NOISE STUDY

MAGNOLIA PUBLIC SCHOOL PROJECT

16600 Vanowen Street
Van Nuys, CA 91406

PREPARED FOR:

Magnolia Public Schools
250 E. 1st Street, Suite 1500
Los Angeles, CA 90012

PREPARED BY:

prepared 5/15/2024

Meridian Consultants

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

MAY 2024

Table of Contents

Figures

Figure **Page**

Tables

Table **Page**

EXECUTIVE SUMMARY

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

On-Site Construction Noise

Construction noise levels would be reduced via Regulatory Compliance Measures (RCMs), which are existing requirements and reasonably anticipated standard conditions based on local, State, or federal regulations and laws that are frequently required independently of CEQA review and serve to offset or prevent specific impacts. RCMs are not included as mitigation measures in the environmental clearance document because the Project is required to comply with RCMs through State and local regulations.

Construction noise sources are regulated within the City of Los Angeles Municipal Code Section 41.40, which prohibits construction between the hours of 9:00 PM and 7:00 AM Monday through Friday, 6:00 PM and 8:00 AM on Saturday, and at any time on Sunday (i.e., construction is allowed Monday through Friday between 7:00 AM to 9:00 PM; and Saturdays and National Holidays between 8:00 AM to 6:00 PM).

Modeled construction noise levels with RCMs would reduce noise levels to within acceptable limits. Noise reduction measures include but are not limited to optimal muffler systems, dampening materials, sound aprons and limiting simultaneous operations.

Off-Site Construction Noise

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

Operational Noise

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

PROJECT DESCRIPTION

The Project site is located at 16600 and 16602 W. Vanowen Street within the Van Nuys neighborhood in the City of Los Angeles, as shown in **Figure 1: Project Site Location**. The 2.5-acre (108,938.3 square foot) Project site is currently vacant and is located within the R1-1 (One-Family) zone and River Implementation Overlay District (RIO). The Project site is bounded by Vanowen Street to the north, Archwood Street to the south and De Celis Place to the east. The proposed development includes removal of the existing uses to construct the Magnolia Public School (Public School) consisting of a 47,997 square foot two-story classroom building and a gym to accommodate 564 students.

More specifically, the Public School will include 27 classrooms (including 1 lab and 3 science classrooms), administration office space, multipurpose room with a servery, outdoor play space (for 6th to 12th grades), onsite parking for 91 parking spaces (pick-up and drop-off within the site), and bicycle racks (108 short-term and 3 long-term).

SOURCE: Google Earth - 2023

FIGURE 1

Meridian Consultants

Project Site Location

389-001-23

Ambient Noise Levels

Short-term sound monitoring was conducted at six (6) locations to measure the ambient sound environment in the Project vicinity. Measurements were taken over 15-minute intervals at each location between the hours of 8:37 AM and 10:24 AM on April 26, 2023, and provided in **Table 1: Ambient Noise Measurements**. **Figures 2-7: Noise Monitoring Locations** depicts locations where ambient noise measurements were conducted. As shown in **Table 2**, ambient noise levels ranged from a low of 61.1 dBA (Leq-15minute) west of the Project site at Archwood Street/Whitaker Avenue (Site 5) to a high of 75.0 dBA (Leq-15minute) north of the Project site across Vanowen Street (Site 4).

TABLE 1
AMBIENT NOISE MEASUREMENTS

Location Number/Description		Nearest Use	Time Period	Noise Source	dBA Leq-15-minute
1	At the Project site along Vanowen Stret	Vacant	8:55 AM-9:10 AM	Vehicle and pedestrian traffic along W. Beverly Boulevard	73.7
2	East of the Project site at the corner of Vanowen Street and De Celis Place	Residential	9:49 AM-10:04 AM	Vehicle and pedestrian traffic along N. Hoover Street	62.6
3	South of the Project site along Archwood Street	Residential	9:13 AM-9:28 AM	Vehicle and pedestrian traffic at N. Hoover Street and Council Street	67.0
4	North of the Project site across Vanowen Street	Residential/Place of Worship	8:37 AM-8:51 AM	Vehicle and pedestrian traffic at S. Commonwealth Avenue and W. 1st Street	75.0
5	West of the Project site at Archwood Street/Whitaker Avenue	Residential	10:09 AM-10:24 AM	Vehicle and pedestrian traffic at N. Commonwealth Avenue and W. Beverly Boulevard	61.1
6	Southeast of the Project site at the corner of Archwood Street and De Celis Place	Residential	9:30 AM – 9:45 AM	Vehicle and pedestrian traffic along N. Hoover Street	64.5

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

Sensitive Uses

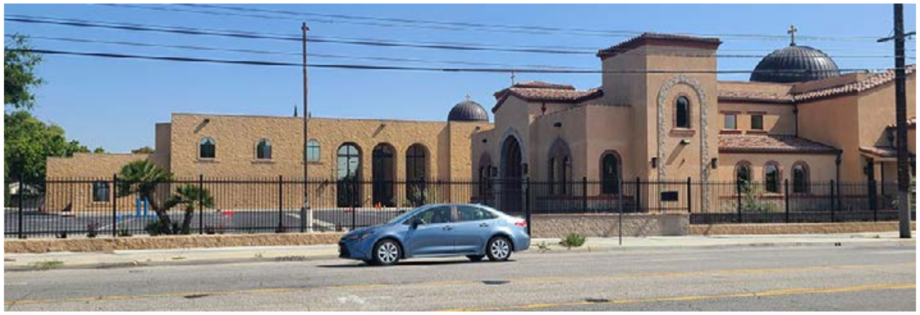
The Project site is predominantly surrounded by single- and multi-family residential uses. The parcels to the north and northeast are zoned R4-1 and contain multi-family residential uses. As shown in **Figure 8: Sensitive Receptor Map**, the parcels to the south and west are zoned R1-1-RIO and contain single-family residential uses and an unoccupied Tennis Ranch. The parcels to the east across De Celis Place are zoned both R1-1-RIO and RD2-1-RIO and contain multi-family residential uses. The parcels to the north across Vanowen Street are zoned RD2 and consist of restricted density multiple dwellings. An overview of the surrounding land uses relative to the noise monitoring location in **Table 1** above is provided below.

- **Noise Monitoring Site 1**: Located at the Project site along Vanowen Street, uses include vacant Tennis Garden. Multi-family residential uses and the St. Michael Antiochian Orthodox Church located across Vanowen Street.
- **Noise Monitoring Site 2**: Located to the east of the Project site at the corner of Vanowen Street and De Celis Place, sensitive uses include multi-family residential buildings.
- **Noise Monitoring Site 3**: Located to the south of the Project site along Archwood Street, sensitive uses include single-family residential.
- **Noise Monitoring Site 4**: Located to the north of the Project site across Vanowen Street, sensitive uses include multi-family residential and the St. Michael Antiochian Orthodox Church.
- **Noise Monitoring Site 5**: Located to the west of the Project site at Archwood Street/Whitaker Avenue, sensitive uses include single-family residential.
- **Noise Monitoring Site 6**: Located to the southeast of the Project site at the corner of Archwood Street and De Celis Place, sensitive uses include single-family residential.

Vibration Conditions

Based on field observations, the primary source of existing ground-borne vibration in the vicinity of the Project site is vehicle traffic on local roadways. According to the Federal Transit Administration,[1] typical road traffic–induced vibration levels are unlikely to be perceptible by people. Trucks and buses typically generate ground-borne vibration velocity levels of approximately 63 VdB (at a 50-foot distance), and these levels could reach 72 VdB when trucks and buses pass over bumps in the road. A vibration level of 72 VdB is above the 60 VdB level of perceptibility.

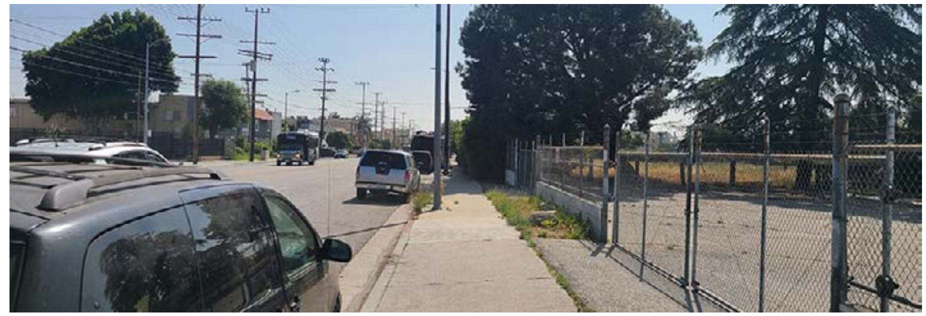
1 Federal Transit Administration, Transit Noise and Vibration Impact Assessment, FTA report no. 0123 (September 2018), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed May 2023.



