

Exhibit L

Vibration Report



January 14, 2026
45dB Project 24039

Project and Address: Multi-Family Housing 1 Hot Springs Rd. Santa Barbara, CA 93108	Architect: DesignARC Attn: Jaeson Greer, AIA jgreer@designarc.net Attn: Melisa Cinarli Turner mcturner@designarc.net	Client to be Invoiced: 1HSR GP, LLC Attn: Brian Holland bcraig.holland@gmail.com
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Addendum

This addendum to our previous report for the above multi-family housing Project, dated January 16, 2025, presents the results of our evaluation of the potential impact of groundborne vibration due to project demolition and development on neighboring locations.

Construction vibration levels are expected to be short-term and less than significant if proper mitigation is implemented. Recommendations for construction-related vibration management have been provided along with Impact Analyses to satisfy CEQA and City requirements.

for 45dB Acoustics, LLC:

Sarah Taubitz, Mem.INCE, ASA
ST@45dB.com

Erin L. Dugan, INCE Bd. Cert.

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1 Construction-Related Vibration Analysis

Construction of the proposed Project would generate noise that *may* temporarily increase noise and vibration levels at nearby sensitive receivers. Vibration impacts resulting from construction depend on the vibration levels generated by various pieces of construction equipment operating on site, the timing and duration of vibration generating activities, and the distance between construction equipment and sensitive receptors. Construction of a project such as this would typically involve site improvements, excavation, construction of foundations, building framing, paving, and landscaping. The hauling of excavated material and construction materials would generate truck trips on local roadways. Blasting or pile-driving is not expected for this project.

Construction activities for a larger project such as this are typically carried out in phases. During each phase of construction, there would be a different mix of operating equipment. The amount of construction-related vibration would vary by phase and vary within the phases based on the amount of equipment in operation and location where the equipment is operating. Typical phases of construction and associated larger equipment are shown in Table 1 below.

Table 1: Typical Construction Equipment Used for Each Project Phase

Phase / Scope of Work	Anticipated Large Equipment
Grading	Dump Truck, Dozer, Backhoe
Utilities	Backhoe, Mini Excavator
Foundations and Pads	Concrete Mixer Truck, Concrete Pump
Framing	Forklift, Compressor
Driveways	Concrete Mixer Truck, Concrete Pump

2 Regulatory Setting

The U.S. government, State of California, and the City of Santa Barbara have established plans and policies that are designed to limit noise and vibration exposure at noise sensitive land uses. Plans and policies applicable to the impact of vibration due to the proposed Project include:

1. California Department of Transportation (Caltrans)
2. California Environmental Quality Act (CEQA)
3. County of Santa Barbara Housing Element, Environmental Impact Report (EIR)
4. City of Carpinteria General Plan & Local Coastal Plan, Noise Element

2.1 State Regulation

2.1.1 California Department of Transportation (Caltrans)

Caltrans¹ has provided recommendations on vibration limits for both human annoyance as well as structural integrity of buildings neighboring a construction site. Caltrans characterizes the human response to vibration as “distinctly perceptible” at PPV levels greater than 0.25 in/sec for transient sources and 0.04 in/sec for continuous sources (Table 2). To prevent structural damage

¹ California Department of Transportation, Transportation and Construction Vibration Guidance Manual, April 2020. <https://dot.ca.gov/programs/environmental-analysis/noise-vibration/guidance-manuals>

in older historic and residential buildings, Caltrans recommends transient vibration levels of no more than a PPV (peak particle velocity) of 0.5 in/sec or 0.3 in/sec for continuous or frequent sources, as shown in Table 3.

Table 2: CalTrans Guidelines for Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 3: CalTrans Guidelines for Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

2.1.2 California Environmental Quality Act (CEQA)

The significance of environmental noise impacts resulting from a proposed project are evaluated based on the California Environmental Quality Act (CEQA) guidelines. Appendix G of the CEQA Guidelines² asks the following applicable questions regarding noise and vibration. These will be answered in Section 4.

