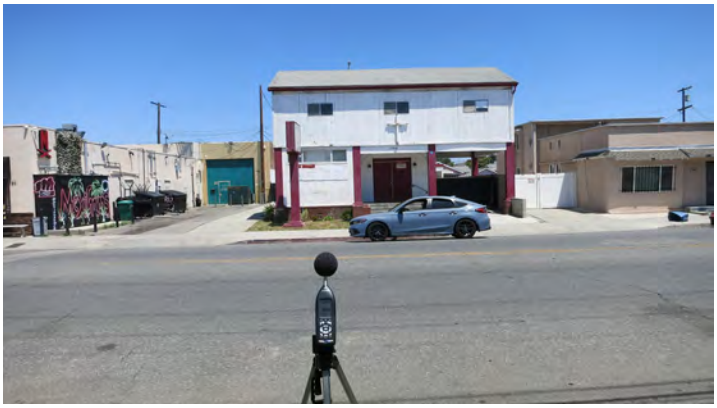
Vista Environmental, *Air Quality, Energy, and Greenhouse Gas Emissions Impact Analysis Polytechnic High School Transformation Project,* February 20, 2025.

APPENDIX A

Field Noise Measurements Photo Index

Noise Measurement Site 1 - looking north

Noise Measurement Site 1 - looking northeast



Noise Measurement Site 1 - looking east

Noise Measurement Site 1 - looking southeast

Noise Measurement Site 1 - looking south

Noise Measurement Site 1 - looking southwest

Noise Measurement Site 1 - looking west

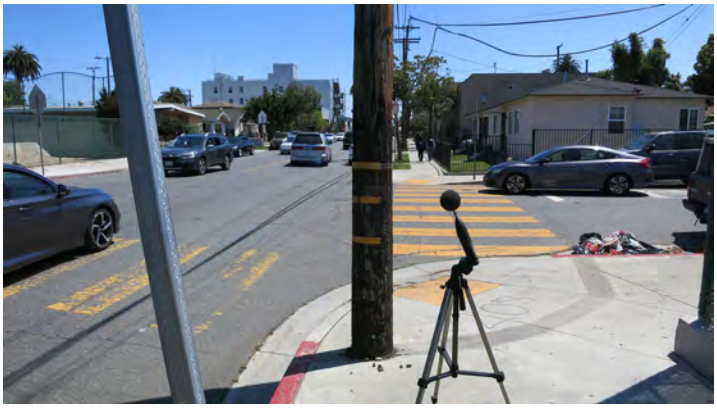
Noise Measurement Site 1 - looking northwest

Noise Measurement Site 2 - looking north

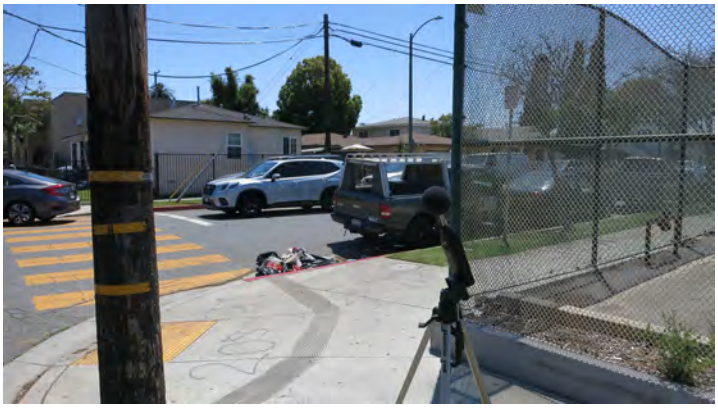
Noise Measurement Site 2 - looking northeast

Noise Measurement Site 2 - looking east

Noise Measurement Site 2 - looking southeast



Noise Measurement Site 2 - looking south

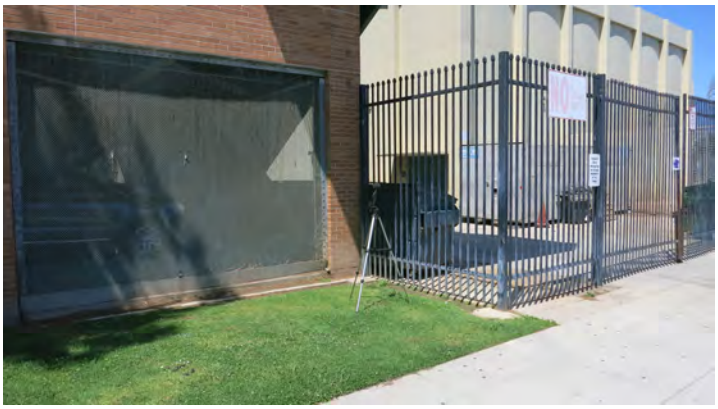


Noise Measurement Site 2 - looking southwest

Noise Measurement Site 2 - looking west

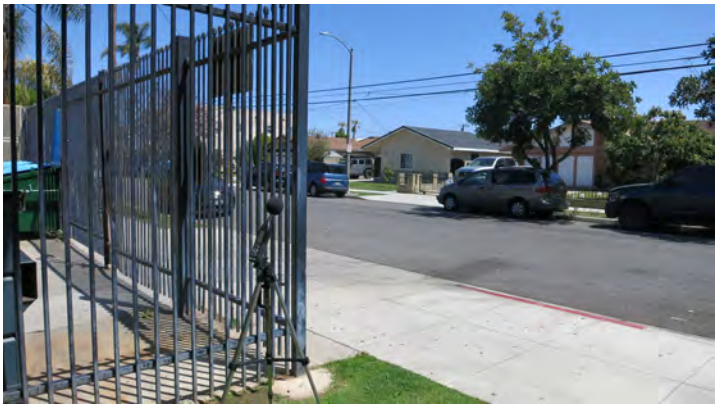
Noise Measurement Site 2 - looking northwest

Noise Measurement Site 3 - looking north

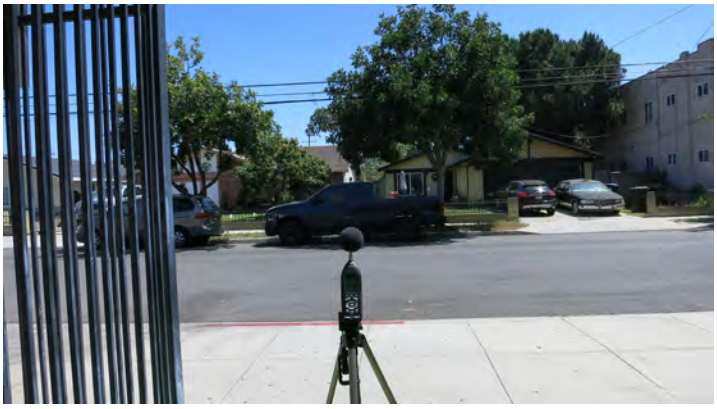


Noise Measurement Site 3 - looking northeast

Noise Measurement Site 3 - looking east



Noise Measurement Site 3 - looking southeast



Noise Measurement Site 3 - looking south

Noise Measurement Site 3 - looking southwest

Noise Measurement Site 3 - looking west

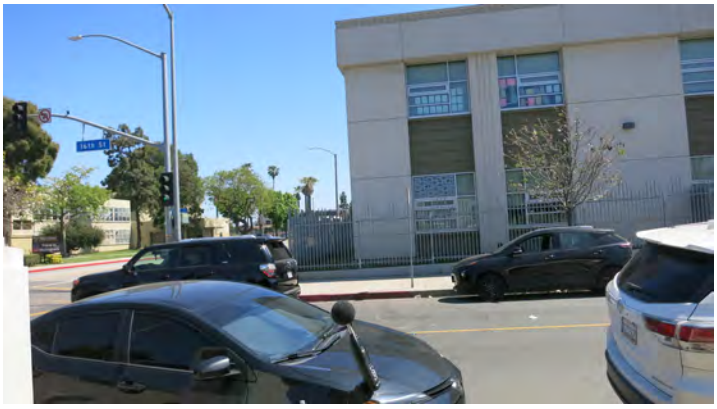
Noise Measurement Site 3 - looking northwest

