MEMORANDUM

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Date: September 18, 2024

Subject: 810 Mission Avenue Project – Noise Technical Memorandum

PURPOSE

The purpose of this technical memorandum is to evaluate potential short- and long-term noise and groundborne vibration impacts resulting from the construction and operation of the proposed 810 Mission Avenue Project (project), located in the City of Oceanside (City), California.

PROJECT LOCATION

The project site is located in the western portion of Oceanside at 810 Mission Avenue (Assessor's Parcel Numbers [APNs] 760-186-3300 and 147-191-1100). The square-shaped site encompasses approximately 61,885 square feet bounded by Clementine Street to the north and northeast, Mission Avenue to the south and southeast, Nevada Street to the southwest and west, and Pier View Way to the northwest and north. The project site excludes the narrow, one-story office building lot situated at the corner of Mission Avenue and Clementine Street. Surrounding land uses generally consist of public/community facility, office, and commercial uses. Regional access to the site is provided via Interstate 5 (I-5) and State Route (SR-76). Local access to the site is provided via Mission Avenue, Clementine Street, Nevada Street, and Pier View Way.

EXISTING SITE CONDITIONS

The project site is currently developed with the North County Transit District (NCTD) Headquarters office building and associated parking lot. Access to the NCTD office building is provided along Mission Avenue and access to the surface parking lot is provided along Nevada Street and Clementine Street. According to the City of Oceanside Land Use and Zoning Map Viewer, the project site is designated Downtown (DT) and zoned Downtown, Subdistrict 2 (D-2)[1]. The D-2 zone provides for a financial center supported by

[1] City of Oceanside, *Land Use and Zoning Map Viewer*, https://oceanside.maps.arcgis.com/apps/webappviewer/index.html?id=b3f0000402044ca1a724f84dda988d0e&extent=-13069787.2898%2C3915650.637%2C-13046856.1813%2C3933919.0868%2C102100, accessed October 24, 2022.

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professional offices; residential uses are permitted, where appropriate, as part of mixed-use development projects.

PROJECT DESCRIPTION

The proposed project involves demolishing the existing NCTD Headquarters office building and surface parking lot and redeveloping the site into an approximately 323,647-square foot mixed-use development. The seven-story mixed-use building would include 206 multi-family units, 255 parking spaces, open space, as well as some indoor amenity areas distributed throughout the residential levels. The residential units would consist of 53 studios, 99 one-bedroom units, 40 two-bedroom units, nine three-bedroom units, and five live-work units. Of the 206 units, 31 units would be affordable low- and moderate-income households.

Open space proposed is comprised common outdoor space and private outdoor space. The open space amenities include common and private porches, patios, and courtyards. The proposed courtyard on the third level features a pool and spa and functions as the main common outdoor living area. Additionally, a seventh-floor amenity deck affords all residents and their guests a view of the Pacific Ocean. Private open space amenities include balconies for upper-level units and private patios for ground level units. An approximately 5,321-square foot solar zone is also proposed on the roof for future solar panel installation.

A total of 255 parking spaces would be accommodated with three levels of parking of which 1.5 levels would be subterranean parking. Specifically, parking spaces include 102 spaces (40 percent) reserved for electric vehicles (EVs), 17 spaces equipped with chargers, five accessible parking spaces, and one van accessible space. Further, the project would provide 42 bicycle parking spaces (one space per every five units) to support alternatives modes of travel by future residents.

The mixed-use building would have a maximum building height of 90 feet and would complement the downtown context as an urban housing mixed-use building on a single City block. Ground level dwelling units are oriented to the street while maintaining sufficient privacy with outdoor patios and landscaped setbacks.

Project construction activities would occur in one phase over approximately 31 months. Construction of the project would include the following: demolition, grading, building construction, paving, and architectural coating. Overall, approximately 41,000 cubic yards of cut would be exported off-site. It is anticipated that the project would be completed and operational in 2030.

FUNDAMENTALS OF SOUND AND ENVIRONMENTAL NOISE

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air and is characterized by both its amplitude and frequency (or pitch). The human ear does not hear all frequencies equally. In particular, the ear deemphasizes low and very high frequencies. To better approximate the sensitivity of human hearing, the A-weighted decibel scale (dBA) has been developed. Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is perceived to be twice as loud and 20 dBA higher is perceived to be four times as loud, and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). On this scale, the human range of hearing extends from approximately 3 dBA to around 140 dBA.

Noise is generally defined as unwanted or excessive sound, which can vary in intensity by over one million times within the range of human hearing; therefore, a logarithmic scale, known as the decibel scale (dB), is used to quantify sound intensity. Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks, and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Noise generated by mobile sources typically attenuates (is reduced) at a rate between 3 dBA and 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance. Noise generated by stationary sources typically attenuates at a rate between 6 dBA and about 7.5 dBA per doubling of distance.

There are several metrics used to characterize community noise exposure, which fluctuate constantly over time. One such metric, the equivalent sound level (L_{eq}), represents a constant sound that, over the specified period, has the same sound energy as the time-varying sound. Noise exposure over a longer period is often evaluated based on the Day-Night Sound Level (L_{dn}). This is a measure of 24-hour noise levels that incorporates a 10-dBA penalty for sounds occurring between 10:00 p.m. and 7:00 a.m. The penalty is intended to reflect the increased human sensitivity to noises occurring during nighttime hours, particularly at times when people are sleeping and there are lower ambient noise conditions. Typical L_{dn} noise levels for light and medium density residential areas range from 55 dBA to 65 dBA. Similarly, Community Noise Equivalent Level (CNEL) is a measure of 24-hour noise levels that incorporates a 5-dBA penalty for sounds occurring between 7:00 p.m. and 10:00 p.m. and a 10-dBA penalty for sounds occurring between 10:00 p.m. and 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. Noise levels described by L_{dn} and CNEL are similar and usually do not differ by more than 1 dBA. Additionally, the L_{max}, or maximum sound level, describes the highest sound level at a single event in which the sound level changes value as time goes on. Although L_{max} is important in evaluating an interference caused by a single noise event, L_{max} could not be totaled into a one-hour or a 24-hour cumulative measure of impact.

FUNDAMENTALS OF ENVIRONMENTAL GROUNDBORNE VIBRATION

Sources of earth-borne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 1, *Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels*, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Table 1
Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception.	Vibrations unlikely to cause damage of any type.
0.08	87	Vibrations readily perceptible.	Recommended upper level to which ruins and ancient monuments should be subjected.
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities.	Virtually no risk of architectural damage to normal buildings.
0.2	94	Vibrations may begin to annoy people in buildings.	Threshold at which there is a risk of architectural damage to normal dwellings.
0.4–0.6	98–104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges.	Architectural damage and possibly minor structural damage.

Source: California Department of Transportation, *Transportation Related Earthborne Vibrations*, 2002.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as pile driving and vibratory compacting activities which require the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per section (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

REGULATORY SETTING

State

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act, find that excessive noise is a serious hazard to public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. The act also finds that there is a continuous and increasing bombardment of noise in urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians that is free from noise that jeopardizes their health or welfare.

California Noise Insulation Standards (CCR Title 24, Part 2, Chapter 2-35)

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for multi-family residential buildings (Title 24, Part 2, California Code of Regulations). Title 24 establishes standards for interior room noise (attributable to outside noise sources). The regulations also specify that acoustical studies must be prepared whenever a multi-family residential building or structure is proposed to be located near an existing or adopted freeway route, expressway, parkway, major street, thoroughfare, rail line, rapid transit line, or industrial noise source, and where such noise source or sources create an exterior CNEL (or L_{dn}) of 60 dBA or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or L_{dn}) of at least 45 dBA.

Local

City of Oceanside

City of Oceanside General Plan

The *Oceanside General Plan* (General Plan) is the primary source of long-range planning and policy direction that will be used to guide growth and preserve the quality of life within the City of Oceanside. The City reformatted the General Plan in June 2002. The Noise Element for the City of Oceanside has been prepared by using the base information made available by the Comprehensive Planning Organization (CPO). The following goals and policies are applicable to the project:

Noise Element

Goal: To minimize the effects of excessive noise in the City of Oceanside.

Objective: To protect the residents and visitors to Oceanside from noise pollution. To improve the quality of Oceanside’s environment.

Policies:

- Noise level shall not be so loud as to cause danger to public health in all zones except manufacturing zones where noise levels maybe greater.
- Noise shall be controlled at the source where possible.
- Noise shall be intercepted by barriers or dissipated by space where the source cannot be controlled.
- Noise shall be reduced from structures by the use of soundproofing where other controls fail or are impractical.
- Noise levels shall be considered in the approval of any projects or activities, public or private, which requires a permit or other approval from the City.
- Noise levels shall be considered in any changes to the Land Use and Circulation Elements of the General Plan.
- Noise levels of City vehicles, construction equipment, and garbage trucks shall be reduced to acceptable levels.

The Noise Element of the General Plan establishes target maximum noise levels in the City. The City has adopted noise control ordinance using scientific methods to identify "noise" and noise sources and establishing enforcement provisions. Noise types are broken into seven categories: aircraft, motor vehicles, construction, noise amplification equipment, noise making apparatus, disturbers of the peace, human voice, and noise caused by animals. The following are suggested controls that are applicable to the project:

Construction Noise

1. *It should be unlawful for any person within any residential zone or 500 feet therefrom to operate any pile driver, power shovel, pneumatic, power hoist, or other construction equipment between 8 p.m. and 7 a.m. generating an ambient noise level of 50 dBA at any property line, unless an emergency exists.*
2. *It should be unlawful for any person to operate any construction at a level in excess of 85 dBA at 100 feet from the source.*
3. *It should be unlawful for any person to engage in construction activities between 6 p.m. and 7 a.m. when such activities exceed the ambient noise level by 5 dBA. A special permit may be granted by the Director of Public Work if extenuating circumstances exist.*

City of Oceanside Municipal Code

The Oceanside Municipal Code Chapter 38, *Noise Control* (also known as "Noise Control Ordinance"), establishes appropriate standards and procedures to ensure the accuracy of sound level measurements.

Section 38.12. – General sound level limits.

(a) Except for exempted activities and sounds as provided in this chapter or exempted properties as referenced in Section 38.15, it shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property in the applicable base district zone on which the sound is produced exceeds the applicable limits set forth below (Table 2, *Sound Level Limits (Decibels)*):

Table 2
Sound Level Limits (Decibels)

Base District Zone	7:00 a.m. to 9:59 p.m.	10:00 p.m. to 6:59 a.m.
(1) Residential Districts		
RE (Residential Estate)	50	45
RS (Single-Family)	50	45
RM (Medium Density)	50	45
RH (High Density)	55	50
RT (Residential Tourist)	55	50
(2) C (Commercial)	65	60
(3) I (Industrial)	70	65
(4) D (Downtown)	65	55
(5) A (Agricultural)	50	45
(6) OS (Open Space)	50	45
Sources: City of Oceanside, *City of Oceanside Code of Ordinance, Chapter 38 Noise Control, Sec. 38.12. – General sound level limits*, October 19, 2022.		

Section 38.15. – Exemptions for construction, maintenance or other public improvement activities by government agencies or public utilities.

Notwithstanding anything in this chapter to the contrary, the city manager, or the manager's designee, on a case-by-case basis, may authorize construction, maintenance or other public improvement activities by a government agency or a public utility, that exceed the noise, duration or hour of work limits established by this chapter, upon a determination that the authorization furthers the public interest.

Section 38.16. – General prohibition

It shall be unlawful for any person to make, continue, or cause to be made or continued, within the limits of the City of Oceanside, any disturbing, excessive, or offensive noise which causes discomfort or annoyance to reasonable person of normal sensitivity.

The following characteristics and conditions shall be considered in determining whether there exists a violation of the general prohibition of this section:

1) The level of noise;
2) Whether the nature of the noise is usual or unusual;
3) The level of background noise;
4) The time of day or night that noise occurs;
5) The duration of the noise;
6) Whether the noise is recurrent, intermittent, or constant.

