

Acoustic Associates, Ltd.



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DRAFT – FOR DISCUSSION ONLY

Wind Creek Casino, Homewood, Illinois - Sound Study

Prepared for:
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c/o Wind Creek IL, LLC

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A second garage is proposed for the Wind Creek Casino planned for west of Halsted and north of 175th Street in Homewood, Illinois. This is a 4-floor parking facility with 3 levels above grade. Acoustic Associates was retained to conduct a noise study to examine the need for acoustical treatment.

Ambient Noise Testing

The extent to which noise from the garage would be audible depends on the level of ambient noise at the site. To assess this, we set up a professional-grade audio recorder on Wednesday, March 9th, at the location shown in **Figure 1**. The recorder was programmed to create a CD-quality recording and a calibration tone that would allow an accurate acoustical analysis. The recording ran nominally from 1:00-2:00 PM. During the recording, the temperature was 42°F with 10 mph winds from WNW.

A lab analysis was performed on the recording that tabulated sound levels at 1-second intervals. The calculated 1-hour time-average sound level from the 3600 samples was **54 dBA**.

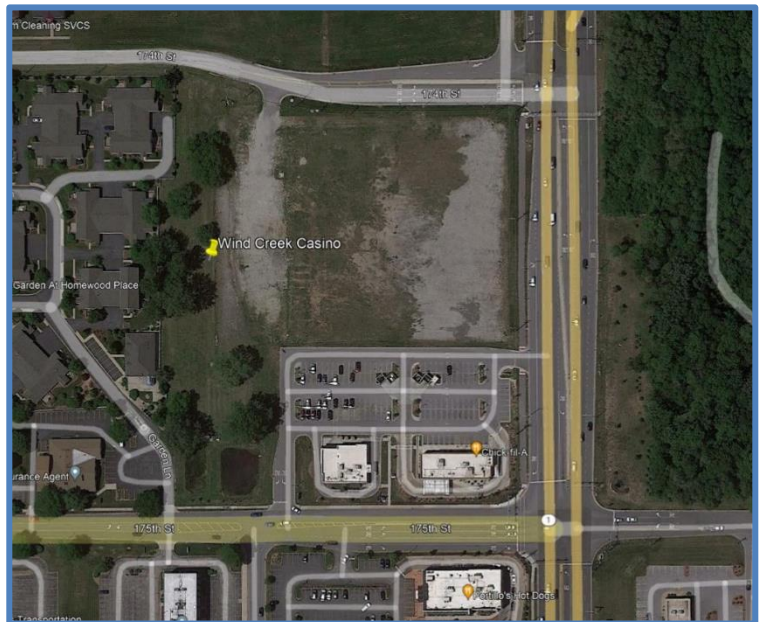


Figure 1 - Aerial view of the audio recording equipment location used to obtain a noise sample at the site.

Since traffic noise varies throughout the day, we obtained hourly traffic volume data from IDOT's Traffic Count Database System (TCDS). Based on 2019 counts for two locations in the area, we extrapolated our 1 PM hour noise measurement to other hours of the day. This analysis, shown in **Figure 2**, reveals that the sound level is steady at 54 dB from 6:00 AM through the 8 PM hour (i.e., 8-9 PM). After 9:00 PM, the sound level drops until reaching a minimum of 43 dB at 1-3 AM and then rises steadily reaching the normal daytime hours by 6 AM.

