

Section 1

GENERAL REQUIREMENTS FOR LABORATORIES

Contents

A. Scope	1-2
B. Building Design Issues	1-2
C. Laboratory Design Considerations	1-2
D. Building Requirements	1-3
E. Hazardous Materials Design Issues	1-3
F. Entries, Exits, and Aisle Width	1-4
G. Electrical and Utility Issues	1-4
H. Laboratory Decommissioning	1-4

A. Scope

The primary objective in laboratory design should be to provide a safe, accessible environment for laboratory personnel to conduct their work. A secondary objective is to allow for maximum flexibility for safe research and teaching use. Therefore, health and safety hazards shall be anticipated and carefully evaluated so that protective measures can be incorporated into the design wherever possible. The requirements listed below illustrate some of the basic health and safety design features required for new and remodeled laboratories. Variations from these guidelines require approval from the Environmental Health & Safety Department (EH&S).

B. Building Design Issues

Because the handling and storage of hazardous materials inherently carries a high risk of exposure and injury, segregate laboratory and non-laboratory activities to the extent possible.

1. Noncombustible construction is preferred.
2. Offices should be separated from laboratories.
3. An automatically triggered main gas shutoff valve for the building should be provided to cut off the natural gas service in a seismic event.

C. Laboratory Design Considerations

1. The laboratory shall be bound by four walls and a roof or ceiling.
2. Design for adjacent spaces for storage and consumption of food and drink as needed.
3. Design laboratory workstations to accommodate the range of body dimensions that may be using the workstations. For example, computer and microscope workstations may require height-adjustable work surfaces and chairs.
4. Each laboratory using hazardous materials, whether chemical, biological, or radioactive, should contain a sink for hand washing.
5. All work surfaces (e.g., bench tops, counters, etc.) should be impervious to the chemicals and materials used in the laboratory.
6. The laboratory shall be designed so that it can be easily cleaned. Bench tops should be of a seamless one-piece design to prevent contamination. Penetrations for electrical, plumbing, and other considerations should be completely and permanently sealed. If the bench top abuts a wall, it should be covered or have a backsplash against the wall.

7. The walls shall be non-porous and painted with a durable, impervious finish to facilitate decontamination and cleaning. High gloss paint is recommended.
8. Provide shelf lips for seismic restraint. Lips should be $\frac{3}{4}$ inch above the shelf surface for bookshelves and 1 $\frac{1}{2}$ " inches above the shelf surface for shelves used to store breakable containers, chemicals, or other hazardous materials.
9. Refer to Chapter 11 of the Guide for design considerations for spaces containing Class 3B or 4 Lasers. Design consideration for spaces containing other sources of non-ionizing radiation (radio-frequency, microwave, ultraviolet, etc.) and large magnetic fields can also be found in Chapter 11 of the Guide.

D. Building Requirements

1. Building Occupancy Classification and Control Areas— Occupancy classification and control areas should be based upon an assessment of the projected chemical inventory of the building. Most teaching and research buildings should not require an H occupancy classification; however, individual H occupancy rooms may be necessary.
2. Facilities using radioactive materials may need to be approved by the State of Washington Department of Health and a Notice of Construction (NOC) may need to be filed with the DOH, depending on what air emission calculations reveal. Please contact the UW Radiation Safety Office to determine if this will be required.

E. Hazardous Materials Design Issues

1. Facilities shall be designed so that use of a respirator is not required for normal operations.
2. There must be adequate in-laboratory storage cabinets to store reagents and chemicals and to provide segregation of incompatible materials. Storage design should be based on projected quantities and waste management practices.
3. The laboratory shall have a means of securing specifically regulated materials such as controlled substances regulated by the Drug Enforcement Administration and radioactive materials, select agents, etc. (i.e., lockable doors, lockable cabinets etc.), where applicable.
4. See Chapters 5 and 6 of the Guide for additional requirements for compressed gas storage and hazardous materials cabinets.
5. Please see Chapter 9 of the Guide for additional requirements for laboratories using radioactive material. Please see Chapter 10 of the Guide for additional requirements for spaces containing large sources of radiation.

F. Entries, Exits, and Aisle Width

1. Self-closing laboratory doors should be operable with a minimum of effort to allow access and egress for physically challenged individuals. A minimum of a 36-inch-wide door should be provided to facilitate equipment movement.
2. Laboratory benches, laboratory equipment and other furniture or obstacles shall not be placed so that there is less than five feet of clear egress within the laboratory.
3. Laboratory doors that separate laboratory areas from non-laboratory areas are to be automatically self-closing.
4. Corridors should not be less than 6 feet wide to allow for movement of large equipment and allow for circulation of materials on carts, etc.
5. Common corridors shall not be programmed for laboratory operations. For more information on use of corridors see [Use of Corridors and Unassigned Spaces](#).
6. Equipment corridors shall be provided with a system designed to allow for securing equipment to prevent movement during an earthquake.

G. Electrical and Utility Issues

1. Electrical receptacles above counter tops within six feet of sinks, safety showers, or other sources of water, should have GFCI circuit protection
2. Laboratories shall be provided with light fixture on emergency power at the entrance/exit door. Hallway and corridor emergency light shall be provided based on the local code requirements.
3. New requirements found in the International Fuel Gas Code (IFGC) state emergency shutoff valves for natural gas lines shall be located INSIDE the lab, adjacent to the egress door. The valve shall be located behind an access panel (similar to a medical gas system) and labeled "GAS SHUTOFF". Consideration should be given to locating valves at a height that allows easy access and operation without becoming blocked.
4. Flexible connections shall be used for connecting gas and other plumbed utilities to any freestanding device where rupture of the supply, return, exhaust or vent line could pose a hazard.

H. Laboratory Decommissioning

1. Prior to a lab being decommissioned or renovated, laboratory staff must leave the laboratory in a clean and safe condition for construction crews. Prior to vacating a laboratory, laboratory staff must remove all chemical, biological and

- radiological materials and they must decontaminate all work surfaces. They must also remove all equipment (unless arrangements have been otherwise) and any garbage or other items that will not be wanted by the new occupants or need to be out of the way of renovation. In addition, the [*Notice of Laboratory Moveout \(UoW 1800\)*](#) must be completed, signed and posted on the inside of one of the laboratory doors.
2. Project Managers must verify that occupants of the laboratory are aware of the requirements in paragraph 1 above. Project managers should ensure that the [*Notice of Laboratory Moveout \(UoW 1800\)*](#) has been completed, signed and posted on the inside of one of the laboratory doors.
 3. If the project includes removal or alteration of existing fume hood ducts, the contractor may require that they be cleaned prior to working on them. Occupants cannot perform this task because it requires working in restricted spaces and coordination with the project. Project Manager should determine if this need is in the scope of the project, determine who will clean the duct, and verify that this work has been included in the contract.