Michael Baker
INTERNATIONAL

# *Technical Memorandum:*
# *NOISE AND GROUNDBORNE VIBRATION*

*Marea Village Mixed Use Development Project*

# Technical Memorandum

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| **TO:** | City of Encinitas | **DATE:** | April 2021 |
| **FROM:** | Michael Baker International | **SUBJECT:** | Noise and Groundborne Vibration for the Marea Village Mixed Use Development Project |

## PURPOSE

The Encinitas Beach Land Venture, LLC (Applicant) is proposing the Marea Village Mixed Use Development Project (project) in the City of Encinitas (City). The project requires California Environmental Quality Act (CEQA) review and approval of a density bonus tentative map, design review permit, and coastal development permit by the City. The purpose of this technical memorandum is to evaluate potential short- and long-term noise and ground-borne vibration impacts as a result of the project.

## PROJECT LOCATION

The project is located at 1900 and 1950 North Coast Highway 101 in the City and the coastal portion of San Diego County (County). The proposed project is comprised of two sites; County of San Diego Assessor Parcel Numbers (APNs) 216-041-20 and 216-041-21 (Site 1), and 216-041-06 (Site 2) totaling approximately 3.8 acres.

The project site is located within the community of Leucadia, one of five designated communities in the City. The City is bordered to the south by Solana Beach and to the west by the Pacific Ocean. The City of Carlsbad borders Encinitas to the north at the Batiquitos Lagoon State Marine Conservation Area and then extends farther to the east and north, across Batiquitos Lagoon.

Regional access to the project site is via Interstate 5 (I-5) to westbound La Costa Avenue, then to southbound North Coast Highway 101. Access to the project site is via North Coast Highway 101 which forms the eastern boundary of the property. Moorgate Road runs along the southern boundary of the site.

## PROJECT DESCRIPTION

The proposed project would demolish the existing buildings on the property and construct 94 apartments, 30 hotel rooms, and 18,262 square feet of retail uses. The project would also include a subterranean parking garage, a walking paseo, pedestrian plaza, and an outdoor seating area. Vehicular access to the site would be provided via a right turn in from the southbound lane of North Coast Highway 101 and a new left turn lane from the northbound North Coast Highway 101. Pedestrian access to the site would be provided at multiple points of ingress from the public right of way along the southbound side of North Coast Highway 101. It is anticipated there would also be pedestrian access to the site from the property

to the north of the project which is the site of a hotel that is currently under construction. The hotel is anticipated to be operational prior to the project.

Site 1 is designated as Visitor Serving Commercial (VSC) by the City of Encinitas General Plan (General Plan) and zoned as Commercial Residential Mixed 1 (N-CRM-1) with a Coastal Zone overlay. Site 2 is designated as General Commercial (GC) by the General Plan and zoned as Limited Visitor-Serving Commercial (N-LVSC) with a Coastal Zone and Residential-30 (R-30) Zone overlay. As part of the City of Encinitas Housing Element Update, Site 1 of the project site was allocated a minimum of 33 residential units if the site is developed at a mixed-use ratio.

Project construction would occur over approximately 15 months. Construction of the project would include the following phases: demolition, grading, building construction, paving, and architectural coating.

## METHODOLOGY

To assess potential noise impacts, a field investigation was conducted to identify land uses and sensitive receptors that could be subject to construction and operational noise impacts from the project, and ambient noise measurements were collected to establish the existing noise environment.

Noise levels of specific construction equipment were determined and resultant noise levels at those sensitive receptors (at measured distances from the source) were then calculated. Potential long-term (i.e., operational) mobile and stationary source noise were assessed based on site reconnaissance information and documented noise levels.

Traffic noise levels were predicted using the using Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108). The RD-77-108 model calculates the average noise level at specific locations based on traffic volumes from the *City of Encinitas Fenway Mixed-Use (Hotel, Residential, Commercial) 1900 N. Coast Highway 101 Draft Local Transportation Analysis* (Traffic Impact Analysis) prepared by LOS Engineering, Inc. (dated November 12, 2020), average speeds represented by the posted speed limit, roadway geometry, and site environmental conditions. As a conservative analysis, shielding features, including topography and intervening buildings, were not considered in the model.

Stationary noise levels were predicted using typical reference noise levels from publications and distances between noise sources and nearest sensitive receptors.

Predicted noise levels were then compared with applicable significance thresholds and City standards for determination of significance.

In addition, an on-site noise level assessment was performed to evaluate whether the project's design is consistent with the City's Noise and Land Use Compatibility Guidelines and Municipal Code.

## EXISTING SITE CONDITIONS

The project site is currently occupied by an operating restaurant, a small commercial center, and a vacant structure formerly operated as a restaurant, along with various supporting surface parking areas and a small area of previously undeveloped land.

The topography of the project site varies. Developed areas in the southern portion of the site are generally flat; however, approximately 14 percent of the overall site has a slope greater than 25 percent, with some on-site slopes exceeding 40 percent.

The existing Seabluffe residential community of 255-gated townhomes is located directly adjacent to the south and west. Moorgate Road and approximately 18 parking stalls run along the southern boundary of

the site. The Pacific Ocean lies further west, approximately 0.14-mile from the site. A new hotel (currently under construction) is located adjacent to the north of the project site. The intersection of La Costa Avenue and North Coast Highway 101 lies approximately 215 feet to the northeast. North Coast Highway 101, a four-lane divided highway with two lanes and a dedicated bike lane in both directions, forms the eastern boundary of the project site. Sidewalks are only available along southbound Highway 101 on the north half of the project site. The North County Transit District (NCTD) railroad runs north-south and parallels Highway 101 on the east, approximately 135 feet to the east of the project site at its nearest point. The closest airport is the McClellan-Palomar Airport, located approximately 3.5 miles to the northeast of the project site.

## 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. This A-weighted dB scale has been chosen by most authorities for regulation of environmental noise. Table 1, Typical Indoor/Outdoor Noise Levels and Common Environmental Noise Sources, lists typical indoor and outdoor noise levels.

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. The presence of a barrier between the source and the receptor may attenuate noise levels. The actual amount of attenuation depends on the barrier size and the frequency of the noise. A noise barrier may be any natural or human-made feature, such as a hill, tree, building, wall, or berm. 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.

**Table 1**
**Typical Indoor/Outdoor Noise Levels and Common Environmental Noise Sources**

| Common Outdoor Activities Noise Level | Noise Level (dBA) | Common Indoor Activities |
|---|---|---|
| | 110 | Rock band |
| Jet fly-over at 1,000 feet | | |
| | 100 | |
| Gas lawn mower at 3 feet | | |
| | 90 | |
| Diesel truck at 50 feet at 50 mph | | Food blender at 3 feet |
| | 80 | Garbage disposal at 3 feet |
| Noisy urban area, daytime | | |
| Gas lawn mower, 100 feet | 70 | Vacuum cleaner at 10 feet |
| Commercial area | | Normal speech at 3 feet |
| Heavy traffic at 300 feet | 60 | |
| | | Large business office |
| Quiet urban daytime | 50 | Dishwasher in next room |
| | | |
| Quiet urban nighttime | 40 | Theater, large conference room (background) |
| Quiet suburban nighttime | | |
| | 30 | Library |
| Quiet rural nighttime | | Bedroom at night, concert hall (background) |
| | 20 | |
| | | Broadcast/recording studio |
| | 10 | |
| Lowest threshold of human hearing | 0 | Lowest threshold of human hearing |
| | | |

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

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.

## 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 2, *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 2**
**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 earth-moving which requires 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.

# EXISTING 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 multi-family residences (Seabluffe Village) located immediately adjacent to the west and south.

## Existing Mobile and Stationary Noise Levels

The majority of the existing noise in the project area is from mobile sources generated from traffic along surrounding roadways including North Coast Highway 101 and trains along the North County Transit District railroad. The primary sources of stationary noise in the project vicinity are urban-related activities (i.e., mechanical equipment and parking areas). Noise associated with the stationary sources may represent a single-event noise occurrence, short-term, or long-term/continuous noise.

## Ambient Noise Measurements

In order to quantify existing ambient noise levels in the project area, Michael Baker International conducted noise measurements on October 27, 2020; refer to Exhibit 1, *Noise Measurement Locations*, and Table 3, *Noise Measurements*. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the project site. The 10-minute short-term measurements were taken at each site between 10:00 a.m. and 12:00 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.[1]

Meteorological conditions were clear skies, warm temperatures, with light wind speeds (approximately 0 to 5 miles per hour), and low humidity. 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. As shown in Table 3, the ambient recorded noise level in the project vicinity ranged from 50.4 dBA to 65.3 dBA. Refer to Appendix A, *Noise Data*, for the results of the field measurement.

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

**Table 3**
**Noise Measurements**

| Measurement Location Number | Location | $L_{eq}$ (dBA) | $L_{max}$ (dBA) | $L_{min}$ (dBA) | Peak (dBA) | Time |
|---|---|---|---|---|---|---|
| 1 | On southern side of the project site near existing driveway and Highway 101 | 65.3 | 79.4 | 44.2 | 99.1 | 10:27 a.m. |
| 2 | Inside Seabluffe Village, the grass area adjacent to Moorgate Road and apartments along Haymarket Road | 50.4 | 66.4 | 41.2 | 84.1 | 10:50 a.m. |
| 3 | Inside Seabluffe Village, at the corner of Milbank Road and Moorgate Road | 53.6 | 75.9 | 44.5 | 100.7 | 11:03 a.m. |

Note: $L_{eq}$ = equivalent sound level; $L_{max}$ = maximum sound level, the highest individual sound level occurring over a given time period; $L_{min}$ = minimum sound level, the lowest individual sound level occurring over a given time period; Peak = peak sound level, the peak level of the sound pressure wave with no time constant applied.

Source: Michael Baker International, October 27, 2020.

# REGULATORY SETTING

## Federal

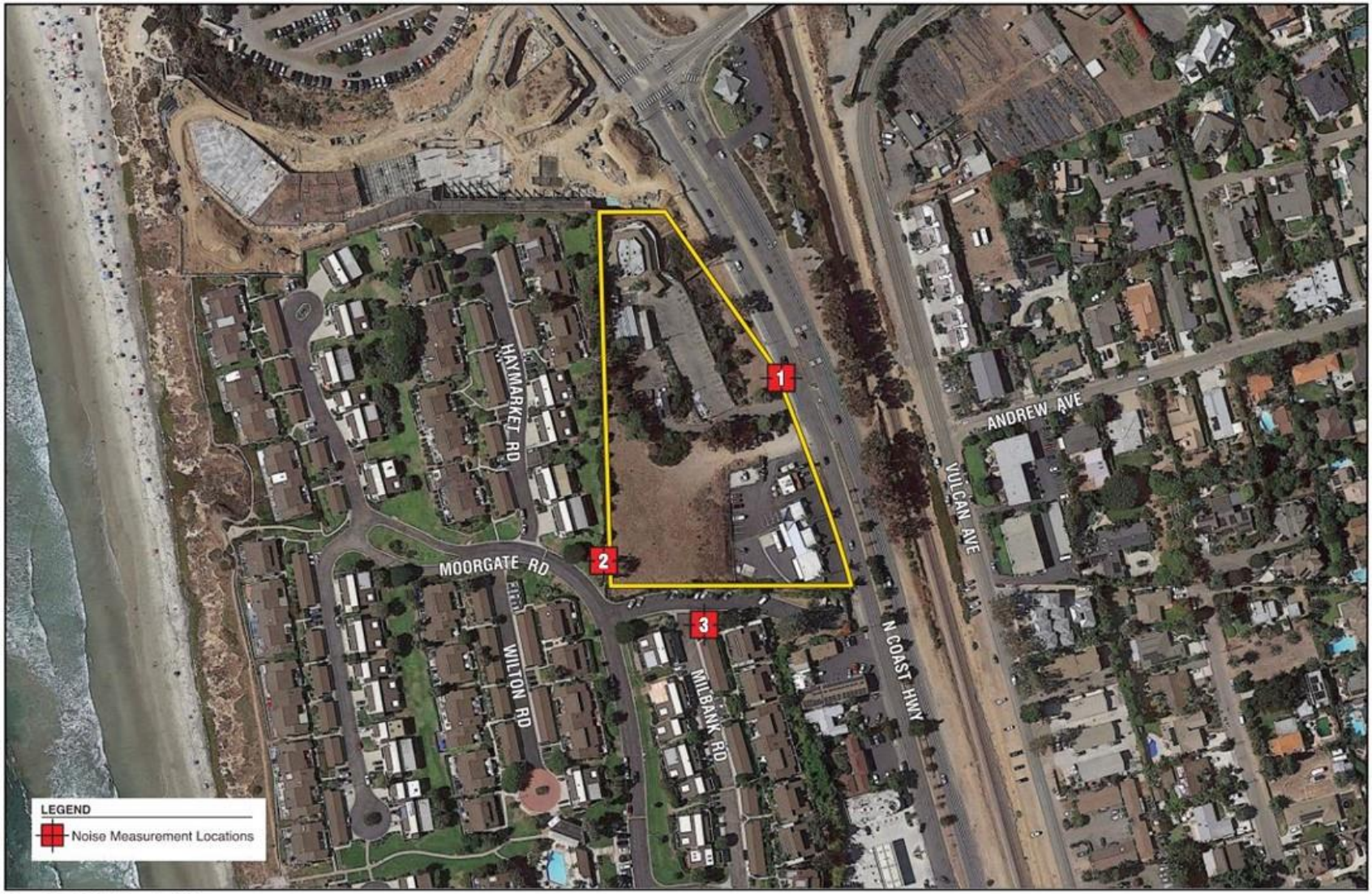
### *U.S. Environmental Protection Agency*

The U.S. Environmental Protection Agency (EPA) offers guidelines for community noise exposure in the publication Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise. These guidelines consider occupational noise exposure as well as noise exposure in homes. The EPA recognizes an exterior noise level of 55 decibels day-night level (dB $L_{dn}$) as a general goal to protect the public from hearing loss, activity interference, sleep disturbance, and annoyance. The EPA and other Federal agencies have adopted suggested land use compatibility guidelines that indicate that residential noise exposures of 55 to 65 dB $L_{dn}$ are acceptable. However, the EPA notes that these levels are not regulatory goals, but are levels defined by a negotiated scientific consensus, without concern for economic and technological feasibility or the needs and desires of any particular community.

## State of California

### *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.




Source: Google Earth, December 2020

NOT TO SCALE

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12/2020 JN 180066

MAREA VILLAGE MIXED USE DEVELOPMENT PROJECT
NOISE AND GROUNDBORNE VIBRATION TECHNICAL MEMORANDUM

**Noise Measurement Locations**

**Exhibit 1**

### *Office of Planning and Research*

The State Office of Planning and Research's *Noise Element Guidelines* include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The *Noise Element Guidelines* contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

## City of Encinitas

### *City of Encinitas General Plan*

The *City of Encinitas General Plan* (General Plan) is the primary source of long-range planning and policy direction used to guide growth and preserve the quality of life in the City. Table 4, *Land Use Compatibility for Community Noise Environments*, presents guidelines from the General Plan Noise Element for determining acceptable and unacceptable community noise exposure limits for various land use categories.

**Table 4**
**Land Use Compatibility for Community Noise Environments**

| Land Use Category | Community Noise Exposure ($L_{dn}$ or CNEL, dBA) | | | |
|---|---|---|---|---|
| | Normally Acceptable | Conditionally Acceptable | Normally Unacceptable | Clearly Unacceptable |
| Residential - Low Density, Single-Family, Duplex, Mobile Homes | 50 – 60 | 55 – 70 | 70 – 75 | 75 – 85 |
| Residential - Multiple Family | 50 – 65 | 60 – 70 | 70 – 75 | 70 – 85 |
| Transient Lodging - Motel, Hotels | 50 – 65 | 60 – 70 | 70 – 80 | 80 – 85 |
| Schools, Libraries, Churches, Hospitals, Nursing Homes | 50 – 70 | 60 – 70 | 70 – 80 | 80 – 85 |
| Auditoriums, Concert Halls, Amphitheaters | NA | 50 – 70 | NA | 65 – 85 |
| Sports Arenas, Outdoor Spectator Sports | NA | 50 – 75 | NA | 70 – 85 |
| Playgrounds, Neighborhood Parks | 50 – 70 | NA | 67.5 – 75 | 72.5 – 85 |
| Golf Courses, Riding Stables, Water Recreation, Cemeteries | 50 – 70 | NA | 70 – 80 | 80 – 85 |
| Office Buildings, Business Commercial and Professional | 50 – 70 | 67.5 – 77.5 | 75 – 85 | NA |
| Industrial, Manufacturing, Utilities, Agriculture | 50 – 75 | 70 – 80 | 75 – 85 | NA |

Notes: NA: Not Applicable; $L_{dn}$: average day/night sound level; CNEL: Community Noise Equivalent Level, dBA: A-weighted Decibel
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 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: City of Encinitas, *General Plan Noise Element*, adopted March 29, 1989.

The General Plan Noise Element also includes goals and policies emphasizing noise reduction through standards, site planning, and in the construction of new development that focus on noise mitigation. The relevant goals and policies for the project include:

- **Goal 2**: Require that new development be designed to provide acceptable indoor and outdoor noise environments.
    - **Policy 2.1**: The Noise and Land Use Compatibility Guidelines and the accompanying discussion set forth the criteria for siting new development in the City of Encinitas. Any project which would be located in a normally unacceptable noise exposure area, based on the Land Use Compatibility Guidelines, shall require an acoustical analysis. Noise mitigation in the future shall be incorporated in the project as needed. As a condition of approval of a project, the City may require post-construction noise monitoring and sign off by an acoustician to ensure that City requirements have been met.
- **Goal 3**: Ensure that residents are protected from harmful and irritating noise sources to the greatest extent possible.
    - **Policy 3.1**: The City will adopt and enforce a quantitative noise ordinance to resolve neighborhood conflicts and to control unnecessary noise in the City of Encinitas. Examples of the types of noise sources that can be controlled through the use of a quantitative noise ordinance are barking dogs, noisy mechanical equipment such as swimming pool and hot tub pumps, amplified music in commercial establishments, etc.
- **Goal 4**: Provide for measures to reduce noise impacts from stationary noise sources.
    - **Policy 4.1**: Ensure inclusion of noise mitigation measures in the design and operation of new and existing development.

***City of Encinitas Municipal Code***

The City of Encinitas Municipal Code (Municipal Code) establishes noise criteria to prevent noise and vibration that may jeopardize the health or welfare of the City's citizens or degrade their quality of life. Chapter 9.32, Noise Abatement and Control, and Chapter 30.40, Performance Standards, establish property line noise level limits. These limits apply to existing uses but will also apply to future uses and are used for evaluating potential impacts of future on-site generated noise levels.

Section 9.32.410 states that it shall be unlawful for any person, including the City, to operate construction equipment at any construction site on Sundays, and days appointed by the President, Governor or the City Council for a public fast, thanksgiving, or holiday. No such equipment, or combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of 75 decibels for more than eight hours during any 24-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

The property line noise limits are summarized in Table 5, City of Encinitas Exterior Noise Limits. In reference to noise levels depicted in Table 5, Municipal Code Section 30.40.10 states, "Every use shall be so operated that the noise generated does not exceed the following levels at or beyond the lot line and does not exceed the limits of any adjacent zone."

**Table 5**
**City of Encinitas Exterior Noise Limits**

| Adjacent Zone | Noise Level [dB(A)] | |
|---|---|---|
| | 7:00 a.m. to 10:00 p.m. | 10:00 p.m. to 7:00 a.m. |
| Rural Residential (RR), Rural Residential-1 (RR-1), Rural Residential-2 (RR-2), Residential-3 (R-3), Residential-5 (R-5), Residential-8 (R-8) | 50 | 45 |
| Residential-11 (R-11), Residential Single Family-11 (RS-11), Residential-15 (R-15), Residential-20 (R-20), Residential-25 (R-25), Mobile Home Park (MHP) | 55 | 50 |
| Office Professional (OP), Limited Local Commercial (LLC), Local Commercial (LC), General Commercial (GC), Limited Visitor Serving Commercial (L-VSC), Visitor Serving Commercial (VSC) | 60 | 55 |
| Light Industrial (L-I), Business Park (BP) | 60 | 55 |
| Source: City of Encinitas Municipal Code 30.40.010(A). | | |

In reference to interior noise standards, Municipal Code Section 30.40.010 states, "The interior noise level as required by the State of California Noise Insulation Standards must not exceed an $L_{DN}$ of 45 dB in multifamily dwellings. This interior standard shall also be applied to single-family dwellings and offices in the City of Encinitas."

