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Date: October 23, 2017
Subject: Andoil Bascom Car Wash - Peer Review Response
MWA Project – 15059B

Mei Wu Acoustics is providing acoustical consulting services for the proposed development of the Andoil Bascom Carwash located at 3702 S Bascom Ave, San Jose, CA.

MWA completed an environmental noise study for the Andoil Bascom Car wash dated December 20, 2016. A peer review of that study has been completed by Illingworth & Rodkin (I&R) dated October 11, 2017. This document is a response to that peer review, intended to address the specific comments provided by I&R.

Carwash Source Noise Levels

The I&R peer review correctly points out that the noise levels used in the original study are based on the noise levels of carwashes observed in previous projects. I&R has also conducted carwash noise studies, and provide a range of noise levels at 20 feet from the exit of 79.4 dBA to 87.0 dBA. The carwash noise levels referenced in the original study are for the RYKO 3-Fan Slimline Dryer; which has a level of 84.2 dBA measured 20 feet from the exit (see Figure 1).

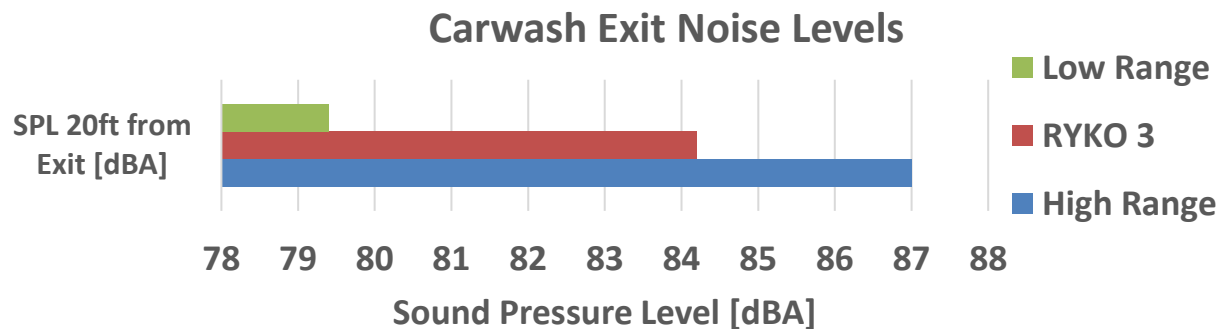


Figure 1: Range of Carwash Exit Noise Levels Relative to the RYKO 3 (Range provided by I&R)

The noise level of the RYKO 3-Fan Slimline Dryer is in the upper half of the range suggested by I&R. The RYKO 3 noise level may be considered an upper ceiling that the actual selected dryer must not exceed.

The selected dryer will be accompanied by manufacturer published noise data that does not exceed the RYKO 3 sound levels. This may be verified via review of the manufacturer submitted noise data by a qualified acoustical consultant.

Existing Ambient Noise Exposure

The I&R peer review estimates that the General Plan noise contour is 65 dBA DNL at the property line, rather than the value of 70 dBA DNL estimated in the initial study. We accept this as a more conservative estimate of the existing ambient noise levels.

Carwash Noise Levels at Property Line and Adjacent Residences

The I&R review concluded that the noise barriers provided in the initial study do not effectively shield the property line towards Residence 3 or the second level of Residence 1. The I&R calculations (shown in the peer review as Table 1) are based on an ambient noise level estimate of 65 dBA DNL.

The carwash noise level of 69 dBA at the property line assumes that the carwash dryers are blowing constantly during a wash cycle, and that there are continuous sequential washes with no downtime between cars. This is an overly conservative estimate of the carwash noise level as the dryers do not blow during the entire wash cycle but only at the end of each cycle during drying. Carwash operational noise levels are significantly lower when the dryers are not running.

From stopwatch measurements conducted by the client on 10/22/17 of an existing Belanger carwash system located at 4995 Mowry Ave in Fremont, the drying cycle lasts approximately 80 seconds, whereas the entire wash cycle takes approximately 253 seconds. This means the dryers are only operational roughly 32% of the time that there are active wash cycles.