North

West

South



East

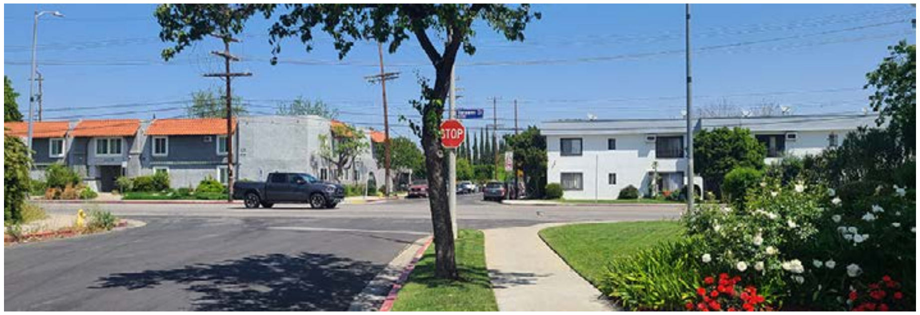
SOURCE: Google Earth - 2023

FIGURE **2**

Meridian Consultants

Noise Monitoring Location (Site 1)

389-001-23



North

West

South

East

SOURCE: Google Earth - 2023

FIGURE **3**

Meridian Consultants

Noise Monitoring Location (Site 2)

389-001-23

North

West

South

East

SOURCE: Google Earth - 2023

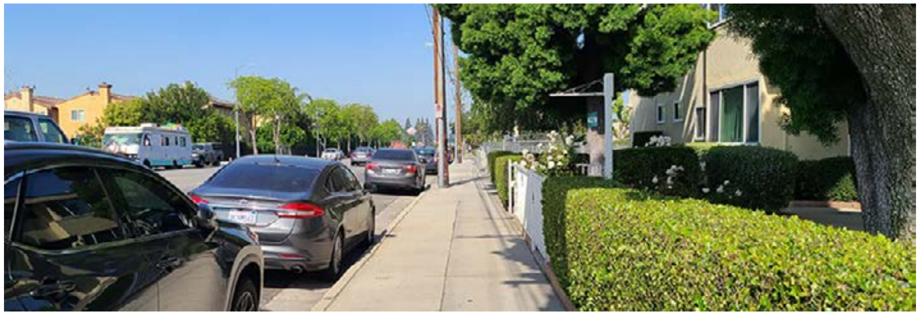
FIGURE **4**

Meridian Consultants

Noise Monitoring Location (Site 3)

389-001-23


North


West


South


East

SOURCE: Google Earth - 2023

FIGURE 5

Meridian Consultants

Noise Monitoring Location (Site 4)

389-001-23

North

West

South

East

SOURCE: Google Earth - 2023

FIGURE **6**

Meridian Consultants

Noise Monitoring Location (Site 5)

389-001-23

North

West

South

East

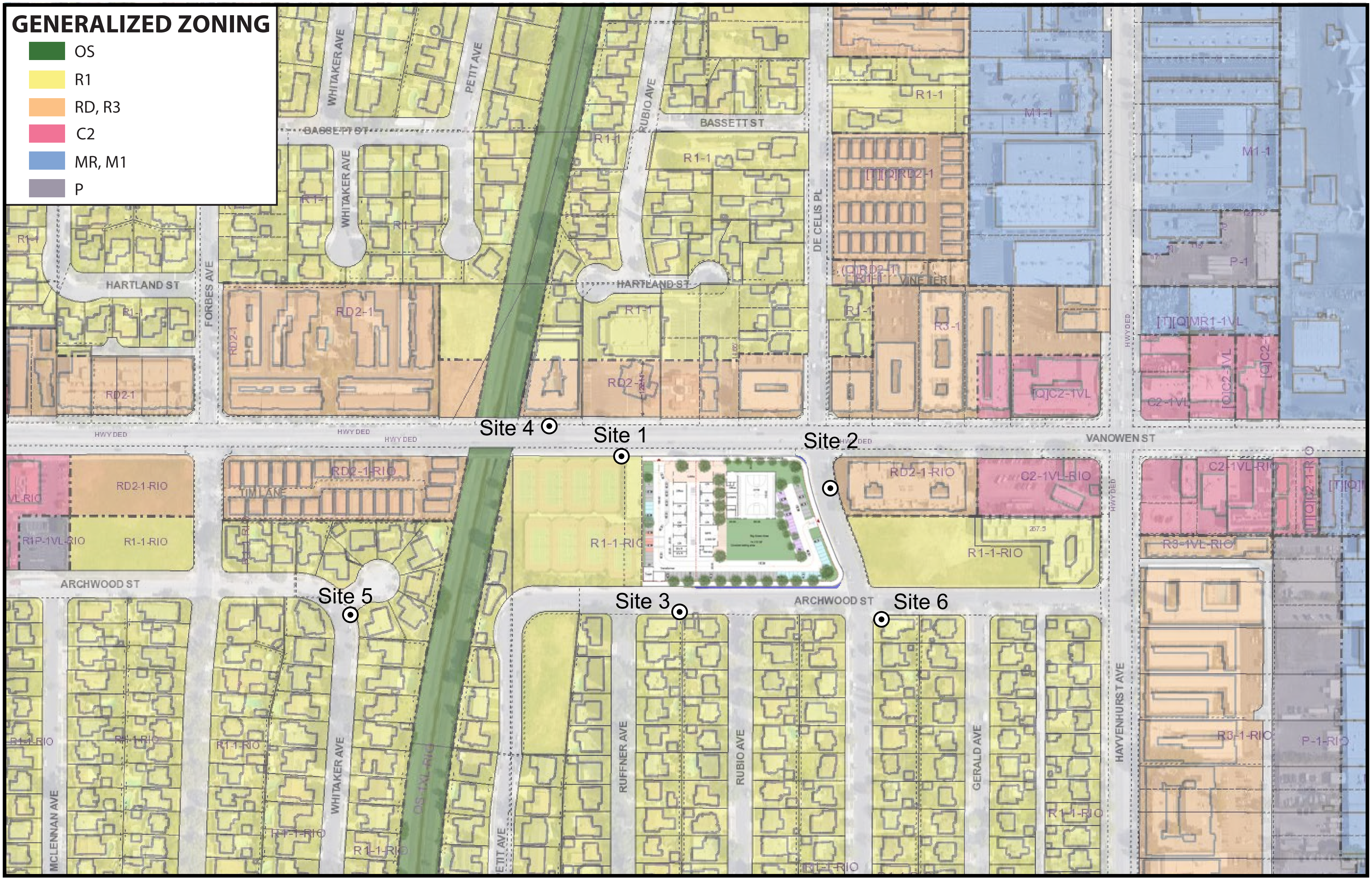
SOURCE: Google Earth - 2023

FIGURE **7**

Meridian Consultants

Noise Monitoring Location (Site 6)

389-001-23



SOURCE: ZIMAS - 2023

FIGURE 2

Meridian Consultants

Sensitive Receptor Map

389-001-23

Ambient Noise Measurements

Noise-level monitoring was conducted by Meridian Consultants on April 26, 2023, at six (6) locations within the Project area vicinity, as shown in **Figure 2** through **7**. Noise-level monitoring was conducted for 15-minute intervals at each location using a Larson Davis Model 831 sound-level meter. This meter satisfies the American National Standards Institute (ANSI) standard for general environmental noise measurement instrumentation. The ANSI specifies several types of sound-level meters according to their precision. Types 1, 2, and 3 are referred to as "precision," "general-purpose," and "survey" meters, respectively. Most measurements carefully taken with a Type 1 sound-level meter will have a margin of error not exceeding 1 dB.

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

Construction

Future dates represent approximations based on the general Project timeline and are subject to change pending unpredictable circumstances that may arise. As such, for purposes of this analysis, project construction is assumed to begin January 2025 and is expected to last until January 2026. Construction would occur over four phases: (1) grading, (2) building construction, (3) paving; and (4) architectural coating.