***Encinitas North 101 Corridor Specific Plan***

The project is located within the Encinitas North 101 Corridor Specific Plan (Specific Plan). Chapter 9.7, Noise, of the Specific Plan establishes goals and policies related to noise control in the Specific Plan area. The relevant goals and policies for the project include:

- **Goal 1:** Provide an acceptable noise environment for existing and future residents of the City of Encinitas.
    - **Policy 1.1**: Review actions or projects that may have noise generation potential to determine what impact they may have on existing land uses. If a project would cause an increase in traffic noise levels, the policy of the City of Encinitas is to accept an increase up to an $L_{dn}$ of 55 dB in outdoor residential use areas without mitigation. If a project would increase the traffic noise level by more than 5 dB and the resulting $L_{dn}$ would be over 55 dB, then mitigation measures must be evaluated. If the project, or action, would increase traffic noise levels by 3 dB or more and the resulting $L_{dn}$ would exceed 60 dB in outdoor use areas in residential development, noise mitigation must be similarly evaluated. The impact of non transportation projects must generally be evaluated on a case-by-case basis. The following recommendations will aid in evaluating the impacts of commercial and industrial projects.
        a) Performance Standards Adjacent to Residential Areas. New commercial construction adjacent to residential areas should not increase noise levels in a residential area by more than 3 dB ($L_{dn}$) or create noise impacts which would increase noise levels to more than an $L_{dn}$ of 60 dB at the boundary of the nearest residential area, whichever is more restrictive.

        b) Performance Standards Adjacent to Commercial and Industrial Areas. New commercial projects should not increase noise levels in a commercial area by more than 5 dB ($L_{dn}$) or increase noise levels to an $L_{dn}$ in excess of 70 dB (office buildings, business and professional) or an $L_{dn}$ of 75 dB (industrial) at the property line of an adjacent commercial/industrial use, whichever is more restrictive.

These criteria may be waived if, as determined by a noise analysis, there are mitigating circumstances (such as higher existing noise levels) and/or no uses would be adversely affected. Where conditions are unusual or where backgrounds are unusually low and the characteristics of a new noise source are not adequately described by using the $L_{dn}$ noise descriptor, additional acoustical analysis is encouraged and the conclusions of such analysis will be considered by the City.

- **Policy 1.2**: An $L_{dn}$ of 60 dB is the maximum acceptable outdoor noise level in residential outdoor use areas. The City recognizes that there are residential areas in which existing noise levels exceed an acceptable level. The City will adopt a Noise Wall/Barrier Installation Policy for determining which areas should receive soundwalls along the major street system and to evaluate possible cost participation programs for constructing these soundwalls.

- **Goal 2**: Require that new development be designed to provide acceptable indoor and outdoor noise environments.

- **Goal 3**: Ensure that residents are protected from harmful and irritating noise sources to the greatest extent possible.

- **Goal 4**: Provide for measures to reduce noise impacts from stationary noise sources.

  - **Policy 4.1**: Ensure inclusion of noise mitigation measures in the design and operation of new and existing development.

## CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) THRESHOLDS

Based on Appendix G of the State CEQA Guidelines and the City of Encinitas' applicable noise standards, the project may have a significant adverse impact related to noise and vibration if it would result in 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. More specifically:

  - operational traffic source noise levels that would result in an increase of 3 dBA and greater than 60 dB at noise-sensitive land uses, or an increase of 5 dBA and greater than 55 dB at noise-sensitive land uses;

  - operational stationary and/or area source (non-transportation) noise levels that would exceed the applicable standard or result in a noticeable increase of 3 dBA or greater at the property line of residential uses or by 5 dBA at the property line of commercial uses;

- Generation of excessive groundborne vibration or groundborne noise levels; 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.

## 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?**

Noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, and some passive recreation areas would each be considered noise-sensitive. The nearest sensitive receptors to the project site are the predominantly residential neighborhoods located immediately adjacent to the west and south of the proposed project site.

***Project Construction***

Construction of the proposed project would involve construction activities such as building demolition, grading, building construction, paving, and architectural coating. The temporary construction noise associated with on-site equipment could potentially expose sensitive receptors to noise levels in excess of the applicable noise standard and/or result in a noticeable increase in ambient noise levels, and/or an exceedance of daytime hour noise standards.

Typical noise levels generated by construction equipment used by the project are shown in Table 6, Noise Levels Generated by Construction Equipment. It should be noted that the noise levels in maximum sound levels ($L_{max}$) identified in Table 6 are the highest individual sound occurring at an individual time period. 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 $L_{max}$ levels were converted to $L_{eq}$ levels based on the acoustical use factor of each equipment, and $L_{eq}$ levels are more representative of the noise levels averaged over time.

**Table 6**
**Noise Levels Generated by Construction Equipment**

| Type of Equipment | Acoustical Use Factor[1] | $L_{max}$ at Property Line (dBA)[2] | $L_{eq}$ at Property Line (dBA)[2] | $L_{max}$ at 50 Feet (dBA) | $L_{eq}$ at 120 Feet (dBA) | $L_{eq}$ at 220 Feet (dBA) |
|---|---|---|---|---|---|---|
| Backhoe | 40 | **112** | 108 | 78 | 66 | 61 |
| Concrete Saw | 20 | **124** | 117 | 90 | 75 | 70 |
| Crane | 16 | **113** | 105 | 79 | 63 | 58 |
| Dozer | 40 | **116** | 112 | 82 | 70 | 65 |
| Dump Truck | 40 | **110** | 106 | 76 | 64 | 59 |
| Excavator | 40 | **115** | 111 | 81 | 69 | 64 |
| Forklift | 40 | **112** | 105 | 78 | 63 | 58 |
| Grader | 40 | **119** | 115 | 85 | 73 | 68 |
| Loader | 40 | **113** | 109 | 79 | 67 | 62 |
| Paver | 50 | **111** | 108 | 77 | 66 | 61 |
| Vibratory Pile Driver | 20 | **129** | 122 | 95 | 80 | 75 |
| Roller | 20 | **114** | 107 | 80 | 65 | 60 |
| Scraper | 40 | **119** | 115 | 85 | 73 | 68 |
| Soil Mix Drill Rig | 50 | **114** | 111 | 80 | 69 | 64 |
| Tractor | 40 | **118** | 114 | 84 | 72 | 67 |
| Water Truck | 40 | **114** | 110 | 80 | 68 | 63 |
| General Industrial Equipment | 50 | **119** | 116 | 85 | 74 | 69 |

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. 2: It is mathematically infeasible to calculate noise levels at zero-foot from the source. Therefore, noise levels are calculated at one foot from the source as an approximate to represent noise levels at the property line.

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

The potential for construction-related noise to affect nearby sensitive receptors would depend on the location and proximity of construction activities to these receptors. The closest sensitive receptors are the multi-family residences located adjacent to the west and south of the project site.

According to the Municipal Code Section 9.32.410 (A), construction activities are only allowed between the hours of 7:00 a.m. to 7:00 p.m. on Mondays through Saturdays except for holidays and construction equipment, or combination of equipment shall be operated so as to cause noise at a level in excess of 75 decibels for more than eight hours during any 24-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

As shown in Table 6, construction noise would potentially range from 105 dBA $L_{eq}$ to 122 dBA $L_{eq}$ at the property line and 77 dBA $L_{eq}$ to 95 dBA $L_{eq}$ at 50 feet from the property line, in exceedance of the 75 dBA threshold. At a distance of 120 feet from the property lines, estimated noise levels from all equipment types with the exception of pile drivers would be reduced to below the 75 $L_{eq}$ thresholds. At a distance of 220 feet from the property line, vibratory pile drivers would be reduced to below the 75 dBA $L_{eq}$ threshold.

Although construction noise may exceed the 75 dBA $L_{eq}$ threshold at any given time, the fraction of use for the types of construction equipment shown in Table 6 would ranges from 16% to 50% over the course of a construction day and in different areas on the property at varying distances from the property boundary; therefore, the rate and duration of individual or cumulative equipment noise in exceedance of the 75 dBA threshold would be variable and intermittent in duration throughout the day and it is unlikely

that construction activities would continuously sustain or exceed the 75 dBA over the course of an 8 hour period.

The applicant for the proposed project would be required to prepare a Construction Noise Control Plan and comply with City's noise ordinance requirements as a condition of project approval. Because the project would be required to prepare a Construction Noise Control Plan to demonstrate compliance with the City's noise ordinance, including the requirements that construction equipment, or combination of equipment would not sustain or exceed the City's 75 dBA significance threshold continuously over the course of an 8 hour period, the impact of temporary construction noise would be **less than significant**.

***Project Operations***

Off-Site Mobile Noise

The proposed project would result in additional traffic on adjacent roadways from daily activities, thereby increasing vehicular noise in the vicinity of existing and proposed land uses. Based on the City of Encinitas Fenway Mixed-Use (Hotel, Residential, Commercial) 1900 N. Coast Highway 101 Draft Local Transportation Analysis (Traffic Impact Analysis) prepared by LOS Engineering, Inc. (dated November 12, 2020), the project would generate a net increase of 1,122 average daily trips, including 60 trips during the a.m. peak hour and 102 trips during the p.m. peak hour. The noise levels under "Existing Without Project" and "Existing With Project" scenarios are modeled using Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) and compared in Table 7, Existing Traffic Noise Levels. Noise modeling assumptions and results are included in Appendix A. As depicted in Table 7, under the "Existing Without Project" scenario, noise levels at 100 feet from roadway centerline would range from approximately 59.5 dBA to 65.0 dBA, with the highest noise levels occurring along Carlsbad Boulevard from Avenida Encinas to La Costa Avenue. The "Existing With Project" scenario noise levels at 100 feet from roadway centerline would range from approximately 59.7 dBA to 65.1 dBA, with the highest noise levels also occurring along Carlsbad Boulevard from Avenida Encinas to La Costa Avenue.

**Table 7**
**Existing and Predicted Traffic Noise Levels**

| Roadway Segment | Existing Without Project | | | | | Existing With Project | | | | | Difference In dBA @ 100 Feet from Roadway |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ADT | dBA @ 100 Feet from Roadway Centerline | Distance from Roadway Centerline to: (Feet) | | | ADT | dBA @ 100 Feet from Roadway Centerline | Distance from Roadway Centerline to: (Feet) | | | |
| | | | 70 CNEL Noise Contour | 65 CNEL Noise Contour | 60 CNEL Noise Contour | | | 70 CNEL Noise Contour | 65 CNEL Noise Contour | 60 CNEL Noise Contour | |
| **Carlsbad Boulevard** | | | | | | | | | | | |
| Avenida Encinas to La Costa Avenue | 16,525 | 65.0 | - | 100 | 216 | 16,749 | 65.1 | - | 101 | 218 | 0.1 |
| **North Coast Highway 101** | | | | | | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 17,801 | 60.6 | - | 51 | 109 | 18,474 | 60.7 | - | 52 | 112 | 0.2 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 17,801 | 60.5 | - | 50 | 108 | 18,923 | 60.8 | - | 52 | 113 | 0.3 |
| Bishops Gate Road to Grandview Street | 17,427 | 60.4 | - | 49 | 107 | 18,538 | 60.7 | - | 52 | 111 | 0.3 |
| Grandview Street to Jupiter Street | 15,918 | 60.0 | - | - | 100 | 16,344 | 60.1 | - | 47 | 102 | 0.1 |
| Jupiter Street to Leucadia Boulevard | 15,873 | 60.0 | - | - | 100 | 16,288 | 60.1 | - | 47 | 102 | 0.1 |
| **La Costa Avenue** | | | | | | | | | | | |
| North Coast Highway 101 to North Vulcan Avenue | 11,686 | 59.5 | - | 43 | 93 | 12,135 | 59.7 | - | 44 | 95 | 0.2 |
| North Vulcan Avenue to Sheridan Road | 13,499 | 60.2 | - | 48 | 102 | 13,925 | 60.3 | - | 49 | 105 | 0.1 |
| Sheridan Road to Interstate 5 | 14,728 | 60.5 | - | 50 | 109 | 15,121 | 60.7 | - | 51 | 111 | 0.1 |

Notes: ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level; "-" = contour is located within the roadway right-of-way.

Source: Noise modeling is based on traffic data within the *City of Encinitas Marea Village Mixed-Use Development (Hotel, Residential, Commercial) 1900 N. Coast Highway 101 Draft Local Transportation Analysis*, prepared by LOS Engineering, Inc., dated November 12, 2020.

Table 7 also shows the difference between the "Existing Without Project" scenario and the "Existing With Project" scenario. As depicted in Table 7, traffic associated with the proposed project would result in a maximum increase of 0.3 dBA along North Coast Highway 101 from 600-foot South of La Costa Avenue to Grandview Street. A significant impact would result only if both of the following occur: an exceedance of the normally acceptable noise standards for residential uses (i.e., 60 dBA CNEL; refer to Table 4) and a perceptible increase in traffic noise levels (i.e., noise increase would be greater than 3.0 dBA).

As shown in Table 7, although traffic noise levels would exceed 60 dBA CNEL along almost all roadway segments under both "Existing Without Project" and "Existing With Project" scenarios in the project area, project-generated average daily trips would not cause a perceptible increase in traffic noise levels (i.e., noise increase would be greater than 3.0 dBA) along any of the surrounding roads. As the project would not cause a perceptible increase in traffic noise levels, the proposed project would not significantly increase noise levels along the roadway segments analyzed. Therefore, a less than significant impact would occur in this regard.

***Stationary Noise***

Mechanical Equipment Noise

Anticipated mechanical equipment noise that would be generate by the proposed project would include Heating Ventilation and Air Conditioning (HVAC) units and swimming pool pumps. The HVAC units would be installed on the rooftops of the proposed buildings and the swimming pool pumps would be located

to the east of Building 11. Typically, mechanical equipment noise is 55 dBA at 50 feet from the source. Because the swimming pool pumps would be located further from the nearest off-site sensitive receptors than the HVAC units, the following discussion focuses on noise generated from the HVAC units. Based upon the Inverse Square Law, sound levels decrease by 6 dBA for each doubling of distance from the source. The closest proposed building to the property line of the multi-family residences to the west would be Building 11, located on northwest of the project site. The HVAC units would be installed on the central-west portion of Building 11's rooftop, approximately 50 feet from the multi-family residences property line. At this distance, noise levels from the HVAC units would be approximately 55 dBA. In addition, the HVAC units would be shielded by a screening wall, which would reduce noise levels by 5 dBA.[2] Therefore, noise levels from HVAC units would be approximately 50 dBA at the nearest residential property line and would not exceed the City's R-11 Zone exterior noise level standards of 55 dBA CNEL for daytime and 50 dBA CNEL for nighttime. The project would be consistent with General Plan Noise Element Policy 3.1 and Policy 4.1 in this regard. In addition, noise levels from HVAC units would be below the ambient noise levels (i.e. 50.4 dBA to 53.6 dBA; refer to Table 3), which would be consistent with the Specific Plan requirements that noise levels shall be 3 dBA or less over ambient noise levels and below 60 dBA. Thus, a less than significant impact would occur.

Parking Lots

The project proposes a combination of on-site garage parking and limited surface parking as well as off-street parking. The on-site surface parking spaces would be located on the west and south portion of the project site.

Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys may be an annoyance to adjacent noise-sensitive receptors. Estimates of the maximum noise levels associated with some parking lot activities are presented in Table 8, *Typical Noise Levels Generated by Parking Lots*.

**Table 8**
**Typical Noise Levels Generated by Parking Lots**

| Noise Source | Maximum Noise Levels at 50 Feet from Source (dBA $L_{eq}$) |
|---|---|
| Car door slamming | 61 |
| Car starting | 60 |
| Car idling | 53 |
| Notes: dBA = A-weighted Decibels; $L_{eq}$ = Equivalent Sound Level<br>Source: Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991. | |

As shown in Table 8, parking lot activities can result in noise levels of up to 61 dBA at a distance of 50 feet. It is noted that parking lot noise are instantaneous noise levels compared to noise standards in the CNEL scale, which are averaged over time. As a result, actual noise levels over time resulting from parking lot activities would be far lower than what is identified in Table 8. The nearest parking spaces would be located approximately 40 feet from the property line of the multi-family residences to the west. At this distance, parking lot noise would range from 55 to 63 dBA. It should be noted that parking lot noise levels would be much lower in the CNEL noise scale (i.e., the noise metric used by the Land Use Compatibility Guidelines to evaluate mobile noise impacts) which represents a time-weighted 24-hour average noise

[2] Federal Highway Administration, *Roadway Construction Noise Model User's Guide*, January 2016.

level based on A-weighted decibels. While parking lot noise may be as loud as 63 dBA, these noise levels would be short-term and intermittent. In addition, there is an existing surface parking lot located on the west side of the project site that is also close to the multi-family residences. Therefore, project-generated parking lot noise levels would not introduce a new source of noise when compared to existing conditions. Thus, the project would be consistent with General Plan Noise Element Policy 3.1 and Policy 4.1, and impacts would be less than significant.

Outdoor Area

The project proposes an outdoor patio area located on the west side of proposed Building 11, which would be a hotel. The proposed outdoor patio area has the potential to be accessed by groups of people intermittently. In addition, the project would play light background music throughout the outdoor area of the project site. Noise generated by groups of people is dependent on several factors including vocal effort, impulsiveness, and the random orientation of the group members. This type of noise is estimated at 60 dBA at one meter (3.28 feet) away for raised normal speaking.[3] 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 group members.[4] Therefore, group noise levels would be approximately 62 dBA at one meter (3.28 feet) from the source. The light background music is assumed to generate similar level of noise as the group. The patio area would be located approximately 30 feet from the property line of the multi-family residences to the west. At this distance, noise level would be reduced to approximately 43 dBA, which would not exceed the City's R-11 Zone exterior noise level standards of 55 dBA CNEL for daytime and 50 dBA CNEL for nighttime. The project would be consistent with General Plan Noise Element Policy 3.1 and Policy 4.1 in this regard. In addition, noise levels from the outdoor patio area would be below the ambient noise levels (i.e. 50.4 dBA to 53.6 dBA; refer to Table 3), which would be consistent with the Specific Plan requirements that noise levels shall be 3 dBA or less over ambient noise levels and below 60 dBA. As such, impacts would be less than significant.

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

Vibration-sensitive land uses are locations where people reside or where there is a potential for damage to structures like buildings and sidewalks. The nearest structures are multi-family residential buildings located approximately 20 feet west of the of the project boundary.

***Construction***

Project construction can generate varying degrees of groundborne vibration, depending on the construction procedure and construction equipment. Operation of 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.

Construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic (e.g., plaster cracks) or structural. The distance at which damage from vibration could be experienced can vary substantially depending on the

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

age and composition of the building structure, soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, buildings that are constructed with typical timber frames and masonry show that a vibration level of up to 0.2 in/sec PPV is considered safe and would not result in any construction vibration damage.[5] This evaluation uses the Federal Transit Administration (FTA) architectural damage criterion for continuous vibrations at non-engineered timber and masonry buildings of 0.2 in/sec PPV. The FTA has published standard vibration velocities for construction equipment operations. Typical vibration produced by construction equipment is detailed in Table 9, Typical Vibration Levels for Construction Equipment.

Groundborne vibration decreases rapidly with distance. The nearest structures are multi-family residential buildings located approximately 20 feet west of the of the project boundary. As indicated in Table 9, vibration velocities from typical heavy construction equipment used during project construction would range from 0.0042 (a small bulldozer) to 0.2935 (vibratory roller) in/sec PPV at 20 feet from the source of activity, which would potentially exceed the FTA's 0.2 in/sec PPV threshold of architectural damage. Therefore, Mitigation Measure MM NOI-2 would be required to reduce vibration levels below the threshold. Mitigation Measure MM NOI-2 would ensure the vibration level at the nearest structures would be closely monitored during construction and by adjusting the vibration frequency settings of the construction equipment, the vibration level would be below the 0.2 in/sec threshold at the nearest structures. With the implementation of Mitigation Measure MM NOI-2, the proposed construction activities associated with the project would not expose sensitive receptors to excessive groundborne vibration levels. Vibration impacts associated with construction would be less than significant with mitigation incorporated.

