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TO: HONORABLE CITY COUNCIL

FROM: ED SHIKADA, CITY MANAGER

DATE: JUNE 22, 2020

SUBJECT: AGENDA ITEM 25 - 1700-1730 Embarcadero Road [20APL-00002 and 19PLN-00291]: Appeal of Director's Approval of a Major Architectural Review to Address the Following Outstanding Issues for a Previously Approved Auto Dealership Project: Color, Landscaping, Parapets, Lighting, Transportation Demand Management Plan, County Airport Land Use Commission Review; and Floor Area Ratio. Environmental Assessment: Addendum to an Initial Study/Mitigated Negative Declaration That was Adopted for the Project on June 24, 2019. Zoning District: CS(D)(AD)

Attached are two noise reports produced for the appellant and a response from Helix, the applicant's noise consultant. Staff is aware of a minor error in the noise report that was not identified when this project first went to Council. Meetings have been held with the neighboring property owner and the applicant to reach resolution. All parties understand that noise emanating from the carwash must comply with the City's noise ordinance.

To ensure conformance with the following PAMC Sections, staff will require an independent noise analysis be performed as part of the Building permit review process and after installation of all equipment. Staff will determined the "local ambient" as part of the noise report produced during the Building permit review process.

• PAMC 9.10.040 -- No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on commercial or industrial property, a noise level more than eight dB above the local ambient at any point outside of the property plane.

This analysis, while funded by the applicant, will be review by staff to meet our independent judgement and will verify compliance with the noise ordinance prior to final occupancy. While unexpected, if the carwash operation violates the noise ordinance – it will not be permitted to operate.

Staff believes there are sufficient safeguards in place through conditions of approval, mitigation measures and regulations set forth in the noise ordinance to ensure noise from the carwash complies with the code and that no further conditions or Council action is necessary.

DocuSigned by: TO

Jonathan Lait Director Planning & Development Services DocuSigned by:

Ed Shikada

Ed Shikada^{9CCC8D4F9...} City Manager HELIX Environmental Planning, Inc. 7578 El Cajon Boulevard La Mesa, CA 91942 619.462.1515 tel 619.462.0552 fax www.helixepi.com



June 18, 2020

Brian Stumph YSM Design 305 North Coast Highway, Suite L Laguna Beach, CA 92651

Subject:Response to Comments from Veneklasen Associates and Wilson IHRIG on the Palo Alto
Mercedes Benz and Audi Dealership Noise Assessment Report

Dear Mr. Stumph:

Per your request, HELIX Environmental Planning, Inc. (HELIX) reviewed the comments from Ryan Schofield from Veneklasen Associates and Pablo Daroux from Wilson IHRIG both dated June 10, 2020 on the Noise Assessment Study prepared by HELIX for the Palo Alto Mercedes Benz Project (project).

HELIX has provided responses to comments related to the technical analysis, which are grouped by topic. Comments related to the ambient noise level and significance threshold are assumed to be provided by the City of Palo Alto (City).

COMMENTS ON CAR WASH ANALYSIS

Pablo Daroux, Wilson IHRIG Comment IV. Car wash automated door (Section 3.2.3.1, page 9)

The report predicts the expected noise reduction to be derived from the introduction of automated doors at the entry end exit of the car wash. The report uses a popular computer prediction model called INSUL to predict the degree of reduction in noise assuming that the door material is a 22-gauge steel plate. However, there are issues with this prediction:

- a. The data shown on Table 3 for the isolation to be provided by the door is too conservative and incorrect as it does not reflect degradations that normally occur due to sound flanking arising from gaps between the door and its frame and between door panels where sound will pass through unimpeded.
- b. The terminology used is also incorrect, as the data provided by the modeling software is of the type Transmission Loss instead of Noise Reduction as labeled in the table.
- c. Some of the data shown is also of an unknown source, as INSUL does not provide information for the 32 Hz. nor the 8 KHz bands shown in the table.

d. The thickness of the 22 Gauge steel used for modeling is incorrectly given as 0.2998" as opposed to 0.02998". This seems to be a typo in the report, as our noise reduction predictions using the correct number for the thickness are similar to those in the report.

If the degradation due to noise flanking through the gaps is considered, then the expected benefit from this mitigation measure is diminished. We have calculated the expected degradation to be approximately 5 decibels with a ½ inch gap on the sides and top of the door, which can be considered typical for lightweight garage doors. This means that predicted noise levels will be at least 5 decibels higher due to just this compromise.¹

Comment VII. Impacts – Car Wash (Section 4.1.2.1, page 14)

In the determination of impacts, predictions are made by Helix at the ambient noise measurement locations. This is in contradiction to the Municipal Code requirements stated in Chapter 9.10.030.(a) that noise limits shall apply to any point outside the property plane. The locations chosen for predicting impacts are farther from the sources of noise than the closest property planes, hence predicted levels are lower than if they were to be evaluated by points closest to the sources and immediately outside the property planes.

Predictions should have been made at the closest points to the car wash outside the property planes. Hence the conclusion that ... The impact would be less than significant with mitigation incorporated... (sic) is questionable.

Further, these predictions do not take into account:

- a. Noise leaks at the perimeter of the door
- b. Noise leaks between door panels
- c. Noise leaks at any ventilation openings in the car wash tunnel. These will likely be necessary to reduce humidity concentration within the tunnel, particularly if doors are to remain closed during operation.

These leaks, if not properly accounted for and mitigated, will result in noise levels higher than those predicted in the report.

Our calculations indicate that the level of noise that could be expected at the property plane adjacent to the Gwin property at a point past the proposed 16 feet long wall and taking the degradation factors into account would be approximately 72 dBA.²

² This is significantly higher than the approximately 50 dBA predicted in the report and will result in a perceived level almost four times louder than what the Helix report predicted. Further, it will exceed allowable levels by over 15 decibels, which is quite significant.



