

Noise and Odor Control

By using proven methods of sound control in concert with a well-designed mechanical system and a sanitary environment, noise and odor control are easily achieved.

NOISE CONTROL

The five areas of focus when controlling noise in animal facilities are absorption, isolation, dissipation, masking, and design of the HVAC system.

Absorption

The first line of defense in controlling noise is to absorb the noise as close to the source as possible. The more surface area of absorbent material you have, the better off you will be. Unfortunately, the typical absorbent material is not very cleanable or durable, so you are faced with a dilemma. How do you absorb sound while providing a clean, aseptic environment? Look for materials with a high Noise Reduction Coefficient (NRC) rating. The NRC rating quantifies the amount of noise a material absorbs. For example, an NRC rating of 1.0 means the material absorbs 100 percent of the reverberant noise that hits it. A typical ceiling tile has an NRC rating of .65. In contrast, concrete block walls and concrete floors have an NRC rating of .00 to .1. It is reasonable to aim for materials with an NRC of approximately .75 to 1.0.

The following materials can be used to absorb sound and are at least somewhat cleanable:

- Ceramic-faced ceiling tiles; NRC of .65.
- Mylar-faced hanging sound baffles; NRC of .75.
- Cementitious spray-on soundproofing; NRC of .85.

Isolation

Given that you cannot absorb all the sound that is produced by the animals, the next goal is to isolate the sound before it spreads. The best way to do this is to build your facility with all penetrations sealed and with walls of sufficient density to eliminate the transmission of noise.

In looking at the isolation of noise, there is a Sound Transmission Class (STC) rating that is used to describe how much noise passes through a given assembly. The STC rating is equivalent to the number of decibels of sound that the assembly screens out. For example, a wall with an STC of 45 means that it will screen out approximately 45 decibels of sound, or the equivalent of a normal person talking. To give some perspective, a dog barks in the range of 100 or more decibels. This means that to effectively screen out *all* sound from a dog run area, you would need to build a wall with an STC of 100. While this is not feasible, it is also not necessary.

The highest effective STC that can be gained in a normal wall is approximately 55 to 65. For the most part, this is workable, because of the remaining sound that escapes, approximately 35 decibels, will be masked by normal background sound.

In addition to creating a wall that has enough mass to isolate the noise, it is also important to eliminate any holes through the wall or any paths where noise can “flank” the wall.

4520 Broadway, Suite E
Boulder, CO 80304

800.332.4413

www.animalarts.com

Dissipation

Another way to control noise is to allow it to dissipate. In the outdoors where there are no walls, sound will die off at the inverse square of the distance. This means that theoretically the sound will die off to nothing in a very short distance. Inside, it is virtually impossible to create a space big enough for sound to die off naturally, but by increasing the height of a room and adding as much absorption as possible, you can move toward this goal.

Masking

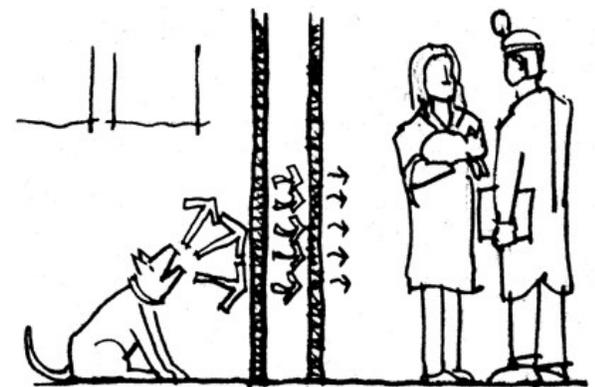
Masking is your last resort if you cannot absorb, isolate, or dissipate the noise. The perception of a noise problem is very much based on the context within which people perceive the noise. It is more difficult to be bothered by noise from an adjacent space if the noise in the space in which you are located is high. This is why it is okay to have a dog kennel located adjacent next to a nightclub, but not a library.

In your facility, Muzak or a sound system can do a lot to mask noise coming from the animal areas. Coincidentally, it has been proven that Muzak in the animal holding areas can actually calm the animals.

HVAC System Considerations

Ducts penetrating from one sound area to another can be a possible source of sound or noise leakage. A ceiling penetration with a diffuser or grille will also allow sound to migrate to another room in the same sound area.

Eliminating ducts that penetrate between sound areas can control sound leakage. However, if ducts do penetrate, two things can be done. First, a sound attenuator can be installed in the duct directly at the penetration. Care should be taken to seal the joint between the wall and the sound attenuator. Second, a duct can be lined with an acoustical wrap to contain the sound within the duct system. With these two methods, noise within HVAC systems can be contained and managed from one sound area to another. Care should be taken at all joints or transitions in the installation of the sound controlling devices.



ODOR CONTROL

Odor can be controlled through:

- Cleanliness
- Space pressure relationships
- Exhaust air and outside air

Odor control can be best accomplished by eliminating the source. Frequent cleaning of the run and cage areas is the first and most obvious step in the control of odor. Locate water hose bibbs in convenient locations. When things are easy to use, the job gets done more efficiently. Floor drains with hinged covers or trenches located at the back of the runs help make cleaning easier and more effective.

Any odor should be contained within its own area. This can be accomplished through the use of positive and negative air pressure. Negative pressure areas will hold odors, and positive pressure areas will not allow odors to enter. You want your facility to have the areas of least odor in the client areas and contain the most odor in the ward and run areas. This can be accomplished by creating positive pressure in the client and staff areas and creating negative pressure in the animal areas.

If you supply more outside air than you exhaust, it will create a positive pressure area. If you exhaust more air than you supply, it will create a negative pressure area. Outside air provides new, odorless air into the facility to help create an odor-free environment. The pressure relationship between areas is critical to odor control.

Air-conditioning systems provide a ducted air supply with either ducted return air or plenum (ceiling space) return air. In order to maintain pressure relationships, the air-conditioning system must have a ducted and well-balanced return air system.

We recommend using an experienced person who can design an effective system. Here are some general criteria for designing animal care facilities:

- In run areas; 12-15 air changes per hour is recommended, with a minimum exhaust fan capacity of 500 Cubic Feet per Minute (CFM).
- In cage areas; 20-25 air changes per hour is recommended, with a minimum exhaust fan capacity of 500 Cubic Feet per Minute (CFM).
- In treatment areas; 10 air changes per hour is recommended, with a minimum exhaust fan capacity of 500 CFM.
- In office/reception areas; 25 to 50 percent of the return air should be made up of outside air.
- Exam rooms: Using exhaust fans can help control temporary odors. These exhaust fans can be separate or ganged together with switches placed in convenient locations.
- Grooming: Odors, heat build-up from dryers, and humidity can be a problem. A minimum of eight air changes per hour is recommended.
- All bathrooms: Fans are usually required by code.
- Isolation: Vent directly to the outside with a recommended minimum of 25-30 air changes per hour for disease and odor control.

