

News to Use

Design Requirements Manual

The formulae $\frac{\partial U_i}{\partial x_i} + \frac{\partial (\rho U_i)}{\partial x_i} = -\frac{\partial p}{\partial x_i} + \frac{\partial (\rho \frac{\partial U_i}{\partial x_i})}{\partial x_i} + s_i(\rho - \rho_0)$ for building $\frac{\partial (\rho U_i U_j)}{\partial x_i} = -\frac{\partial p}{\partial x_i} + \frac{\partial (\rho \frac{\partial U_i}{\partial x_i} - \rho u_i^2)}{\partial x_i} + s_i(\rho - \rho_0)$ state of the art $\frac{\partial (\rho U_i U_j)}{\partial x_i} = -\frac{\partial p}{\partial x_i} + \frac{\partial (\rho \frac{\partial U_i}{\partial x_i} - \rho u_i^2)}{\partial x_i}$ biomedical research facilities.

'Design Requirements Manual (DRM) News to Use' is a monthly ORF publication featuring salient technical information that should be applied to the design of NIH biomedical research laboratories and animal facilities. NIH Project Officers, A/E's and other consultants to the NIH, who develop intramural, extramural and American Recovery and Reinvestment Act (ARRA) projects will benefit from 'News to Use'. Please address questions or comments to: ms252u@nih.gov

Integrated Pest Management Program

Integrated Pest Management (IPM) program is facilitated by professional entomologists in the Community Health Branch (CHB) of the NIH Division of Occupational Health and Safety (DOHS). Pest control is extremely important since pests carry disease organisms; cause physical damage; contaminate and compromise research and pests are unacceptable in work place. NIH has implemented effective long term prevention methods and strategies that work in unison with the building design and its use. Pests are dependent upon biotic factors to provide nourishment and moisture and abiotic factors to provide harborage and ingress into buildings. Through proactive steps taken during building planning, design, construction, and commissioning, resources for pests are minimized, thus diminishing pest infestation during the building's functional life cycle. The IPM program focuses on designing new projects that do not create conditions that encourage pests, and that minimize pesticide applications by reducing the amount of food, water, and harborage to pests.

To significantly reduce pest infestation, the following basic components should be instituted during the design and construction phases of buildings:

1. Facility Design: Proactive approach to facility designs not contributing to the harborage of pests.
2. Structural Repairs: Performance of small repairs that exclude pests.
3. Sanitation: Proper sanitation on the construction site; reduction of clutter and pest harborage; and banning cellulose type fill and/or debris.

Following should be implemented during construction and facility operation:

1. Monitoring: Regular surveillance areas using traps, visual inspections, interviews with staff, and surveys to determine if a pest problem exists; the location and size of the pest infestation; and conditions contributing to pest problems.
2. Communication: Staff cooperation in correcting conditions that contribute to pest problems.
3. Record-Keeping: Data monitoring of pest numbers and observations on housekeeping and structural deficiencies.
4. Pest Control without Pesticides: Pest exclusion, trapping, screening, and sealant used as effective, long-term methods of pest prevention and applied with a high degree of safety and effectiveness.
5. Pest Control with Pesticides: Pesticide application using the safest, most effective methods, and only where needed.
6. Program Evaluation: Data/observations monitoring periodically summarized and reviewed to evaluate program effectiveness.
7. Safety: Significant reduction of the use of pesticides through IPM; and emphasis on the use of more permanent non-pesticidal control practices, minimizing the potential of exposure to pesticides by the research environment and staff.
8. Quality Assurance: Technical oversight providing an objective, ongoing evaluation of program activities and effectiveness.
9. NIH DOHS CHB Involvement: CHB manages IPM programs in biomedical laboratories and animal research facilities, with

involvement during the planning, design, and construction phases of new construction and alteration projects. For NIH projects, the Project Officer and design team shall involve the CHB early during the planning and design process for any project to obtain input on proposed designs from the pest management perspective.

Animal facilities present some of the most challenging circumstances to an effective pest management program and the performance of IPM services. Additional care and attention shall be paid during all phases of planning, design, and construction of animal facilities. Some components that require specialized design and review by DOHS CHB include:

1. Building integrity (site design, building envelope, exterior building lighting).
2. Receiving areas.
3. Interior wall, floor, and ceiling finishes.
4. Door types, locations, materials and requirements for door sweeps.
5. Wall and door protection design and materials.
6. Access panels.
7. Sealing locations and details.
8. Interior lighting.
9. Cage wash design.
10. Solid waste disposal, recycling, and storage facilities.
11. Floor drains.
12. Locker rooms and break rooms.
13. Administration areas.

These items shall be evaluated and reviewed with respect to the overall program requirements of the entire building, specific animal species, size of the facility, and anticipated future use(s) of the facility.

Lights are attractive to insects and to some vertebrates. The type and placement of lights around and in a facility can impact the occurrences of pests and nuisance incidental invaders indoors. Avoid light fixture design and installation that provide pest harborage outside a building, such as overhead lights with a flat upper surface which serve as nesting or roosting sites. The power conduit for the lights shall be designed so there is no provision for roosting or nesting sites for nuisance birds.

Landscape planting impacts the number and types of pests found around the exterior of the building, as well as within the building envelope. The following shall NOT be used in NIH projects:

1. Dense ground covers such as ivy, providing harborage for rodents.
2. Ornamental plants such as spirea, attracting certain beetle species that can become indoor pests.
3. Raised planters or garden beds, which can be nesting sites for rodents.
4. Dense foundation plantings, reducing air circulation around buildings, harboring pests such as wasps, and obstructing pest management survey and control activities.

Proper use of sealants in high containment labs is critical for pest management. Refer to DRM Exhibit X4-2A for sealant requirements.