To ensure a worst-case analysis, we assume there will be continuous sequential washes with no downtime between cars for all hours of operation. We conservatively assume that operational noise levels are 10 dBA lower when not drying.

Furthermore, the hours of operation for this carwash have been limited to 7AM-9PM. Previous analyses assumed the carwash would be operational from 7AM-10PM. This reduction of one hour of operating time will result in a reduction in the DNL (24-hour average noise level) at the property line.

We have recalculated the expected DNL levels and increases at the property lines using the suggested ambient noise level of 65 dBA, and suggested noise levels of potentially unshielded locations adjusted to account the reduction in operation hours and drying time. The results of these calculations are provided below as Table 2.

Receiver	DNL without Carwash operation	DNL of Carwash Only	DNL at Property Line with Carwash	DNL Property Line Increase
Residence 1	65	55.5	65.5	0.5
Residence 2	65	45.7	65.1	0.1
Residence 3	65	62.5	67.0	2.0

Table 2: Projected DNL noise levels and increases due to Carwash operation

The exit barrier wall effectively shields the majority of the property line and façade of Residence 3. Where exposed, the DNL increase at the property line is at most 2.0 dBA DNL. The new development does not result in an increase in the DNL by more than 3 dBA DNL and is compliant with the Goals of the San Jose General Plan.

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This concludes our response to the peer review study that was performed by I&R dated October 11, 2017 regarding the noise study performed by MWA dated December 20, 2016 for the Bascom Ave Carwash. Please contact Mei Wu Acoustics with any questions regarding this document.



Mei Wu Acoustics

Experts in acoustics, noise and vibration

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Education

- Doctor of Philosophy – Mechanical Engineering (Noise Control), Auburn University
- Master of Science – Physics (Acoustics and Noise Control), Tongji University, China
- Undergraduate Study – Physics (Acoustics), Nanjing University, China

Professional Societies

- Fellow of the Acoustical Society of America
- Member of the National Council of Acoustical Consultants
- Board Certified Member of the Institute of Noise Control Engineering (INCE) of the USA
- Former Chairperson of the Building Noise Control Committee of INCE

Consulting Experience

- Acoustics, noise and vibration control for hospitals and research facilities
- Acoustics, noise and vibration control for office buildings, hotels, conference centers, and residential buildings
- Acoustics, noise and vibration control for auditoriums and recording studios
- Noise control for microelectronics manufacturing cleanrooms
- Industrial noise and vibration control
- Environmental noise and vibration control
- Problem solving in existing buildings
- Sound and vibration monitoring

Research and Development Experience

- Specialty silencer development
- Sound intensity measurement
- Active noise cancellation
- Structure dynamics testing
- Finite element and boundary element modeling

Publications

Mei Wu has published over 40 technical articles in professional journals. The articles cover the fields of noise control in cleanrooms and high-rise residential buildings, wireless sound and vibration monitoring, floor vibration, etc. A list of publication can be found on our website.



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William Rosentel

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Education

- Bachelor of Science in Mechanical Engineering
The University of Texas at Austin
Mechanical Engineer-In-Training - EIT #53474

Representative Skills

- Engineering Acoustics – Sound Isolation, Room Acoustics, Vibration Isolation
- Mechanical Design & Component Selection
- MATLAB Programming
- LabVIEW Programming & Data Acquisition
- Computer-Aided Drafting & Design (SolidWorks)

Representative Projects (* indicates projects before MWA)

- **Corporate Office / Commercial / Industrial**
 - Design and fabrication of vibration tolerant electro-mechanical systems. *
 - HVAC noise and vibration mitigation
 - Sound Isolation between sensitive spaces to enhance speech privacy
 - Room acoustics design for reverberation time and flutter echo
- **Laboratory and R&D**
 - Floor vibration mitigation for structural design of laboratory building
 - Experiment design and development of operating procedures for material science research.
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- **Residential**
 - Environmental noise impact analysis
 - Design of noise mitigation measures including sound walls, façade design, and sound absorption techniques