Would the project result in:

- a) *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?*
- b) *Generation of excessive groundborne vibration or groundborne noise levels?*

² 2024 CEQA Statutes and Guidelines.

https://www.califaep.org/docs/2024_CEQA_Statute_and_Guidelines_Handbook.pdf

- c) 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?

2.2 Local Regulation - City of Santa Barbara Municipal Code

The City of Santa Barbara Municipal Code³ regulates noise impacts from construction as well as stationary sources. Section 9.16.040, “Construction Work at Night Prohibited,” includes the following statement:

“It is unlawful for any person, between the hours of 8:00 p.m. of any day and 7:00 a.m. of the following day to erect, construct, demolish, excavate for, alter or repair any building or structure unless a special permit has been applied for and granted by the Chief Building Official.”

3 Construction Equipment Vibration

Although the construction activities at this project site are not expected to produce high levels of vibration, such as blasting or pile driving, some project equipment may produce vibration levels that should be evaluated for potential impact on sensitive receptors. Construction equipment at this site is expected to include bulldozers, vibratory rollers, and loaded trucks. Vibration source amplitudes for typical construction equipment, as measured at a distance of 25 feet, are shown below in Table 4.

Table 4: Construction Equipment Vibration Source Amplitudes

Equipment	Reference PPV at 25 ft. (in/sec)
Vibratory roller	0.210
Large bulldozer	0.089
Caisson drilling	0.089
Loaded trucks	0.076
Jackhammer	0.035
Small bulldozer	0.003
Crack-and-seat operations	2.4

Sources: Federal Transit Administration 2018 (except Hanson 2001 for vibratory rollers) and Caltrans 2000 for crack-and seat-operations.

3.1 Expected Vibration Levels

The nearest sensitive receptor (structure) to the construction site is a historic fountain at the southwest corner of the Project site, as shown in Figure 1. The minimum distances that must be maintained for each type of vibrating construction equipment are shown below in Table 5 for continuous and transient sources.

³ City of Santa Barbara Municipal Code, Section 9.16.040, 2016. <https://ecode360.com/44100126#44100154>

Table 5: Minimum Distances to Maintain to Avoid Structural Damage

Equipment Type	Minimum distance to maintain (ft) from building type to avoid structural damage from <u>Continuous</u> sources:				
	Modern industrial/commercial	New residential	Historic and old buildings	Fragile buildings	Extremely fragile buildings/ ruins/ monuments
Vibratory roller	14	14	22	41	48
Large bulldozer	8	8	13	23	27
Caisson drilling	8	8	13	23	27
Loaded trucks	7	7	11	21	24
Jackhammer	4	4	7	12	14
Small bulldozer	1	1	1	2	3
Crack-and-seat operations	71	71	113	208	241
Equipment Type	Minimum distance to maintain (ft) from building type to avoid structural damage from <u>Transient</u> sources:				
	Modern industrial/commercial	New residential	Historic and old buildings	Fragile buildings	Extremely fragile buildings/ ruins/ monuments
Vibratory roller	6	9	14	26	36
Large bulldozer	3	5	8	15	20
Caisson drilling	3	5	8	15	20
Loaded trucks	3	4	7	13	18
Jackhammer	2	3	4	8	11
Small bulldozer	0	1	1	2	2
Crack-and-seat operations	28	45	71	131	184

Additionally, the buildings located at the Santa Barbara Cemetery directly to the south of the Project, are located approximately 70 feet from the perimeter of the site. Based on the reference values in Table 4 and the distance from any potential vibration sources, we calculate that the vibratory roller, which has the highest level of vibration among typical construction equipment, would have a PPV level of 0.045 in/sec, which is well below the criteria for building damage or human annoyance due transient vibration sources. *We assume there will be no crack-and-seat, blasting, or pile-driving operations at this site.*

If a vibratory roller operates continuously along the south perimeter of the site, the resulting vibration may be distinctly perceptible by people in the north side of the cemetery. In this case, we would recommend that the roller not operate within 5 feet of the Project site's south boundary, unless it is just transitory movement.

