

6.0 Construction and Renovation

6.1 Planning

Infection control precautions during construction should be integrated into the design and documented from the beginning of the design stage. It is important that the dust and infection control principles developed during the pre-design stage be integrated at the initial stages of the design development. It is important that the pre-design team comprehensively brief the design team and submit the findings of the survey and risk profile.

6.2 Risk Management

A formal approach to risk management must be part of all building and renovation activities. Risk management should include specific assessment of infection control risks. The design stages of a project shall include an infection control risk assessment.

A more detailed review of risk is beyond the scope of this document but adherence to risk management principles will provide the framework to assemble a relevant risk management strategy.

Airborne sampling may be part of a risk management program. Cumulative data is used to establish indoor and outdoor background levels of filamentous fungi for a particular site. This will enable establishment of risk profiles for particular locations in and around the hospital.

The risk profile should as a minimum:

- Identify the location of high-risk patients in relation to the site
- Identify ventilation system types and potential impact
- Determine air monitoring requirements, methodology and frequency
- Take air quality samples to establish a baseline
- Identify possible contaminants and their locations (contaminants may be present in ceiling dust, service shafts, sprayed on fire retardants and bird droppings).

6.3 Infection Control

Current construction practices can affect patient well-being by the dissemination of bacteria and fungi that can cause healthcare associated infections.

Building, renovation and maintenance activities within a healthcare facility impose risks upon the incumbent population unlike any other building site. Building practices therefore require a range of precautions appropriate to the risk. Identification of the at risk population, a knowledge of the transmission route of a likely pathogen and location of the at risk population in relation to the construction, all need to be taken into account in the planning stages.

Infection control measures to consider during construction are:

- Infection control site induction of building workers should be carried out as a major component of the OSH induction. This induction process should be documented and signed off by each person inducted
- Worker compliance with procedures should be monitored and the results of this monitoring should be fed back to the workers routinely through the builder. A system must be in place to manage major breaches
- Ensure that adequate inspections by the nominated representatives take place during the construction of the barriers. These inspections should be monitored and reported on.

6.4 Air Sampling

Negative pressurization of the construction zone is recommended to maintain correct airflow direction. The exhaust/extraction systems specified in the contract documentation must be constantly monitored and maintained to ensure no failures occur. These inspections should be documented and reported on.

If HEPA filtration is required, a person must be nominated as responsible for that duty. The filters should have differential pressure monitoring with alarms. Spare filter elements must be kept on hand. These inspections should be documented and reported on.

Routine inspections of barriers should be conducted by the hospital's nominated representative from the contractor. These inspections should be documented and reported on.

Routine air sampling should be employed by the hospital to monitor the effectiveness of the barriers, pressurization and housekeeping procedures. The routine air sampling should be documented and reported on.

A high level of site cleanliness is essential. It is recommended that tools with efficient dust extraction systems connected to HEPA filters be used. Tasks such as sanding plasterboard present a high level of potential risk; therefore it is recommended that mechanical sanding should be used.

Demolition and jack hammering of concrete should be undertaken with a filter unit in close proximity.

HEPA vacuuming, not sweeping, should be used to clean up. Conventional vacuum cleaners disseminate huge quantities of dust and fungal spores and should not be used.

Movement in and out of the site shall be controlled by restricting access to only those who have undergone site induction. This will assist greatly in reducing the spread of contaminants.

All inspections should be documented including a non-conformance system for defaults complete with a corrective and preventative action loop.

6.5 Air Sampling Methodology

There are two distinct sampling methodologies for the detection of viable airborne fungal spores. These are high air volume sampling and low air volume sampling. Sampling for viable fungal spores almost universally is via low air volume sampling. Low volume sampling is used to measure high spore concentrations. High volume sampling is used to measure low spore concentrations.

Along with airborne sampling, routine surface sampling should be used. A combination of settle plates and surface swabbing can be employed to augment airborne sampling. Airborne sampling has limitations due to the burst nature of fungi and the transience of bacilli.

It is important to have a clear idea of what outcomes are required of the sampling. Equally important is to have an approximate idea of the expected number of fungi that will be obtained. This will determine the appropriate sampling system. Refer to ISO 14001 for additional information related to air sampling.