¹ This calculation was done by computing the composite transmission loss resulting from that of the steel plate and that of the gaps at the two sides and the top, which was assumed to be ½". The door is approximately 10 feet wide by 10 feet tall, hence the surface is 100 sq. ft. The gap area is then 180 sq. inches (0.5in * 120in * 3 gaps).

Pages 9 and 10 of the report assume a door construction and page 14 Table 6 gives a loss of 29 decibels to the car wash exit roll-up garage door. This assumption and this calculation are not for a closed door, but for a steel sheet without moving parts or gaps to allow movement. This style of roll-up door moves by rolling tracks. The top of the door and the rolling tracks have gaps between the door surfaces and the building. These air leaks allow sound to pass through freely. Assuming typical gaps at roll-up garage doors account for 0.5% to 2% of the garage door area, the sound leaks around the sides and top of door would be 8 to 13 decibels louder than reported. Furthermore, the report does not specify sound isolation requirements for the car wash doors. This error alone changes the car wash dryers' noise from meeting Code to violating Code.

Comment 5.2 Car Wash Audio Alarms and Buzzers

The report fails to mention if the car wash has alarms or buzzers. Typical car washes may have buzzers to guide drivers through the car wash.

Audible alarms must be clearly louder than all other equipment to be even heard, including the dryers. Because this would be the loudest noise in the car wash, these types of signals would violate the Municipal Code, and therefore should not be used. The report should explicitly prohibit the use of audio alarms and buzzers in the car wash.

HELIX Response to Comments on Car Wash Analysis

The comments center on a single factor of purported leaks and low-quality door installation increasing the noise associated with the car wash. The cracks and gaps discussed would be typical for a residential garage door. However, these comments fail to recognize several major elements:

- The discussion is in reference to a high-speed high-quality industrial door with rubber seals and a continuous operating capability, not a common garage door. The proposed door is an industrial quality, high speed door. Construction materials and types for the door may vary and the specific type of material remains unknown. The intended carwash structure and door closure are commercial construction, designed to provide a high-quality look and operate on a continuous basis for years in a purpose-built building.
- Because the specifications for the door were and are unknown, planning and analysis focused on a minimum possible door made with 22-gauge steel. This material was assumed as a conservative case with the typical thinnest lightest weight steel that could be used in a door (most manufacturers use heavier weight often in multiple layers or even heavy rubber for durability).

The analysis assumes that noise comes through this lightweight sheet metal door. While it is true that very thin cracks and gaps would significantly change the noise control ability of a heavy purpose-built noise control rated door, sealing requirements and seal compression is vital for a high Sound Transmission Class (STC) rated door to achieve its rated noise control ability. However, the noise coming through a single 22-gauge sheet metal layer is already significant (as shown in the analysis). A high-speed industrial door uses a built-in heavy steel track with



substantial overlap to the guide edges. It is agreed that this type of construction would have some noise leakage at the edges and around a rubber flap bottom seal. However, these small noise leaks would have a minimal overall impact on the noise control ability when compared to the already high level of noise coming through the assumed 22-gauge sheet metal.

- 3. Typically, the alarms and lights are within the carwash bay, and operate when the doors are closed. These sources would not contribute substantially to the exterior noise impact calculations.
- 4. If desired, the City can condition the project as part of final approval to require verification of compliance with the noise ordinance by conducting exterior noise measurements prior to allowing full operation of the facility to the public.

COMMENTS ON BACK UP GENERATOR ANALYSIS

Pablo Daroux, Wilson IHRIG Comment V. Back Up Generators (Section 3.2.3.2, page 10)

Noise data used to make predictions is based on a generic device, as it was not known at the time of report preparation the specific units to be installed. This is also a potential source of error.

Comment IX. Impacts - Backup Generators (Section 4.1.2.2, page 15)

The data shown in Table 7 compares predictions of expected noise to be produced by the generators without mitigation and those resulting from the construction of a 9 feet tall sound barrier surrounding the generators. These predictions are very optimistic and unrealistic because they suffer from the following inaccuracies:

- a. <u>Prediction locations</u>: They are made at the arbitrary locations where noise was measured during the survey. As indicated above, these locations do not reflect the highest level of noise that could impact adjacent properties, as they are further than the nearest point outside the property plane as required by the Municipal Code, hence predicted levels are lower than they would be by as much as 4 decibels if the correct locations were used for the predictions presented.
- b. <u>Barrier benefit</u>: Mitigation benefits attributed to the sound barrier are excessive, ranging from a predicted reduction in noise of 14.7 decibels at location M2 and 15.2 decibels at locations M1 and M4. This is unrealistic for a barrier in front of a generator when the proposed height of the barrier is only 1.5 feet taller than the installed height of the generator because one of the main sources of noise of the proposed generators and their high performance noise enclosures is the air discharge louver, which is located on top of the generator enclosure. As the noise reduction benefit of a barrier is dictated by the height of the barrier top with respect to the line- of-sight interruption point at the barrier, the expected benefit with that distance being just slightly more than 1.5 feet would yield reductions in noise of between 5 and 10 decibels only. See the diagram on page 55 of the noise report, reproduced and annotated in Figure 4 below.
- c. <u>Barrier type</u>: The barrier type should be sound absorbent if significant mitigation of noise is to be derived from it, otherwise sound reflections within the enclosed area created by the barrier will



amplify the noise produced by the generator, significantly reducing the expected shielding benefit of the sound barrier. This amplification effect could be as high as 10 decibels for geometries such as those on this project.