4 Impact Analysis and Recommendations

4.1 Recommended Mitigations

The following Vibration Mitigation Measures (VMM) are recommended for this project:

- **VMM-01 Notification:** Any/all residential property owners, tenants, and commercial uses/businesses within 300 feet of the project area (this is the standard noticing distance the City employs) must be informed in writing of the anticipated construction schedule and activities taking place for that period of time, at least 30 days prior to commencing activity. This notice shall, at a minimum, contain a description of the proposed project, a construction schedule including days and hours of construction, and a description of noise- and vibration-reducing measures.
- **VMM-02 Scheduling:** Noise- and vibration-generating construction activities (which may include preparation for construction work) shall be permitted weekdays between the hours of 7:00 AM and 5:00 PM, excluding holidays observed by the City as legal holidays: New Year's Day (January 1); Martin Luther King Jr.'s birthday (3rd Monday in January); President's Day (3rd Monday in February); Memorial Day (Last Monday in May); Independence Day (July 4); Labor Day (1st Monday in September); Thanksgiving Day (4th-Thursday in November); Day Following Thanksgiving Day (Friday following Thanksgiving); Christmas Day (December 25). When a holiday falls on a Saturday or Sunday, the preceding Friday or following Monday respectively shall be observed as a legal holiday. Occasional night work may be approved for the hours between 5:00 PM and 7:00 AM weekdays by the Chief of Building and Zoning (per Section 9.13.015 of the Municipal Code). In the event of such night work approval, the applicant shall provide written notice to all property owners and occupants within 450 feet of the project property boundary and the City Planning and Building Divisions at least 48 hours prior to commencement of night work. Night work shall not be permitted on weekends or holidays.
- **VMM-03 Limit Continuous Vibration Near South Property Line:** The vibratory roller would produce a PPV level of 0.045 in/sec at the cemetery located south of the Project site, which is below above the criteria for building damage or human annoyance due to transient vibration sources; however, if operated continuously in this area, it will exceed the criteria for human annoyance. If operated continuously, to avoid exceeding this criterion, we recommend that a minimum distance of 5 feet from the south boundary line is maintained. *All other vibrating construction equipment (i.e., bulldozers and loaded trucks) may operate as normal.*
- **VMM-04 Separate/Distance Vibration Operations:** Phase the earthmoving and any ground-impacting operations so as not to occur in the same time period. *Unlike noise, the total vibration level produced could be significantly less when each vibration source operates separately.*
- **VMM-05 Limit Continuous and Transient Vibration Near Historic Fountain:** All vibrating equipment should operate with a minimum distance from the fountain at the southwest corner of the site. See Table 5 for the specified distances to be maintained for each equipment type.

4.2 CEQA

The following table summarizes the CEQA Noise and Vibration Thresholds and the expected impact of the proposed Project.

Table 6: CEQA Threshold Checklist

CEQA Noise and Vibration Thresholds	NA (Not Applicable)	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Threshold 1: Would the proposed project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X	
Threshold 2: Would the proposed project generate excessive groundborne vibration or groundborne noise levels?			X See Section 3.1		
Threshold 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 proposed project expose people residing or working in the project area to excessive noise levels?	X				

5 Conclusion

Construction vibration levels are expected to be short-term and less than significant if proper mitigation is implemented. Recommendations for noise management have been provided along with Impact Analyses to satisfy CEQA and City requirements.

The conclusions and recommendations of this addendum are based upon the information known to 45dB Acoustics, LLC ("**45dB**") at the time the analysis was prepared concerning the proposed site plan and typical construction equipment. Any significant changes to these factors will require a reevaluation of the findings of this report.

Figure 1: Project Site and Nearest Sensitive Receptors / Structures