**Table 9**
**Typical Vibration Levels for Construction Equipment**

| Equipment | Approximate peak particle velocity at 25 feet (inches/second)[1] | Approximate peak particle velocity at 20 feet (inches/second)[1] |
|---|---|---|
| Large bulldozer | 0.089 | 0.1244 |
| Loaded trucks | 0.076 | 0.1062 |
| Small bulldozer | 0.003 | 0.0042 |
| Jackhammer | 0.035 | 0.0489 |
| Pile Drivers (Low Vibration) | 0.170 | 0.2376 |
| Vibratory Rollers | 0.210 | 0.2935 |

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

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

[5] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

***Operation***

The project proposes a mixed-use development including residential use, office, retail, restaurant, and hotel. The operation of the project would involve occasional truck deliveries and trash pick-up, which would potentially generate groundborne vibration. However, the truck operations would not be substantial, and the groundborne vibration levels would not be perceptible or felt at surrounding uses. Therefore, the impact would be less than significant.

**MM NOI-1: Implement Vibration Control Measures During Construction**

The project applicant shall incorporate the following measures on all grading and building plans and specifications subject to approval of the City of Encinitas prior to issuance of a demolition or grading permit (whichever occurs first):

- The Applicant shall utilize a construction vibration monitoring system with the potential to measure low levels of vibration. The Applicant shall adjust the vibration frequency settings of the equipment to ensure vibration levels do not exceed the 0.2 inch-per-second PPV threshold at the residential buildings located to the west of the project site.
- The Applicant shall conduct sensitivity training to inform construction personnel about the existing sensitive receptors surrounding the project and about methods to reduce noise and vibration.

**Timing/Implementation:** Before and during all construction activities.

**Enforcement/Monitoring:** City of Encinitas and the general contractor.

**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?**

**No Impact.** The closest airport is the McClellan-Palomar Airport, located approximately 3.5 miles to the northeast of the project site. The site is not within the McClellan-Palomar Airport influence area where aircraft noise levels are a concern.[6] Thus, the proposed project would not expose people residing or working in the area to excessive noise levels. Therefore, no impacts would occur.

***Mitigation Measures:*** No mitigation is required.

## CUMULATIVE IMPACTS

When determining whether the overall noise (and vibration) impacts from cumulative projects would be cumulatively significant and whether the proposed project's incremental contribution to any significant cumulative impacts would be cumulatively considerable, it is important to note that noise and vibration are localized occurrences; as such, they decrease rapidly in magnitude as the distance from the source to the receptor increases.

### Short-Term Construction Noise Impacts

Construction activities associated with the proposed project and cumulative projects may overlap, resulting in construction noise in the area. However, as analyzed above, construction noise impacts primarily affect the areas immediately adjacent to the project site. As a condition of project approval, the project would be required to prepare a Construction Noise Control Plan to demonstrate that all construction activity is in compliance with all appliable City noise standards and submit it to the City's Planning and Building Department for review and approval, which would to reduce construction noise impacts to less than significant levels.. All other housing projects covered under the 2019 HEU would be subject to the same requirements. The construction activities associated with other cumulative development projects would also be required to comply with the City's Municipal Code and would incorporate mitigation measures on a project-by-project basis, as applicable, to reduce construction noise pursuant to CEQA provisions. Therefore, with implementation of a City-approved Construction Noise Control Plan, the project's contribution to cumulative short-term construction impacts would be less than cumulatively considerable.

### Long-Term (Mobile) Noise Impacts

Long-term cumulative noise impacts from mobile sources would occur primarily as a result of increased traffic on area roadways due to buildout of the proposed project and other projects in the vicinity. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions (FTA 2006). An increase of 3 dB is widely accepted as "barely perceptible." With regard to traffic noise, traffic volumes would need to roughly double to result in a perceptible change in ambient noise levels.

To determine if cumulative traffic noise levels would increase to a level of significance with the development of the proposed project and other planned projects, traffic data from the Local

[6] County of San Diego, *McClellan-Palomar Airport Far Part 150 Study Update Noise Exposure Maps*, April 26, 2005, https://www.sandiegocounty.gov/content/dam/sdc/dpw/AIRPORTS/palomar/documents/Part150/NoiseExposureMaps.pdf , accessed December 3, 2020.

Transportation Analysis, prepared by LOS Engineering, Inc., dated November 12, 2020 was analyzed for the following traffic scenarios:

- Existing: Current day noise conditions without construction of the project.
- Existing Plus Cumulative Projects without Project : Current day noise conditions plus the completion of the project and the completion of other permitted, planned projects or approved ambient growth factors.
- Existing Plus Cumulative Projects with Project: Comparison of the existing noise levels and the related noise level increases from the combination of the project and all other planned or permitted projects in the vicinity of the site.

As shown in Table 10, Cumulative Traffic Noise, combined effect for roadway segment noise levels would increase between 0.4 dBA and 1.2 dBA with development of the proposed project and other cumulative projects. As the noise increase would not exceed the 3 dBA threshold, the proposed project would not contribute to a significant cumulative noise impact to any existing or future noise sensitive land use. Therefore, mobile source noise impacts would be less than cumulatively considerable.

**Table 10**
**Cumulative Traffic Noise**

| Roadway Segment | dBA @ 100 Feet from Roadway Centerline | | | Combined Effects | Incremental Effects | Cumulatively Significant Impact?[1] |
|---|---|---|---|---|---|---|
| | Existing | Cumulative without Project | Cumulative with Project | Difference in dBA Between Cumulative With Project and Existing | Difference in dBA Between Cumulative With Project and Cumulative Without Project | |
| **Carlsbad Boulevard** | | | | | | |
| Avenida Encinas to La Costa Avenue | 65.0 | 65.7 | 65.7 | 0.7 | 0.1 | No |
| **North Coast Highway 101** | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 60.6 | 60.8 | 61.0 | 0.4 | 0.2 | No |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 60.5 | 60.8 | 61.0 | 0.5 | 0.3 | No |
| Bishops Gate Road to Grandview Street | 60.4 | 60.7 | 60.8 | 0.4 | 0.1 | No |
| Grandview Street to Jupiter Street | 60.0 | 60.3 | 60.4 | 0.4 | 0.1 | No |
| Jupiter Street to Leucadia Boulevard | 60.0 | 60.3 | 60.4 | 0.4 | 0.1 | No |
| **La Costa Avenue** | | | | | | |
| North Coast Highway 101 to North Vulcan Avenue | 59.5 | 60.6 | 60.7 | 1.2 | 0.1 | No |
| North Vulcan Avenue to Sheridan Road | 60.2 | 61.1 | 61.2 | 1.1 | 0.1 | No |
| Sheridan Road to Interstate 5 | 60.5 | 61.5 | 61.6 | 1.1 | 0.1 | No |

Notes:
1. A cumulative impact would occur if the "Combined Effects" and "Incremental Effects" criterion are exceeded, and the modeled noise level exceeds the normally acceptable noise standard shown in Table 3.

Source: Noise modeling is based on traffic data within *City of Encinitas Fenway Mixed-Use (Hotel, Residential, Commercial) 1900 N. Coast Highway 101 Draft Local Transportation Analysis*, prepared by LOS Engineering, Inc., dated November 12, 2020.

***Mitigation Measures:*** No mitigation is required.

### Long-Term (Stationary) Noise Impacts

Although related cumulative projects have been identified within the project study area, the noise generated by stationary equipment on-site cannot be quantified due to the speculative nature of each development. However, each cumulative project would require separate discretionary approval and CEQA assessment, 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. As noted above, the proposed project would not result in significant stationary noise impacts. Therefore, the proposed project would not result in stationary long-term equipment that would significantly affect surrounding sensitive receptors. Thus, the proposed project and identified cumulative projects are not anticipated to result in a significant cumulative impact.

***Mitigation Measures:*** No mitigation is required.

### Vibration Impacts

As discussed above, project construction activities would not generate groundborne vibration off-site above the significance criteria (i.e. 0.2 in/sec PPV threshold for construction as established by the FTA) with implementation of Mitigation Measure MM NOI-1, and project operation activities would not generate perceptible groundborne vibration. Although construction activities associated with the proposed project and off-site cumulative projects may overlap, off-site projects within the City would also be subject to the 0.2 in/sec PPV threshold. Further, the 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, with implementation of Mitigation Measure MM NOI-1, the project's contribution to cumulative vibration impacts would be less than cumulatively considerable.

***Mitigation Measures:*** Refer to Mitigation Measure MM NOI-1.

## ON-SITE NOISE LEVEL ASSESSMENT

CEQA review focuses on potential impacts to off-site sensitive receptors as a result of project implementation; however, as a condition of design review permit approval, the City also requires that new development be designed to provide acceptable on-site indoor and outdoor noise environments. An on-site noise level assessment was also performed to evaluate whether the proposed project's design is consistent with the City's Noise and Land Use Compatibility Guidelines and other applicable policies. No outdoor entertainment is proposed for the project. The main sources of on-site noise from the implementation of the proposed project would be from traffic and noise generated by groups of people in outdoor gathering spaces. Each of these sources are discussed further below.

#### *Traffic Noise*

The proposed on-site residences would be exposed to the traffic noise from North Coast Highway 101. The closest on-site residences to North Coast Highway 101 would be within Building 2 and Building 6 on the east side of the project site, located approximately 50 feet from the roadway centerline. FHWA RD-77-108 program was used to model traffic noise levels at the proposed on-site residences under "Existing Plus Cumulative Plus Project" condition as a conservative analysis and the modeled results are shown in Table 11, Noise Levels at Proposed On-Site Residence. Noise modeling assumptions and results are included in Appendix A. As shown in Table 11, noise levels at on-site residences would be within the City's conditionally acceptable noise and land use compatibility standards, refer to Table 4, which is consistent

with General Plan Noise Element Policy 2.1. According to the U.S. Environmental Protection Agency (EPA) Protective Noise Levels[7], typical buildings in warm climates could provide a 24 dBA exterior to interior noise level reduction with windows closed. Therefore, as shown in Table 11, interior noise levels at the proposed on-site residences would not exceed the City's interior noise standard of 45 dBA $L_{dn}$. As such, the proposed project would be consistent with the City's design and policies with respect to on-site noise.

**Table 11**
**Noise Levels at Proposed On-Site Residence**

| Roadway Segment | Existing Plus Cumulative Plus Project ADT[1] | $L_{dn}$ at 100 Feet from Centerline of Roadway (dBA)[2] | Exterior $L_{dn}$ at Proposed On-Site Residences (dBA)[1] | Interior $L_{dn}$ at Proposed On-Site Residences (dBA)[1, 2] |
|---|---|---|---|---|
| **North Coast Highway 101** | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 19,538 | 60.5 | 65.7 | 41.7 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 19,987 | 60.5 | 65.5 | 41.5 |

ADT = average daily trips; $L_{dn}$ = day-night sound level

Notes:
1. Traffic noise levels were calculated using the FHWA roadway noise prediction model. Refer to Appendix A, *Noise Data* for noise modeling assumptions and results.
2. According to the EPA *Protective Noise Levels*, typical buildings in warm climate could provide 24 dBA exterior to interior noise reduction with windows closed.

Source: City of Encinitas Fenway Mixed-Use (Hotel, Residential, Commercial) 1900 N. Coast Highway 101 Draft Local Transportation Analysis prepared by LOS Engineering, Inc., dated November 12, 2020.

***Stationary Noise***

The proposed on-site residences would be exposed to stationary noise generated by groups of people in outdoor gathering spaces.

Outdoor Area. The project proposes an outdoor pool area located on the east side of proposed Building 11, which would be a hotel. The proposed outdoor pool area has the potential to be accessed by groups of people intermittently. As discussed above, noise generated by groups of people would be approximately 62 dBA at one meter (3.28 feet) from the source. The pool area would be located approximately 40 feet from the nearest residences on-site within Building 6. At this distance, noise level would be reduced to approximately 40 dBA. With 24 dBA exterior to interior noise reduction with windows closed, interior noise level would be approximately 16 dBA, which would not exceed the City's interior noise standard of 45 dBA $L_{dn}$. As such, the design and operation of the proposed project would be consistent with the City's design and policies with respect to on-site noise.

Background Music. The project would play light background music throughout the outdoor area of the project site. The residences on-site would be potentially exposed to excess noise level. To ensure consistency with the City's interior noise standard of 45 dBA $L_{dn}$, the project would need to implement Control Measure NOI-2, which requires that when measured on balconies and patios of on-site residential units, noise level from the background music shall not exceed 69 dBA. With 24 dBA exterior to interior noise reduction with windows closed, implementation of Control Measure NOI-2 would ensure the interior noise level would not exceed 45 dBA. Therefore, with implementation of Control Measure NOI-

[7] U.S. Environmental Protection Agency, *Protective Noise Levels*, November 1978.

1, the design and operation of the proposed project would be consistent with the City's design and policies with respect to on-site noise.

***Control Measure***

**NOI-2** The project applicant shall ensure that during project operation, noise level from background music played on-site shall not exceed 69 dBA when measured on balconies and patios of on-site residential units.

## REFERENCES

### Documents


1. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.
2. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, Table 20, April 2020.
3. City of Encinitas, *General Plan Noise Element*, adopted March 29, 1989.
4. City of Encinitas, *Municipal Code*, http://www.qcode.us/codes/encinitas/, accessed December 4, 2020.
5. City of Encinitas, *Zoning Map*, https://ezoning.encinitasca.gov/index.html, accessed December 4, 2020.
6. County of San Diego, *McClellan-Palomar Airport Far Part 150 Study Update Noise Exposure Maps*, April 26, 2005, https://www.sandiegocounty.gov/content/dam/sdc/dpw/AIRPORTS/palomar/documents/Part150/NoiseExposureMaps.pdf, accessed December 3, 2020.
7. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
8. Federal Highway Administration, *Roadway Construction Noise Model User's Guide*, January 2006.
9. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
10. Harris, Cyril, *Handbook of Noise Control*, 1979.
11. Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), March 10, 1991.
12. LOS Engineering, Inc., *City of Encinitas Fenway Mixed-Use (Hotel, Residential, Commercial) 1900 N. Coast Highway 101 Draft Local Transportation Analysis*, November 12, 2020.
13. National Institute on Deafness and Other Communication Disorders, *Noise-Induced Hearing Loss*, https://www.nidcd.nih.gov/sites/default/files/Documents/health/hearing/NoiseInducedHearingLoss.pdf, accessed August 12, 2019.
14. State Office of Planning and Research, *State of California General Plan Guidelines*, October 2017.
15. U.S. Department of Transportation, *Highway Traffic Noise Analysis and Abatement Policy and Guidance*, https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed April 15, 2020.

16. U.S. Environmental Protection Agency, *Noise Effects Handbook – A Desk Reference to Health and Welfare Effects of Noise*, October 1979 (revised July 1981).

## Websites / Programs

1. Google Earth, 2020.

Michael Baker
INTERNATIONAL

# Appendix A:
## Noise Data

| | |
|---|---|
| **Site Number:** Marea Village EIR On-Site #1 | |
| **Recorded By:** Pierre Glaize & Zhe Chen | |
| **Job Number:** 180066 | |
| **Date:** 10/27/2020 | |
| **Time:** 10:27 a.m. | |
| **Location:** On-site of the Project, adjacent to existing driveway. | |
| **Source of Peak Noise:** Traffic along North Coast Highway 101. | |

| **Noise Data** | | | |
|---|---|---|---|
| **Leq (dB)** | **Lmax(dB)** | **Lmin (dB)** | **Peak (dB)** |
| 65.3 | 79.4 | 44.2 | 99.1 |

| **Equipment** | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Type** | **Vendor** | **Model** | **Serial No.** | **Cert. Date** | **Note** |
| Sound | Sound Level Meter | **Brüel & Kjær** | **2250** | **3011133** | **04/08/2019** | |
| | Microphone | **Brüel & Kjær** | **4189** | **3086765** | **04/08/2019** | |
| | Preamp | **Brüel & Kjær** | **ZC 0032** | **25380** | **04/08/2019** | |
| | Calibrator | **Brüel & Kjær** | **4231** | **2545667** | **04/08/2019** | |

| **Weather Data** | | | |
|---|---|---|---|
| **Est.** | **Duration:** 10 minutes | | **Sky:** Sunny |
| | **Note:** dBA Offset = 0.00 | | **Sensor Height (ft):** 5 ft |
| | **Wind Ave Speed (mph / m/s)** | **Temperature (degrees Fahrenheit)** | **Barometer Pressure (inches)** |
| | 3 | 66° | 30.07 |

## Photo of Measurement Location

## 2250

| | | |
|---|---|---|
| Instrument: | | 2250 |
| Application: | | BZ7225 Version 4.7.4 |
| Start Time: | | 10/27/2020 10:27:41 |
| End Time: | | 10/27/2020 10:37:41 |
| Elapsed Time: | | 00:10:00 |
| Bandwidth: | | 1/3-octave |
| Max Input Level: | | 142.16 |

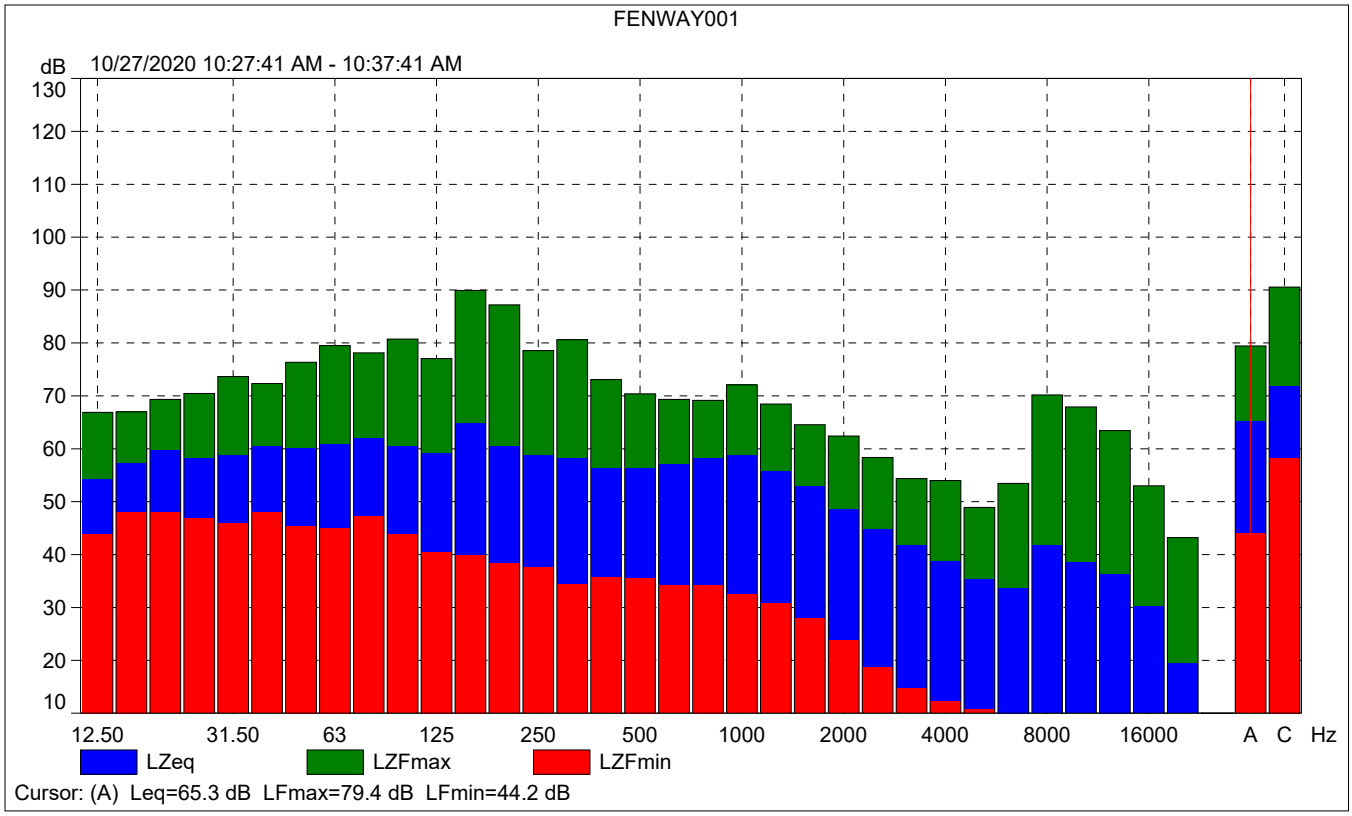
| | Time | Frequency |
|---|---|---|
| Broadband (excl. Peak): | FSI | AC |
| Broadband Peak: | | C |
| Spectrum: | FS | Z |