It shall be rebuttably presumed that any noise which complies with the area sound level limits prescribed by Section 38.12 is not in violation of the general prohibition of this section.

Section 38.17. – Specific noises prohibited.

Notwithstanding the rebuttable presumption referenced in section 38.16, the following acts are declared to cause disturbing, excessive, or offense noise in violation of this article although such enumeration shall not be deemed to be exclusive:

h) Pile drivers, hammers, etc. The operation between the hours of 10:00 p.m. and 7:00 a.m. of any pneumatic or air hammer, pile driver, steam shovel, derrick, steam, or electric hoist, parking lot cleaning equipment or other appliance, the use of which is attended by loud or unusual noise.

City of Oceanside Engineering Design Manual

The City of Oceanside Engineering Design Manual (EDM) serves to establish procedures and minimum standards for various plans and documents submitted to and processed by the Engineering Department. The standards presented in the manual govern the processing of subdivision maps and related documents as well as public and private improvement and grading plans. Based on the EDM, construction is normally limited to the hours between 7:00 a.m. and 6:00 p.m., Monday through Friday.

EXISTING NOISE SETTING

Noise Sensitive Receptors

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The nearest sensitive receptors to the project site are single-family residences across Clementine Street, located approximately 60 feet to the northeast of the project boundary.

Existing Stationary Noise Levels

The primary sources of stationary noise in the project vicinity are urban-related activities (i.e., mechanical equipment and parking areas). The noise associated with these sources may represent a single-event noise occurrence, short-term, or long-term/continuous noise.

Existing Roadway Noise Levels

The majority of the existing noise in the project area is generated from traffic along surrounding roadways including Pier View Way, North Clementine Street, Mission Avenue, and North Nevada Street.

Existing Ambient Noise Levels

In order to quantify existing ambient noise levels in the project area, Michael Baker International conducted two short-term noise measurements in the project vicinity on October 26, 2022. The noise measurement locations are shown in Exhibit 1, *Noise Measurement Locations*, and were representative of typical existing noise exposure within and immediately adjacent to the project site. The 10-minute measurements were taken between 11:30 p.m. and 12:30 p.m. Short-term (L_{eq}) measurements are considered representative of the noise levels throughout the day. The noise measurements were taken during "off-peak" (9:00 a.m. through 3:00 p.m.) traffic noise hours as this provides a more conservative baseline. During rush hour traffic, vehicle speeds and heavy truck volumes are often low. Free-flowing traffic conditions just before or after rush hour often yield higher noise levels.[2] The noise levels measured near the project site is identified in Table 3, *Noise Measurements*.

Table 3
Noise Measurements

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Peak (dBA)	Start Time
1	Corner of Clementine Street and Pier View Way	60.7	45.7	76.5	93.5	11:58 a.m.
2	Corner of Horne Street and Seagaze Drive	58.1	45.5	73.4	97.5	12:15 p.m.
Source: Michael Baker International, October 26, 2022. Refer to *Appendix A*, *Noise Data*, for the results of the field measurements.						

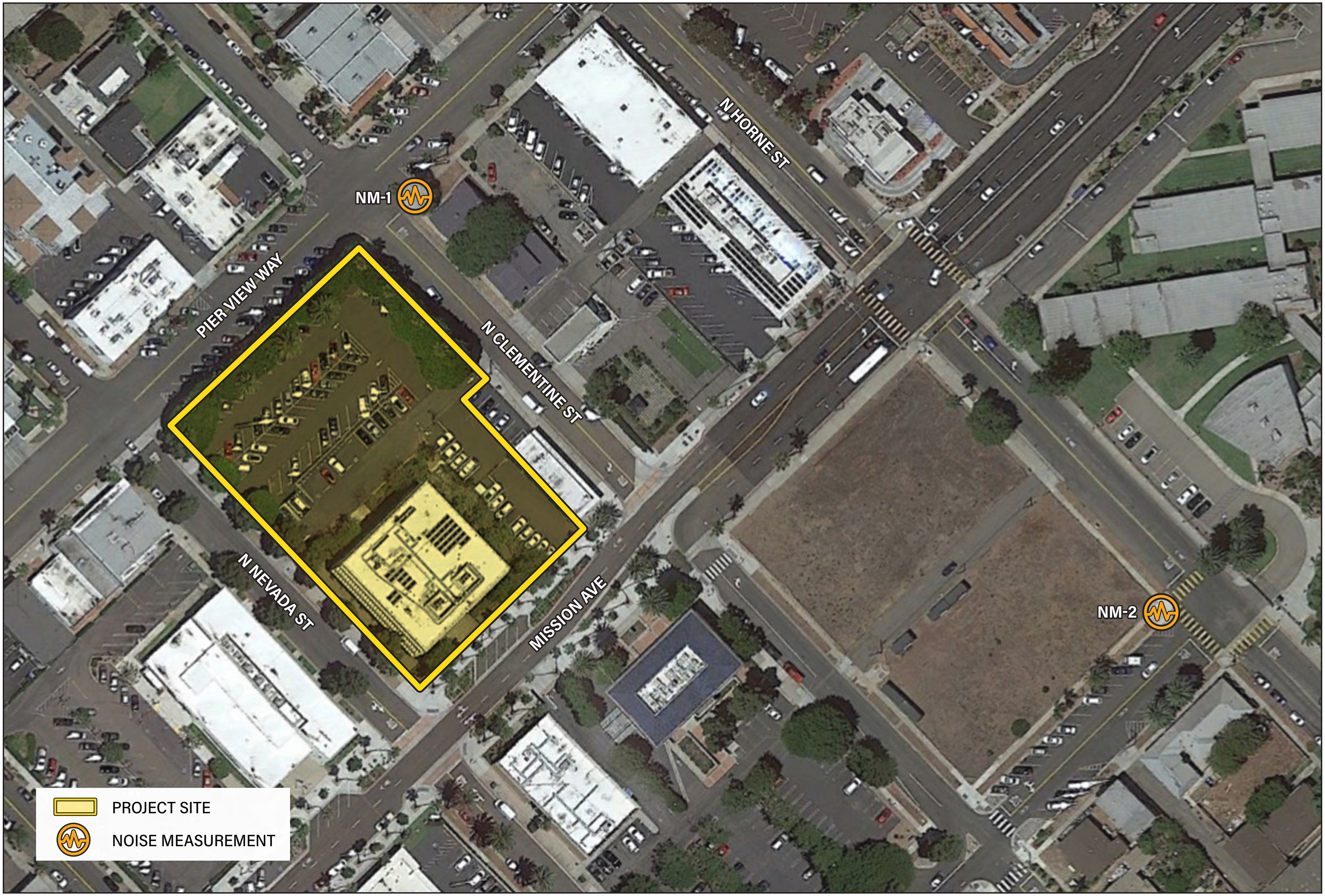
Meteorological conditions were clear, warm temperatures (74.8 degrees Fahrenheit [°F]), and light wind speeds (approximately 1.4 mile per hour). Measured noise levels during the daytime measurements ranged from 58.1 to 60.7 dBA L_{eq}. The sources of peak noise include traffic along the roadways. Noise monitoring equipment used for the ambient noise survey consisted of a Brüel & Kjær Hand-held Analyzer Type 2250 equipped with a Type 4189 pre-polarized microphone. The monitoring equipment complies with applicable requirements of the American National Standards Institute (ANSI) for Type I (precision) sound level meters. Refer to Appendix A, *Noise Data*, for the results of the field measurement.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) THRESHOLDS

The environmental analysis in this memorandum is patterned after the Initial Study Checklist recommended by the *CEQA Guidelines*. The issues presented in the Initial Study Checklist have been utilized as thresholds of significance in this section. Accordingly, a project may have a significant adverse impact related to noise and vibration if it would do any of the following:

- 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 (refer to Impact NOI-1);
- Generation of excessive groundborne vibration or groundborne noise levels (refer to Impact NOI-2); and/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 (refer to Impact NOI-3).

[2] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.



Source: Google Earth Pro, November 2022

Michael Baker INTERNATIONAL

NOT TO SCALE

11/2022 • JN 190739

810 MISSION AVENUE PROJECT
NOISE TECHNICAL MEMORANDUM

Noise Measurement Locations

Exhibit 1

IMPACT ANALYSIS

NOI-1 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. Noise-sensitive land uses are those that may be subject to stress and/or interference from excessive noise. Noise-sensitive land uses include public schools, hospitals, and institutional uses such as churches, museums, and private schools. Typically, residential uses are also considered noise-sensitive receptors. Industrial and commercial land uses are generally not considered sensitive to noise.

Construction Noise Impacts

Temporary increases in ambient noise levels as a result of the project would predominantly be associated with construction activities. Construction activities would occur over approximately 31 months and would include the following phases: demolition, grading, building construction, paving, and architectural coating. Typical noise levels generated by construction equipment are shown in Table 4, *Maximum Noise Levels Generated by Construction Equipment*. It should be noted that the noise levels identified in Table 4 are maximum sound levels (L_{max}), which are the highest individual sound occurring at an individual time period. Although L_{max} is important in evaluating an interference caused by a single noise event, L_{max} could not be totaled into a one-hour or a 24-hour cumulative measure of impact as CNEL or L_{dn} could. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be due to random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts).

The nearest sensitive receptors are the single-family residences that are located approximately 60 feet to the northeast of the project site, measured from the project boundary. This sensitive receptor may be exposed to elevated noise levels during project construction. However, the project construction activities would adhere to the standards set forth by City's Noise Ordinance Section 38.17, *Specific Noise Prohibited*, and the EDM. In accordance with these regulations, construction activities would be limited to normal working hours (7:00 a.m. to 6:00 p.m. Monday through Friday). The General Plan prohibits any person to operate any powered construction equipment if the operation of such equipment emits noise at a level in excess of 85 dBA when measured within a radius of 100 feet from such equipment. Due to geometric spreading, these noise levels would diminish with distance from the construction site at a rate of approximately 6 dBA per doubling of distance; refer to Table 4.

As seen in Table 4, the loudest piece of equipment would operate at a maximum noise level of 84 dBA at 100 feet from the source. Therefore, construction noise levels would not exceed the City's General Plan threshold of 85 dBA at 100 feet. As such, the noise impacts associated with construction activities would be considered less than significant.

Table 4
Maximum Noise Levels Generated by Construction Equipment

Type of Equipment	Acoustical Use Factor[1]	Reference L_{max} at 50 Feet (dBA)[2]	L_{max} at 60 Feet (dBA)	L_{max} at 100 Feet (dBA)
Backhoe	40	78	76	72
Compressor	40	78	76	72
Concrete Saw	20	90	88	84
Dozer	40	82	80	76
Dump Truck	40	76	74	70
Excavator	40	81	79	75
Flatbed Truck	40	74	72	68
Grader	40	85	83	79
Loader	40	79	77	73
Paver	50	77	75	71
Roller	20	80	78	74
Scraper	40	85	83	79
Tractor	40	84	82	78
Water Truck	40	80	78	74
Welder	40	74	72	68

Note:
1. Acoustical Use Factor (percent): Estimates the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.
2. These noise levels represent the A-weighted maximum sound level (L_{max}) measured at a distance of 50 feet from the construction equipment.

Source: Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006.

Construction Trips Noise Impacts

Construction activities would also cause increased noise along access routes to and from the site due to movement of equipment and workers, as well as haul trips. According to the *810 Mission Avenue Project – Air Quality Technical Memorandum*, prepared by Michael Baker International, dated September 18, 2024, air quality modeling anticipated that project construction would generate a maximum of 116 hauling trips per day during the grading phase, 191 worker trips per day during the building construction phase, and 39 vendor trips per day also during the building construction phase. As a result, mobile source noise would increase along access routes to and from the project site during construction. However, mobile traffic noise from construction trips would be temporary and would cease upon project completion.

