

OPERATIONS NOISE STUDY FOR A PROPOSED AUTOMATIC CAR WASH IN THE SHERMAN OAKS DISTRICT OF LOS ANGELES

October 12, 2017

PREPARED FOR:

Ms. Chantly Banayan
4822 Van Nuys Blvd.
Sherman Oaks, CA 91403

PREPARED BY:

ADVANCED ENGINEERING ACOUSTICS
663 Bristol Avenue
Simi Valley, CA 93065

1. Introduction

At the request of Mr. Jian Keredian and Ms. Chantly Banayan, and in compliance with requirements of the City of Los Angeles (City), a noise study has been conducted by Advanced Engineering Acoustics (AEA). They are planning to build a new Automatic Car Wash east of and adjacent to an existing gas station at 4822 Van Nuys Blvd., on the northeast corner of Van Nuys Blvd. and Riverside Drive, in Sherman Oaks (see Figure 1). An alley is east of the project site with single and multi-family residences beyond the alley. This report provides the projected noise from the operation of the proposed car wash and the potential noise impacts to nearby businesses and residences.

In order to document the level of potential noise from the car wash operations, AEA has reviewed noise measurements of operating sound levels at existing car wash facilities as well as vendor equipment information, with and without noise abatement. AEA also has measured the ambient noise 35 feet north-northwest of the tunnel exit centerline (see Figure 2).

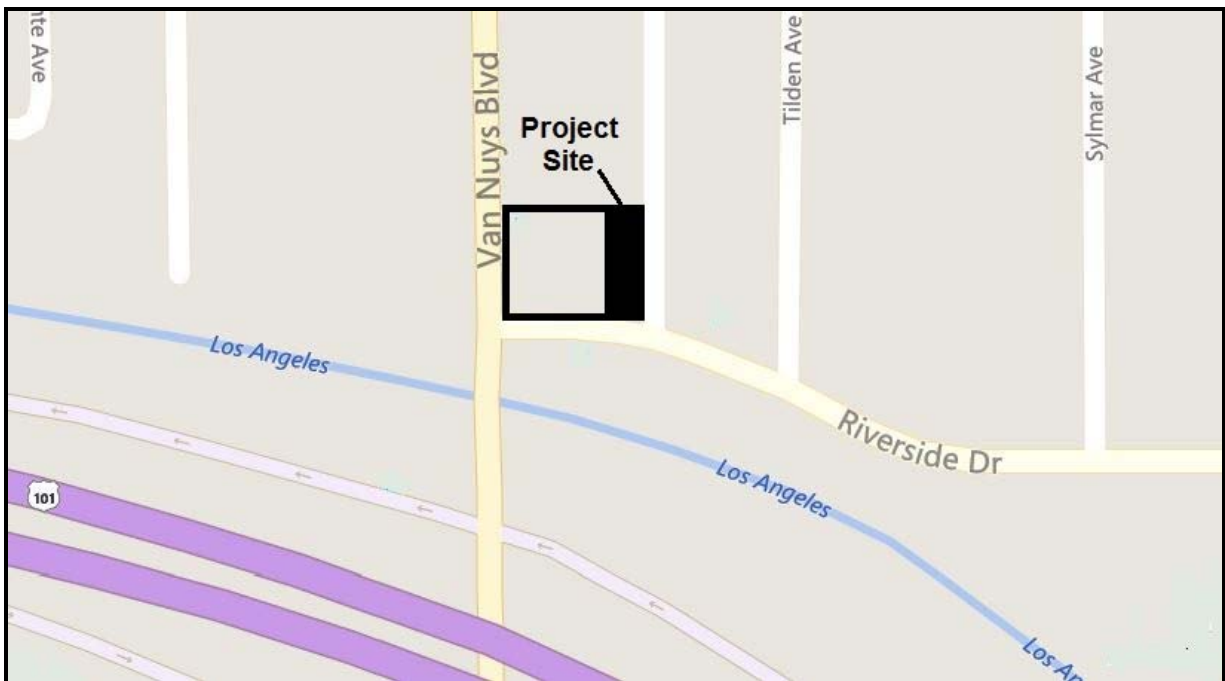


Figure 1. Project Vicinity Map

2. Sound Fundamentals

Physically, sound pressure magnitude is measured and quantified in terms of the decibel (dB), which is associated with a logarithmic scale based on the ratio of a measured sound pressure to the reference sound pressure of 20 micropascal ($20 \mu\text{Pa} = 20 \times 10^{-6} \text{ N/m}^2$). However, the decibel system can be very confusing. For example, doubling or halving the number of sources of equal noise output (a 2-fold change in acoustic *energy*) changes the noise level at the receptor by only 3 dB, which is a barely perceptible sound change for humans. While doubling or halving the sound *loudness* at the receptor results from a 10 dB change and also represents a 10-fold change in the acoustic *energy*.

