

Integration of BSL-3 Laboratories into Existing Facilities



- General BSL-3 Design Issues
- Modular Options
- Equipment Considerations
- Existing Conditions
- Room Layout as Constructed
- Pressure Differential
- Finishes
- Planning for Duct Work
- HVAC Design
- Validation
- Summary

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General BSL-3 Design Issues

Before You Start


Experience, Understanding

- An integrated team and process begins early in the planning phase; document goals and expected outcomes; revisit continually
- Focus is on the process in planning of facility, combining understanding of process with facility design
- Life Safety a key part of planning and development

Integrated Process

- All team members “vertically integrated” for project responsibility; streamlines the process
- Drives the commissioning process, and ensures a well documented end product
- Delivers facility that meets functional and operational goals

Summary of Design Features (Secondary Barriers)

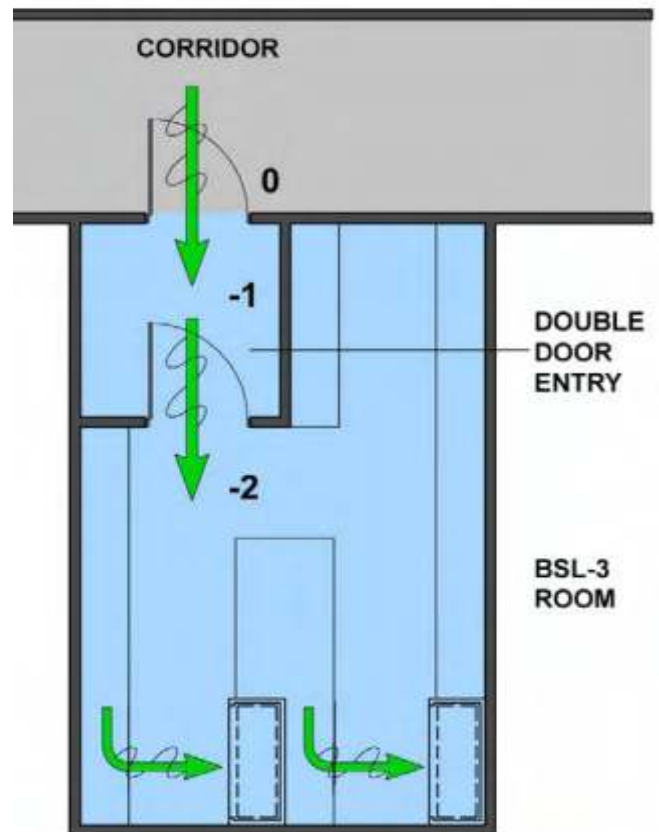
	Double Door Entry	Access Control Devices	Personnel Shower-Out	Hand Washing Sink	Hands Free Hand Washing Sink	Autoclave Available	Pass-through Autoclave	Dunk Tank and/or Fumig Chamber	Single-Pass Air, Directional Airflow	HEPA Filtered Exhaust	HEPA Filtered Supply	Supply/Exhaust Interlock	Gas-Tight Dampers (Room Level)	Visual Airflow/Pressure Monitor	HEPA Plumbing Vents	Effluent Decontamination	Vacuum Line Protection	Monolithic Walls & Ceiling	Seamless Flooring	Airtight Construction	Breathing Air System	Chemical Shower
BSL-2 Laboratory		●		●		●			●								●		●			
ABSL-2 Animal Facility		●		●		●	●		●								●	●	●			
BSL-3 Laboratory	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
ABSL-3 Animal Facility	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
BSL-3 Ag Animal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
BSL-4 Lab/Animal (Suit)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● = Required by BMBL (5th ed.)
 ● = Not required by BMBL (5th ed.), however, generally considered as an enhancement



General BSL-3 Design Issues

- HEPA Filter Exhaust ?
- Location in Building
 - Life Safety
 - Utility Routing
 - Mechanical Equipment Room
- Location
- Double door access (vestibule)
- Negative Airflow
- Plan to include personnel shower
- Decontamination



- Pressure Differential vs. “Airtight”
 - Sealing surface penetrations
- Finishes
 - Seamless flooring options
 - Washable/scrubbable surfaces
- Room Layout Issues
 - Design for mobile casework
 - High concentration of BSC’s
 - Substantial Lab Equipment
- Planning for Ductwork
 - Access to filters,
 - Volume Control Dampers
- HVAC Design





Summary

- Hire a **BSL3-experienced** design team with a demonstrated commitment to understanding of how the lab is going to be used and maintained.
- Insist on an integrated approach to planning, design and construction.
- The devil is in the details: operational **and** physical!
- HVAC system retrofit is often difficult due to space constraints and adjacency issues
- Don't depend on published cost data!
- Plan for BSL-3 expansion now if it may be a possibility; route ductwork and provide adequate utility services

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