The only specifications provided in the Helix report for the sound barrier recommended under this mitigation measure are a minimum height of 1.5 feet higher than the installed height and a Sound Transmission Class (STC) of 20. However, there are no requirements for the barrier material to provide sound absorption, hence the claimed benefit from this measured, as listed in Table 7, page 15 of the report will not be achieved due to the reasons described under item c above. In addition, the minimum height specified will significantly limit performance as discussed under item b above.

d. <u>Due to all the foregoing, the Helix report is underestimating the expected levels of generator</u> noise by at least 15 decibels and likely more, which, when combined with the incorrect determination of the threshold of significance will result in violations of the Municipal Code <u>limits.</u>

HELIX Response to Comments on Back Up Generator Analysis

The commenter is correct in that the generator type was unknown at the time of the analysis. However, comment is not correct with regard to the concept that different generators have wildly varying noise ratings. In reality, manufacturers target a noise level of about 75 dBA at 7 meters for generators larger than 50 kW and about 65 dBA at 7 meters for generators of 50 kW and smaller when equipped with a Class II noise control cabinet. This can be seen in a literature search of almost any manufacturers equipment where the levels are plus or minus 1 or 2 dB from this level.

The noise from a generator in a manufacturers Class II noise control cabinet is dominant out the sides and top metal panel locations of the generator. This noise comes out of a flat surface panel. Noise modeling for the generator was done as noise radiating surfaces on the sides and top. Further, a mockup noise model was setup as a noise source in an open environment and the modeled noise levels for the source planes adjusted so the source created within 1 dBA of the manufacturers data sheet to provide an accurate forecast model.

The flat radiating side planes of the real generator (not an idealized point source used by most when doing generator planning) makes it an ideal situation for noise barrier control as the barrier directly blocks much of the direct noise radiation and performs better than is typical for a noise wall with large roadway traffic noise.

While it is true that noise-absorbing paneling substantially improves the noise control abilities of a noise control wall around a generator. However, noise-absorbing paneling has both a cost and long-term maintenance element. If the paneling is not required for the design to comply with the property line noise control requirements and it is not provided as part of the planned design, it is not necessary to include it as part of project requirements.

As noted earlier, the City can condition the project as part of final approval to require verification of compliance with the noise ordinance by conducting exterior noise measurements prior to allowing full operation of the facility to the public.



COMMENTS ON SERVICE BAY ANALYSIS

Ryan Schofield, Veneklasen Associates, Inc. Comment 5.1 Service Bays

The report fails to address noise from automobile service areas. This includes noise from pneumatic tools, impact wrenches, hydraulic lifts and car stackers. While these areas are indoors, large bay doors will remain open, allowing noise to travel uninterrupted to outdoor areas.

The report should include descriptions of the dealership service areas, types of equipment used with measured noise levels, openings in the building at these areas and their relationship to the property plane. Resulting noise levels at the property plane should be calculated.

HELIX Response to Comments on Service Bay Analysis

Historically, repair facilities were designed with separate bays located along the back wall of the dealership with no client access or visibility. In these type of service environments there was typically a fairly high level of noise with mechanics taking apart engines and suspension systems for rebuilding. Pneumatic impact wrenches were used on air operated lifts, which created high levels of noise in the immediate area.

Modern high-end dealerships, like the proposed project, are typically built with completely different design. As seen in the site plan for the proposed dealership, which includes the entire service area indoors next to the showroom floor, the design is around a single large room with no real dividers for the service area. Access is through a double opening where the clients drive their cars into the first opening and are greeted by a service manager who sets up the paperwork and then drives the vehicle through the second set of doors and into the service area. The clients are not allowed in the service area for clear safety and insurance reasons but can get a clear view (and audible impacts) of the area through the large access doors.

In the service bay internal to the building just to the edge of the sales showroom floor, the lifts (when needed) are electrically driven with low noise level electric hydraulic units. The technicians are typically engaged using computer systems to diagnose the computer codes to find the needed repair requirements (not disassembling drive train components); which are far more likely to require removal and replacement of a sensor or fuel injector with occasional service of ancillary units such as alternators or similar. This will typically require the removal of access panels and covers with a battery-operated (not air) impact tool. Noise coming out of the main building through the large double opening service entry is minimal.

COMMENTS ON OFF-SITE ANALYSIS

Ryan Schofield, Veneklasen Associates, Inc. Comment 5.3 School Noise Exposure

There is a school (Bay Area Christian Church) located 380 feet from the project location. Noise analysis to this sensitive location was not mentioned in the noise study. The study provides analysis with the car



wash doors open; this condition would violate the Municipal Code at the school location assuming the local ambient is approximately similar at the school location.

The report should include analysis of the car wash dryers to the school property line, including establishing local ambient at the location on the school property line nearest the car wash dryers.

HELIX Response to Comments on Off-Site Noise Analysis

Noise reports typically do not analyze every location in a large area around the planning area of the site unless there is specific justification for the analysis.

For the proposed project, the site was determined to be in compliance with the noise ordinances at its property boundaries. At further distances from the site boundary, noise levels would be lower. All other land uses both adjacent and, like the school, at longer distances in the subject site area have the same noise control requirements and ambient conditions dominated by the nearby freeway. No specific mention or specific planning was appropriate for the analysis.

SUMMARY

The responses in this letter provide clarification on the noise analysis prepared by HELIX for the proposed project. These explanations do not alter the conclusions with regard to project impacts and no revisions to the report are necessary.

