**External Walls**

**Function of the external wall**

- Keep the occupants safe, dry and warm – shelter from the elements
- Support the floors/upper floor(s) and roof
- Anchor roof to walls
- Spread evenly the superimposed loads over the foundations
- Provide robust openings for doors and windows
- Have sufficient structural integrity to avoid cracks or other failure under load
- Provide low-maintenance climate-proof exterior surfaces
- Prevent the transfer of heat to the outside or to the inside of the dwelling
- Insulate evenly against the formation of cold bridges
- Prevent the formation of condensation and dampness
- Prevent interstitial dampness
- Prevent the uncontrolled passage of air through the structure
- Stop the ingress of water
- Prevent access of vermin to the building and the roof space
- Be aesthetically pleasing and be in keeping with the surroundings of the dwelling.
**Different types of external walls**

- Concrete block with partial-fill insulated cavity
  - Concrete block with full-fill wide insulated cavity
  - Timber frame with insulated inner leaf and weatherproof external cladding
  - Timber frame with concrete block external leaf and insulated inner leaf
  - Light steel frame or combination wood and steel frame with insulated external cladding
  - Solid concrete block with external insulation and weather proof exterior finish
  - Timber frame with external insulation and weather proof external rain screen
  - Solid stone walls with breathable insulation and plaster

**Evaluate two different external walls**

**Concrete block with insulated cavity**
- Robust inside and outside
- Readily takes a range of economical, easily applied finishes
- Provides a heat sink in the blockwork of the inner leaf
- Needs relatively more heat to bring the internal temperature up from cold
- The insulating materials are protected from accidental damage
- Materials and skills widely available – traditional skills of blocklaying
- Convenient and robust fixing for cills, windows, door frames and other components.

**Timber frame with insulation and weather proof external cladding** - such as
- Easily accommodates greater thicknesses of insulation
- Uses of sustainably produced materials – low embodied energy
- Wood aids carbon sequestration • reduces use of concrete – less CO2
- Quicker heating of living spaces - using less energy
- Allows wide choice of rain screens and external finishes
- Cement board can be used as external rain screen
- High air-tightness standard, particularly if sections are manufactured off-site
- Services more easily accommodated within the service cavity
- Quick to erect - saving on erection and drying-out time, can be assembled off-site

Tomás Callanan
Light steel frame or combination wood and steel frame with external insulated cladding

- Speedily erected
- High insulation values possible
- More complex detailing required around openings, particularly in the fixing of door and window frames and at cills
- Mounting of fittings, such as light fittings, rainwater goods etc, on external surface more exacting
- Exterior finishes available more limited.

Images are sourced from State Examinations Commission Marking Schemes