AS Unit 1: Our Built Environment

2.1.7: SUPERSTRUCTURES (3 OF 3)

STAIRS AND OPEN SPACES

Staircases provide a means of pedestrian circulation between storeys. Their design will need to suit the floor to floor dimension, or total rise and comply with building regulations, as follows:

- Vertically. Risers must all be equal, between 150 and 220mm, depending on type of building.
- Horizontally. Goings must all be equal, between 220 and 400mm, depending on type of building.
- Incline. The maximum pitch for a private stair = 42°. In all other cases calculated the pitch should be calculated so that 2 x the rise + the going is between 550 - 700 mm.
- Width. 900 mm min. in dwellings, 1m clear between handrails elsewhere. Wide staircases should be subdivided with additional handrails to maintain the 1m gaps.
- Handrails. Should be positioned 900 – 1000mm above the pitch line and be provided on both sides on all but narrow private stairs.
- Headroom over stairs should be 2m minimum.
- Flights. Generally, the number of risers between landings should be between 12 and 16. Stairs with more than 36 risers in consecutive flights should have at least one change in direction between flights.

Timber staircases are generally used in dwellings, usually single flight or with a half landing. Designs with tapered treads are also used to save space by forming turns in flights.

Metal staircases are durable, can withstand heavy loads, are weather resistant and are sustainable due to their potential for recycling. Metal spiral staircases can also be used as a feature or where space is restricted, including as external escape stairs.

STAIRS AND OPEN SPACES (cont.)

Concrete staircases. Can be precast or formed insitu and be designed to add structural stability and are inherently fire resistant.

Tolerances. The size of a pre-made stair should be less than size of the stairwell measured on site, as this may not permit parts of the flight to be manoeuvred into position and allowances must be made for finishes to be applied to the surrounding walls or floors.

Fire Safety. Building Regulations, Approved Document B includes specific and complex requirements for the fire separation of stairs – depending on the height of the building – for external escape stairs and for the provision of protected stairs, which are stairs enclosed with fire resisting construction, that lead to a place of safety.

INTERNAL PARTITIONS

Partitions are non-load bearing walls that separate internal spaces and provide privacy, potential for security and protection from fire and noise.

Blockwork partitions

Partitions are often constructed in blockwork, with precast concrete, or profiled steel lintels over openings, to provide a solid internal wall for plastering. With inherent fire resistance, dense concrete blocks may be used to provide adequate levels of sound insulation, particularly in party walls.

Timber and metal stud partitions

Stud partition, either in timber, or framed using light steel sections to form taller partitions. The fire performance of framed partitions will be determined by the thickness and number of layers of the boarding, usually plasterboards. The hollow nature of stud partitions helps with wiring and allows sound absorbing materials to be built in.

FLOOR AND CEILING FINISHES

Timber floors

Traditionally, finished with planed softwood, tongue and grooved boards, typically 18 x 120 mm, OR with plywood or chipboard sheets to suit application, such as water-resistant ply in bathrooms. Hardwood strip flooring may be used as an alternative to provide a polished floor.

Screeds and structural toppings

Concrete slabs are typically finished with a 50mm sand cement levelling screed. The thickness of a screed may be increased, and the screed reinforced to provide a structural topping, which may be used over insulation and/or to add to the strength of the floor. The density of a screed may also be increased for added sound proofing.

Raised floors

Built above a solid floor with an open void used for the distribution of building services, such as electrical / communication cables and air conditioning ducts. A raised floor is useful in open plan spaces where removable floor panels allow services to be re-routed to suit changing layouts. Typically, the floor panels comprise 600 x 600mm laminated boards in steel frames on steel stands or legs to form the floor void.

Ceilings

Plasterboards with a skim finish, fixed directly to the underside of floor joists. The ceiling is the fire resistant element of the floor. Alternatively, suspended ceilings formed below a structural floor can provide a finish and create a void for services, such as cabling, ductwork and pipework for plumbing, sprinkler, and heating systems. A suspended ceiling will comprise a metal grid with in-laid ceiling tiles clipped in position. In addition to appearance, the ceiling tiles should be selected according to their moisture resistance and the level of fire protection, sound absorption and thermal insulation required.