Regards,

Charles Terry Principal Specialist Noise, Acoustics & Vibration





June 10, 2020

Gwin Property Inc. 2479 E. Bayshore Road, Suite 135 Palo Alto, CA 94030

Attention: Jin Pi | CEO

Subject: Car Dealership; Palo Alto, California Acoustic Review Veneklasen Project No. 7644-001

Dear Jin:

Veneklasen has reviewed the Mercedes Benz/Audi Car Dealership project noise study report dated May 20, 2019 and other project information at your request. This letter summarizes our comments.

EXECUTIVE SUMMARY

The May 2019 noise study contains multiple errors that falsely predict the car wash dryers' noise to meet Palo Alto Municipal Code 9.10. Technical corrections to this report show that the project's car wash is calculated to be <u>more</u> than twice as loud as noise levels allowed by Code. Furthermore, the May 2019 noise study fails to address all major noise sources from the car dealership and does not evaluate noise exposure to a nearby school.

1.0 INTRODUCTION

This proposed project includes an expanded car dealership, car wash along the property line including 45-hp blower dryer fans, indoor parking area including car stacking systems, associated outdoor mechanical equipment, and automobile service areas.

The project's car wash is immediately adjacent an office complex's outdoor seating area, and near an office building with teleconference rooms' and private offices' glazing facing the car wash.

Veneklasen has focused only on the major elements of this project that concern Gwin Property.

2.0 PROJECT REQUIREMENTS

Palo Alto Municipal Code 9.10.020 gives the following definitions:

(c) "Noise level" means the maximum continuous sound level or repetitive peak sound level, produced by a source or group of sources as measured with a precision sound level meter. In order to measure a noise level, the controls of the precision sound level meter should be arranged to the setting appropriate to the type of noise being measured.

(d) "Local ambient" means the lowest sound level repeating itself during a six-minute period as measured with a precision sound level meter, using slow response and "A" weighting. The minimum sound level shall be determined with the noise source at issue silent, and in the same location as the measurement of the noise level of the source or sources at issue. However, for purposes of this chapter, in no case shall the local ambient be considered or determined to be less than: (1) Thirty dBA for interior noise in Section 9.10.030 (b); (2) Forty dBA in all other sections. If a significant portion of the local ambient is produced by one or more individual identifiable sources which would otherwise be operating continuously during the six-minute measurement period and contributing significantly to the ambient sound level, determination of the local ambient shall be accomplished with these separate identifiable noise sources silent.



(f) "Property plane" means a vertical plane including the property line which determines the property boundaries in space.

Veneklasen interprets "local ambient" to approximate the L_{90} when measured over an interval of one hour. L_{90} is the sound level exceeded 90% of the time (six minutes of an hour would be quieter than this sound level). L_{90} is generally considered to represent the background or ambient sound level of an environment.

The Code also states allowable noise levels at neighboring properties:

9.10.040 Commercial and industrial property noise limits.

No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on commercial or industrial property, a noise level more than eight dB above the local ambient at any point outside of the property plane.

3.0 PALO ALTO DETERMINATION OF LOCAL AMBIENT

Veneklasen understands that for this project, the City of Palo Alto may have determined "local ambient" by using noise contours of Figure N-5 of the 2030 General Plan's Noise Element (based on the email sent Friday, May 29, 2020). The sound levels given in Figure N-5 are daily average sound levels measured from a specific noise source (in this case US-101) at calculated distances. Simply translating these sound levels as "local ambient" is incorrect for the following reasons:

- Palo Alto's definition of "local ambient" is <u>not</u> the average and is significantly quieter than the average.
- The 24-hour average sound levels reported in Figure N-5 are CNEL. This metric penalizes nighttime hours by 10 decibels; this weights nighttime noise as twice as loud as daytime noise. As a result, normal traffic patterns typically have the loudest hour's average approximately equal to the CNEL value. In other words, CNEL value is approximately equal to the average of the loudest hour of the day.
- The noise contours simplify noise exposure without regard for shielding effects from terrain or buildings. These effects can easily account for sound levels being quieter by 15 decibels or more. For this case, shielding effects from overpasses and buildings including Stanford Health Care at 2452 Watson Ct, 2370 Watson Ct, and 2479 E Bayshore Rd affect the noise levels from US-101 at the project location.

In summary, the noise contours of Figure N-5 should *never* be interpreted as equal to "local ambient" as defined by the Palo Alto Municipal Code. For the case of this project, using this method would result in a local ambient *more than twice as loud* as measured data as presented in Section 4.3 of this report.

4.0 REVIEW OF INFORMATION PRESENTED

The May 2019 report (<u>https://www.cityofpaloalto.org/civicax/filebank/blobdload.aspx?t=57654.04&BlobID=72230</u>) contains multiple technical errors that change the predicted noise levels from violating Code to meeting Code.

4.1 Distance to Nearest Property Plane

Page 14 of the noise study gives predicted noise levels from the car wash dryers at the corners of the project site. The report does not give predicted noise levels at the nearest point from the car wash.

Using the data presented in the report and information provided about a proposed wall at the car wash exit, the nearest point on the neighboring property would be 17 feet away. With simple distance attenuation calculated using the correct distance, the difference between noise levels reported at approximately 62 feet away at the corner of the project site and 17 feet away at the nearest point on the neighboring property with the proposed wall is 11 decibels louder.

This error alone changes the car wash dryers' noise from meeting Code to violating Code.



4.2 Calculation of Dryer Noise through Closed Door

Pages 9 and 10 of the report assume a door construction and page 14 Table 6 gives a loss of 29 decibels to the car wash exit roll-up garage door. This assumption and this calculation are not for a closed door, but for a steel sheet without moving parts or gaps to allow movement. This style of roll-up door moves by rolling tracks. The top of the door and the rolling tracks have gaps between the door surfaces and the building. These air leaks allow sound to pass through freely. Assuming typical gaps at roll-up garage doors account for 0.5% to 2% of the garage door area, the sound leaks around the sides and top of door would be 8 to 13 decibels¹ louder than reported. Furthermore, the report does not specify sound isolation requirements for the car wash doors.

