

The Problem Solvers Case Study

QuietMod™ RF Shielded Test Rooms



The Problem:

The Department of the Army developed a research facility for a “Mission Impact Through Neuro-Inspired Design (MIND) laboratory” Subtitled: “Design Principles and Performance Characteristics” at the Army Research Laboratory, Aberdeen Proving Grounds, Maryland. The MIND Lab features three (3) acoustically treated and electrically shielded chambers and one (1) control room for conducting multiple simultaneous human research studies in an environment that enables flexible environmental control. The goal was to make efficient use of available space that enabled collaborative work among research personnel and allowed for flexibility as research requirements change.

The Project Parameters:

Inadequacies in the previous research facility were numerous and needed to be upgraded. These issues included: lack of dedicated space, inadequate sound attenuation and inadequate electromagnetic interference/radio frequency interference (EMI/RFI) shielding. These upgrades would enable the facility to conduct repeatable experiments without the influence of confounding environmental variables, and external signal contamination.

Noise Barriers’ local rep, Richard von Lange of TechStar Industries, Baltimore, Md. was the primary contractor for the design/build/construction project.

Noise Barriers, of Libertyville, IL, designed the acoustically treated and electromagnetic interference/radio frequency (EMI/RF) shielded chambers.

The Challenge:

The entire MIND Laboratory needed to be constructed as an “equipment-in-place” system. (Equipment-in-place is defined by the U.S. Army as personal property consisting of capital equipment and other equipment of a movable nature which has been fixed in place or attached to real property, but which may be severed or removed from buildings without destroying the usefulness of the structures [DA PAM 420-11, 2010]).



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Noise Barriers' Scope of Work:

The MIND Laboratory space consists of modular acoustically treated and electrically shielded chambers constructed from pre-engineered QuietGuard Modular panel systems including wall and ceiling panels, QuietSwing doors, QuietLite windows, and QuietAir silenced ventilation systems. These systems are manufactured by Noise Barriers.

The prefabricated wall sections were assembled on top of an RF shielded floor. All walls of the MIND Laboratory are constructed of 4" thick modular panels rated as STC-50. The interior of all wall surfaces from the floor to the underside of the suspended ceiling are covered in 1-in-thick, cloth-wrapped fiberglass acoustic absorption panels attached with magnets to maintain the integrity of the rooms for both RF and acoustics.

Double doors installed on each end of the control room provide a minimum sound transmission class of STC-50. All personnel doors between the chambers provide a minimum of STC-50 isolation and RFI/EMI shielding between spaces when closed.

"The chambers are integrated into the life safety systems installed in the building (including sprinkler, fire alarm, and mass-notification systems)."

TechStar Industries installed the chambers and doors and coordinated the interface of HVAC, fire protection and electrical work.

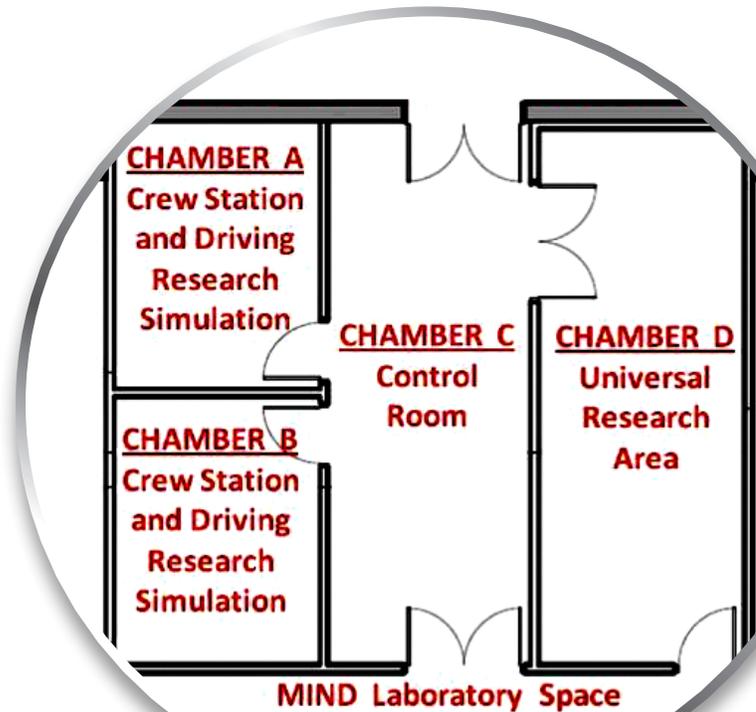
The Results:

Brune Consulting, LLC, of Towson, MD, performed the acoustic testing. Each chamber was required to meet or exceed noise isolation class 50 (NIC-50). Measurement were taken at nineteen (19) locations. NIC levels ranged from NIC 50 to NIC 58. Meeting and in most cases far exceeding the specification requirements.

An independent Consultant performed the EMI/RF testing; RF Isolation test performance requirements were: Electric 45-50 dB, Magnetic 10-45 dB and Plane Wave 40-50 dB. The dB range depends upon frequency. Measurements were taken at 28 test points and 6 doors for a total of 34 test locations. Each test was taken at 13 frequencies. According to the report submitted by the Consultant "As indicated by the Test Data Sheets, the enclosure met all criteria for RF Isolation at all frequencies".

According to an Unclassified Abstract written by Christopher C. Stachowiak and Bruce E Amrein "In the long-term, the versatility afforded by the MIND Laboratory provides increased flexibility for adapting to the changing research requirements that are driven by rapid advances in neurotechnology."

"The MIND Laboratory research space was fabricated and installed over a 20-month period. The research facility meets all specified performance requirements and should fully meet the needs of ARL's neuroscience research for many years to come."



The Bottom Line:
 Our QuietGuard/QuietMod Enclosures are just one of the many products Noise Barriers can use to solve your unwanted sound issues.