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Introduction

I'm Mike Drapak and I work for Stan Roller Acoustics in Bolingbrook. We are consultants in the field of Architectural Acoustics and our company's principal consultants are Members of the Acoustical Society of America and the National Council of Acoustic Consultants. We have been a part of the design team for many of Illinois most complex noise isolation issues and recommend design parameters, materials, and work with teams to engineer some of the most complex acoustical spaces built today. Our successful designs include over 500 Performing Arts, Civic, Professional, and Worship spaces across the country. Our managing partner, Stan Roller, has been involved with complex acoustic studies and worked with teams to design spaces such as Chicago's Orchestra Hall, The Art Institute of Chicago, The J Edgar Hoover Building, and the Harold Washington Library. We have also worked extensively on projects to help reduce noise transmission in a wide array of classes. We have successfully addressed noise related issues locally for the Village of Barrington, the Village of Lisle, the Village of Niles, the Village of South Barrington, The Village of Schaumburg, the City of the Bartlett, The City of St. Charles and several more. Stan's involvement on the ground floor locally at Riverbank Laboratories, while working at USG was critical in the contribution to acoustic product research and development. Locally and Nationally our list of projects is extensive and in my 12 Years at SRA I have had the privilege of working with design teams for local projects like the Homeland Security building at College of Dupage, Crimi Auditorium and Perry Theater at Aurora University, Cole Hall at Northern Illinois University, The Paramount School for the Performing Arts and many more.

Summary of Findings

First, it is necessary to determine the sound pressure level of the noise sources and whether it is a steady state, broadband noise, or if it is an impulse noise. A steady state noise can be compared to the noise produced by an ordinary fan. An impulse noise can be compared to door slamming, gunfire, or a barking dog. In this situation we are dealing with impulse noise and numerous sources versus a single source. We often refer people to the Fahrenheit scale on temperature as an accurate gauge for the human tolerance of sound pressure levels. 70 Degrees being comfortable, 90 degrees being hot, and 120 degrees being unbearable and even life threatening.

The impulse sound level of a barking dog, at a distance of 5 feet away, will range between 115-dBA and 125 dBA. In comparison, conversation level speech at the same distance is about 65-dBA. Outdoor sound level will reduce naturally by about 5dB for every doubling of distance. A simple calculation will show, the level of a barking dog to be 110-dBA at 20 feet, 100-dBA at 80 feet, 90-dBA at 320 feet, and 80dBA at 1,280 feet. A marching band is about 100-dBA when playing in a gymnasium.

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Sound travels with the same principles of light and a proper design for sound isolation would assume that any isolation design is only as strong as its weakest point or leak. We work with highway noise barriers quite often and can assure you the maximum attenuation of a barrier is typically in the area of 20 dba with one very big caveat, anything with a line-of-sight above the barrier has a maximum attenuation of only 5 dba with a doubling of distance.

A fence called Acoustifence is proposed to surround the outdoor area as a noise barrier. A noise barrier must be lined on the interior with a highly sound absorptive material. Otherwise, sound will build up within the barrier creating a louder noise resulting in the necessity of more attenuation by the barrier. The barrier wall must not have any cracks and must extend tightly to the ground. A properly designed sound barrier will attenuate approximately 20 dBA between the source and the listener, and this is again assuming there is no line of sight to the listener on the second floor of a neighboring home. Therefore, even with the best isolation, the noise levels will be 90-dBA at 20 feet, 80-dBA at 80 feet, 70-dBA at 320 feet, and 60-dBA at 1,280 feet.

We've been told the closest property is 130 feet away from the kennel and at 70-80 dBA this would not be within the guidelines set by Title 35 of the Illinois compiled statute's recommendation of acceptable daytime noise levels at the property line. The section makes clear the noise intrusion from neighboring properties should be no more than 55-dBA for this class of property.

As a reference, the sound ordinance for the City of St. Charles states no noise should be "audible" at the property line which is one of the strictest standards we have observed. This sets the threshold even higher than the Illinois compiled statutes section relating to noise pollution specifically in regard to a neighboring residential area being in such close proximity. No matter what, when a dog barks outside of this building it will be audible at the property line.

The noise created from dog barking tends to be startling in nature and can cause a person to tense up. That sudden sense of tension is our Autonomic Nervous System speeding up the inner workings of our bodies and our sympathetic nervous system's response to a perceived threat. This, in turn, causes physiological changes to occur like elevated heart rate, muscle contraction, rapid breathing, etc. The neuronal encoding of sound helps the body identify the auditory nature of the threat but without the visual confirmation this can create even more confusion and distress. The disturbing nature of impulse noise is one of the primary reasons sound ordinances exist and are a perfect example of their importance. Even at a distance the constant and repetitive exposure to impulse noise 12 hours a day; week after week; can be distressing to many people with extra-sensory issues and have a direct effect on the market value of neighboring properties. Noise pollution laws help protect the well-being of the community by limiting our body's exposure to loud, startling, and repetitive noises for sustained periods of time.

Conclusion

Therefore, it is my professional opinion there would be no possible or reasonable way to alleviate the noise to a necessary level that sound nuisance issues will not continue to be an ongoing problem for the neighboring properties.

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