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Office of Construction &
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DESIGN ALERT

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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 Design Alert 121 is hereby rescinded.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
- l. National Institute of Health (NIH) Design Requirements 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
 - iv. NIH’s Design Requirements Manual (DRM): VA’s Research and Development Design Guide
 - 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)

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