Each phase of construction would result in varying levels of intensity and a number of construction personnel. The construction workforce would consist of approximately 10 worker trips per day during grading; approximately 20 worker trips per day and 8 vendor trips per day during building construction; approximately 13 worker trips per day during paving; and approximately 4 worker trips per day during architectural coating.

On-Site Construction Equipment

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

In order to calculate construction noise levels, hourly activity or utilization factors (i.e., the percentage of normal construction activity that would occur, or construction equipment that would be active, during each hour of the day) are estimated based on the temporal characteristics of other previous and current construction projects. The hourly activity factors express the percentage of time that construction activities would emit average noise levels. Typical noise levels for each type of construction equipment were obtained from the FHWA Roadway Construction Noise Model.[2]

An inventory of construction equipment, including the number and types of equipment, which would be operating simultaneously within the Project Site was identified for each phase/component of construction and shown in **Table 2: Construction Equipment by Phase**. It is highly unlikely that all pieces of construction equipment identified in **Table 2** would operate simultaneously in any specific location during construction because equipment is generally operated only when needed and space constraints limit the equipment that can be used at any one time in a specific location. Therefore, this modeling is considered a conservative approach to calculate the maximum noise levels that would be generated.

TABLE 2
CONSTRUCTION EQUIPMENT BY PHASE

Construction Phase	Equipment Type	Quantity	Usage Hours (per day)	Noise Level at 50 feet (dBA Leq-1hour)	Calculated Average Noise Level (dBA Leq-1hour)
Grading	Graders	1	8	81.0	85.9
	Rubber Tired Dozers	1	8	77.7	
	Tractors/Loaders/Backhoes	2	7	83.0	
Building Construction	Cranes	1	6	72.6	85.6
	Forklifts	1	6	85.0	
	Generator Sets	1	8	77.6	
	Tractors/Loaders/Backhoes	1	6	80.0	
	Welders	3	8	74.8	
Paving	Pavers	1	8	80.8	82.4
	Paving Equipment	1	8	74.2	
	Rollers	1	8	73.0	
	Tractors/Loaders/Backhoes	1	8	80.0	
Architectural Coating	Air Compressors	1	6	73.7	73.7

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

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

The calculated average noise levels provided in **Table 2** were inputted into the noise model SoundPLAN,[3] which generates computer simulations of noise propagation from sources such as construction noise. SoundPLAN forecasts noise levels at specific receptors using sound power data and three-dimensional topographical data.

Construction noise levels have been calculated at each of the analyzed sensitive receptors during each of the construction phases. Noise levels generated by on-site construction equipment can be reduced via specific noise control measures including the following: (1) muffler requirements; (2) equipment modifications that reduce noise levels; and (3) maintenance and operational requirements. These noise control measures can be used separately or in combination in order to reduce the noise levels generated by on-site construction equipment.

Most on-site construction-related noise originates from equipment powered by either gasoline or diesel engines. A large part of the noise emitted is due to the intake and exhaust portions of the engine cycle. Reducing noise from this source can be achieved via muffler systems. This noise control strategy would include the replacement of worn mufflers and retrofitting on-site construction equipment where mufflers are not in use. Using muffler systems on on-site construction equipment reduces construction noise levels by 10 dBA or more.[4]

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

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

3 SoundPLAN model is in compliance with ISO 9613-2 standards for assessing attenuation of sound propagating outdoors and general calculation method.

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

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

Construction Traffic Noise

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

Construction Equipment Vibration

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

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

For quantitative construction vibration assessments related to building damage and human annoyance, vibration source levels for construction equipment are taken from the FTA *Transit Noise and Vibration Impact Assessment Manual*.[6] Building damage would be assessed for each piece of equipment individually and assessed in terms of peak particle velocity.

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

Playground Noise

Noise-level calculations at the location of noise-sensitive land uses in the Project vicinity were assessed using the SoundPLAN noise model. The SoundPLAN model depicts noise contours at varying distances and accounts for various inputs to analyze topography, vegetation, propagation from buildings, and existing- and proposed-noise sources and barriers.

To quantify events related to playground activities, an area sources was modeled with a sound power level[7] (LwA) of 60 dB/m, m^2, as referenced in the SoundPLAN noise library for play and sports areas with low noise (e.g. tennis courts, smaller children's playground). Assumed hours of operation were between 7:00 AM – 7:00 PM.

---

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

7 The Sound Power Level represents the total sound energy produced by the source under the specified operating conditions. Sound Power Levels cannot be measured directly; instead they are computed from reference sound pressure level measurements

REGULATORY COMPLIANCE MEASURES

Noise levels generated by on-site construction equipment can be reduced via Regulatory Compliance Measures (RCMs), which are existing requirements and reasonably anticipated standard conditions based on local, State, or federal regulations and laws that are frequently required independently of CEQA review and serve to offset or prevent specific impacts. RCMs are not included as mitigation measures in the environmental clearance document because the Project is required to comply with RCMs through State and local regulations.

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

Most on-site construction-related noise originates from equipment powered by either gasoline or diesel engines. A large part of the noise emitted is due to the intake and exhaust portions of the engine cycle. Reducing noise from this source can be achieved via muffler systems. This noise control strategy would include the replacement of worn mufflers and retrofitting on-site construction equipment where mufflers are not in use. Using muffler systems on on-site construction equipment reduces construction noise levels by 10 dBA or more.[8]

Another effective method of diminishing noise levels associated with individual pieces of construction equipment is by modifying the equipment. Modifications such as the dampening of metal surfaces is effective in reducing on-site construction equipment noise levels. These modifications are typically done by the manufacturer or with factory assistance. Noise reductions of up to 5 dBA are achieved using dampening materials.[9]

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

8 FHWA, Special Report—Measurement, Prediction, and Mitigation, updated June 2017, https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm, Accessed March 2022.

9 FHWA, Special Report—Measurement, Prediction, and Mitigation, updated June 2017, accessed March 2022, https://www.fhwa.dot.gov/Environment/noise/construction_noise/special_report/hcn04.cfm.

RCM-1 Adherence to Existing Noise Standards

The Proposed Project shall comply with the City of Los Angeles General Plan Noise Element, the City of Los Angeles Noise Ordinance, and any subsequent ordinances that prohibit the emission or creation of noise beyond certain levels at adjacent uses.

To implement RCM-1 and reduce construction noise, the Contractor would be required to implement reduction measures, which may include but are not limited to:

- Schedule construction activities to avoid operating similar pieces of equipment simultaneously, to achieve a minimum noise reduction of 1.5 dBA.
- Retrofit mobile equipment with optimal muffler systems capable of reducing construction noise levels by 10 dBA or more.
- Dampen mobile equipment capable of reducing construction noise levels by a minimum of 5 dBA.
- Enclose stationary equipment with shields such as sound skins that are capable of achieving reduction of 20 dBA at high frequencies and 10 dBA in the middle frequency range or sound aprons capable of achieve noise reductions of up to 10 dBA.
- Locate all construction areas for staging and warming up as far as possible from adjacent residential buildings and sensitive receivers.

RCM-2 Construction Hours

The Proposed Project shall comply with LAMC Section 41.40, which restricts construction activities to the hours of 7:00 AM to 9:00 PM Monday through Friday, and 8:00 AM to 6:00 PM on Saturday and national holidays with no construction permitted on Sunday.

RCM-3 Construction Site Noticing

The Proposed Project shall comply with the City's Building Regulations Ordinance No. 178,048 (LAMC Section 91.106.4.8), which requires a construction site notice to be provided that includes the following information: job site address, permit number, name and phone number of the contractor or owner or owner's agent, hours of construction allowed by code or any discretionary approval for the site, and the Applicant's telephone number where violations can be reported. The notice shall be posted and maintained at the construction site prior to the start of construction and displayed in a location that is readily visible to the public.

THRESHOLDS OF SIGNIFICANCE

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

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

Appendix G of the State CEQA Guidelines also includes:

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

The Project site is not located within an airport land use plan and is not located within two miles of public airport or public use airport, nor is it within the vicinity of private airstrips. As such, the Project would result in no impacts to this screening criteria and no further analyses of this topic is necessary.

Construction Noise

A Project would normally have a significant impact on noise levels from construction if:

- Construction activities lasting more than one day would exceed existing ambient exterior sound levels by 10 dBA (hourly Leq) or more at a noise-sensitive use;
- Construction activities lasting more than 10 days in a three-month period would exceed existing ambient exterior noise levels by 5 dBA (hourly Leq) or more at a noise-sensitive use; or
- Construction activities of any duration would exceed the ambient noise level by 5 dBA (hourly Leq) at a noise sensitive use between the hours of 9:00 PM and 7:00 AM Monday through Friday, before 8:00 AM or after 6:00 PM on Saturday, or at any time on Sunday.

