

6. Construction and Renovation

6.1 Planning

Infection prevention and control (IPC) precautions during construction should be integrated into the design and documented from the beginning of the design stage. It is important that the infection and prevention control principles developed during the pre-design stage are integrated at the initial stages of the design development.

Infection Prevention and Control needs to be addressed throughout the planning process and measures taken should provide appropriate advice at the right time so that costly mistakes can be avoided.

A back-up emergency power supply should be provided to ensure that mechanical fans, alarms and monitoring systems do not fail when there is a main supply disruption.

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.

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.

A back-up emergency power supply should be provided to ensure that mechanical fans, alarms and monitoring systems do not fail when there is a main supply disruption.

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)
- Identify previously unknown holes, shafts, penetrations etc. connecting one area to another

6.3 Construction

Current construction practices can impact on patient well-being by the dissemination of bacteria and fungi that can cause health care associated infections.

Building, renovation and maintenance activities within a Health Care 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, need to be taken into account in the planning stages.

At Risk population in this context refers to:

- Inpatients and Outpatients

- Staff
- Visitors

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 Occupational Health and Safety 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 barrier hoardings; inspections should be monitored and reported on.

Negative pressurisation of the construction zone is recommended to eliminate dust or pollutant penetration into clinical areas. 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 the responsible person 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 hospitals 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, pressurisation 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 with vacuum duct collection 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 must 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 methodology.

6.3.1 Air Sampling Methodology

Air sampling may be undertaken during renovations, construction and the commissioning process and should involve Microbiology specialists.

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 from the sampling. Equally important it is necessary to have an approximate idea of the expected number of fungi that will be obtained. This will determine the appropriate sampling system.

6.4 Verification

All infection control measures described in this section are required to be capable of verification by inspection. There should be no obstacles to prevent the checking and validating the infection control measures described.