AS Unit 1: Our Built Environment

2.1.8: SERVICES (1 of 2)

Key terms

Term	Definition
National grid	A network for the distribution of electricity and gas supplies – made up of high-voltage power lines, gas pipelines, interconnectors and storage facilities – that connects users with energy generators and suppliers.
BIM	Building Information Modelling is an intelligent 3D model based system for the design and management of buildings.
UPS	Uninterruptible Power Supply. An emergency power source to maintain systems in the event of mains failure.
RLV	Reduced Low Voltage. A system to reduce the risk of electric shock, where voltage between live conductors is limited to a maximum of 110 v.
CU	Consumer Unit. The interface, or control, between the mains electricity supply and a domestic power system.
Earthing	A fundamental safety system used in electrical installations. It works in co-ordination with circuit breakers to ensure that an electrical supply can be disconnected quickly in the event of a fault. This greatly reduces the risk of injury from electric shock.
Smart meters	Meters that use wireless networks to send data directly to the energy supplier, monitor electricity use and encourage more efficient use of energy resources.

REQUIREMENTS FOR COMMERCIAL BUILDINGS

Lifts

There are two main categories of lift:

Traction lifts, which operate with steel ropes running over a wheel attached to an electric motor located above the lift shaft, with a counterweight to balance the load on the motor. Suitable for use in high-rise buildings.

Hydraulic lifts use an electric pump and hydraulic piston to push up the car, and a release valve to lower the hydraulic pressure in the piston. Hydraulic lifts require a lift pit below the lift shaft and are used at relatively slow speeds in 2-8 story buildings.

REQUIREMENTS FOR RESIDENTIAL BUILDINGS

Electrical supplies

This will comprise a mains supply connected to an electricity meter with connections from the meter to the CU, which will contain:

- a main isolating switch
- at least two RCDs (Residual Current Devices), which reduce the risks of injury from electric shock
- MCBs (Miniature Circuit Breakers) for each circuit, which cut the power to the circuit in the event of high fault current
- earth and neutral connection blocks
- transformers for low voltage systems such as door entry and lighting.

Most systems will include a split load CU, which divides the MCBs into 2 or more separate banks, each with its own RCD. This allows some wiring work to be carried out with just a section of a CU turned off, possibly retaining access to light and power while working. The circuits connected to the MCBs in the consumer unit will include:

- ring circuits supplying mains sockets
- radial lighting circuits, with two-way lighting switching for stairs and walk through spaces
- individual high current circuits to high demand appliances such as electric cookers, heat pumps and showers
- outdoor lighting often controlled via a PIR motion detector switch
- supplies to any storage heaters or underfloor heating, often connected via a timeswitch to a dual tariff meter
- supplies to trickle charged batteries that power maintained systems such as fire and intruder alarms.

RESIDENTIAL BUILDINGS (cont.)

Modern systems may include powered whole house ventilation systems with heat exchangers, smart meters and smart phone apps for the remote control of lighting, heating and other powered appliances.

Communication services

Cable or satellite broadband connections for media and internet services used to provide television, telephone and private wi-fi networks.

Gas supplies

Metered supplies, similar to electrical supplies with internal pipework connected to appliances such as cookers and central heating boilers, that provide domestic hot water in addition to space heating.

Water supply

Applying a metered supply to a stop valve to enable whole house isolation, with pipework to direct feed points such as the kitchen sink and to storage facilities connected to the hot and cold-water system.