This error alone changes the car wash dryers' noise from meeting Code to violating Code.

4.3 Incorrect Determination of Local Ambient

The noise study defined local ambient per the Palo Alto Municipal Code but used data that was very different from this definition. An average sound level for a single 15-minute measurement was reported as ambient. This inflates the local ambient level significantly.

Veneklasen measured sound levels from 8 am to 5 pm Thursday June 4, 2020 to establish local ambient. Hourly local ambient levels ranged from 48 dBA at 11 am to 52 dBA during afternoon hours. This measurement data is given in the appendix, along with comparison to the May 2019 noise study data (average to average) showing that noise levels are similar, but the incorrect metric was reported. As stated in section 2 of this report, the L₉₀ should be used as local ambient, not the average sound level.

With the local ambient measured to be 48 dBA, the allowed noise limit at the property plane is 56 dBA. This correction reduces the Code limit 5 dBA quieter than the Code limit established in the May 2019 noise study.

5.0 REVIEW OF INFORMATION ABSENT

The following summarizes Veneklasen's review of major points not mentioned in the May 2019 noise study.

5.1 Service Bays

The report fails to address noise from automobile service areas. This includes noise from pneumatic tools, impact wrenches, hydraulic lifts and car stackers. While these areas are indoors, large bay doors will remain open, allowing noise to travel uninterrupted to outdoor areas.

The report should include descriptions of the dealership service areas, types of equipment used with measured noise levels, openings in the building at these areas and their relationship to the property plane. Resulting noise levels at the property plane should be calculated.

5.2 Car Wash Audio Alarms and Buzzers

The report fails to mention if the car wash has alarms or buzzers. Typical car washes may have buzzers to guide drivers through the car wash.

Audible alarms must be clearly louder than all other equipment to be even heard, including the dryers. Because this would be the loudest noise in the car wash, these types of signals would violate the Municipal Code, and therefore should not be used. The report should explicitly prohibit the use of audio alarms and buzzers in the car wash.

¹ Mehta, Johnson, Rocafort, Architectural Acoustics Principles and Design, (Prentice-Hall, 1999), p. 103.



Car Dealership; Palo Alto, California Acoustic Review; Veneklasen Project No. 7644-001 June 10, 2020; Page 4 of 6

5.3 School Noise Exposure

There is a school (Bay Area Christian Church) located 380 feet from the project location. Noise analysis to this sensitive location was not mentioned in the noise study. The study provides analysis with the car wash doors open; this condition would violate the Municipal Code at the school location assuming the local ambient is approximately similar at the school location.

The report should include analysis of the car wash dryers to the school property line, including establishing local ambient at the location on the school property line nearest the car wash dryers.

6.0 CONCLUSION

- The project's car wash dryers are calculated to violate the Palo Alto Municipal Code, as shown by information
 presented in the May 2019 noise study but applied with correct analysis. Multiple errors in the noise study
 individually account for a violation of Municipal Code; the sum of these errors is approximately four times louder
 than what was reported, and more than twice as loud as allowed by Municipal Code. Calculated noise levels from
 the car wash dryers range as high as 74 dBA at the nearest point on the neighboring property. As shown in
 Appendix B, this noise level is significantly louder than conversation level.
- 2. The noise study fails to address other major car dealership noise sources and analysis of car wash noise to a nearby school. These should be included in the noise study and reviewed by Palo Alto Planning as part of the approval process.

Please call with any questions.

Sincerely, Veneklasen Associates, Inc.

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Ryan Schofield Senior Associate



Appendix A – Sound Level Measurements of Local Ambient

The following sound levels in Table 1 were measured Thursday June 4, 2020. These were measured near location M1 as described in the May 20, 2019 noise study.

Table I – Local Amblent Measured		
Time	L ₉₀ (dBA)	
8:10 – 9:00 am	50	
9:00 am – 10:00 am	50	
10:00 am – 11:00 am	49	
11:00 am – 12:00 pm	48	
12:00 pm – 1:00 pm	49	
1:00 pm – 2:00 pm	51	
2:00 pm – 3:00 pm	52	
3:00 pm – 4:00 pm	52	
4:00 pm – 5:00 pm	52	

Table 1 shows that the hourly ambient sound levels are as low as 48 dBA during weekday daytime hours.

Measured average sound levels from Thursday June 4 is included in Table 2 in comparison with data published May 2019 measured by Helix (location M1) on Tuesday April 30, 2019.

Time	6/4/2020 L _{eq} (dBA)	4/30/2019 L _{eq} (dBA)
8:10 – 9:00 am	66	
9:00 am – 10:00 am	64	
10:00 am – 11:00 am	63	
11:00 am – 12:00 pm	56	
12:00 pm – 1:00 pm	52	
1:00 pm – 2:00 pm	54	53
2:00 pm – 3:00 pm	56	
3:00 pm – 4:00 pm	54	
4:00 pm – 5:00 pm	55	

Table 2 - Comparison of average sound levels to previously published data by others

Table 2 shows that the average sound levels measured Thursday June 4, 2020 are similar to or louder than the previously measured average sound levels on Tuesday April 30, 2019.



