Feasibility Study of Expandable Mobile BSL-3 Laboratory Concept (EMLAB)

ABSTRACT

Medical service accessibility has always been a concerning problem among the community of inner Sabah region, in Malaysia and many more places around the world. To make medical diagnostic service more accessible, this paper proposes Expandable Mobile BSL-3 Laboratory (EMLAB) as a technological relief measure. The objective of this paper is review and evaluate the feasibility of EMLAB in terms of concept practicality and design consideration. EMLAB is a mobile laboratory in a form of an expandable mobile building structure compliant to BSL-3 and ISO Cleanroom standards. The rationale behind the design of EMLAB was the lack of workspace in existing mobile BSL-3 laboratory for optimum workflow and overall laboratory functionality. One of the vital functions of EMLAB is to address the space issue with an expansion mechanism along with a novel bellow shape foldable seal joint to maintain structurally airtight. The proposed virtue model study can achieve almost 3 times expansion of the initial 10-meter squares floor area making it comfortable for laboratory personal to work. With the use of a novel bellow shaped foldable seal joint, the BSL-3 and clean room standard with negative air pressure are highly achievable. A layout with projected equipment for the proposed study shown the expandable mobile BSL-3 laboratory is highly feasible and practical.