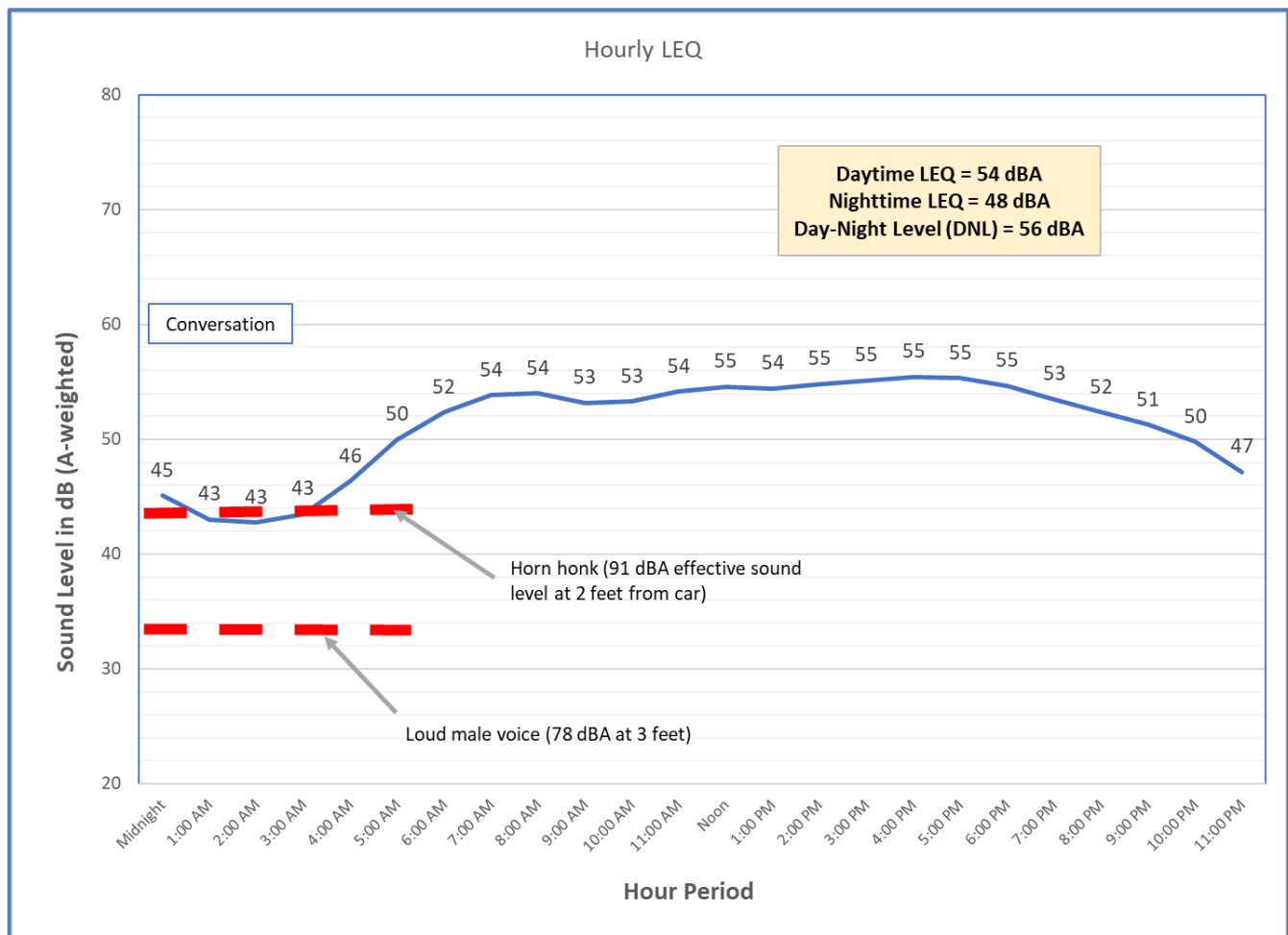


Figure 2 – Hourly LEQ sound levels at the site.

The EPA has adopted a time-averaging metric called the equivalent sound level or LEQ. For the “daytime” hours of 7:00 AM to 10:00 PM, the LEQ at the site was 54 dB. For the “nighttime” hours of 10:00 PM to 7:00 AM, the LEQ was 48 dB. To express the noise as a single number for a full 24-hour period, the EPA has adopted the Day-Night Level (DNL) metric. The DNL is a 24-hour LEQ but with the nighttime LEQ penalized by 10 dB. The basis of this penalty is that people are more sensitive to noise during the night. **The DNL at this site is 66 dB.**

Sound Sources and Mitigation

Source of noise coming from the garage includes horn honks and people speaking loudly. Because the west side of the garage will be precast concrete, the only potential impact would be when these sources are on the top floor because they would be open. Our analysis, however, reveals that a 6-foot high parapet would be sufficient to attenuate this noise to below the nighttime ambient level as illustrated in **Figure 2**.

Another source would be the enhanced noise from I-80/I-294. To explain, because the west side of the garage would be solid concrete and extend some 39 feet high, this large surface would reflect traffic noise down to the residents on the west side. To eliminate this reflected path, we recommend that 2” thick sound absorption panels be fastened to the exterior wall (facing the residents) with a coverage of 60-70%. An example of such a panel is the QuietPerf (<https://www.noisebarriers.com/panels.html>) NB-II panel by Noise Barriers – a local company. These panels would only be needed for elevations higher than the ground level.

Another source is passing cars along the service road on the west side of the garage. Trucks must be prohibited from this road during nighttime hours because they are significantly louder. Currently, the plan is a 6-foot high stockade fence on top of a 3-foot berm. This effectively is a 9-foot high sound barrier. However, the stockade-style fence would not attenuate the noise because too much noise would transmit through openings between the boards. To achieve maximum attenuation, this fence should be replaced with a Sim Tek (<https://www.certainteed.com/fence/simtek/>). This is a solid fence with sufficient surface density to prevent sound from going through the fence. The noise going over the top would be significantly attenuated due to acoustic diffraction. Although landscaping on the residential side offers no acoustical benefit, it offers the “green effect,” that is, the sense that the noise is lower with vegetation.

Submitted by,



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