The human hearing system is not equally sensitive to sound at all frequencies. Because of this variability, a frequency-dependent adjustment called “A-weighting” has been devised so that sound may be measured in a manner similar to the way the human hearing system responds. The A-weighted sound level is abbreviated “dBA”. Figure 2 gives typical A-weighted sound levels for various noise sources and the typical responses of people to these levels.



Figure 2. Aerial View of Proposed Car Wash Vicinity

3. City Noise Standards

The City has established exterior noise criteria for drive-through car wash operations. Los Angeles Municipal Code (“LAMC”) Section 12.22 A.28 provides that a car wash must maintain noise levels below the levels provided in Table II in LAMC Section 111.03. Table II specifies presumed A-weighted noise levels (dBA) for day and night based on the property’s zoning. These sections are included in Appendix A. The noise limit for the Project Site’s C1.5-1VL-RIO zone is 60 dBA during daytime hours and 55 dBA at night. The adjacent residential properties are zone R1 and RD1.5, which makes their daytime car wash noise limit 50 dBA and 45 dBA at night.

4. Ambient Noise Monitoring Equipment and Locations

In monitoring the existing ambient noise between the residential homes and the proposed car wash entrance, AEA used a Larson-Davis Model 820 Type 1 Integrating Sound Meter. The sound meter was calibrated according to the manufacturer’s instructions just prior to making the ambient noise measurements. The ambient noise monitoring position was 35 feet NNW of the proposed tunnel exit and 90 feet south-southeast of the proposed car wash tunnel entrance, as shown in Figures 2 and 3. There is currently a masonry property line wall east of the proposed car wash, which the City requires to be removed for the project.

5. Ambient Noise Measurements and Results

Ambient noise was monitored over an 83 interval monitoring period beginning at about 4 p.m. The results for the existing site ambient noise measurements are given in Table 1. Traffic on Van Nuys Blvd. and Riverside Dr. was quite busy during the noise measurement period.

Table 1. Ambient Noise Monitoring Results 35-ft NNW of Proposed Tunnel Exit (SLM)

Date	Time	Duration	Leq	LMax	L1.67	L8.33	L25	L50	L90	LMin
16-Sep-17	16:08	83.0	61.4	82.6	69.1	64.8	61.5	59.3	57.0	50.9

The hourly ambient noise measurement results include the energy equivalent or average sound level (Leq), the instantaneous minimum sound level (Lmin) and the instantaneous maximum sound level (Lmax). In addition, the noise measurement results include the percentile or exceedance levels. An L1.67 exceedance level is the sound level that is exceeded for 1.67% of the time (for example, about 30 seconds in a half-hour or 1 minute in an hour). The L8.33 exceedance level is the sound level that is exceeded for 8.33% of the time (for example, about 5 minutes in an hour). L25, L50 and L90 are the sound levels that are exceeded for their respective percentages of the time and would represent exceedance levels of 15 minutes, 30 minutes and 54 minutes per hour, respectively. All noise level data herein are referenced to 20 micropascal (20 μ Pa = 0.0002 dynes/sq.cm) and are A-weighted sound levels (dBA).

6. Car Wash Equipment and Unabated Operations Noise

The Applicant proposes to install a Autec™ car washing system with dryer/blowers inside the exit end of the tunnel. Maximum through-put of this automatic washing system is 30 vehicles per hour, thus one vehicle every 2 minutes. Figure 3 shows the proposed layout of the automatic car wash and the location of the sound meter that measured the ambient noise near the planned exit position. Based on the manufacturer’s measured noise data and noise measurements at many other car washes, the unabated car wash noise layout for this proposed system is given in Figure 4.

