

Structurally Insulated Panels Checklist for Builders Sheet 1 revA 05.12.13



Structurally Insulated Panels (SIPs) The basics

SIPs construction is a form of construction which is very similar to timber framing. This checklist is intended for builders, who have a basic understanding of construction, but are not familiar with SIPs. It is not an instruction manual; it is a guide for helping to ensure that good building practice is considered from the outset. The authors cannot be held responsible for defective construction where they have not been commissioned to design or fabricate SIP panels on a specific project.

For building in the UK it is essential to comply with part 1 of the Building Regulations, which outlines specific requirements for building structure, in terms of strength, stability and robustness. If in doubt about any of the items below always consult a qualified structural engineer.

Checklist:

1. Tie in cross walls.

As a rule all walls (masonry, SIP or other) should be tied together at a junction to stabilise a building. Panel drawings should indicate connection details for connecting SIP panels together. Mostly long screws are used and internal timber studs are located at joints to strengthen connections. Walls should be propped temporarily during construction at intervals of no less than 3.6m (3 panel width) as a rule with a timber sloping prop. The prop should be well secured to the timber header plate with a minimum of 2 nails or screws (4mm/150mm long).

2. Roofs and floor strapping

Roofs and floors should be sufficiently strapped together. Straps are not necessarily employed where SIP panels are fixed together with screws, which effectively tie structural elements together. SIP is no different from masonry construction; if care is not taken elements such as roof rafters can cause spreading in unrestrained walls.

3. Sole Plate Fixings

SIP walls are generally fixed to foundations by means of a 'sole plate'. Walls may be attached to beam and block floors with concrete self tapping screws; brickwork or blockwork with nail anchors (8-10mm) or concrete with resin anchors or expanding anchors. Fixings are sometimes essential to resist wind uplift forces loadings should be checked.

4. Roof SIP panels - Span Tables and Creep

Span tables are available to determine spans with some manufacturers. These should be consulted at all times. SIP panels have a tendency to 'creep'; that is following erection, a panel may experience increasing downward sagging, up to a period of around 6 months or more. Ensure that span tables take this effect into account.

5. Differential movement/shrinkage

Unlike timber frames SIP panels, if kept dry, have very low shrinkage or expansion in use. During construction panels should be weather protected if there is any risk of prolonged exposure to rain/damp. Consideration should be given to differential shrinkage/expansion of any adjacent materials. For example brickwork and blockwork, if tied to an adjacent SIP wall, to a height greater than 3 stories should have sliding ties to accommodate vertical movement.

6. Site Cut Holes

A manufactured panel with openings will generally have reinforcement in the form of built in timber joists or factory fixed angles. If it is desired to form an opening by cutting a panel on site, timber trimming joists or other forms of reinforcement, should be used around edges. If a hole is greater than 300mm (1ft) square the structural engineer or SIP designer should be consulted prior to forming the hole.

7. Panel assemblies – Adhesive is essential

In any site finished joint, where OSB or Magnesium Oxide (MgO) face panels are connected to sole plates, slice joints are formed between panels, wall plates are connected to the tops of walls and so on, it is essential to use adhesive. Generally foam adhesive is applied a face and the OSB/MgO board is nailed or screwed to the face of the timber at regular intervals. As a rule of thumb a sufficient amount of glue is indicated when adhesive seeps out of the edges of a joint.

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9. Roof SIP panels – Building on Existing Masonry Buildings

HMA SSK_{1xxx/32} is available for general cautionary notes. There are two important issues for the builder: potential lack of fit on gable ends (the roof should be properly fixed to restrain the gable in the long term) and the possibility of pushing outwards and cracking eaves walls and gables when SIP panels are lifted into place. Temporary propping should be provided to prevent the latter.