Appendix B – Sound Levels on the Decibel Scale

Future a last a sud		130	Aircraft Takeoff
Extremely Loud		120	Jackhammer
	2.0	110	Car horn
Very Loud		100	Subway
		90	Truck, Motorcycle
		80	Hair Dryer
Loud		70	Vacuum Cleaner
Moderate		60	Normal Conversation
		50	Dishwasher
	1.0	40	Rain
Quiet		30	Whisper
		20	Rustling Leaves
	2.0	10	A Pin Dropping

Decibel Comparison Chart

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CALIFORNIA WASHINGTON NEW YORK

10 June 2020

Gemma Lim, CPM Innopeak Technology Inc. Gwin Property Inc. 2479 E. Bayshore Road, Ste 135 Palo Alto, CA 94030 email: gemma.lim@innopeaktech.com

Subject: Peer review and general observations. Mercedes/Audi Dealership Car Wash Noise Report Dated May 2019 by Helix

Dear Ms. Lim:

I have reviewed the Noise Assessment Study report prepared by Helix Environmental Planning dated May 2019, primarily with regards to the two operational noise sources identified in the report which are likely to produce adverse impacts, namely the car wash and backup emergency generators.

Executive summary

The Noise Assessment Report is significantly deficient in at least the following key areas and should not be relied upon in the determination of potential adverse noise impacts to neighboring properties:

- The mitigation measures required *are not sufficient*. Our independent predictions based on the manufacturer's data for the various sources of noise included in the Helix report reveal that it underestimates the expected levels of noise by more than 22 decibels, which will be perceived as over four times louder and also greatly exceed the limits imposed by the Municipal Code, *even after mitigation*.
- I have also reviewed the assumptions made by the Planning Department in the determination of the maximum allowable noise level by the proposed operation and found it to be severely flawed. The 73 dBA noise limit proposed should not be used. A detailed analysis is given under item I below, which by actual measurement reveals that the correct threshold of significance should be 57 dBA.
- The determination of noise impact thresholds in the report is also flawed due to incorrect metrics used and by being extrapolated from very short duration measurements lasting only 15 minutes while the proposed hours of operation for the facility are in excess of 11 hours each day. Independent measurements conducted by us encompassing multiple days indicate lower levels of ambient noise than those used throughout the report
- Predictions of expected future noise due to the operation of the facility with mitigation in place are flawed due to the unrealistically high expected benefits to be provided by those measures. This will result in higher levels of noise during operation of the facility than those stated in the Helix report.

WILSON, IHRIG	Page 2 of 11	1700 Embarcadero Noise Study
Acoustics · Noise · Vibration		Peer review

Detailed review

My comments and observations in more detail are as follows:

Threshold of significance determined by City Planning I. I have reviewed the email dated May 29th, 2020 by Sheldon Ah Sing, where it is indicated that the Local Ambient was established as being 65 dBA "as modeled by the City's Comprehensive Plan for areas near Embarcadero Road (See Map N-5—Attached)". This is reproduced in Appendix A below.

This level determination is incorrect due to two key aspects:

- 1) It was derived based on a noise contour map created using a computer model that does not take into account the shielding of road noise that is provided by buildings, hence noise levels on sides of buildings opposite freeways and major roads —as it is the case here— will be significantly lower than those shown in the map
- 2) The noise metric used in the map (Community Noise Equivalent Level CNEL) is the average noise level over 24 hours, while that required by the Municipal Code is a minimum noise level, i.e. "...the lowest sound level repeating itself during a six-minute period..." (Chapter 9.10.020.(d)). Further, the CNEL metric penalizes noises occurring between 7 p.m. and 10 p.m. by 5 decibels and those occurring between 10 p.m. and 7 a.m. by 10 decibels, hence the resulting 24 hour average noise level is always significantly higher than the lowest repeating sound level used for the evaluation of the Local Ambient upon which the impact threshold for the proposed project is based (Local Ambient + 8 dB) as stated in the Municipal Code. For example, our independent measurements revealed that the lowest repeating noise level is 49 dBA but the CNEL at the same location is 59.

Therefore, using 65 dBA as the Local Ambient will result in a threshold of significance of 73 dBA, which is significantly higher than the 57 dBA arrived at by actual measurement that follows the requirements of the Municipal Code. The use of a 73 dBA threshold of significance would allow for significant noise impacts to the nearby Gwin Property office building and other neighboring land uses.

II. Ambient noise measurements (Section 2.3.1, page 6)

Even though the proposed hours of operation are 7:30 a.m. to 7:00 p.m. M-F, 8:00 a.m. to 7 p.m. on Saturdays and 10 a.m. to 6 p.m. on Sundays (Section 3.2.3, page 9) environmental noise was measured for only 15 minutes at each of the four locations assessed. As noise levels vary significantly throughout the proposed hours of operation, and the City of Palo Alto Municipal Code, Chapter 9.10 Noise relies on the prevailing level of ambient noise in the establishment of a limit for offending noises, this approach is insufficient.

III. Local Ambient Noise Level (Section 3.2.2, page 9)

As the measurement time was very short at 15 minutes only, an extrapolation is made in the Helix report based on distributions of hourly traffic volume throughout the day to arrive at the expected level of ambient noise during the proposed hours of operation, which, with the exception of Sundays, will be at least 11 hours each day. In addition, the metric used for this extrapolation is not the "lowest repeating noise level" called for by the Municipal Code but an average level, which is, by definition, higher. This is also incorrect.

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IV. Car wash automated door (Section 3.2.3.1, page 9)

The report predicts the expected noise reduction to be derived from the introduction of automated doors at the entry end exit of the car wash. The report uses a popular computer prediction model called INSUL to predict the degree of reduction in noise assuming that the door material is a 22-gauge steel plate. However, there are issues with this prediction:

- a. The data shown on Table 3 for the isolation to be provided by the door is too conservative and incorrect as it does not reflect degradations that normally occur due to sound flanking arising from gaps between the door and its frame and between door panels where sound will pass through unimpeded.
- b. The terminology used is also incorrect, as the data provided by the modeling software is of the type *Transmission Loss* instead of *Noise Reduction* as labeled in the table.
- c. Some of the data shown is also of an unknown source, as INSUL does not provide information for the 32 Hz. nor the 8 KHz bands shown in the table.
- d. The thickness of the 22 Gauge steel used for modeling is incorrectly given as 0.2998" as opposed to 0.02998". This seems to be a typo in the report, as our noise reduction predictions using the correct number for the thickness are similar to those in the report.