According to the California Department of Transportation (Caltrans), a doubling of traffic (100 percent increase) on a roadway would result in a perceptible increase in traffic noise levels (3 dBA).[3] According to *General Plan Circulation Element*, the average daily trips along Mission Avenue (between Coast Highway to Horne Street) is 8,500.[4] As such, the project's construction trips would not double existing traffic volumes and any increase in traffic noise levels would thus be imperceptible. Therefore, short-term haul truck noise impacts from construction traffic would be less than significant.

[3] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol,* September 2013.

[4] City of Oceanside, *General Plan Circulation Element*, September 2012.

Long-Term Operational Noise Impacts

Off-Site Mobile Noise

Future development generated by the proposed project would result in some additional traffic on adjacent roadways, thereby potentially increasing vehicular noise in the vicinity of existing and proposed land uses. Based on the trip generation data provided in the *810 Mission Avenue Residential Project – Local Transportation Assessment,* prepared by Stantec and dated May 9, 2024, the proposed project would generate approximately 832 net average daily trips (ADT) on weekdays and weekends. The most prominent source of mobile traffic noise in the project vicinity is along Mission Avenue. According to *General Plan Circulation Element*, the average daily trips along Mission Avenue (between Coast Highway to Horne Street) is 8,500.[5]

According to the California Department of Transportation (Caltrans), a doubling of traffic (100 percent increase) on a roadway would result in a perceptible increase in traffic noise levels (3 dBA).[6] As the project-related traffic would not result in doubling of traffic, the project would not result in a perceptible increase traffic noise level. This analysis conservatively assumes that every single project-generated trip would travel along Mission Avenue. However, in reality, the project's ADTs would be split across multiple nearby local roadways. Thus, the project's net new ADTs would not have the potential to significantly increase traffic noise volumes along roadways were not further analyzed. Less than significant impacts would occur in this regard.

Stationary Noise

Stationary noise sources associated with the project would include the operation of mechanical equipment, parking lot activities, and outdoor gathering areas.

Mechanical Equipment Noise

Heating, ventilation, and air conditioning (HVAC) units would be installed on the roof of the proposed building. Typically, mechanical equipment noise is approximately 60 dBA at 20 feet from the source.[7] Based upon the Inverse Square Law, sound levels decrease by 6 dBA for each doubling of distance from the source.[8] The project proposed mechanical equipment (HVAC units) would be located on the roof of the structure (90 feet in height). The nearest sensitive receptors to the project site are the single-family residences located approximately 60 feet to the northeast of the project site. As such, HVAC units could be located as close as 108 feet from the nearest sensitive receptor.[9] Noise from the proposed HVAC units would be approximately 45 dBA without an enclosure or noise attenuation features at this distance and

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5 Ibid.

6 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol,* September 2013.

7 Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, June 26, 2015.

8 Cyril M. Harris, *Noise Control in Buildings*, 1994.

9 The Pythagorean theorem allows individuals to calculate the actual distance between a starting point and a suspended object. In this case, the starting point would be the closest sensitive receptor located approximately 60 feet to the north (side a) of the HVAC unit. The suspended object would be the HVAC unit, located 90 feet up (side b). By plugging these values into the Pythagorean theorem equation, the hypotenuse (side c), or the distance between the HVAC unit and the sensitive receptor, would result (108 feet).

would not exceed the City's 50 dBA noise standard for single-family residences and would not increase 5 dBA over ambient noise level (refers to Table 3, 58.1 to 60.7 L_{eq}). Thus, the proposed project would not result in significant noise impacts from HVAC units to the nearest sensitive receptor, and stationary noise levels from the proposed HVAC units would comply with the City's Noise Ordinance. Impacts in this regard would be less than significant.

Outdoor Gathering Area Noise

The project would include a seventh floor amenity deck that affords all residents and their guests a view of the Pacific Ocean and private open space (i.e., patios) for all units. These areas have the potential to be accessed by groups of people intermittently for various occasions (e.g., private parties, events, and other social gatherings, etc.). Noise generated by groups of people (i.e., crowds) is dependent on several factors including vocal effort, impulsiveness, and the random orientation of the crowd members. Crowd noise is estimated at 60 dBA at one meter (3.28 feet) away for raised normal speaking.[10] This noise level would have a +5 dBA adjustment for the impulsiveness of the noise source, and a -3 dBA adjustment for the random orientation of the crowd members.[11] Therefore, crowd noise would be approximately 62 dBA at 3.28 feet from the source (i.e., at the private open space).

As a conservative analysis, the project would analyze the possible noise from outdoor patios of the ground level units to the nearest sensitive receptors as the public common space (i.e., seventh floor deck) is located facing the ocean which is away from the sensitive receptors. The outdoor patios on the ground floor would be approximately 60 feet from the nearest sensitive receptors. Based on the Inverse Square Law, crowd noise from the ground floor open space would be reduced to approximately 36 dBA at the closest sensitive receptor. Therefore, noise from proposed outdoor gathering areas would not exceed the City's 50 dBA noise standard for the nearest receptor (i.e., single-family residences). Impacts would be less than significant.

Cumulative Operational

Off-Site Mobile Noise

As discussed above, the project's potential traffic redistribution noise levels would not exceed the established significance criteria (i.e., 3.0 dB increase and exceedance of 50 dBA CNEL). Traffic noise generated from cumulative development projects would be required to implement any required mitigation measures on a project-by-project basis, as applicable, pursuant to CEQA provisions. Therefore, the proposed project, in combination with cumulative traffic noise levels, would result in less than significant impacts.

Stationary Noise

Although the proposed mixed-use building may occur in proximity to other future development, the proposed development would not involve stationary noise sources that is capable to produce substantial amount of noise (typical of industrial projects) above existing ambience noise levels. Stationary noise sources associated with the project would include the operation of mechanical equipment, parking lot activities, and outdoor gathering areas, all of which are typical noise sources that are currently present in

[10] M.J. Hayne, et al, *Prediction of Crowd Noise*, Acoustics, November 2006.

[11] Ibid.

any urban setting. Further, each cumulative project would require separate discretionary approval and CEQA analysis, which would address potential noise impacts and identify necessary attenuation measures, where appropriate. Additionally, as noise dissipates as it travels away from its source, noise impacts from stationary sources would be limited to each of the respective sites and their vicinities. Thus, the project and any cumulative development in the project vicinity are not anticipated to result in a significant cumulative impact. A less than significant impact would occur in this regard.

Mitigation Measures: No mitigation is required.

NOI-2 Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact.

Construction Vibration Impacts

Project construction can generate varying degrees of groundborne vibration, depending on the construction procedure and the construction equipment used. Operation of some heavy-duty construction equipment generates vibrations that spread through the ground and diminish in amplitude with distance from the source. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

As shown in Table 1, Caltrans has published reactions of people and the effects on buildings produced by continuous vibration levels. Based on Table 1, there is a risk of architectural damage to normal dwellings at 0.2 inches/second PPV. Further, Table 1 notes that vibrations may begin to annoy people at 0.2 inches/second PPV. Thus, for the purposes of this analysis, 0.2 inches/second PPV is utilized for the human annoyance and building damage groundborne vibration threshold. Typical vibration produced by construction equipment is illustrated in Table 6, *Typical Vibration Levels for Construction Equipment*.

Groundborne vibration decreases rapidly with distance. As indicated in Table 6, based on the FTA provided reference vibration levels, vibration velocities from typical heavy construction equipment operations that would be used during project construction range from 0.003 to 0.734 inches/second PPV at 25 feet from the source of activity. The nearest structure occupied by sensitive receptors are the single-family residences that are located approximately 60 feet to the northeast of the project site, measured from the project boundary. As shown in Table 6, the vibration velocities ranges from 0.0008 to 0.0565 inches/second PPV at 60 feet during the operation of loaded trucks, small bulldozer, jackhammer, and vibratory roller, and would not exceed the 0.2 inches/second PPV significance threshold at the nearest structure occupied by sensitive receptors.

Table 6
Typical Vibration Levels for Construction Equipment

Equipment	Approximate peak particle velocity at 25 feet (inches/second)[1]	Approximate peak particle velocity at 60 feet (inches/second)[1]	Approximate peak particle velocity at 80 feet (inches/second)[1]
Loaded trucks	0.076	0.0204	-
Small bulldozer	0.003	0.0008	-
Jackhammer	0.035	0.0094	-
Vibratory Roller	0.210	0.0565	-
Pile Driver (sonic, upper range)[2]	0.734	-	0.1282

Notes:

1. Calculated using the following formula:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: PPV (equip) = the peak particle velocity in in/sec of the equipment adjusted for the distance
PPV (ref) = the reference vibration level in in/sec from Table 7-4 of the FTA *Transit Noise and Vibration Impact Assessment Manual.*
D = the distance from the equipment to the receiver

2. According to project Applicant, the project would use sonic pile drivers to install shoring members in accordance with a shoring plan proposed. The shortest distance measured from proposed shoring line to the nearest structure occupied by sensitive receptors (i.e., single-family residences across Clementine Street) would be 80 feet.

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 7-4 *Vibration Source Levels for Construction Equipment*, September 2018.

It should be noted that the project would use sonic pile drivers to install shoring members in accordance with a shoring plan proposed. The shortest distance measured from the proposed shoring line to the nearest structure occupied by sensitive receptors (i.e., single-family residences across Clementine Street) would be 80 feet. As shown in Table 6, the estimated vibration velocities from operation of a pile driver would be approximately 0.1282 inches/second PPV at 80 feet and would not exceed the 0.2 inches/second PPV significance threshold.

Therefore, vibration impacts from the project construction activities are not anticipated to exceed significance threshold at the nearest structure occupied by sensitive receptors, and a less than significant impact would occur in this regard.

Operational Vibration Impacts

Operation of the project would not include or require equipment, facilities, or activities that would result in perceptible groundborne vibration. According to the FTA, it is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. As such, it can be reasonably inferred that project operations would not create perceptible vibration impacts to the nearest sensitive receptors. A less than significant impact would occur in this regard.

Mitigation Measures: No mitigation is required.

NOI-3 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. The nearest public use airport to the project site is the Oceanside Municipal Airport which lies approximately 1.65 miles to the northeast of the project site. According to the San Diego Airport Land Use Compatibility Plan, the project site is not located within an aviation noise exposure range of 60 dBA CNEL and would therefore not expose people residing or working in the project area to excessive noise level, since the 60 dB CENL exterior noise standard is compatible with State noise insulation standards.[12] The project site is not in the vicinity of a private airstrip. Therefore, a less than significant impact to airport land use compatibility would occur.

Mitigation Measures: No mitigation is required.

[12] San Diego International Airport, *Oceanside Municipal Airport Land Use Compatibility Plans,* https://www.san.org/DesktopModules/Bring2mind/DMX/API/Entries/Download?Command=Core_Download&EntryId=2988&language=en-US&PortalId=0&TabId=225, accessed November 10, 2022.

REFERENCES

Documents

1. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol,* September 2013.

2. California Department of Transportation, *Traffic Census Program*, https://dot.ca.gov/programs/traffic-operations/census, accessed by November 11, 2022.

3. California Department of Transportation, *Transportation Related Earthborne Vibrations*, 2002.

4. City of Oceanside, *General Plan Circulation Element*, September 2012.

5. City of Oceanside, *General Plan Noise Element*, June 2002.

6. Cyril M. Harris, *Noise Control in Buildings*, 1994.

7. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, June 26, 2015.

8. Federal Highway Administration, *Roadway Construction Noise Model (FHWA-HEP-05-054)*, January 2006.

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

10. Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.

11. Michael Baker International, *810 Mission Avenue Project – Air Quality Technical Memorandum*, *Appendix A, Air Quality Emissions Data*, September 18, 2024.

12. San Diego International Airport, *Oceanside Municipal Airport Land Use Compatibility Plans*, https://www.san.org/DesktopModules/Bring2mind/DMX/API/Entries/Download?Command=Core_Download&EntryId=2988&language=en-US&PortalId=0&TabId=225, accessed November 10, 2022.