The latest published unabated and abated noise data from the Autec™ manufacturer are in Appendix B and show the unabated and abated car wash drying equipment noise out along a tunnel exit center line. These noise data are for the Premier Plastic Blower Housing and do not apply for the aluminum blower housing. For the planned automatic car wash, the unabated noise would be 82.8 dBA ten (10) feet out from the tunnel entrance and 89 dBA ten feet out from the tunnel exit. Equipment noise coming out the tunnel openings will spread in all directions, diminishing in intensity with distance and by tunnel entrance and exit wall shielding. Therefore, the unabated car wash noise would be 71.0 dBA at ten (10) feet 90 degrees east of the tunnel entrance and 77.7 dBA at ten (10) feet 90 degrees east of the tunnel exit. Therefore, the unabated car wash noise would be 62.9 dBA on the nearest residential lot from the tunnel entrance and 70.0 dBA on the nearest residential lot from the tunnel exit. The unabated car wash noise would not comply with the City car wash noise ordinance. Noise abatement is therefore necessary.

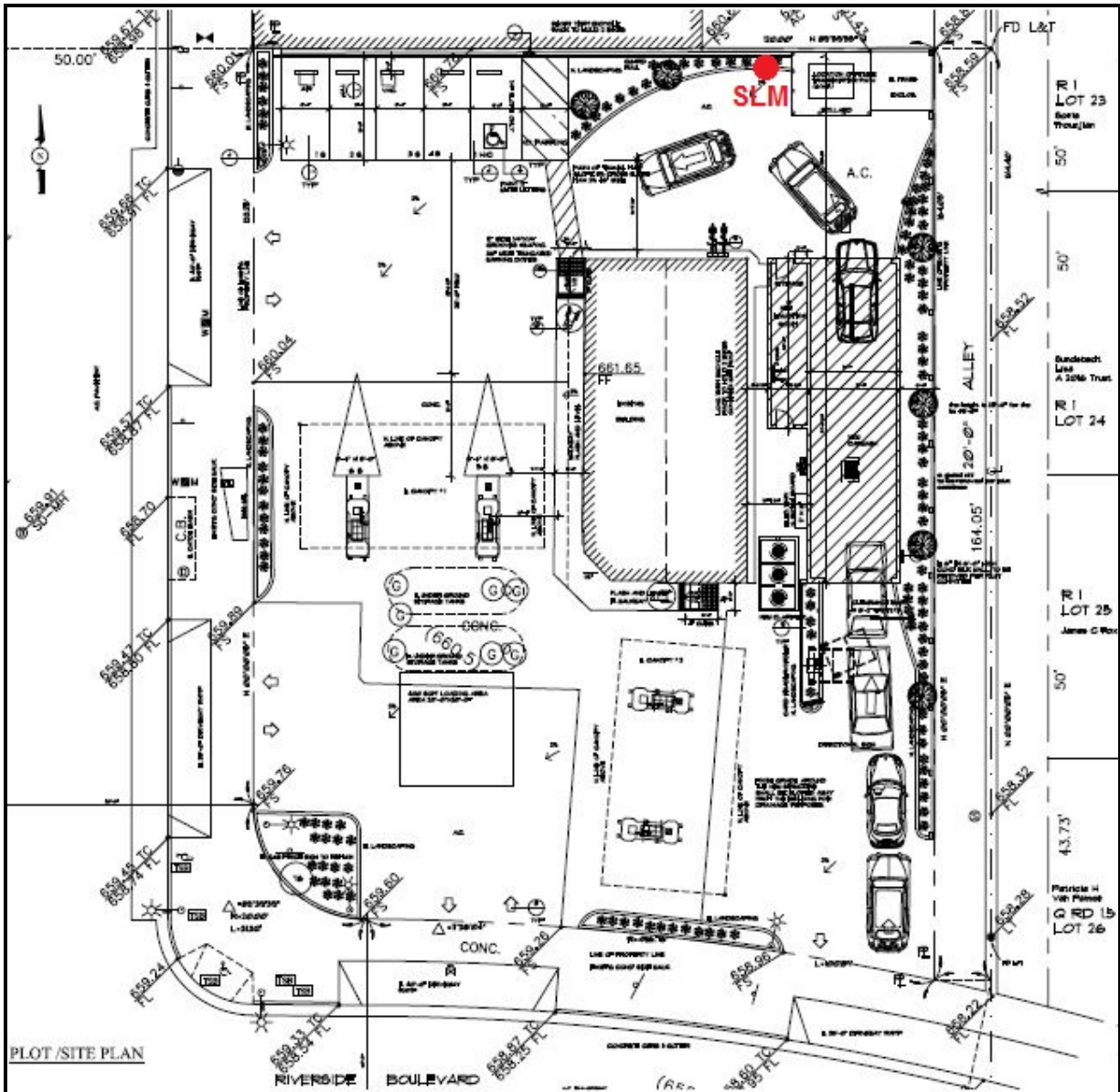


Figure 3. Proposed Car Wash Layout and Ambient Noise Meter Location

7. Proposed Car Wash Dryer Noise Reduction and Abated Operations Noise

The Applicant proposes to include several features to reduce noise of the proposed car wash. The car wash manufacturer's noise data sheets in Appendices B indicate the possible noise reduction associated with the dryer/blowers and the car wash tunnel, as follows:

- Plan for quick-opening tunnel doors at the entrance and exit to further reduce the dryer noise outside the tunnel. The tunnel doors would remain closed until the blower drying cycle was finished for each vehicle. After the blower stops, the doors would open for the vehicles to exit and enter the tunnel.
- In addition, the installation of full cover surrounds or silencer cones per dryer would further reduce noise by another 5 dBA on average.

Planned Automatic Car Wash Noise Study

Manufacturer's noise data with doors closed are given in Appendix B and the resulting abated noise layout is shown in Figure 5.