If the degradation due to noise flanking through the gaps is considered, then the expected benefit from this mitigation measure is diminished. We have calculated the expected degradation to be approximately 5 decibels with a ½ inch gap on the sides and top of the door, which can be considered typical for lightweight garage doors. This means that predicted noise levels will be at least 5 decibels higher due to just this compromise.¹

V. Back Up Generators (Section 3.2.3.2, page 10)

Noise data used to make predictions is based on a generic device, as it was not known at the time of report preparation the specific units to be installed. This is also a potential source of error.

VI. Determination of threshold of significance (Section 3.3, page 12)

The threshold of significance chosen, which is based on the existing local ambient +8 decibels was determined to be 60.9 dBA and 64.4 dBA in the report by locations M1 and M4 respectively. However, the ambient upon which these thresholds are based was arrived at by means of a very short duration survey time of 15 minutes and using the average noise level instead of the lowest level called for by the Municipal Code.

We conducted independent, continuous, second-by-second measurements between Wednesday, 3 June and Monday, 8 June by means of a precision, calibrated, logging sound meter system deployed at the property line at a location closest to the exit of the proposed car wash. See the photo in Figure 2 of the sound meter device deployed on-site. This device provided data that allowed to determine the Local Ambient per the Municipal Code to be 49 dBA. See the graph in Figure 3 which illustrates the second-by-second noise level observed near the property plane close to the area where the proposed car wash exit is to be located.

¹ This calculation was done by computing the *composite* transmission loss resulting from that of the steel plate and that of the gaps at the two sides and the top, which was assumed to be $\frac{1}{2}$ ". The door is approximately 10 feet wide by 10 feet tall, hence the surface is 100 sq. ft. The gap area is then 180 sq. inches (0.5in * 120in * 3 gaps)

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VII. Impacts – Car Wash (Section 4.1.2.1, page 14)

In the determination of impacts, predictions are made by Helix *at the ambient noise measurement locations*. This is in contradiction to the Municipal Code requirements stated in Chapter 9.10.030.(a) that noise limits shall apply to any point *outside the property plane*. The locations chosen for predicting impacts are farther from the sources of noise than the closest property planes, hence predicted levels are lower than if they were to be evaluated by points closest to the sources and immediately outside the property planes.

Predictions should have been made at the closest points to the car wash outside the property planes.

Hence the conclusion that ... *The impact would be less than significant with mitigation incorporated*... (sic) is questionable.

Further, these predictions do not take into account:

- a. Noise leaks at the perimeter of the door
- b. Noise leaks between door panels
- c. Noise leaks at any ventilation openings in the car wash tunnel. These will likely be necessary to reduce humidity concentration within the tunnel, particularly if doors are to remain closed during operation.

These leaks, if not properly accounted for and mitigated, will result in noise levels higher than those predicted in the report.

Our calculations indicate that the level of noise that could be expected at the property plane adjacent to the Gwin property at a point past the proposed 16 feet long wall and taking the degradation factors into account would be approximately 72 dBA.²

This is significantly higher than the approximately 50 dBA predicted in the report and will result in a perceived level almost four times louder than what the Helix report predicted. Further, it will exceed allowable levels by over 15 decibels, which is quite significant.

VIII. Impacts – Car Wash - Mitigation Measure MM-1 (Section 4.1.2.1, page 14)

This mitigation measure relies on incorrectly derived ambient noise levels, predictions at points farther than those required by the Municipal Code and on incomplete mitigation requirements, as noise leaks are not accounted for (see item VII above)

IX. Impacts – Backup Generators (Section 4.1.2.2, page 15)

The data shown in Table 7 compares predictions of expected noise to be produced by the generators without mitigation and those resulting from the construction of a 9 feet tall sound barrier surrounding the generators. These predictions are very optimistic and unrealistic because they suffer from the following inaccuracies:

a. <u>Prediction locations:</u> They are made at the arbitrary locations where noise was measured during the survey. As indicated above, these locations do not reflect the highest level of noise that could impact adjacent properties, as they are further than the nearest point outside the property plane as required by the Municipal Code, hence

² Predictions were made by Helix at location M1, which is approximately 52 feet from the car wash door, however the closest point on the property plane is at the end of the proposed 16ft long concrete wall. Our predictions are based on the manufacturer-supplied data at 10 feet of the blowers of 91.5 dBA, and then extrapolating to 16 feet while taking into account leaks at the perimeter of the door

predicted levels are lower than they would be by as much as 4 decibels if the correct locations were used for the predictions presented³.

