MD ACOUSTICS
Sound Solutions for Planning and Design
www.mdacoustics.com

AZ Office
4960 S. Gilbert Rd, Suite 1-461
Chandler, AZ 85249
p. (602) 774-1950

CA Office
1197 Los Angeles Ave, Suite C-256
Simi Valley, CA 93065
p. (805) 426-4477

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Quick Quack Development II, LLC
Vance A. Shannon
1380 Lead Hill Blvd #260
Roseville, CA 95661

Subject: Quick Quack Car Wash Sienna Ridge (Store #26-126) – Noise Review Letter – County of El Dorado, CA

MD Acoustics, LLC (MD) has previously completed a Noise Impact Study for the Quick Quack Car Wash on Sienna Ridge (Store #26-126) dated 3/3/2023. This Noise Review Letter focuses on the acoustical differences between this proposed Sienna Ridge site and other Quick Quack tunnels, specifically the tunnel at 1750 Cavitt Dr, Folsom, CA, in response to the El Dorado Hills Area Planning Advisory Committee (EDH APAC) letter dated 3/10/23. Exhibit A (page 3 of this letter) shows the site plan for the Sienna Ridge project. The project proposes to install a 12 Sonny's Blower System with silencers and acoustic liner 15' from the exit, including a lined interior wall with a 10'x10' opening. The proposed exit is 10'x10'. The proposed operational hours are 7 AM to 9 PM. A glossary of acoustical terms is located in Appendix A.

1.0 Acoustical Treatments

The Quick Quack Car Wash site at 1750 Cavitt Dr, Folsom, CA, is a standard tunnel with no acoustical treatments, and the exit measures 12'x12'. The following outlines the typical differences in noise level due to the various treatments on the proposed tunnel at the Sienna Ridge site:

- Reducing the exit from 12'x12' to 10'x10' reduces the noise levels by approximately 2 dB at the exit.
- The exit liner with the lined interior wing walls reduces the entrance noise levels by about 5 dB and the exit noise levels by about 3 dB.
- Silencers reduce the exit and entrance noise levels by about 4 dB.

These are the level reductions anticipated directly facing the exit and entrance. These treatments tend to be more effective than the levels listed for receptors located to the sides of the tunnel, such as the homes adjacent to Sienna Ridge. The overall expected reduction in noise level for the Sienna Ridge site when compared to a standard tunnel is approximately 9 dB. This equates to a perceived halving of the noise level.

These acoustical treatments focus primarily on reducing the sound levels at and near the source, making them effective at reducing the noise level in all directions and for any topography.

As a Quick Quack standard, the vacuum producers are proposed to be enclosed in an 8' tall CMU structure, similar to the producers at the Folsom location. However, the proposed site also includes a metal deck lid at 11' tall, which will further block the noise from the vacuum producers.

The proposed project site benefits from existing masonry walls to the south and east of the project site, reducing the noise level significantly at the first row of houses (10 total) adjacent to Sienna Ridge (fronting on Bronzewing Place) and the vacant lot to the south. Masonry walls are most effective where they block the line of sight from the source. In this case, the primary sources are the blowers in the car wash tunnel. Blocking the line of sight from some or all of the blowers significantly reduces the noise level.

2.0 Model

The proposed tunnel was modeled in SoundPLAN. SoundPLAN inputs include factors such as topography imported from Google Earth, ground effects, building and wall reflections, and source heights. The sources are calibrated using over 100 points of data, including over 50 points specifically from Quick Quack tunnels, to ensure that the model aligns with real-world conditions.

3.0 Comparison of Future Operational Noise to Ambient

Per the Noise Impact Study dated 3/3/23, the existing ambient noise level was measured to be 54 dBA Leq on the southern property line of the proposed project and 58 dBA Leq on the northeast property line. The future operational noise level at the existing adjacent residential properties to the east is 48 dBA Leq (see Exhibit B). The overall noise level is not anticipated to increase significantly as a result of the project. Residential properties further from the site, including Bass Lake North, Serrano Village J Lot H, Serrano Village J7, Bridlewood Canyon, Woodridge, the Hills of El Dorado, Hawk View, and Laurel Oaks, are projected to be below 45 dBA Leq. Therefore, the overall noise level is not anticipated to increase significantly at these sites either due to the proposed project.

