Division of Technical Resources
Office of Research Facilities
The National Institutes of Health
Vol. 01, No. 61
April 2015

# 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* $\frac{\partial}{\partial x_j}(\rho\overline{U_i}\overline{U_j})=-\frac{\partial \bar{P}}{\partial x_i}+\frac{\partial}{\partial x_j}\left(\mu\frac{\partial \overline{U_i}}{\partial x_j}-\rho\overline{u_i'u_j'}\right)+g_i(\rho-\rho_0)$ *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:** shawm@mail.nih.gov

# NIH Design Requirements Manual 2015 Update

The National Institutes of Health (NIH) Design Requirements Manual (DRM) establishes policy, design requirements, standards and technical criteria for use in planning, programming, and designing NIH owned, leased, operated, and funded buildings and facilities. The DRM is the only detailed design requirements and guidance manual for biomedical research and animal research facilities in the U.S. The information compiled within the 2015 DRM is the result of technical studies that have set numerous national and international standards, lessons learned and ever advancing architectural and engineering technologies used in the design and construction of research facilities. The Division of Technical Resources (DTR) is responsible for maintaining and updating the DRM.

In order to ensure the most current, relevant, and comprehensive manual, DTR continuously researches and tests state-of-the-art and innovative technologies that may be applicable to biomedical research facilities. DTR has gathered data from these studies as well as from numerous years of specialized experience and an accumulation of lessons-learned from the design and construction of NIH's unique biomedical research and animal facilities. This has led to data-driven decision making and best practices for the design and construction of NIH's facilities. The results of these studies are incorporated into the 2015 DRM and new information will be added as it becomes available.

The 2015 DRM edition constitutes a major restructuring and reorganization of the 2008 edition, with the addition of a vast amount of new and updated information for architects & engineers (A/E) and stakeholders to use in the facility design process.

**The DRM Update Process:**

In order to provide guidance and standards which represent the best practices in biomedical research facility design, DTR assembled over 120 professionals from industry, academia, as well as government consisting of lab designers, architects, engineers, researchers, veterinarians, maintenance staff, biosafety specialists, and others. These professionals were divided into nine technical committees with one Executive Steering Committee to advise and arbitrate. The nine technical committees were divided as follows: Architecture, Mechanical, Electrical, Plumbing, Structural, Civil, Biosafety, High Containment, and Animal. Each committee was comprised of professionals with expertise in a variety of disciplines and unique insights into the complicated design, construction, and functional issues involved in biomedical research facilities.

Each committee reviewed the initial draft for the update to the 2008 DRM and provided comments during a series of weekly meetings. DTR then incorporated the committee comments and insights into a second draft of the DRM update. After thorough review by the DTR staff as well as technical editors and outside independent experts, the second draft was released again to the committees for another round of comments and 2nd Draft of the document. DTR technical staff evaluated each comment and modified the DRM as appropriate.

The 2015 DRM is now being reassembled and reviewed internally before it once again is released for a wider public review of over 200 experts and professionals. It is DTR's expectation that due to this extensive and thorough process the 2015 DRM will be the premier document in laboratory design guidance in the country.

**Significant Changes from the 2008 DRM:**

The 2015 Design Requirements Manual has undergone major changes from the 2008 edition. Every chapter and appendix has been updated to align with the latest in research laboratory design.

Some of the notable additions / changes to the 2015 edition are as follows:

- **Design, Format, & Links:** New look & two column format to ease reading. Additionally, links have been added to ease the transition between references within the document.
- **Rationales:** Additional text further elaborates and clarifies difficult technical issues related to facility design; providing the intent of requirements and giving better guidance to A/E's who utilize the document.
- **Expanded Sustainability Requirements:** In order to meet new and changing sustainability goals, the DRM now provides further guidance on the design of facilities with smaller carbon footprints and reduced energy goals.
- **Graphics:** The 2015 DRM contains significantly more diagrams and graphics to help illustrate complex planning & design concepts.
- **Specialty Labs:** As science and research is ever changing specialty labs are becoming more common. The 2015 DRM will include information on a variety of specialty lab facilities, highlighting important technical issues which the A/E's need to be aware of during design.
- **New Appendices & Reference Documents:** New and updated appendices will provide more concise and valuable direction to A/E's. Some new and updated appendices include: A/E Submission Checklist, Room Data Sheets, Sample Equipment Schedule, among others.

After a long and meticulous process the 2015 DRM will be published within a few months. It is through the efforts of many dedicated individuals that the 2015 DRM has become a reality. DTR extends our sincerest thanks to all of the people who helped improve and refine the 2015 NIH Design Requirements Manual.

Further details on this month's topic are available on the DRM website
http://orf.od.nih.gov/PoliciesAndGuidelines/BiomedicalandAnimalResearchFacilitiesDesignPoliciesandGuidelines/Pages/DesignRequirementsManualPDF.aspx