- b. <u>Barrier benefit:</u> Mitigation benefits attributed to the sound barrier are excessive, ranging from a predicted reduction in noise of 14.7 decibels at location M2 and 15.2 decibels at locations M1 and M4. This is unrealistic for a barrier in front of a generator when the proposed height of the barrier is only 1.5 feet taller than the installed height of the generator because one of the main sources of noise of the proposed generators and their high performance noise enclosures is the air discharge louver, which is located on top of the generator enclosure. As the noise reduction benefit of a barrier is dictated by the height of the barrier top with respect to the line-of-sight interruption point at the barrier, the expected benefit with that distance being just slightly more than 1.5 feet would yield reductions in noise of between 5 and 10 decibels only. See the diagram on page 55 of the noise report, reproduced and annotated in Figure 4 below.
- c. <u>Barrier type:</u> The barrier type should be *sound absorbent* if significant mitigation of noise is to be derived from it, otherwise sound reflections within the enclosed area created by the barrier will amplify the noise produced by the generator, significantly reducing the expected shielding benefit of the sound barrier. This amplification effect could be as high as 10 decibels for geometries such as those on this project. The only specifications provided in the Helix report for the sound barrier recommended under this mitigation measure are a minimum height of 1.5 feet higher than the installed height and a Sound Transmission Class (STC) of 20. However, there are no requirements for the barrier material to provide *sound absorption*, hence the claimed benefit from this measured, as listed in Table 7, page 15 of the report will not be achieved due to the reasons described under item c above. In addition, the minimum height specified will significantly limit performance as discussed under item b above.
- d. Due to all the foregoing, the Helix report is underestimating the expected levels of generator noise by at least 15 decibels and likely more⁴, which, when combined with the incorrect determination of the threshold of significance will result in violations of the Municipal Code limits.

X. Combined Operational Noise Levels (Section 4.1.2.3, page 16)

Due to the many shortcomings of the analysis indicated above, namely:

- the incorrect evaluation of the level of ambient noise, and hence the derivation of the threshold of maximum allowable noise level,
- the unrealistically high expected benefit resulting from the mitigation measures recommended and
- the farther distances used for the evaluation of noise

then the conclusion stated on the right column of Table 9 that the threshold will not be exceeded with all equipment running simultaneously and that noise levels would not result in

³ Calculations indicate underpredictions of 3.3 decibels for the generator on the east and 4.6 decibels for the one on the west.

⁴ At least 3 decibels due to incorrect prediction locations —item (a) above—, plus 5 to 10 decibels due to the unrealistic expected benefit of 15 decibels claimed —item (b.)— plus at least 5 to 10 decibels lower performance due to reflections within the enclosed area —item (c)—

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the generation of a substantial permanent increase in ambient noise, resulting in a less than significant impact will result is not correct.

CONCLUSION

Based on the results from the calculations made and those of the noise survey conducted on-site, it is our opinion that operation of the car wash and of the emergency generators will result in exceedances of the allowable exterior limits established by the City of Palo Alto (City) noise ordinance and significant permanent increases in noise in surrounding areas.

Please do not hesitate to contact me if you have any questions.

Very truly yours

WILSONJHRIG

Ila

Pablo A. Daroux, MS (Acoustics) Principal

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Figure 1: Car wash exit door and 16 feet tall by 18 feet long CMU block wall

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Figure 2: Noise meter near the proposed car wash exit door



Figure 3: Second-by-second noise levels observed for a six-minute period on Thursday, 4 June from 11:22 to 11:28 a.m. by the property line. Lowest sound level repeating itself which represents the Local Ambient as per the Municipal Code is approximately 49 dBA.

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Weather and Sound Enclosure



Figure 4: Weather and sound enclosure proposed for the generators. Notice the main source of noise being the air discharge is located on top of the enclosure (red circle)

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Appendix A Email from City Planning re. Local Ambient

From: Sheldon Ah Sing <<u>SAhsing@m-group.us</u>>
Sent: Friday, May 29, 2020 2:46 PM
To: Gemma Lim <<u>gemma.lim@innopeaktech.com</u>>; Jin Pi <<u>jinpi@yahoo.com</u>>; Lyle Hutson
<<u>lhutson@ysmdesign.com</u>>; Brian Stumph <<u>bstumph@ysmdesign.com</u>>; Cc: jodie.gerhardt@cityofpaloalto.org
Subject: 1730/1700 Embarcadero Appeal 5.29.2020 Meeting Summary

Thank you for participating in the call earlier today. It gave all of us perspective and a better understanding of the issues and we have a path forward. The summary from the meeting is that:

1. The appellant disagrees with some of the information in the Helix study (Applicant Noise Study).

- 2. The appellant will provide another noise study based on the proposed plans by applicant.
 - Use the project plans on the City's website:
 - https://www.cityofpaloalto.org/news/displaynews.asp?NewsID=4367
 - In particular the following are relevant to show the car wash (2-5-2020 Part 1, page 28 (ZA200)) and (2-5-2020 Part 2, page 2 (ZA225))
 - The appellant will coordinate through the City for information from the applicant
- 3. The appellant will provide the City and in turn the City will provide the applicant the noise study in advance of the June 22 City Council meeting by June 10 or at the very latest to include last minute edits to staff report would be June 18.
- 4. The City will inquire whether we can request a continuance in the event the noise study is not completed in time.

Some assumptions to be used in the noise study are the following from the City's noise ordinance:

9.10.040 Commercial and industrial property noise limits.

No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on commercial or industrial property, a noise level more than eight dB above the local ambient at any point outside of the property plane.

(d) "Local ambient" means the lowest sound level repeating itself during a six-minute period as measured with a precision sound level meter, using slow response and "A" weighting. The minimum sound level shall be determined with the noise source at issue silent, and in the same location as the measurement of the noise level of the source or sources at issue. However, for purposes of this chapter, in no case shall the local ambient be considered or determined to be less than: (1) Thirty dBA for interior noise in Section <u>9.10.030(b)</u>; (2) Forty dBA in all other sections. If a significant portion of the local ambient is produced by one or more individual identifiable sources which would otherwise be operating continuously during the six-minute measurement period and contributing significantly to the ambient sound level, determination of the local ambient shall be accomplished with these separate identifiable noise sources silent.

• We established the local ambient as 65 dBA as modeled in the City's Comprehensive Plan for areas near Embarcadero Road (See Map N-5—Attached).

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