Noise Measurement Site 4 - looking north

Noise Measurement Site 4 - looking northeast

Noise Measurement Site 4 - looking east

Noise Measurement Site 4 - looking southeast

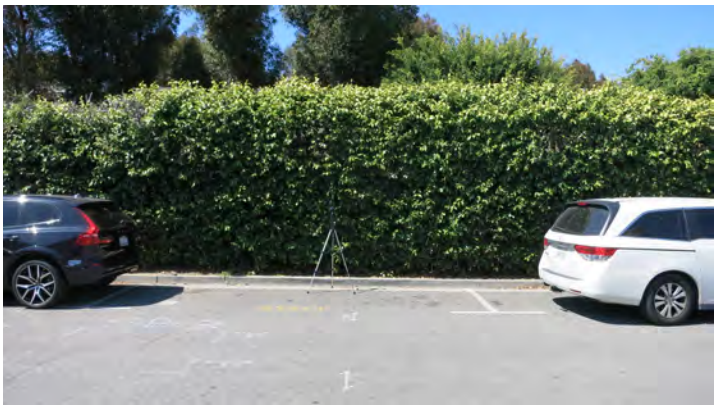


Noise Measurement Site 4 - looking south

Noise Measurement Site 4 - looking southwest

Noise Measurement Site 4 - looking west

Noise Measurement Site 4 - looking northwest



Noise Measurement Site 5 - looking north

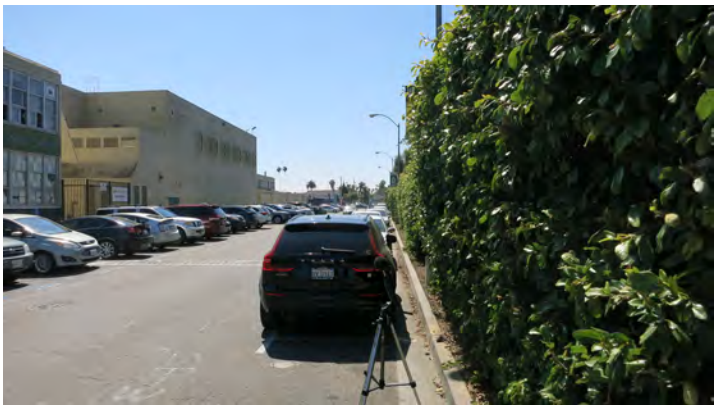
Noise Measurement Site 5 - looking northeast

Noise Measurement Site 5 - looking east

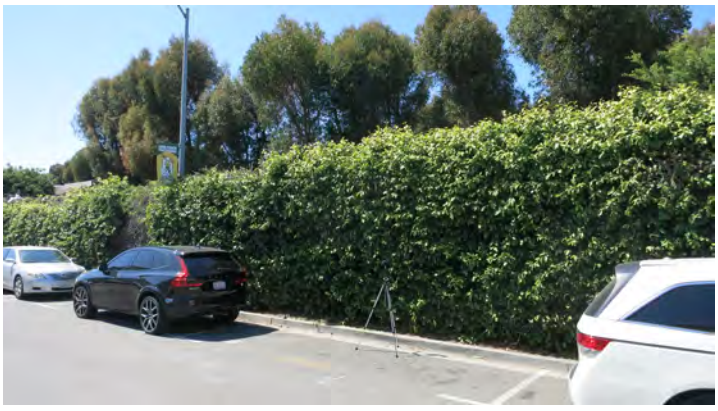
Noise Measurement Site 5 - looking southeast

Noise Measurement Site 5 - looking south

Noise Measurement Site 5 - looking southwest



Noise Measurement Site 5 - looking west



Noise Measurement Site 5 - looking northwest

Noise Measurement Site 6 - looking north

Noise Measurement Site 6 - looking northeast

Noise Measurement Site 6 - looking east

Noise Measurement Site 6 - looking southeast

Noise Measurement Site 6 - looking south

Noise Measurement Site 6 - looking southwest

Noise Measurement Site 6 - looking west

Noise Measurement Site 6 - looking northwest

APPENDIX B

Field Noise Measurements Printouts

Measurement Report

Report Summary

Meter's File Name	831_Data.005	Computer's File Name	SLM_0002509_831_
Meter	831		
Firmware	2.403		
User	GT		Location
Description	LBUSD Polytechnic High School Transformation		
Note	Located near NE Corner of School, approximately 25 ft west of MLK Jr Ave CL and 70 ft south of Jackrabbit Ln CL		
Start Time	2024-05-14 13:38:12	Duration	0:15:00.0
End Time	2024-05-14 13:53:12	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	61.6 dB		
LAE	91.2 dB	SEA	--- dB
EA	146.1 µPa²h		
LZ_{peak}	101.2 dB	2024-05-14 13:50:03	
LAS_{max}	74.0 dB	2024-05-14 13:43:42	
LAS_{min}	47.7 dB	2024-05-14 13:47:13	
LA_{eq}	61.6 dB		
LC_{eq}	72.2 dB	LC_{eq} - LA_{eq}	10.6 dB
LAI_{eq}	63.7 dB	LAI_{eq} - LA_{eq}	2.0 dB

Exceedances	Count	Duration
LAS > 65.0 dB	37	0:02:44.9
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	61.6 dB	61.6 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	61.6 dB	61.6 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	61.6 dB		72.2 dB		74.1 dB	
$LS_{(max)}$	74.0 dB	2024-05-14 13:43:42	87.5 dB	2024-05-14 13:43:37	90.7 dB	2024-05-14 13:38:13
$LF_{(max)}$	76.6 dB	2024-05-14 13:43:42	90.1 dB	2024-05-14 13:43:37	93.2 dB	2024-05-14 13:38:13
$LI_{(max)}$	77.3 dB	2024-05-14 13:43:42	91.5 dB	2024-05-14 13:43:37	95.5 dB	2024-05-14 13:38:26
$LS_{(min)}$	47.7 dB	2024-05-14 13:47:13	62.1 dB	2024-05-14 13:41:25	64.3 dB	2024-05-14 13:41:49
$LF_{(min)}$	46.4 dB	2024-05-14 13:41:23	60.1 dB	2024-05-14 13:41:25	62.2 dB	2024-05-14 13:41:25
$LI_{(min)}$	47.2 dB	2024-05-14 13:41:23	62.2 dB	2024-05-14 13:41:25	64.9 dB	2024-05-14 13:41:49
$L_{Peak(max)}$	88.7 dB	2024-05-14 13:52:32	98.7 dB	2024-05-14 13:43:37	101.2 dB	2024-05-14 13:50:03

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	67.7 dB
LAS 10.0	65.7 dB
LAS 33.3	60.6 dB
LAS 50.0	56.6 dB
LAS 66.6	53.9 dB
LAS 90.0	50.8 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.006	Computer's File Name	SLM_0002509_831_Data
Meter	831		
Firmware	2.403		
User	GT	Location	
Description	LBUSD Polytechnic High School Transformation		
Note	Located near SE Corner of School, approximately 22 ft west of MLK Jr Ave CL and 35 ft north of E 15th St CL		
Start Time	2024-05-14 13:56:23	Duration	0:15:00.0
End Time	2024-05-14 14:11:23	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	62.9 dB		
LAE	92.5 dB	SEA	--- dB
EA	195.7 µPa²h		
LZ_{peak}	105.3 dB	2024-05-14 13:57:24	
LAS_{max}	76.9 dB	2024-05-14 14:07:35	
LAS_{min}	46.2 dB	2024-05-14 14:05:50	
LA_{eq}	62.9 dB		
LC_{eq}	72.5 dB	LC_{eq} - LA_{eq}	9.6 dB
LAI_{eq}	66.3 dB	LAI_{eq} - LA_{eq}	3.4 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	51	0:03:46.0
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
62.9 dB	62.9 dB	0.0 dB

LDEN	LDay	LEve	LNight
62.9 dB	62.9 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	62.9 dB		72.5 dB		77.1 dB	
$LS_{(max)}$	76.9 dB	2024-05-14 14:07:35	86.7 dB	2024-05-14 14:10:53	94.5 dB	2024-05-14 13:56:23
$LF_{(max)}$	80.3 dB	2024-05-14 14:07:35	90.0 dB	2024-05-14 14:10:53	96.9 dB	2024-05-14 13:57:24
$LI_{(max)}$	80.9 dB	2024-05-14 14:07:34	92.4 dB	2024-05-14 13:57:24	100.0 dB	2024-05-14 13:57:24
$LS_{(min)}$	46.2 dB	2024-05-14 14:05:50	60.0 dB	2024-05-14 14:03:56	63.2 dB	2024-05-14 14:03:56
$LF_{(min)}$	44.7 dB	2024-05-14 13:59:55	58.4 dB	2024-05-14 13:59:21	61.6 dB	2024-05-14 14:03:55
$LI_{(min)}$	46.1 dB	2024-05-14 14:05:50	60.9 dB	2024-05-14 14:03:53	64.3 dB	2024-05-14 14:03:53
$L_{Peak(max)}$	94.1 dB	2024-05-14 14:01:34	98.9 dB	2024-05-14 14:09:54	105.3 dB	2024-05-14 13:57:24