13. Stantec, *810 Mission Avenue Residential Project – Local Transportation Assessment*, May 9, 2024.

Websites / Programs

1. Google Earth, 2024.

Appendix A

Noise Data

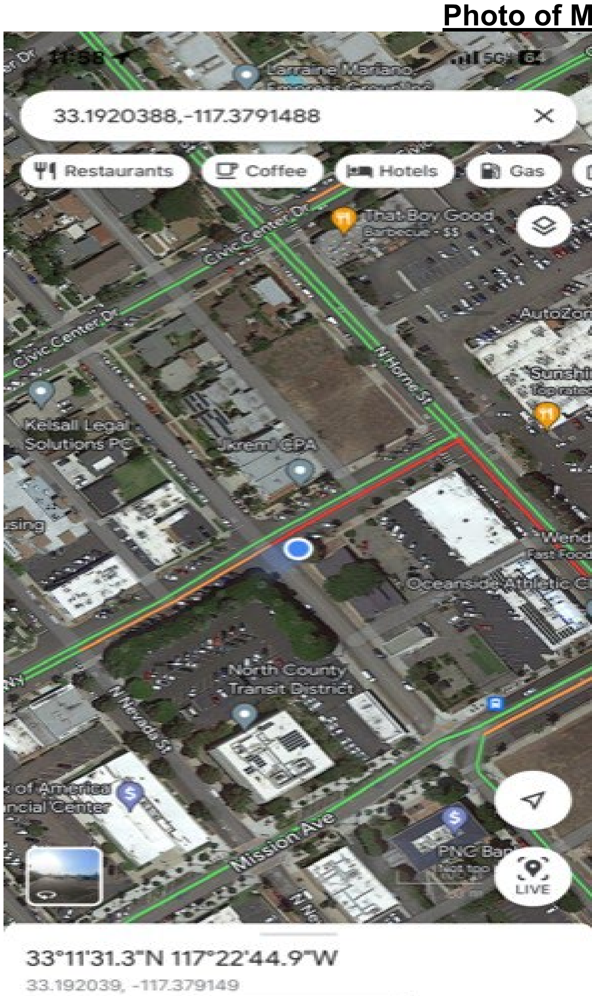
Site Number: NM-1
Recorded By: Eddie Torres
Job Number: 190739
Date: 10/26/22
Time: 11:58 am
Location: Corner of Clementine Street and Pier View Way
Source of Peak Noise: Traffic Noise

Noise Data			
Leq (dB)	**Lmax(dB)**	**Lmin (dB)**	**Peak (dB)**
60.7	76.5	45.7	93.5

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**3011133**	**03/10/2022**	
	Microphone	**Brüel & Kjær**	**4189**	**3086765**	**03/10/2022**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**25380**	**03/10/2022**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**03/10/2022**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** Clear
	Note: dBA Offset = 0.0		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (inches)**
	1.8 mph	74.3	53.7

<u>Photo of Measurement Location</u>



2250

Instrument:		2250
Application:		BZ7225 Version 4.7.6
Start Time:		10/26/2022 11:57:11
End Time:		10/26/2022 12:07:11
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		142.18

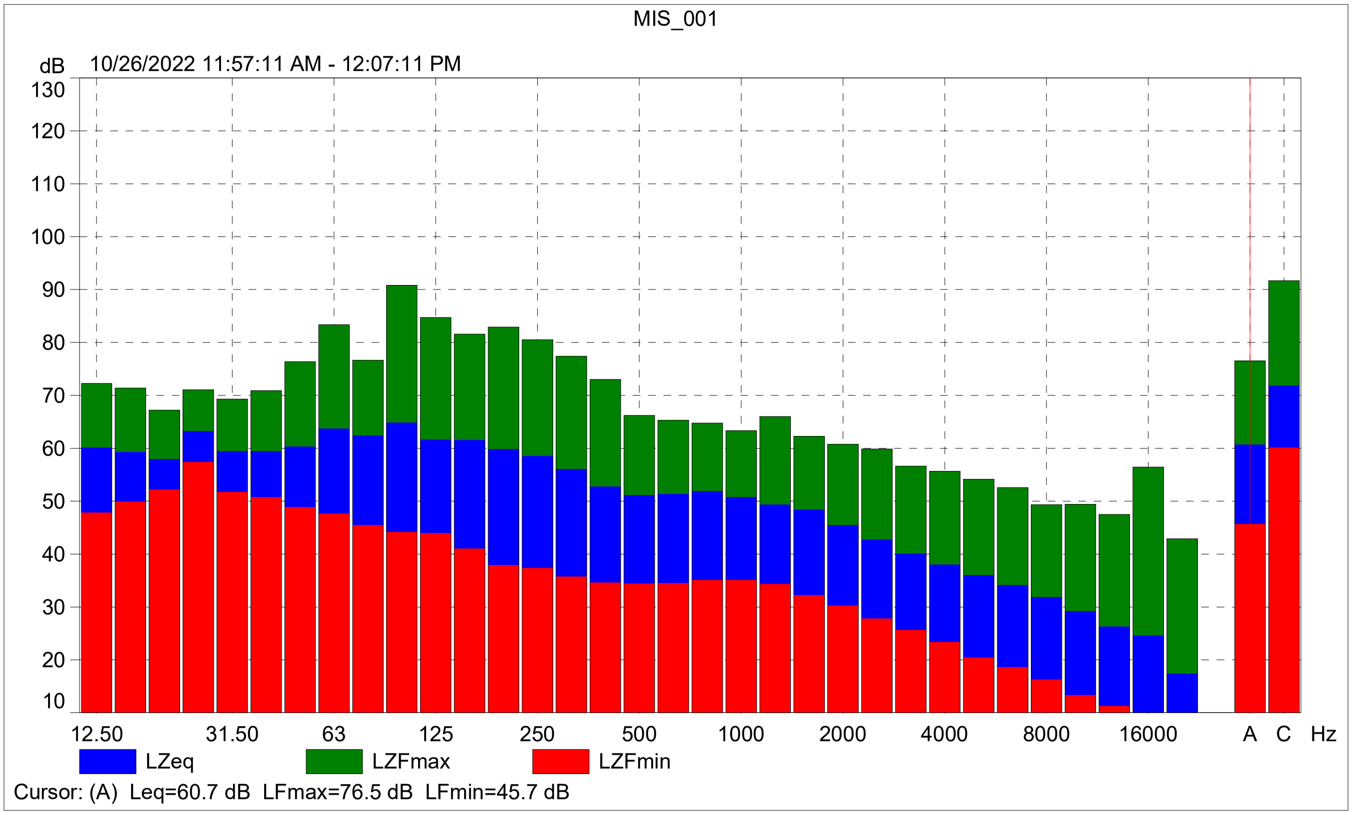
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

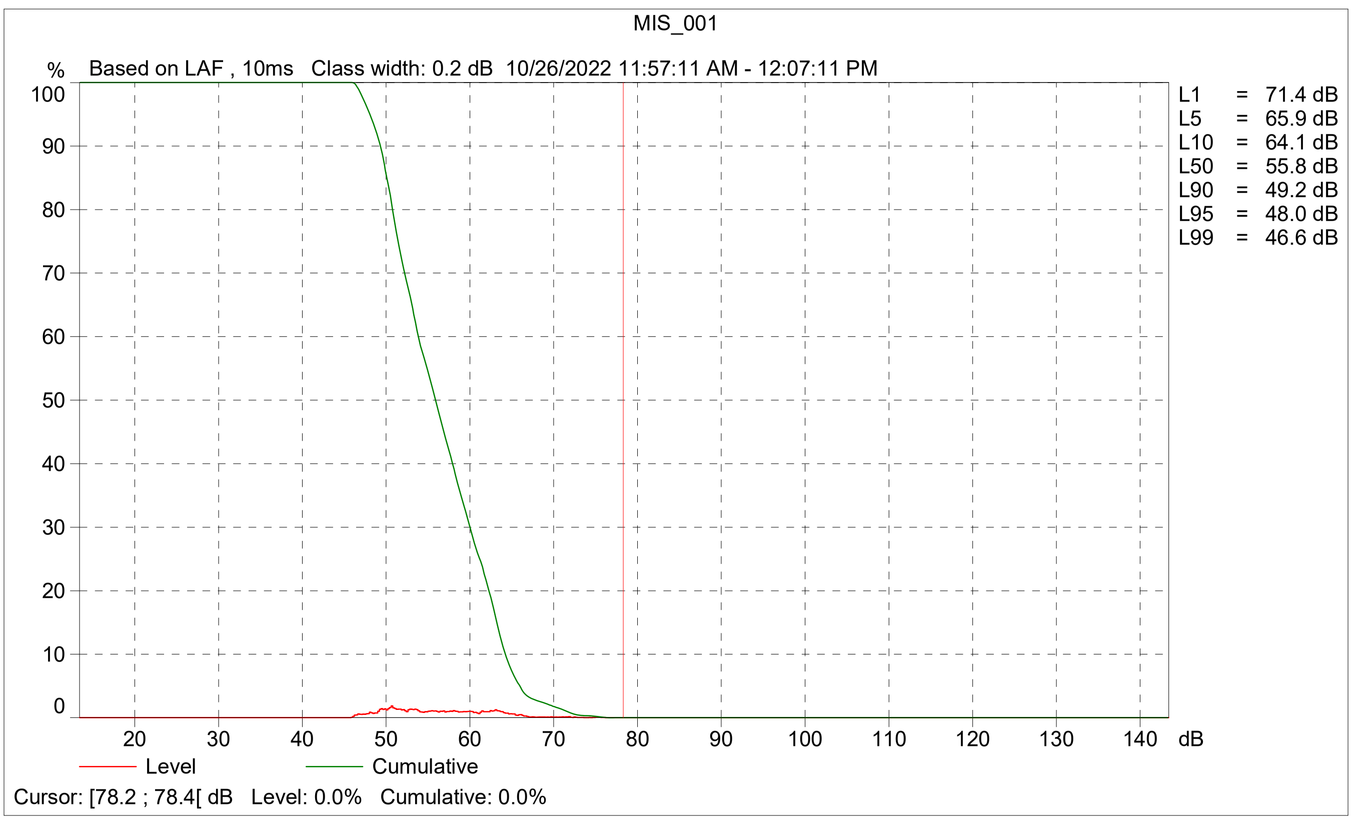
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Free-field

