



**THE HUMANE SOCIETY**  
OF THE UNITED STATES

# **Shelter Design**

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## Planning and Building an Animal Shelter

An animal shelter is the physical nucleus of a community animal care and control program, and should be constructed, maintained, and operated so that it is attractive and convenient to the community. Above all, an animal shelter must be a place of security and comfort for the animals sheltered there.

A sheltering facility should be built in a central location accessible to the human population being served, and should be sited and designed in a way that is welcoming to the public. It should provide a safe and healthy environment for both animals and the people who care for them.

Keep in mind that the pre-construction planning phase is absolutely crucial to building a good animal shelter. The HSUS advises animal care and control agencies to spend as much time as necessary to identify its needs and those of its community before planning a new facility. Doing so will help achieve the objective of providing a humane, secure environment for animals and avoid costly errors in the process.

The Humane Society of the United States (HSUS) strongly recommends that local architects hired to build a new shelter consult with an architect experienced in successful shelter design.

Also enclosed are materials that provide basic information on a number of key aspects of shelter construction. Among the enclosures are floor plans of animal shelters located in different parts of the country and serving widely disparate populations. Please note that while these plans incorporate many essential elements in animal shelter design, they all have certain limitations. For example, in all the designs enclosed, cats and kittens are housed in the same area. The HSUS recommends that shelters house cats and kittens separately to reduce the transmission of contagious diseases such as upper respiratory infections. Despite their limitations, the enclosed plans can be used to show your building committee and architect the variety of approaches to animal shelter design.

### Find Animal Shelter Architects

A list of experienced animal shelter architects can be found at [animalsheltering.org/marketplace](http://animalsheltering.org/marketplace).

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# Estimating the Number of Pets in Your Community

A figure that often seems difficult to estimate is the total number of owned animals in your community. Even if you have a handle on the number of licensed animals, there'll still be a high percentage of people who don't register their pets.

The formula that follows is by no means exact; it is based on national averages and does not account for potential variables among regions, states, and communities. If, for example, you live in a densely populated suburban area with a large number of apartments and full-time workers, cats may be the pet of choice for many more people with limited time and space. On the other hand, a suburban area with mostly housing developments may be the stomping ground for a higher number of dog lovers.

Keep such variables in mind so you can make necessary adjustments when using this formula. For the purposes of explanation, we'll use the fictional example of Anytown, a community with 100,000 households.

## Step 1

Find out the number of households in your community; the local emergency management or property appraiser's office should be able to help with this. Again, in this example, the number of households is 100,000.

	Percentage of U.S. Households Owning A Pet	Number of Pets Per Household
<b>Dogs</b>	39	1.7
<b>Cats</b>	34	2.3
<b>Birds</b>	6	2.5

Source: The American Pet Products Manufacturers Association's 2007-2008 National Pet Owners Survey

## Step 2

Using the figures in the table above, determine how many households in the community own dogs, how many own cats, and how many own birds. You can arrive at this number by multiplying the number of households in your community by the percentage of people who own each species nationally. Here's what the math would look like in a community of 100,000 households:

- 100,000 households in Anytown x 0.39 (percentage of dog owners nationally) = 39,000 dog-owning households in Anytown
- 100,000 households in Anytown x 0.34 (percentage of cat owners nationally) = 34,000 cat-owning households in Anytown
- 100,000 households in Anytown x 0.06 (percentage of bird owners nationally) = 6,000 bird-owning households in Anytown

## Step 3

Multiply the numbers you arrived at in Step 2 by the average number of each species owned per household.

- 39,000 dog-owning households in Anytown x 1.7 (percentage of dogs owned per household nationally) = 66,300 dogs in Anytown
- 34,000 cat-owning households in Anytown x 2.3 (percentage of cats owned per household nationally) = 78,200 cats in Anytown
- 6,000 bird-owning households in Anytown x 2.5 (percentage of birds owned per household nationally) = 15,000 pet birds in Anytown

Now Anytown has rough estimates of the number of dogs, cats, and birds in its community. You can also apply this formula to other species, using national statistics for fish, reptile, equine or small-animal ownership.

From *Animal Sheltering* magazine, Jan-Feb. 2001, updated APPMA figures March 2008. [www.APPMA.org](http://www.APPMA.org)

## Estimating the Size and Cost of an Animal Shelter

For a ballpark estimate of the size and cost of a new animal sheltering facility, use the formula below. For more accurate size and cost estimates, local governments must go through a comprehensive needs-assessment process.

1. Enter the number of dogs housed<sup>1</sup> \_\_\_\_\_  
 Multiply that number by the square  
 Feet (s.f.) per dog (90-100 s.f. per dog).<sup>2</sup> \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ s.f.

2. Enter the number of cats housed.<sup>1</sup> \_\_\_\_\_  
 Multiply that number by the  
 s.f. per cat (45-50 s.f. per cat)<sup>2</sup> \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ s.f.

3. Add the totals in 1. and 2. above to  
 determine total building square footage. \_\_\_\_\_ s.f.

4. Multiply the total building s.f. (3.) by the  
 cost per s.f.<sup>3</sup> to determine the total  
 building cost. \_\_\_\_\_ s.f. x 150 = \$ \_\_\_\_\_

5. Multiply the total building cost (4.) by  
 the total project cost factor.<sup>4</sup> \_\_\_\_\_ x \_\_\_\_\_ = \$ \_\_\_\_\_

The result of 5. is the total project cost.

Example:

1. 100 dogs x 100 s.f. = 10,000 s.f.
2. 50 cats x 50 s.f. = 2,500 s.f.
3. Total building s.f.= 12,500 s.f.
4. 12,500 s.f. x \$200 = \$2,500,000
5. \$2,500,000 x 1.67 = #4,175,000

**Note:**

**New Construction costs ranged from \$175 - \$212 per square foot, not including land. Renovation/New Construction ranged from \$160 - \$215 per square foot not including land. Most of these figures were derived from actual costs but were on projects completed in 2002-2004, so you can add at least 20% onto these prices for current estimates. The renovation project prices above included a combination of retrofitting an older facility combined with some new construction for additional square footage. Pricing MUST be considered as a range, as construction costs vary widely by geographic region.**

<sup>1</sup> This is the estimated total number of animals to be housed at the facility at any one time. Most jurisdictions can estimate this number by analyzing the number of animals housed at the existing facility during previous years and adjust that number on the basis of relevant data about the community – data such as the number of other shelters in the area, existing animal control ordinances and programs, demographic trends for both people and animals, and the location of the new facility vis-à-vis the community’s population base.

<sup>2</sup> The s.f. allowance includes space for administrative offices, education space, medical space (such as assessment and spay/neuter areas), storage, and support space.

<sup>3</sup> The national average is \$150.00 per s.f. (in 2000).

<sup>4</sup> In this example, building-related costs are estimated at 60% (a typical percentage) and other costs (grounds, architects’ fees, interest, etc.) are estimated at 40% for the complete project. Divide 40 by 60 (result: .666) and add 1, for a final project cost factor of 1.67. Note that the result of this formula is that building-related costs are represented by the 1 and other costs are represented by the .67.

## Building a Safer Shelter

So the money you asked for to build a new facility came through – now what? Along with concerns about noise reduction, waiting areas, and cleanable surfaces, you also want to make sure your new buildings are better equipped to handle security issues than the old one: The goal of any new design should be improvement. Learn from the flaws you found in the old building, and work with your architects to make sure they aren't duplicated in the new one.

In California, Escondido Humane Society is recovering from the tragic fire that destroyed its old facility in January 2001. Plans for construction of a new shelter, complete with security enhancements, are underway, says Phil Morgan, the shelter's executive director. In its old building, Escondido endured the same problems found in many shelters – the building was outdated, and the lack of a sprinkler system ended up costing animals' lives.

The new facilities will be far better prepared to prevent such calamities; a sprinkler system is only one of the improvements, Morgan says. "In addition, our old place was all within one building....The new design will have more of a campus layout, with a separate animal control facility, so that if one building were to burn, the other one won't." Also in the new shelter, potential adopters will have to come and go through the front lobby, passing staff along the way; this should decrease the potential for animal theft.

A safe space for veterinary supplies is another primary element of shelter design planning, says Larry Gates of Gates Hafen Cochrane, an architectural firm that has been helping organizations design new facilities for shelters for years. Installing a safe, preferably in a nondescript cabinet, is the simplest way to secure such supplies, says Gates. "Another way we handle it is with a steel roll-down grill covering the entire pharmacy wall," he says. "That has some advantages, in that when nobody's there you can just close the whole thing down so it will be secure... It tends to work better than having a pharmacy in an enclosed room, because it's more accessible during the day but totally secure at night."

Nighttime security can also affect the decision to install indoor/outdoor or indoor-only runs. While indoor/outdoor runs can provide more exercise space and fresh air for dogs, some organizations are moving towards indoor-only runs, in part to boost security. The Capital Humane Society in Lincoln, Nebraska, found that the switch to an indoor-only facility solved many of its security problems. "We used to get people who'd come to the shelter and they'd see their dog in an outside run, but they wouldn't tell anyone," says Bob Downey, executive director. "Then at night, they'd come back and cut the fence of the run they knew their animal was in and take it. But when we went to all indoor kennels that stopped."

Some shelters have found that indoor/outdoor runs also increase burglars' ability to gain access to the rest of the facility. Many indoor/outdoor runs have doors or hatches large enough for a smaller person to fit through; if an intruder breaks through these, he can probably get into the rest of your facility from there.

In transitioning shelters toward indoor-only facilities, Gates and his firm have occasionally planned only partial overhauls – a move Gates says is often more affordable than building an entirely new shelter, yet still allows the organization to fix layout problems. "If we're doing something like that, we're typically moving toward an entirely new type of 'adoption pavilion,'" says Gates. "In existing shelters, you kind of focus on the areas the public sees, and we might put some Band-Aids on the old building, but we'll focus most of our attention into a new addition, and then the public's contact with the shelter remains mostly positive."

Whatever you decide your organization needs to address, either through renovation, new construction, or something in between, you should work closely with the architects and consultants involved in the project and make sure they understand your shelter's security-related issues. They'll probably have some innovative ideas you haven't considered, and any innovation that results in increased safety is a good one.

"All security concerns can and should be addressed in the design of new facilities," says Eric Blow, who has retrofitted fences and locks and added new lighting systems at Jefferson County Animal Protection in Louisville, Kentucky, where he serves as director. "Architects are much well-versed in incorporating security measures into buildings than they are in designing buildings for animals. The security part will be a comparative breeze for them."

# Special Design Considerations for Animal Shelters

Building an animal shelter requires making a series of decisions unique to animal-housing facilities—such as choosing safe caging materials and selecting appropriate floor coatings. Here is some guidance on what to plan for and what to watch out for:

## **Acoustics**

A key acoustical consideration is the placement (housing) of animals in relation to each other. For example, house yapping puppies away from kittens, nursing mothers, and debilitated animals; locate noisy equipment such as furnaces, washing machines, or phones well away from the euthanasia room. The din of barking can be reduced through proper design of and materials selection for the dog-kennel area.

## **Automatic Feeders**

Avoid these because they can be difficult to clean and disinfect. Their use also reduces the opportunities for interaction and socialization between the animals and their caretakers.

## **Double- and triple-decker cages**

The HSUS strongly discourages using triple-decker cages for any animal, as well as double-decker cages and kennels for dogs and puppies. They not only are impossible to clean, but also pose a danger to kennel staff when animals need to be placed in or removed from the cages. Double-decker cages are acceptable for cats provided they are not positioned too high along the wall.

## **Electrical sockets**

These should be positioned on the wall at least three feet above the floor to avoid “splash-ups” of water and cleaning solutions used in floor hosing.

## **Electric warming coils under concrete-slab flooring**

Avoid installing this type of system because it is nearly inaccessible in case of failure.