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	68.9 dB
LAS 10.0	66.9 dB
LAS 33.3	62.0 dB
LAS 50.0	59.2 dB
LAS 66.6	56.3 dB
LAS 90.0	51.1 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.007	Computer's File Name	SLM_0002509_831_Data_
Meter	831		
Firmware	2.403		
User	GT		Location
Description	LBUSD Polytechnic High School Transformation		
Note	Located on South Side of School, near SE Corner of Science/Parking 250, approx 30 ft north of E 15th St CL		
Start Time	2024-05-14 14:14:23	Duration	0:15:00.0
End Time	2024-05-14 14:29:23	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	61.5 dB		
LAE	91.1 dB	SEA	--- dB
EA	142.9 µPa²h		
LZ_{peak}	106.6 dB	2024-05-14 14:22:29	
LAS_{max}	85.0 dB	2024-05-14 14:22:30	
LAS_{min}	44.2 dB	2024-05-14 14:24:38	
LA_{eq}	61.5 dB		
LC_{eq}	69.8 dB	LC_{eq} - LA_{eq}	8.2 dB
LAI_{eq}	66.0 dB	LAI_{eq} - LA_{eq}	4.4 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	11	0:00:58.2
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
61.5 dB	61.5 dB	0.0 dB

LDEN	LDay	LEve	LNight
61.5 dB	61.5 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	61.5 dB		69.8 dB		74.5 dB	
$LS_{(max)}$	85.0 dB	2024-05-14 14:22:30	93.0 dB	2024-05-14 14:22:30	93.9 dB	2024-05-14 14:14:24
$LF_{(max)}$	87.6 dB	2024-05-14 14:22:29	95.6 dB	2024-05-14 14:22:29	95.9 dB	2024-05-14 14:26:24
$LI_{(max)}$	88.4 dB	2024-05-14 14:22:29	96.7 dB	2024-05-14 14:22:29	99.1 dB	2024-05-14 14:26:24
$LS_{(min)}$	44.2 dB	2024-05-14 14:24:38	59.5 dB	2024-05-14 14:24:56	63.6 dB	2024-05-14 14:23:16
$LF_{(min)}$	43.2 dB	2024-05-14 14:24:38	58.1 dB	2024-05-14 14:24:54	61.8 dB	2024-05-14 14:24:57
$LI_{(min)}$	44.3 dB	2024-05-14 14:23:09	60.4 dB	2024-05-14 14:24:29	64.4 dB	2024-05-14 14:23:15
$L_{Peak(max)}$	98.3 dB	2024-05-14 14:22:29	106.6 dB	2024-05-14 14:22:29	106.6 dB	2024-05-14 14:22:29

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	65.1 dB
LAS 10.0	61.4 dB
LAS 33.3	52.8 dB
LAS 50.0	49.9 dB
LAS 66.6	48.1 dB
LAS 90.0	46.1 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.008	Computer's File Name	SLM_0002509_
Meter	831		
Firmware	2.403		
User	GT		Location
Description	LBUSD Polytechnic High School Transformation		
Note	Located west of Front Entrance to School, approximately 22 ft north of E 16th St CL and 65 ft west of Atlantic Ave CL		
Start Time	2024-05-14 14:32:45	Duration	0:15:00.0
End Time	2024-05-14 14:47:45	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	64.0 dB		
LAE	93.5 dB	SEA	--- dB
EA	248.5 µPa²h		
LZ_{peak}	102.8 dB	2024-05-14 14:35:41	
LAS_{max}	79.9 dB	2024-05-14 14:45:24	
LAS_{min}	49.2 dB	2024-05-14 14:43:11	
LA_{eq}	64.0 dB		
LC_{eq}	72.3 dB	LC_{eq} - LA_{eq}	8.3 dB
LAI_{eq}	67.0 dB	LAI_{eq} - LA_{eq}	3.0 dB

Exceedances	Count	Duration
LAS > 65.0 dB	29	0:04:45.4
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	64.0 dB	64.0 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	64.0 dB	64.0 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	64.0 dB		72.3 dB		77.5 dB	
$LS_{(max)}$	79.9 dB	2024-05-14 14:45:24	91.4 dB	2024-05-14 14:45:24	93.0 dB	2024-05-14 14:32:45
$LF_{(max)}$	86.8 dB	2024-05-14 14:43:27	94.7 dB	2024-05-14 14:45:24	98.9 dB	2024-05-14 14:35:41
$LI_{(max)}$	89.0 dB	2024-05-14 14:43:27	95.6 dB	2024-05-14 14:45:24	101.1 dB	2024-05-14 14:35:41
$LS_{(min)}$	49.2 dB	2024-05-14 14:43:11	61.6 dB	2024-05-14 14:47:07	64.4 dB	2024-05-14 14:47:06
$LF_{(min)}$	48.2 dB	2024-05-14 14:44:57	60.1 dB	2024-05-14 14:47:06	62.6 dB	2024-05-14 14:47:06
$LI_{(min)}$	48.9 dB	2024-05-14 14:44:58	62.0 dB	2024-05-14 14:47:06	65.1 dB	2024-05-14 14:47:06
$L_{Peak(max)}$	96.6 dB	2024-05-14 14:43:27	101.5 dB	2024-05-14 14:45:24	102.8 dB	2024-05-14 14:35:41

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	68.6 dB
LAS 10.0	67.3 dB
LAS 33.3	63.8 dB
LAS 50.0	61.5 dB
LAS 66.6	58.8 dB
LAS 90.0	52.2 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.009	Computer's File Name	SLM_0002509_831_Data_009.00.ldbin
Meter	831		
Firmware	2.403		
User	GT	Location	
Description	LBUSD Polytechnic High School Transformation		
Note	Located on north side of Building 800, approximately 12 ft north of Jackrabbit Ln CL		
Start Time	2024-05-14 14:51:44	Duration	0:15:00.0
End Time	2024-05-14 15:06:44	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	58.2 dB		
LAE	87.8 dB	SEA	--- dB
EA	66.6 µPa²h		
LZ_{peak}	107.6 dB	2024-05-14 14:55:24	
LAS_{max}	77.1 dB	2024-05-14 14:58:59	
LAS_{min}	49.7 dB	2024-05-14 15:02:53	
LA_{eq}	58.2 dB		
LC_{eq}	69.5 dB	LC_{eq} - LA_{eq}	11.3 dB
LAI_{eq}	62.6 dB	LAI_{eq} - LA_{eq}	4.3 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	9	0:00:29.1
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
58.2 dB	58.2 dB	0.0 dB

LDEN	LDay	LEve	LNight
58.2 dB	58.2 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	58.2 dB		69.5 dB		73.7 dB	
$LS_{(max)}$	77.1 dB	2024-05-14 14:58:59	84.7 dB	2024-05-14 14:55:24	93.2 dB	2024-05-14 14:51:45
$LF_{(max)}$	80.0 dB	2024-05-14 14:58:50	92.1 dB	2024-05-14 14:55:24	96.7 dB	2024-05-14 14:51:45
$LI_{(max)}$	80.9 dB	2024-05-14 15:00:49	96.2 dB	2024-05-14 14:55:24	100.5 dB	2024-05-14 14:55:24
$LS_{(min)}$	49.7 dB	2024-05-14 15:02:53	63.4 dB	2024-05-14 15:04:39	66.5 dB	2024-05-14 15:04:39
$LF_{(min)}$	49.2 dB	2024-05-14 15:02:51	61.4 dB	2024-05-14 15:03:10	64.1 dB	2024-05-14 14:53:48
$LI_{(min)}$	49.3 dB	2024-05-14 15:02:51	63.5 dB	2024-05-14 15:02:57	67.5 dB	2024-05-14 14:52:52
$L_{Peak(max)}$	92.2 dB	2024-05-14 14:55:24	104.8 dB	2024-05-14 14:55:24	107.6 dB	2024-05-14 14:55:24

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	62.9 dB
LAS 10.0	60.5 dB
LAS 33.3	55.1 dB
LAS 50.0	53.5 dB
LAS 66.6	52.5 dB
LAS 90.0	51.2 dB

Measurement Report

Report Summary

Meter's File Name	831_Data.010	Computer's File Name	SLM_0002509_831_Data_010.00.ldbin
Meter	831		
Firmware	2.403		
User	GT	Location	
Description	LBUSD Polytechnic High School Transformation		
Note	Located near NW corner of School, approximately 105 ft west of Baseball field		
Start Time	2024-05-14 15:10:30	Duration	0:15:00.0
End Time	2024-05-14 15:25:30	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	52.9 dB		
LAE	82.5 dB	SEA	--- dB
EA	19.6 µPa²h		
LZ_{peak}	101.9 dB	2024-05-14 15:10:30	
LAS_{max}	73.0 dB	2024-05-14 15:19:45	
LAS_{min}	45.5 dB	2024-05-14 15:16:41	
LA_{eq}	52.9 dB		
LC_{eq}	65.6 dB	LC_{eq} - LA_{eq}	12.7 dB
LAI_{eq}	57.9 dB	LAI_{eq} - LA_{eq}	5.0 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	1	0:00:02.7
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
52.9 dB	52.9 dB	0.0 dB