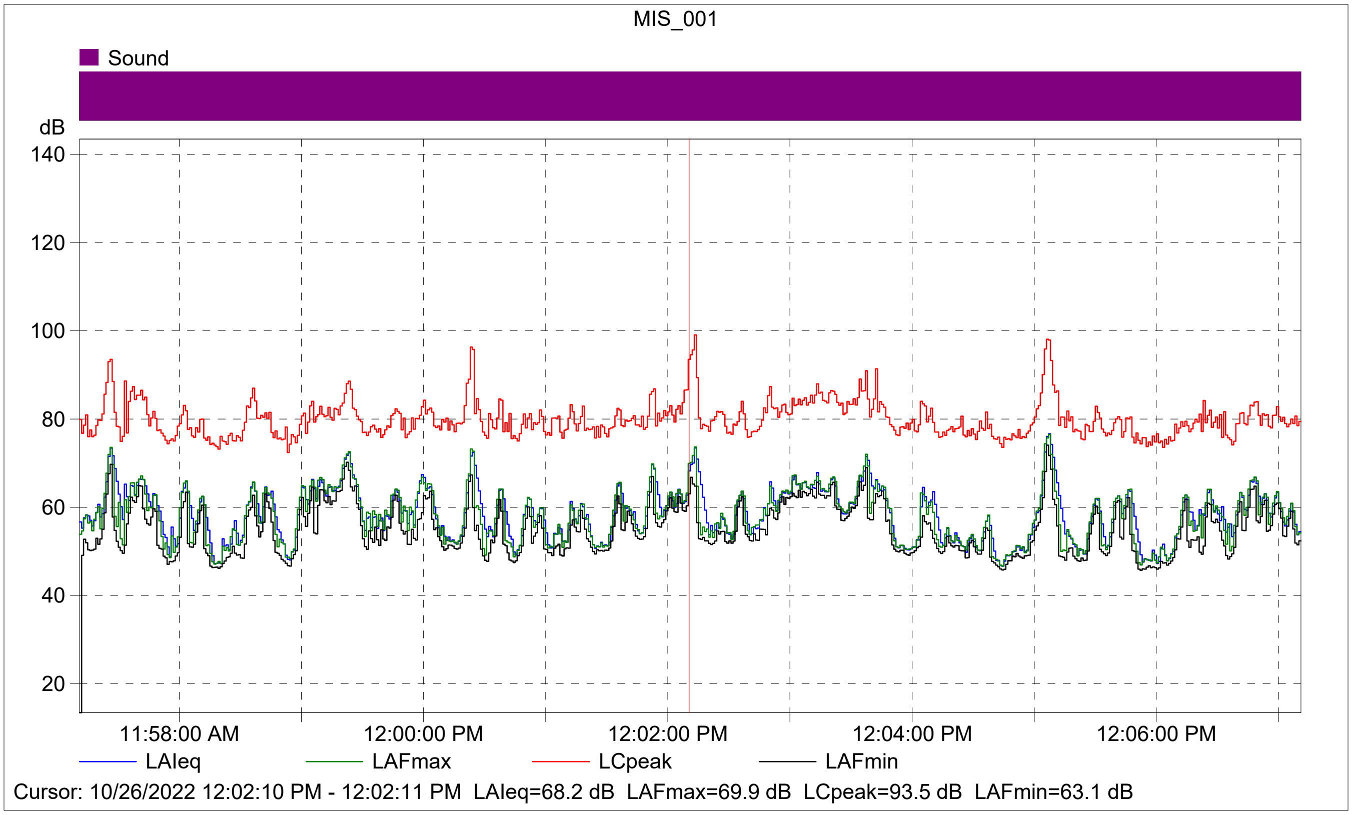
Calibration Time:		10/19/2022 07:11:45
Calibration Type:		External reference
Sensitivity:		43.3151684701443 mV/Pa

MIS_001

	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	60.7	76.5	45.7
Time	11:57:11 AM	12:07:11 PM	0:10:00				
Date	10/26/2022	10/26/2022					

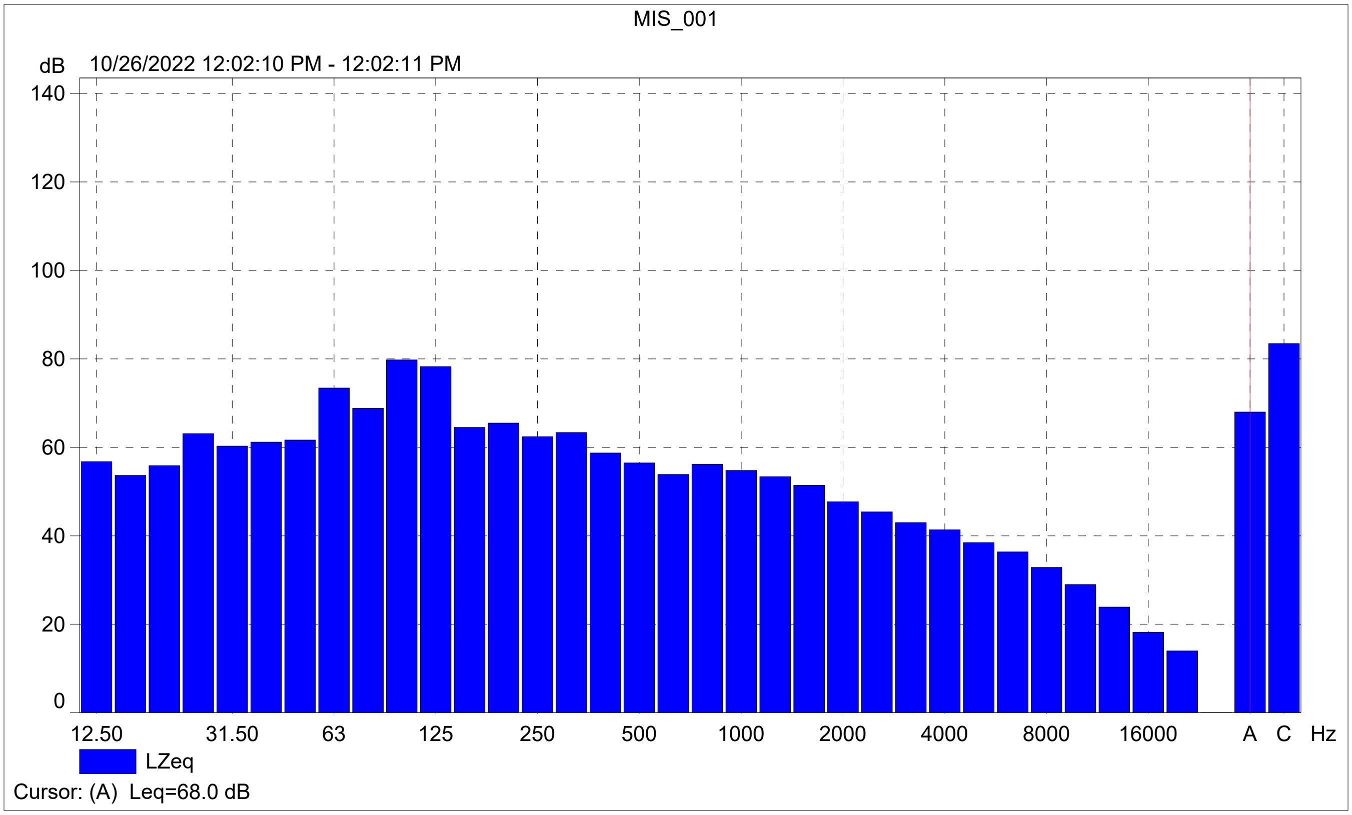

MIS_001
dB 10/26/2022 11:57:11 AM - 12:07:11 PM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=60.7 dB LFmax=76.5 dB LFmin=45.7 dB

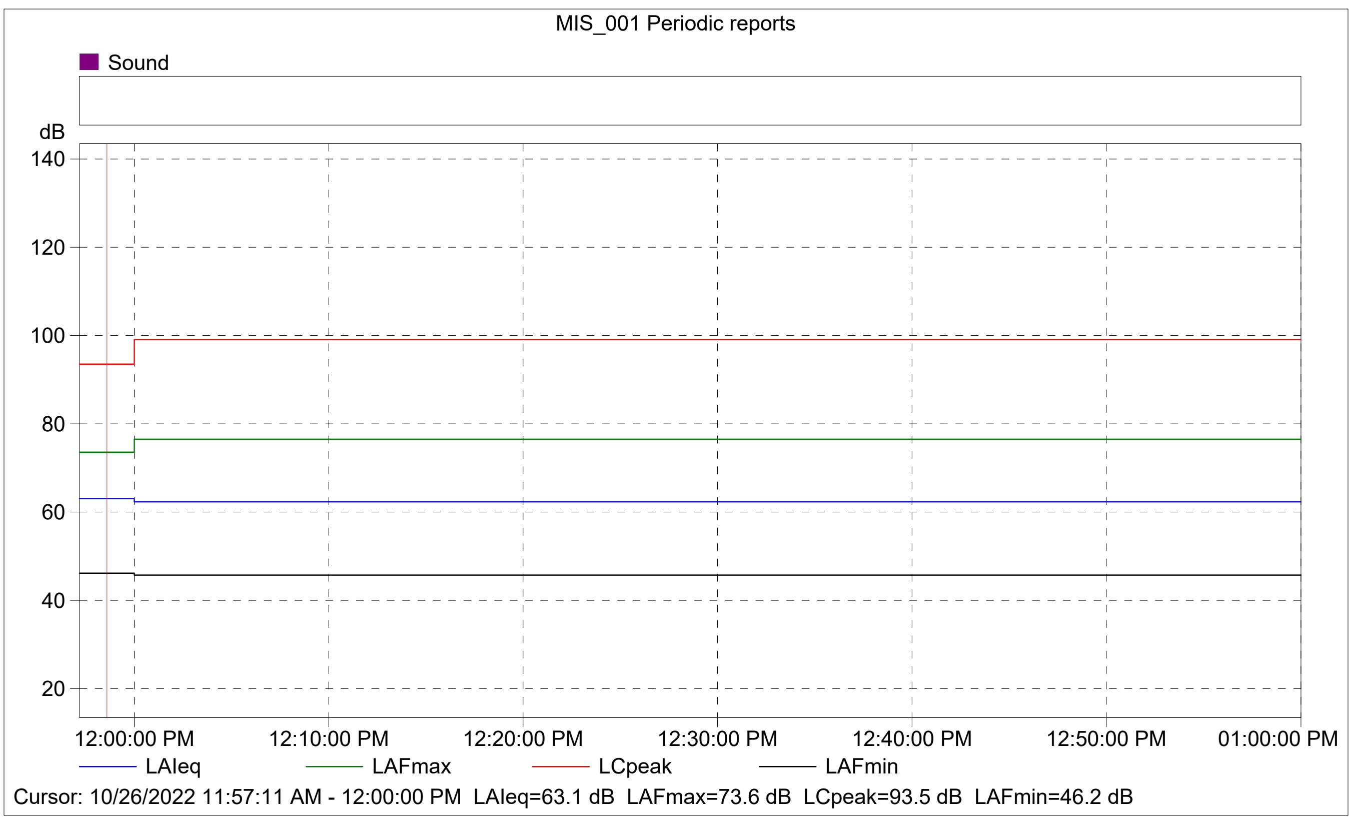

MIS_001
% Based on LAF , 10ms Class width: 0.2 dB 10/26/2022 11:57:11 AM - 12:07:11 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 71.4 dB
L5 = 65.9 dB
L10 = 64.1 dB
L50 = 55.8 dB
L90 = 49.2 dB
L95 = 48.0 dB
L99 = 46.6 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[dB Level: 0.0% Cumulative: 0.0%



MIS_001

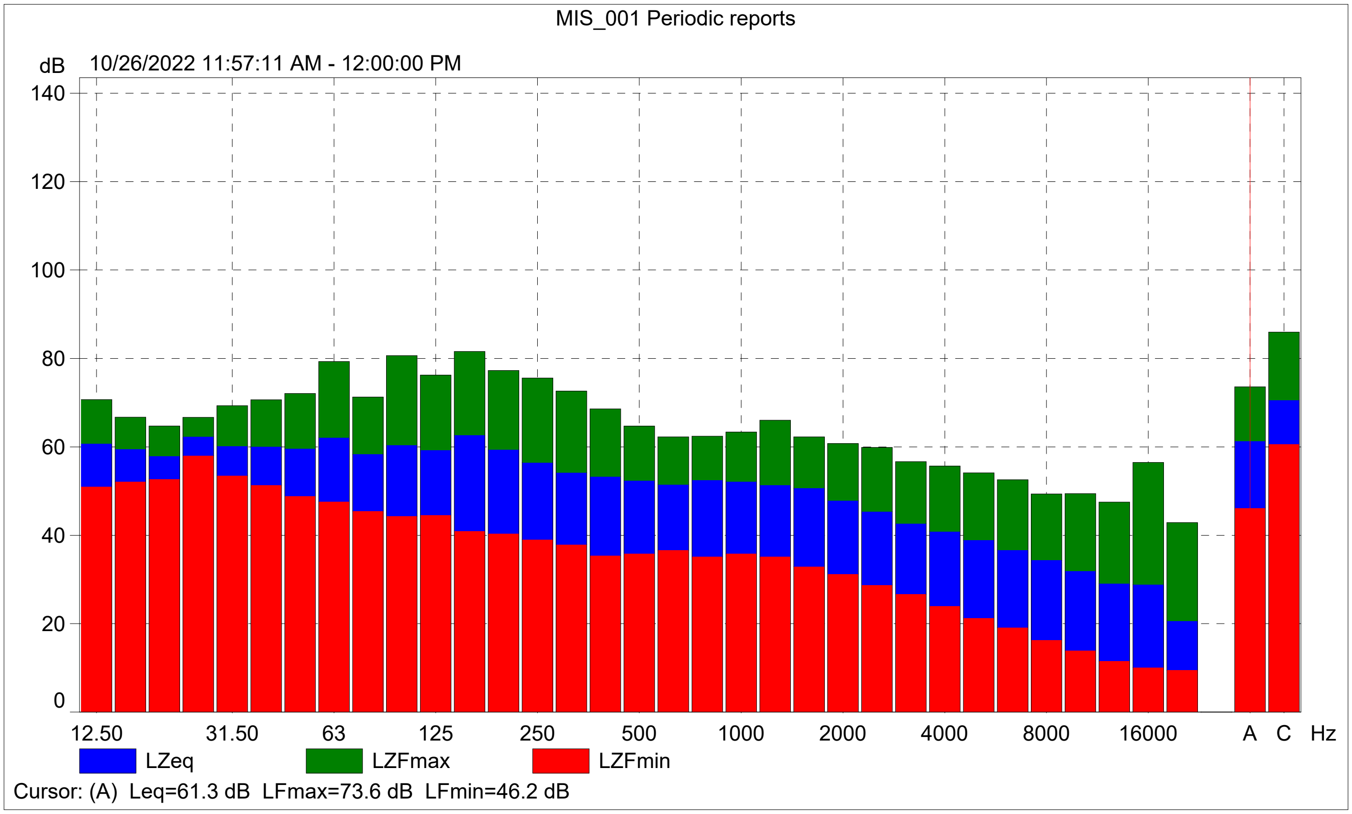
	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			68.2	69.9	63.1
Time	12:02:10 PM	0:00:01			
Date	10/26/2022				

