



MEMORANDUM

To: Wayne Feiden, Director Planning & Sustainability

From: Berkshire Design Group

Date: February 10, 2022

Project: Animal Control Facility, Moose Lodge Site, 196 Cooke Avenue

Re: Noise review

Berkshire Design was asked to look into the level of noise associated with dog barking at a potential animal control facility located at 196 Cooke Avenue. This memo includes information about typical sound levels and noise reduction associated with building construction, outdoor sound barriers and distance from the facility.

1. Typical sound levels in decibels (dB)

Quiet rural area	30 dB
Library or quiet night-time neighborhood	40 dB
Quiet neighborhood daytime	50 dB
Normal conversation	50-60 dB
Snow blower/lawn mower	85-90 dB
Chain saw	120 dB

2. Published information on dog barking level of noise

Single dog barking	80-100 dB
Inside kennel dog chorus (range)	85-122 dB
Inside kennel dog chorus (common)	85-100 dB

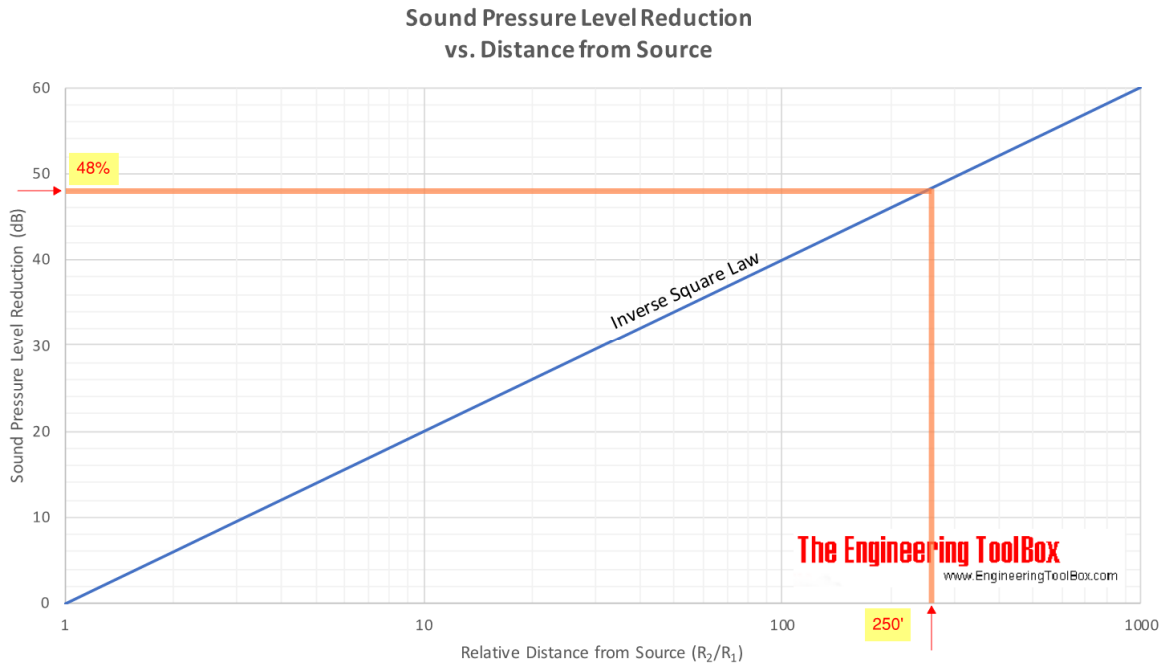
3. Sound reduction based on building construction, distance to neighbors and other factors

Building construction:

Building construction standards include ratings for *Sound Transmission Class (STC)*. The higher the STC rating, the better sound isolation within the wall assembly. The STC translates into a decibel reduction. STC can vary from 37 to much higher values such as 50-65. The actual reduction in noise provided by the building is dependent on the noise source, windows etc. For the animal control facility, we will assume a STC rating of 50 and conservatively assume that this results in a 25 dB reduction in sound to the outside.

Effect of distance:

Sound volume reduces with distance from the source and the noise reduction can be calculated using the *Inverse Square Law*. For every doubling of distance, the sound level reduces by 6 dBA. The following chart illustrates graphically how sound diminishes with distance.



A sound reduction of 48% is obtained at a distance of 250 feet (approximate distance to nearby homes).

Topography and landforms:

Topography and landforms can effectively reduce sound propagation. For example, an earth mound will reflect a portion of the noise, thus reducing the external noise as long as the source is lower than or level with the barrier. The reduction of sound is approximately 10 dB.

Vegetation:

Vegetation is not very effective at reducing noise. However, it appears that a wide belt of high-density trees and shrubs can achieve some noise reduction. For example, a 100' wide belt can reduce sound 5 to 8 dBA.

Noise Abatement inside the building:

Sound proofing with foam and sound absorbing products can be added inside the building to decrease the dog chorus noise. This can reduce the sound within the facility by 8 to 10 dB.

4. Summary

Building construction and distance will have the largest effect on noise reduction. Table 1 illustrates how an initial sound level of 100 dB (high end of dog chorus) will be reduced with good building construction and 250 feet of distance from the facility.

Table 1 – Building and Distance

	Dogs inside facility	Dogs outside the facility – Dogs will only be outside when the animal control officer is present
Noise level within building	100 dB	-
Noise level outside of building – building constructed with STC of 50 minimum	75 dB*	100 dB
Noise level 250 ft away from facility	39 dB	52 dB

* It is assumed that STC 50 construction will result in a minimum of 25 dB reduction.

Table 2 illustrates how the addition of an earth berm or a sound wall would affect the noise levels from the facility.

Table 2 – Add Earth Mound or Sound Wall

	Dogs inside facility	Dogs outside - Dogs will only be outside when the animal control officer is present
Noise level within building	100 dB	-
Noise level outside of building – building constructed with STC of 50 minimum	75 dB	100 dB
Noise level outside with berm/wall	65 dB	90 dB
Noise level 250 ft away from facility	34 dB	47 dB

Table 3 illustrates how the addition of noise abatement inside the building affects the noise levels from the facility.

Table 3 – Add noise abatement inside building

	Dogs inside facility	Dogs outside - Dogs will only be outside when the animal control officer is present
Noise level within building with noise abatement	92 dB	-
Noise level outside of building – building constructed with STC of 50 minimum	67 dB	100 dB
Noise level outside with berm/wall	57 dB	90 dB
Noise level 250 ft away from facility	30 dB	47 dB

5. Conclusion

Building construction and distance as well as earth berms and noise abatement can all be effective means of reducing the noise from an animal control facility. The above calculations indicate that a dog chorus from animals within the building can be reduced to the level of a quiet night-time neighborhood at a distance of 250 feet from the facility. The calculations also indicate that the sound of a dog barking outside the building (dogs will only be outside when the animal control officer is on site) will be reduced to under 50 dB or the sound of a quiet day-time neighborhood.

6. References

<https://extension.purdue.edu/extmedia/va/va-18-w.pdf>
<https://www.controlnoise.com/about-netwell/who-is-netwell/>
https://www.engineeringtoolbox.com/inverse-square-law-d_890.html
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