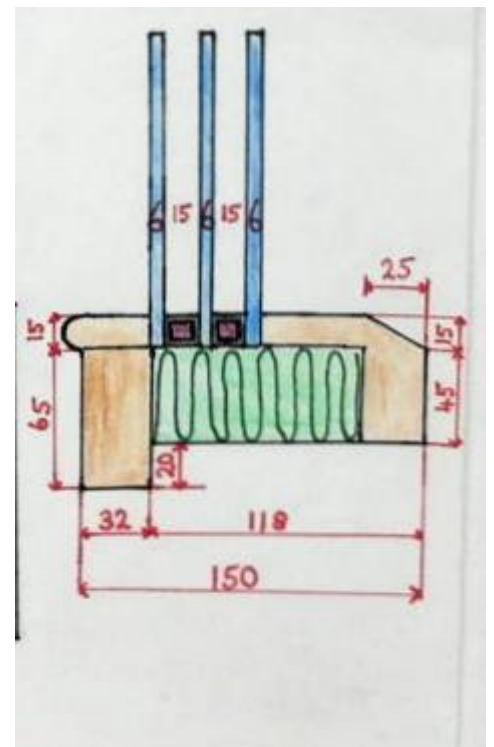
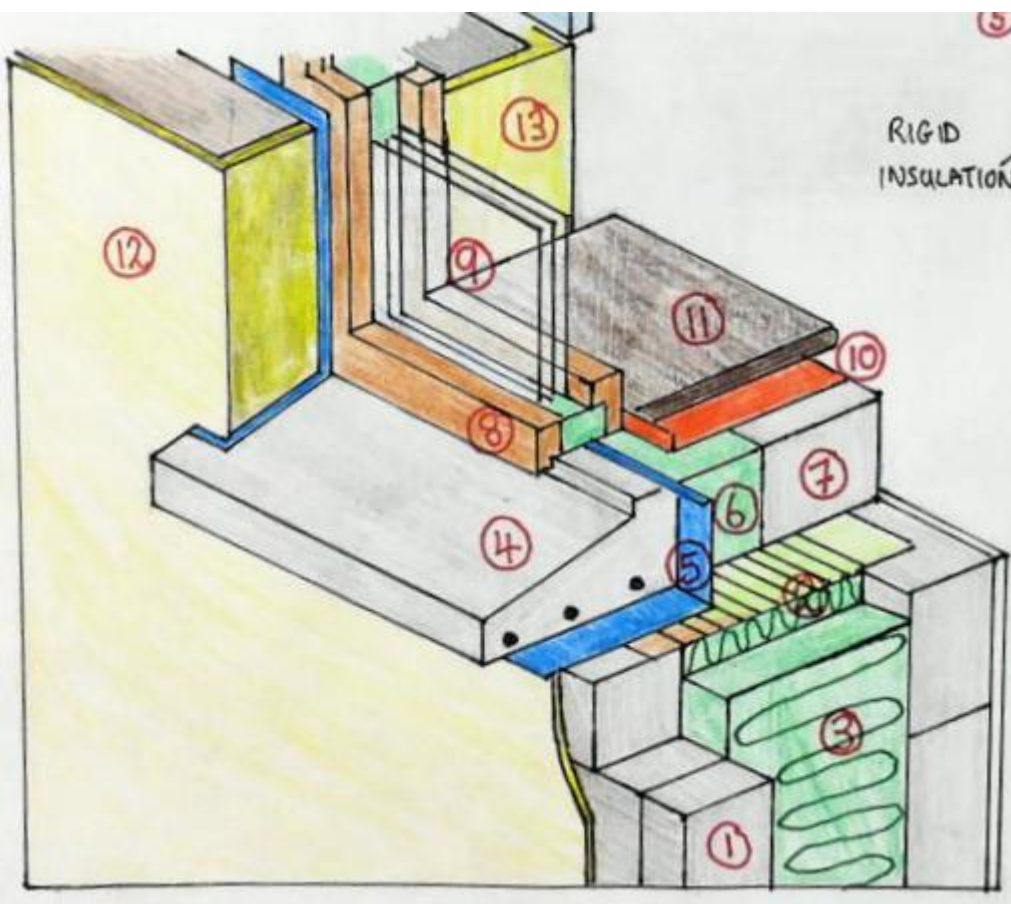
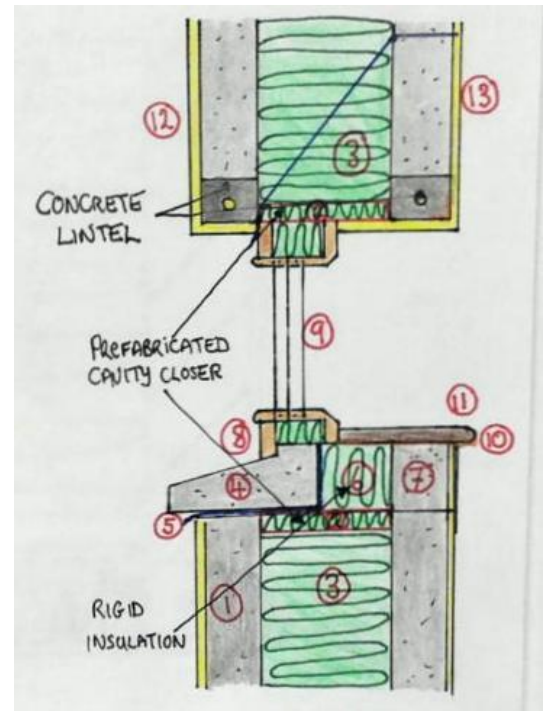
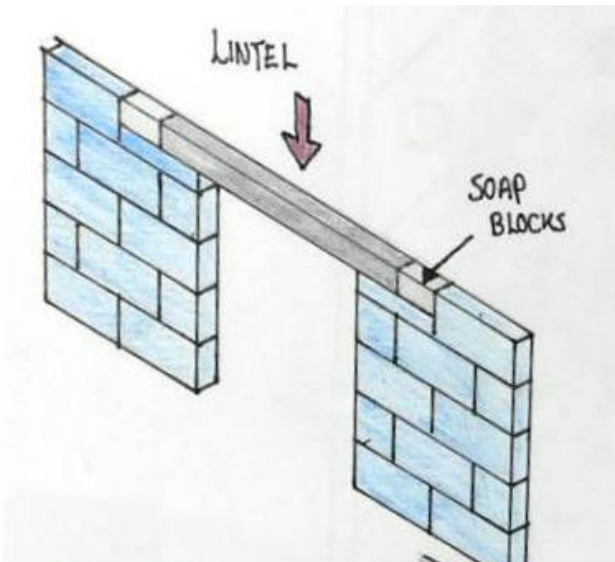