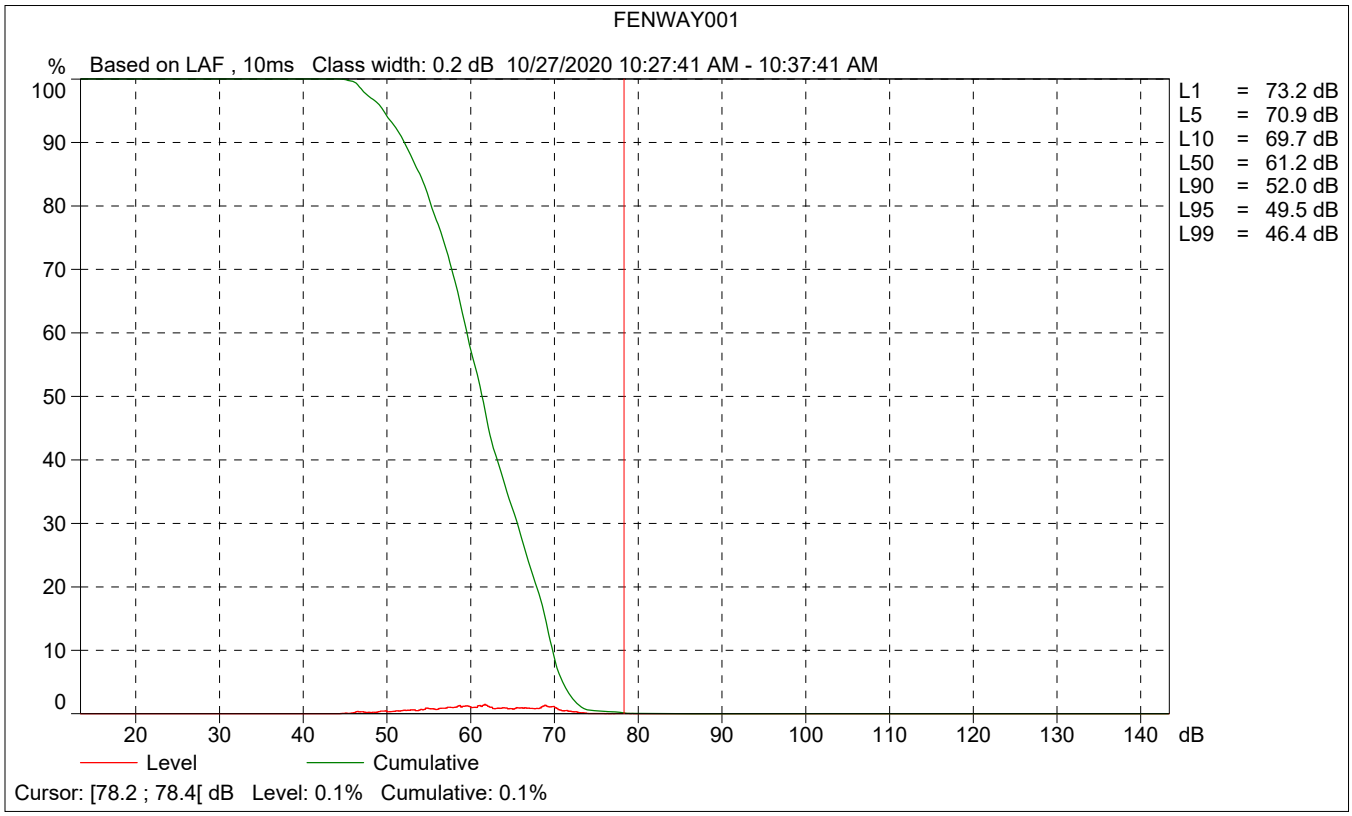
| | | |
|---|---|---|
| Instrument Serial Number: | | 3011133 |
| Microphone Serial Number: | | 3086765 |
| Input: | | Top Socket |
| Windscreen Correction: | | UA-1650 |
| Sound Field Correction: | | Free-field |

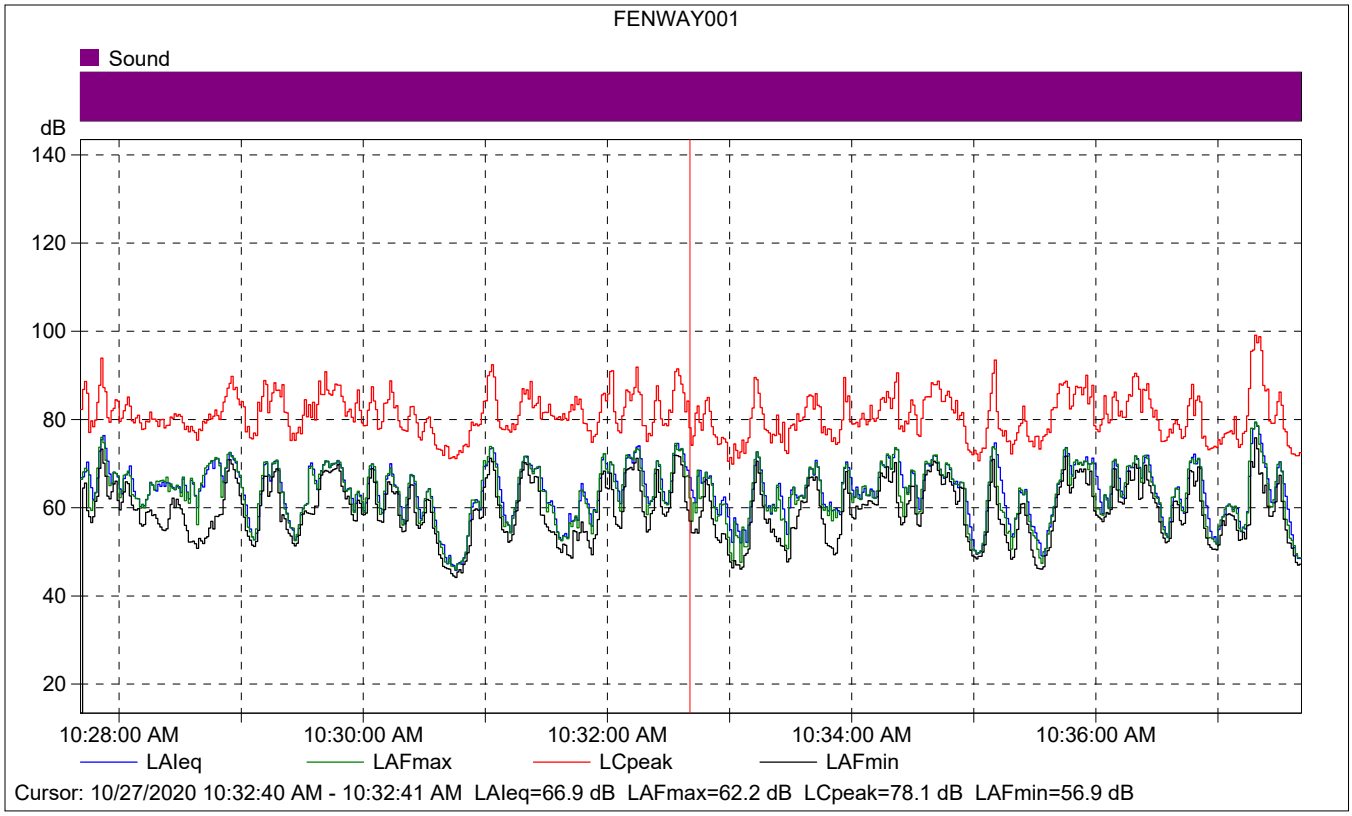
| | | |
|---|---|---|
| Calibration Time: | | 10/27/2020 07:17:01 |
| Calibration Type: | | External reference |
| Sensitivity: | | 43.4200167655945 mV/Pa |

## FENWAY001

| | Start time | End time | Elapsed time | Overload [%] | LAeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|---|---|
| Value | | | | 0.00 | 65.3 | 79.4 | 44.2 |
| Time | 10:27:41 AM | 10:37:41 AM | 0:10:00 | | | | |
| Date | 10/27/2020 | 10/27/2020 | | | | | |

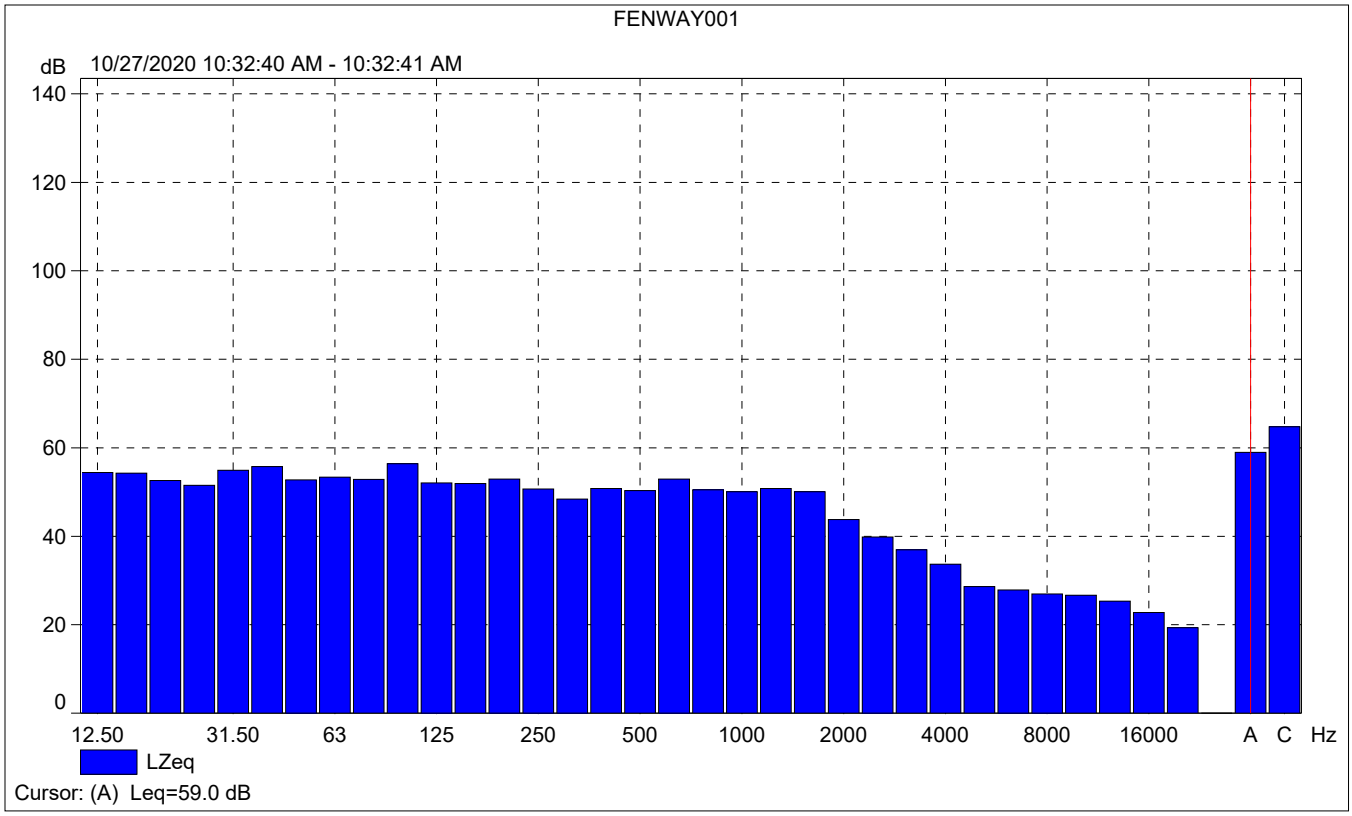

FENWAY001
dB
10/27/2020 10:27:41 AM - 10:37:41 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=65.3 dB LFmax=79.4 dB LFmin=44.2 dB

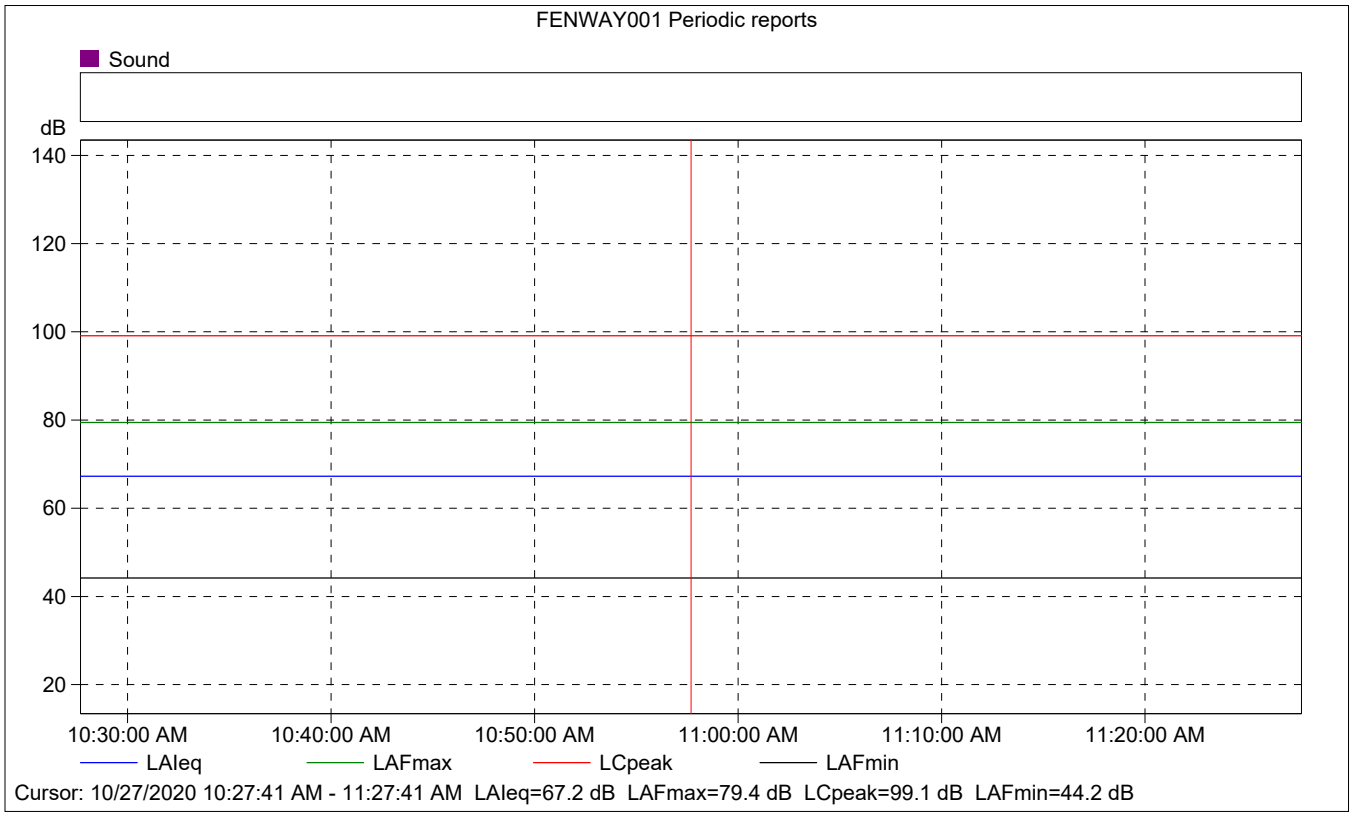

FENWAY001
%
Based on LAF , 10ms Class width: 0.2 dB 10/27/2020 10:27:41 AM - 10:37:41 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 73.2 dB
L5 = 70.9 dB
L10 = 69.7 dB
L50 = 61.2 dB
L90 = 52.0 dB
L95 = 49.5 dB
L99 = 46.4 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[ dB Level: 0.1% Cumulative: 0.1%




## FENWAY001

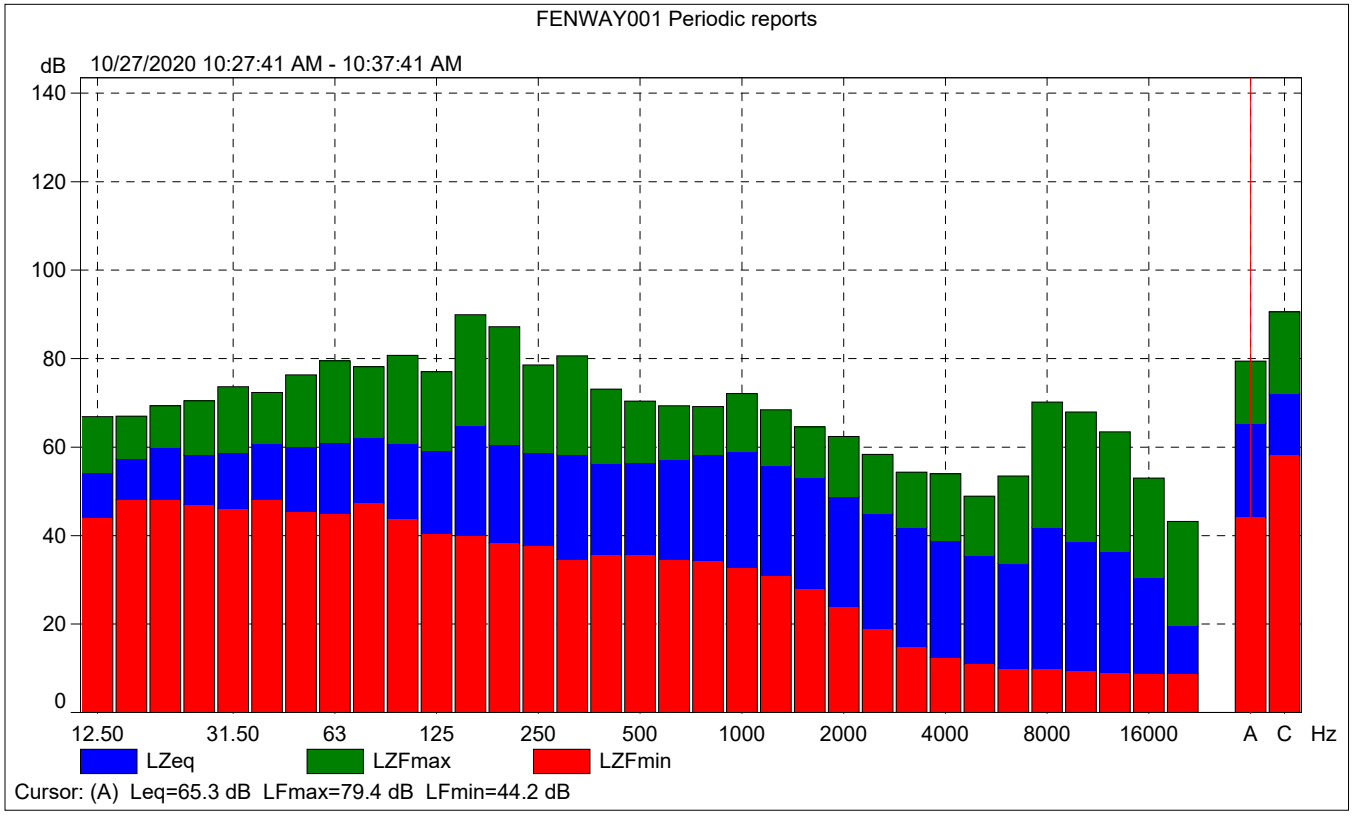
| | Start time | Elapsed time | LAIeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|
| Value | | | 66.9 | 62.2 | 56.9 |
| Time | 10:32:40 AM | 0:00:01 | | | |
| Date | 10/27/2020 | | | | |

