Division of Technical Resources
Office of Research Facilities
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News to Use
Design Requirements Manual
The formulae $\frac{\partial \rho U_i}{\partial t}+\frac{\partial}{\partial x_j}(\rho U_j U_i)=-\frac{\partial P}{\partial x_i}+\frac{\partial}{\partial x_j}\left(\mu\frac{\partial U_i}{\partial x_j}\right)+g_i(\rho-\rho_0)$ for building $\frac{\partial}{\partial x_j}(\rho\overline{U_i}\overline{U_j})=-\frac{\partial \overline{P}}{\partial x_i}+\frac{\partial}{\partial x_j}\left(\mu\frac{\partial \overline{U_i}}{\partial x_j}-\rho\overline{u_i'u_j'}\right)+g_i(\rho-\rho_0)$ state of the art $\frac{\partial}{\partial x_i}(\rho\overline{U_i}\overline{H})=\frac{\partial}{\partial x_i}\left(\lambda\frac{\partial \overline{T}}{\partial x_i}-\rho\overline{u_i'H'}\right)$ 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

Sustainable Design

The Department of Health and Human Services policy for Sustainable and High Performance Buildings applies to all buildings under the control of the NIH. The policy stated in Section 1-10 of the DRM is as follows: All construction projects will incorporate the *Guiding Principles* of the Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding (MOU) into the planning, design, construction, operation, maintenance, and decommissioning processes. Construction projects under the scope of this policy, which have a total project cost equal to or greater than $3 million, will obtain a third party certification to meet the requirements of a multi-attribute green building standard or rating system developed by an ANSI-accredited organizations (such as U.S. Green Building Council's (USGBC) and the Green Building Initiative's (GBI)).

Existing facilities will incorporate the *Guiding Principles* of the MOU to the maximum extent feasible in all improvement, repair and maintenance projects. In addition to incorporating the *Guiding Principles* of the MOU, improvements and repair projects, which have a total project cost equal to or greater than $10 million and/or impacting 40% or more of the overall floor area, will obtain a third party certification that meets the requirements of a multi-attribute green building standard or rating system developed by an ANSI-accredited organization.

NIH incorporates the Guiding Principles established by the MOU as follows:

1. Employ Integrated Design Principles

a. Integrated Design – An integrated project team is involved in planning to delivery for all projects.

b. Commissioning – NIH requires commissioning for all projects. The level or scope of commissioning for any single project shall be determined by the complexity of the project requirements. Commissioning is a comprehensive process for ensuring that:

i. All building systems are installed and perform according to the design intent.

ii. Systems are efficient, cost effective and meet the user's operational needs.

iii. The installation is adequately documented.

iv. The operators are adequately trained.

2. Optimize Energy Performance

a. Energy Efficiency – NIH projects are required to incorporate energy efficient strategies in Architectural, Heating Ventilating Air Conditioning, Electrical and Plumbing systems. Renewable energy is implemented based on life cycle cost analysis.

b. Measurement and Verification – Utility metering shall be provided for primary utility services, capable of automatically registering peak flow and totalization to NIH building automation utility monitoring systems.

3. Protect and Conserve Water

a. Indoor Water – To conserve indoor water, the DRM specifies flow rate for faucets and showers; maximum flush rates are specified for urinals and water closets.

b. Outdoor Water – Water efficient landscape is required for NIH projects.

c. Process Water – Systems are designed to conserve water. Existing process water systems are retrofitted with water saving measures as applicable.

d. Water-Efficient Products.

4. Enhance Indoor Environmental Quality

a. Ventilation and Thermal Comfort – DRM specifies minimum requirements for ventilation rate and indoor design conditions for temperature and humidity.

b. Moisture control – Water tight envelope including roof is designed for new construction projects.

c. Day lighting – Incorporated in applicable areas of buildings with proper controls.

d. Low-emitting Materials – DRM requires specifying materials and products with low pollutant emissions, including adhesives, sealants, paints, carpet systems, and furnishings.

e. Protect Indoor Air Quality during construction - Sheet Metal and Air Conditioning Contractor's National Association Indoor Air Quality Guidelines for Occupied Buildings are required to be followed during Construction.

5. Reduce Environmental Impact of materials

a. Recycled content – Materials with recycled content are specified.

b. Biobased content – Products with Biobased content is purchased and specified.

c. Environmentally preferable products.

d. Construction waste and materials management - Demolition waste is separated and recycled to the maximum extent practicable.

e. Ozone-depleting compounds – Refrigerants and Fire suppressions agents are specified with non-Ozone-depleting compounds.

References relating to sustainable design found in the DRM are listed in Exhibit X1-10-A.

Further details on this month's topic are available on the DRM website
http://orf.od.nih.gov/PoliciesAndGuidelines/BiomedicalandAnimalResearchFacilitiesDesignPoliciesandGuidelines/DesignRequirementsManualPDF.htm
DRM Chapter 1, Sections 1-1, 1-7, 1-10, 1-11, & Exhibit X1-10A