Construction and the Built Environment – Unit 1

1.4 Technologies and Materials (1 of 2)

THE MAIN ELEMENTS AND COMPONENTS OF LOW-RISE BUILDINGS

The **substructure** refers to the elements of a building located below ground level. It includes the **foundations**, which provide a firm base to support the weight of the building above ground.

The **superstructure** refers to the part of a building constructed above ground level. Superstructures are designed to provide a controlled environment (in terms of shelter, comfort, privacy, and security) to suit the intended activities within the building.

The main elements of the superstructure are:

Ground floor is the floor of a building that is at the same level as the ground around the building.

Walls are the layers of material that enclose a building. They can be load-bearing or non-load-bearing.

Upper floors are the levels of the building above the ground floor, typically up to four floors in low-rise buildings.

The **frame** is the rigid structure that supports the building and its basic components such as walls, doors, windows, and the roof.

Roof supports are the elements, such as rafters and trusses, that support the roof deck.

Wall claddings are layers of non-load-bearing materials fixed to the wall frame, either externally or internally.

Roof finishes are the covering materials used to provide a weatherproof barrier, such as tiles or metal sheeting.

External walls consist of three main elements:

1. **Structural element** is the rigid structure that supports a building and its basic components such as walls, doors, windows, and roof. This is commonly made of masonry, steel, or timber frame.
2. **Insulation** buildings need to be temperature insulated to keep out heat in summer and protect against the cold in winter.
3. **External cladding** is a non-load bearing 'skin' of material fixed to the main building frame or structure. Cladding seals the building from the elements and can provide an attractive aesthetic finish.

Internal walls are generally non-load-bearing and divide a building into rooms. They are typically made of blockwork or stud (timber or steel) partitions.

Floors rest on timber, concrete, or steel joists.

Secondary structures are elements that support other components (e.g. roof trusses that hold a roof deck in place) but are not crucial to the building's overall structural integrity. Examples include lintels and rafters.

Roof finishes describe various covering materials used to provide a weatherproof barrier. These are fixed to the main roof structure. Slate, tiles, steel sheeting, rubber sheeting, and fibreglass are common roof finishing materials.

Internal finishes are the surface materials used for floors (screed, floorboards, and laminate), and walls and ceilings (for example, plasterboard and plastering).

Building services include lighting, heating, ventilation, electrics, clean water, and sewage. The most common materials used for building services are:

- Plastic and copper pipework for plumbing and heating services.
- Plastic rainwater goods such as guttering and downpipes.
- Copper cable for electricity and communication services.