## **Ergonomic considerations**

For the sake of staff and volunteers, plan the facility with their safety in mind. For example, to minimize back strain, install bathtubs at a “working height” for groomers/caretakers and inset an area at the base for feet. Similarly, install hydraulic lift mechanisms for tables where heavy animals will be examined, groomed, or otherwise handled.

## **Flat roofs**

Although flat roofs are convenient for accommodating HVAC equipment, they are more prone to leaks and may collapse under heavy ice and snow build-up.

## **Floor and wall finishes**

Finishes must be applied to materials that are properly cured and dried. Concrete and other surfaces should be tested with a moisture meter before being painted. To avoid subsequent deterioration, avoid using epoxy paints unless proper application techniques are guaranteed to be nearly perfect. Colorless sealers are usually more effective but must be applied over well-cured, thoroughly dry concrete that has not been previously painted.

## **Flooring**

Appropriate flooring materials are vital to maintaining a clean facility in which microorganisms and odors are minimized. Poured floors with a minimum of seams are best. Ceramic tile is not a good choice for kennel or housing areas because grout is permeable and therefore impossible to clean adequately.

## **Guillotine doors**

To permit dogs housed in indoor/outdoor kennels to avoid drafts, set guillotine doors off-center.

## **Height of solid dividers between kennels**

For kennels made of chain-link fencing, a solid divider must be installed to avoid nose-to-nose contact among dogs. For large dogs, install solid dividers that are five feet or higher. For small-to-medium dogs, four-foot-high dividing walls are generally acceptable.

## **HVAC**

Once a well-designed heating, ventilating, and air-conditioning (HVAC) system is installed, it is essential to maintain it properly and clean the ducts regularly. Residual coatings of dirt and hair inside ducts cause airborne contaminants to be constantly re-circulated into kennel areas, and these contaminants can be a major source of disease.

## **Indoor/Outdoor Runs**

Indoor/outdoor runs offer benefits for both the shelter staff as well as the dogs that are being housed. They simplify the cleaning process by allowing a dog to be isolated to one side of the run while the other side is being disinfected and scrubbed. When the guillotine doors are open, fresh air can circulate throughout the shelter, decreasing the likelihood of kennel cough and other airborne diseases. Indoor/outdoor runs also diminish noise levels and odor inside the facility. They encourage house-training skills by providing dogs an outdoor area in which to eliminate. Finally, providing indoor and outdoor access helps maintain a healthy environment for dogs, both physically and mentally. The downside to indoor/outdoor runs is that the outside portion cannot be disinfected in temperatures below freezing. In addition, guillotine doors may cause drafts, making it more difficult to regulate temperature levels within the facility. For this reason, when constructing indoor/outdoor runs, it is important to set the guillotine doors off center to allow dogs to shield themselves from cold drafts.

## **Lighting**

Lighting fixtures in kennels should be placed over dog runs rather than down the middle of the aisle separating facing runs. This makes it easier for visitors and staff to view the animals. Positioning the fixtures in this way should allow sufficient light to spill over to the walkways so that no safety hazard is created for the public or staff.

## **Plumbing**

The drainage system must be designed so that waste from one kennel never contaminates another. Drain openings should be at least 4" in diameter. Lead-away pipes should be at least 6" in diameter. Drain covers should be of stainless steel or other non-corrosive and easily cleanable material. These should be easily removable for cleaning but otherwise kept in place to prevent puppies, other small animals, the public, or staff from falling or slipping into them. Drain Traps should also be installed and cleaned on a regular basis.

## **Poles and support beams**

Vertical supports or beams should not be positioned inside kennels or in the middle of walkways to protect the safety of staff and the public.

**Segregation of species/traffic flow**

Different species should be housed in different rooms, and adult animals should be separated from infants (except for nursing mothers/litters). Traffic-flow patterns should keep incoming animals with unknown health status separate from the general population to prevent the possible spread of disease. For this reason, public traffic should flow through the shelter similarly, progressing from early life-stage groups to older animals.

**Sink faucets**

These should be outfitted with handles, such as those on surgical sinks that can be turned off with the forearms to avoid re-contaminating hands after washing.

**Wall/floor joints**

Any wall/floor joints should be covered. Standard joints are microbe collectors and impossible to clean properly.

**Wood and other permeable materials**

Any kind of permeable material must not be used in areas that are frequently washed.



# GETTING STARTED

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As simple as a building? We often find ourselves explaining why animal shelters are so costly. The reality is that these buildings are unique and complicated. They are individualized endeavors designed to a specific set of requirements. As opposed to manufactured goods, the prototype *is* the final product. Some projects begin with years of systematic planning, others in response to spur-of-the-moment opportunity, most with a combination of both. So how do you get started?

## The Pre-Design Phase

Whatever motivates the start of a project, there are common elements to establishing a workable program. The pre-design phase is often overlooked, but from our perspective it is the most important, because everything done later is built on this foundation. There are several elements to consider:

**Establish scope, quality, schedule, and budget** - In order for your project to be built on a solid footing, time should be spent developing a program that answers the needs of your long-range plan as well as your immediate needs for the diverse functions required in your animal shelter. Once you have established a “vision” of what your shelter should be, the budget should be developed, financing options explored, and a schedule determined.

**Site Studies** - After determining that your site has the capacity to meet the needs of your long-term plan, but prior to the initiation of design, site surveys, environmental impact, and soils reports should be ordered. They may reveal concerns that will affect the viability of the project, and they will certainly be necessary later in the construction documents phase. (See attached check list.)

**Financing** - With a building program established, the next step is to determine how you will capitalize your project. For non-profits, this will likely entail a capital campaign targeting individual and corporate donors, or in some instances, obtaining a mortgage. Government-operated facilities are typically funded through bonds or taxes.

**Planning approvals** - Most projects require regulatory approvals prior to construction. With each passing year, the time it takes to obtain even simple approvals increases. The best response is to be well prepared, hire experienced consultants, and review with the appropriate agency the time required for approvals.

**Delivery Process** - This includes determining the design, consulting, and construction services you need. How you choose to work with a contractor and establish cost controls will have a significant impact on the success of your project.

## The Team

It takes a great many people to produce even the simplest building project. As the owner, you have determined the need, or opportunity, for a new or renovated facility. You have selected a site, secured financing, and secured approvals to proceed. Architects and other design professionals have integrated your needs, resources, and ideas into appropriate solutions. An army of contractors, fabricators, suppliers, manufacturers, and craftspeople will assemble the structure. The insurance, accounting, and legal professions are involved throughout, as are local, state, and federal regulatory agencies. Finally you, the public, and your staff are involved with the building on an everyday basis. With this many people involved in the creating of your project, teamwork is critical.

**Owner** - As the owner, you are ultimately in charge of establishing the project’s priorities, building program, budget, and financing. You will also need to provide surveys, soils reports, and other baseline information on the project, as well as make timely decisions to keep the design team progressing efficiently. One of your architect’s skills is drawing out your needs and priorities and translating those requirements into bricks and mortar.

**Architect** - Your architect is the creator and coordinator of your facility's design. He/she provides design services and project documentation, administers construction contracts, observes construction, and processes a variety of submissions for the project.

**Engineers** - Approximately half of the cost of a typical veterinary facility stems from structural, mechanical, plumbing, and electrical systems. Professional engineers have an in-depth knowledge and experience in these areas, and they understand the full range of design possibilities and details in their specific areas of expertise.

**Contractors** - The physical act of construction is accomplished by a virtual army of contractors, suppliers, and craftspeople.

General contractors assemble the labor, materials, and management necessary to construct a project. They typically maintain small organizations, with the average firm having fewer than ten employees. Contractors are responsible for on-site equipment, such as tools, generators, temporary facilities and other items that support the construction process, but do not become part of the building.

Most of the actual construction work is done by specialty contractors (subs) who are responsible for only a portion of the work, such as mechanical, plumbing, roofing, or drywall.

**Suppliers** - Building materials, components, and subsystems are manufactured, fabricated, and sometimes installed by suppliers.

### **Selecting Design Consultants**

You and your staff bring a great deal into the design of your shelter: professional expertise, needs, desires, aspirations, and biases. In turn, your consultants should be more than just people who "draw up a building" for you. As the people who will help you turn your ideas into reality, they should challenge your preconceptions and not lose sight of the fact that they are designing for YOU and YOUR NEEDS. After the completion of the design stages, your consultants will also serve as your agents in dealing with the various government agencies and the contractor, ensuring that you are receiving the quality of workmanship and materials for which you have contracted.

Your architect will serve as your primary design consultant, and he/she will rely on the expertise of civil, structural, mechanical, and electrical engineers, as well as acoustical consultants and landscape architects.

The American Institute of Architects has published a memo on "Selecting the Architect". The following are some of the most important points:

**Experience** - Look for a firm that will be able to show you projects of similar functional and design complexity. Each firm brings a different combination of skills, expertise, interest, and values to its projects. But as important as experience is, you need to watch for "off-the-shelf" designs that may not fulfill your specific requirements. Select an architect who has the flexibility and imagination to provide you with the services that will best fulfill your needs.

**References** - Find out how prospective architects do business, how responsible they are to their clients' needs, and how they stack up to their clients' expectations. The best way to do this is to talk with people in other shelters for whom the architect has provided services.

**Fees** - Once you have selected the best firm for you, request a proposal for services and fees. If you cannot agree, begin negotiating with your second choice. Nationally-known experts may charge more than inexperienced local architects. You will need to judge for yourself whether the experience and efficiency gained are worth the higher fee.

**Rapport** - Having personal confidence in, and rapport with, your architect are critical elements. Find an architect who believes that it is important to listen to you and is someone who you will enjoy working closely with throughout the life of your project.

Finally, be FRANK. Tell your architect what you expect and what your capabilities are. Ask for an explanation of anything you don't understand. Discuss your needs and the architect's motivations. The result will be a better and more successful project for both of you.

## **The Design Phase**

In our office, we typically divide design into three phases: schematic (or preliminary) drawings, design development (detailed preliminary drawings), and construction documents (or working drawings). The schematic drawings are the initial drawings done by the architect based on the owner's vision of the project. They are then refined into the construction documents that are used by the contractor.

**Schematic Drawings** - These drawings represent the basic configuration and appearance of the building. They are often used by the owner to get preliminary pricing or to get governmental or financial approval. For the architect, they are the basic drawings that are, with refinement, later developed into the design development drawings. The actual time it takes for your architect to develop the schematic drawings is dependent on a realistic and well-considered program, the capacity of you and your board to make timely and consistent decisions, your architect's ability to understand and translate your ideas onto paper, and the degree of familiarity your architect has with animal shelter design. It will generally take four to six weeks for this process.

**Design Development** - This phase refines the schematic drawings and in greater detail establishes the construction requirements for the building, including plans, elevations, sections, systems, materials, and equipment. This phase will take about six to eight weeks.

**Construction Documents** - During the construction document phase, the architect creates the drawings necessary to cost and build your facility. These documents are also the legal basis for your contract with the contractor. Production and coordination of construction documents takes about eight to ten weeks.

**The Construction Phase** - Upon completion of the construction documents, a building permit is obtained and bids are obtained from contractors (if the traditional owner/contractor relationship has been chosen). The time required to get a building permit varies greatly, from days to months, depending on where the project is located. With the design and permitting process complete, construction can finally begin! Construction time can change substantially based on the complexity of the job, whether or not the project has to be phased, the size and organizational skills of the contractor, and weather delays. As a general rule, a freestanding facility will take six to eight months.

## **Move In**

Transitioning to your new facility - With your building complete, it's time to move in. The care and planning taken in preparation for the move pay big dividends in fully getting "up to speed". While most of our clients are functioning within a couple of days, it is typical for it to take months to get well organized.