LDEN	LDay	LEve	LNight
52.9 dB	52.9 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	52.9 dB		65.6 dB		72.9 dB	
$LS_{(max)}$	73.0 dB	2024-05-14 15:19:45	76.6 dB	2024-05-14 15:19:45	91.7 dB	2024-05-14 15:10:30
$LF_{(max)}$	79.5 dB	2024-05-14 15:19:45	81.7 dB	2024-05-14 15:19:44	96.7 dB	2024-05-14 15:10:30
$LI_{(max)}$	81.8 dB	2024-05-14 15:19:45	85.3 dB	2024-05-14 15:19:44	99.5 dB	2024-05-14 15:10:30
$LS_{(min)}$	45.5 dB	2024-05-14 15:16:41	60.6 dB	2024-05-14 15:16:45	64.6 dB	2024-05-14 15:16:43
$LF_{(min)}$	44.8 dB	2024-05-14 15:16:40	58.2 dB	2024-05-14 15:14:17	62.0 dB	2024-05-14 15:14:16
$LI_{(min)}$	45.3 dB	2024-05-14 15:14:20	61.9 dB	2024-05-14 15:25:22	65.2 dB	2024-05-14 15:10:43
$L_{Peak(max)}$	93.4 dB	2024-05-14 15:19:45	93.4 dB	2024-05-14 15:19:45	101.9 dB	2024-05-14 15:10:30

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	57.5 dB
LAS 10.0	55.3 dB
LAS 33.3	52.0 dB
LAS 50.0	50.5 dB
LAS 66.6	49.2 dB
LAS 90.0	47.7 dB

APPENDIX C

RCNM Model Construction Noise Calculations

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Demolition

				---- Receptor #1 ----
		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Hotel to North	Commercial	52.9	52.9	52.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	235	0
Dozer	No	40		81.7	235	0
Dozer	No	40		81.7	235	0
Excavator	No	40		80.7	235	0
Excavator	No	40		80.7	235	0
Excavator	No	40		80.7	235	0

			Results			
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Concrete Saw	76.1	69.1	N/A	N/A	N/A	N/A
Dozer	68.2	64.2	N/A	N/A	N/A	N/A
Dozer	68.2	64.2	N/A	N/A	N/A	N/A
Excavator	67.3	63.3	N/A	N/A	N/A	N/A
Excavator	67.3	63.3	N/A	N/A	N/A	N/A
Excavator	67.3	63.3	N/A	N/A	N/A	N/A
Total	**76**	**73**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Demolition

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to North	Residential	58.2	58.2	58.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	85	5
Dozer	No	40		81.7	85	5
Dozer	No	40		81.7	85	5
Excavator	No	40		80.7	85	5
Excavator	No	40		80.7	85	5
Excavator	No	40		80.7	85	5

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Concrete Saw	80.0	73.0	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A
Excavator	71.1	67.1	N/A	N/A	N/A	N/A
Excavator	71.1	67.1	N/A	N/A	N/A	N/A
Excavator	71.1	67.1	N/A	N/A	N/A	N/A
Total	**80**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Demolition

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Church to East	Commercial	61.6	61.6	61.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	265	0
Dozer	No	40		81.7	265	0
Dozer	No	40		81.7	265	0
Excavator	No	40		80.7	265	0
Excavator	No	40		80.7	265	0
Excavator	No	40		80.7	265	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Concrete Saw		75.1	68.1	N/A	N/A	N/A	N/A
Dozer		67.2	63.2	N/A	N/A	N/A	N/A
Dozer		67.2	63.2	N/A	N/A	N/A	N/A
Excavator		66.2	62.2	N/A	N/A	N/A	N/A
Excavator		66.2	62.2	N/A	N/A	N/A	N/A
Excavator		66.2	62.2	N/A	N/A	N/A	N/A
	Total	**75**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Demolition

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to South	Residential	61.5	61.5	61.5

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	140	0
Dozer	No	40		81.7	140	0
Dozer	No	40		81.7	140	0
Excavator	No	40		80.7	140	0
Excavator	No	40		80.7	140	0
Excavator	No	40		80.7	140	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Concrete Saw		80.6	73.6	N/A	N/A	N/A	N/A
Dozer		72.7	68.7	N/A	N/A	N/A	N/A
Dozer		72.7	68.7	N/A	N/A	N/A	N/A
Excavator		71.8	67.8	N/A	N/A	N/A	N/A
Excavator		71.8	67.8	N/A	N/A	N/A	N/A
Excavator		71.8	67.8	N/A	N/A	N/A	N/A
	Total	**81**	**78**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Demolition

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
MFHs to West	Residential	64.0	64.0	64.0

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	290	0
Dozer	No	40		81.7	290	0
Dozer	No	40		81.7	290	0
Excavator	No	40		80.7	290	0
Excavator	No	40		80.7	290	0
Excavator	No	40		80.7	290	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Concrete Saw		74.3	67.3	N/A	N/A	N/A	N/A
Dozer		66.4	62.4	N/A	N/A	N/A	N/A
Dozer		66.4	62.4	N/A	N/A	N/A	N/A
Excavator		65.4	61.5	N/A	N/A	N/A	N/A
Excavator		65.4	61.5	N/A	N/A	N/A	N/A
Excavator		65.4	61.5	N/A	N/A	N/A	N/A
	Total	**74**	**71**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Site Preparation

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Hotel to North	Commercial	52.9	52.9	52.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	235	0
Dozer	No	40		81.7	235	0
Dozer	No	40		81.7	235	0
Backhoe	No	40		77.6	235	0
Front End Loader	No	40		79.1	235	0
Tractor	No	40	84		235	0
Tractor	No	40	84		235	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Dozer	68.2	64.2	N/A	N/A	N/A	N/A
Dozer	68.2	64.2	N/A	N/A	N/A	N/A
Dozer	68.2	64.2	N/A	N/A	N/A	N/A
Backhoe	64.1	60.1	N/A	N/A	N/A	N/A
Front End Loader	65.7	61.7	N/A	N/A	N/A	N/A
Tractor	70.6	66.6	N/A	N/A	N/A	N/A
Tractor	70.6	66.6	N/A	N/A	N/A	N/A
Total	**71**	**73**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Site Preparation

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to North	Residential	58.2	58.2	58.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40.0		81.7	85	5
Dozer	No	40.0		81.7	85	5
Dozer	No	40.0		81.7	85	5
Backhoe	No	40		77.6	85	5
Front End Loader	No	40		79.1	85	5
Tractor	No	40	84		85	5
Tractor	No	40	84		85	5

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Dozer	72.1	68.1	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A
Dozer	72.1	68.1	N/A	N/A	N/A	N/A
Backhoe	68.0	64.0	N/A	N/A	N/A	N/A
Front End Loader	69.5	65.5	N/A	N/A	N/A	N/A
Tractor	74.4	70.4	N/A	N/A	N/A	N/A
Tractor	74.4	70.4	N/A	N/A	N/A	N/A
Total	**74**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Site Preparation

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Church to East	Commercial	61.6	61.6	61.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	265	0
Dozer	No	40		81.7	265	0
Dozer	No	40		81.7	265	0
Backhoe	No	40		77.6	265	0
Front End Loader	No	40		79.1	265	0
Tractor	No	40	84		265	0
Tractor	No	40	84		265	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Dozer	67.2	63.2	N/A	N/A	N/A	N/A
Dozer	67.2	63.2	N/A	N/A	N/A	N/A
Dozer	67.2	63.2	N/A	N/A	N/A	N/A
Backhoe	63.1	59.1	N/A	N/A	N/A	N/A
Front End Loader	64.6	60.6	N/A	N/A	N/A	N/A
Tractor	69.5	65.5	N/A	N/A	N/A	N/A
Tractor	69.5	65.5	N/A	N/A	N/A	N/A
Total	**70**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Site Preparation

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to South	Residential	61.5	61.5	61.5

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	140	0
Dozer	No	40		81.7	140	0
Dozer	No	40		81.7	140	0
Backhoe	No	40		77.6	140	0
Front End Loader	No	40		79.1	140	0
Tractor	No	40	84		140	0
Tractor	No	40	84		140	0

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Dozer	72.7	68.7	N/A	N/A	N/A	N/A
Dozer	72.7	68.7	N/A	N/A	N/A	N/A
Dozer	72.7	68.7	N/A	N/A	N/A	N/A
Backhoe	68.6	64.6	N/A	N/A	N/A	N/A
Front End Loader	70.2	66.2	N/A	N/A	N/A	N/A
Tractor	75.1	71.1	N/A	N/A	N/A	N/A
Tractor	75.1	71.1	N/A	N/A	N/A	N/A
Total	**75**	**77**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Site Preparation

