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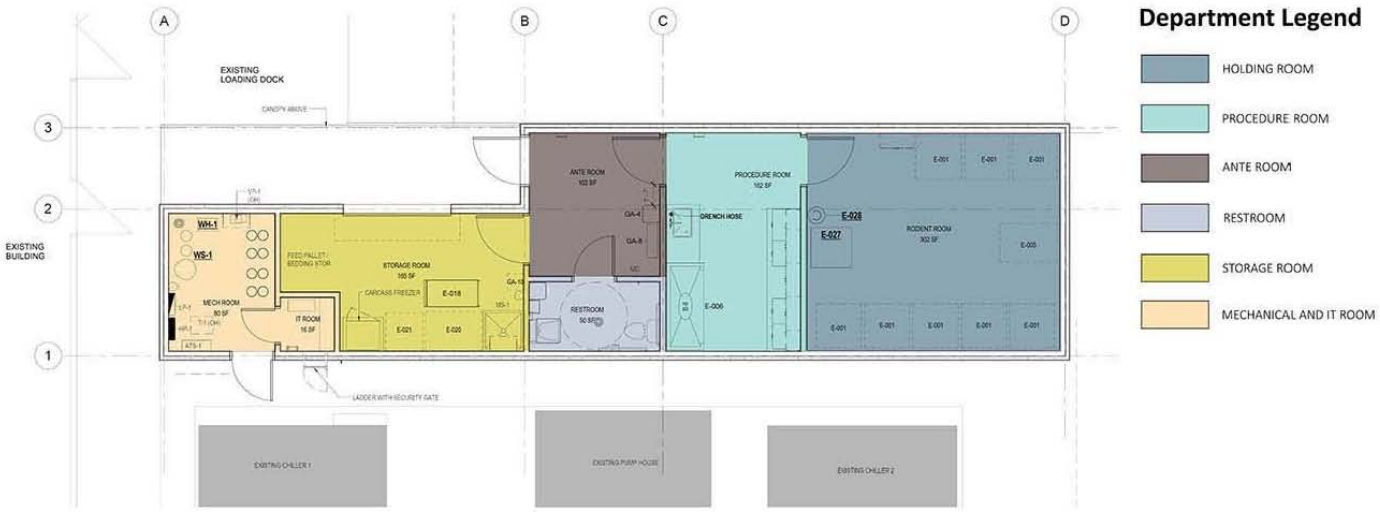

CASE STUDY: FLEXIBLE SOLUTIONS ADDRESSING OPERATIONAL NEEDS ARE KEY TO SUCCESS IN VIVARIUM PLANNING:

Mar 2016 /// BY KEVIN HAUGH

On a recent CRB project, a research university needed to add a small rodent vivarium to an existing perinatal research center that had previously only worked with larger animals. Once funding was approved and the project team was selected, the team began the planning process by validating the program and the concept.

The project was conceived as a satellite modular unit that would utilize an existing unused trailer. The proposed location was separate from other rodent facilities on campus. The team immediately realized some challenges with the location and structure.

The existing modular unit encroached on an existing fire water line easement, so a smaller footprint was needed to avoid crossing the easement. The site was constrained by an existing loading dock, existing cooling towers and a fire separation distance requirement from the adjacent building. The confined site

also had blind corners that posed a security risk. A barrier-free environment was required for the vivarium, but that would be a challenge with a modular unit. And shipping times for modular units were longer than anticipated.

In the program validation phase, the team identified additional questions that they needed to address. Without a wash facility on site, how would the racks be cleaned? How many cages should be kept on hand? The preferred single-use caging systems would not work with automated watering, so how many bottles should be kept on hand? And what if there was an interruption in availability of single-use caging systems? Could the building meet energy efficiency goals? Were adequate dumpsters available?

Initial planning was based on dimensions that could be constructed as a modular or stick-built option. The proposed footprint fit within the constraints on all four sides, including the easement, the loading dock, cooling towers and fire-separation distance. The general contractor calculated cost and schedule comparisons and determined that a stick building would be faster to construct and cost less based on the market conditions. This design required minimal ramps—an option preferred by the team because it better facilitated the movement of the racks to the existing rack washer on the main facility for periodic cleaning.

Using a spreadsheet, operations were modeled based on 4 grams of food per day per mouse, 3.5 mice per cage and 100 cages per rack on eight racks to generate a daily, weekly and monthly model of required food, bedding, water, single-use cages and waste to determine the size required for storage. The model showed that the facility could house 800 cages and store a two-week supply of cages, feed and bedding. The rodents propagate on their own at full capacity. The design team specified Animal Care Systems' ultra-high density Optimice® caging system because it made efficient use of the available floor space. An additional benefit to specifying this system was that there was no blower to take up floor space. This allowed for the addition of a small procedure room, gowning room, restroom and mechanical room.

The building and storage room entrances were located near the dock. This shortened the path for the movement of materials in and out of the facility and provided better visibility of entrances to address the security concern. The stick-built option provided the ability to construct increased interior height to

accommodate supply and exhaust ducts that returned to a single rooftop unit with an integral air-to-air heat exchanger and internal redundancy.

The new facility was recently completed to the university's satisfaction. A key factor to the success of the project was early programming and planning to provide a facility that worked with the single-use caging system, using simple modeling to validate the program, and building in the flexibility and adaptability to address future needs. There are various opinions for and against single-use caging. Whichever system is chosen, the design needs to provide features that maximize the benefits of the caging system to be used, and provide flexibility for future change, in order to have a successful facility.

About the Author

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