Openings in Walls

"Windows"

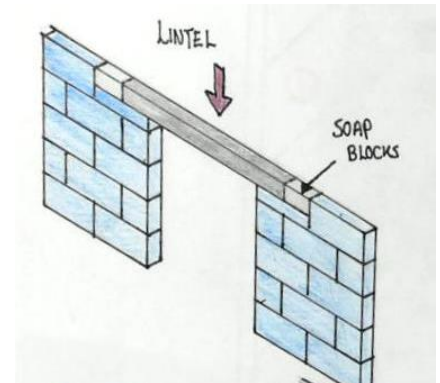


Openings

- An opening (ope) is a hole created in a wall to facilitate windows and doors
- Problems cause by opes include:
 - They create an area of unsupported wall
 - They leave an area from which heat can easily escape (thermal bridging)
 - Opes create an area through which fire can easily spread

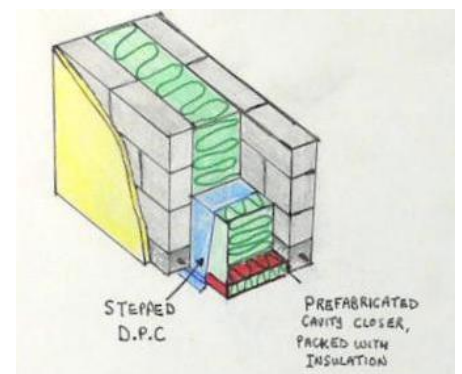
Concrete Lintels

- The weight above an opening in a wall must be spread to the surrounding wall
- Lintels are used to spread this weight
- Lintels can be either pre-stressed concrete or rolled steel lintels

