

FIRE SAFETY REQUIREMENTS FOR HIGH CONTAINMENT FACILITY (BIO-SAFETY LEVEL 3 / 4)

SCOPE

1. The scope of this Fire Safety Guidelines covers the fire safety requirements for high containment facility or laboratory that handles biological agents or toxins, designed to meet the WHO and MOH's requirements of Bio-Safety Level 3 [BSL-3] or higher.

DEFINITIONS

2. **“Biological Agent”** refers to the biological agents stipulated in the First Schedule, Second Schedule and Third Schedule of the Biological Agents and Toxins Act.
3. **“Toxin”** refers to the toxins stipulated in the Fifth Schedule of the Biological Agents and Toxins Act.
4. **“High Containment Facility”** refers to containment laboratory of Bio-safety Level 3 and maximum containment laboratory of Bio-safety Level 4 (WHO, 2004)¹(it includes interstitial space, waste treatment area and anteroom etc). They are designed to comply with the WHO and MOH's requirements for storing or handling of biological agents.
5. **“Anteroom”** is the proceeding room leading into the BSL-3 or BSL-4 containment laboratory. This room is for showering and changing. It is also served as a containment facility in controlling of air flow and providing additional physical containment between the laboratory and adjoining spaces.

¹. Laboratory Bio-safety manual (2004), third edition, World Health Organization.

GENERAL REQUIREMENTS

6. BSL-3 or BSL-4 containment laboratory shall preferably be located at the ground floor and shall be separated from areas that are open to unrestricted traffic flow within the building. They shall be designed and constructed to comply with the requirements listed herein, and the requirements of other relevant authorities, such as WHO, MOH, NEA, etc.
7. The word “BSL-3” or “BSL-4” shall be stated clearly in the project title and printed on the top-right corner (lettering shall be bold, in red colour and at least 15mm in size) of all the fire safety plans of the high containment facility.

FIRE COMPARTMENT

8. In sprinkler-protected building, the high containment facility shall be fire compartmented (it include interstitial space, waste treatment area, anteroom, etc.) from adjoining spaces with at least one-hour fire rated walls, floor and ceiling. For non-sprinkler-protected building, the fire rating shall be at least two hours.
9. The protecting structure shall be constructed of masonry or drywall. If drywall construction is used, it shall comply fully with *clauses 3.8.7(c)(i) to (iv)* of the Fire Code.

FIREMAN STAGING LOBBY

10. Entry to the high containment facility shall be either through a fire compartmented lobby or an anteroom having at least 1-hour fire rating. The anteroom can also be doubled up as the fireman staging lobby and both shall have a free working space of at least 6 m² in size. This additional fireman staging lobby is only meant for BSL-3 or BSL-4 and shall comply fully with the *clauses 2.2.13(b), (b)(i) and (b)(ii)* of the Fire Code. A designated rising main landing valve, complete with standby fire hose, and fire hose reel shall be installed within the fireman staging lobby.

TWO-WAY EMERGENCY COMMUNICATION SYSTEM

11. For biomedical facility or building provided with two-way emergency voice communication system, the two-way communication system shall be extended to the fireman staging lobby.

FIRE DETECTION AND SUPPRESSION SYSTEMS

12. All high containment facilities shall be protected with sprinkler system. In a non-sprinkler-protected building, smoke detectors shall be installed along the exterior of the periphery walls of the high containment facility. The fire protection circuit for BSL-3 or BSL-4 shall be grouped in a different fire zone for ease of identification. The fire protection systems shall be linked to the building fire alarm system and shall be connected to fire station through an approved alarm monitoring station. If water discharge within the high containment facility is undesirable or unacceptable, the sprinkler system may be replaced by an approved fire extinguishing system.

LABEL AND SIGN

13. Caution labels shall be provided at all the laboratory entrances and exits in accordance with SS 286. In addition, a label indicating the information as shown in Annex A shall be also provided.
14. A sign of the following wording **“In the event of fire or any water discharge, please notify PUB at 1800-2255782 for control of contaminated water run off”** shall be displayed at all entrances to the high containment facility.



BIOHAZARD

MS 10 004

ADMITTANCE TO AUTHORIZED PERSONNEL ONLY

Biosafety Level: _____

Responsible Investigator: _____

In case of emergency call: _____

Daytime phone: _____ Home phone: _____

**Authorization for entrance must be obtained from
the Responsible Investigator named above.**