SECTION 13 00 02
VIVARIA FACILITY REQUIREMENTS

1. INTENT AND USE

A. The animal research facility will be designed to house animals in an appropriate species-specific environment that meets or exceeds all applicable policies, guidelines and regulations as outlined below. These guidelines are not intended to be all-encompassing.
   1. Applicable USDA Animal Welfare Act and Regulations
   2. Applicable Brown Design Standards
   3. Applicable Brown Environmental Health & Safety and Brown Center for Animal Resources and Education (CARE) Requirements
   4. Applicable International Building Code
   5. Applicable Energy Conservation Codes
   6. Applicable Mechanical, Electrical, Plumbing and Fire Protection Codes
   7. Applicable NFPA and ASHRAE Standards
   8. Applicable NIH design policies and guidelines
   9. Applicable AAALAC International guidelines
   10. Applicable Biosafety in Microbiological and Biomedical Laboratories design guidelines
   11. National Research Council - The Guide for the Care and Use of Laboratory Animals (The Guide)

2. ARCHITECTURAL CONSIDERATIONS

A. The vivarium shall be designed using animal biosafety level-2 (ABSL-2) requirements.

B. Provide anterooms and changing areas with storage for PPE requirements. The vivarium shall be separated from areas that are open to unrestricted personnel traffic within the building. External facility doors shall be self-closing and self-locking.

C. Doors to areas where infectious materials and/or animals are housed shall open inward, be self-closing, kept closed when experimental animals are present, and should never be propped open. Doors to cubicles inside an animal room may open outward or slide horizontally or vertically.

D. If the vivarium has segregated areas where infectious materials and/or animals are housed or manipulated, a sink shall also be available for hand washing at the exit from each segregated area.

E. The vivarium shall be designed, constructed, and maintained to facilitate cleaning and housekeeping. The interior surfaces (walls, floors and ceilings) shall be water resistant.

F. Penetrations in floors, walls and ceiling surfaces shall be sealed, including openings around ducts, doors and doorframes, to facilitate moisture protection, pest control and proper cleaning.

G. Cabinets and bench tops shall be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals. Spaces between benches, cabinets, and equipment shall be accessible for cleaning.

H. Floors shall be smooth, durable, moisture proof, nonabsorbent, and slip resistant and resistant to the adverse effects of disinfectants, high temperature water, detergent cleaning, and chemicals

used in holding and procedure rooms and continuous movement of cages and equipment. If thresholds are used to separate dissimilar flooring materials, provide a type that permits the easy wheeling of cages or other equipment through the vivarium. All exposed concrete floors shall be sealed. These are mandatory for animal research facilities. VCT or rubber floor and base materials are not permitted for use in animal research facilities.

I. Furniture shall be minimized. Chairs used in animal areas shall be covered with a non-porous material that can be easily cleaned and decontaminated. Furniture shall be capable of supporting anticipated loads and uses. Sharp edges and corners shall be avoided.

J. External windows are not recommended; if present, windows shall be sealed and resistant to breakage. The presence of windows may impact facility security and therefore shall be assessed by security personnel.

K. Internal facility appurtenances, such as luminaires, air ducts, and utility pipes, are arranged to minimize horizontal surface areas, to facilitate cleaning and minimize the accumulation of debris or fomites.

3. MECHANICAL SYSTEMS

A. Animal housing spaces shall maintain more negative air pressure with respect to animal support spaces; animal support spaces shall maintain negative air pressure with respect to non-animal spaces. Operating rooms and some animal procedure space shall be positive to non-animal spaces. Review all space pressurization requirements with CARE during design.

B. Standard deviation of space temperature shall maintain plus or minus 2 degrees Fahrenheit of design set point.

C. Standard deviation of space humidity shall maintain plus or minus 10 percent of design set point.

D. Mechanical equipment, including HVAC, BAS Controls and Operations related equipment, shall be supplied in sufficient quantities to ensure n+1 redundancy and supported by standby power (N+1) to sustain life support systems as appropriate for the species and number of animals housed. Review redundancy requirements at all phases of design to confirm specific components shall.

4. MISCELLANEOUS CONSIDERATIONS

E. Emergency eyewash and shower shall be readily available; locations shall be determined by risk assessment. Refer to standard 13 00 22 Plumbing for appropriate eyewash and emergency shower specifications.

F. All drainage piping shall be readily accessible via cleanouts; locate cleanouts in common/public spaces (not within vivarium spaces).

G. Provide individual isolation valves for piping serving each vivaria space. Locate isolation valves outside of the space.

H. Provide vivaria floor flushing drain traps with remote operation pedestal remotely located on the nearest wall.

I. Vivaria floor drains shall have removable strainer baskets and covers secured with screws to prevent accidental removal. Screws shall not require special tools but shall be removable with a

standard screwdriver or allen key.

J. Card access shall be provided for CARE Facility exterior doors. Consult with CARE staff for additional card access requirements.

K. Luminaires and electrical devices shall have minimum NEMA 4X covers. Luminaries shall have light levels ranges that are within the acceptable range per governing bodies and CARE standards. Automatic occupancy sensing devices (for occupancy control) that emit ultrasonic sounds shall not be used within animal housing rooms to prevent adverse impacts on the animals. Programmable light timers must be available for each individual housing room. Real-time monitoring of light timer and lighting functionality shall be included.

L. Equipment shall be sufficiently separated or insulated to maintain a noise level below 85 dB and minimize vibration inside the animal housing areas.

END OF SECTION