---- Receptor #5 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to West	Residential	64.0	64.0	64.0

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	290	0
Dozer	No	40		81.7	290	0
Dozer	No	40		81.7	290	0
Backhoe	No	40		77.6	290	0
Front End Loader	No	40		79.1	290	0
Tractor	No	40	84		290	0
Tractor	No	40	84		290	0

		Calculated (dBA)		Results Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Dozer		66.4	62.4	N/A	N/A	N/A	N/A
Dozer		66.4	62.4	N/A	N/A	N/A	N/A
Dozer		66.4	62.4	N/A	N/A	N/A	N/A
Backhoe		62.3	58.3	N/A	N/A	N/A	N/A
Front End Loader		63.8	59.9	N/A	N/A	N/A	N/A
Tractor		68.7	64.8	N/A	N/A	N/A	N/A
Tractor		68.7	64.8	N/A	N/A	N/A	N/A
	Total	**69**	**71**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Hotel to North	Commercial	52.9	52.9	52.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	235	0
Excavator	No	40		80.7	235	0
Grader	No	40	85		235	0
Dozer	No	40		81.7	235	0
Scraper	No	40		83.6	235	0
Scraper	No	40		83.6	235	0
Front End Loader	No	40		79.1	235	0
Tractor	No	40	84		235	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Excavator	67.3	63.3	N/A	N/A	N/A	N/A
Excavator	67.3	63.3	N/A	N/A	N/A	N/A
Grader	71.6	67.6	N/A	N/A	N/A	N/A
Dozer	68.2	64.2	N/A	N/A	N/A	N/A
Scraper	70.1	66.2	N/A	N/A	N/A	N/A
Scraper	70.1	66.2	N/A	N/A	N/A	N/A
Front End Loader	65.7	61.7	N/A	N/A	N/A	N/A
Tractor	70.6	66.6	N/A	N/A	N/A	N/A
Total	**72**	**74**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Grading

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to North	Residential	58.2	58.2	58.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	85	5
Excavator	No	40		80.7	85	5
Grader	No	40	85		85	5
Dozer	No	40		81.7	85	5
Scraper	No	40		83.6	85	5
Scraper	No	40		83.6	85	5
Front End Loader	No	40		79.1	85	5
Tractor	No	40	84		85	5

		Calculated (dBA)		Results Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Excavator		71.1	67.1	N/A	N/A	N/A	N/A
Excavator		71.1	67.1	N/A	N/A	N/A	N/A
Grader		75.4	71.4	N/A	N/A	N/A	N/A
Dozer		72.1	68.1	N/A	N/A	N/A	N/A
Scraper		74.0	70.0	N/A	N/A	N/A	N/A
Scraper		74.0	70.0	N/A	N/A	N/A	N/A
Front End Loader		69.5	65.5	N/A	N/A	N/A	N/A
Tractor		74.4	70.4	N/A	N/A	N/A	N/A
	Total	**75**	**78**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Grading

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Church to East	Commercial	61.6	61.6	61.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	265	0
Excavator	No	40		80.7	265	0
Grader	No	40	85		265	0
Dozer	No	40		81.7	265	0
Scraper	No	40		83.6	265	0
Scraper	No	40		83.6	265	0
Front End Loader	No	40		79.1	265	0
Tractor	No	40	84		265	0

	Results					
	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Excavator	66.2	62.2	N/A	N/A	N/A	N/A
Excavator	66.2	62.2	N/A	N/A	N/A	N/A
Grader	70.5	66.5	N/A	N/A	N/A	N/A
Dozer	67.2	63.2	N/A	N/A	N/A	N/A
Scraper	69.1	65.1	N/A	N/A	N/A	N/A
Scraper	69.1	65.1	N/A	N/A	N/A	N/A
Front End Loader	64.6	60.6	N/A	N/A	N/A	N/A
Tractor	69.5	65.5	N/A	N/A	N/A	N/A
Total	**71**	**73**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Grading

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to South	Residential	61.5	61.5	61.5

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	140	0
Excavator	No	40		80.7	140	0
Grader	No	40	85		140	0
Dozer	No	40		81.7	140	0
Scraper	No	40		83.6	140	0
Scraper	No	40		83.6	140	0
Front End Loader	No	40		79.1	140	0
Tractor	No	40	84		140	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Excavator		71.8	67.8	N/A	N/A	N/A	N/A
Excavator		71.8	67.8	N/A	N/A	N/A	N/A
Grader		76.1	72.1	N/A	N/A	N/A	N/A
Dozer		72.7	68.7	N/A	N/A	N/A	N/A
Scraper		74.6	70.7	N/A	N/A	N/A	N/A
Scraper		74.6	70.7	N/A	N/A	N/A	N/A
Front End Loader		70.2	66.2	N/A	N/A	N/A	N/A
Tractor		75.1	71.1	N/A	N/A	N/A	N/A
	Total	**76**	**79**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Grading

---- Receptor #5 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to West	Residential	64.0	64.0	64.0

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	290	0
Excavator	No	40		80.7	290	0
Grader	No	40	85		290	0
Dozer	No	40		81.7	290	0
Scraper	No	40		83.6	290	0
Scraper	No	40		83.6	290	0
Front End Loader	No	40		79.1	290	0
Tractor	No	40	84		290	0

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Excavator	65.4	61.5	N/A	N/A	N/A	N/A
Excavator	65.4	61.5	N/A	N/A	N/A	N/A
Grader	69.7	65.8	N/A	N/A	N/A	N/A
Dozer	66.4	62.4	N/A	N/A	N/A	N/A
Scraper	68.3	64.3	N/A	N/A	N/A	N/A
Scraper	68.3	64.3	N/A	N/A	N/A	N/A
Front End Loader	63.8	59.9	N/A	N/A	N/A	N/A
Tractor	68.7	64.8	N/A	N/A	N/A	N/A
Total	**70**	**73**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Hotel to North	Commercial	52.9	52.9	52.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	235	0
Gradall	No	40		83.4	235	0
Gradall	No	40		83.4	235	0
Gradall	No	40		83.4	235	0
Generator	No	50		80.6	235	0
Backhoe	No	40		77.6	235	0
Front End Loader	No	40		79.1	235	0
Tractor	No	40	84		235	0
Welder / Torch	No	40		74	235	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Crane	67.1	59.1	N/A	N/A	N/A	N/A
Gradall	70.0	66.0	N/A	N/A	N/A	N/A
Gradall	70.0	66.0	N/A	N/A	N/A	N/A
Gradall	70.0	66.0	N/A	N/A	N/A	N/A
Generator	67.2	64.2	N/A	N/A	N/A	N/A
Backhoe	64.1	60.1	N/A	N/A	N/A	N/A
Front End Loader	65.7	61.7	N/A	N/A	N/A	N/A
Tractor	70.6	66.6	N/A	N/A	N/A	N/A
Welder / Torch	60.6	56.6	N/A	N/A	N/A	N/A
Total	**71**	**74**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Building Construction

---- Receptor #2 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to North	Residential	58.2	58.2	58.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	85	5
Gradall	No	40		83.4	85	5
Gradall	No	40		83.4	85	5
Gradall	No	40		83	85	5
Generator	No	50		81	85	5
Backhoe	No	40		78	85	5
Front End Loader	No	40		79.1	85	5
Tractor	No	40	84		85	5
Welder / Torch	No	40		74	85	0

	Calculated (dBA)		Results Noise Limits (dBA)			
			Day		Evening	
Equipment	***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Crane	70.9	63.0	N/A	N/A	N/A	N/A
Gradall	73.8	69.8	N/A	N/A	N/A	N/A
Gradall	73.8	69.8	N/A	N/A	N/A	N/A
Gradall	73.8	69.8	N/A	N/A	N/A	N/A
Generator	71.0	68.0	N/A	N/A	N/A	N/A
Backhoe	68.0	64.0	N/A	N/A	N/A	N/A
Front End Loader	69.5	65.5	N/A	N/A	N/A	N/A
Tractor	74.4	70.4	N/A	N/A	N/A	N/A
Welder / Torch	69.4	65.4	N/A	N/A	N/A	N/A
Total	**74**	**78**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Building Construction

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Church to East	Commercial	61.6	61.6	61.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	265	0
Gradall	No	40		83.4	265	0
Gradall	No	40		83.4	265	0
Gradall	No	40		83.4	265	0
Generator	No	50		80.6	265	0
Backhoe	No	40		77.6	265	0
Front End Loader	No	40		79.1	265	0
Tractor	No	40	84		265	0
Welder / Torch	No	40		74	265	0

