



July 10, 2019

J.B. Belknap  
Herons Glen Recreation District  
2250 Herons Glen Boulevard  
North Fort Myers, FL 33917

Dear Mr. Belknap,

Re: Herons Glen Country Club Pickleball Noise Survey

The following is the summary of Keane Acoustics' noise study with acoustical remediation guidance for the pickleball courts at Herons Glen Country Club in North Fort Myers.

### **Goal**

The goal of this study is to determine if the current noise mitigation strategy is needed, and to make recommendations to ensure noise impacts are minimized while allowing sufficient ventilation for the players (if possible). Noise impact is determined by comparison of the noise levels of pickleball play compared to the ambient noise levels in the community. This document summarizes the current performance of the installed noise mitigation measures and provides guidance regarding adjustments to these measures.

### **Noise Monitoring**

Keane Acoustics conducted a noise impact assessment of a group of 4 pickleball courts adjacent to residential properties. Noise monitoring was conducted on Thursday, June 20<sup>th</sup> 2019, from approximately 9-11 am.

### **Instrumentation**

Measurement instrumentation for the ambient sound measurements consisted of one Bruel and Kjaer Type 2270 Hand Held Analyzers, Serial No. 3010767 and 3010848, which meet ANSI standards for Type 1 instruments. The calibration of the instruments was checked before and after measurements with a Bruel and Kjaer Calibrator Type 4231, Ser. No. 2545588.

A running "logging" style measurement was conducted at 1 second intervals, measuring Leq (equivalent), maximum, minimum values for each second. Both sound level data and digital audio were recorded during the measurements.

### **Atmospheric Conditions**

During the visit, the wind was blowing at approximately 5 mph from the SSW and the temperature ranged from approximately 87-90 degrees Fahrenheit. Relative humidity was 70%.

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### Ambient Noise Sources

The following were ambient noise sources that were frequently heard during the visit

- Construction (backup alarms at 1 kHz)
- Air conditioning from residences
- Pool pumps from residences
- Insects
- Birds
- Dogs barking
- Vehicular traffic
- Landscaping activity
- Aircraft (occasional)

### **Current Noise Mitigation Strategy**

A full height 10' wall constructed of Acoustiblok clad chain link fence has been installed to protect residences to the west and NW of the pickleball courts. The portion of the wall facing west is full height, while the 10' high portion facing north has a 4' gap at the bottom to allow for ventilation. Hedges sit in front of the 4' high gap, which may help reduce the effect of the small gap.

A full height 6' Acoustiblok wall is located to the south to protect homes to the SW. Given that this wall is adjacent to trees the effect of the wall is subtle at best. Given that balls are typically struck about 3' from the ground, the effective height of the fence is short, especially considering the effect of the trees.



**Current Noise Mitigation Scheme**

Methodology

Sound level readings were taken at locations shown on the map below. Efforts were made to avoid being too close to air conditioning or pool equipment.



The numbers "1" and "2" on the map show the exact location of the measurements (with distances).

**Measurement Results**

Location	Type of Measurement	Typical maximum dBA	Typical equivalent dBA Leq	Dominant Frequencies (Hz)
1	Ambient Noise	45-50	45	Full spectrum
1	Pickleball Play with fencing	27-32	<25	1,000 Hz
1	Pickleball Play no fencing	30-35	<25	1,000 Hz
2	Ambient Noise	45-50	45	Full spectrum
2	Pickleball Play with fencing	25-32	<25	1,000 Hz
2	Pickleball Play no fencing	30-35	<25	1,000 Hz

In general, while pickleball was occasionally lightly audible, the overall sound level contribution from pickleball play was negligible (both with and without the noise barriers in place). Only occasional hits were slightly louder than the ambient noise, and only in a very narrow frequency range around 1,000 Hz. Due to the short duration of sound, the equivalent decibel level of the pickleball play is less than 25 dBA, which is 20 dB lower (perceived as 4 times as loud) than the ambient noise measured during the visit. The construction equipment backup alarms were also audible in the same frequency range as the pickleball strokes, and typically measured about 10 dB louder than the loudest pickleball strokes and lasted for a longer duration.

**Noise Ordinance**

As shown from the table above, noise emissions from the pickleball courts fall far below the more stringent nighttime decibel limits stated in the Lee County Noise Ordinance (55 dBA).

**Discussion**

Effect of Noise Barriers

*Noise*

The difference in pickleball noise emissions with and without the fence was subtle, due to the low sound levels of each hit and the much higher ambient noise. When the ambient noise is lower (during late fall and winter months and once nearby construction is complete) it is likely that the noise impact may be slightly higher, but not enough to justify using the Acoustiblok material during hurricane season (as the barrier material needs to be removed during high winds).

It is understood that the courts could be lit in the future. It is anticipated that the ambient noise will be much lower in the colder months (most a/c units will be running infrequently), especially in the evenings. It is during this time when pickleball play will be clearly audible, and despite decibel levels staying constant, pickleball play will appear to be significantly louder and may give rise to complaints.

The 4' high gaps at the bottom of the northward facing fence reduce the effectiveness of the noise barrier. Given the resultant noise levels are low without the fencing, the tradeoff for better ventilation appears to be a good compromise.

*Ventilation*

The lack of ventilation during warmer months is a serious concern for the pickleball players. Given that the noise impact experienced during the July visit was negligible, it is recommended that the barrier material stays down for the hot months of the year.

**Conclusion**

In conclusion, the activities associated with pickleball currently have a negligible noise impact to the residences to the south and west of the pickleball courts and are in compliance with the Lee Noise ordinance, even without the noise barrier material installed.

It is recommended that during hurricane season that the fencing is taken down (to improve ventilation for players). It is anticipated that the ambient noise levels will drop during colder months, which will result in higher audibility of the pickleball shots, but will not likely give rise to much more than a small noise impact. Installing court lighting will likely increase the potential for noise complaints, with or without the noise barrier being installed. Based on the lack of the cold weather ambient noise data, use of the sound mitigating Acoustiblok material is recommended for consideration for the colder months (November – February) when air conditioners are not frequently running.

Please contact me if you have any comments/questions.

Best regards,



Michael Keane, P.E.  
President, Keane Acoustics, Inc.