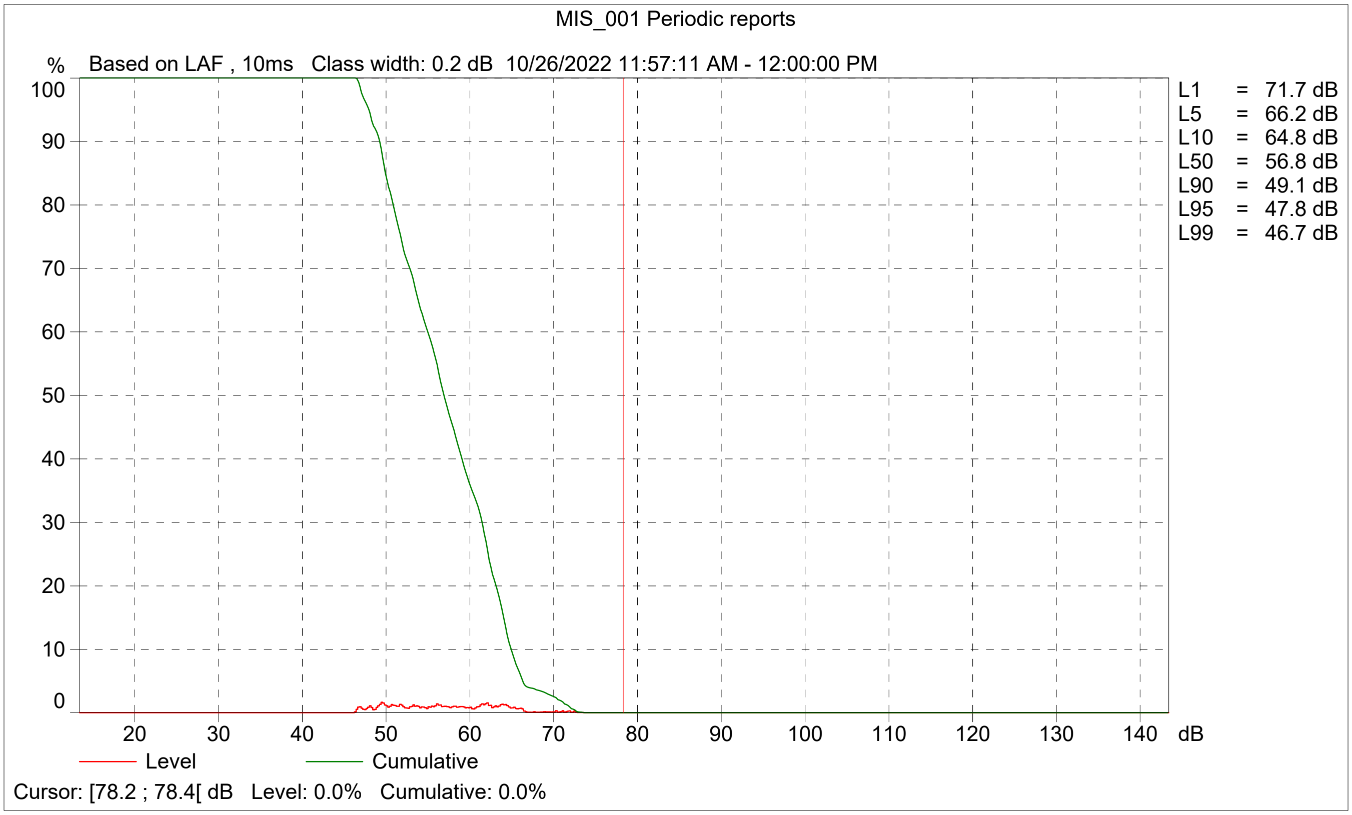

MIS_001
dB 10/26/2022 12:02:10 PM - 12:02:11 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=68.0 dB


MIS_001 Periodic reports
Sound
dB
140
120
100
80
60
40
20
12:00:00 PM
12:10:00 PM
12:20:00 PM
12:30:00 PM
12:40:00 PM
12:50:00 PM
01:00:00 PM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 10/26/2022 11:57:11 AM - 12:00:00 PM LAIeq=63.1 dB LAFmax=73.6 dB LCpeak=93.5 dB LAFmin=46.2 dB

MIS_001 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	63.1	73.6	46.2
Time	11:57:11 AM	0:02:49				
Date	10/26/2022					



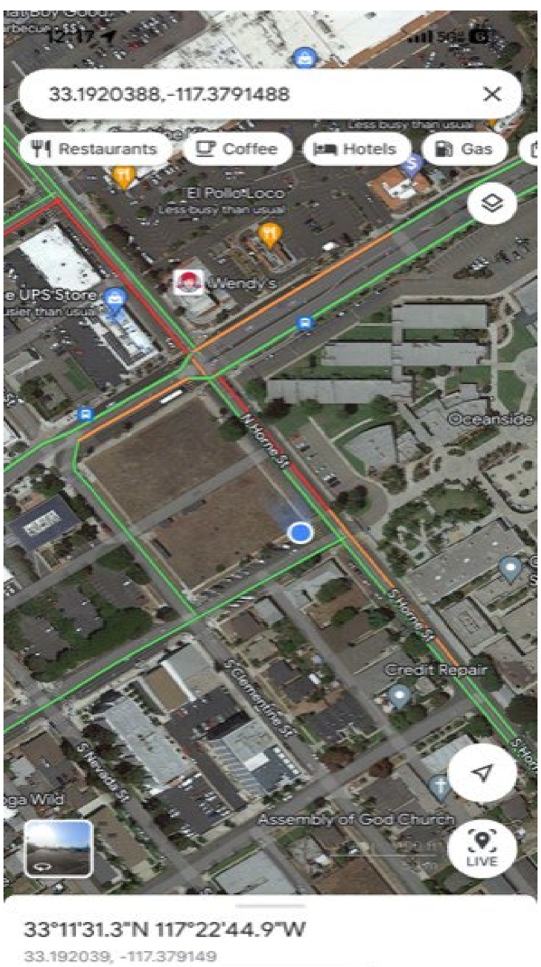

MIS_001 Periodic reports
%
Based on LAF , 10ms Class width: 0.2 dB 10/26/2022 11:57:11 AM - 12:00:00 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 71.7 dB
L5 = 66.2 dB
L10 = 64.8 dB
L50 = 56.8 dB
L90 = 49.1 dB
L95 = 47.8 dB
L99 = 46.7 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[dB Level: 0.0% Cumulative: 0.0%

Site Number: NM-2			
Recorded By: Eddie Torres			
Job Number: 190739			
Date: 10/26/22			
Time: 12:15 pm			
Location: Corner of Horne Street and Seagaze Drive			
Source of Peak Noise: Traffic Noise			
Noise Data			
Leq (dB)	**Lmax(dB)**	**Lmin (dB)**	**Peak (dB)**
58.1	73.4	45.5	97.5

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Brüel & Kjær**	**2250**	**3011133**	**03/10/2022**	
	Microphone	**Brüel & Kjær**	**4189**	**3086765**	**03/10/2022**	
	Preamp	**Brüel & Kjær**	**ZC 0032**	**25380**	**03/10/2022**	
	Calibrator	**Brüel & Kjær**	**4231**	**2545667**	**03/10/2022**	

Weather Data			
Est.	**Duration:** 10 minutes		**Sky:** Clear
	Note: dBA Offset = 0.0		**Sensor Height (ft):** 5 ft
	Wind Ave Speed (mph / m/s)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (inches)**
	1.4 mph	74.8	52.6

Photo of Measurement Location



2250

Instrument:		2250
Application:		BZ7225 Version 4.7.6
Start Time:		10/26/2022 12:16:11
End Time:		10/26/2022 12:26:11
Elapsed Time:		00:10:00
Bandwidth:		1/3-octave
Max Input Level:		142.18

	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z

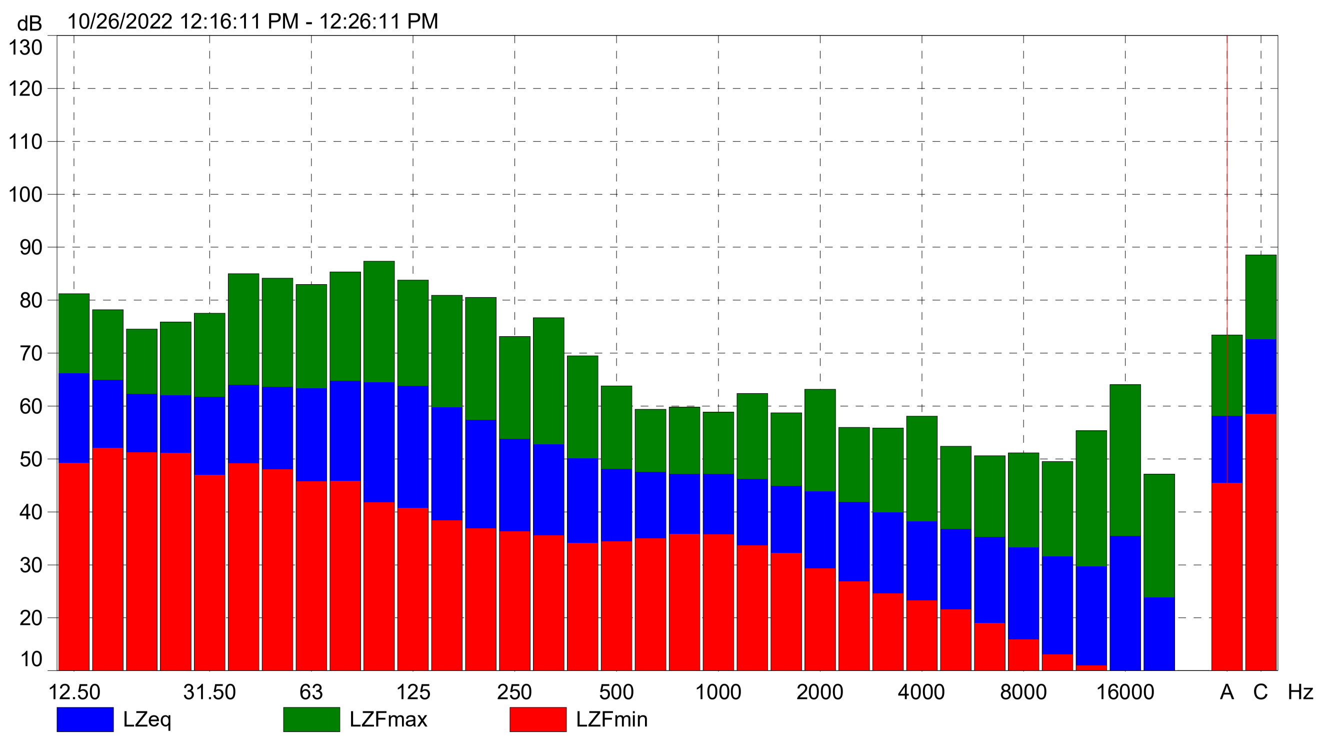
Instrument Serial Number:		3011133
Microphone Serial Number:		3086765
Input:		Top Socket
Windscreen Correction:		UA-1650
Sound Field Correction:		Free-field