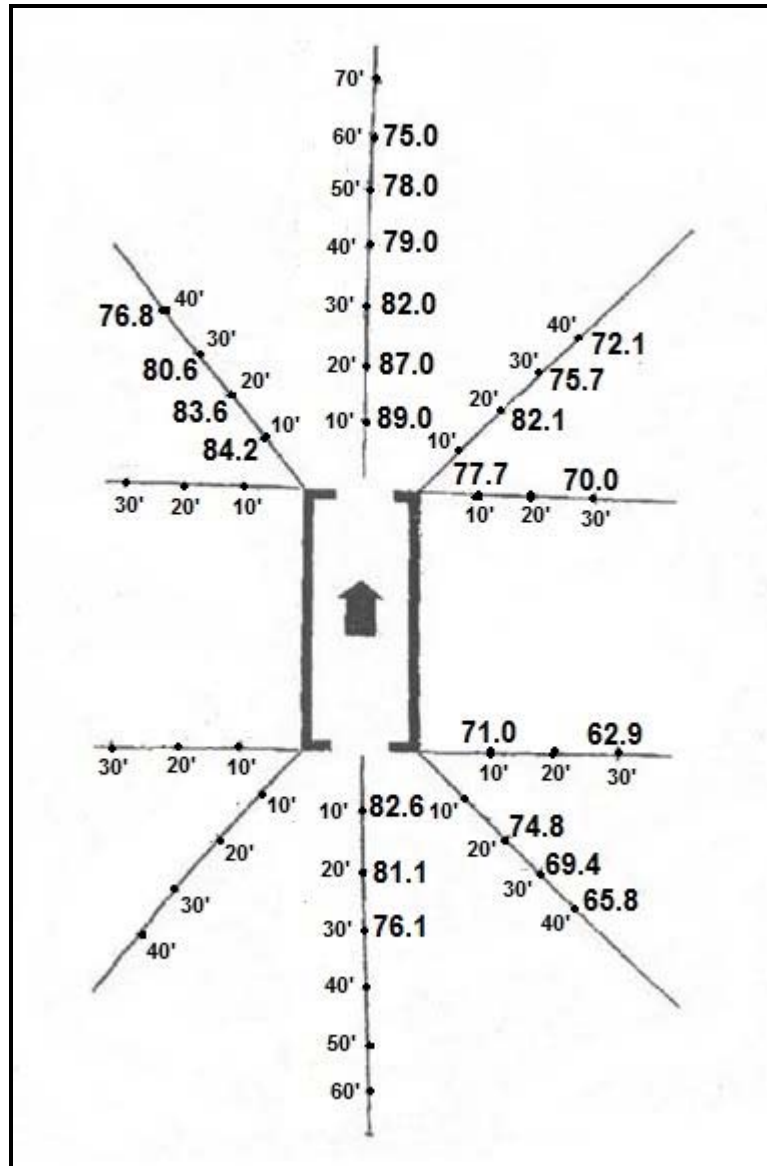


Figure 4. Measured and Calculated Unabated Car Wash Noise

8. Mechanics of Car Wash Tunnel Doors Noise Reduction Option

Table 5 summarizes these noise reduction results when the Applicant's proposed noise reduction features are included. As shown in Table 5, with the dryer muffler, muffler cover plate and VFD features, the car wash noise level will be reduced to 56 dBA at the entrance and 58 dBA at the exit, both of which are below the daytime noise level of 60 dBA given in LAMC Section 111.03 Table II for C4 zone. When the polycarbonate tunnel doors are added to these features, the car wash noise level will be further reduced by 9 dBA to 47 dBA at the entrance and 49 dBA at the exit, both of which are below the daytime and nighttime noise limits of 60 and 55 dBA, respectively, given in LAMC Section 111.03 Table II for C4 zone.

The proposed project is adjacent to an existing masonry property line wall. The existing property line wall could be raised to 8 feet above local ground level along the property line. This would provide an additional 4 dBA car wash noise reduction at the nearest residence façade and lot.