## **Project Costs**

The average construction cost for new animal shelters that we have completed nationally over the past year is \$138 per square foot.

Regional Variations - Whereas the average construction cost listed above is \$138, the cost of construction varies across the country from a low of 74% (in rural Alabama) to a high of 136% (in New York City) based on data developed by the R.S. Means Company, a national clearinghouse for construction.

## **Percentage of Total Project Costs**

Building Cost	60%
Land Cost	15%
Equipment, Furniture & Computers	10%
Architectural & Engineering Fees	7%
Interest,	
Insurance, & Fees	3%
Contingencies	5%

With a building cost of \$138 per square foot, you might expect an *overall project cost* to run in the \$200 range based on “average” land costs and expenses.

**Inflation** - Even if you assume that the above-listed costs are very current, there still could be as much as a six-month time lag between the date that you initiate the project and when bidding occurs and construction begins. According to R.S. Means, construction costs are increasing at a rate of 6 to 9 percent per year, once again depending on the region in which you are located.

**Contingency** - Rather than “lock-in” to a specific construction cost per square foot, it makes sense to determine a target range that would take into account factors as diverse as variations in project size, anticipated project complexity, contractor availability and pricing methods, code requirements, availability of utilities, site improvement, soil conditions, the price of labor, and a contingency factor for the unforeseen costs. For these reasons, it is recommended that, at minimum, you set a range that would be plus or minus 5 percent.

### **Go Out and Do It**

Building is a team effort, and relies on the abilities of a large number of people. Animal shelters are unique and intricate facilities. When properly designed and executed, they can provide a secure and comforting environment for the animals, a tremendous asset to the efficiency and the level of satisfaction for you and your staff, and ultimately play a significant role in your efforts to increase adoptions.

## **ARCHITECTURAL CONCERNS for Site Selection**

### o LAND COSTS

- Purchase price
- "Hidden development costs"

### o SITE CONSTRAINTS

- Sufficient size to accommodate:
  - Building program
  - Expansion requirements
  - Parking requirements
  - Landscaping requirements
  - Setbacks

- Public rights-of-way

- Access

- Anticipated street improvements/restrictions

- Topographical constraints

- Soils

- Availability, capacity, and inverts for utilities

- Water

- Sewer

- Gas

- Electric

- Telephone

- Storm drainage

- Off-site requirements for street or utility work

### o GOVERNMENT REGULATIONS

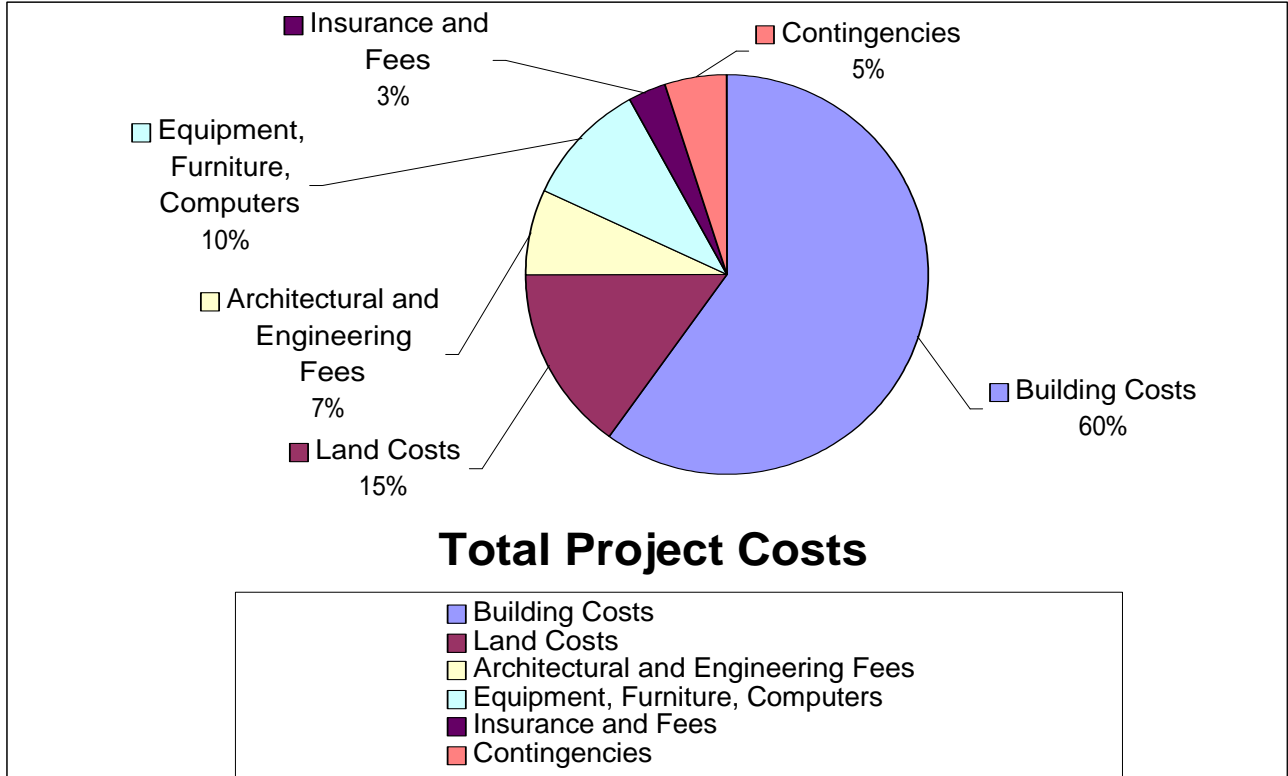
- Zoning of property and adjacent properties

- Restrictions for shelters

Anticipated changes in zoning or planning districts  
Development fees

o SPECIAL CONSIDERATIONS

Adjacent property owner or tenant opposition  
Neighborhood opposition



# LISTING OF POSSIBLE PROJECT COSTS

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## I. Pre-design Services

- A. Site Selection Studies
- B. Concept Plan
- C. Legal Fees
  - 1. Site Acquisition Negotiation
  - 2. Contract Review
- D. Environmental Studies
- E. Survey (Meets and Bounds, Improvement, Topo)
- F. Title Commitment
- G. Planning and Zoning Review and Application
  - 1. Filing Fees
  - 2. Consultant Coordination
  - 3. Legal Fees
- H. Ground Costs

## II. Financing / Fund raising

- A. Capital Campaign
  - 1. Staff
  - 2. Advertising
  - 3. Consultants
- B. Government Sponsored
  - 1. Legal
  - 2. Origination Fees

## III. Site Costs

- A. Soils Report
- B. Additional Hazardous Waste Studies
- C. Improvements to Right of Way
- D. Development Fees
- E. Tap and Utility Fees
  - 1. Water
  - 2. Gas
  - 3. Electric
  - 4. Sewer
- F. Utility Upgrade Costs

## IV. Site and Building Costs

- A. Site Development Costs
  - 1. Landscape Costs
  - 2. Fencing and Screen Walls
  - 3. Site Demolition
- B. Building Construction Costs
- C. Building System Equipment

1. Emergency Generator
  2. Cremation Equipment
- D. Building Department Application

1. Fees
  2. Consultant Coordination
- E. Builder's Risk Insurance
- F. Owner Required Testing and Coordination

- G. Design Fees
1. Architectural
  2. Structural
  3. Mechanical
  4. Electrical
  5. Interiors
  6. Landscaping
  7. Civil Engineering

V. Equipment

A. Veterinary Equipment Built-in

1. Surgery/Exam Lights
2. Tub/Tables
3. Cages and Runs
4. X-Ray Equipment
5. Other

B. Veterinary Medical Equipment

1. Lab/Processing
2. Surgical
3. Dental
4. Prep
5. Other

C. Telephone and Communication Systems

D. Computer Systems

E. Other

VI. Furnishings

- A. Furniture
- B. Signage
- C. Educational Systems
- D. Retail Display

VII. Relocation Costs

- A. Moving
- B. Transition Costs

## **MATERIALS**

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Selecting materials and finishes for your shelter is an exercise in balancing appearance with initial cost, life cycle cost, and durability. When looking at appearance, consider what colors, textures, patterns, and sizes are available.

The perfect surface would have these characteristics:

- Pleasing visual impact.
- Durable.
- Easily cleanable.
- Resilient.
- Nonabsorbent to liquids and odors.
- Prevents microbial growth.
- Sound absorbent.

No single material is appropriate for use in all areas of your shelter, and no material is a top performer in all of these categories, so choosing the “best” surface is a matter of balancing the requirements for specific areas with the cost and performance of available materials

When considering cost, look at the initial cost of the product, the cost of installation, the cost of maintenance over time, and the cost of replacing a less expensive product when it reaches the end of its life cycle. For example, vinyl tile can be purchased and installed for as little as \$1.50 per square foot, while porcelain tiles cost in the \$10.00 per square foot range. Once the overall maintenance costs for stripping, refinishing, and buffing the vinyl floor is factored in, the cost differential can be offset in approximately five years, with the added benefit of having a durable and attractive floor that can last as much as three times as long. Frequently lost in the desire to keep initial construction costs low are the long-term expenses involved in cleaning and maintenance.

Of course, there is the other side of life cycle cost analysis: if you can't afford the initial cost of a material, it really doesn't matter how good the material is.

The following materials list briefly reviews some of the advantages, disadvantages, and costs of some of the materials we recommend for animal shelters.

### **Flooring Materials**

Quarry and ceramic tile is a very durable and “dressy” material for the front of the facility and can be used throughout if desired. When selecting tile, check for slip resistance, make sure that the sub floor does not flex, consider using darker grouts, and use tiles that don't need waxing or sealing. We typically recommend epoxy grout, but make certain that the tile installer has experience working with it.

Cost: Quarry Tile	\$3.35 to \$7.00/sq. ft.
Porcelain Ceramic Tile	\$3.25 to \$12.00/sq. ft.



VCT (Vinyl Composition Tile) is a good all around, inexpensive, and durable material. It typically comes in 8" x 8" or 12" x 12" sizes and is available in "designer" colors. While a practical material in the general service areas of a shelter, it is not appropriate for animal holding areas. Frequent waxing is required to keep joints sealed, since the joints cannot be heat or chemically welded. The base cannot be coved.  
Cost: \$1.25 to \$1.50/sq. ft.

Sheet vinyl is very durable and easy to maintain. Seams can be heat welded or chemically bonded, and the base can be coved as high as desired for a seamless joint. Use commercial grade, homogeneous PVC that has no specific wear layer. Since adhesives are not what they once were, be very cautious to test the moisture content of concrete slabs, make sure that installers follow the manufacturer's recommendations, and be sure that you understand the warranties.

Cost: Higher quality \$3.50 to \$4.50/sq. ft.

Medium quality \$2.75 to \$4.00/sq. ft.

Lower quality \$1.85 to \$2.25/sq. ft.

Liquid applied epoxy and MMA (acrylic resin) flooring is very durable and easy to clean, although fairly expensive. Surface preparation is critical and experienced installers are recommended. Color, slip resistance, and thickness can be difficult to achieve.

Cost: Liquid Applied Epoxy \$6.00 to \$8.50/sq. ft.

Acrylic Resin \$7.50 to \$10.50/sq. ft., about 25% more than liquid applied epoxy.

Exposed concrete slabs in runs, wards, and utility areas are very affordable and durable. It is strongly recommended to seal the concrete rather than paint it, because the sealer actually bonds with the concrete. Liquid applied sealers are inexpensive and easy to apply, but need to be reapplied every six months. Concrete slabs can be dressed up by ordering the concrete with an integral color or by staining the concrete once the slab is installed. Staining requires a sealer for protection.