Calibration Time:		10/19/2022 07:11:45
Calibration Type:		External reference
Sensitivity:		43.3151684701443 mV/Pa

MIS_002

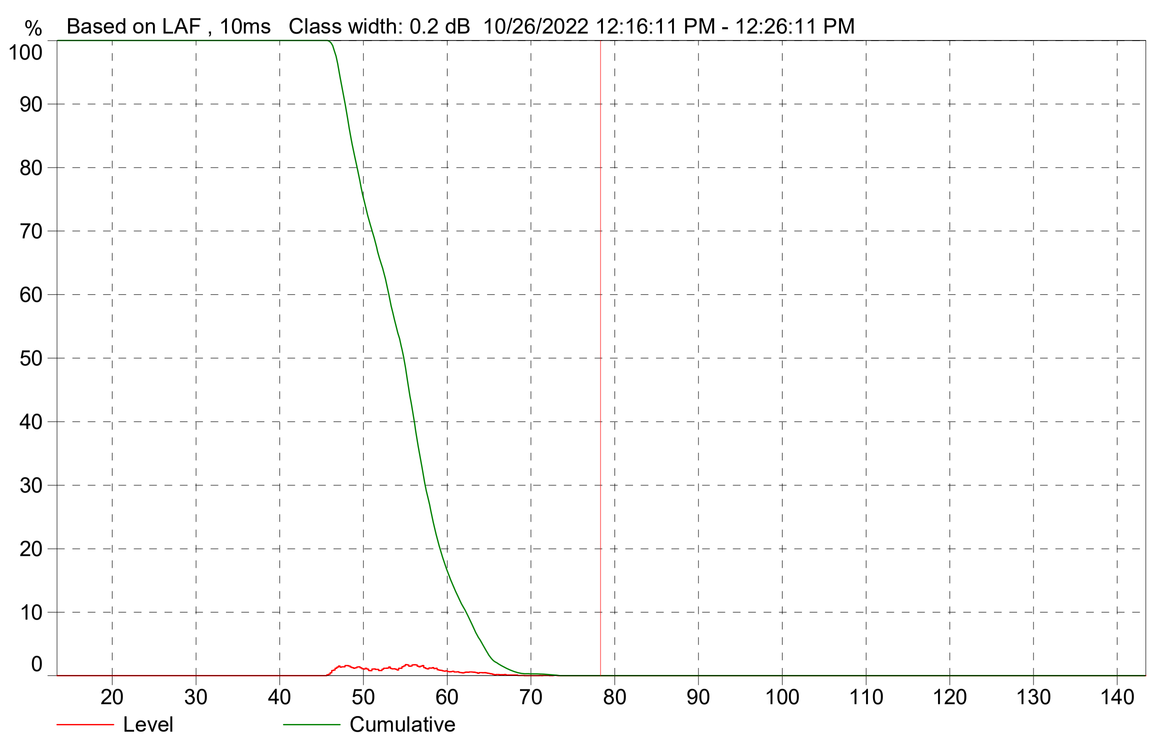
	Start time	End time	Elapsed time	Overload [%]	LAeq [dB]	LAFmax [dB]	LAFmin [dB]
Value				0.00	58.1	73.4	45.5
Time	12:16:11 PM	12:26:11 PM	0:10:00				
Date	10/26/2022	10/26/2022					

MIS_002



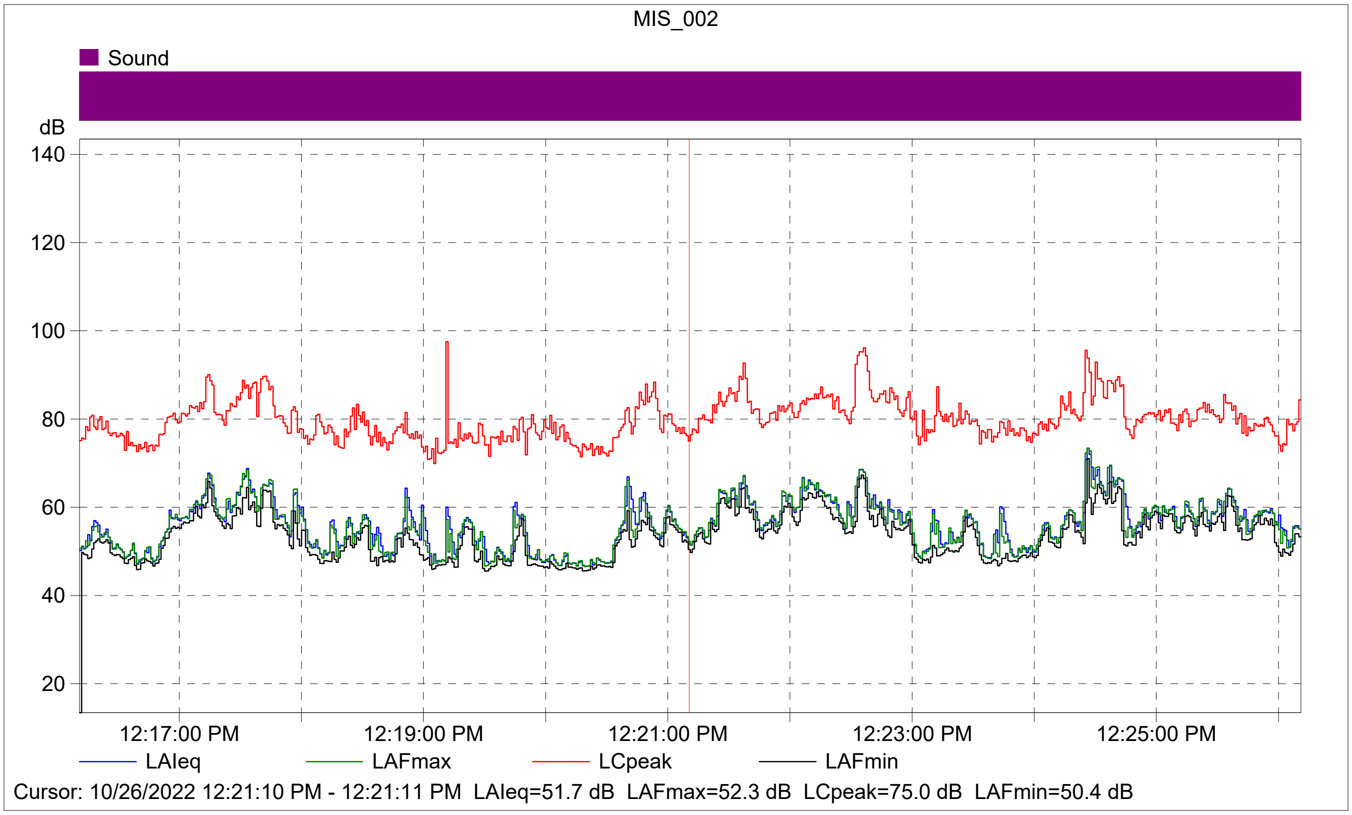
Cursor: (A) Leq=58.1 dB LFmax=73.4 dB LFmin=45.5 dB

MIS_002



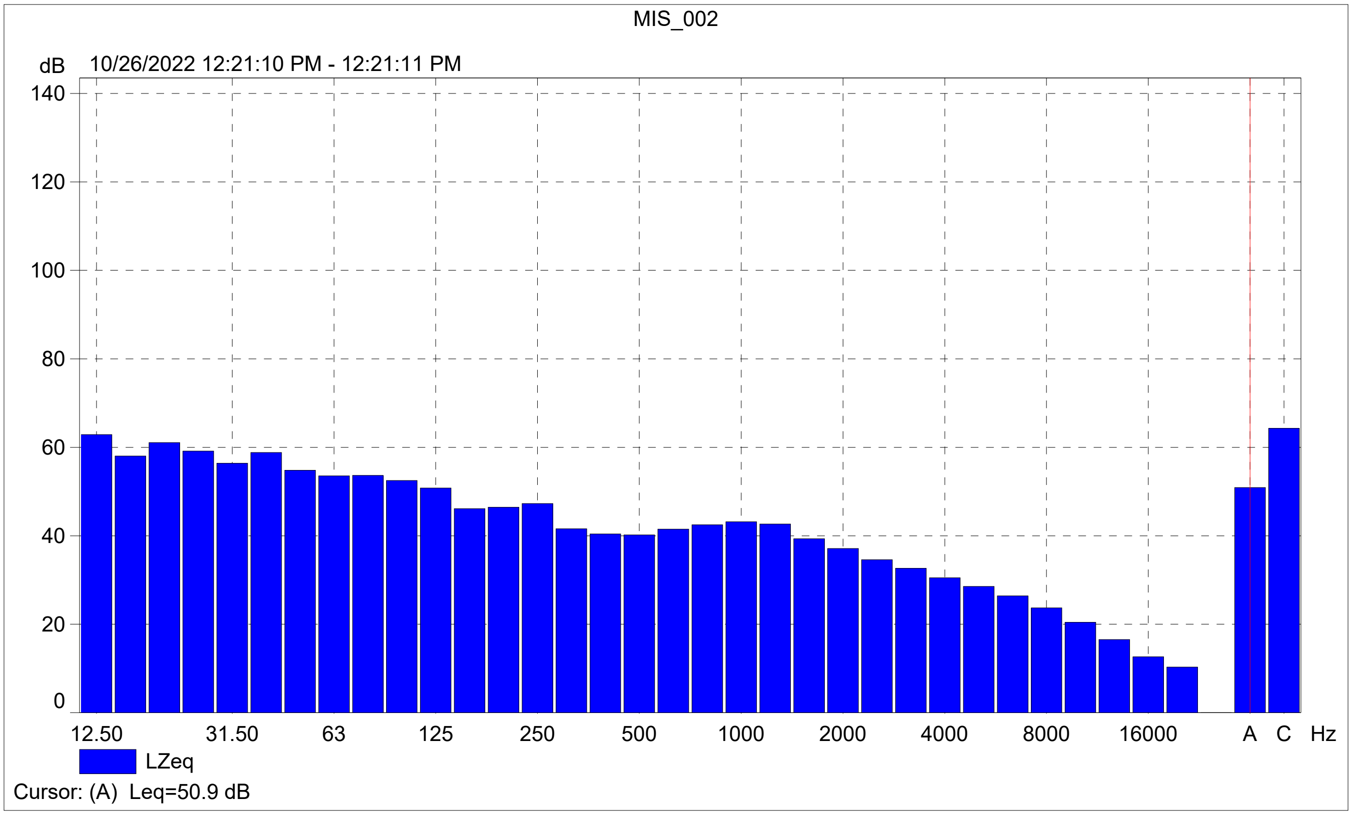
L1 = 67.2 dB
L5 = 64.1 dB
L10 = 62.2 dB
L50 = 54.7 dB
L90 = 47.7 dB
L95 = 47.0 dB
L99 = 46.2 dB

