HANDOUT 11
Structural Insulated Panels

Structural Insulated Panels (SIPs) are an advanced method of construction, exploiting composite panel techniques to deliver excellent structural and thermal characteristics in one system.

SIPs have two parallel faces - usually Oriented Strand Board (OSB) - sandwiching a rigid core of Polyurethane (PUR) foam. The result is a lightweight system which is quick to erect and free from the complications surrounding compression shrinkage and thermal bridging, that is often associated with other forms of construction.

Delivering rapid and robust energy efficient buildings, with superior insulation, structural strength and airtightness - SIP systems are used for walls, roofs and floors. Structural Insulated Panels offer extremely high thermal performance throughout the lifecycle of the building, whilst minimising wall thickness. The PUR core of rigid insulation and OSB3 facing panels achieve U-values as low as 0.10 W/m²K, making significant savings on operating costs.

Using SIPs technology for residential applications will reduce build programmes, enabling houses to be completed much faster than conventional building methods. If the house design facilitates habitable living space in the roof zone – then SIPs are a fantastic solution, as they do not require roof trusses, ensuring maximum space availability, whilst providing superb thermal performance and limited air leakage.

Types of SIPs

There are two fundamental applications for SIPs - a full structural wrap or infill walling - in all cases the product will be engineered for load bearing capability, racking resistance and wind loading requirements.

Infill Walling

SIPS are often specified as infill to steel, concrete or engineered timber structural frames and can sit inside or outside the frame itself

Infill walling is incredibly quick to install, making it an innovative solution for high-rise residential applications to deliver a rapid dry building envelope.

Full Structural Wrap

Structural Insulated Panels Systems can be used to form a loadbearing full structural wrap.

Currently five storeys are the maximum practical height for loadbearing SIP buildings. Above this, an additional structure needs to be incorporated into the building to carry the imposed load.