Cost: Basic sealed concrete \$4.00/sq. ft. installed, sealing is negligible

Sealed with integral color \$1.00 to \$1.50/sq. ft. more

Stained and sealed \$1.50 to \$2.00/sq. ft. more

## Interior Wall Finishes

Flat latex paint can be used where cleaning is not critical. It hides imperfections and has a warmer feel than glossy paints. Washable latex paint can be washed, but not scrubbed, and is good for most working portions of the hospital. Alkyd (oil) enamel paint should be used where a higher durability finish than latex paint is required. Epoxy paint should be used in animal holding and in other high-maintenance, high-moisture areas.

Glazed concrete block is very durable, dressy, and relatively maintenance free. It works well in ward and run areas. It costs more than exotic paints and epoxies, but it is significantly more durable.

Cost: \$12.50/sq. ft., about two times more than painted block.

Glass block is a low-maintenance material that can contribute light, warmth, and a feeling of openness for runs and in walls. It must be set in frames and/or reinforced for application in runs. Glass block is also quite expensive, with installed costs in the \$20.00 to \$25.00/sq. ft. range.

Ceramic tile is predominantly used for backsplashes, shower enclosures, and occasionally applied to block in wards and runs. Install over "tile-backed board" or water-resistant gypsum board or a stable masonry surface such as concrete block.

Cost: \$2.20/sq. ft. for basic white on up.

There are two grades of vinyl wall covering. The first is typically used in the client areas as a decorative accent or in lieu of paint. Choose commercial grade, anti-microbial, washable brands. The heavy-duty grade vinyl wall coverings are very durable.

Cost: \$1.00 to \$4.00/sq. ft.

Kydex is an acrylic PVC sheet in rolls designed for heavy duty wall protection. The material is easy to maintain and comes in a wide range of colors.

Cost: \$4.00/sq. ft. for .040" (1/16") thickness.

FRP (Fiberglass Reinforced Plastic) is used in commercial kitchens and bathrooms. It is virtually indestructible, water resistant, and inexpensive. The weak point in using FRP as a wall surface is the water resistance of the plastic channels used around the edges and between panels.

Cost: \$2.00/sq. ft. for basic pebble finish.

## **Ceiling Finishes**

Painted drywall ceilings can be used in most locations and have a nicer appearance than ceiling tiles. However, drywall has almost no sound absorption qualities, and offers less accessibility to spaces above the ceiling.

SAT (Suspended Acoustic Tile) is economical and offers good sound absorption qualities. It typically comes in standard 2' x 4' tiles, although dressier 2' x 2' and high-profile tiles are available. For moist areas, specify cleanable tiles that are foil wrapped or ceramic bonded.

Cost: \$1.00/sq. ft. for standard 2' x 4' tiles

\$1.25 to \$2.50/sq. ft. for fancier tiles

\$1.75 to \$2.25/sq. ft. for "cleanable" clean room and mylar-faced tiles

\$3.00/sq. ft. for theme tiles

## **Counter Materials**

Plastic laminate is affordable, easy to install, and is available in a very wide range of colors. In most cases it is durable, but it can chip, scratch, and peel.

Cost: \$30.00/sq. ft. for plain, standard colors, \$40.00/sq. ft. for fancy colors and patterns

Add \$4.00/sq. ft. for chemical-resistant laminates

Solid surface and solid surface veneer (SSV) has a dressy appearance with no exposed joints. With this material, it is possible to install integral sinks. It is expensive and vulnerable to strong cleaning agents.

Cost: \$55.00 to \$75.00/sq. ft. for ½" thick solid surface material

\$32.00 to \$40.00/sq. ft. for 1/8" thick solid surface veneer

Stainless steel is durable, easy to clean, and appealing. However, it is expensive, it can scratch, and it can be cold, both in appearance and to the touch.

Cost: \$80.00/sq. ft. and up

## **Final Words**

Always follow manufacturer's recommendations for installation and maintenance of all materials. This is very important for the warranty of the product and for your own satisfaction. Be sure that you fully understand both manufacturers' and installers' warranties. Use commercial-grade products. Talk to people in other animal shelters who have used the products you are considering. Investigate the advertising claims of a product to see how these claims compare to its actual performance.

Building materials are introduced every day claiming to be the revolutionary solution to the problem. Some may fit that bill, but be careful to invest the time and effort to follow through on who is using them, where they are used, in what applications they are being used, and if the installer and manufacturer will stand behind the materials and installation.

# HVAC, ODOR, AND NOISE CONTROL

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Imagine an animal shelter where your ears didn't ring with the sound of barking dogs and the air smelled fresh. It's possible! Using proven methods of sound control in concert with a well-designed mechanical system and a sanitary environment can help reinforce a positive adoption experience.

HVAC (Heating, Ventilation, and Air Conditioning)

The goal in designing an effective HVAC system is to create a comfortable working environment. A comfort zone includes the following elements:

1. A room temperature of 72 to 78 degrees.
2. Twenty to sixty percent humidity.
3. Six to twelve air changes per hour.
4. Air velocity at head level of 10 to 50 feet per minute (a special issue in animal habitats).

To maintain the comfort zones for particular areas in your shelter, you should meet these requirements:

5. Public areas: Provide a minimum of six of eight changes per hour, with slightly positive pressure.
6. Adoption, relinquishment, lost and found, holding areas, grooming, and isolation: Exhaust should be 110 percent of air supplied to maintain negative pressure. Provide ten air changes per hour.
7. Veterinary care: Provide a minimum of six of eight changes per hour.
8. Surgery: Air supply should be 110 percent of exhaust to maintain positive pressure. Provide 95 percent filter for supply duct.

A variety of systems can accomplish this comfort zone. In an animal shelter, a forced-air system works best. This system can respond to your needs more quickly and help control odors more effectively than a radiant heat system.

## **The Run Environment**

Typically, it is required that you exhaust a tremendous amount of the air from the run area. Finding an efficient, cost-effective way to condition this air is imperative. Some alternatives to the typical forced-air system include:

9. Radiant heat flooring: Use either low-voltage electric or hot water piping. It's a good system for runs because floors dry more quickly during cleaning.
10. Air-to-heat exchanger: A relatively expensive process for reclaiming the heat or air conditioning from the used air before it is exhausted. The exchanger effectively preheats/cool the new air as it is drawn into the system.

## **Environments for Exotics**

With increasing frequency, shelters are creating special environments for housing exotics. Exotic wards often require special venting and additional heat. Using a radiant

ceiling panel or wall unit will add the required heating capacity. A "reheat coil" set into the duct that supplies the exotic environment offers another way of providing custom heating for this species-specific area.

## **ODOR CONTROL**

Odors arise in dirty or damp environments. To isolate odors, you should divide your shelter into mechanical zones that correspond to your functional modules. Separate air handling units, including heating and cooling, should service these zones. Each zone should have its own supply and return so that air from one zone doesn't cross into another.

Air pressure separations isolate odors. If you exhaust more air in the animal habitats than you put in, you create a negative air pressure. And, in the public zone, if you put more air in than you exhaust, you create positive pressure. The positive air pressure in the public zones keep the odors trapped in the negative pressure animal habitats.

Exhaust fans play a significant role in creating the negative pressure zones, particularly in the animal areas. By using exhaust fans, you can typically vent 120 percent of the air that you put into the animal areas.

Effectively exhausting air from your shelter is probably the single best thing you can do to control odors and to decrease drying time in the runs. It is often a good idea to install a high-volume exhaust fan to be available in the animal areas for "emergency" situations.

Odor control can be best accomplished by eliminating the source. Frequent cleaning of the runs 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. High-pressure washing systems with flow-monitoring injection pumps for chemical disinfectant are extremely efficient for cleaning animal holding areas. Valves control the flow of fresh rinsing water and water containing disinfectant. Quick disconnects used with spray wands or hose reels mounted from the ceiling make the system easy to use.

## **Animal Enclosures**

A major consideration in evaluating which run enclosure is best for your shelter should not only be ease of cleaning, but also how thoroughly the enclosure can be cleaned.

Concrete-block runs. Concrete-block runs are durable and easily cleaned when filled and painted with epoxy paint. These are quieter than modular metal or fiberglass runs. In addition, concrete block provides a relatively inexpensive solution for separating adjoining runs. A variation of the concrete-block approach is to cover the surface of the demising wall with ceramic tile. This technique combines the durability of a concrete wall with a dressier finish. To ensure a well-finished look, trim and bullnose pieces should be used at all corners, top edges, and the base of the wall.

Another way to use ceramic tile on a concrete-block substrate is to use "glazed concrete block," in which a heavy ceramic glazing is integrally attached to an ordinary concrete block through a sophisticated firing process. Although expensive, the finished product is quite durable and easy to clean. Glass block also works well in run enclosures to

create a more friendly environment. Cleaning characteristics are similar to glazed block.

Modular runs. Generally, modular runs consist of an aluminum or stainless-steel frame with solid in-fill or cage "rod" in-fill panels. The metal frame and in-fill system usually looks nicer than a concrete-block run. The panels can vary in color and configuration to provide visual variety. The system easily combines with raised-flooring systems to keep dogs off the run floor. Care must be taken during installation to seal hidden surfaces.

Panelized kennel fencing. One of the oldest and most-effective methods, the panelized fencing system combines a smooth chain link with a galvanized metal frame that is smaller than that commonly found in chain-link cyclone fencing. Unlike typical chain link, the fabric of the panelized system doesn't have any burrs, because the material is electro-galvanized, not hot-dipped. Furthermore, dogs can't climb it as easily as chain link, because the gauge, or thickness, of the wire is smaller and the spacing of the mesh tighter. Finally, the fabric is laced to the framework more tightly than chain link and is flush-welded without hub connections, which prevents dogs from getting caught on the edges. Fencing can be more difficult to clean than solid walls.

#### Drainage systems

The most contentious aspect of constructing a dog run is likely to be the drainage system. An effective system makes the runs easy to clean, using minimum staff time and effort. Possibilities include:

Single drains in each run. This is the simplest solution and, in shelters with fewer than a dozen runs, is often the least expensive. Generally, you set the drain in the center of the run at the back and slope the floor a minimum of 1/4 inch per foot to the drain.

Unless you're using a raised-flooring system, consider installing grates or covers over the drains to keep dogs from stepping into them. This specification requires that your staff pick up any solid waste before washing down the run.

A trench drain behind the run. One of the more recent innovations locates the two-foot wide trench drain, equipped with a flushing floor drain, behind the runs. All runs drain into this trench. For cleaning, your staff accesses the trench through the end runs in the bank of cages. Generally, no more than ten runs should face on a trench.

The flushing floor drain in the trench presents a unique advantage. A small water line is stubbed into the floor drain. When solid wastes need to be washed down the drain, you simply open a valve. Although the floor drain can be expensive, it is an effective system provided you specify an adequately-sized line and use a "ball valve," which can be opened quickly.

A trench drain in the run. Here, a floor drain is located in the trench that runs through the back of the runs, offering a more space-efficient solution than a drain behind the run. Like the flushing floor drain system, a water line is stubbed into either end of the trench, so that you can flush the trench itself.

To minimize cross-contamination between runs with this method, install a grate or raised-floor system to keep dogs out of the trench. Or, you might consider covering the trench with a raised-floor sleeping bench at the back of the run.

The concrete subcontractor forms the trench, or you can specify a prefabricated corrosion-resistant polymer concrete unit and grate. Either way, the trench usually is located at the back of the run, allowing a staff member standing in front of the run to "chase" the wastes into the trench.

## **NOISE CONTROL**

Controlling noise is a significant issue, not only for the comfort of the staff, public, and the animals, but it can also be a legal concern. OSHA has specific standards for noise abatement in the workplace with which few shelters comply. Methods of combating noise pollution are Absorption, Isolation, Dissipation, and Masking.