Section 112.05 of the City's Municipal Code sets a maximum noise level for construction equipment of 75 dBA at a distance of 50 feet when operated within 500 feet of a residential zone. Construction equipment includes crawler-tractors, dozers, rotary drills and augers, loaders, power shovels, cranes, derricks, motor graders, paving machines, off-highway trucks, ditchers, trenchers, compactors, scrapers, wagons, pavement breakers, compressors, and pneumatic or other powered equipment. Compliance with this standard is only required where "technically feasible."[10] Section 41.40 of the City's Municipal Code

10 In accordance with the City's Noise Ordinances, "technically feasible" means that the established noise limitations can be compiled with at a project site, with the use of mufflers, shields, sound barriers, and/or other noise reduction devices or techniques employed during the operation of equipment.

prohibits construction between the hours of 9:00 PM and 7:00 AM Monday through Friday, 6:00 PM and 8:00 AM on Saturday, and at any time on Sunday (i.e., construction is allowed Monday through Friday between 7:00 AM to 9:00 PM; and Saturdays and National Holidays between 8:00 AM to 6:00 PM). In general, the City's Department of Building and Safety enforces noise ordinance provisions relative to equipment and the Los Angeles Police Department enforces provisions relative to noise generated by people.

Operational Noise

Operational noise impacts are evaluated for Project-related off-site roadway traffic noise impacts and on-site stationary source noise from on-site activities and equipment.

- The Project would cause any ambient noise levels to increase by 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" category; or
- The Project causes the ambient noise levels measured at the property line of affected noise-sensitive uses to increase by 5 dBA CNEL or greater; or
- Project-related operational (i.e., nonroadway) noise sources, such as outdoor activities, building mechanical/electrical equipment, outdoor activities, loading, trash compactor, or parking facilities, increase ambient noise level (hourly Leq) at noise sensitive uses by 5 dBA.

The significance criterion used in the noise analysis for the on-site operations presented below is an increase in the ambient noise level of 5 dBA (hourly Leq) at the noise-sensitive uses, in accordance with the City's Noise Regulations (LAMC Chapter XI). The Noise Regulations do not apply to off-site traffic (i.e., vehicles traveling on public roadways). Therefore, the significance criteria for off-site traffic noise associated with Project operations is an increase in the ambient noise level by 3 dBA or 5 dBA in CNEL (depending on the land use category) at noise-sensitive uses. In addition, the significance for composite noise levels (on-site and off-site sources) is an increase in the ambient noise level of 3 dBA or 5 dBA in CNEL (depending on the land use category) for the Project's composite noise (both Project-related on-site and off-site sources) at noise-sensitive uses.

Groundborne Vibration

The City has not adopted a significance threshold to assess vibration impacts during construction. Thus, the Caltrans *Transportation and Construction Vibration Guidance Manual*[11] is used as a screening tool to assess the potential for adverse vibration effects related to structural damage. Impacts related to vibration would be considered significant if it exceeds the following standards:

---

11 Caltrans, Transportation and Construction Vibration Guidance Manual (September 2013), https://cityofdavis.org/home/showdocument?id=4521. Accessed May 2023.

- Project construction activities cause ground-borne vibration levels to exceed 0.5 PPV at the nearest off-site reinforced-concrete, steel, or timber building.
- Project construction activities cause ground-borne vibration levels to exceed 0.3 PPV at the nearest off-site engineered concrete and masonry building.
- Project construction activities cause ground-borne vibration levels to exceed 0.2 PPV at the nearest off-site non-engineered timber and masonry building.
- Project construction activities cause ground-borne vibration levels to exceed 0.12 PPV at buildings extremely susceptible to vibration damage, such as historic buildings.

Construction

On-Site Construction Noise

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

The construction equipment reference noise levels provided in **Table 2** above, are based on measured noise data compiled by the FHWA and would occur when equipment is operating under full power conditions. However, equipment used on construction sites typically operate at less than full power. The acoustical usage factor is the percentage of time that each type of construction equipment is anticipated to be in full power operation during a typical construction day. These values are estimates and will vary based on the actual construction process and schedule.

Construction equipment operates at its noisiest levels for certain percentages of time during operation. As such, equipment would operate at different percentages over the course of an hour.[12] During a construction day, the highest noise levels would be generated when multiple pieces of construction equipment are operated concurrently.

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

The estimated construction noise levels were calculated for each of the analyzed receptors (refer to **Figure 8**) during each of the construction phases. As mentioned previously, given the physical size of the Project site and logistical limitations, and with the noise equipment located at the construction area nearest to the affected receptors to present a conservative impact analysis. This is considered a worst-case evaluation because construction of the Project would typically use fewer pieces of equipment simultaneously at any given time as well as operating throughout the construction site (i.e., most of the time construction equipment would be operating at distances further away from the off-site receptors

12 Federal Highway Administration, Traffic Noise Model (2006).

than that assumed in the forecasting of Project construction noise levels). As such, Project construction would often generate lower noise levels than reported herein.

Table 3: Maximum Noise Impacts Associated With On-Site Construction Activities presents the maximum noise impacts that are forecasted to occur at each of the receptor sites. As shown, average noise levels during construction would result in a maximum increase of 12.1 dBA (Leq-1hour) above the significance threshold of 5 dBA over ambient noise levels during the grading phase east of the Project at the multi-family residential uses (Site 2) without implementation of technically feasible noise reduction measures as mentioned in Section 112.05 of the City's Municipal Code.

TABLE 3
CONSTRUCTION MAXIMUM NOISE ESTIMATES

Monitoring Site[1]	Ambient Noise Levels	Calculated Noise Level (Leq-1hour) by Construction Phase				Significance Threshold	Maximum Increase Above Significance Threshold
		Grading	Building Construction	Paving	Architectural Coating		
Site 2	62.6	79.7	73.0	76.2	61.1	67.6	**+12.1**
Site 3	67.0	78.1	70.8	74.5	58.9	72.0	**+6.1**
Site 4	75.0	78.4	73.0	74.9	61.1	80.0	**-1.6**
Site 5	61.1	60.1	53.0	56.5	41.1	66.1	**-6.0**
Site 6	64.5	72.9	66.5	69.3	54.6	69.5	**+3.4**

*Refer to **Appendix B** for Construction Noise Worksheets*
Note:
[1] Site 1 located at the Project site thus excluded from this analysis.
[2] Ambient noise level plus 5 dBA.

As mentioned previously, in devising construction noise control strategies, important options include controlling the noise at the source. Source control requirements include added benefits in promoting technological advances in the development of quieter equipment. Source control techniques can include: (1) muffler requirements, (2) maintenance and operational requirements, and (3) equipment emission level requirements. These control techniques can be used separately or in combination in order to achieve the desired results. Most control noise originates from equipment powered by either gasoline or diesel engines. A large part of the noise emitted is due to the intake and exhaust portions of the engine cycle. A remedy for controlling much of the engine noise is by adhering to **RCM-NOISE-1** which requires the use of optimal muffler systems. **RCM-NOISE-1** would lead to replacement of worn mufflers and to retrofitting where mufflers are not in use. Using optimal muffler systems on all equipment would reduce construction noise levels by 10 dBA or more.[13]

Other effective methods of diminishing the noise impacts associated with individual pieces of construction equipment is to employ less noisy machinery. This is accomplished by specifying the quietest

---

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

available equipment. Modifications such as dampening of metal surfaces or a redesign of a particular piece of equipment is effective in reduction noise due to vibration. These modifications are typically conducted by the manufacturer or with factory assistance. The reduction is controlled by the imposed limits on the technical capabilities of the manufacturer or the equipment user. Noise reductions of up to 5 dBA can be achieved using dampening materials.[14] Additionally, shields such as sound skins may achieve reductions of 20 dBA at high frequencies and 10 dBA in the middle frequency range. Sound aprons may achieve noise reductions of up to 10 dBA.[15] Sound aprons are typically designed from absorptive mats and are draped on the frames attached to the equipment. This material can be constructed from polyvinyl chloride (PVC) layers, lead-filled fabric, or rubber. These aprons are most useful when equipment only needs partial shielding or has to be regularly moved. Additionally, limiting the number of noise-generating, heavy-duty construction equipment to two (2) pieces operating simultaneously would reduce construction noise levels by approximately 1.5 dBA.