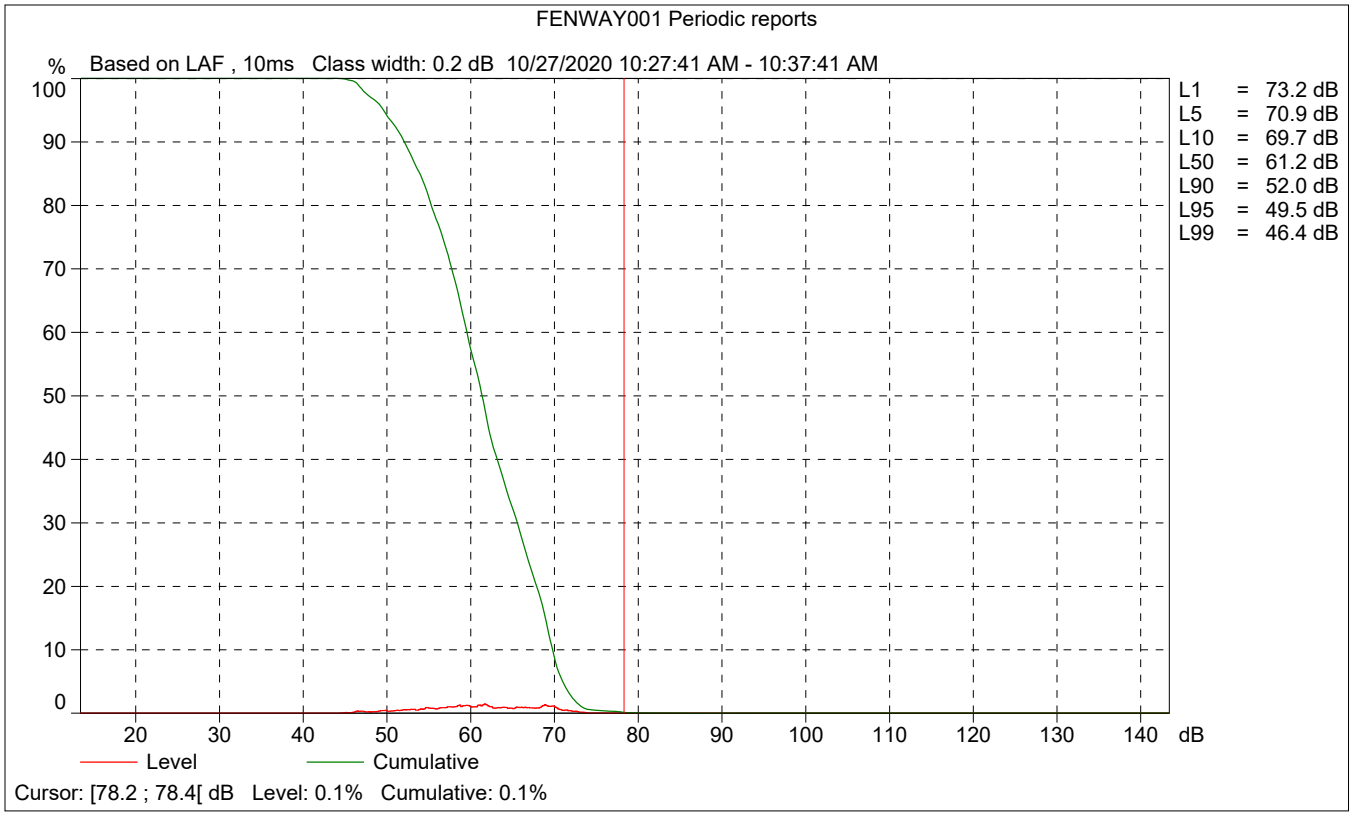

FENWAY001
dB
10/27/2020 10:32:40 AM - 10:32:41 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=59.0 dB


FENWAY001 Periodic reports
Sound
dB
140
120
100
80
60
40
20
10:30:00 AM
10:40:00 AM
10:50:00 AM
11:00:00 AM
11:10:00 AM
11:20:00 AM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 10/27/2020 10:27:41 AM - 11:27:41 AM LAIeq=67.2 dB LAFmax=79.4 dB LCpeak=99.1 dB LAFmin=44.2 dB

# FENWAY001 Periodic reports

| | Start time | Elapsed time | Overload [%] | LAIeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|---|
| Value | | | 0.00 | 67.2 | 79.4 | 44.2 |
| Time | 10:27:41 AM | 0:10:00 | | | | |
| Date | 10/27/2020 | | | | | |



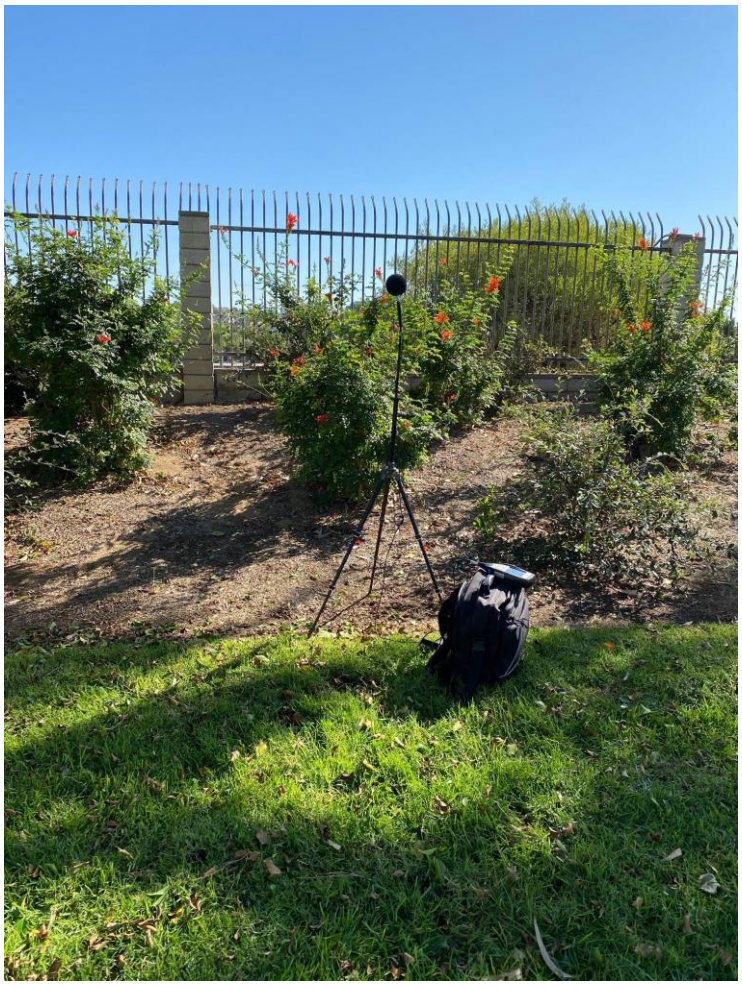

FENWAY001 Periodic reports
% Based on LAF , 10ms Class width: 0.2 dB 10/27/2020 10:27:41 AM - 10:37:41 AM
100
90
80
70
60
50
40
30
20
10
0
20 30 40 50 60 70 80 90 100 110 120 130 140 dB
L1 = 73.2 dB
L5 = 70.9 dB
L10 = 69.7 dB
L50 = 61.2 dB
L90 = 52.0 dB
L95 = 49.5 dB
L99 = 46.4 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[ dB Level: 0.1% Cumulative: 0.1%

| | | | |
|---|---|---|---|
| **Site Number:** Marea Village EIR Site #2 | | | |
| **Recorded By:** Pierre Glaize and Zhe Chen | | | |
| **Job Number:** 180066 | | | |
| **Date:** 10/27/2020 | | | |
| **Time:** 10:50 a.m. | | | |
| **Location:** Grass area adjacent to Moorgate road and residential buildings along Haymarket road. | | | |
| **Source of Peak Noise:** Fedex and water delivery truck. | | | |
| **Noise Data** | | | |
| **Leq (dB)** | **Lmax(dB)** | **Lmin (dB)** | **Peak (dB)** |
| 50.4 | 66.4 | 41.2 | 84.1 |

| **Equipment** | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Type** | **Vendor** | **Model** | **Serial No.** | **Cert. Date** | **Note** |
| Sound | Sound Level Meter | **Brüel & Kjær** | **2250** | **3011133** | **04/08/2019** | |
| | Microphone | **Brüel & Kjær** | **4189** | **3086765** | **04/08/2019** | |
| | Preamp | **Brüel & Kjær** | **ZC 0032** | **25380** | **04/08/2019** | |
| | Calibrator | **Brüel & Kjær** | **4231** | **2545667** | **04/08/2019** | |

| **Weather Data** | | | |
|---|---|---|---|
| **Est.** | **Duration:** 10 minutes | | **Sky:** Sunny |
| | **Note:** dBA Offset = 0.00 | | **Sensor Height (ft):** 5 ft |
| | **Wind Ave Speed (mph / m/s)** | **Temperature (degrees Fahrenheit)** | **Barometer Pressure (inches)** |
| | 4 | 68° | 30.07 |

## Photo of Measurement Location



## 2250

| | | |
|---|---|---|
| Instrument: | | 2250 |
| Application: | | BZ7225 Version 4.7.4 |
| Start Time: | | 10/27/2020 10:50:58 |
| End Time: | | 10/27/2020 11:00:58 |
| Elapsed Time: | | 00:10:00 |
| Bandwidth: | | 1/3-octave |
| Max Input Level: | | 142.16 |

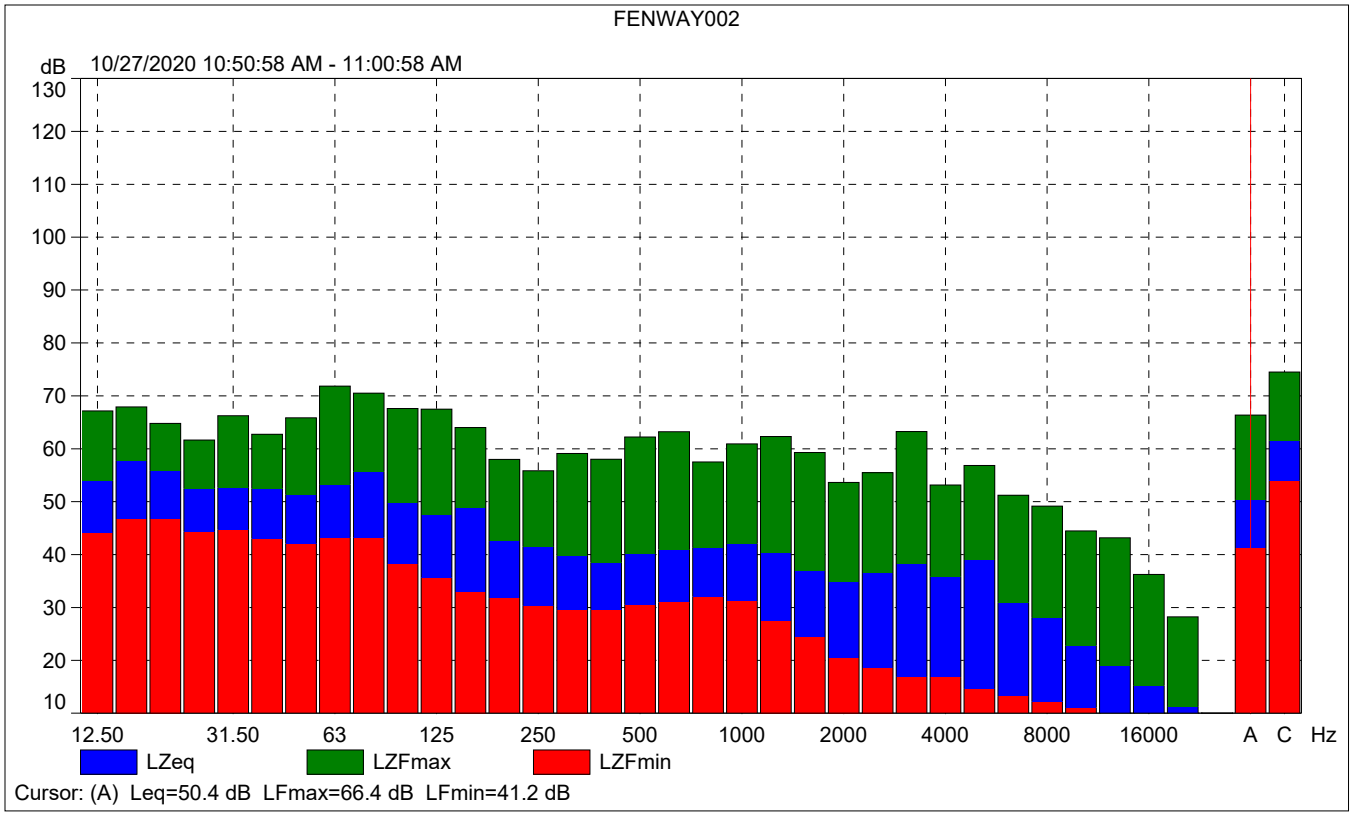
| | Time | Frequency |
|---|---|---|
| Broadband (excl. Peak): | FSI | AC |
| Broadband Peak: | | C |
| Spectrum: | FS | Z |

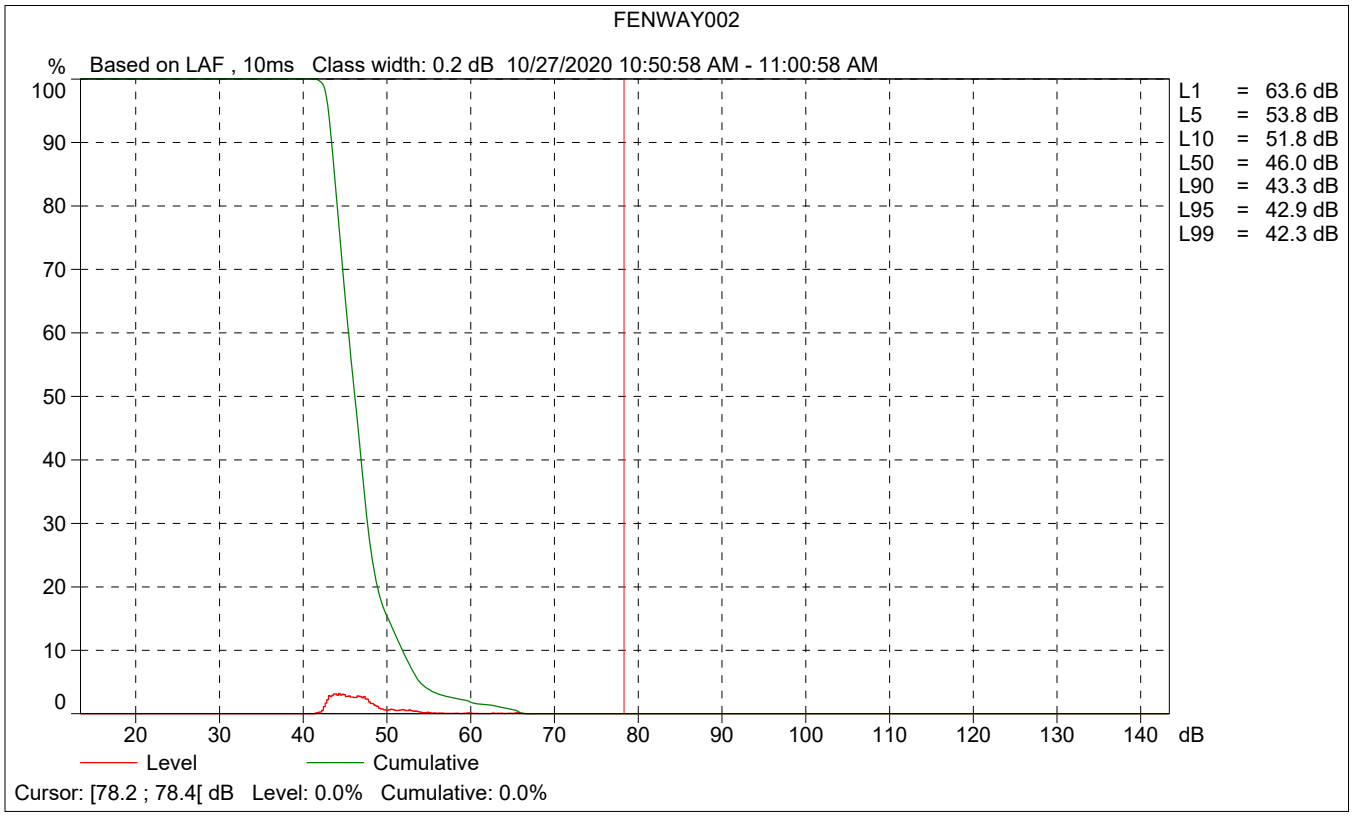
| | | |
|---|---|---|
| Instrument Serial Number: | | 3011133 |
| Microphone Serial Number: | | 3086765 |
| Input: | | Top Socket |
| Windscreen Correction: | | UA-1650 |
| Sound Field Correction: | | Free-field |

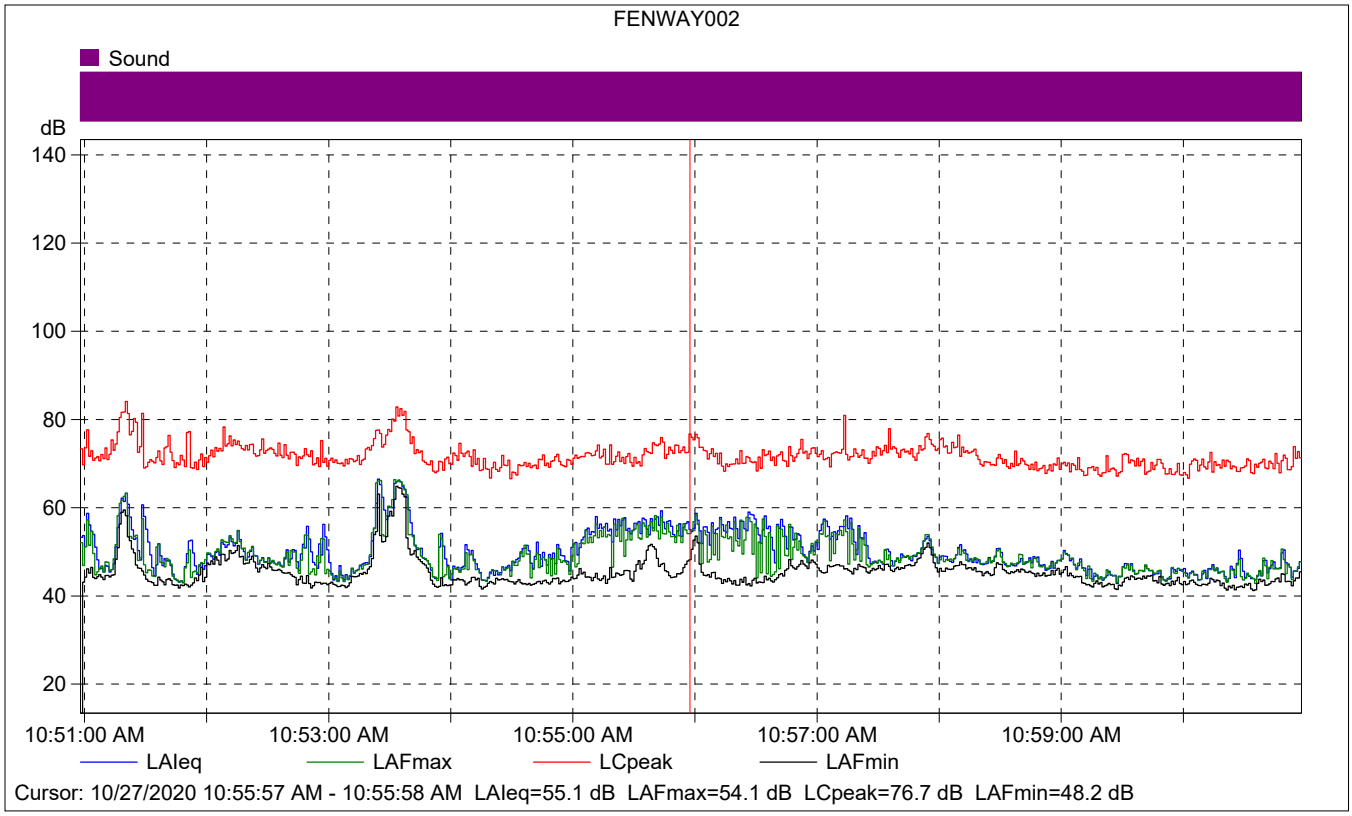
| | | |
|---|---|---|
| Calibration Time: | | 10/27/2020 07:17:01 |
| Calibration Type: | | External reference |
| Sensitivity: | | 43.4200167655945 mV/Pa |

## FENWAY002

| | Start time | End time | Elapsed time | Overload [%] | LAeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|---|---|
| Value | | | | 0.00 | 50.4 | 66.4 | 41.2 |
| Time | 10:50:58 AM | 11:00:58 AM | 0:10:00 | | | | |
| Date | 10/27/2020 | 10/27/2020 | | | | | |