### **Absorption**

The way to absorb sound is to use porous, sponge-like materials. Carpet, drapery, foam rubber, acoustic ceiling tile, and sprayed-on fibers are all sound-absorbing materials. They have a high NRC (Noise Reduction Coefficient). For example, a concrete floor has a NRC of .005, whereas carpet has an NRC of about .75. This means the carpet, in relative terms, absorbs 75% of the noise that hits it.

Other sound-absorbing materials that could be used within a boarding area where durability and cleanliness are an issue might be:

- mylar-faced ceiling baffles - NRC 0.95
- quilted blankets/banners hung from ceiling- NRC 1.10
- fabric-wrapped wall panels - NRC 0.90
- sound block (concrete block with slots and foam inside) - NRC 0.35

### **Isolation**

The second step in controlling noise is isolating it within a specific area with a wall or ceiling assembly that has a high mass. A wall material or assembly that is effective at dampening noise is said to have a high STC (Sound Transmission Coefficient). For example, a typical gypsum board partition built on 2 x 4 wood studs has a STC of approximately 34. This means that the wall effectively keeps 34 decibels of sound from being transmitted through to the other side. Increasing the mass by doubling the layers of gypsum board on each side increases this same assembly to STC 45. If we then add 1 ½ " sound batts between the studs, we can then increase the STC to 53. The practical limit to cost-effective STC wall assemblies is approximately 65. Some typical wall and ceiling assemblies with their STC rating are listed below:

11. 3 ½" steel stud wall with gypsum drywall both sides - 47 STC
12. 3 ½" steel stud wall with one layer gypsum one side, two layers on the other side - 51 STC
13. 6" concrete block wall - 44 STC
14. 6" concrete block wall with the block filled with sand - 47 STC
15. two wythes (layers) of 4" brick with plaster - 59 STC

In addition to creating a barrier with mass, it is also important to watch out for "sound leaks" and "tracking of sound". "Sound leaks" occur when you have holes in your wall or ceiling barrier, or when the wall assembly is incomplete. Windows with an STC of 26 perform like a hole in your acoustic wall. Hollow core wood doors are also tremendous

“leaks”, with an STC rating of 19. Other leaks include electrical outlets that are back to back in the wall and mechanical ducts that penetrate acoustic wall assemblies. Incomplete assemblies occur when your barrier, whether it be wall or ceiling, does not reach all the way to the outside enclosure of the building. A good example is a massive wall assembly that reaches only up to the ceiling. In this case, the sound “flanks” by going around the wall, up and through the ceiling, and back to the space on the other side. The following describes some ways you can “plug” sound leaks:

**Windows** - By using double panes of glass separated by at least 4" of air space, you can increase the STC rating of a window to 43. Be sure to caulk the glass into place and, if possible, use two different thicknesses of glass, such as ¼" and 3/16", so they won't vibrate in unison.

**Doors** - Use tight-fitting, solid core wood doors or hollow metal doors with insulation. Weather strip the doors, and on interior doors, add an “automatic door bottom” that extends the weather stripping down to the threshold when you close the door. Avoid double swinging doors because they are very large sound leaks.

**Wall Assemblies** - Caulk around the perimeter of wall assemblies and around wall outlets, and be sure the wall assemblies fit tight to adjacent surfaces.

**Duct Penetrations** - If you have to penetrate an acoustic wall with a duct, have the duct zigzag to create a sound trap. Also, if you build a boot around the zigzag with sheet lead, you will better isolate the noise.

Sound will “track” when the sound vibrations in one material can be transmitted through contact into the adjacent material, and thereby through the total wall assembly. One of the best ways to break the “tracking” of sound is by inserting an airspace between materials. A resilient material will also act like an air space, or miniature shock absorber, between adjacent materials. Some STC ratings for typical wall assemblies with different forms of airspaces are listed below:

16. double layer of drywall each side on two separate stud walls 1" apart - 56 STC
17. single layer drywall each side on staggered 2 x 4 studs on a 6" stud plate - 46 STC
18. 6" airspace added to any assembly - 8 STC

Some examples of resilient materials that can be used to break the sound “track” are listed below:

**Resilient clips** - Spring metal clips that are mounted between layers of gypsum board, creating an additional STC gain of approximately 10 STC.

**Ceiling Isolators** - Spring hangers that can be used to hang a ceiling and isolate any vibration.

**Foam Spacer** - Mounted between the drywall and the studs.



**Barrium Loaded Vinyl** - A heavy-duty rubber sheet that has both mass and resiliency sandwiched between multiple layers of drywall in a wall or ceiling assembly; it will markedly increase the STC.

**Dissimilar Materials** - Instead of using two layers of drywall with the same reverberation frequency in a wall assembly, use a layer of plywood and a layer of drywall. They have different natural “harmonic oscillations”, cutting down on the transmittance of sound.

#### **Dissipation**

Probably one of the most effective ways to control sound is one of the simplest. In a non-reverberant situation, i.e. in the outdoors where the sound does not typically bounce off of anything, sound dissipates quickly. In fact, once you are more than approximately four feet from the sound source, the sound level declines by six decibels with each doubling of distance from the source.

#### **Masking**

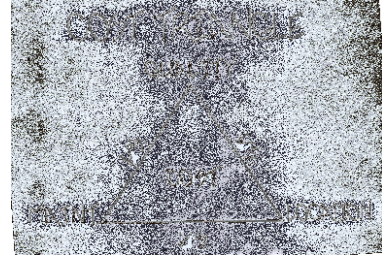
This brings us to one of the most overlooked ways to control sound: masking the noise. You can mask the noise that leaks through a wall assembly by covering it up with another more pleasant sound. Specifically, if you have noise from barking dogs, penetrating to the client areas of your shelter, you can overlay it with Muzak and make the barking less noticeable. Because sound adds logarithmically and not arithmetically, the combined sound level of the barking dogs and the Muzak is not twice as loud as the barking. The Muzak effectively covers the barking without significantly increasing the sound level.

#### **Summary**

A successful shelter creates a pleasant environment for the animals, the public, and the staff. Controlling noise and odor play a significant role in the design of an adoption-friendly facility. Although there are costs associated with adding capacity to mechanical systems and installing sound-deadening materials, much can be done during the initial planning stages to increase the practical performance of your shelter.

# MATERIALS SUPPLIERS

When choosing materials remember the **Cost Triangle:**  
**Quality vs. Maintenance vs. Location**



## FLOORING MATERIALS

### Porcelain Tile

\$ Suppliers:  
American Marazzi Tile  
[www.marazzitile.com](http://www.marazzitile.com)  
Graniti / Fiandre ([www.granitifiandre.com](http://www.granitifiandre.com))  
American Olean Tile Co. (214/398-1411)

### Quarry Tile

\$ Suppliers: American Olean, Dal Tile, Lafaenza, Florida Tile, and Buchtal, among others

### Ceramic Tile

\$ Suppliers: American Olean, Dal Tile, Lafaenza, Florida Tile, and Buchtal, among others

### Grouts

\$ Suppliers: Latapoxy SP100 Epoxy Grout, Laticrete Adhesive #4237, and Mapei Karapoxy ([www.laticrete.com](http://www.laticrete.com))

### Resinous Flooring

\$ Suppliers:  
Dex-O-Tex, Cheminert, Neotex ([www.dexotex.com](http://www.dexotex.com))  
Dur-a-flex, ([www.dur-a-flex.com](http://www.dur-a-flex.com))  
Silikal Resin Systems, ([www.silikalresins.com](http://www.silikalresins.com))  
Garon (800/631-5380) has a complete catalog of epoxy coatings and sealers.

### Vinyl Composition Tile

\$ Suppliers: Armstrong, Azrock and Tarkett.(see below)

### Sheet Vinyl

- Suppliers: Armstrong C Medintech or Crosswalk ([www.armstrong.com](http://www.armstrong.com))  
Forbo C Smaragd ([www.forbo.com](http://www.forbo.com))  
Tarkett CGranit Acoustiflor ([www.tarkettusa.com](http://www.tarkettusa.com))

### Terrazzo

\$ Vendors have products like Dex-a-Tex, a plastic epoxy poured terrazzo-type product that is far less expensive than real terrazzo, yet is as durable.

### Carpet

## KENNEL OR DOG HOUSING MATERIALS

### Flooring Materials

Resinous Flooring (See above)  
Concrete Sealers, Colors and Hardeners  
Integrally colored concrete:  
Suppliers:  
True Tone Cement Colors (Davis Colors)  
Solomon Grind (Chemical Service)  
Nonmetallic Grit:

Supplier: The Burke Company

Dry Shake, Nonmetallic Hardeners:

Suppliers:

Dry Shake (Sonneborn)  
Colorcron (Master Builders)  
Tnemec

### **Wall Materials**

Glazed Concrete Blocks or Glazed Brick

• Suppliers:

Stark Ceramics, Canton, OH  
Elgin-Butler  
Astro Glaze or Habco Glaze Products (Tenwith Indus.),  
Emigsville, PA  
Hanley Brick, Summerville, PA  
Spectra Glaze, The Burns and Russell Company

Glass Block Walls

• Suppliers: Altemp Co. (Amiran)

Fiber Glass Wall Board

§ Suppliers:

Glassbord (Crane, Dyrotech Industries)  
Glasboard (Kemlite)  
Dipcraft MFG (Braddock, PA)

### **CAGES AND MODULAR KENNEL SYSTEMS**

• Suppliers

Cedar River (800/323-4858, [cedarriverlaboratories.com](http://cedarriverlaboratories.com)) Modular system  
Clark Cages (800/461-9972, [www.clarkcages.com](http://www.clarkcages.com))  
Horst Company (800/221-4724, [www.horstcompany.com](http://www.horstcompany.com)) Modular system  
J.R. Kennel Manufacturing (937/780-6104) Galvanized system  
LGL Animal Care Products (979/775-1776, [www.lglacp.com](http://www.lglacp.com)) Stainless steel system  
Mason Co. (800/543-5567, [www.masonco.com](http://www.masonco.com)) Galvanized system  
Shor-Line / Schroer Mfg, Co. (888/551-4064, [www.shor-line.com](http://www.shor-line.com)) Stainless steel system  
Snyder Manufacturing (800/422-1932, [www.snydermfg.com](http://www.snydermfg.com)) Aluminum system  
Suburban Surgical Co. (800/323-7366, [www.suburbansurgical.com](http://www.suburbansurgical.com)) Stainless steel system  
T Kennel System (800/377-7103, [www.t-kennel.com](http://www.t-kennel.com)) Galvanized system  
Tristar Metals, Inc. (877/459-7827, [www.tristarvet.com](http://www.tristarvet.com)) Stainless steel system

### **ACOUSTICAL MATERIALS**

#### **Sound Block**

§ Manufacturers: SoundBlox, Sound Cell, Trendstone / Acousta-Wall

#### **Acoustical Decks**

§ Most deck manufacturers fabricate decking

#### **Acoustical Plasters**

\$ Manufacturers: Pyrock; 3-M acoustical spray

### **Wall Carpet**

### **Sound Absorbing Wall Panels**

\$ Suppliers: Soundsoak (Armstrong)  
Softscape, Capaul, Acoustiflex Corp.  
Acoustone Space Units, US Gypsum  
Silent Auratone Panels, US Gypsum Company

## **PAINTS/COATINGS**

### **Chlorinated Rubber/Alkyd Enamel Paint:**

\$ Supplier: Lindsay Finishes Inc.