Equipment		Calculated (dBA) *Lmax	Leq	Results Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Crane		66.1	58.1	N/A	N/A	N/A	N/A
Gradall		68.9	64.9	N/A	N/A	N/A	N/A
Gradall		68.9	64.9	N/A	N/A	N/A	N/A
Gradall		68.9	64.9	N/A	N/A	N/A	N/A
Generator		66.1	63.1	N/A	N/A	N/A	N/A
Backhoe		63.1	59.1	N/A	N/A	N/A	N/A
Front End Loader		64.6	60.6	N/A	N/A	N/A	N/A
Tractor		69.5	65.5	N/A	N/A	N/A	N/A
Welder / Torch		59.5	55.5	N/A	N/A	N/A	N/A
	Total	**70**	**73**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Building Construction

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
MFHs to South	Residential	61.5	61.5	61.5

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	140	0
Gradall	No	40		83.4	140	0
Gradall	No	40		83.4	140	0
Gradall	No	40		83.4	140	0
Generator	No	50		80.6	140	0
Backhoe	No	40		77.6	140	0
Front End Loader	No	40		79.1	140	0
Tractor	No	40	84		140	0
Welder / Torch	No	40		74	140	0

Equipment		Results Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Crane		71.6	63.6	N/A	N/A	N/A	N/A
Gradall		74.5	70.5	N/A	N/A	N/A	N/A
Gradall		74.5	70.5	N/A	N/A	N/A	N/A
Gradall		74.5	70.5	N/A	N/A	N/A	N/A
Generator		71.7	68.7	N/A	N/A	N/A	N/A
Backhoe		68.6	64.6	N/A	N/A	N/A	N/A
Front End Loader		70.2	66.2	N/A	N/A	N/A	N/A
Tractor		75.1	71.1	N/A	N/A	N/A	N/A
Welder / Torch		65.1	61.1	N/A	N/A	N/A	N/A
	Total	**75**	**78**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Building Construction

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
MFHs to West	Residential	64.0	64.0	64.0

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	290	0
Gradall	No	40		83.4	290	0
Gradall	No	40		83.4	290	0
Gradall	No	40		83.4	290	0
Generator	No	50		80.6	290	0
Backhoe	No	40		77.6	290	0
Front End Loader	No	40		79.1	290	0
Tractor	No	40	84		290	0
Welder / Torch	No	40		74	290	0

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Crane	65.3	57.3	N/A	N/A	N/A	N/A
Gradall	68.1	64.2	N/A	N/A	N/A	N/A
Gradall	68.1	64.2	N/A	N/A	N/A	N/A
Gradall	68.1	64.2	N/A	N/A	N/A	N/A
Generator	65.4	62.4	N/A	N/A	N/A	N/A
Backhoe	62.3	58.3	N/A	N/A	N/A	N/A
Front End Loader	63.8	59.9	N/A	N/A	N/A	N/A
Tractor	68.7	64.8	N/A	N/A	N/A	N/A
Welder / Torch	58.7	54.8	N/A	N/A	N/A	N/A
Total	**69**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Hotel to North	Commercial	52.9	52.9	52.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	235	0
Paver	No	50		77.2	235	0
Paver	No	50		77.2	235	0
Paver	No	50		77.2	235	0
Roller	No	20		80	235	0
Roller	No	20		80	235	0

Equipment	Calculated (dBA) *Lmax	Leq	Results Day Lmax	Noise Limits (dBA) Day Leq	Evening Lmax	Evening Leq
Paver	63.8	60.8	N/A	N/A	N/A	N/A
Paver	63.8	60.8	N/A	N/A	N/A	N/A
Paver	63.8	60.8	N/A	N/A	N/A	N/A
Paver	63.8	60.8	N/A	N/A	N/A	N/A
Roller	66.6	59.6	N/A	N/A	N/A	N/A
Roller	66.6	59.6	N/A	N/A	N/A	N/A
Total	**67**	**68**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Paving

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
MFHs to North	Residential	58.2	58.2	58.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	85	5
Paver	No	50		77.2	85	5
Paver	No	50		77.2	85	5
Paver	No	50		77.2	85	5
Roller	No	20		80	85	5
Roller	No	20		80	85	5

		Calculated (dBA)		Results Noise Limits (dBA) Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Paver		67.6	64.6	N/A	N/A	N/A	N/A
Paver		67.6	64.6	N/A	N/A	N/A	N/A
Paver		67.6	64.6	N/A	N/A	N/A	N/A
Paver		67.6	64.6	N/A	N/A	N/A	N/A
Roller		70.4	63.4	N/A	N/A	N/A	N/A
Roller		70.4	63.4	N/A	N/A	N/A	N/A
	Total	**70**	**72**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Paving

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Church to East	Commercial	61.6	61.6	61.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	265	0
Paver	No	50		77.2	265	0
Paver	No	50		77.2	265	0
Paver	No	50		77.2	265	0
Roller	No	20		80	265	0
Roller	No	20		80	265	0

		Calculated (dBA)		Results Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Paver		62.7	59.7	N/A	N/A	N/A	N/A
Paver		62.7	59.7	N/A	N/A	N/A	N/A
Paver		62.7	59.7	N/A	N/A	N/A	N/A
Paver		62.7	59.7	N/A	N/A	N/A	N/A
Roller		65.5	58.5	N/A	N/A	N/A	N/A
Roller		65.5	58.5	N/A	N/A	N/A	N/A
	Total	**66**	**67**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Paving

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to South	Residential	61.5	61.5	61.5

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	140	0
Paver	No	50		77.2	140	0
Paver	No	50		77.2	140	0
Paver	No	50		77.2	140	0
Roller	No	20		80	140	0
Roller	No	20		80	140	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Paver		68.3	65.3	N/A	N/A	N/A	N/A
Paver		68.3	65.3	N/A	N/A	N/A	N/A
Paver		68.3	65.3	N/A	N/A	N/A	N/A
Paver		68.3	65.3	N/A	N/A	N/A	N/A
Roller		71.1	64.1	N/A	N/A	N/A	N/A
Roller		71.1	64.1	N/A	N/A	N/A	N/A
	Total	**71**	**73**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Paving

---- Receptor #5 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to West	Residential	64.0	64.0	64.0

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	290	0
Paver	No	50		77.2	290	0
Paver	No	50		77.2	290	0
Paver	No	50		77.2	290	0
Roller	No	20		80	290	0
Roller	No	20		80	290	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Paver		62.0	58.9	N/A	N/A	N/A	N/A
Paver		62.0	58.9	N/A	N/A	N/A	N/A
Paver		62.0	58.9	N/A	N/A	N/A	N/A
Paver		62.0	58.9	N/A	N/A	N/A	N/A
Roller		64.7	57.7	N/A	N/A	N/A	N/A
Roller		64.7	57.7	N/A	N/A	N/A	N/A
	Total	**65**	**66**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Painting

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Hotel to North	Commercial	52.9	52.9	52.9

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	235	0

		Calculated (dBA)		Results Noise Limits (dBA) Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Compressor (air)		64.2	60.2	N/A	N/A	N/A	N/A
	Total	**64**	**60**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
MFHs to North	Residential	58.2	58.2	58.2

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	85	5

		Calculated (dBA)		Results Noise Limits (dBA) Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Compressor (air)		68.1	64	N/A	N/A	N/A	N/A
	Total	**68**	**64**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Painting

---- Receptor #3 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Church to East	Commercial	61.6	61.6	61.6

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	265	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Compressor (air)		63.2	59.2	N/A	N/A	N/A	N/A
	Total	**63**	**59**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
MFHs to South	Residential	61.5	61.5	61.5

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	140	0

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Compressor (air)		68.7	64.7	N/A	N/A	N/A	N/A
	Total	**69**	**65**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/13/2025
Case Description: Poly HS Transformation - Painting

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
MFHs to West	Residential	64.0	64.0	64.0

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	290	0

		Results Calculated (dBA)		Noise Limits (dBA) Day		Evening	
Equipment		***Lmax**	**Leq**	Lmax	Leq	Lmax	Leq
Compressor (air)		62.4	58.4	N/A	N/A	N/A	N/A
	Total	**62**	**58**	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

APPENDIX D

Operational Reference Noise Measurements and Noise Barrier Calculations

General Information

Serial Number	02509
Model	831
Firmware Version	2.314
Filename	831_Data.001
User	GT
Job Description	LBCC 2041 Facilities Master Plan
Location	Approx 30 ft north of pool and 5 ft south of scoreboard
Measurement Description	
Start Time	Friday, 2018 March 30 12:24:51
Stop Time	Friday, 2018 March 30 12:34:52
Duration	00:10:00.5
Run Time	00:10:00.5
Pause	00:00:00.0
Pre Calibration	Friday, 2018 March 30 12:23:28
Post Calibration	None
Calibration Deviation	---

Note

Noise from swim meet at pool 30 ft from pool and 60 ft from loud speaker
76F, 29.91 in Hg, 51% hu, 2 mph wind, hazy sky

