IP DESIGN GROUP
CONSULTING + DESIGN

Sound Study Results

Rocket Car Wash – Grimes, IA
April 2022

Summary

The proposed project consists of the construction of a Rocket Car Wash located at 200 NE Destination Drive in Grimes, Iowa. The City of Grimes requested a sound study be conducted to ensure noise levels do not significantly impact surrounding properties.

IP Design Group conducted noise level measurements at an existing Rocket Car Wash in Elkhorn, NE on April 27, 2022. The results from these measurements are included in this report and will be used to estimate noise levels of the proposed car wash.

Background

Noise is often described as unwanted sound and sound is defined as any pressure variation in air that is detected by the human ear. Sound pressure level is measured in decibels (dB) which is the log squared ratio of the pressure disturbance to a reference disturbance multiplied by ten. Table 1 shows common noise levels associated with various sources.

Table 1 – Typical Sound Levels

Sound Pressure Level (dB)	Common Indoor and Outdoor Noises
130	Threshold of pain
120	Near a jet aircraft at takeoff
110	Riveting machine
100	Construction Site
90	Boiler Room
80	Shouting at 3ft
70	Vacuum cleaner
60	Conversational speech at 3ft
50	Quiet urban area during daytime
40	Quiet urban area at night
30	Quiet suburban area at night
20	Quiet countryside
10	Human breathing
0	Threshold of audibility

Measurement Procedure

Sound level measurements were taken at 7 locations in and around the Rocket Car Wash, including directly next to the dryers, 50' away and at three separate property line locations. See Figure 1 for measurement locations. Two measurements were taken at each location and then averaged. The city of Grimes indicated concern with the noise level of the dryers so measurements were taken while the dryers were in use. Photos of the dryers are shown in Figure 2 below. The dryers operate only when a vehicle is going through the car wash and the drying time is about 35 seconds. Ambient noise level measurements were also taken at two locations while the dryers were not in use.

Figure 1 – Measurement Locations

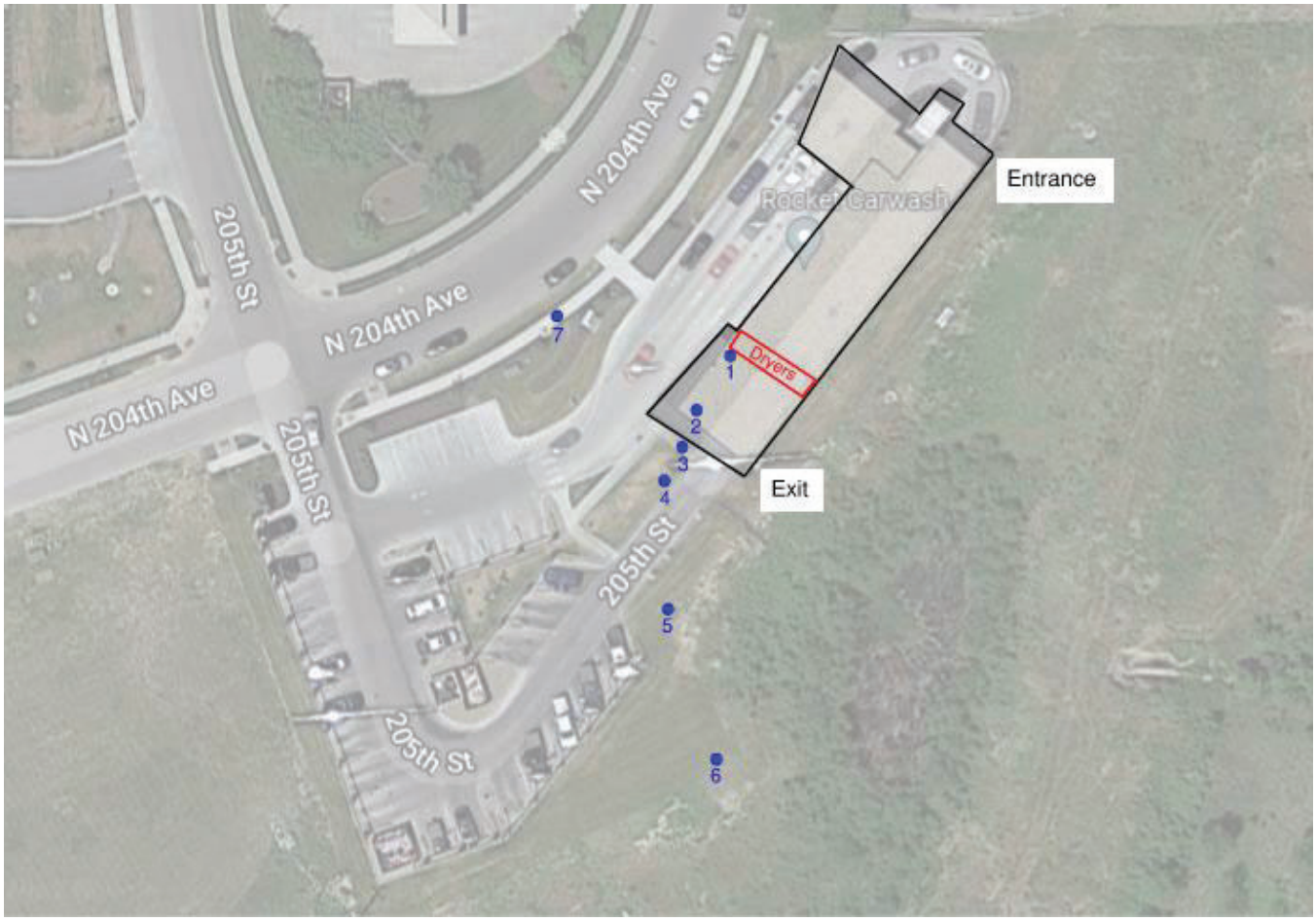

Figure 2 – Car Wash Dryers

Measurement Results

Measurements were taken at 2:15pm on a Wednesday afternoon. The weather was cloudy with an air temperature of 78° and 14 MPH winds. A number of vehicles were observed going through the car wash at this time. The type of vehicle did not have any impact on level of sound or spectra of the sound coming from the dryers. Sound level measurement results are reported in Table 2 below. Table 3 shows ambient noise level measurements with dryers off versus sound level measurements with dryers on.

Table 2 – Sound Level Measurements

Measurement Location	LAeq
(1) At dryers inside carwash	**104 dBA**
(2) Near exit inside carwash (32’ from dryers)	**102 dBA**
(3) Directly outside carwash (5’ from carwash exit)	**94 dBA**
(4) 50’ from dryers outside carwash	**90 dBA**
(5) At property line (48’ from carwash exit)	**81 dBA**
(6) At property line (115’ from carwash exit)	**73 dBA**
(7) At property line (77’ from carwash exit)	**67 dBA**

Table 3 – Sound Level Measurements with Dryers Off vs Dryers On

Measurement Location	LAeq (Dryers Off)	LAeq (Dryers On)
(3) Directly outside carwash (5’ from carwash exit)	**73 dBA**	**94 dBA**
(6) At property line (115’ from carwash exit)	**68 dBA**	**73 dBA**

Conclusion

Noise levels generated by an existing Rocket Car Wash were measured in order to estimate noise levels at a proposed location in Grimes, IA. Please reach out if you have any questions or concerns regarding the results in this report.

JME