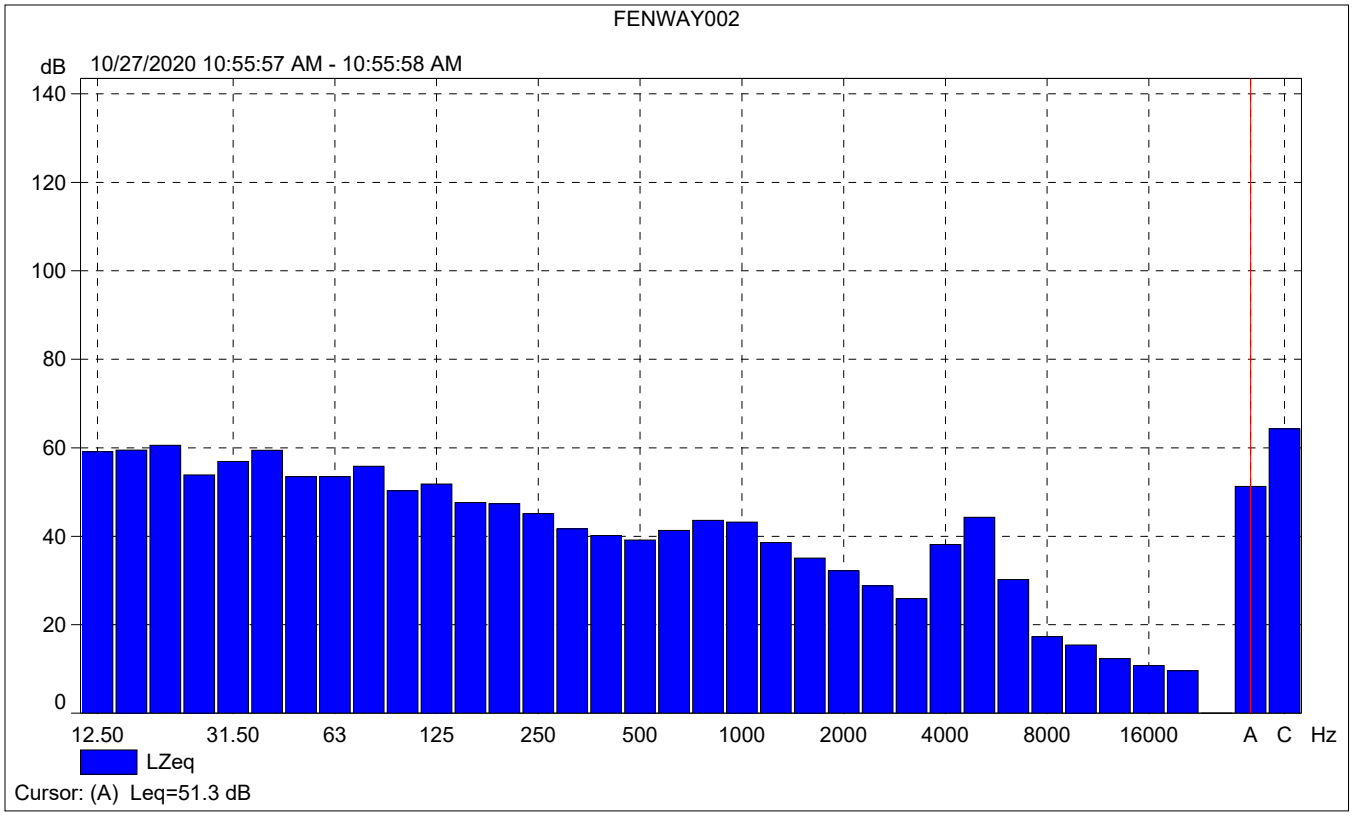

FENWAY002
dB
10/27/2020 10:50:58 AM - 11:00:58 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=50.4 dB LFmax=66.4 dB LFmin=41.2 dB

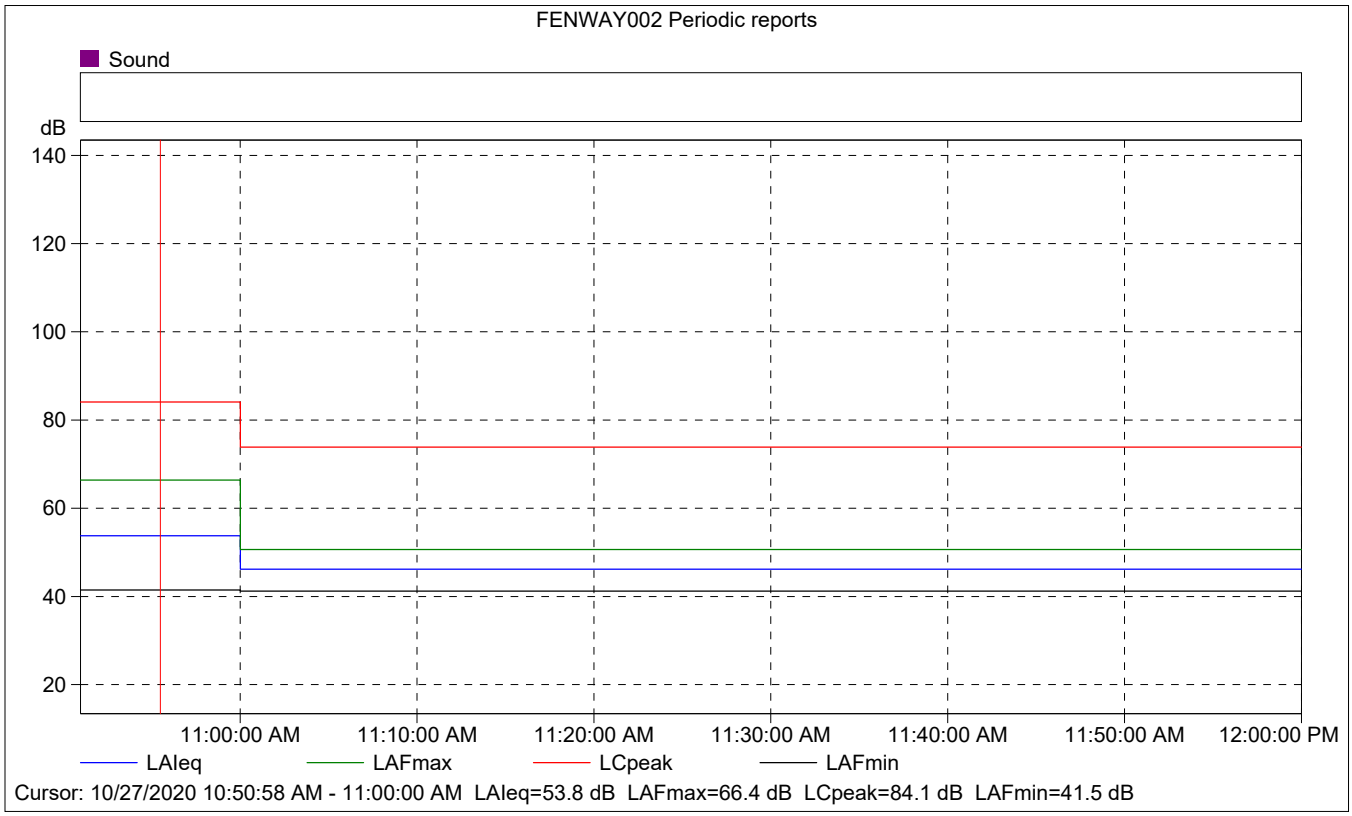

FENWAY002
%
Based on LAF , 10ms Class width: 0.2 dB 10/27/2020 10:50:58 AM - 11:00:58 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 63.6 dB
L5 = 53.8 dB
L10 = 51.8 dB
L50 = 46.0 dB
L90 = 43.3 dB
L95 = 42.9 dB
L99 = 42.3 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[ dB Level: 0.0% Cumulative: 0.0%




## FENWAY002

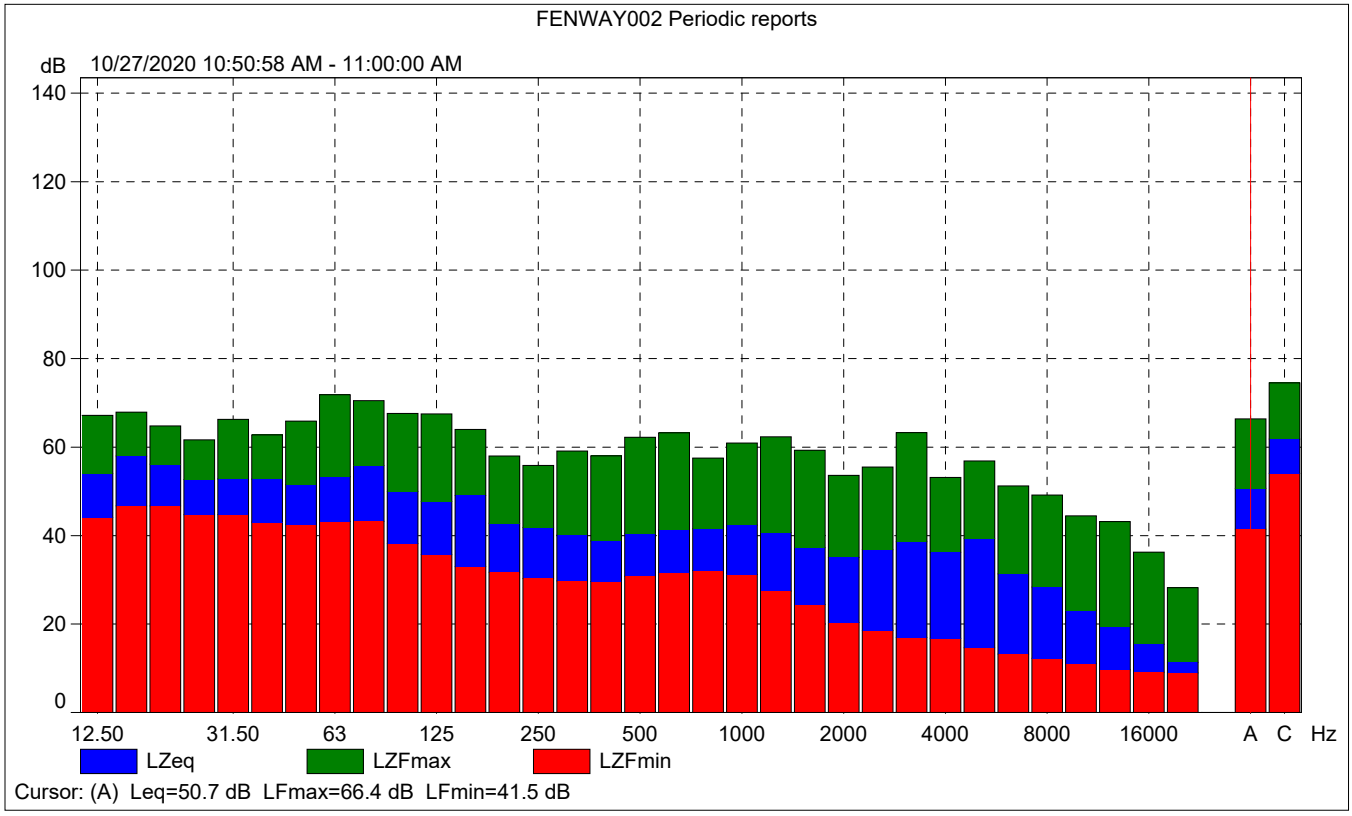
| | Start time | Elapsed time | LAIeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|
| Value | | | 55.1 | 54.1 | 48.2 |
| Time | 10:55:57 AM | 0:00:01 | | | |
| Date | 10/27/2020 | | | | |

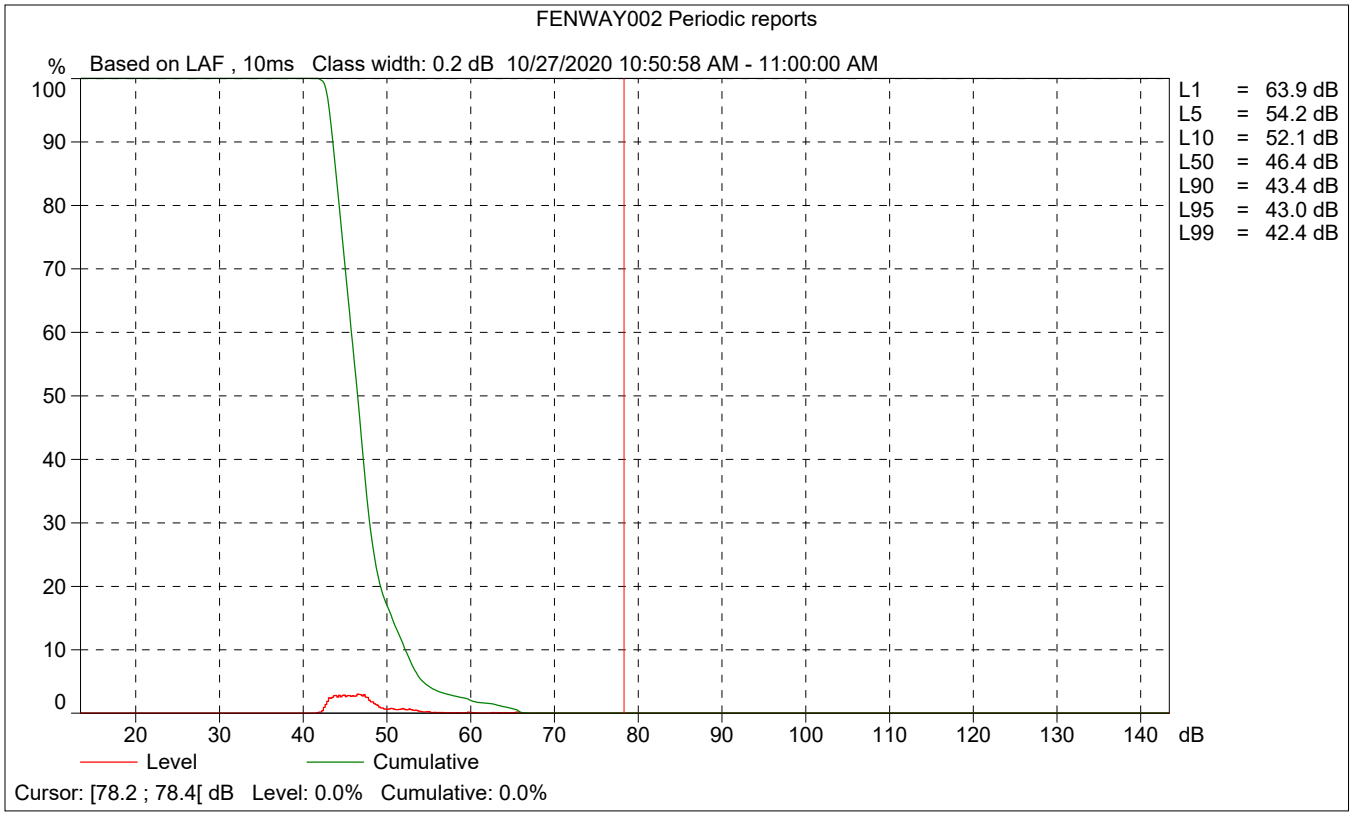

FENWAY002
dB
10/27/2020 10:55:57 AM - 10:55:58 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=51.3 dB


FENWAY002 Periodic reports
Sound
dB
140
120
100
80
60
40
20
11:00:00 AM
11:10:00 AM
11:20:00 AM
11:30:00 AM
11:40:00 AM
11:50:00 AM
12:00:00 PM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 10/27/2020 10:50:58 AM - 11:00:00 AM LAIeq=53.8 dB LAFmax=66.4 dB LCpeak=84.1 dB LAFmin=41.5 dB

# FENWAY002 Periodic reports

| | Start time | Elapsed time | Overload [%] | LAIeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|---|
| Value | | | 0.00 | 53.8 | 66.4 | 41.5 |
| Time | 10:50:58 AM | 0:09:02 | | | | |
| Date | 10/27/2020 | | | | | |




FENWAY002 Periodic reports
% Based on LAF , 10ms Class width: 0.2 dB 10/27/2020 10:50:58 AM - 11:00:00 AM
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 = 63.9 dB
L5 = 54.2 dB
L10 = 52.1 dB
L50 = 46.4 dB
L90 = 43.4 dB
L95 = 43.0 dB
L99 = 42.4 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[ dB Level: 0.0% Cumulative: 0.0%

| | | | |
|---|---|---|---|
| **Site Number:** Marea Village EIR Site #3 | | | |
| **Recorded By:** Pierre Glaize and Zhe Chen | | | |
| **Job Number:** 180066 | | | |
| **Date:** 10/27/2020 | | | |
| **Time:** 11:03 a.m. | | | |
| **Location:** Corner of Milbank road and Moorgate road. | | | |
| **Source of Peak Noise:** Highway 101 traffic and people loudly talking on the phone. | | | |
| **Noise Data** | | | |
| **Leq (dB)** | **Lmax(dB)** | **Lmin (dB)** | **Peak (dB)** |
| 53.6 | 75.9 | 44.5 | 100.7 |

| **Equipment** | | | | | | |
|---|---|---|---|---|---|---|
| **Category** | **Type** | **Vendor** | **Model** | **Serial No.** | **Cert. Date** | **Note** |
| Sound | Sound Level Meter | **Brüel & Kjær** | **2250** | **3011133** | **04/08/2019** | |
| | Microphone | **Brüel & Kjær** | **4189** | **3086765** | **04/08/2019** | |
| | Preamp | **Brüel & Kjær** | **ZC 0032** | **25380** | **04/08/2019** | |
| | Calibrator | **Brüel & Kjær** | **4231** | **2545667** | **04/08/2019** | |

| **Weather Data** | | | |
|---|---|---|---|
| **Est.** | **Duration:** 10 minutes | | **Sky:** Sunny |
| | **Note:** dBA Offset = 0.00 | | **Sensor Height (ft):** 5 ft |
| | **Wind Ave Speed (mph / m/s)** | **Temperature (degrees Fahrenheit)** | **Barometer Pressure (inches)** |
| | 4 | 68° | 30.07 |

## Photo of Measurement Location

## 2250

| | | |
|---|---|---|
| Instrument: | | 2250 |
| Application: | | BZ7225 Version 4.7.4 |
| Start Time: | | 10/27/2020 11:03:28 |
| End Time: | | 10/27/2020 11:13:28 |
| Elapsed Time: | | 00:10:00 |
| Bandwidth: | | 1/3-octave |
| Max Input Level: | | 142.16 |

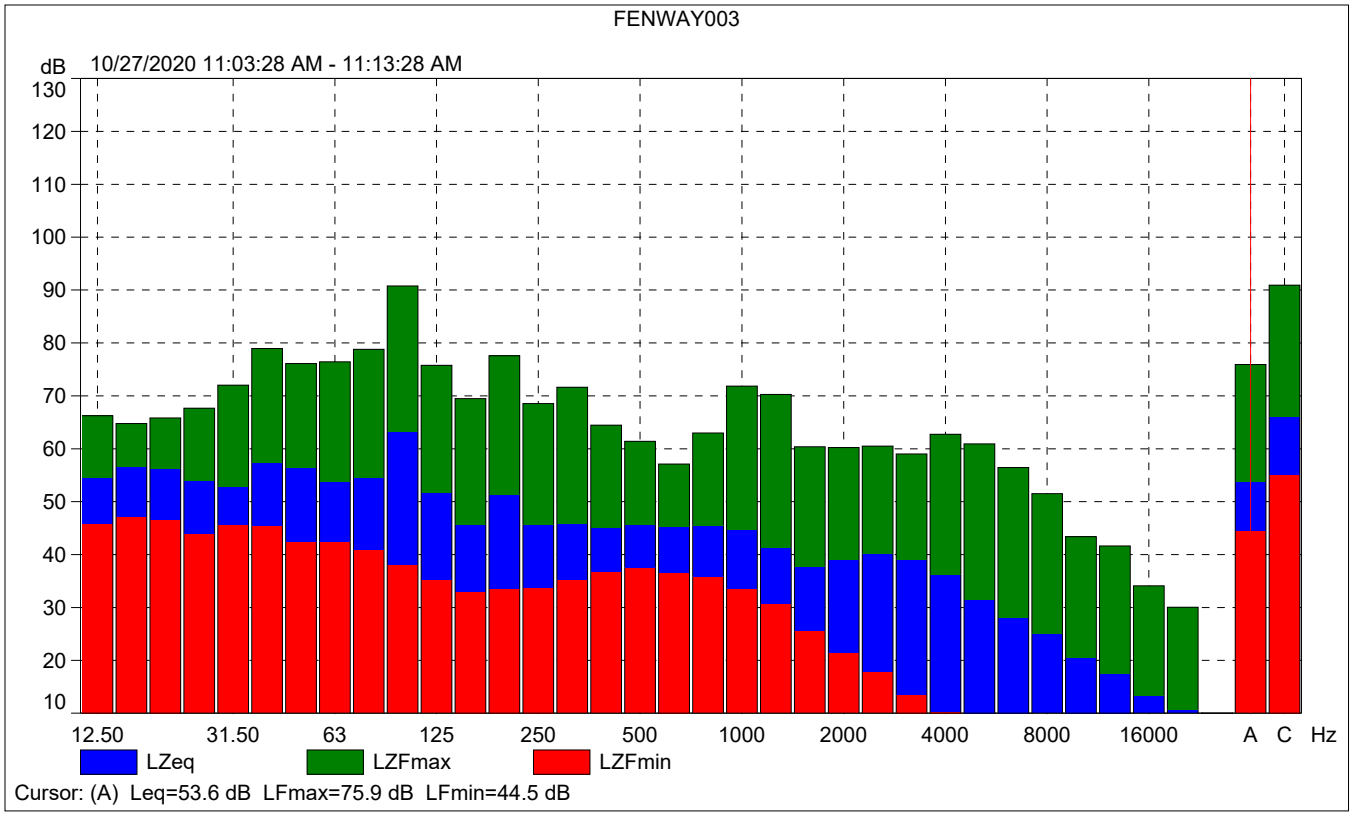
| | Time | Frequency |
|---|---|---|
| Broadband (excl. Peak): | FSI | AC |
| Broadband Peak: | | C |
| Spectrum: | FS | Z |