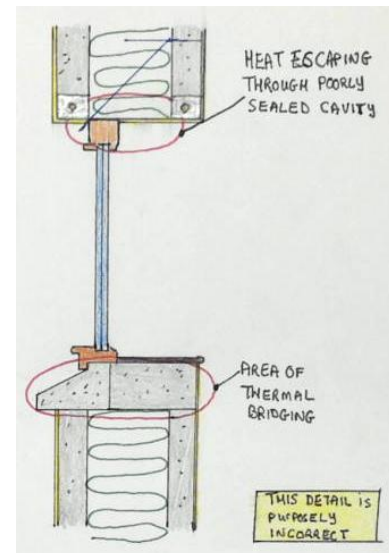


Closing the cavity around the opes

- Where concrete blocks are used, **pre-stressed concrete lintels** are installed
- **Prefabricated cavity closers** are used to close the cavity and **damp proof course (DPC)** is placed over the lintel to prevent **moisture** bridging the lintel



- It is important to properly seal/close the cavity space around the ope.
- If this is not done correctly, heat can easily travel out of the building.
- Heat can also escape across the solid components by **thermal bridging**



Thermal Bridging

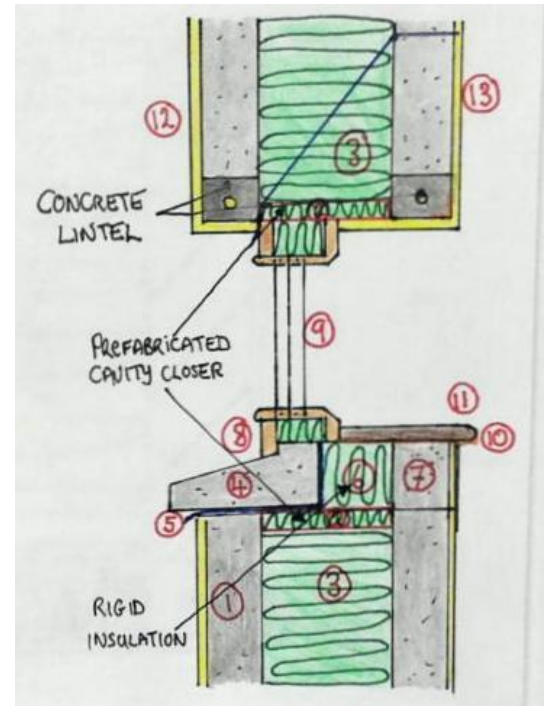
- A thermal bridge occurs where a portion of a structure has a high conductivity, resulting in pathways through which significant heat is lost
- It is uncontrolled and undesirable heat loss across building materials
- A thermal bridge will occur at openings in external walls or where cavities are bridge with materials of poor insulating value.
- Thermal bridges lead to increased energy costs as thermal bridges lower the overall thermal insulation properties of the structure
- Thermal bridging may also lead to condensation forming on the internal surface of the external walls