### **Epoxy Paint:**

\$ Suppliers: Tile & Epoxy Coating  
Porter International  
Tile Clad II (Sherwin Williams)  
Try-Glaze 4, Gloss or Semi-Gloss (Moore)

### **Corner Guards**

\$ Suppliers: Acrovyn, Construction Specialities, Inc. (www.c-sgroup.com)  
Tepromark, Tepromark International

## **CEILING FINISHES**

### **Painted Drywall**

### **Suspended Acoustical Tile**

• Suppliers: US Gypsum Company, Owens Corning, Celotex, Armstrong

## **SPECIAL SYSTEMS OR EQUIPMENT**

### **Incinerators C Crematoriums**

\$ Suppliers: Industrial Equipment & Engineering (800/327-2831)  
Crawford Equipment & Engineering (800/228-0884)  
Shenandoah (800/476-7436)

• Note: Do not forget, most of these vendors will guarantee local environmental clearance as part of the sale. Make them put the guarantee in writing!

### **Floor Drains Systems**

#### **Flushing Floor Drains:**

The Sani-Ceptor R-type flushing floor drain is the most commonly used drain. It is 14 inches in diameter with a hinged, perforated grate cover. The inside of the drain is porcelain enamel. The important benefit of this drain is that it can be flushed from controls on the wall so solids can be forced out of the system, which includes out of the P-trap.

#### **Trench Drains:**

Hydraulic Trench Systems, such as those from ACO Polymer Products (800/543-4764) or Polydrain Trench Drain System (800/438-6057), have been used successfully in canine runs. These can be installed for each individual run so cross-contamination is eliminated.

#### **Individual Kennel Drains:**

Separate drains in each run are an alternative that reduces the chance of cross-contamination and eliminates the mechanical parts of the above system. Six-inch diameter drains are the smallest indicated unless ALL solids are to be collected before washing the run; with a solid-removal program, four-inch drains are usually adequate. A drawback is the stall washes to one small target.

Drain Covers:

Materials include plastics to stainless steel with stainless preferred.

### **Grinder Pumps**

Set up for individual run collectors or larger for common interceptors.

### **Plantings**

Don't forget plantings; they add color, help with acoustics and scale, and provide comfort for animals and people.

### **Glass/windows**

Adds more light, opens facility and allows viewing of and by dogs.

Note: As with all such information, manufacturer's names, phone numbers and E-mail addresses are guaranteed to change!

Sources:

*Design Starter Kit for Veterinary Hospitals*. American Animal Hospital Association. 3<sup>rd</sup> ed. Denver, Colorado, 1996.

*Shelter Pages 2004, Animal Sheltering Magazine*: The Humane Society of the United States, Washington, DC, 2004.

*Sweet's Catalog File*. McGraw-Hill Construction Information Group. New York, NY: McGraw-Hill Companies, 2005.

# Design and Construction Project Useful Definitions

These definitions are intended to provide rudimentary information about the professionals or processes commonly encountered during a design and construction project.

## Design Consultants

*Acoustical Consultant* - state licensed consultant who is qualified to test noise levels and design or recommend design features that will moderate ambient, external or internal noise levels.

*Architect* - state-licensed consultant who is responsible for the design and coordination of the overall project including site, building and systems. The project architect will serve as the interface between the Owner, consultants and outside agencies.

*Architectural/engineering Consultant* - design consultant, usually licensed, who has special knowledge of and experience with specific building types or systems required for a project, e.g. swimming pool engineer.

*Civil Engineer* - state-licensed consultant responsible for a project site design including drainage, water management, paving, roadways and utilities related to the project. The civil engineer does not design electrical service or landscaping. On larger projects, this engineer is responsible for assisting in the site master planning including traffic flow.

*Cost Estimator* - consultant qualified to review the design documents and prepare Statements of Probable Construction Cost based on project type, prevailing materials costs and labor conditions of the project location. This consultant may also provide value engineering, review construction schedules, pay requests and contractor Change Orders.

*Designer/Computer Drafter* - individuals of widely varying degrees of skill who work under the direct supervision of a licensed architect or engineer to design portions of a project. While manual drafting is still used in some cases, most projects are now designed and drafted with the aid of computer programs such as CADD (computer aided drafting and design). Some advantages of computer drafting are greater accuracy in the construction documents, easier redesigns, direct communication with engineering consultants and files management. Disciplines often digitally transfer current drawings to each other via the internet.

*Electrical Engineer* - state-licensed consultant responsible for all electrical (power and lighting) including site designs for the project; concerned with all communications including telephone and computers, television and power generation, etc.

*Environmental Consultant* - a variety of usually industry certified or state-licensed consultants qualified to study, recommend, design and perform remedial work concerning a myriad of environmental tasks such as wetlands mitigation, endangered flora and fauna on a site, chemical/fuels contamination or asbestos and lead-based paint abatement.

*Geotechnical Engineer* - state-licensed consultant responsible for testing and determining soil and sub-surface conditions. These test results help determine building placement as well as foundation and pavement design. Investigation may further define environmental and hidden conditions.

*Landscape Architect* - state-licensed consultant responsible for the landscape design, plantings, and irrigation system and site permitting. This consultant may also become involved with site amenities including lighting, furnishings, accessories, etc.

*Mechanical Engineer* - state-licensed consultant responsible for all the mechanical systems such as HVAC (heating, ventilating, air conditioning) systems. This consultant is often the plumbing engineer, too.

*Project Manager* - depending on the nature of the project, either an architect or engineer is responsible for the overall coordination of the entire project and interfaces with the client, design team, specialists and construction professionals. This person is usually responsible for the overall success of the project.

*Plumbing Engineer* - state-licensed consultant responsible for the plumbing and fire suppression systems and may include the water supply, waste water and storm water systems, etc.

*Roofing Consultant* - qualified, and often industry-certified, consultant who evaluates, recommends, designs and reviews the construction of roofing systems for structures. This consultant often involved in renovations and remedial projects.

*Structural Engineer* - state-licensed consultant responsible for the structural infrastructure of a building including foundations, wall construction, roof framing, etc. conforming to all code requirements including wind and hurricane and snow loads.

*Surveyor* - state-licensed consultant responsible for establishing site boundaries including legal descriptions, set backs, easements, etc., existing and new building locations, elevations (grades), utilities, wetlands, trees, etc.

## **Design Phases**

*Programming* - this phase determines both internal and external spaces required for the project. This may include the size, location, relationship to other spaces, furnishings, equipment, and all other support information.

*Schematic* - this phase develops the program into a two or three dimensional graphic format. Scale is developed, relationships are further refined, systems are reviewed and materials are evaluated. Basic costs are established.

*Design Development* - this phase refines the schematic phase and establishes in graphic and written format, the entire building including plans, elevations, systems, materials, equipment, etc. A more detailed Statement of Probable Construction Cost is provided.

*Construction Documents* - this phase sets forth in both graphic and written format the construction documents for both bidding and construction. This is the culmination of the

design process. A comprehensive Statement of Probable Construction Cost is provided.

*Bidding* - during this phase contractors review the contract documents and contract requirements and submit a fee proposal to complete the construction. This usually includes both cost and construction schedule. The architect is responsible for plan interpretation, clarifications, bid review and recommendations.

*Construction* - this is the time where the successful bidder is contracted to complete the construction of the project.

## **Construction**

*General Contractor* - this entity is responsible for the overall construction of the project including coordination of the sequence of work, sub-contractors and schedule. The contractor is legally contracted with the Owner, not the architect.

*Sub-contractor* - this entity works for the prime contractor for specific areas of construction. The sub-contractor is legally contracted with the prime contractor.

*Clerk-of-the-Works* - responsible for documentation of the day-to-day construction activities, expedites official requests for information, proposals and change orders, verifies with the architect the accuracy of pay requests prior to submission to the owner, maintains clear and correct lines of communication between all parties, and coordinates move-in and close-out documents and any systems training. Clerks are present full-time on the construction site, may be an employee of the Owner or may be provide via contract with the architect. Because of cost, clerks are utilized most often on larger projects. In the absence of the full-time clerk, the architect, or representative from the design team, is usually required to be on-site on a weekly basis to provide construction observation.

*Building Inspector* - this representative of a local, state or federal entity responsible for reviewing the construction relative to the codes of his/her jurisdiction.

## **Project Delivery Methods**

*Design/Bid/Build* - this is the most recognized method of project delivery. The Owner selects a design entity to design the project to budget and the Owner's needs. The contract documents are then bid with the contract awarded to the most responsible bidder. The Owner then enters into a contractual relationship with the contractor. The architect and contractor do not have a contractual relationship. Advantages of this method are it is suitable for competitive bidding, has a system of checks and balances and insurance/bonding programs are well defined. Disadvantages include diffused responsibility and project delivery may be slow.

*Design/Build* - this method of project delivery is used when the Owner desires a single source of contact and responsibility. Both the architect and contractor act as a single contractual entity. The advantages for the Owner are time savings, earlier knowledge of firm costs and lower incidence of claims. Some disadvantages include Owner's loss of control, institutional barriers to procurement and licensing and elimination of checks and balances.



*Partnering* - this method of project delivery requires the owner to enter into contracts with the architect and contractor at about the same time. All three entities work together to establish the most cost effective project. This method endeavors to eliminate adversarial relationships.

*Construction Management (CM)* - a project delivery method where the Owner contracts directly with a Construction Management firm that in turn contracts with the trade contractors. The architect is contracted by the Owner. Advantages include preconstruction involvement, cost savings and better scheduling. Disadvantages of pure CM place too much risk and burden on the Owner while modified CM is not very different from design/bid/build.

# Role of The Architect in Project Delivery Systems

Planning and Building an Animal Shelter

HSUS Animal Care Expo 2002

Richard S. Bacon, AIA

Primary Design Advice: Have an architect on the design team who has recent design experience with animal sheltering facilities. Your geographical location, political situation and financing may dictate what role the architect will play in your design process. The three most common interactions we have encountered are the architect as prime consultant, the architect as owner=s representative and the architect as specialty design consultant.

## Architect as Prime Consultant - Architect is responsible for the entire design team

- ☞ Architect assembles team of architects, engineers and sub-consultants who may or may not be locally based.
- ☞ Be sure an architect on the design team has recent experience with that building type.
- ☞ Architect oversees all tasks related to the programming, design and production of contract documents. Some tasks, such as surveying and geotechnical or environmental testing which are usually done by the owner, can be assigned to the architect to manage.
- ☞ Architect=s role during construction may depend on the project delivery methods being used but usually the designer oversees construction for compliance with the contract for the owner.

## Architect as Owner=s Representative - Design contract with another architect

- ☞ As an owner=s representative, this architect=s chief role is to assure the building is designed and built to the owner=s specifications. He or she is hired by the owner.
- ☞ This is a good way to have outside expertise.
- ☞ This architect would be most involved during the programming and initial stages of design where floor plans, elevations, systems and finishes are first determined.
- ☞ He or she will step back during development of working drawings which is handled by another architect hired by the owner expressly to perform this task.
- ☞ The owner=s rep architect may be responsible for reviewing the plans and making periodic site visits during construction.

## Architect as Specialty Consultant to a Prime or Local Architect

- ☞ The specialty design consultant is hired by the architect, not by the owner.
- ☞ He or she will provide design expertise to the prime, usually a local, architect and may be involved during the schematic design phase and in recommending systems and finishes.
- ☞ It is up to the prime architect to decide what tasks the expert will handle, which means the expert may be used a lot or just a little.

## When Using a Municipal and Local Architect Without Shelter Design Experience

Sometimes circumstances dictate that the design process must be lead by an architect or engineer who has little or no knowledge about the complexities of an animal care or shelter facility. Your best line of defense is to EDUCATE, EDUCATE, EDUCATE yourself and that design professional about the special needs of a shelter. Here are some suggestions for dealing with this situation.