Overall Data

LAeq		71.8	dB
LASmax	2018 Mar 30 12:34:05	89.5	dB
LApeak (max)	2018 Mar 30 12:34:05	100.5	dB
LASmin	2018 Mar 30 12:32:15	56.5	dB
LCeq		73.2	dB
LAeq		71.8	dB
LCeq - LAeq		1.4	dB
LAIeq		78.1	dB
LAeq		71.8	dB
LAIeq - LAeq		6.2	dB
Ldn		71.8	dB
LDay 07:00-22:00		71.8	dB
LNight 22:00-07:00		---	dB
Lden		71.8	dB
LDay 07:00-19:00		71.8	dB
LEvening 19:00-22:00		---	dB
LNight 22:00-07:00		---	dB
LAE		99.6	dB
# Overloads		0	
Overload Duration		0.0	s
# OBA Overloads		0	
OBA Overload Duration		0.0	s

Statistics

LAS5.00	77.5	dBA
LAS10.00	75.3	dBA
LAS33.30	70.1	dBA
LAS50.00	67.6	dBA
LAS66.60	65.3	dBA
LAS90.00	62.4	dBA
LAS > 65.0 dB (Exceedence Counts / Duration)	28 / 489.8	s
LAS > 85.0 dB (Exceedence Counts / Duration)	2 / 2.8	s
LApeak > 135.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 137.0 dB (Exceedence Counts / Duration)	0 / 0.0	s
LApeak > 140.0 dB (Exceedence Counts / Duration)	0 / 0.0	s

Settings

RMS Weight	A Weighting	
Peak Weight	A Weighting	
Detector	Slow	
Preamp	PRM831	
Integration Method	Linear	
OBA Range	Low	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	Bin Max	
Gain	+0	dB
Under Range Limit	26.1	dB
Under Range Peak	75.8	dB
Noise Floor	17.0	dB
Overload	143.4	dB

1/1 Spectra

Freq. (Hz):	8.0	16.0	31.5	63.0	125	250	500	1k	2k	4k	8k	16k
LZeq	58.3	61.4	64.5	63.1	61.2	59.2	64.8	69.9	62.3	60.1	43.3	34.0
LZSmax	80.3	74.2	70.6	73.0	69.5	66.1	81.7	89.2	75.4	77.9	59.7	47.9
LZSmin	49.2	55.8	60.8	57.2	56.6	53.6	53.7	52.4	48.0	43.0	33.5	23.8

1/3 Spectra

Freq. (Hz):	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0
LZeq	52.9	54.4	53.8	56.2	57.5	56.5	60.5	61.7	53.2	53.9	55.6	61.5
LZSmax	73.7	77.7	69.9	70.3	71.4	69.4	65.9	68.2	62.5	60.4	65.8	72.8
LZSmin	40.5	39.9	43.6	48.1	49.2	50.1	56.1	57.5	47.9	48.5	51.3	53.5

Freq. (Hz):	100	125	160	200	250	315	400	500	630	800	1k	1.25k
LZeq	58.9	54.3	54.5	55.6	53.2	54.3	56.5	59.5	62.3	62.9	67.9	62.4
LZSmax	67.1	68.4	64.7	63.3	60.9	63.5	68.0	75.3	80.7	77.9	88.4	82.7
LZSmin	52.6	49.1	48.5	48.9	47.4	47.6	49.1	48.9	48.8	48.7	47.1	46.2

Freq. (Hz):	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	12.5k	16k	20k
LZeq	58.7	55.5	57.7	59.7	51.6	45.6	40.6	38.0	35.1	31.8	28.4	23.6
LZSmax	70.1	68.7	75.4	78.6	67.7	60.1	52.0	58.6	48.3	45.1	43.1	38.1
LZSmin	44.3	43.3	41.5	39.8	36.4	32.9	30.4	27.9	25.4	21.4	17.7	13.4

Calibration History

Preamp	Date	dB re. 1V/Pa
PRM831	30 Mar 2018 12:23:25	-25.8
PRM831	07 Mar 2018 13:40:34	-25.8
PRM831	28 Feb 2018 12:16:10	-25.9
PRM831	30 Jan 2018 23:18:32	-26.2
PRM831	30 Jan 2018 13:42:45	-26.2
PRM831	30 Jan 2018 13:32:25	-26.0
PRM831	30 Jan 2018 10:54:43	-26.0
PRM831	06 Jan 2018 13:07:04	-26.0
PRM831	19 Dec 2017 10:41:35	-25.5
PRM831	25 Oct 2017 08:21:25	-25.2
PRM831	11 Oct 2017 12:05:04	-25.5

Measurement Report

Report Summary

Meter's File Name	831_Data.004	Computer's File Name	SLM_0002509_831_Data_004.02.ldbin
Meter	831		
Firmware	2.314		
User	GT	Location	
Description	Riverside - The Motorcycle Company - Phase 3		
Note	On Roof - Approx 6 feet from HVAC Unit		
Start Time	2020-05-09 13:23:15	Duration	0:10:00.2
End Time	2020-05-09 13:33:15	Run Time	0:10:00.2
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	65.1 dB		
LAE	92.9 dB	SEA	--- dB
EA	214.7 µPa²h		
LZ_{peak}	106.4 dB	2020-05-09 13:25:40	
LAS_{max}	80.1 dB	2020-05-09 13:25:19	
LAS_{min}	55.1 dB	2020-05-09 13:30:14	
LA_{eq}	65.1 dB		
LC_{eq}	78.1 dB	LC_{eq} - LA_{eq}	13.0 dB
LAI_{eq}	68.9 dB	LAI_{eq} - LA_{eq}	3.8 dB

Exceedances	Count	Duration
LAS > 65.0 dB	16	0:02:46.5
LAS > 85.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	65.1 dB	65.1 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	65.1 dB	65.1 dB	--- dB	--- dB

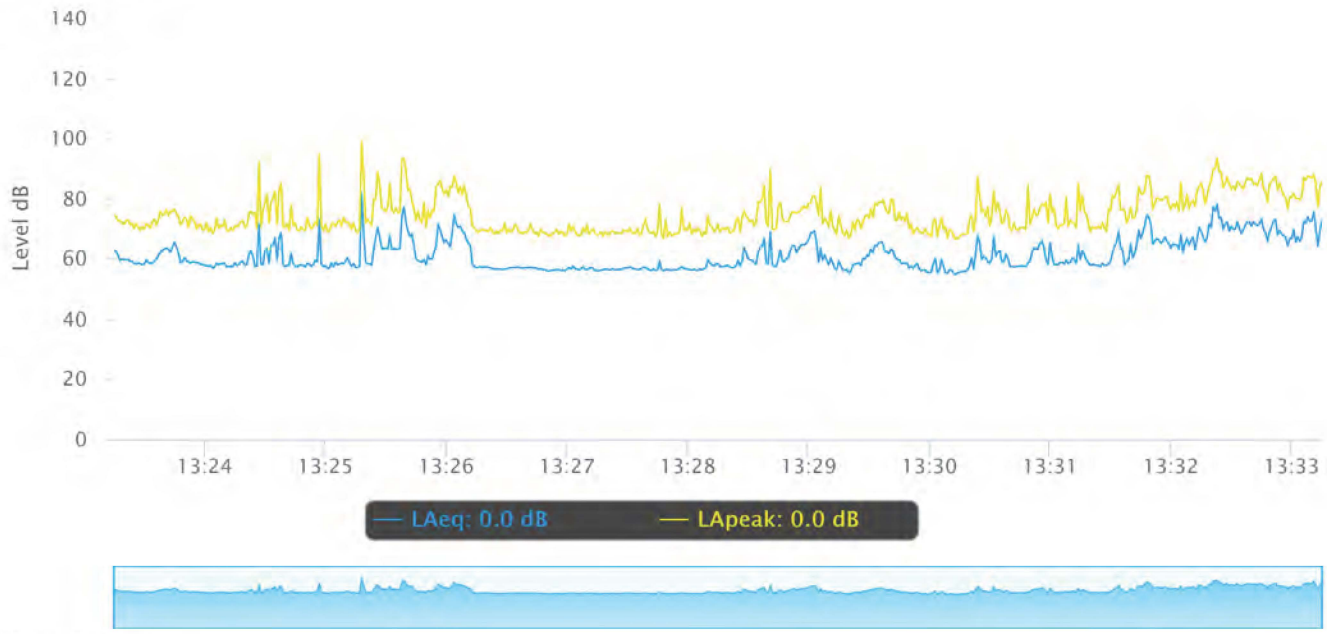
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	65.1 dB		78.1 dB		80.9 dB	
$LS_{(max)}$	80.1 dB	2020-05-09 13:25:19	91.6 dB	2020-05-09 13:26:05	97.4 dB	2020-05-09 13:23:15
$LF_{(max)}$	84.7 dB	2020-05-09 13:25:18	95.4 dB	2020-05-09 13:25:40	97.5 dB	2020-05-09 13:23:15
$LI_{(max)}$	86.7 dB	2020-05-09 13:25:18	97.5 dB	2020-05-09 13:25:40	99.6 dB	2020-05-09 13:23:15
$LS_{(min)}$	55.1 dB	2020-05-09 13:30:14	64.7 dB	2020-05-09 13:30:02	67.4 dB	2020-05-09 13:28:06
$LF_{(min)}$	54.3 dB	2020-05-09 13:30:13	63.0 dB	2020-05-09 13:30:12	65.8 dB	2020-05-09 13:27:31
$LI_{(min)}$	54.6 dB	2020-05-09 13:30:13	65.0 dB	2020-05-09 13:30:02	68.0 dB	2020-05-09 13:27:59
$L_{Peak(max)}$	98.9 dB	2020-05-09 13:25:18	105.7 dB	2020-05-09 13:25:40	106.4 dB	2020-05-09 13:25:40

