

The formulae  $\frac{\partial \rho U_i}{\partial t} + \frac{\partial (\rho U_i U_j)}{\partial x_j} = -\frac{\partial P}{\partial x_i} + \frac{\partial}{\partial x_j} \left( \mu \frac{\partial U_i}{\partial x_j} \right) + g_i (\rho - \rho_s)$  for building  $\frac{\partial}{\partial x_j} (\rho U_j \bar{U}_i) = -\frac{\partial P}{\partial x_i} + \frac{\partial}{\partial x_j} \left( \mu \frac{\partial \bar{U}_i}{\partial x_j} - \rho \bar{u}_i' u_j' \right) + g_i (\rho - \rho_s)$  state of the art  $\frac{\partial}{\partial x_i} (\rho U_i \bar{H}) = \frac{\partial}{\partial x_i} \left( \lambda \frac{\partial \bar{T}}{\partial x_i} - \rho \bar{u}_i' h' \right)$  biomedical research facilities.

## NIH Design Requirements Manual/Revision 2.1

**D**RM Revision 2.1, published on August 2, 2024, is the latest installment of a comprehensive update of the DRM. It includes updates to Chapters 2 (Planning and Programing) and 4 (Architectural Design) and Appendices E (Construction Document Submission Requirements) and J (Research Facilities Questionnaires). <https://orf.od.nih.gov/TechnicalResources/Documents/DRM/DRM2.108022024.pdf>

DRM revision 2.0, published in March 2024, was the first installment, which included the revised Chapters 3 (Civil Engineering and Site Development), 5 (Structural Design), and 9 (Fire Protection & Suppression). As with previous revisions, 2.1 has been reviewed by a committee of experts to address current best practices, lessons-learned, and industry trends in the planning, design, and construction of state-of-the-art biomedical research facilities. Selected highlights of the updates include:

### Chapter 2:

- Laboratory types have been classified as Primary or Support, and Wet or Dry. These classifications will help establish functional requirements.
- Laboratory planning and programming information has been substantially updated, including photographs and graphics.
- Additional requirements for facility planning and programming, including data collection, flexibility, and workplace enhancements.

### Chapter 4:

- New requirements for flood protective design, including waterproofing mechanical rooms and interstitial spaces.
- New requirements for the certification of high-performance coating applicators and third-party inspections for applications.
- A new requirement for performance assessment and upgrade if more than 100 square feet of interior surface of exterior wall is removed.

### Appendix E:

- Increased content on the process of developing documents, including programming, data collection, and investigation of existing conditions.

- Provides information on the Permit Review process.

### Appendix J:

- Research facility Questionnaires have been moved from Chapter 2 Exhibits to Appendix J (formerly *Lease Facilities DRM Checklist*, which has been removed).
- Expanded questions relative to Standard Operating Procedures, functional relationships, and other programmatic information.

As with revision 2.0, the revised chapters and appendices will be accented in green to distinguish them from the blue accents of chapters and appendices whose revisions are still pending.



New photographs and graphics illustrate key points

When using the DRM as a reference document for a design project, it is recommended that project team members (Project Officers, A/Es, and consultants) download the current version of the DRM on the date of award and reference that version for the duration of the project. It is important to note the version being referenced in the Basis of Design and the Construction Documents.

DTR looks forward to supporting NIH and the international community as a reliable resource for best practices in biomedical research facility design.

We would like to thank our committee members and peer reviewers who generously lent their time and expertise and without whose help this revision would not have been possible.

If you have questions or need additional information about the DRM, please email [DRM@nih.gov](mailto:DRM@nih.gov) or contact communications editor Nika Lilley at [nika.lilley@nih.gov](mailto:nika.lilley@nih.gov).