With implementation of **RCM-NOISE-1**, construction noise levels resulting in a increase of 12.1 dBA (Leq-1hour) above the significance threshold of 5 dBA over ambient noise levels would be reduced by a minimum of 26.5 dBA (Leq-1hour) when utilizing a combination of optimal muffler systems, dampening materials, sound aprons and limiting simultaneous operations. Moreover, with implementation of **RCM-NOISE-2**, the Project would be required to comply with Section 41.40 of the LAMC by ensuring construction activities would only occur between the hours of 7:00 AM and 9:00 PM Monday through Friday, and 8:00 AM to 6:00 PM on Saturday and national holidays with no construction permitted on Sunday. Additionally, implementation of **RCM-NOISE-3** would require construction site notices to be provided that includes the following information: job site address, permit number, name and phone number of the contractor or owner or owner's agent, hours of construction allowed by code or any discretionary approval for the site, and the Applicant's telephone number where violations can be reported. Compliance with the above practices would ensure construction noise levels would be below the significance threshold; thus, construction noise levels would not be considered significant.

Off-Site Construction Noise

Construction of the Project would require worker, haul, and vendor truck trips to and from the site to work on the site, export soil, and deliver supplies to the site. Trucks traveling to and from the Project site would be required to travel along a haul route approved by the City. At the maximum, approximately 8 vendor trips per day would take place during the building construction phase. Haul truck traffic would take the most direct route to the freeway ramp along Vanowen Street.

Noise associated with construction truck trips were estimated using the Caltrans FHWA Traffic Noise Model based on the maximum number of worker and truck trips in a day. Project haul truck trips, which

---

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

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

includes medium- and heavy-duty trucks, would generate noise levels of approximately 46.3 to 51.1 dBA, respectively, measured at a distance of 25 feet from the adjacent sensitive receptor. As shown in **Table 1**, existing noise levels ranged from 61.1 dBA to 75.0 dBA. The noise level increases from truck trips would be below the significance threshold of 5 dBA. As such, off-site construction noise impacts would not be considered significant.

Construction Vibration

As mentioned previously, the Project site is predominantly surrounded by single- and multi-family residential uses. As shown in **Table 4: On-Site Construction Vibration Impacts-Building Damage**, the forecasted vibration levels due to on-site construction activities would not exceed the building damage significance threshold of 0.5 PPV for reinforced-concrete, steel, or timber building at the adjacent residential uses. Impacts related to building damage from on-site construction vibration would not be considered significant.

TABLE 4
ON-SITE CONSTRUCTION VIBRATION IMPACTS – BUILDING DAMAGE

Monitoring Site	Nearest Off-Site Building Structures	Estimated Vibration Velocity Levels at the Nearest Off-Site Structures from the Project Construction Equipment			Significance Threshold (PPV ips)
		Loaded Trucks	Jackhammer	Small bulldozer	
2	Residential	0.015	0.007	0.001	0.5
3	Residential	0.027	0.012	0.001	0.5
4	Residential	0.012	0.006	0.000	0.5
5	Residential	0.005	0.002	0.000	0.5
6	Residential	0.006	0.003	0.000	0.5

Source: US Department of Transportation, Federal Transportation Authority, Transit Noise and Vibration Impact Assessment.

*Refer to **Appendix C** for construction vibration worksheets.*

Operation

Playground Noise

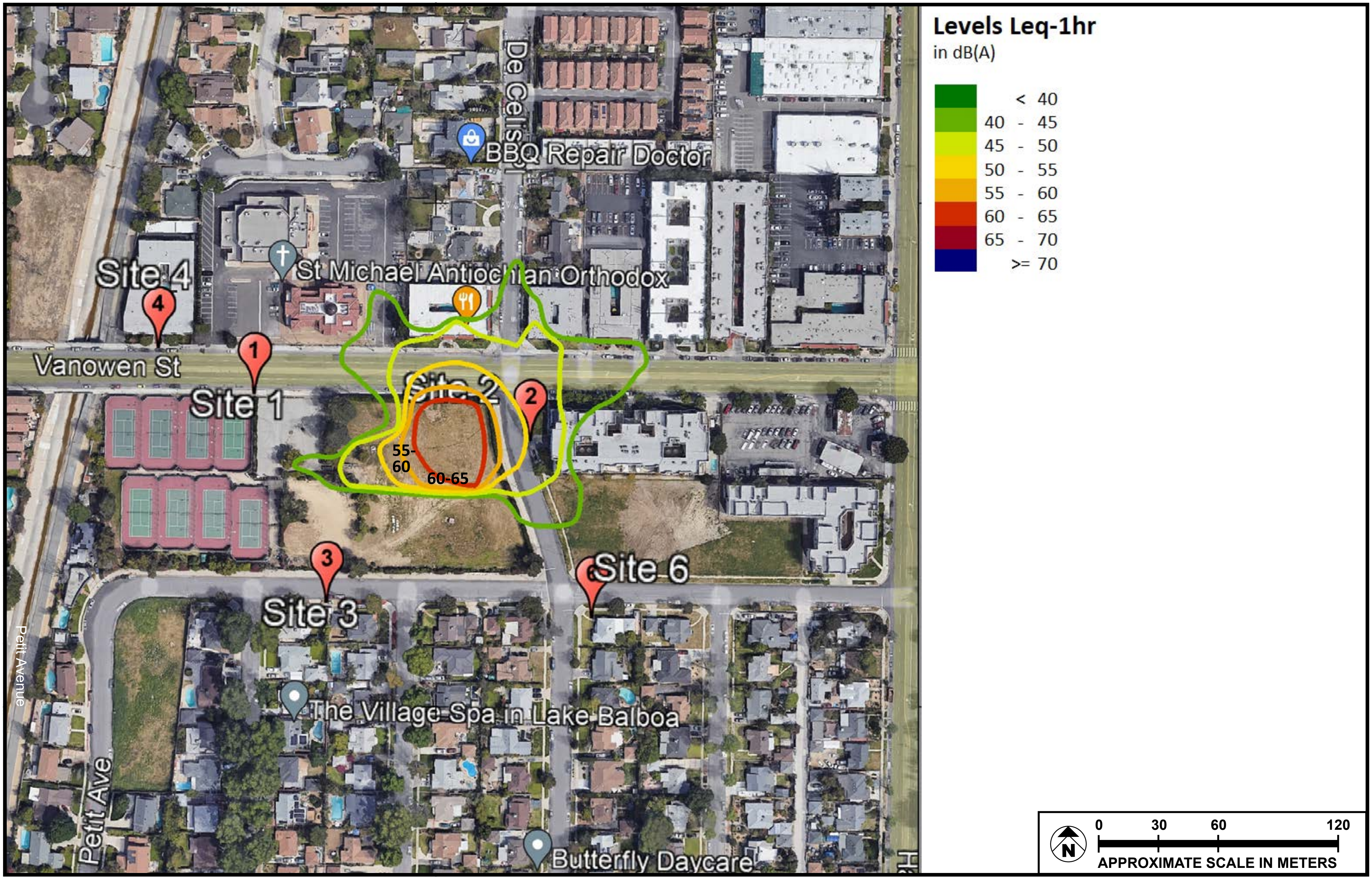
Noise levels within the parking areas would fluctuate with the amount of automobile and human activity, similar to the current conditions that exist along Vanowen Street. Sources of noise would mostly emanate within the playground area during breaks between classes and during lunchtime located at the southern portion of the site (refer to **Figure 1**). It is important to note, the School does not include any outdoor athletic events that would draw large spectator events. However, for purposes of this analysis and a worst-case assessment, it was assumed the playground area would be fully operational between the hours of 7:00 AM – 7:00 PM. As shown in **Table 5: Operational Noise Levels (Playground)**, noise levels generated from the playground area would not result in any increase above ambient noise levels. For illustrative purposes, noise levels generated from the field area are shown graphically in **Figure 9: Operational Noise Level Contour Map**. As such, operational impacts would not be considered significant.

