Biosafety Level 3 (BSL-3) Architectural & Engineering Considerations Update

ISSUE: Engineering and Architectural Considerations in Biosafety Level 3 (BSL-3) Laboratories.

DISCUSSION: Due to safety and security protocols of BSL-3 laboratories, this design alert updates the BSL 3 requirements from the Mycobacterial Laboratories – BSL 3 Labs Architectural and Engineering Controls Update design alert (003C2B-DA-121) dated September 15, 2004. Design Alert 121 is hereby rescinded.

REQUIREMENTS: For new construction or major renovation of clinical infectious diseases, infection control and epidemiology testing laboratories, the following architectural and engineering controls are recommended as per the following:

1. The BSL-3 laboratory area shall be identified based on discussions with the medical center personnel and Office of Research and Development program office.
2. The architectural and engineering design/contract documents shall identify the area requiring BSL-3 compliance.
3. Laboratory Facilities (Secondary Barriers) for Biosafety Level 3 Laboratories must comply with, but not limited to the following, VA directives and standards, along with nationally recognized standards:
   a. VA Handbook 1106.01 – Pathology and Laboratory Medicine Service (P&LMS) Procedures
   b. VA Handbook 1200.06 – Control of Hazardous Agents in VA Research Laboratories
   c. VA Directive 1200.08 – Safety of Personnel and Security of Laboratories Involved in VA Research
   d. Biosafety Level (BSL) 3 Research Laboratory Physical Security Inspections, dated March 23, 2007
   e. VA Electrical Design Manual
   f. VA HVAC Design Manual
   g. VA Plumbing Design Manual
   h. VA PG 18-14 - Room Finishes, Door, & Hardware Schedule
   i. VA Physical Security and Resiliency Design Manual
   j. VA Research and Development Design Guide
k. VA Structural Design Manual
m. Biosafety in Microbiological and Biomedical Laboratories (BMBL)

The following list of specific sections for the above references is intended to assist with navigating the documents for BLS-3 specific planning and design criteria but is not all inclusive.

a. VA PG 18-14 - Room Finishes, Door, & Hardware Schedule
   i. Chapter 278 Research and Development, FA3: Biomedical Research Unit Biosafety Laboratory Area

b. VA Physical Security and Resiliency Design Manual must be followed with specific attention to the following sections for BSL-3 laboratories, 5 Functional Areas – 5.15 Research Laboratory and Vivarium:
   i. 5.15.2.2 Interior Entry and Emergency Egress Doors
   ii. 5.15.3 Construction
   iii. 5.15.3.2 Interior Construction
   iv. 5.15.3.3 Partitions
   v. 5.15.3.5 HVAC
   vi. 5.15.4.1 SSTV
   vii. 5.15.4.2 Intercom
   viii. 5.15.4.3 Biometric
   ix. 5.15.4.5 Alarm
   x. 5.15.6 Alteration/Renovation of Existing Facilities – Research Laboratory and Vivarium
   xi. 7.4 Prevention of Progressive Collapse

c. VA Research and Development Design Guide must be followed with specific attention to the following sections for BSL-3 laboratories:
   i. 3.0 Building Technical Considerations: 3.5.6 Exhaust Hoods

d. NIH – Design Requirements Manual (DRM) must be followed with specific attention to the following sections for BSL-3 laboratories:
   i. Chapter 1 – Administration, section 1.13 Security Requirements and Procedures: Applicable for VA leased facilities. For VA owned facilities, follow VA’s PSRDM, VA Handbook 0730 and the references listed within.
   ii. Chapter 2 – Planning and Programming, section 2.5 Biocontainment Facility Predesign
   iii. Chapter 4 – Architectural Design, section 4.4.5 Wall and Ceiling Finishes for Aseptic Facilities, BSL-3, ABSL-3 and Similar Facilities
   iv. Chapter 4 – Architectural Design, section 4.9 BSL-3 and ABSL-3
   v. Chapter 6 – Mechanical Design, section 6.6 BSL-3 and ABSL-3
   vi. Chapter 7 – Building Automation Systems, section 7.7 BSL-3 and ABSL-3
vii. Chapter 8 – Plumbing Design, section 8.6 BSL-3 and ABSL-3
viii. Chapter 10 – Electrical Design, section 10.8.4 Lighting BSL-3 and ABSL-3

Biocontainment

Notes:

i. NIH’s DOHS BioRisk Program: VA equivalent is Institutional Biosafety Committee (IBC).
ii. NIH’s Division of Fire Marshal (DFM): VA equivalent is HEFP Fire Protection Engineer.
iii. NIH’s Division of Occupational Health & Safety (DOHS): VA Environmental Programs Services
v. NIH’s Division of Technical Resources (DTR): VA, CFM Offices of Facilities Standards Service and Consulting Support Services
vi. NIH’s Office of Research Facility (ORF): VA equivalent is Office of Research and Development

e. Biosafety in Microbiological and Biomedical Laboratories (BMBL) must be followed with specific attention to the following sections for BSL-3 laboratories:
   i. Section IV - Laboratory Biosafety Level Criteria - Biosafety Level 3, D Laboratory Facilities (Secondary Barriers)

CONTACT: Don Myers, Director, Facilities Standards Service at 202-632-5388
Facilities Standards Service at til@va.gov