4.0 Conclusion

MD is pleased to provide this noise review for this project which incorporates a 12 silenced Sonny's blower system with acoustic liner. If you have any questions regarding this letter, please call our office at (805) 426-4477.

Sincerely,
MD Acoustics, LLC

Claire Pincock, INCE-USA
Acoustical Consultant

Exhibit A
Site Plan

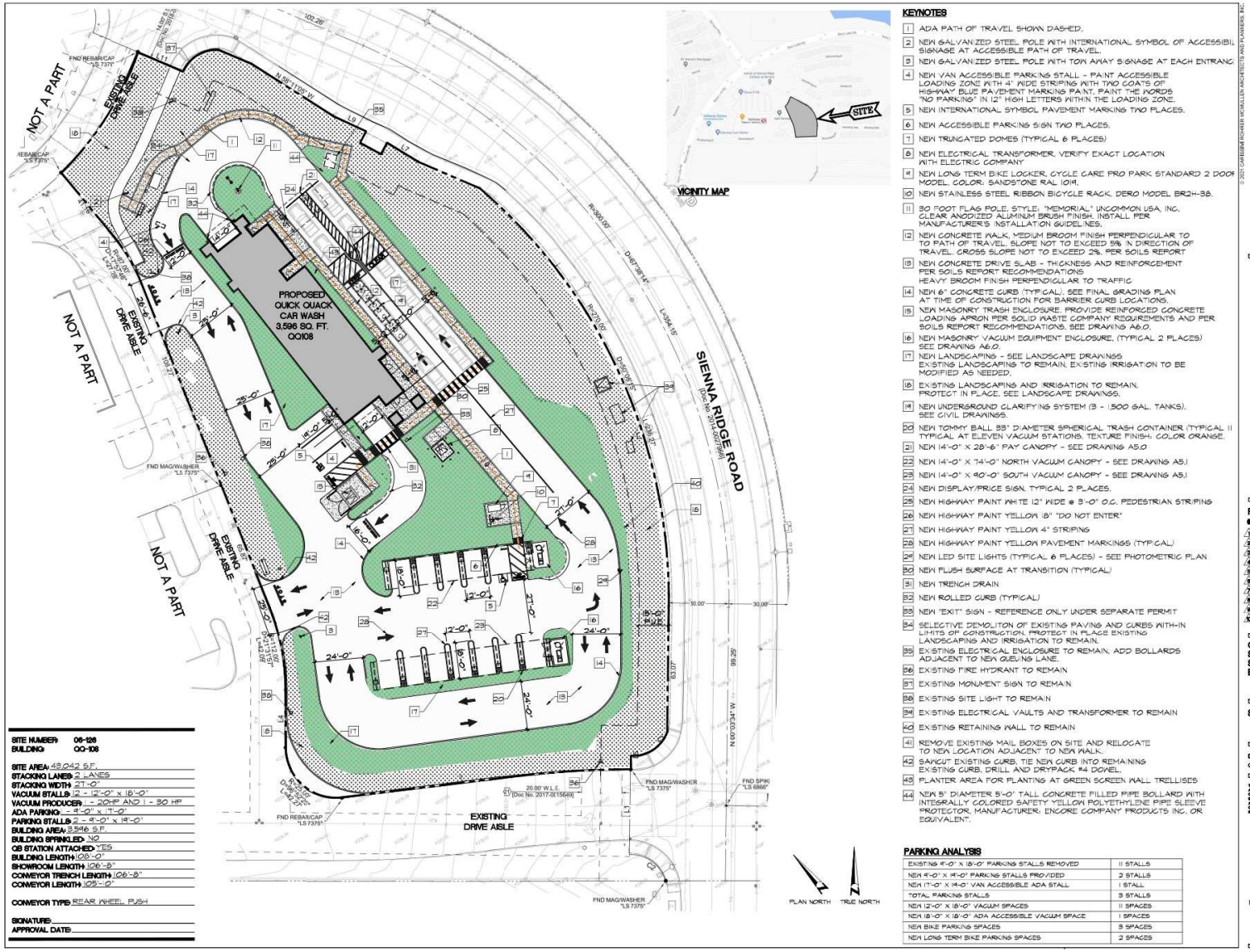
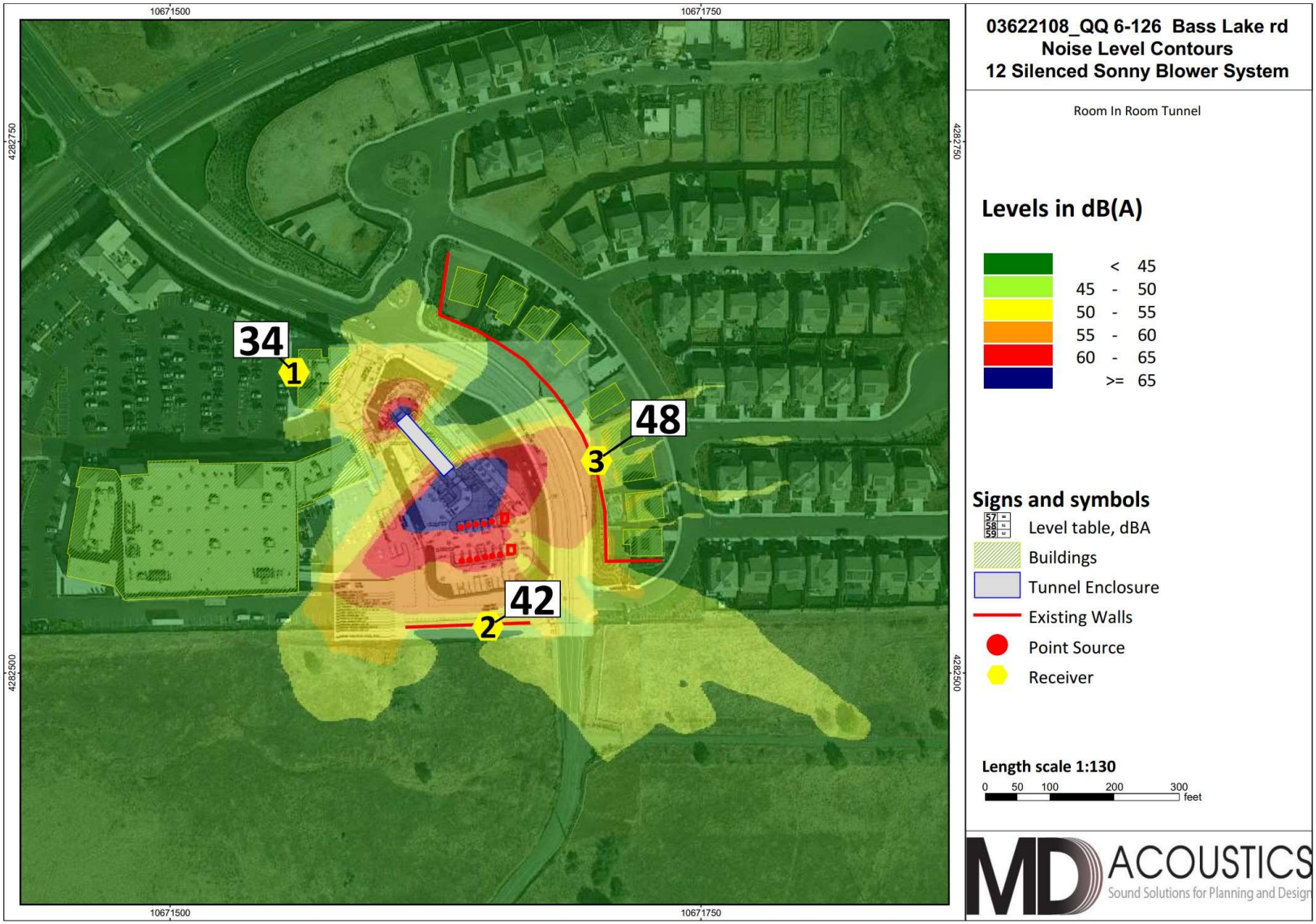