TABLE 5 OPERATIONAL NOISE LEVELS (PLAYGROUND)				
Monitoring Site	Ambient Noise Levels	Modeled Operational Noise Levels (dBA, Leq)	Increase above Ambient	Significant Impact?
2	62.6	48.5	0	**No**
3	67.0	19.5	0	**No**
4	75.0	47.3	0	**No**
5	61.1	16.6	0	**No**
6	64.5	33.0	0	**No**

Source: Refer to ***Appendix D*** *for SoundPLAN Output Sheets.*

Fixed Mechanical Equipment Noise

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



SOURCE: Google Earth - 2023

FIGURE **9**

Meridian Consultants

Operational Noise Level Contour Map

389-001-23

Cumulative Noise

For purposes of this analysis, development of the related projects will be considered to contribute to cumulative noise impacts. Noise, by definition, is a localized phenomenon and drastically reduces as distance from the source increases. As a result, only related projects and growth in the general area of the Project site (within 500 feet) would contribute to cumulative noise impacts. Cumulative construction-noise impacts have the potential to occur when multiple construction projects in the local area generate noise within the same time frame and contribute to the local ambient noise environment. It is expected that, as with the Project, related projects would implement noise reduction techniques such as mufflers, shields, sound barriers, which would minimize any noise-related nuisances during construction. In addition, distance attenuation and intervening structures would further reduce construction noise levels and not result in noticeable increases. Therefore, the combined construction-noise impacts of related projects within 500 feet and the Project's contribution would not cause a significant cumulative impact.

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

CERTIFICATION

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

Sincerely,

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

APPENDIX A

Noise Monitoring Data Spreadsheets

Monitoring Location: Site 1
Monitoring Date: 4/26/2023

Monitoring Period

Time	LAeq	LASmax	LASmin
8:55:40	75.5	82.3	61.5
8:56:40	73.2	78.9	57.9
8:57:40	74.2	79.6	53.4
8:58:40	75.6	82.0	54.5
8:59:40	72.4	78.1	58.2
9:00:40	72.3	81.1	59.0
9:01:40	73.1	78.5	55.1
9:02:40	74.7	80.6	62.9
9:03:40	72.8	80.0	60.4
9:04:40	74.0	78.8	62.0
9:05:40	75.1	79.8	61.6
9:06:40	71.1	80.5	49.2
9:07:40	73.2	78.2	64.8
9:08:40	75.3	81.9	63.6
9:09:40	73.2	80.2	59.1
9:10:40	70.1	73.7	69.2
		82.3	49.2

15-minute LAeq **73.7**

Monitoring Location: Site 2
Monitoring Date: 4/26/2023

Monitoring Period

Time	**LAeq**	**LASmax**	**LASmin**
9:49:31	62.6	69.2	54.8
9:50:31	62.3	66.5	54.7
9:51:31	59.9	64.5	49.3
9:52:31	65.4	72.6	57.3
9:53:31	62.8	68.2	53.8
9:54:31	63.0	66.9	53.8
9:55:31	64.7	74.3	55.5
9:56:31	60.6	66.9	52.2
9:57:31	63.5	67.8	59.1
9:58:31	62.4	67.2	57.7
9:59:31	62.0	66.6	57.4
10:00:31	61.9	66.3	58.6
10:01:31	63.5	67.7	60.2
10:02:31	64.1	69.7	52.1
10:03:31	58.6	66.3	49.4
10:04:31	53.0	53.0	51.3
		74.3	49.3

15-minute LAeq	**62.6**

Monitoring Location: Site 3
Monitoring Date: 4/26/2023

Monitoring Period

Time	LAeq	LASmax	LASmin
9:13:04	62.7	65.2	60.6
9:14:04	61.7	63.7	60.2
9:15:04	60.7	63.7	58.4
9:16:04	60.7	62.6	58.9
9:17:04	61.4	63.1	60.1
9:18:04	63.3	66.0	61.1
9:19:04	63.2	65.9	60.0
9:20:04	68.1	75.6	62.0
9:21:04	60.6	62.7	59.1
9:22:04	62.9	65.8	60.3
9:23:04	70.0	76.6	59.4
9:24:04	69.9	73.3	68.9
9:25:04	68.7	69.4	68.5
9:26:04	71.0	79.6	68.3
9:27:04	72.7	82.5	57.6
9:28:04	56.1	58.0	56.0
		82.5	56.0

15-minute LAeq **67.0**

Monitoring Location: Site 4
Monitoring Date: 4/26/2023

Monitoring Period

Time	**LAeq**	**LASmax**	**LASmin**
8:37:52	75.0	78.6	62.7
8:38:52	73.3	81.2	60.2
8:39:52	74.5	81.9	60.5
8:40:52	75.1	82.3	63.6
8:41:52	76.2	83.1	67.8
8:42:52	74.0	80.7	60.9
8:43:52	77.3	85.0	65.5
8:44:52	75.0	82.1	64.6
8:45:52	74.6	79.5	61.5
8:46:52	77.4	83.4	65.0
8:47:52	71.8	78.2	58.9
8:48:52	75.0	84.3	66.4
8:49:52	73.5	79.8	60.1
8:50:52	74.5	82.0	55.0
8:51:52	74.3	83.3	60.1
		85.0	55.0

15-minute LAeq **75.0**

Monitoring Location: Site 5
Monitoring Date: 4/26/2023

Monitoring Period

Time	LAeq	LASmax	LASmin
10:09:53	54.0	59.8	48.0
10:10:53	56.5	64.6	48.4
10:11:53	53.7	62.7	48.0
10:12:53	50.8	55.1	48.3
10:13:53	65.3	77.2	48.3
10:14:53	67.2	77.8	54.9
10:15:53	58.7	66.1	54.6
10:16:53	56.7	64.7	54.6
10:17:53	56.5	60.3	54.9
10:18:53	58.3	59.2	55.0
10:19:53	63.3	70.6	59.1
10:20:53	62.3	70.5	54.8
10:21:53	64.1	72.0	48.9
10:22:53	62.7	69.3	49.5
10:23:53	52.8	58.3	49.2
10:24:53	54.1	56.8	50.8
		77.8	48.0

15-minute LAeq **61.1**

Monitoring Location: Site 6
Monitoring Date: 4/26/2023

Monitoring Period

Time	LAeq	LASmax	LASmin
9:30:42	64.1	70.9	55.8
9:31:42	60.1	62.8	57.1
9:32:42	68.6	78.2	58.8
9:33:42	61.1	64.3	56.1
9:34:42	63.8	72.1	56.0
9:35:42	57.6	59.6	56.3
9:36:42	63.2	70.6	55.4
9:37:42	59.0	61.6	55.8
9:38:42	62.5	65.2	61.5
9:39:42	62.1	63.4	61.6
9:40:42	62.8	66.8	61.9
9:41:42	66.3	76.5	61.9
9:42:42	71.6	79.6	64.4
9:43:42	62.7	65.1	55.1
9:44:42	58.1	64.3	54.7
9:45:42	55.1	55.1	55.0
		79.6	54.7

15-minute LAeq **64.5**

APPENDIX B

Construction Noise Data Spreadsheets

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/27/2023
Case Description: Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
At 50 feet	Residential	75	75	75

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
			Equipment			
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0
Tractor	No	40	84		50	0
Tractor	No	40	84		50	0

Calculated (dBA)

Equipment		*Lmax	Leq
Grader		85	81
Dozer		81.7	77.7
Tractor		84	80
Tractor		84	80
	Total	85	85.9

*Calculated Lmax is the Loudest value.

Source type	Time slice	Li	R'w	L'w	Lw	l or A	KI	KT	DO	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	Cmet	dLw	ZR	Lr
		dB(A)	dB	dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB(A)	dB(A)	dB	dB	dB	dB(A)
Receiver REC-2 Fl G Leq-1hr dB(A) Leq-1hr 77.6 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	69.69	-47.9	-3.6	0.0	-0.1		0.0	0.1	77.6	0.0	0.0	0.0	77.6
Receiver REC-2 Fl F2 Leq-1hr dB(A) Leq-1hr 78.9 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	70.04	-47.9	-2.3	0.0	-0.1		0.0	0.1	78.9	0.0	0.0	0.0	78.9
Receiver REC-2 Fl F3 Leq-1hr dB(A) Leq-1hr 79.7 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	70.59	-48.0	-1.4	0.0	-0.1		0.0	0.1	79.7	0.0	0.0	0.0	79.7
Receiver REC-3 Fl G Leq-1hr dB(A) Leq-1hr 78.7 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	62.45	-46.9	-3.4	0.0	-0.1		0.0	0.0	78.7	0.0	0.0	0.0	78.7
Receiver REC-4 (16609 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 77.0 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	73.51	-48.3	-3.9	0.0	-0.1		0.0	0.3	77.0	0.0	0.0	0.0	77.0
Receiver REC-4 (16609 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 78.0 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	73.77	-48.3	-2.9	0.0	-0.1		0.0	0.2	78.0	0.0	0.0	0.0	78.0
Receiver REC-4 (16655 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 71.6 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	128.36	-53.2	-4.4	0.0	-0.2		0.0	0.2	71.6	0.0	0.0	0.0	71.6
Receiver REC-4 (16655 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 72.0 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	128.50	-53.2	-3.9	0.0	-0.2		0.0	0.2	72.0	0.0	0.0	0.0	72.0
Receiver REC-5 Fl G Leq-1hr dB(A) Leq-1hr 60.4 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	193.42	-56.7	-4.7	-7.0	-0.4		0.0	0.1	60.4	0.0	0.0	0.0	60.4
Receiver REC-6 Fl G Leq-1hr dB(A) Leq-1hr 73.2 dB(A)																						
Area	Leq-1hr			85.9	126.1	10521.3	0.0	0.0	3	106.55	-51.5	-4.2	0.0	-0.2		0.0	0.0	73.2	0.0	0.0	0.0	73.2