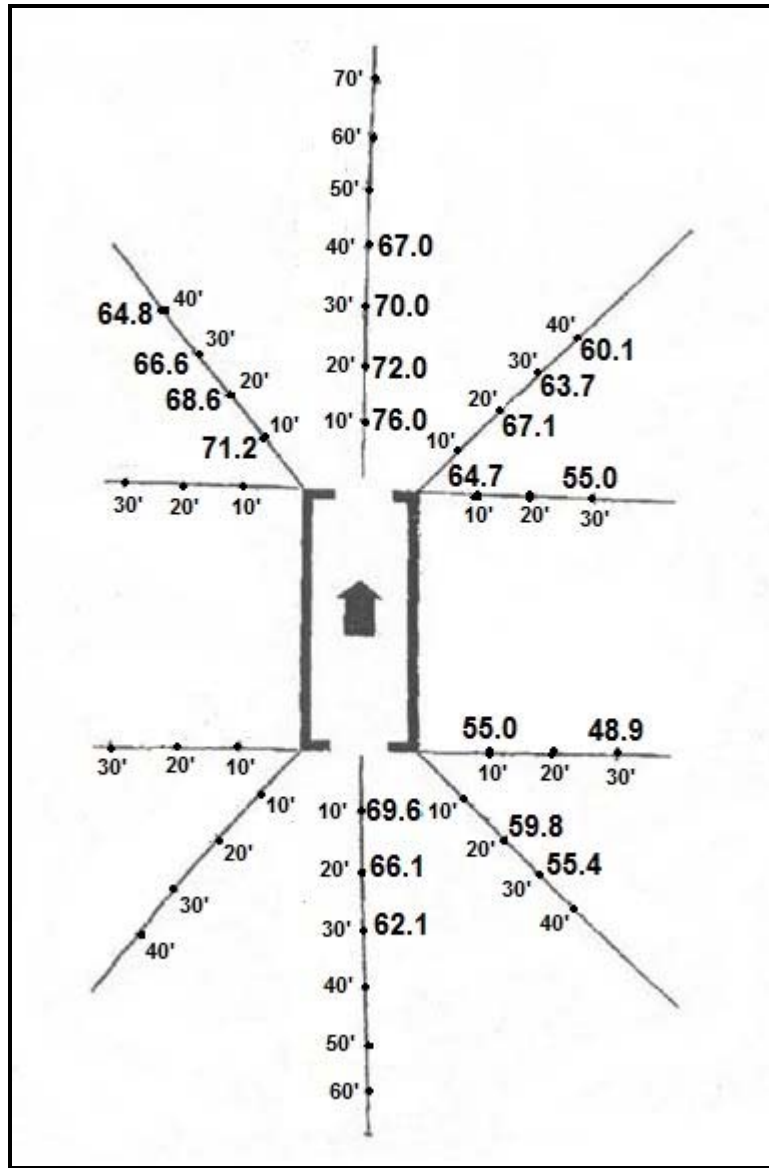


Figure 5. Calculated Aabated Car Wash Noise

Table 5. Car Wash Equipment Noise Unabated and Abated

LOCATION	dBA AT DISTANCE FROM DOOR OPENING				
	NR	10 Feet, 0°	10 Feet, 90°	30 Feet, 0°	30 Feet, 90°
ENTRANCE NOISE UNABATED	--	82.6	71.0	76.1	62.9
<i>With Entrance Door Closed</i>	-13 dB	69.6	55.0	62.1	48.9
<i>+ CONE MUFFLER + FULL COVER</i>	-5 dB	64.6	50.0	57.1	43.9
<i>Residential P/L Wall (6 ft)</i>	-5 dB	n/a	n/a	52.1	38.9
EXIT NOISE UNABATED	--	89.0	65.2	64.0	52.7
<i>With Exit Door Closed</i>	-13 dB	76.0	64.7	70.0	55.7
<i>+ CONE MUFFLER + FULL COVER</i>	-5 dB	71.0	59.7	65.0	50.7
<i>Residential P/L Wall (6 ft)</i>	-5 dB	n/a	n/a	60.0	45.7

9. Conclusion

Based on the noise reduction data provided by the car wash and tunnel door vendors, the project noise study finds that with the noise reduction features they offer, the car wash operation noise would be below the car wash noise standard specified in the LAMC. By choosing to utilize the polycarbonate tunnel doors as well as the other noise attenuation features, the Applicant will reduce car wash noise levels well below the City car wash code noise limits both during the day and at night.

The Applicant's proposed car wash will comply with the LAMC noise levels on the nearest residential properties. Locations farther away would experience further reductions in noise levels. In addition, actual ambient noise in the proposed car wash vicinity currently exceeds the proposed car wash operation noise without the noise reduction features proposed by the Applicant. When the noise attenuation features are added, as proposed, the car wash operation noise will be further below the existing ambient noise. However, the car wash noise would likely be audible, even when buried in the existing ambient noise. Thus, we certify that for the proposed car wash, with the noise reduction features, no significant noise impacts are predicted and no violations of the City noise standards would occur due to the Applicant's proposed car wash operation.