Advantages of eliminating thermal bridging

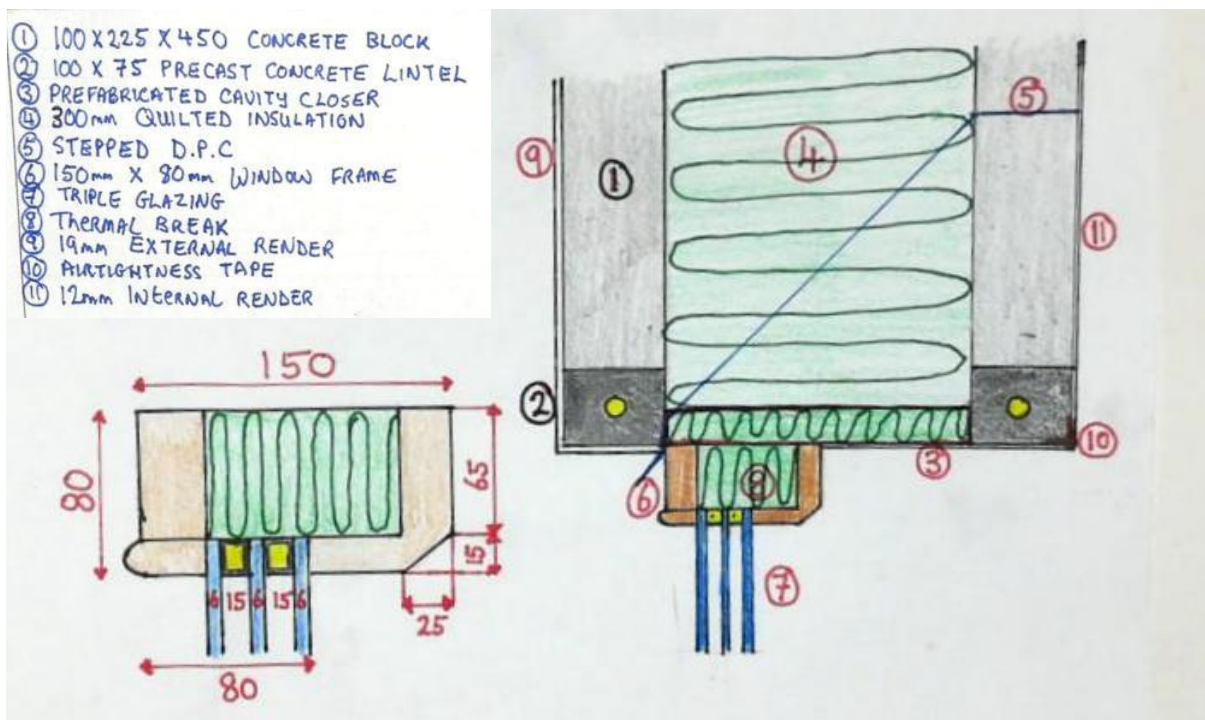
- Eliminating thermal bridges improves the thermal comfort and performance of the house
- This saves money as less heat is required and reduces the carbon footprint of the building
- This also reduces the likelihood of dampness and mould occurring, and thus results in a healthier building environment

Door and Window Openings

- Prefabricated cavity closers are used to line the entire opening in order to fully close the cavity. These are hard plastic sections that are filled with insulation and fit between the inner and outer leaf. The underside is textured and can be plastered over.
- Insulation is packed behind the cill to prevent thermal bridging