- 👉 Be honest and straightforward with your designer about your need for expertise and help the architect educate himself or herself about animal shelters.
- 👉 Take the architect on a tour of your facility and point out areas that are problems or are well designed.
- 👉 Take the design professional on tours of good, and bad, examples of other shelters.
- 👉 Use statistics and research to back up your requests for expert design assistance or equipment.
- 👉 Demonstrate through analysis and research how your operation will improve if you had better circulation, better ventilation, new kennels, etc.
- 👉 Use health and safety issues to your advantage. Would a properly designed shelter reduce workers compensation claims?
- 👉 Write your RFQ or RFP in such a way that design teams are required to include a shelter design consultant, only teams with shelter design experience will be considered or teams that have included experienced shelter design professionals are favored in the selection process.
- 👉 Hire a shelter design expert to do a feasibility study and make recommendations. You may be able to do this via a purchase order.
- 👉 Hire a shelter design expert to peer review your plans and make recommendations to your designer.
- 👉 Encourage, or require, your architect to attend seminars or training about shelter design.
- 👉 Nurture those supervisors, volunteers, board members or elected officials who are sympathetic to your cause about the special needs of shelter design.
- 👉 In the long-run, it may cost you more time, money and headaches to live with the mistakes or omissions of an architect without shelter design expertise that it would to have hired a specialist in the first place.

### Fee Structuring

- 👉 Hourly, with or without a fee cap
- 👉 Fee based on a percentage of the total construction budget, usually between 7% and 10% depending on the complexity of the project
- 👉 Lump sum fee based on a scope of services
- 👉 Allowance compensation

### Procurement Methods for Design Services

- 👉 Qualifications Based Selection / Fee Negotiated Based on Scope of Work or Percentage of Construction Cost (Preferred by design professionals over RFP. Costly and time consuming.)
- 👉 Fee Based Selection: Request for Proposals (RFP) / Defined Scope of Work / Fee Proposal (Least favorable method because there are usually too many unknowns for the design professional to provide a fair and adequate fee. Costly and time consuming method and may be illegal in your state due to competitive negotiation based on qualifications based selection.)
- 👉 Direct Negotiation with the consultant for a scope of work (OK method if the

architect or engineer is qualified to perform the work to be done. Least costly and time consuming but owner should request and check qualifications and references.)

## Resources

- ☞ American Institute of Architects, Washington, DC (local, state and national): <[www.aia.org](http://www.aia.org)>
- ☞ Design Build Institute of America, Washington, DC: <[www.dbia.org](http://www.dbia.org)>
- ☞ *Profile: The Architects Sourcebook*, published by Construction Market Data (CMD): <[www.cmdg.com/profile](http://www.cmdg.com/profile)>
- ☞ Building Product Information via *Sweet's Directory* (McGraw - Hill Construction Information Group <[www.mcgraw-hill.com](http://www.mcgraw-hill.com)>) <[www.sweets.com](http://www.sweets.com)>
- ☞ F.W. Dodge - *Dodge Report*, a division of McGraw - Hill, national network of publications of current construction projects and plan rooms used by contractors and sub-contractors to review plans for bid submittals. <[www.fwdodge.construction.com](http://www.fwdodge.construction.com)> and <[www.construction.com](http://www.construction.com)>
- ☞ There are many local and regional construction publications similar to *Dodge Report*

# Project Delivery Systems

Planning and Building an Animal Shelter

HSUS Animal Care Expo 2002

Richard S. Bacon, AIA

## All Methodologies Require

\$ Well defined need

\$ Planning

\$ Financing

\$ A designer

\$ A builder

\$ Some manner of control

## Design - Bid - Build

- Standard or traditional delivery method where the owner selects an architect; the architect prepares documents; the documents are bid out usually to general contractors; the contract is awarded to the lowest responsible bidder.

With the Design-Bid-Build method the architect designs the project to the owner=s budget and needs and the contractor builds the plans according to the plans using the fastest and most efficient methods.

- Pros
  - High comfort level
  - Suitable for competitive bidding
  - Built-in system of checks and balances
  - Established body of legal precedent
  - Insurance and bonding programs are well defined.
- Cons
  - Responsibility is too diffuse with contractor, architect and others having different agendas
  - Owner acts as traffic cop
  - Owner has exposure to contractor for adequacy of design
  - Project delivery may be slow
  - Cost savings are not always realized.

## Design - Build

- Design-Build is a system of contracting under which one entity performs both architecture/engineering and construction under one single contract. Use of this method is relatively new to public and not-for-profit sector owners but not to the industry as it is employed regularly in the commercial and private sectors.
- Pros
  - Single source of responsibility
  - Time savings through financing and savings
  - Creative design solutions due to collective effort
  - Owner is freed of responsibility for coordination

Owner avoids adversarial web of architect and contractor  
Costs savings through value engineering and/or feasibility studies  
Reduction of change orders.

- Cons

Unfamiliar with roles and responsibilities  
Institutional barriers: procurement and licensing  
Owner=s loss of control  
Less creative design due to cost control  
Elimination of checks and balances  
Insurance industry still developing necessary products.

- Design - Build Supervision

Contractor Led: This is the most common form and provides a single source of responsibility where the contractor is responsible for cost control and often leads the design effort. The design process is sometimes subservient to the budget to the point where the architect may not have his or her heart into the effort.

Architect Led: Provides a single source of responsibility where the architect leads the design effort and is responsible for cost control. The architect assumes greater risk for project costs and the contractor can still Ablame@ the design (architect) for cost overruns.

## Construction Management

- Types

Construction Management(Pure CM): With this method, a Construction Manager is hired to serve as an agent of the owner. The architect is hired by the owner to provide design services. The owner contracts directly with the trade contractors during construction of the project.

Construction Management(Modified): With the modified method the owner hires both the architect to provide design and a CM. However, the CM and not the owner is the entity that hires the trade contractors during construction.

- Pros

Preconstruction involvement may provide constructability review, cost savings and scheduling advantages  
Work can still be bid competitively among trade (often called sub) contractors

Cons

Pure CM places too much risk and burden on the owner  
Modified CM is not fundamentally different form Design-Bid-Build

## Partnering

Partnering is a method of project delivery that requires the owner to enter into contracts with the architect and contractor at about the same time. All three entities work together to establish the most cost effective project. This method endeavors to eliminate adversarial relationships. The owner should be very knowledgeable about the design and construction process.

- Pros  
Project is team effort and all parties know design and cost goals
- Cons  
The owner is on an equal level at the architect and contractor in lieu of using them as experts

## Procurement Methods

*Strategic Alliance/Sole Source:* This method is normally driven by a short deadline and an immediate need for expertise. The owner contracts without competition with designer, contractor, design/build firm or a construction manager. In the private sector there are few restrictions but governments are subject to constraints via public law. Control is determined by specifics.

*Qualifications Based Selection:* Normal procedure for government for design services where the owner requests qualifications for a defined project. Short lists are created and negotiation occurs for a reasonable price. For design/build, it may involve a best value. Control is determined by specifics.

*Best Value Procurement (RFP):* Method used for design/build where the owner provides some level of criteria. Selection is based on qualifications, technical expertise, project management and cost. Procurement is negotiated and money is normally left on the table.

*Low Bid (IFB):* This traditional method of facility acquisition is where the owner procures the final design and invites bids. Awards are to the bidder having the lowest cost offered and usually the designer oversees construction for the owner.

# BASIC MANAGEMENT OF ANIMAL HOUSING AREAS

The design of the animal shelter and how the agency manages the animals being cared for is critical to the overall operation and efficiency of the agency. For instance, without the ability to separate animals within the facility, a disease prevention plan and adoption plan is almost impossible to develop. One of the basic goals should be to reduce stress and disease transmission. Separation of the animals in the care of the facility in the following manner is critical:

- Dogs from cats
- Infectious from healthy animals.
- Aggressive animals from all others
- Nursing mothers and their young from all others
- Newly arrived owner relinquished and stray from adoptable animals
- Recently recovered or mildly ill animals from seriously ill, infectious animals
- Animals with respiratory illness separate from those with skin (such as ringworm) or gastrointestinal illness.

In order for the isolation and separation concept to work, it must be strictly adhered to. Some organizations make the mistake of not using space as it is designed and designated.

The quality and design of animal housing is one of the most important aspects of preventative health care and disease control. Unfortunately animals in a shelter environment will experience some level of stress.

Shelter animals must be housed in a way that minimizes stress, provides for their special needs, affords protection from the elements, provides adequate ventilation, and minimizes the spread of disease and parasites.

Animals that are stressed or recuperating from injuries or illness must have a quiet place to rest during their recovery period. If kept awake, stressed, or forced to be on guard because of close proximity to barking dogs, their recovery period may be lengthened or otherwise compromised.

The isolation and separation concept of managing the population provides the staff with the space flexibility they need, protects the public from potential bites, insures a healthier environment for the animals, and protects the agency from unnecessary liability issues. It also allows staff to make better euthanasia decisions, and allow the agency to present adoptable animals to the public instead of every animal without regard of its adoptability. Even the smallest shelters can provide isolation and separation if the shelter is designed correctly. The isolation and separation concept works as follows (flow charts follow at the end of this section):

## **Evaluation at intake**

There needs to be a place where all incoming animals are triaged. It should be a priority to do health examinations the day the animal comes in. After the staff examines an animal, he will be housed in healthy hold, quarantine, isolation or euthanized depending on the outcome of his exam. There need not be a great deal of holding space in the intake evaluation as staff should be available to perform exams promptly and move the animal to it's more permanent housing.



## **Healthy hold**

Only healthy dogs and cats that arrive at the shelter should be placed in these areas, with the exception of bite case animals. There should be approximately twice the number of kennels/cages for healthy hold than for adoptions. Where does this figure come from?

If healthy and possibly adoptable, the animal should be held in healthy hold. The healthy hold area allows the animal time to acclimate to the shelter and time for the staff to observe and evaluate the animal. The only exception may be for animals that are surrendered by their owners and are adoptable, healthy, current on vaccinations, and preferably altered. These animals may immediately be moved to adoptions. If your shelter conducts behavior evaluations then it is recommended that animals remain in healthy hold or off-view until the evaluation is complete. Although this exception can be made for dogs as well, it is preferable for cats because they do not generally need the waiting period for a full temperament evaluation like dogs do.

Once an animal had been held in healthy hold, evaluated and determined healthy and adoptable, he is then moved from the healthy hold area to the adoption area. If there is no room in adoptions, the decision to euthanize that animal or an animal in adoptions to make room must be made. Many shelters that are effective in managing their animal populations will also place stray animals up for adoption while still in their stray period. While the animal must remain at the shelter for the entire stray hold, by allowing the animal the opportunity for people to apply for adoption, the animal can be adopted as soon as the stray hold is complete thereby making space for other animals.

If stray, healthy, and determined unadoptable, the animal should be held in healthy hold for the stray hold period and then euthanized. If owner surrendered, healthy, and determined unadoptable, the animal would be euthanized immediately after intake.

Daily evaluations should be performed on the animals in healthy hold in order to choose which healthy, adoptable animals to move into the adoption area.

## **Adoptions**

Animals should be housed in adoptions after they have been vaccinated, evaluated for behavior and health and have been deemed a candidate for adoption. The adoption areas should be the only areas the public have access to without staff escort. There should be approximately half the numbers of adoption kennels/cages as there are healthy hold kennels/cages this will allow the agency to provide more behind the scenes holding and separation of animals.

Daily evaluations should be performed on animals already in the adoption area, and those that are no longer considered good candidates for adoption should be euthanized. In order to avoid “warehousing” animals, this evaluation process needs to be performed daily (sometimes multiple times a day) and consistently.

## **Quarantine**

If a healthy, stray animal coming in through the triage process is being held for biting/rabies observation, the animal should be housed in quarantine for the rabies hold period. This animal can then be euthanized or evaluated for adoption, depending on the circumstance of the bite.

If the animal is owner surrendered and determined to be aggressive or unpredictable, but has not bitten, he can be euthanized. If he is a stray and determined to be aggressive or unpredictable, but has not bitten, he should be held in quarantine (to limit staff contact) for the stray hold period.