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/27/2023
Case Description: Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
At 50 feet	Residential	75	75	75

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	0
All Other Equipment > 5 HP	No	50	85		50	0
All Other Equipment > 5 HP	No	50	85		50	0
Generator	No	50		80.6	50	0
Tractor	No	40	84		50	0
Welder / Torch	No	40		74	50	0
Welder / Torch	No	40		74	50	0
Welder / Torch	No	40		74	50	0

Calculated (dBA)

Equipment		*Lmax	Leq
Crane		80.6	72.6
All Other Equipment > 5 HP		85	82
All Other Equipment > 5 HP		85	82
Generator		80.6	77.6
Tractor		84	80
Welder / Torch		74	70
Welder / Torch		74	70
Welder / Torch		74	70
	Total	85	87.2

*Calculated Lmax is the Loudest value.

Magnolia Public School

Mean propagation Leq - Building Construction

Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	Kl dB	KT dB	DO dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	Cmet dB	dLw dB	ZR dB	Lr dB(A)
Receiver REC-2 Fl G Leq-1hr dB(A) Leq-1hr 71.1 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	69.93	-47.9	-3.8	0.0	-0.1		0.0	0.0	69.9	0.0	0.0	0.0	69.9
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	88.08	-49.9	-4.1	0.0	-0.2		0.0	0.1	64.7	0.0	0.0	0.0	64.7
Receiver REC-2 Fl F2 Leq-1hr dB(A) Leq-1hr 72.0 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	70.18	-47.9	-2.8	0.0	-0.1		0.0	0.0	71.0	0.0	0.0	0.0	71.0
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	88.22	-49.9	-3.4	0.0	-0.2		0.0	0.1	65.4	0.0	0.0	0.0	65.4
Receiver REC-2 Fl F3 Leq-1hr dB(A) Leq-1hr 72.9 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	70.59	-48.0	-1.7	0.0	-0.1		0.0	0.0	72.0	0.0	0.0	0.0	72.0
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	88.45	-49.9	-2.8	0.0	-0.2		0.0	0.1	66.0	0.0	0.0	0.0	66.0
Receiver REC-3 Fl G Leq-1hr dB(A) Leq-1hr 70.8 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	69.17	-47.8	-4.0	0.0	-0.1		0.0	0.0	69.9	0.0	0.0	0.0	69.9
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	96.92	-50.7	-4.3	0.0	-0.2		0.0	0.0	63.6	0.0	0.0	0.0	63.6
Receiver REC-4 (16609 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 72.0 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	84.73	-49.6	-4.2	0.0	-0.2		0.0	0.7	68.5	0.0	0.0	0.0	68.5
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	52.67	-45.4	-3.7	0.0	-0.1		0.0	0.0	69.5	0.0	0.0	0.0	69.5
Receiver REC-4 (16609 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 73.0 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	84.87	-49.6	-3.5	0.0	-0.2		0.0	0.6	69.1	0.0	0.0	0.0	69.1
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	52.91	-45.5	-2.4	0.0	-0.1		0.0	0.0	70.8	0.0	0.0	0.0	70.8
Receiver REC-4 (16655 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 65.8 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	143.48	-54.1	-4.5	0.0	-0.3		0.0	0.3	63.2	0.0	0.0	0.0	63.2
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	111.66	-52.0	-4.4	0.0	-0.2		0.0	0.1	62.4	0.0	0.0	0.0	62.4
Receiver REC-4 (16655 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 66.2 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	143.58	-54.1	-4.1	0.0	-0.3		0.0	0.3	63.6	0.0	0.0	0.0	63.6
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	111.78	-52.0	-3.9	0.0	-0.2		0.0	0.1	62.9	0.0	0.0	0.0	62.9
Receiver REC-5 Fl G Leq-1hr dB(A) Leq-1hr 53.0 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	202.01	-57.1	-4.7	-8.6	-0.4		0.0	0.0	50.9	0.0	0.0	0.0	50.9
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	197.08	-56.9	-4.7	-8.0	-0.4		0.0	0.0	48.8	0.0	0.0	0.0	48.8
Receiver REC-6 Fl G Leq-1hr dB(A) Leq-1hr 66.5 dB(A)																						
Area	Leq-1hr			85.6	118.7	2064.6	0.0	0.0	3	108.62	-51.7	-4.3	0.0	-0.2		0.0	0.0	65.5	0.0	0.0	0.0	65.5
Area	Leq-1hr			85.6	115.8	1041.5	0.0	0.0	3	149.42	-54.5	-4.5	0.0	-0.3		0.0	0.2	59.7	0.0	0.0	0.0	59.7

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/27/2023
Case Description: Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
At 50 feet	Residential	75	75	75

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

Calculated (dBA)

Equipment		*Lmax	Leq
Paver		77.2	74.2
Paver		77.2	74.2
Roller		80	73
Roller		80	73
Tractor		84	80
	Total	84	82.9

*Calculated Lmax is the Loudest value.

Magnolia Public School

Mean propagation Leq - Paving

10

Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m²	KI dB	KT dB	DO dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	Cmet dB	dLw dB	ZR dB	Lr dB(A)
Receiver REC-2 Fl G Leq-1hr dB(A) Leq-1hr 73.2 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	68.64	-47.7	-3.6	-2.0	-0.1		0.0	1.3	73.2	0.0	0.0	0.0	73.2
Receiver REC-2 Fl F2 Leq-1hr dB(A) Leq-1hr 74.6 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	68.97	-47.8	-2.3	-1.8	-0.1		0.0	1.1	74.6	0.0	0.0	0.0	74.6
Receiver REC-2 Fl F3 Leq-1hr dB(A) Leq-1hr 75.4 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	69.51	-47.8	-1.4	-1.8	-0.1		0.0	1.1	75.4	0.0	0.0	0.0	75.4
Receiver REC-3 Fl G Leq-1hr dB(A) Leq-1hr 73.7 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	65.40	-47.3	-3.5	-1.6	-0.1		0.0	0.8	73.7	0.0	0.0	0.0	73.7
Receiver REC-4 (16609 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 71.7 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	70.00	-47.9	-3.9	-3.3	-0.1		0.0	1.4	71.7	0.0	0.0	0.0	71.7
Receiver REC-4 (16609 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 73.0 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	70.28	-47.9	-2.7	-3.0	-0.1		0.0	1.2	73.0	0.0	0.0	0.0	73.0
Receiver REC-4 (16655 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 65.8 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	128.01	-53.1	-4.4	-3.7	-0.2		0.0	1.7	65.8	0.0	0.0	0.0	65.8
Receiver REC-4 (16655 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 66.3 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	128.15	-53.1	-3.9	-3.6	-0.2		0.0	1.7	66.3	0.0	0.0	0.0	66.3
Receiver REC-5 Fl G Leq-1hr dB(A) Leq-1hr 55.7 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	195.18	-56.8	-4.7	-8.6	-0.4		0.0	0.8	55.7	0.0	0.0	0.0	55.7
Receiver REC-6 Fl G Leq-1hr dB(A) Leq-1hr 67.9 dB(A)																						
Area	Leq-1hr			82.4	122.4	10067.2	0.0	0.0	3	109.14	-51.8	-4.2	-2.3	-0.2		0.0	0.8	67.9	0.0	0.0	0.0	67.9

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 4/27/2023
Case Description: Architectural Coating

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
At 50 feet	Residential	75	75	75

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	0

Calculated (dBA)

Equipment		*Lmax	Leq
Compressor (air)		77.7	73.7
	Total	77.7	73.7

*Calculated Lmax is the Loudest value.