Window Lintel Detail

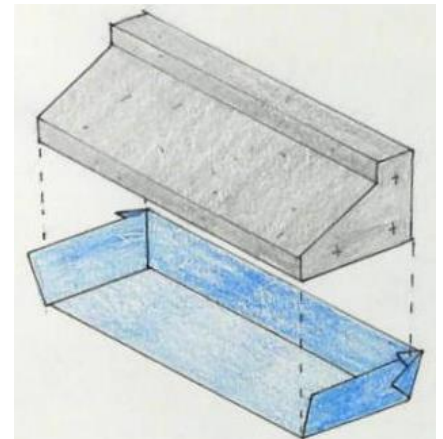


DPC at the Lintel



Window Cill

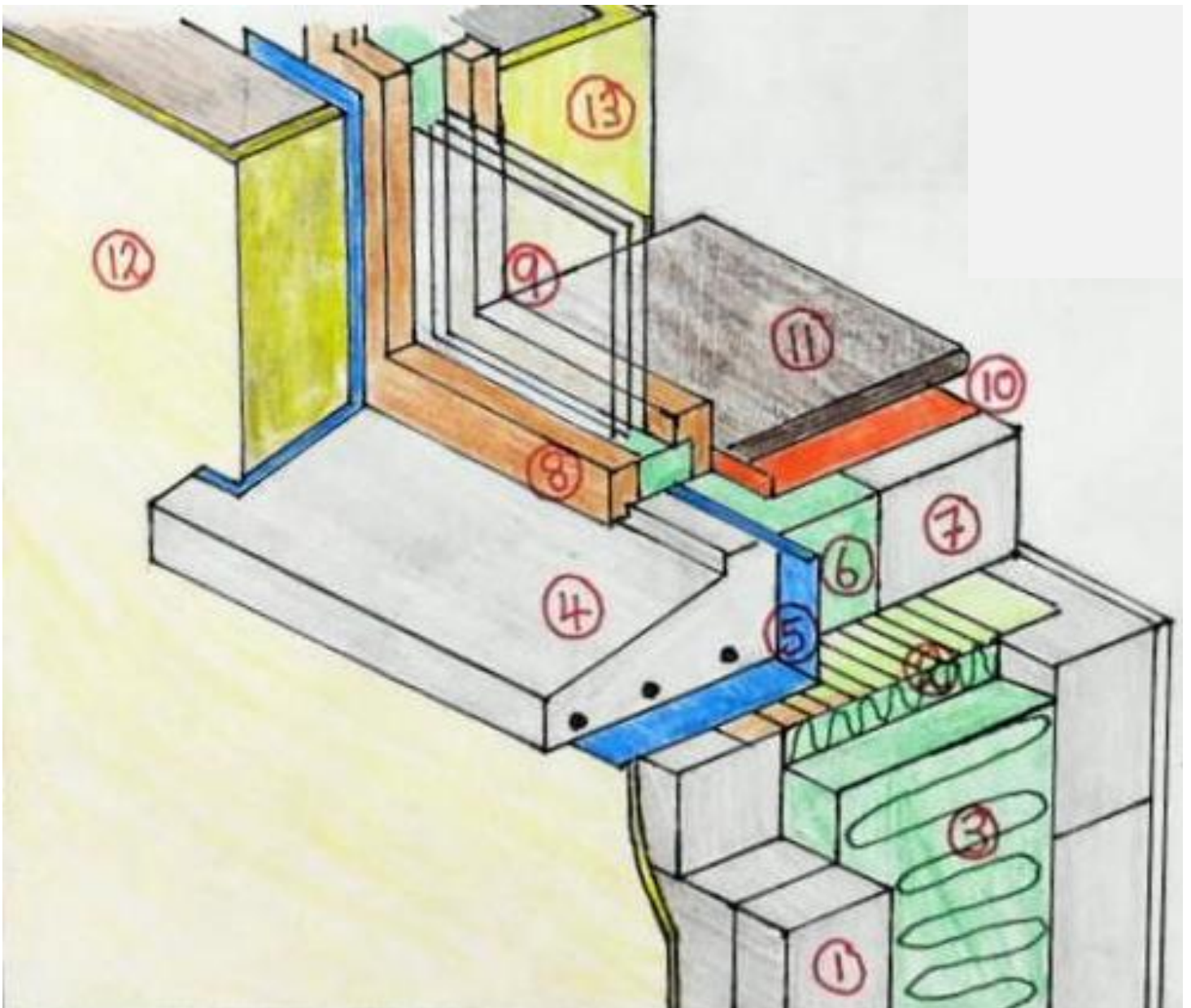
- The base of the window is called the window cill
- The window cill is typically made from prefabricated concrete which is pre stressed with steel reinforcement
- The entire cill is wrapped in a damp proof plastic sheet to ensure moisture resistance
- Insulation is packed behind the cill to prevent thermal bridging
- Concrete infill is then poured behind the insulation to finish the section



DPC at the cill



Window Cill Detail in 3D



1. 100 x 225 x 450mm Concrete Block	8. <u>150 x 80 Window Frame</u>
2. Prefabricated Cavity Closer	9. <u>Triple Glazing</u>
3. <u>300mm Quilted Insulation</u>	10. <u>Airtightness membrane</u>
4. <u>Prefabricated Concrete Cill</u>	11. <u>Window Board</u>
5. <u>DPC Tray</u>	12. <u>19mm External Render</u>
6. <u>Rigid Insulation</u>	13. <u>12mm Internal Render</u>
7. <u>Concrete Infill</u>	