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

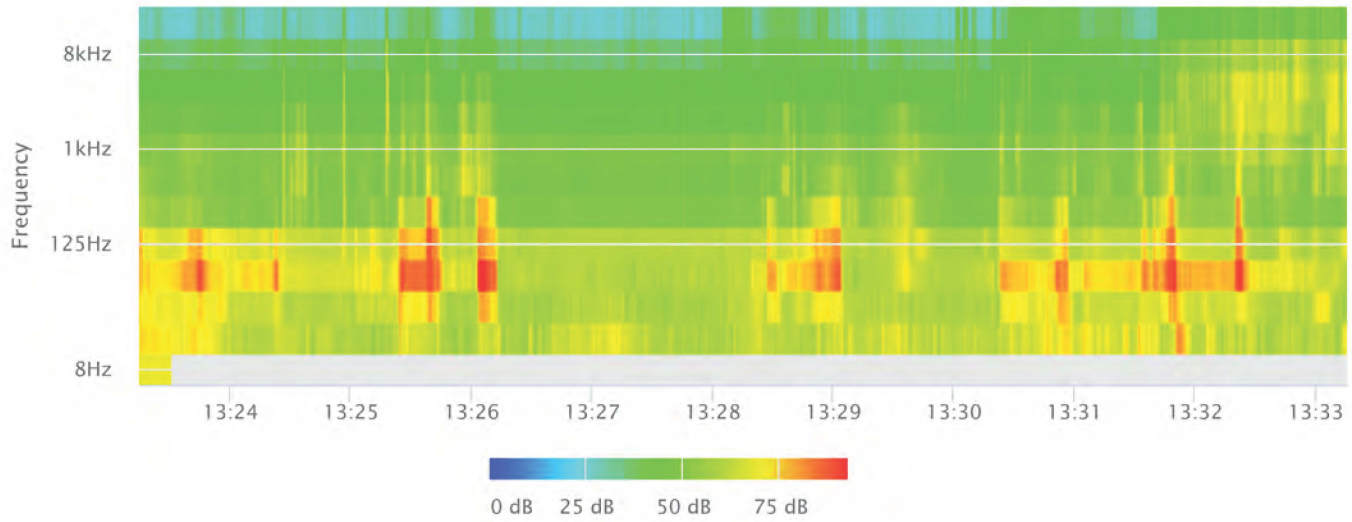
Statistics

LAS 5.0	71.5 dB
LAS 10.0	69.4 dB
LAS 33.3	62.7 dB
LAS 50.0	59.5 dB
LAS 66.6	58.1 dB
LAS 90.0	56.5 dB

Time History



OBA 1/1 Leq



Stationary Noise Calculations at Hotel North of Project Site

Stationary Noise Sources	Reference Measurement Distance	Reference Measurement Leq	Unmitigated Noise Level at Receptor Distance	Unmitigated Noise Level at Receptor Leq	1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Pool Activities - Swim Meet	30	71.8	740	44	(eq. N-2141.2 of TeNS)
Rooftop HVAC	6	65.1	530	26	

Stationary Noise Sources	Distance from Receptor to Barrier	Distance from source to Barrier	Height of Barrier (feet)	Without Wall Noise Level at Hotel	With Wall Noise Level at Hotel	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	line of sight (slope)	fresnel	Barrier Atten
Pool Activities - Swi	710	30	30	44	**25**	3	5	800	710.44	40.36	740.00	10.80	1	30.71	-18.814
Rooftop HVAC	520	10	30	26	**21**	30	5	800	520.60	10.00	530.59	0.01	1	0.00	-4.9

Combined Noise Levels with Barrier Attenuation **27 dBA Leq**

Stationary Noise Calculations at Multi-Family Homes North of Project Site

Stationary Noise Sources	Reference Measurement Distance	Reference Measurement Leq	Unmitigated Noise Level at Receptor Distance	Unmitigated Noise Level at Receptor Leq	1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Pool Activities - Swim Meet	30	71.8	370	50	(eq. N-2141.2 of TeNS)
Rooftop HVAC	6	65.1	130	38	

Stationary Noise Sources	Distance from Receptor to Barrier	Distance from source to Barrier	Height of Barrier (feet)	Without Wall Noise Level at MFHs	With Wall Noise Level at MFHs	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	line of sight (slope)	fresnel	Barrier Atten
Pool Activities - Swi	340	30	30	50	**31**	3	5	800	340.92	40.36	370.01	11.27	1	32.07	-18.841
Rooftop HVAC	100	30	30	38	**26**	30	5	800	103.08	30.00	132.38	0.70	1	1.98	-12.24

Combined Noise Levels with Barrier Attenuation **32 dBA Leq**

Stationary Noise Calculations at Church East of Project Site

Stationary Noise Sources	Reference Measurement Distance	Leq	Unmitigated Noise Level at Receptor Distance	Leq	1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Pool Activities - Swim Meet	30	71.8	780	44	(eq. N-2141.2 of TeNS)
Rooftop HVAC	6	65.1	560	26	

Stationary Noise Sources	Distance from Receptor to Barrier	Distance from source to Barrier	Height of Barrier (feet)	Without Wall Noise Level at Church	With Wall Noise Level at Church	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	line of sight (slope)	fresnel	Barrier Atten
Pool Activities - Swi	740	40	30	44	**25**	3	5	800	740.42	48.26	780.00	8.68	1	24.69	-18.534
Rooftop HVAC	550	10	30	26	**20**	30	5	800	550.57	10.00	560.56	0.01	1	0.03	-5.2

Combined Noise Levels with Barrier Attenuation **26 dBA Leq**

Stationary Noise Calculations at Mult-Family Homes South of Project Site

Stationary Noise Sources	Reference Measurement Distance	Reference Measurement Leq	Unmitigated Noise Level at Receptor Distance	Unmitigated Noise Level at Receptor Leq	1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
Pool Activities - Swim Meet	30	71.8	390	50	(eq. N-2141.2 of TeNS)
Rooftop HVAC	6	65.1	110	40	

Stationary Noise Sources	Distance from Receptor to Barrier	Distance from source to Barrier	Height of Barrier (feet)	Without Wall Noise Level at MFHs	With Wall Noise Level at MFHs	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	line of sight (slope)	fresnel	Barrier Atten
Pool Activities - Swi	370	20	30	50	**31**	3	5	800	370.84	33.60	390.01	14.44	1	41.07	-19.021
Rooftop HVAC	100	10	30	40	**30**	30	5	800	103.08	10.00	112.81	0.27	1	0.78	-9.58

Combined Noise Levels with Barrier Attenuation **33 dBA Leq**

Stationary Noise Calculations at Multi-Family Homes West of Project Site

Stationary Noise Sources	Reference Measurement Distance	Reference Measurement Leq	Unmitigated Noise Level at Receptor Distance	Unmitigated Noise Level at Receptor Leq
Pool Activities - Swim Meet	30	71.8	860	43
Rooftop HVAC	6	65.1	420	28

1 (Line Source: hard=0, soft=.5; Point Source: hard=1, soft=1.5)
(eq. N-2141.2 of TeNS)

Stationary Noise Sources	Distance from Receptor to Barrier	Distance from source to Barrier	Height of Barrier (feet)	Without Wall Noise Level at MFHs	With Wall Noise Level at MFHs	Source Height (feet)	Exterior Observer Height (feet)	Source Frequency (hz)	barrier to receiver - b (all)	source to barrier - a	source to receiver - c	path difference y =a+b-c (auto)	line of sight (slope)	fresnel	Barrier Atten
Pool Activities - Swi	610	250	30	43	**27**	3	5	800	610.51	251.45	860.00	1.96	1	5.59	-15.648
Rooftop HVAC	410	10	30	28	**23**	30	5	800	410.76	10.00	420.74	0.02	1	0.05	-5.5

Combined Noise Levels with Barrier Attenuation **28 dBA Leq**