Means of Escape

General

The means of escape are the routes and doors that occupants need to use to get out of a building in an emergency. It should be ensured that they are immediately available for use at all material times, which is whenever people, (staff, visitors, students or contractors) are in the premises.

Exit routes

The normal routes used to move around the building are usually the main exit routes as people are familiar with them and it will be apparent if they are obstructed, so dedicated exit routes which are not in regular use are the ones that need extra attention. The storage of combustibles and obstructing escape routes not only puts people and the premises at risk from fire, but puts the University at risk of prosecution.

Fire exit doors

Exit doors also provide security to the building, so some form of lock acceptable to Oxford University Security Services should be provided. However they should remain openable from the inside whenever anyone, including staff and contractors are on the premises. If it can be foreseen that there is any possibility that a door could be locked for any reason, it should be fitted with a device that can be easily opened without the use of a key. This could be a thumb-turn operated dead lock or magnetic lock linked to the fire alarm system.

Thumb turn lock

Magnetic lock release

A magnetic lock should be also provided with a green break glass point, which isolates the electrical current to the magnet and releases the door. Final exit doors usually fail safe locked when the fire alarm activates to maintain security when the

building is empty. Internal doors on escape routes should fail safe unlocked when the fire alarm sounds, so should be networked.

The use of a Redlam Bolt has been adopted on some of the University's older building. These are only acceptable on exit doors that are used by staff who understand how the lock works. The padlock which keeps the ceramic breakable tube in place can easily be mistaken by visitors, contractors or students that the door itself is padlocked. A metal hammer should always be chained to the device to break the tube in an emergency.

Redlam Bolt

A key in a box, with a breakable cover is not an acceptable locking mechanism for a fire exit door.

Opening-up procedures should include checking that escape routes are available, unlocked and free from obstructions and unauthorised storage of combustibles.

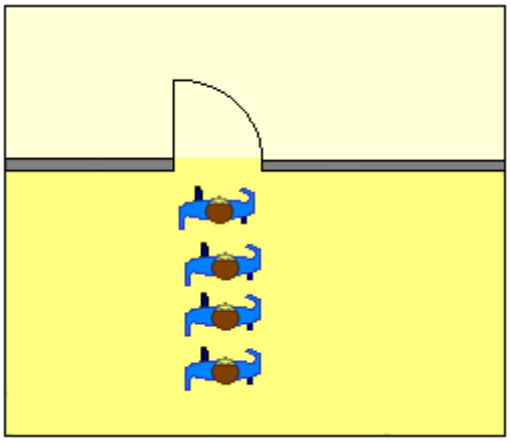
Exit Capacity

The number of people allowed to occupy the premises should not exceed the exit capacity. The exit capacity is the number of occupants of a room or building that can escape in a given period, usually 2.5 minutes. There are two methods of calculating exit capacities

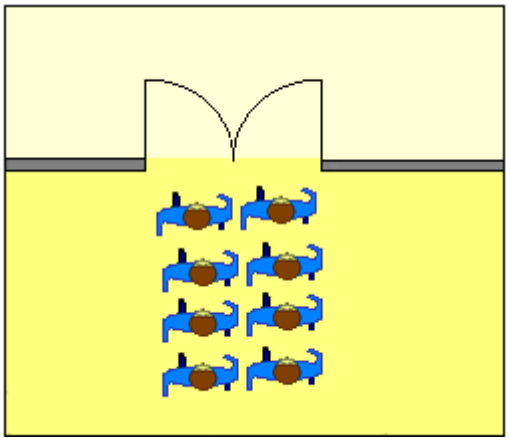
a) assigning a flow rate of people through a unit of exit width of 525mm (which is about shoulder width) or
b) giving a varying width from 3.3mm – 6 mm width per person depending on the anticipated fire growth rate and the fire safety facilities in the building.

On existing buildings method (a) will give an acceptable degree of accuracy. A single outward opening door will allow 40 persons per minute to pass through it in single file, so 100 persons can exit in 2.5 minutes. If the door/s are more than two units of

exit width (1050mm) two columns of people can exit allowing 200 persons to pass in 2.5mm.



40 people per minute through a single door



80 people per minute through a double door over 1050mm

Where there is more than one exit, the largest door is discounted as if it is obstructed by fire and the exit capacity is the sum of the exit capacity of the remaining doors.

A limit of 60 persons is imposed on inward opening doors as the problem of crushing could occur if larger numbers of people try to exit at once. This limit applies to the number of persons expected to have to evacuate through this single door, rather than the overall capacity of the building. A room with four inward opening doors would have an exit capacity of 180 persons, which is the sum of the remaining three doors after one has been discounted.

Method (b) relies on many other criteria contained in British Standard 9999 and should only be used by an experienced fire safety engineer or the University Fire Officers.

Capacity of a building

The number of persons that resort to a building is generally restricted by the amount of room available to them. This is easily calculated where there are fixed seats, tables or benches, but where there are open spaces a floor space factor according to use is multiplied by the floor area.

The floor space factor varies from 0.4m^2 per person for a bar area to 1m^2 per person for a dance floor and 7m^2 per person for a museum or art gallery. After the initial assessment of the capacity of the building and assuming there are enough exits of sufficient width for this capacity, there is no need to count and restrict the number of visitors passing through a building in normal circumstances. However if part of a building is used for a special event which is going to alter the floor space factor, the numbers will need to be restricted to match the exit capacity.