



# LABORATORIES

## LABS FOR TEACHING AND RESEARCH DESIGNING HIGH-TECH ENVIRONMENTS

GLHN Architects & Engineers, Inc. has designed numerous laboratory facilities. Many of the laboratories contain unique environments and require highly-specific, climate-controlled conditions. GLHN’s architects and engineers have a thorough understanding of how to successfully manage the integration of the architectural and engineering components of specialized facilities. Their breadth of experience includes new research and teaching laboratories, complex renovation projects, energy conservation improvements, feasibility studies, and infrastructure upgrades to accommodate laboratory facilities. Projects have involved a variety of unique environmental requirements for experimentation with pest, plant, animal, and human pathogens.

## LABORATORY PROJECTS RECENT EXPERIENCE FOCUSES ON ENERGY EFFICIENCY

The \$43 million **University of Arizona ENR2** project is to be the centerpiece of the UA Environmental and Natural Resources program. The building represents total integration of architecture and engineered systems. To meet the UA’s goal for LEED Platinum certification requires technologically-innovative methods to reduce energy consumption, decrease water use, and increase the useful life of the building components and spaces. Raised floors allow easy remodel and reconfiguration of the interior spaces. Organizing the building around a central courtyard reduces the amount of conditioned space by 20%. In addition to harvested rainwater, condensate from the mechanical system is used for irrigation (a clean by-product normally discarded), providing more than half of the 600,000 gallons of water needed annually for landscape. Utilizing “hibernation”, portions of the building are shut down or allowed higher temperature swings during non-use periods, increasing energy savings.

Design will continue through 2012. GLHN is Architect and Engineer of Record, Richard + Bauer is Design Architect.

*Thanks to the design team for your effort, dedication, and enthusiasm. I have been especially impressed with how well this team worked together to produce this amazing package within challenging time constraints.*

*May Carr, UA Project Manager*



## University of Arizona, Tucson, Arizona

- **Bio5 Pancreas Auto Transplantation Laboratory**, design and construction administration of a class 10,000 clean lab with exhausted biological safety cabinets, cryogenic storage, optical and imaging equipment, and FDA-validated robotic sample processing equipment
- **Lunar and Planetary Laboratory**, design and construction administration of a class 10,000 clean room for the manufacture and testing of a critical optical device for the final stages of asteroid sample acquisition in the NASA OSIRIS-Rex project
- **Biomedical Imaging Facilities**, planning, design and construction administration installation of a new 3 Tesla MRI for Human Subjects, and infrastructure improvements to an existing university research facility to facilitate operation of a 7 Tesla MRI for animal subjects.
- **NMR Laboratory**, planning, design and construction administration of a new laboratory facility to house relocated NMR equipment. Project included RF Shielded room, light tight curtains, and environmental control chamber
- **College of Agriculture Veterinary Sciences Research Building**, BSL2, BIM design project featuring a large animal laboratory with dual duct air handling system for high ventilation rates
- **Geochemistry Trace Element Laboratory**, design and construction administration of laboratory suite featuring non-metallic finishes, highly corrosive materials, low flow fume hoods, clean room pressure cascade
- **Chemistry Laser Laboratory**, design and construction administration of new laser lab within an existing building that accommodated extreme light and vibration sensitivity
- **UA Phoenix Biomedical Campus Enhanced Commissioning**, systems commissioning of classroom and teaching space along with 10,000 GSF vivarium
- **Biosphere II Facility Condition Assessment**, life safety study of unique environmental research facility
- **Biosphere II Corrosion Repair Project**, design and construction administration of project to replace heavily corroded space frame components and air handling systems within a unique environmental research facility
- **Keating Building BSL3 Laboratory**, design and construction administration of renovation/improvement project within an existing vivarium. Includes sterilization facilities
- **College of Pharmacy Master Plan and Laboratories**, planning and design of new wet labs in existing building and new laboratory wing
- **Gould-Simpson Spectrometer Laboratory**, design and construction administration of pressure controlled clean laboratory suite to house sensitive instrumentation.
- **Electrical and Computer Engineering Laboratory**, design and construction administration of pressure controlled laboratory housing new tool line in microelectronics teaching lab
- **Marley Building Laboratory & Classroom Shell Space Build-Out**, design and construction administration of a tenant improvement project involving converting two floors of shell space to fume hood intensive wet laboratories
- **Marley Building Fume Hood Replacement**, analysis, design and commissioning for an energy savings project to reduce airflows in wet laboratory
- **Gross Anatomy Laboratory**, design, construction administration and commissioning of a 35-station gross anatomy lab, unique, energy efficient ventilated table design.

## Arizona State University, Tempe, Arizona

- **Energy Services Contract and Campus-Wide Laboratory Renovations**, analysis and design of installation of energy efficient fume hood controls and reduce building ventilation rates in 1.2 million SF of laboratories, 250 fume hoods
- **Vaiana and Redding Laboratory Renovations**, design and construction administration space conversion of physical sciences laboratories in existing buildings to wet lab and dry laser lab
- **Physical Science C-Wing 3rd Floor Laboratory Renovation**, design and construction administration of ventilation and fume hood intensive physical chemistry laboratory. Involved major air handling system and manifolded exhaust replacement, complete replacement of laboratory control and plumbing systems
- **Physical Sciences F-Wing Infrastructure Upgrades**, design and construction administration of HVAC systems upgrades to support additional lab spaces
- **Life Sciences E-Wing Renovation**, analysis and design of improvements along with complete re-commissioning of existing pneumatic controls and rebalance of airflows



#### Northern Arizona University, Flagstaff, Arizona

- **Science and Health Building** (above), design and construction administration of a 120,000 SF teaching and research labs for chemistry, biology, and health sciences. Space functions include Physical Chemistry, Organic Chemistry, Laser laboratories and teaching laboratories along with instrumentation and support spaces and a new university central chemical stores and distribution facility, that meets H3 occupancy requirements.
- LEED Commissioning for **Applied Research and Development (ARD), Chemistry Laboratory Building Commissioning, College of Engineering.**
- **Building 17 improvements**, redesign and construction administration of fire life safety and functional improvements to an existing fume hood intensive teaching and research laboratory. Work was designed and phased to enable continuous, uninterrupted operation of the facility during renovation.
- **Wettaw Biology / Biochemistry Laboratory**, design and construction administration of chemistry teaching and research facility
- **Chemistry Building Renovations**, design and construction administration of a fire life safety and building ventilation improvement project in a 1960 era chemistry teaching and research building.

#### New Mexico State University, Las Cruces, New Mexico

- **New Mexico Department of Agriculture Laboratory Renovations**, design and construction administration
- **Foster Hall Lab Ventilation Improvements**, evaluation and preliminary design of ventilation improvements to a 1960 era chemistry teaching and research facility

#### University of New Mexico, Albuquerque, New Mexico

- **Castetter Hall**, design of MP&E systems for office, support and wet lab space in major wing expansion to and existing 1960 era Biology Building
- **Castetter Hall Research Greenhouses**, design of HVAC system to support a unique of rooftop research laboratory

#### Glendale Community College, Glendale, Arizona

- **New Physical Science Building and Math Building Addition and Remodel**

#### Department of Veterans Affairs

- **Renovate Research Lab into BSL3 Lab**, VA Medical Center, Tucson
- **Facility Condition Assessment BSL3**, VA Medical Center, Seattle
- **Value Engineering for Cancer Research Center**, VA Medical Center, Portland