Source type	Time slice	Li	R'w	L'w	Lw	l or A	KI	KT	DO	S	Adiv	Agr	Abar	Aatm	Amisc	ADI	dLrefl	Ls	Cmet	dLw	ZR	Lr
		dB(A)	dB	dB(A)	dB(A)	m,m²	dB	dB	dB	m	dB	dB	dB	dB	dB	dB	dB(A)	dB(A)	dB	dB	dB	dB(A)
Receiver REC-2 Fl G Leq-1hr dB(A) Leq-1hr 65.4 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	69.69	-47.9	-3.6	0.0	-0.1		0.0	0.1	65.4	0.0	0.0	0.0	65.4
Receiver REC-2 Fl F2 Leq-1hr dB(A) Leq-1hr 66.7 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	70.04	-47.9	-2.3	0.0	-0.1		0.0	0.1	66.7	0.0	0.0	0.0	66.7
Receiver REC-2 Fl F3 Leq-1hr dB(A) Leq-1hr 67.5 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	70.59	-48.0	-1.4	0.0	-0.1		0.0	0.1	67.5	0.0	0.0	0.0	67.5
Receiver REC-3 Fl G Leq-1hr dB(A) Leq-1hr 66.5 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	62.45	-46.9	-3.4	0.0	-0.1		0.0	0.0	66.5	0.0	0.0	0.0	66.5
Receiver REC-4 (16609 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 64.8 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	73.51	-48.3	-3.9	0.0	-0.1		0.0	0.3	64.8	0.0	0.0	0.0	64.8
Receiver REC-4 (16609 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 65.8 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	73.77	-48.3	-2.9	0.0	-0.1		0.0	0.2	65.8	0.0	0.0	0.0	65.8
Receiver REC-4 (16655 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 59.4 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	128.36	-53.2	-4.4	0.0	-0.2		0.0	0.2	59.4	0.0	0.0	0.0	59.4
Receiver REC-4 (16655 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 59.8 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	128.50	-53.2	-3.9	0.0	-0.2		0.0	0.2	59.8	0.0	0.0	0.0	59.8
Receiver REC-5 Fl G Leq-1hr dB(A) Leq-1hr 48.2 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	193.42	-56.7	-4.7	-7.0	-0.4		0.0	0.1	48.2	0.0	0.0	0.0	48.2
Receiver REC-6 Fl G Leq-1hr dB(A) Leq-1hr 61.0 dB(A)																						
Area	Leq-1hr			73.7	113.9	10521.3	0.0	0.0	3	106.55	-51.5	-4.2	0.0	-0.2		0.0	0.0	61.0	0.0	0.0	0.0	61.0

APPENDIX C

Construction Vibration Data Spreadsheets

Meridian Consultants LLC

Magnolia Public Schools
Construction Vibration Model
(Site 2)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	75	0.017	0.004	73
Jackhammer		1	0.035	75	0.007	0.002	65
Large bulldozer		1	0.089	75	0.017	0.004	73
Loaded trucks		1	0.076	75	0.015	0.004	71
Pile Drive (impact)		1	0.644	75	0.124	0.031	90
Vibratory Roller		1	0.210	75	0.040	0.010	80
Small bulldozer		1	0.003	75	0.001	0.000	43

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

Magnolia Public Schools
Construction Vibration Model
(Site 3)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	50	0.031	0.008	78
Jackhammer		1	0.035	50	0.012	0.003	70
Large bulldozer		1	0.089	50	0.031	0.008	78
Loaded trucks		1	0.076	50	0.027	0.007	77
Pile Drive (impact)		1	0.644	50	0.228	0.057	95
Vibratory Roller		1	0.210	50	0.074	0.019	85
Small bulldozer		1	0.003	50	0.001	0.000	48

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

Meridian Consultants LLC

Magnolia Public Schools
Construction Vibration Model
(Site 4)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	85	0.014	0.004	71
Jackhammer		1	0.035	85	0.006	0.001	63
Large bulldozer		1	0.089	85	0.014	0.004	71
Loaded trucks		1	0.076	85	0.012	0.003	70
Pile Drive (impact)		1	0.644	85	0.103	0.026	88
Vibratory Roller		1	0.210	85	0.033	0.008	78
Small bulldozer		1	0.003	85	0.000	0.000	42

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

Meridian Consultants LLC

Magnolia Public Schools
Construction Vibration Model
(Site 5)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	160	0.005	0.001	63
Jackhammer		1	0.035	160	0.002	0.001	55
Large bulldozer		1	0.089	160	0.005	0.001	63
Loaded trucks		1	0.076	160	0.005	0.001	61
Pile Drive (impact)		1	0.644	160	0.040	0.010	80
Vibratory Roller		1	0.210	160	0.013	0.003	70
Small bulldozer		1	0.003	160	0.000	0.000	33

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

Magnolia Public Schools
Construction Vibration Model
(Site 6)

Equipment		Pieces of Equipment	PPV at 25 feet (in/sec)	Distance from Equipment	PPV at adjusted distance	RMS velocity amplitude in in/sec at adjusted distance[a]	RMS Vibration level in VdB at adjusted distance
Caisson drilling		1	0.089	130	0.008	0.002	65
Jackhammer		1	0.035	130	0.003	0.001	57
Large bulldozer		1	0.089	130	0.008	0.002	65
Loaded trucks		1	0.076	130	0.006	0.002	64
Pile Drive (impact)		1	0.644	130	0.054	0.014	83
Vibratory Roller		1	0.210	130	0.018	0.004	73
Small bulldozer		1	0.003	130	0.000	0.000	36

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

APPENDIX D

SoundPLAN Output Sheets

Magnolia Public School

Mean propagation Leq - Operational

Source type	Time slice	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	l or A m,m^2	KI dB	KT dB	DO dB	S m	Adiv dB	Agr dB	Abar dB	Aatm dB	Amisc dB	ADI dB	dLrefl dB(A)	Ls dB(A)	Cmet dB	dLw dB	ZR dB	Lr dB(A)
Receiver REC-2 Fl G Leq-1hr dB(A) Leq-1hr 41.6 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	70.23	-47.9	-3.9	-0.8	-0.1		0.0	0.1	41.6	0.0	0.0	0.0	41.6
Receiver REC-2 Fl F2 Leq-1hr dB(A) Leq-1hr 42.5 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	70.42	-47.9	-3.1	-0.8	-0.1		0.0	0.2	42.5	0.0	0.0	0.0	42.5
Receiver REC-2 Fl F3 Leq-1hr dB(A) Leq-1hr 43.5 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	70.75	-48.0	-2.2	-0.8	-0.1		0.0	0.3	43.5	0.0	0.0	0.0	43.5
Receiver REC-3 Fl G Leq-1hr dB(A) Leq-1hr 42.7 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	72.62	-48.2	-4.1	-0.1	-0.1		0.0	1.0	42.7	0.0	0.0	0.0	42.7
Receiver REC-4 (16609 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 33.8 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	88.29	-49.9	-4.3	-13.8	-0.2		0.0	7.7	33.8	0.0	0.0	0.0	33.8
Receiver REC-4 (16609 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 34.5 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	88.43	-49.9	-3.6	-13.3	-0.2		0.0	7.2	34.5	0.0	0.0	0.0	34.5
Receiver REC-4 (16655 Vanowen) Fl G Leq-1hr dB(A) Leq-1hr 22.0 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	160.64	-55.1	-4.5	-13.2	-0.3		0.0	0.8	22.0	0.0	0.0	0.0	22.0
Receiver REC-4 (16655 Vanowen) Fl F2 Leq-1hr dB(A) Leq-1hr 23.0 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	160.72	-55.1	-4.2	-12.4	-0.3		0.0	0.8	23.0	0.0	0.0	0.0	23.0
Receiver REC-5 Fl G Leq-1hr dB(A) Leq-1hr 19.3 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	216.59	-57.7	-4.8	-12.5	-0.4		0.0	0.3	19.3	0.0	0.0	0.0	19.3
Receiver REC-6 Fl G Leq-1hr dB(A) Leq-1hr 40.4 dB(A)																						
Area	Leq-1hr			60.0	91.3	1337.4	0.0	0.0	3	97.32	-50.8	-4.3	0.0	-0.2		0.0	1.4	40.4	0.0	0.0	0.0	40.4