APPENDIX A

CHAPTER IX

ARTICLE 1

GENERAL PROVISIONS

SEC. 111.03. MINIMUM AMBIENT NOISE LEVEL.

(Amended by Ord. No. 156,363, Eff. 3/29/82.)

Where the ambient noise level is less than the presumed ambient noise level designated in this section, the presumed ambient noise level in this section shall be deemed to be the minimum ambient noise level for purposes of this chapter.

TABLE II
SOUND LEVEL "A" DECIBELS

(In this chart, daytime levels are to be used from 7:00 a.m. to 10:00 p.m. and nighttime levels from 10:00 p.m. to 7:00 a.m.)

ZONE	PRESUMED AMBIENT NOISE LEVEL (dB(A))	
	DAY	NIGHT
A1, A2, RA, RE, RS, RD, RW1, RW2, R1, R2, R3, R4, and R5	50	40
P, PB, CR, C1, C1.5, C2, C4, C5, and CM	60	55
M1, MR1, and MR2	60	55
M2 and M3	65	65

Los Angeles Municipal Code 12.22 A.28

28. **Automotive Use.** (Added by Ord. No. 178,382, Eff. 3/24/07.) In the C2 or less restrictive zones, a new automotive use, change of use or addition of floor area to an existing automotive use may be established without first obtaining an approval pursuant to Section 12.24 W.4. of this Code if the development standards set forth in Paragraph (a) and the operating conditions set forth in Paragraph (b) of this subdivision are met. Notwithstanding the above, new automobile dealership franchises, and their associated activities, are exempt from the requirements of this subdivision.

...

(b) **Operating Conditions.**

...

(13) Any automotive laundry or wash rack, in which power driven or steam cleaning machinery is used, shall maintain noise levels below the levels provided in Table II of Section 111.03 of this Code. The comparison between the noise emanating from the automotive laundry or wash rack and from Table II shall be made in the manner set forth in Section 111.02(a) of this Code.

...