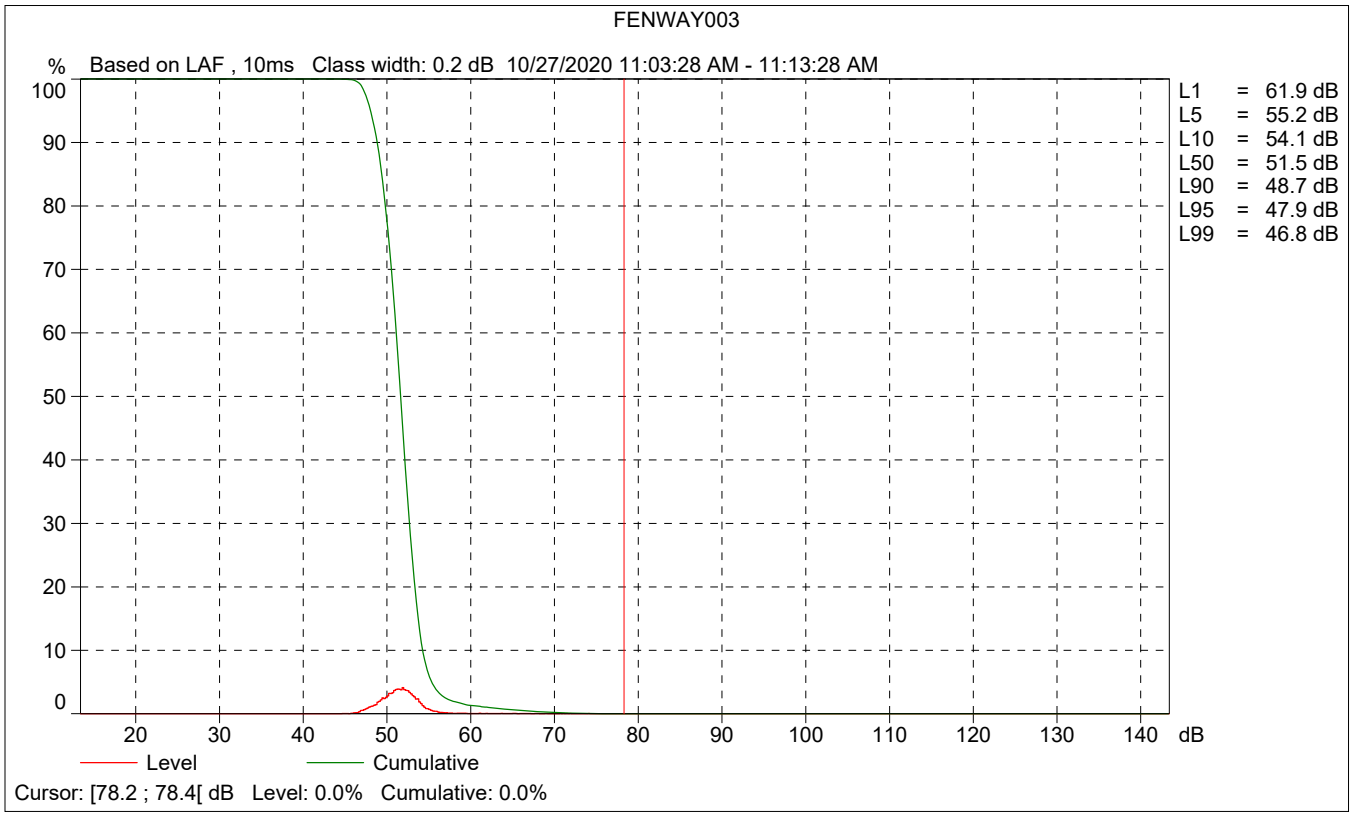
| | | |
|---|---|---|
| Instrument Serial Number: | | 3011133 |
| Microphone Serial Number: | | 3086765 |
| Input: | | Top Socket |
| Windscreen Correction: | | UA-1650 |
| Sound Field Correction: | | Free-field |

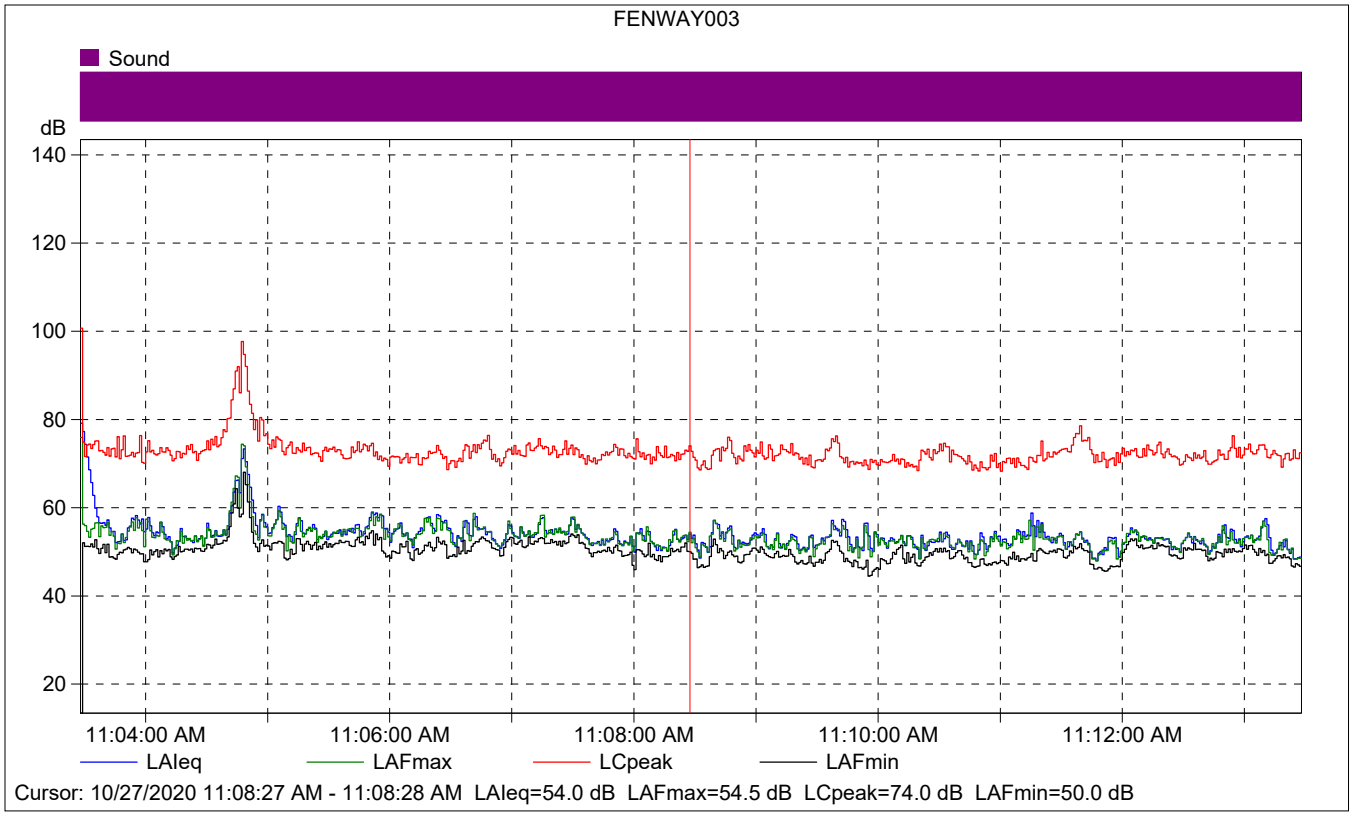
| | | |
|---|---|---|
| Calibration Time: | | 10/27/2020 07:17:01 |
| Calibration Type: | | External reference |
| Sensitivity: | | 43.4200167655945 mV/Pa |

## FENWAY003

| | Start time | End time | Elapsed time | Overload [%] | LAeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|---|---|
| Value | | | | 0.00 | 53.6 | 75.9 | 44.5 |
| Time | 11:03:28 AM | 11:13:28 AM | 0:10:00 | | | | |
| Date | 10/27/2020 | 10/27/2020 | | | | | |

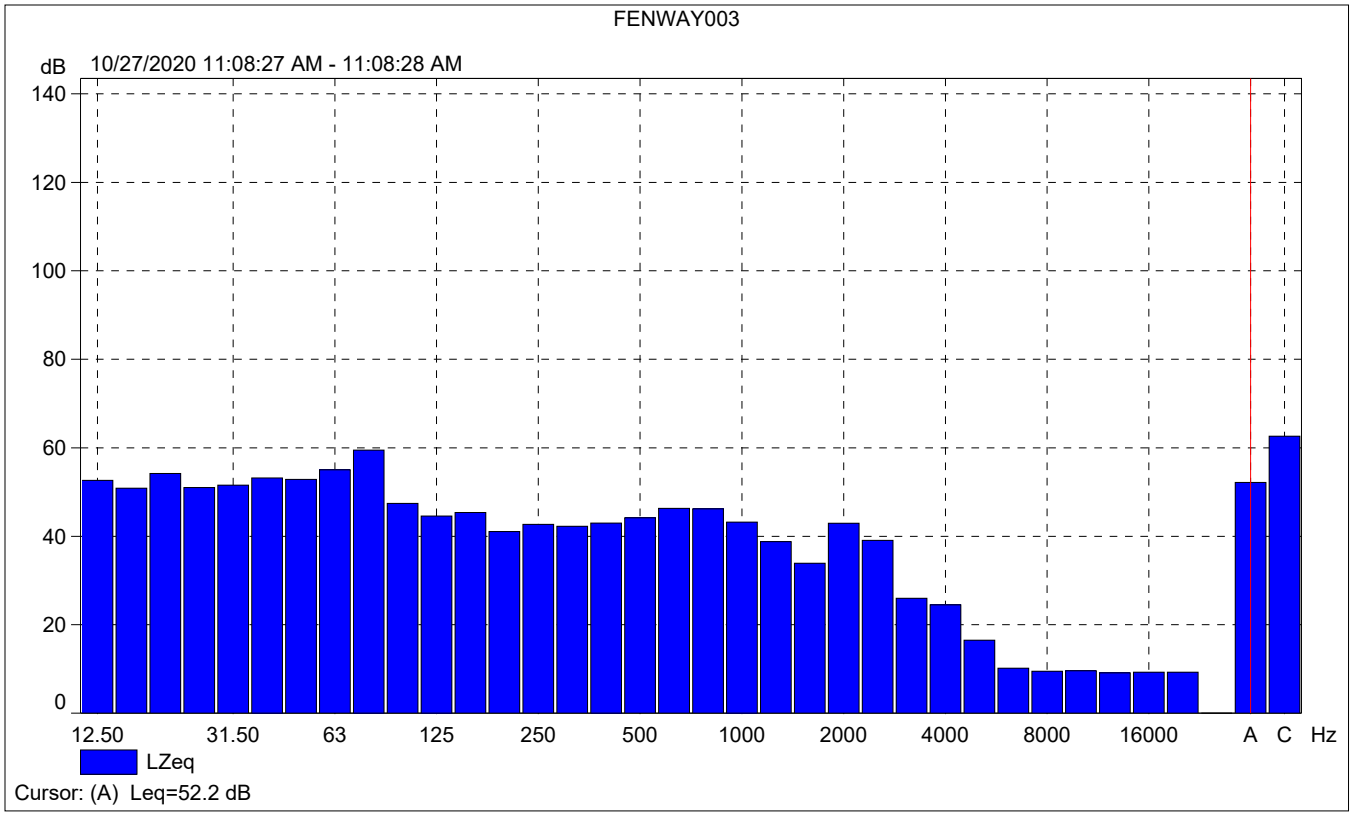

FENWAY003
dB
10/27/2020 11:03:28 AM - 11:13:28 AM
130
120
110
100
90
80
70
60
50
40
30
20
10
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
LZFmax
LZFmin
Cursor: (A) Leq=53.6 dB LFmax=75.9 dB LFmin=44.5 dB

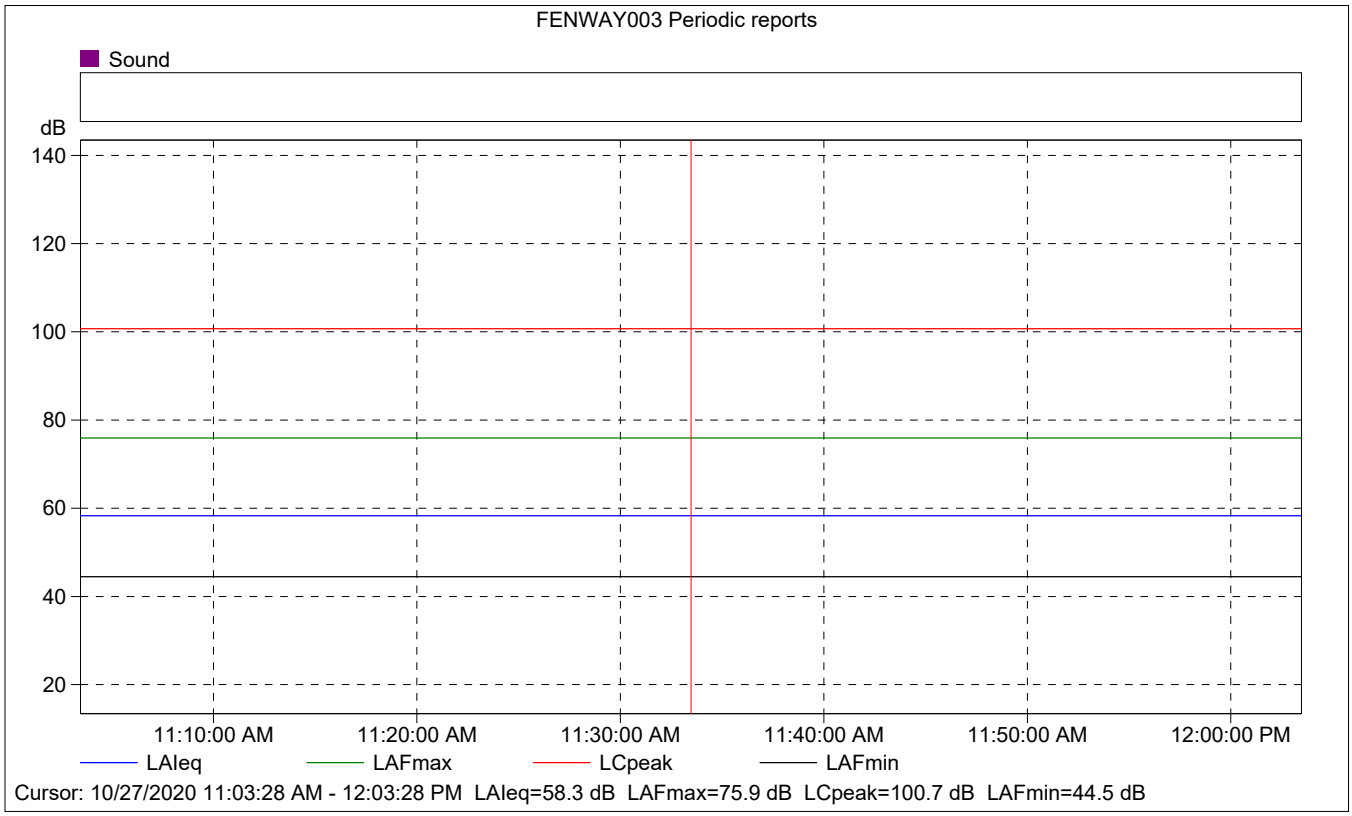

FENWAY003
%
Based on LAF , 10ms Class width: 0.2 dB 10/27/2020 11:03:28 AM - 11:13:28 AM
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
dB
L1 = 61.9 dB
L5 = 55.2 dB
L10 = 54.1 dB
L50 = 51.5 dB
L90 = 48.7 dB
L95 = 47.9 dB
L99 = 46.8 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[ dB Level: 0.0% Cumulative: 0.0%




## FENWAY003

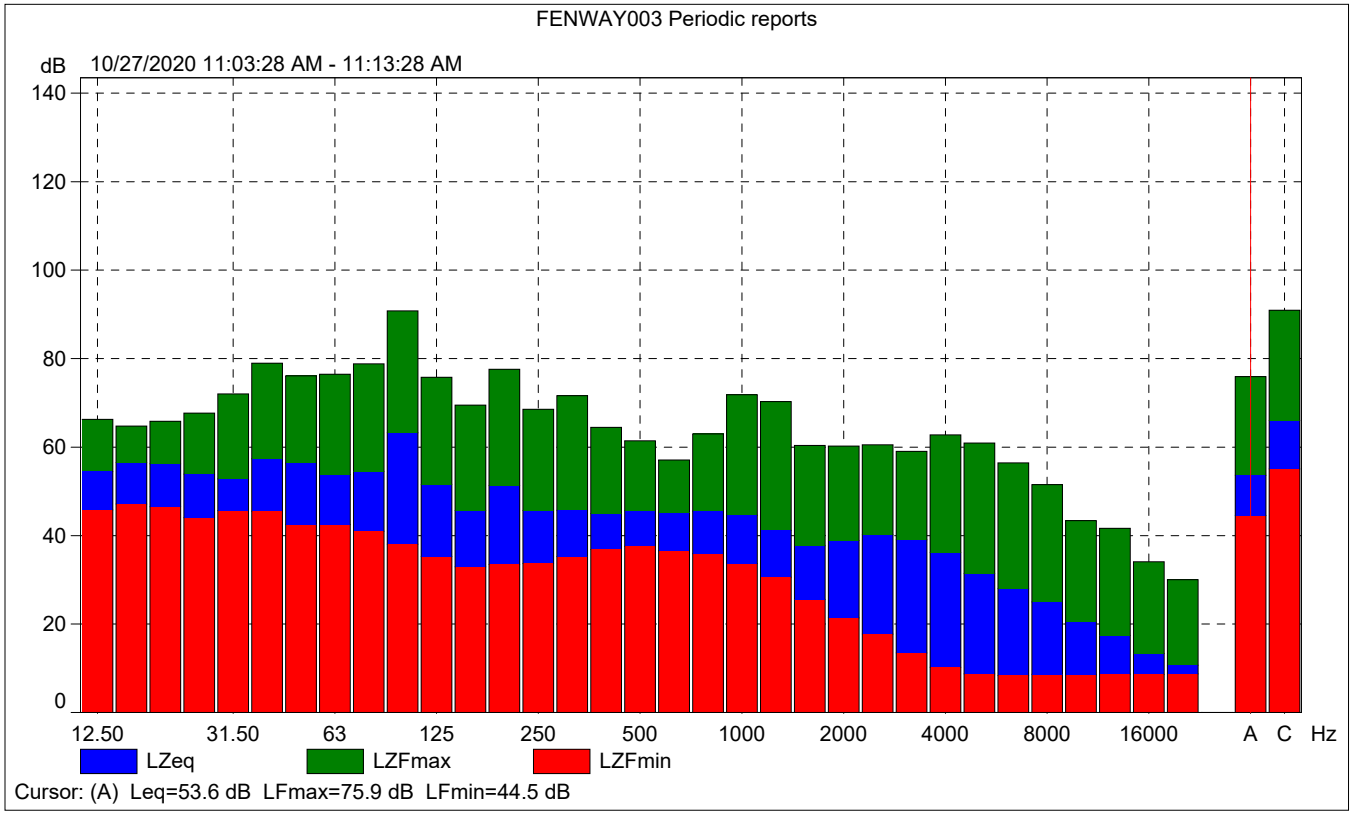
| | Start time | Elapsed time | LAIeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|
| Value | | | 54.0 | 54.5 | 50.0 |
| Time | 11:08:27 AM | 0:00:01 | | | |
| Date | 10/27/2020 | | | | |