Exhibit B
Future Operational Noise Level



Appendix A

Glossary of Acoustical Terms

Glossary of Terms

A-Weighted Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient or Background Noise Level: The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Decibel (dB): A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A): A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ): The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Field Sound Transmission Class (FSTC): The field sound transmission class (FSTC) rating is used for in situ wall and floor/ceiling sound isolation performance assessment. The standard requires the measurement of sound transmission loss and includes required procedure to show that the FSTC rating, as it has been determined by the test procedure, was not influenced by flanking of sound around the partition intended to be tested. Sound transmission class and FSTC ratings are intended by standard to be equivalent; however, practical experience indicates that FSTC ratings tend to be up to five ratings points less than laboratory-measured STC ratings.

Day-Night Level (LDN or DNL): LDN is the average noise level over a 24-hour period. The noise between the hours of 10PM to 7AM is artificially increased by 10 dB. This noise is weighted to take into account the decrease in community background noise of 10 dB during this period.

Noise: *A*ny unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Noise Isolation Class (NIC): The noise isolation class (NIC) rating is similar to STC and FSTC. However, the standard STC rating contour is applied to the one-third octave band noise reduction measured in a field situation, rather than the transmission losses measured in the field. No correction to the measured noise reduction data is made to account for partition size, receiving room absorption, or sound flanking. Like the STC and FSTC ratings, the field measured NIC rating of a noise reduction spectrum is equal to the value of the contour crossing at 500 Hz. In the absences of sound flanking, the NIC is generally within five points of the laboratory STC rating for typical building partition constructions. The NIC rating is used to assess the sound isolation performance of in situ partition construction, especially complicated ones that involve

multiple sound transmission paths that are not suited for laboratory testing. The NIC rating is often used in lieu of STC and FSTC.

Normalized Noise Isolation Class (NNIC): The normalized noise isolation class (NNIC) is the same as the NIC rating except the receiving room absorption is normalized to correspond to a 0.5-s reverberation time.

Sound Level (Noise Level): The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter: An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

***Sound Transmission Class (STC)*:** To quantify STC, a Transmission Loss (TL) measurement is performed in a laboratory over a range of 16 third-octave bands between 125 – 4,000 Hertz (Hz). The average human voice creates sound within the 125 – 4,000 Hz 1/3rd octave bands.

STC is a single-number rating given to a particular material or assembly. The STC rating measures the ability of a material or an assembly to resist airborne sound transfer over the specified frequencies (see ASTM International Classification E413 and E90). In general, a higher STC rating corresponds with a greater reduction of noise transmitting through a partition.

STC is highly dependent on the construction of the partition. The STC of a partition can be increased by: adding mass, increasing or adding air space, adding absorptive materials within the assembly. The STC rating does not assess low frequency sound transfer (e.g. sounds less than 125 Hz). Special consideration must be given to spaces where the noise transfer concern has lower frequencies than speech, such as mechanical equipment and or/or music. The STC rating is a lab test that does not take into consideration weak points, penetrations, or flanking paths.

Even with a high STC rating, any penetration, air-gap, or “flanking path can seriously degrade the isolation quality of a wall. Flanking paths are the means for sound to transfer from one space to another other than through the wall. Sound can flank over, under, or around a wall. Sound can also travel through common ductwork, plumbing or corridors. Noise will travel between spaces at the weakest points. Typically, there is no reason to spend money or effort to improve the walls until all weak points are controlled first.