If the quarantine area is full and the animal is not sick, he can be held in the healthy hold area until the stray period is complete, where only the staff has access.

Sick bite case or sick aggressive animals should be housed in isolation.

Dog kennels with guillotine doors limits staff handling of dogs in quarantine housing. Quarantined cats should be housed in special cages that limit staff from having to handle them. With these cages, staff can move the cats to one side in order to clean the other side, similar to the guillotine doors for the dog kennels. Agencies can also utilize specially designed “feral cat boxes” placed in regular cat cages very effectively as well.

No matter what room bite case or aggressive animals are housed in, their kennels/cages should be locked at all times and the animals should remain in the same kennel or cage for the duration of their stay. These kennels/cages should be clearly marked “QUARANTINE” or “AGGRESSIVE.” The public should not be allowed in these areas unescorted. The number of quarantine kennels/cages designated should be based on the typical number of animals needing to be quarantined.

### **Isolation**

Only animals that arrive sick/infectious or become sick while at the shelter should be housed in these areas. The public should not have access to these areas without staff escort. The number of kennels/cages will depend on the agency’s resources and desire to treat sick animals.

In order to keep the general population healthy, the following animals should be housed in the isolation area thereby minimizing the spread of disease and sickness:

- A stray, sick/infectious animal that is brought in and needs to be held for the stray hold period
- A dog or cat that got sick during his stay at the shelter
- A sick animal that is surrendered by his owner

Animals in the last two categories should be kept only if the agency feels they have the staff and budget to attempt treatment. The agency needs to determine if its infrastructure can support the treatment of animals for illnesses such as URI or kennel cough. There will be many animals that come in sick and will have to be treated for their stray period, but the agency needs to decide if it has the luxury of treating animals beyond their stray period.

Please note that euthanasia recommendations are made based on the assumption that there is no foster program or behavioral modification program in place.

In order for the isolation and separation concept to work, it must be strictly adhered to. Some organizations make the mistake of bending the rules by not using space as it is designated. There may be times when the healthy hold kennels/cages are full and instead of making a decision to euthanize an animal that has been at the facility, to make room, some agencies will house healthy and sick animals together. This negates the entire reasoning and benefits that result from the isolation and separation concept by exposing healthy animals to sick ones.

# Proper Use of the Guillotine Door

## **The Problem:**

Many dog runs are designed with a guillotine door; usually this door divides the run in half. All too often the inappropriate use of this door creates many problems for the agency. The guillotine doors are to facilitate cleaning and were never designed to be permanently shut. The policy of housing a dog on either side of the guillotine door (effectively turning 10 runs into 20) is not how most agencies were designed and when the agency houses dogs on either side in this manner it is impossible to properly clean the facility resulting in disease outbreaks, too many animals for the staff to adequately care for and an environment that is not conducive to encouraging the public to adopt. In fact this practice is the beginning of the majority of problems we see in shelters around the country.

## **The Cleaning Process with the Door Down:**

One at a time, each dog is taken out of his kennel and tethered to the fencing while his kennel is being cleaned; however, tethering each dog to the same area facilitates the spread of disease. Each run, one-by-one is hosed down, disinfectant applied, scrubbed, let sit 10 minutes (all disinfectants need a minimum of 10 minutes contact time to be effective, any less is a false sense of economy), and then rinsed. To conclude the process, the kennel is squeegeed dry and the dog returned. This is a one by one process – or possibly 4-5 dogs at a time if you have a strong volunteer program (HSUS Volunteer Manual) with volunteers walking 5 dogs at time.

## **Cleaning Process Using the Guillotine Door Properly**

First, the agency must decide to only house one dog or at the maximum two compatible dogs per run. If matching two dogs that did not come in together follow these guidelines (same sex, same size, not aggressive to animals or people, compatible). So, if you have 10 runs and you (by closing the guillotine door created 20 runs each holding 1 dog) by making this change you still have the ability to house the same number of dogs – you just have to take a bit more time in matching up the animals.

Proper animal management will allow any agency to discontinue housing dogs on both sides of a kennel. One or two compatible dogs should be housed in each kennel and the guillotine door should be kept open, except for cleaning. This will speed up the cleaning process tremendously. It is important to note that the dog kennels should not be cleaned one by one, but rather all the dogs in a section should be moved to one side of their kennels so the empty side can be cleaned as a whole in order to expedite cleaning of that section.

The time you save in cleaning and the result of healthier and happier dogs will be worth it. By making this change you achieve the following:

- Quieter kennels
- Easier to clean
- Dogs stay cleaner
- Healthier animals
- Public less intimidated by 'too many' dogs
- Instead of waiting for the 10 minutes for the disinfectant to work for each run, the staff by cleaning one whole side of the kennels at once – now you can wait one period of time with the disinfectant working on all kennels which will result in better use of staff time for clean-up.

## **How to Make the Switch?**

Many agencies understand the rationale of using the guillotine doors properly, but are concerned about the perception that by not housing animals on both side of the door that the agency will hold fewer animals and be criticized for reducing the population. Here are some tips for making the switch:

### **Staff**

Do not attempt to actually make the change in operation until you have done the following:

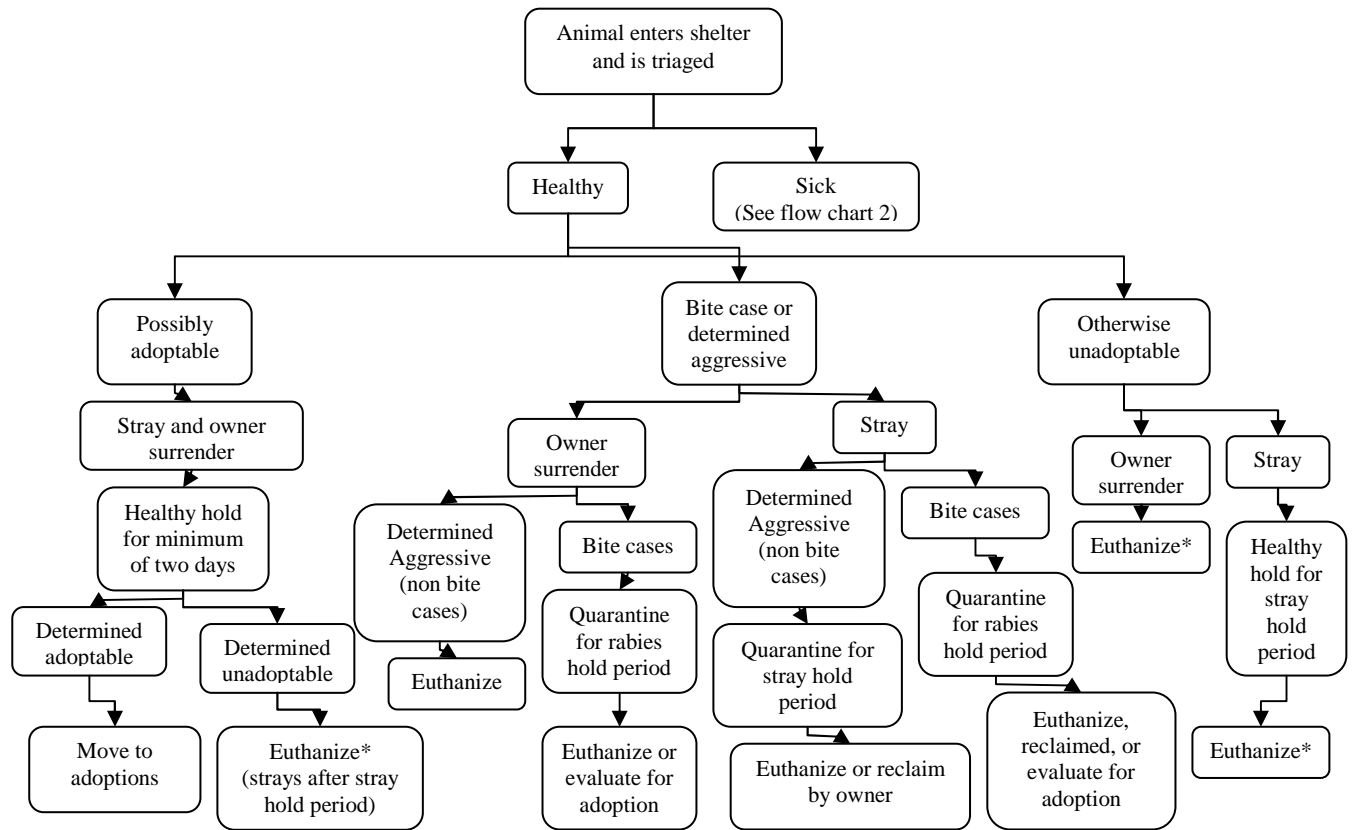
- Sit down with staff and discuss the concept, walk through the benefits of improved cleaning and animal health. Be sure to present this as a discussion, not an edict. Provide time for staff to ask questions and assist with brainstorming how this will affect their work.
- Once the staff is onboard with the why and the how, then sit down with the board of directors or any oversight department and obtain their approval.
- Then make sure you have presented the why, the how to any person in the community that may not understand this and might react in a negative manner.

### **Will We Hold Fewer Animals?**

This is a valid concern however as long as you match compatible animals together (two to a run) then you are holding the same number of animals. There may be situations where you hold a few less animals, but when you consider the disease concerns compound with more animals the results of holding a few less animals actually improves the likelihood that you will place more as they will stay healthier and the community trusts that they will receive a healthy animal.

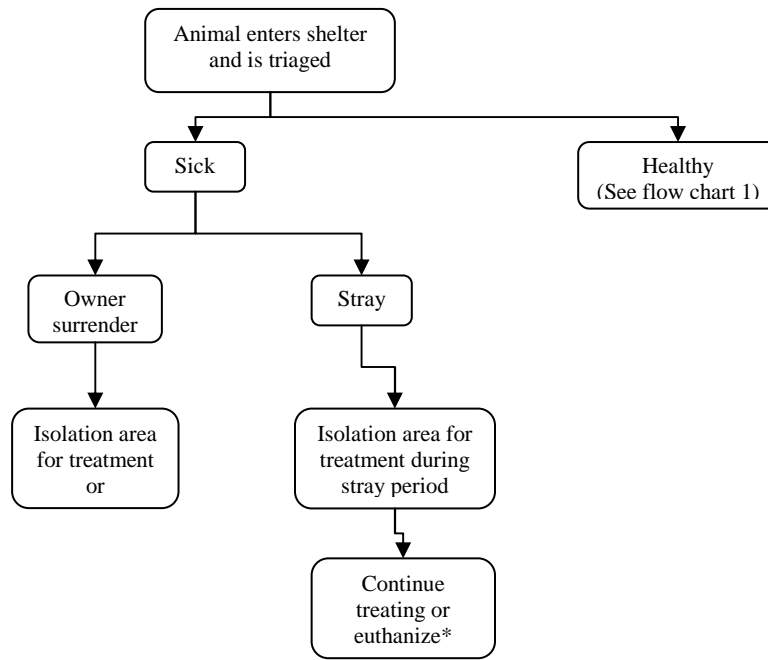
### **When Do We Make the Change?**

Once the agency is ready to raise the guillotine doors – the timing is very important. The agency should find a time when the population is low (do not euthanize to reach this, unless the animals were scheduled for other reasons), move the animals in sections making the matches (temperament) as you go to find the dogs that are compatible with each other. You must clean each run before moving animals to ensure you are not spreading disease. Your facility must be dealing with healthy animals only and be prepared to move any unhealthy animal to the isolation section of the facility, or make the decision for euthanasia if the agency does not have the budget or staff to properly treat the sick animals.



**Isolation/Separation Flow Chart 1**

\*Assumes no foster or behavior modification programs are in place



**Isolation/Separation Flow Chart 2**

\*Assumes no foster or behavior modification programs are in place