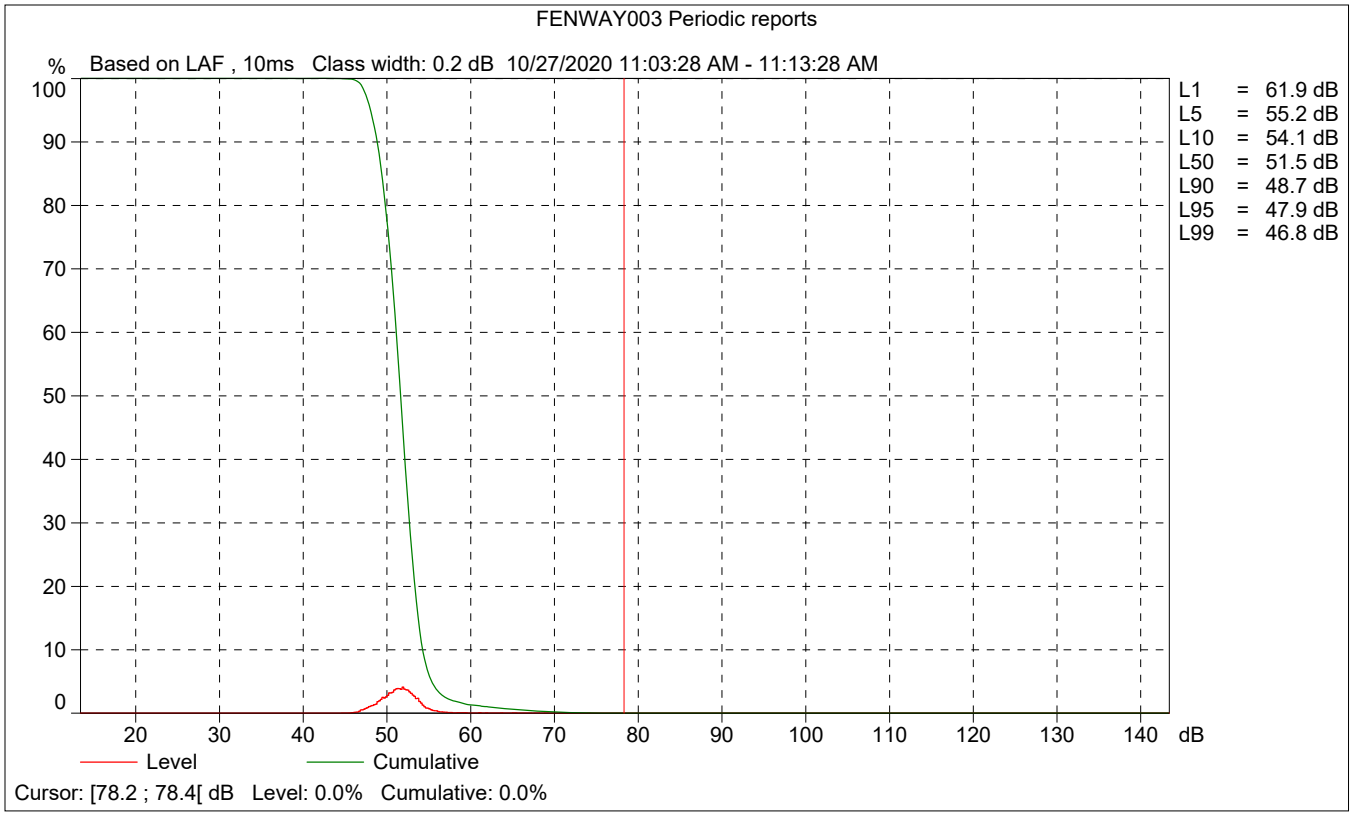

FENWAY003
dB
10/27/2020 11:08:27 AM - 11:08:28 AM
140
120
100
80
60
40
20
0
12.50
31.50
63
125
250
500
1000
2000
4000
8000
16000
A
C
Hz
LZeq
Cursor: (A) Leq=52.2 dB


FENWAY003 Periodic reports
Sound
dB
140
120
100
80
60
40
20
11:10:00 AM
11:20:00 AM
11:30:00 AM
11:40:00 AM
11:50:00 AM
12:00:00 PM
LAIeq
LAFmax
LCpeak
LAFmin
Cursor: 10/27/2020 11:03:28 AM - 12:03:28 PM LAIeq=58.3 dB LAFmax=75.9 dB LCpeak=100.7 dB LAFmin=44.5 dB

# FENWAY003 Periodic reports

| | Start time | Elapsed time | Overload [%] | LAIeq [dB] | LAFmax [dB] | LAFmin [dB] |
|---|---|---|---|---|---|---|
| Value | | | 0.00 | 58.3 | 75.9 | 44.5 |
| Time | 11:03:28 AM | 0:10:00 | | | | |
| Date | 10/27/2020 | | | | | |




FENWAY003 Periodic reports
% Based on LAF , 10ms Class width: 0.2 dB 10/27/2020 11:03:28 AM - 11:13:28 AM
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 = 61.9 dB
L5 = 55.2 dB
L10 = 54.1 dB
L50 = 51.5 dB
L90 = 48.7 dB
L95 = 47.9 dB
L99 = 46.8 dB
Level
Cumulative
Cursor: [78.2 ; 78.4[ dB Level: 0.0% Cumulative: 0.0%

## TRAFFIC NOISE LEVELS AND NOISE CONTOURS

**Project Number:** 180066
**Project Name:** Marea Village Mixed Use Development Project
**Scenario:** Existing

**Background Information**

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Traffic Impact Analysis
Community Noise Descriptor: $L_{dn}$: _____ CNEL: X

| Assumed 24-Hour Traffic Distribution: | Day | Evening | Night |
|---|---|---|---|
| Total ADT Volumes | 77.50% | 12.90% | 9.60% |
| Medium-Duty Trucks | 84.80% | 4.90% | 10.30% |
| Heavy-Duty Trucks | 86.50% | 2.70% | 10.80% |

| **Analysis Condition** | | Median | ADT | Design Speed | Alpha | Vehicle Mix Medium | Heavy | Distance from Centerline of Roadway CNEL at | Distance to Contour | | | | Calc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway, Segment | Lanes | Width | Volume | (mph) | Factor | Trucks | Trucks | 100 Feet | 70 CNEL | 65 CNEL | 60 CNEL | 55 CNEL | Dist |
| Carlsbad Boulevard | | | | | | | | | | | | | |
| Avenida Encinas to La Costa Avenue | 4 | 30 | 16,525 | 50 | 0.5 | 1.8% | 0.7% | 65.0 | - | 100 | 216 | 466 | 100 |
| North Coast Highway 101 | | | | | | | | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 4 | 12 | 17,801 | 30 | 0.5 | 1.8% | 0.7% | 60.6 | - | 51 | 109 | 235 | 100 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 3 | 17 | 17,801 | 30 | 0.5 | 1.8% | 0.7% | 60.5 | - | 50 | 108 | 233 | 100 |
| Bishops Gate Road to Grandview Street | 3 | 18 | 17,427 | 30 | 0.5 | 1.8% | 0.7% | 60.4 | - | 49 | 107 | 230 | 100 |
| Grandview Street to Jupiter Street | 3 | 18 | 15,918 | 30 | 0.5 | 1.8% | 0.7% | 60.0 | - | - | 100 | 216 | 100 |
| Jupiter Street to Leucadia Boulevard | 3 | 17 | 15,873 | 30 | 0.5 | 1.8% | 0.7% | 60.0 | - | - | 100 | 216 | 100 |
| La Costa Avenue | | | | | | | | | | | | | |
| North Coast Highway 101 to North Vulcan Avenue | 2 | 0 | 11,686 | 35 | 0.5 | 1.8% | 0.7% | 59.5 | - | 43 | 93 | 201 | 100 |
| North Vulcan Avenue to Sheridan Road | 2 | 0 | 13,499 | 35 | 0.5 | 1.8% | 0.7% | 60.2 | - | 48 | 102 | 221 | 100 |
| Sheridan Road to Interstate 5 | 2 | 0 | 14,728 | 35 | 0.5 | 1.8% | 0.7% | 60.5 | - | 50 | 109 | 234 | 100 |

"-" = contour is located within the roadway right-of-way.

## TRAFFIC NOISE LEVELS AND NOISE CONTOURS

**Project Number:** 180066
**Project Name:** Marea Village Mixed Use Development Project
**Scenario:** Existing+Project

**Background Information**

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Traffic Impact Analysis
Community Noise Descriptor: $L_{dn}$: _____ CNEL: X

| Assumed 24-Hour Traffic Distribution: | Day | Evening | Night |
|---|---|---|---|
| Total ADT Volumes | 77.50% | 12.90% | 9.60% |
| Medium-Duty Trucks | 84.80% | 4.90% | 10.30% |
| Heavy-Duty Trucks | 86.50% | 2.70% | 10.80% |

| Analysis Condition | | | | Design | | Vehicle Mix | | Distance from Centerline of Roadway | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Median | ADT | Speed | Alpha | Medium | Heavy | CNEL at | | Distance to Contour | | | Calc |
| Roadway, Segment | Lanes | Width | Volume | (mph) | Factor | Trucks | Trucks | 100 Feet | 70 CNEL | 65 CNEL | 60 CNEL | 55 CNEL | Dist |
| Carlsbad Boulevard | | | | | | | | | | | | | |
| Avenida Encinas to La Costa Avenue | 4 | 30 | 16,749 | 50 | 0.5 | 1.8% | 0.7% | 65.1 | - | 101 | 218 | 470 | 100 |
| North Coast Highway 101 | | | | | | | | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 4 | 12 | 18,474 | 30 | 0.5 | 1.8% | 0.7% | 60.7 | - | 52 | 112 | 240 | 100 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 3 | 17 | 18,923 | 30 | 0.5 | 1.8% | 0.7% | 60.8 | - | 52 | 113 | 242 | 100 |
| Bishops Gate Road to Grandview Street | 3 | 18 | 18,538 | 30 | 0.5 | 1.8% | 0.7% | 60.7 | - | 52 | 111 | 239 | 100 |
| Grandview Street to Jupiter Street | 3 | 18 | 16,344 | 30 | 0.5 | 1.8% | 0.7% | 60.1 | - | 47 | 102 | 220 | 100 |
| Jupiter Street to Leucadia Boulevard | 3 | 17 | 16,288 | 30 | 0.5 | 1.8% | 0.7% | 60.1 | - | 47 | 102 | 219 | 100 |
| La Costa Avenue | | | | | | | | | | | | | |
| North Coast Highway 101 to North Vulcan Avenue | 2 | 0 | 12,135 | 35 | 0.5 | 1.8% | 0.7% | 59.7 | - | 44 | 95 | 206 | 100 |
| North Vulcan Avenue to Sheridan Road | 2 | 0 | 13,925 | 35 | 0.5 | 1.8% | 0.7% | 60.3 | - | 49 | 105 | 225 | 100 |
| Sheridan Road to Interstate 5 | 2 | 0 | 15,121 | 35 | 0.5 | 1.8% | 0.7% | 60.7 | - | 51 | 111 | 238 | 100 |

"-" = contour is located within the roadway right-of-way.

## TRAFFIC NOISE LEVELS AND NOISE CONTOURS

**Project Number:** 180066
**Project Name:** Marea Village Mixed Use Development Project
**Scenario:** Existing+Cumulative

**Background Information**

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Traffic Impact Analysis
Community Noise Descriptor: $L_{dn}$: _____ CNEL: X

| Assumed 24-Hour Traffic Distribution: | Day | Evening | Night |
|---|---|---|---|
| Total ADT Volumes | 77.50% | 12.90% | 9.60% |
| Medium-Duty Trucks | 84.80% | 4.90% | 10.30% |
| Heavy-Duty Trucks | 86.50% | 2.70% | 10.80% |

| **Analysis Condition** | | | | Design | | Vehicle Mix | | Distance from Centerline of Roadway | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Median | ADT | Speed | Alpha | Medium | Heavy | CNEL at | Distance to Contour | | | | Calc |
| Roadway, Segment | Lanes | Width | Volume | (mph) | Factor | Trucks | Trucks | 100 Feet | 70 CNEL | 65 CNEL | 60 CNEL | 55 CNEL | Dist |
| Carlsbad Boulevard | | | | | | | | | | | | | |
| Avenida Encinas to La Costa Avenue | 4 | 30 | 19,316 | 50 | 0.5 | 1.8% | 0.7% | 65.7 | - | 111 | 240 | 517 | 100 |
| North Coast Highway 101 | | | | | | | | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 4 | 12 | 18,865 | 30 | 0.5 | 1.8% | 0.7% | 60.8 | - | 53 | 113 | 244 | 100 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 3 | 17 | 18,865 | 30 | 0.5 | 1.8% | 0.7% | 60.8 | - | 52 | 112 | 242 | 100 |
| Bishops Gate Road to Grandview Street | 3 | 18 | 18,489 | 30 | 0.5 | 1.8% | 0.7% | 60.7 | - | 51 | 111 | 239 | 100 |
| Grandview Street to Jupiter Street | 3 | 18 | 16,980 | 30 | 0.5 | 1.8% | 0.7% | 60.3 | - | 49 | 105 | 226 | 100 |
| Jupiter Street to Leucadia Boulevard | 3 | 17 | 16,934 | 30 | 0.5 | 1.8% | 0.7% | 60.3 | - | 48 | 104 | 225 | 100 |
| La Costa Avenue | | | | | | | | | | | | | |
| North Coast Highway 101 to North Vulcan Avenue | 2 | 0 | 14,927 | 35 | 0.5 | 1.8% | 0.7% | 60.6 | - | 51 | 110 | 236 | 100 |
| North Vulcan Avenue to Sheridan Road | 2 | 0 | 16,917 | 35 | 0.5 | 1.8% | 0.7% | 61.1 | - | 55 | 119 | 257 | 100 |
| Sheridan Road to Interstate 5 | 2 | 0 | 18,507 | 35 | 0.5 | 1.8% | 0.7% | 61.5 | - | 59 | 126 | 273 | 100 |

"-" = contour is located within the roadway right-of-way.

## TRAFFIC NOISE LEVELS AND NOISE CONTOURS

**Project Number:** 180066
**Project Name:** Marea Village Mixed Use Development Project
**Scenario:** Existing+Cumulative+Project

**Background Information**

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Traffic Impact Analysis
Community Noise Descriptor: $L_{dn}$: _____ CNEL: X

| Assumed 24-Hour Traffic Distribution: | Day | Evening | Night |
|---|---|---|---|
| Total ADT Volumes | 77.50% | 12.90% | 9.60% |
| Medium-Duty Trucks | 84.80% | 4.90% | 10.30% |
| Heavy-Duty Trucks | 86.50% | 2.70% | 10.80% |

| **Analysis Condition** | | Median | ADT | Design Speed | Alpha | Vehicle Mix Medium | Heavy | Distance from Centerline of Roadway CNEL at | Distance to Contour | | | | Calc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Roadway, Segment | Lanes | Width | Volume | (mph) | Factor | Trucks | Trucks | 100 Feet | 70 CNEL | 65 CNEL | 60 CNEL | 55 CNEL | Dist |
| Carlsbad Boulevard | | | | | | | | | | | | | |
| Avenida Encinas to La Costa Avenue | 4 | 30 | 19,540 | 50 | 0.5 | 1.8% | 0.7% | 65.7 | - | 112 | 242 | 521 | 100 |
| North Coast Highway 101 | | | | | | | | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 4 | 12 | 19,538 | 30 | 0.5 | 1.8% | 0.7% | 61.0 | - | 54 | 116 | 250 | 100 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 3 | 17 | 19,987 | 30 | 0.5 | 1.8% | 0.7% | 61.0 | - | 54 | 117 | 251 | 100 |
| Bishops Gate Road to Grandview Street | 3 | 18 | 18,927 | 30 | 0.5 | 1.8% | 0.7% | 60.8 | - | 52 | 113 | 243 | 100 |
| Grandview Street to Jupiter Street | 3 | 18 | 17,406 | 30 | 0.5 | 1.8% | 0.7% | 60.4 | - | 49 | 107 | 229 | 100 |
| Jupiter Street to Leucadia Boulevard | 3 | 17 | 17,349 | 30 | 0.5 | 1.8% | 0.7% | 60.4 | - | 49 | 106 | 229 | 100 |
| La Costa Avenue | | | | | | | | | | | | | |
| North Coast Highway 101 to North Vulcan Avenue | 2 | 0 | 15,376 | 35 | 0.5 | 1.8% | 0.7% | 60.7 | - | 52 | 112 | 241 | 100 |
| North Vulcan Avenue to Sheridan Road | 2 | 0 | 17,343 | 35 | 0.5 | 1.8% | 0.7% | 61.2 | - | 56 | 121 | 261 | 100 |
| Sheridan Road to Interstate 5 | 2 | 0 | 18,900 | 35 | 0.5 | 1.8% | 0.7% | 61.6 | - | 60 | 128 | 276 | 100 |

"-" = contour is located within the roadway right-of-way.

## TRAFFIC NOISE LEVELS AND NOISE CONTOURS

**Project Number:** 180066
**Project Name:** Marea Village Mixed Use Development Project
**Scenario:** Existing+Cumulative+Project (100 feet Ldn)

**Background Information**

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Traffic Impact Analysis
Community Noise Descriptor: $L_{dn}$: X CNEL:

| Assumed 24-Hour Traffic Distribution: | Day | Evening | Night |
|---|---|---|---|
| Total ADT Volumes | 77.50% | 12.90% | 9.60% |
| Medium-Duty Trucks | 84.80% | 4.90% | 10.30% |
| Heavy-Duty Trucks | 86.50% | 2.70% | 10.80% |

| | | | | Design | | Vehicle Mix | | Distance from Centerline of Roadway | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analysis Condition** | | Median | ADT | Speed | Alpha | Medium | Heavy | Ldn at | Distance to Contour | | | | Calc |
| Roadway, Segment | Lanes | Width | Volume | (mph) | Factor | Trucks | Trucks | 100 Feet | 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn | Dist |
| North Coast Highway 101 | | | | | | | | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 4 | 12 | 19,538 | 30 | 0.5 | 1.8% | 0.7% | 60.5 | - | 50 | 108 | 233 | 100 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 3 | 17 | 19,987 | 30 | 0.5 | 1.8% | 0.7% | 60.5 | - | 50 | 109 | 234 | 100 |

"-" = contour is located within the roadway right-of-way.

## TRAFFIC NOISE LEVELS AND NOISE CONTOURS

**Project Number:** 180066
**Project Name:** Marea Village Mixed Use Development Project
**Scenario:** Existing+Cumulative+Project (50 feet Ldn)

**Background Information**

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Traffic Impact Analysis
Community Noise Descriptor: $L_{dn}$: X CNEL:

| Assumed 24-Hour Traffic Distribution: | Day | Evening | Night |
|---|---|---|---|
| Total ADT Volumes | 77.50% | 12.90% | 9.60% |
| Medium-Duty Trucks | 84.80% | 4.90% | 10.30% |
| Heavy-Duty Trucks | 86.50% | 2.70% | 10.80% |

| | | | | Design | | Vehicle Mix | | Distance from Centerline of Roadway | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analysis Condition** | | Median | ADT | Speed | Alpha | Medium | Heavy | Ldn at | Distance to Contour | | | | Calc |
| Roadway, Segment | Lanes | Width | Volume | (mph) | Factor | Trucks | Trucks | 50 Feet | 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn | Dist |
| North Coast Highway 101 | | | | | | | | | | | | | |
| La Costa Avenue to 600-foot South of La Costa Avenue | 4 | 12 | 19,538 | 30 | 0.5 | 1.8% | 0.7% | 65.7 | - | 55 | 120 | 257 | 50 |
| 600-foot South of La Costa Avenue to Bishops Gate Road | 3 | 17 | 19,987 | 30 | 0.5 | 1.8% | 0.7% | 65.5 | - | 54 | 117 | 251 | 50 |

"-" = contour is located within the roadway right-of-way.