Cursor: [78.2 ; 78.4[dB Level: 0.0% Cumulative: 0.0%

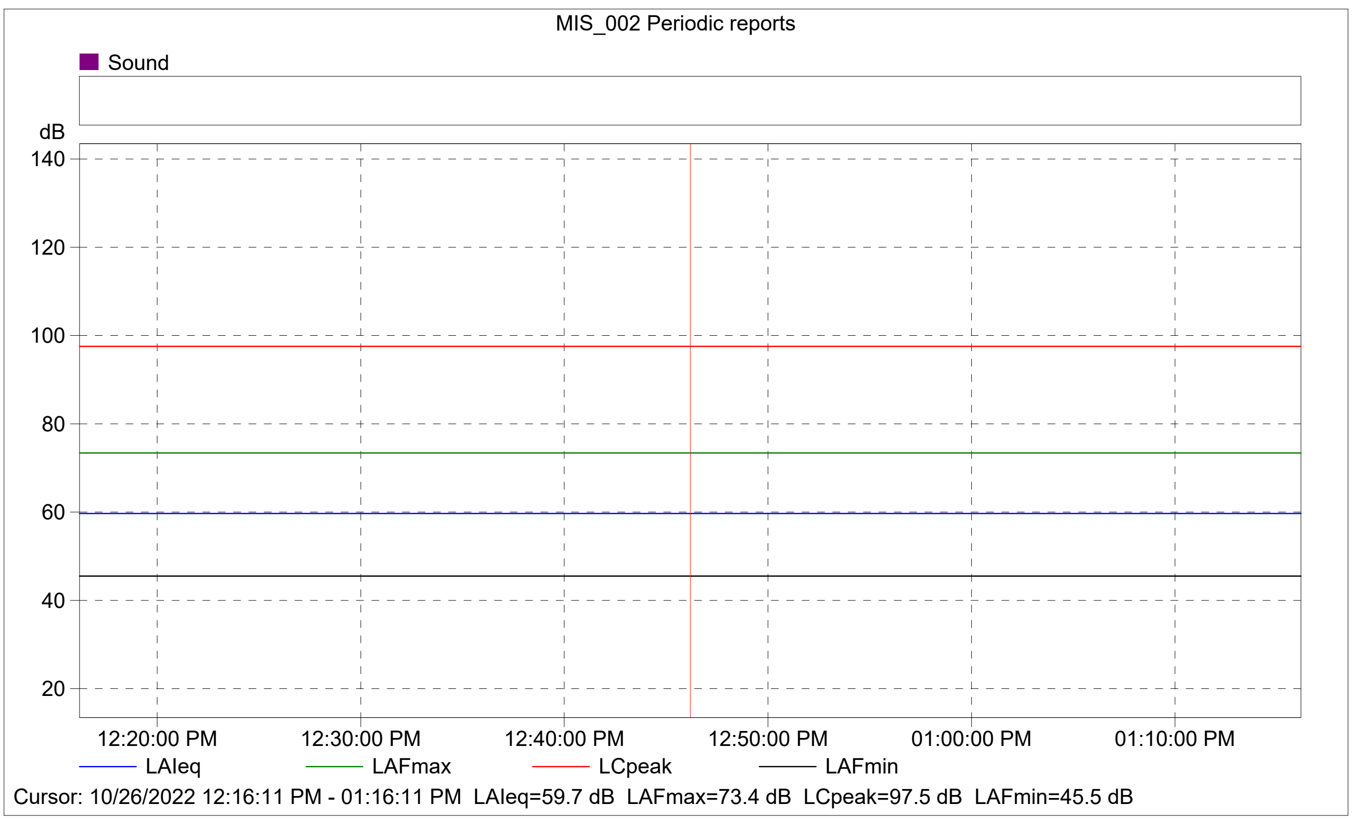


MIS_002

	Start time	Elapsed time	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			51.7	52.3	50.4
Time	12:21:10 PM	0:00:01			
Date	10/26/2022				



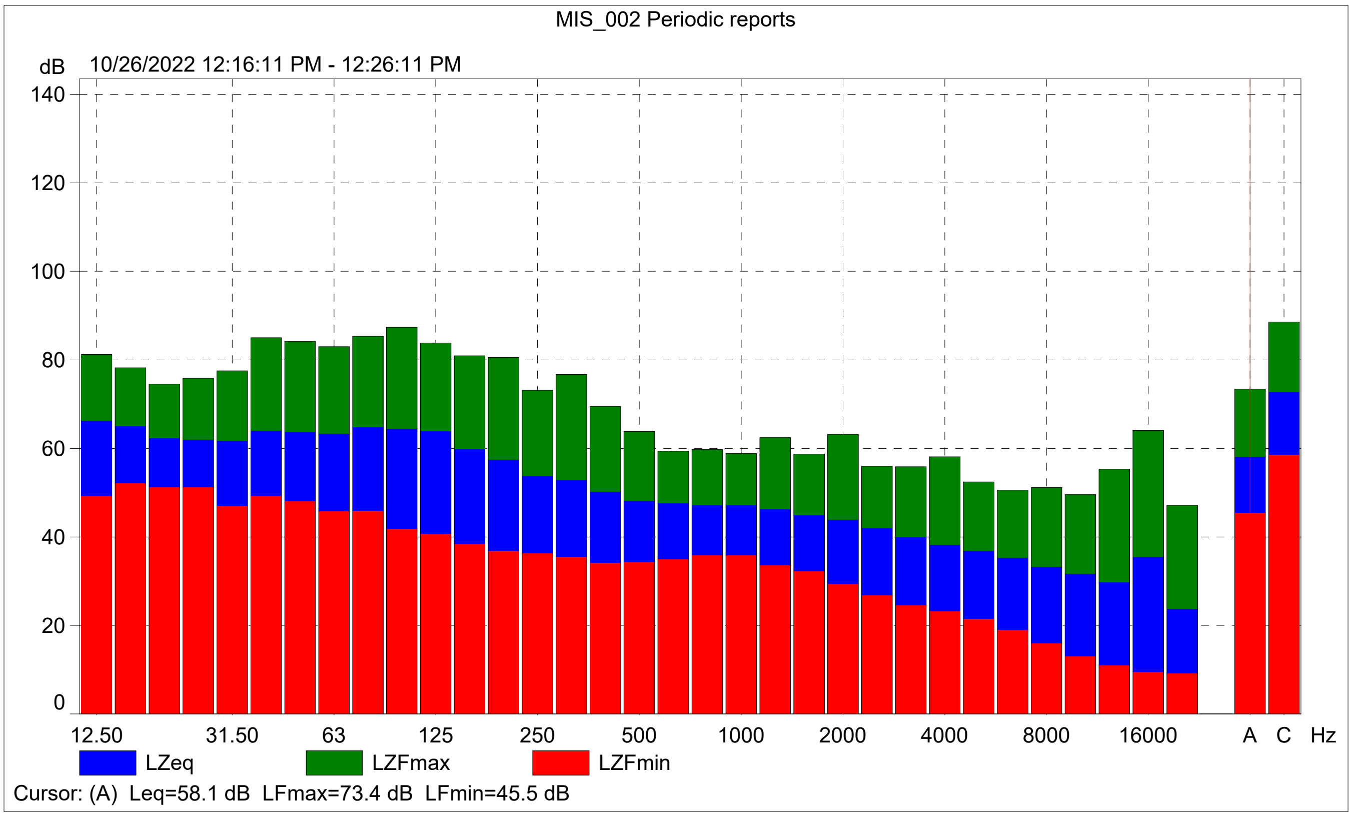
MIS_002
dB
10/26/2022 12:21:10 PM - 12:21:11 PM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=50.9 dB

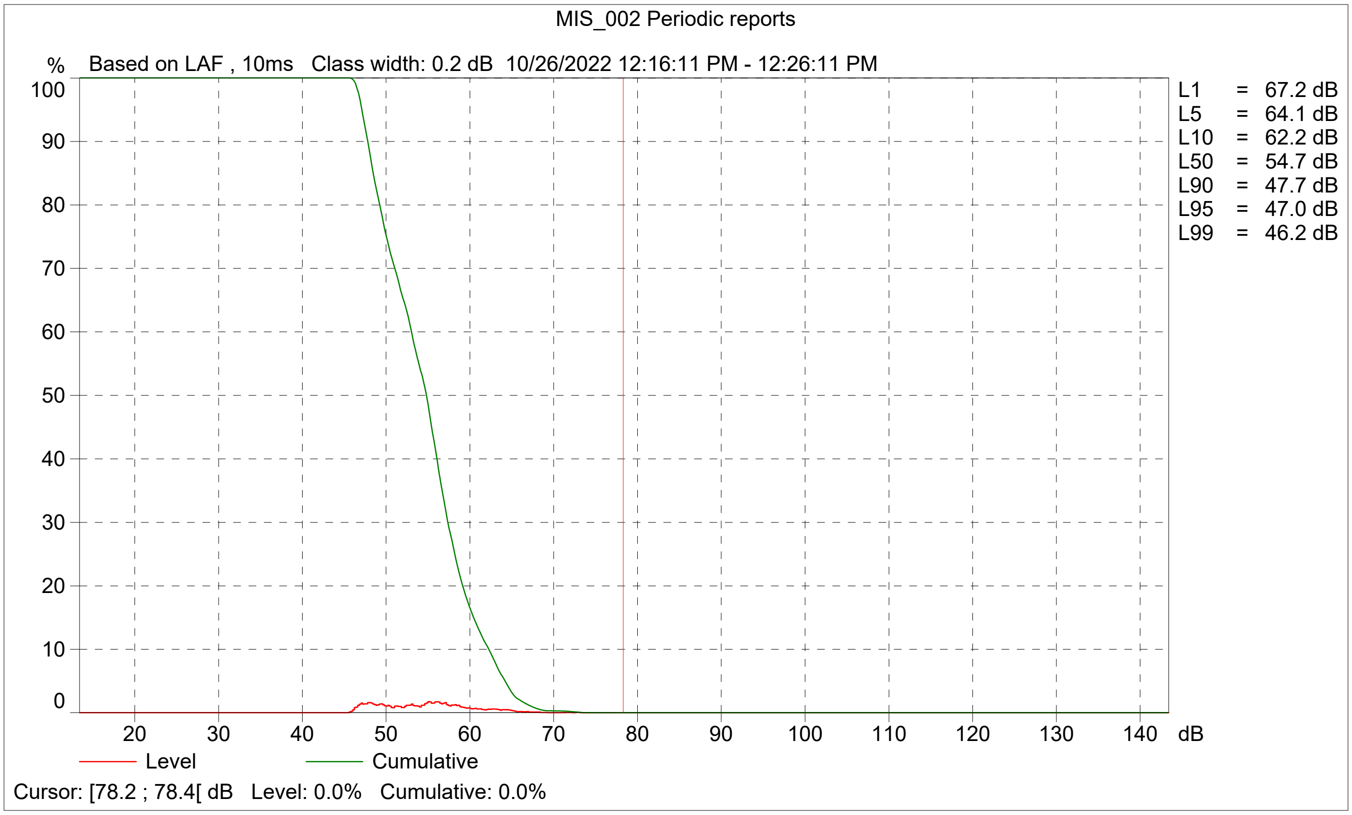


MIS_002 Periodic reports
Sound
dB
140
120
100
80
60
40
20
12:20:00 PM
12:30:00 PM
12:40:00 PM
12:50:00 PM
01:00:00 PM
01:10:00 PM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 10/26/2022 12:16:11 PM - 01:16:11 PM LAIeq=59.7 dB LAFmax=73.4 dB LCpeak=97.5 dB LAFmin=45.5 dB

MIS_002 Periodic reports

	Start time	Elapsed time	Overload [%]	LAIeq [dB]	LAFmax [dB]	LAFmin [dB]
Value			0.00	59.7	73.4	45.5
Time	12:16:11 PM	0:10:00				
Date	10/26/2022					




MIS_002 Periodic reports
%
Based on LAF , 10ms   Class width: 0.2 dB   10/26/2022 12:16:11 PM - 12:26:11 PM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 67.2 dB
L5 = 64.1 dB
L10 = 62.2 dB
L50 = 54.7 dB
L90 = 47.7 dB
L95 = 47.0 dB
L99 = 46.2 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[dB   Level: 0.0%   Cumulative: 0.0%