

Laboratory Planning and Design

With the rapid advances in technology and the shifting emphasis in research, it is important that laboratories and support spaces be designed for flexibility and adaptability.

CRB specializes in the innovative planning and design of laboratories. We provide planning and design services for a variety of laboratory facilities including university, research and development, biomedical, pharmaceutical, and industrial research.

As experienced, award-winning laboratory design engineers, we can assist you in the programming stage with design criteria for the mechanical, electrical and plumbing systems, fume hood exhaust systems, specialty gas systems, and additional support systems.

Research conducted dictates that utilities must be highly reliable and environmental conditions repeatable. Electric power will, in many cases, need to be conditioned and in some cases uninterruptible. In addition, precise environmental controls such as spatial pressure relationships, temperature and humidity will be necessary. Deviation from these requirements can void the findings of the research project. Precise control of the building utility systems can help to assure that the labs have the ability to meet the needs of the researchers.



The building and the systems serving the laboratory facilities must be carefully designed to maintain critical containment of laboratory pressurization. This requires that conceptual facility design includes identifying the proper spatial pressure relations between the various labs and surrounding spaces. The evaluation should properly address whether primary concern is for contamination to the research lab or from the research lab. In particularly critical areas, such as a BL-3 lab, the answer will be both, and special containment chambers may be required. Energy-efficient systems and recovery methods must be considered early in the planning process.

CRB has LEED accredited staff and is a Laboratories for the 21st Century Supporter for Sustainable Building Design and Construction.



LABORATORY PLANNING AND DESIGN

Project Management

The goal of CRB is to provide quality, responsive, and safe engineering solutions, in a timely and cost effective manner. Principal investigators may not even be on staff during the planning and programming stages, so the facility must be flexible and adaptable, while maintaining the overall budget objectives. Each lab is unique and must be designed as such. The very nature of research and development (R&D) requires visionary thinking about possibilities, not merely what has been done before.



Biocontainment Laboratories

- Pressurization Control
- BSL-1 through 4
- ABSL-1 through 4
- Solvent Storage and Distribution
- AIDS, HIV, TB, Anthrax Research, etc.
- Biological Safety Cabinets (Classes I - III)
- Fume Hoods (Chemical, Radioisotope, Distillation, Perchloric Acid)



Animal Laboratories

- AAALAC Requirements
- ABSL-1 through 4
- Vivariums
- Non-Human Primates
- Large Animal
- Aquatic
- Avian
- Biowaste Decontamination
- Pathological Incinerators and Tissue Digesters



Wet Laboratories

- Biochemistry/Pathology
- Combinatorial Chemistry
- Physical Chemistry
- Organic Chemistry
- Pharmacokinetics
- Cell Biology
- Molecular Biology



Dry Laboratories

- Bioinformatics/Robotics
- Electrophysiology/Biophysics
- Electron Microscopy
- Laser
- Magnetic Resonance Imaging (MRI)
- Nuclear Magnetic
- X-Ray Crystallography
- Mass Spectrometer
- HPLCs



Laboratory Support Systems

- Autoclaves
- Glasswashers
- Environmental Chambers
- Radioactive Work Areas
- USP and RO/DI Water Systems
- pH Neutralization Systems
- Commissioning
- Validation
- Emergency Shower/Eyewash (Tempered Loops)
- Vacuum Systems
- Process Gases