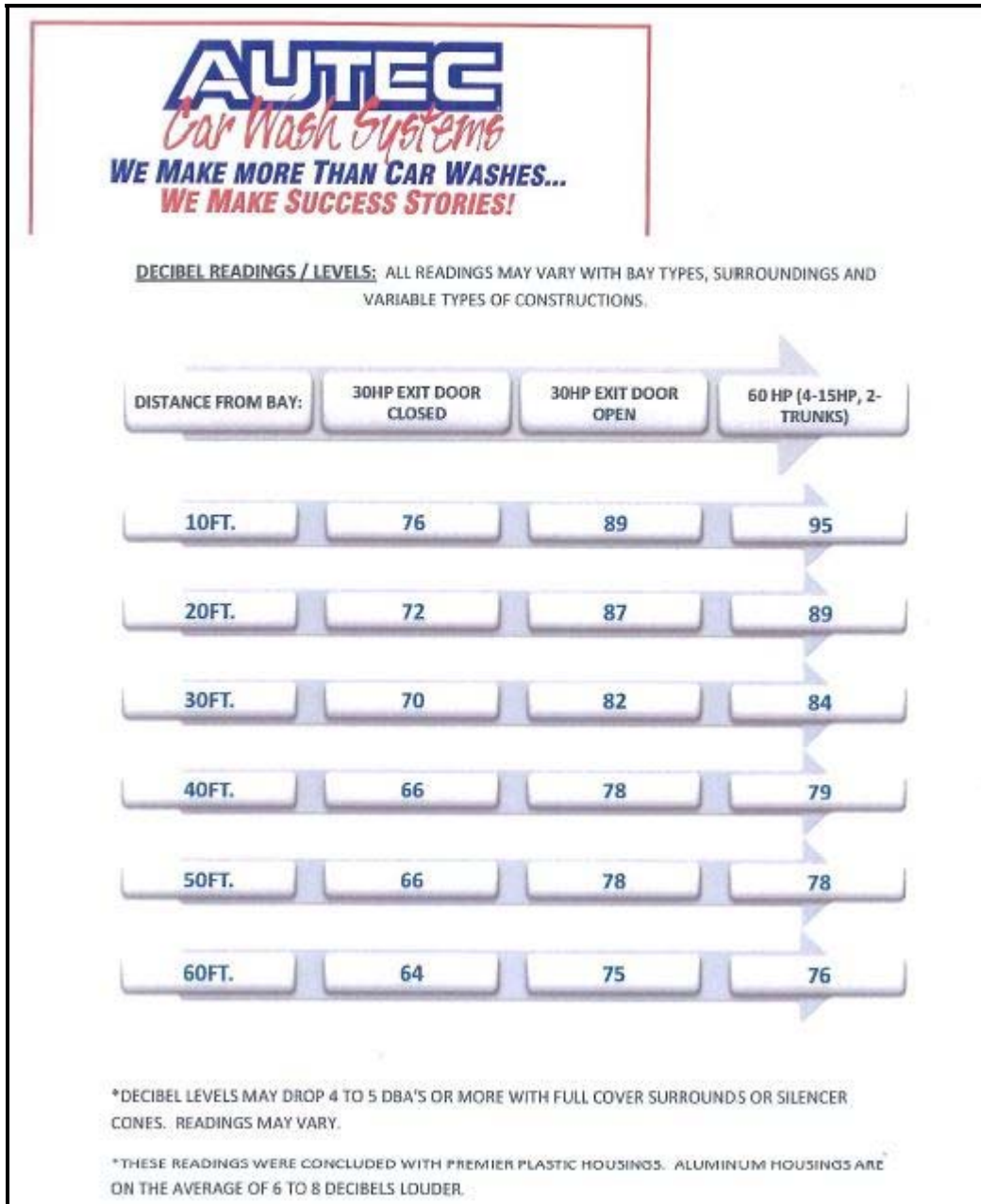
(18) **Covenant.** Prior to the issuance of a building permit or land use permit, the owner of the lot or lots shall execute and record a covenant and agreement in a

Planned Automatic Car Wash Noise Study

form satisfactory to the Director of Planning, acknowledging that the owner shall implement each of the conditions set forth in this paragraph, and shall not permit the establishment of any uses enumerated in Section 12.24 W.4. of this Code without first obtaining a conditional use approval. The covenant and agreement shall run with the land and be binding upon the owners, and any assignees, lessees, heirs, and successors of the owners. The City's right to enforce the covenant and agreement is in addition to any other remedy provided by law.

APPENDIX B

Vendor Document Showing Tunnel Door Noise Reduction Options



70