Horizontal Escape Route Design

Principles of Escape Routes

Means of escape should be provided from any point on a floor to an exit. The general principle is that any person confronted by a fire can turn away from it and escape safely.

In certain conditions, typically classrooms, a single direction of escape (a dead-end condition) can be accepted as providing reasonable safety, provided that the recommendations of Table 1 on travel distances in a single direction are met and the occupancy of the space is limited to 60.

Number of Escape Routes and Exits, and Limits on Travel Distance

The number of escape routes and exits depends on the number of occupants and the limits on travel distance to the nearest exit, as given in Table 1. It is only the distance to the nearest exit that needs to meet the recommendations; other exits may be further away. In multi-storey buildings, more than one stair will be needed for escape.

A single route is acceptable for parts of a floor from which a storey exit or escape in two directions can be reached within the travel distance limit for travel in one direction set in Table 1. Very young children will move more slowly and require constant supervision during egress. Direct access to an external place of safety from their classrooms is an advantage.

Number of Occupants and Exits

The number of occupants used for design should be based on the specified capacity. If the number of occupants is not known, capacity should be calculated according to the appropriate floor space factors (see Table 2).

Table 3 gives the minimum number of escape routes and exits from a room or storey according to the number of occupants. The number of exits may need to be increased to comply with the travel distance limits given in Table 1.

Alternative Escape Routes

A choice of escape routes is of little value if two or more are likely to be disabled simultaneously. Alternative escape routes should therefore satisfy the following criteria:

- They are in directions 45° or more apart.

- If they are less than 45° apart, they are separated by fire-resisting construction.

Inner Rooms

A room from which the only escape route is through another room is called an inner room. Classrooms can be inner rooms when the corridor they escape into is used for teaching or other purposes. This arrangement is acceptable if the following conditions are met:

- The occupant capacity of the inner room does not exceed 60, and the access room is not a place of special fire hazard.

- The escape route from the inner room does not pass through more than one access room.

- The travel distance from any point in the inner room to the exit(s) from the access room does not exceed the limit in Table 1.

- One of the following arrangements is made:

  - The enclosures of the inner room are stopped at least 500mm below the ceiling.

  - A suitably sited vision panel of at least $0.1m^2$ is located in the door or walls of the inner room.

  - The access room is fitted with an automatic fire detection and alarm system.

Open Plan

Escape routes should not be within 4.5m of open connections between floors. In open-plan spaces connecting more than one storey, rooms accessed from the space should be treated as inner rooms, with the space regarded as the access room. Escape routes should be designed to avoid openings in floors, either by traveling away from the opening or providing an alternative escape route that does not pass within 4.5m of the opening.

In schools with sprinklers, rooms accessed by an open balcony less than 4.5m wide, without an alternative escape route, should satisfy the following conditions:

- Escape should be available in at least two directions.

- The travel distance along the balcony should not exceed 18m.

Access to Stairways

Stairways and associated exit passageways should not form part of the primary circulation route unless fitted with an automatic release mechanism for the doors.

Escape Routes and Exits

The minimum clear headroom height in escape routes should be at least 2m, except in doorways. For escape purposes, the minimum corridor width of 1200mm is sufficient for up to 250 people. For more than 250 people, the width should increase by 50mm for each additional 10 persons. The aggregate width of all escape routes should accommodate the maximum number of people likely to use them.

Discounting Exits

In a storey or room with more than one exit, it must be assumed that a fire might prevent the use of one exit. When deciding the total width of exits needed, the largest exit should be discounted. Table 4 gives the required exit width against the maximum number of persons.

Corridors

Corridors used for escape should be enclosed by non-fire-resistant partitions carried up to the soffit of the floor above or to a suspended ceiling. Corridors connecting two or more storey exits should be subdivided by self-closing fire doors positioned mid-way between the exits. Cavity barriers should be fitted above enclosures if the partitions do not reach the floor or roof above.

Dead-End Corridors

Dead-end corridors should be avoided if possible. If present, they should be enclosed in fire-resistant construction up to the point where escape is available in two directions. Self-closing fire doors with smoke seals should separate dead-end corridors longer than 4.5m from areas where escape is available in more than one direction.

External Escape Routes

External escape routes beside an external wall should have the wall within 1800mm of the route constructed to be fire-resistant up to a height of 1100mm above the paving level.

Security

Doors in school buildings should be secured against entry but provided with emergency hardware to ensure they can be opened when needed. Electrically powered locks should fail-safe open on alarm or loss of power and be equipped with a manual release unit positioned on the escape side of the door.