

# SIPS

## INDUSTRIES

### INSTALLATION GUIDE

## SIPS INDUSTRIES – INSTALLATION GUIDE

This document is to serve to assist engineers in specifying SIPS Floor panels for use for Residential Buildings or floor Live Loads up to 1.5kPa. The panels are certified by Codemark and accepted for use across Australia and New Zealand.

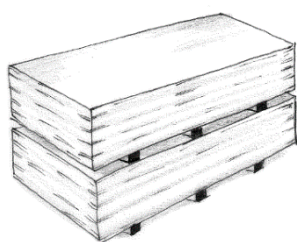
INDEX	
MATERIALS	2
TERMINOLOGY	2
When you receive your Panels:	2
SIPS FLOOR PANEL INSTALLATION PROCESS	3
WALL PANEL INSTALLATION PROCESS	4
ROOF PANEL INSTALLATION PROCESS	6
ALTERATIONS	7
DEMOLITION	7
CHECKLIST	7
CERTIFICATION	8
ENGINEERING	8

## INTRODUCTION

### MATERIALS

All materials should be covered and level on site until required. All timber to be straight and true.

SIP panels should be stacked carefully and in a manner which is in the order of the erection process. Care must be taken not to damage the exposed edges of the OSB, as this will make positioning of the panel difficult.



**Fig Left** – Supported Stacking with allowance for air movement. Unwrap packs once in position and store inside.

There must be adequate room around the materials to allow ease of mechanical lift or human lifting. Lifting straps used must be positioned in accordance with any

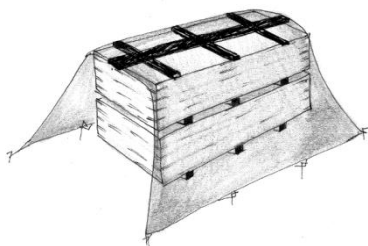
manufacturer's guidelines and safety procedures.

### Fig Right – Tarped Packs

If storing panels inside is not an option, then unwrap the plastic wrapping, at least 50% of the plastic wrap must be removed.

The panels must be elevated from the ground and placed on gluts that will not allow moisture absorbance to reach the panels. Wrap tarpaulin over the packs as shown, allowing air movement throughout the packs.

Within your SIPS pack, you may have an ancillary pack which could include; project documentation, fixings, breather membrane and other ancillaries agreed within your scope of works. Check off all items and ensure they are kept in a safe place.



### TERMINOLOGY

<b>SIPS</b> -	Structural Insulated Panel System
<b>OSB</b> -	Oriented Strand Board – an Engineered Termite Resistant Structural Sheet – OSB3
<b>EPS</b> -	Expanded Polystyrene – a strong rigid insulation board – SL Grade
<b>Sole Plate</b> -	Bottom Timber fixed to floor, SIPS panels fit over this and is glued and nailed
<b>Top Plate</b> -	Opposite to Baseplate, fitted to top of SIPS walls
<b>End Closer</b> -	Timber fitted to corners and ends of panel walls, roofs and floors.
<b>Expanding Foam</b> -	Foam glue that expands beyond its original size, filling gaps ensuring an insulated seal between building elements.

## SIPS INDUSTRIES DO AND DON'T GUIDE

### When you receive your Panels:

Do Install SIPS in conjunction with the typical detail drawings for clarity.

Do handle SIPS with care.

Do provide adequate support for SIPS when storing them.

Do store SIPS lying flat and covered.

Do use a mastic or expanding foam where EPS is exposed prior to installing SIPS.

Do use mastic or expanding foam on timber to timber, timber to EPS, EPS to EPS connections.

Do use construction adhesive in conjunction with specified fixings for timber to steel connections.

Do use only continuous timber and or block splines for spline connections.

Do provide level and square foundations or floors that support SIP walls.

Do install based plate back from the edge of the floor system to allow full bearing of both SIP OSB skins.

Do provide adequate bracing of panels during the erection process.

Do remove debris from sole plate area prior to panel placement.

Do not cut timber OSB skins without consulting with SIPS Industries or the engineer. Call before you cut.

Do not install SIPS directly on concrete (use a levelling plate with DPC under or DPM as a barrier).

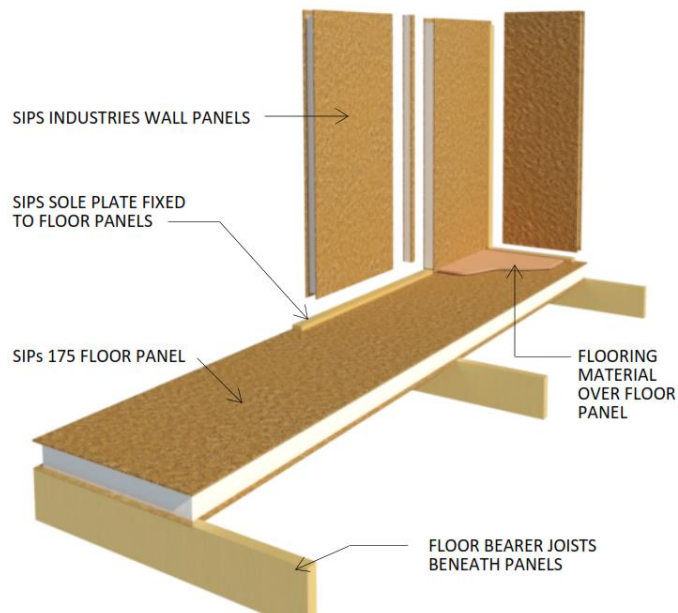
Don't drop SIPS on corners.

Don't lift SIPS by top skins at edges and corners to avoid possible peeling of the local OSB from the EPS.

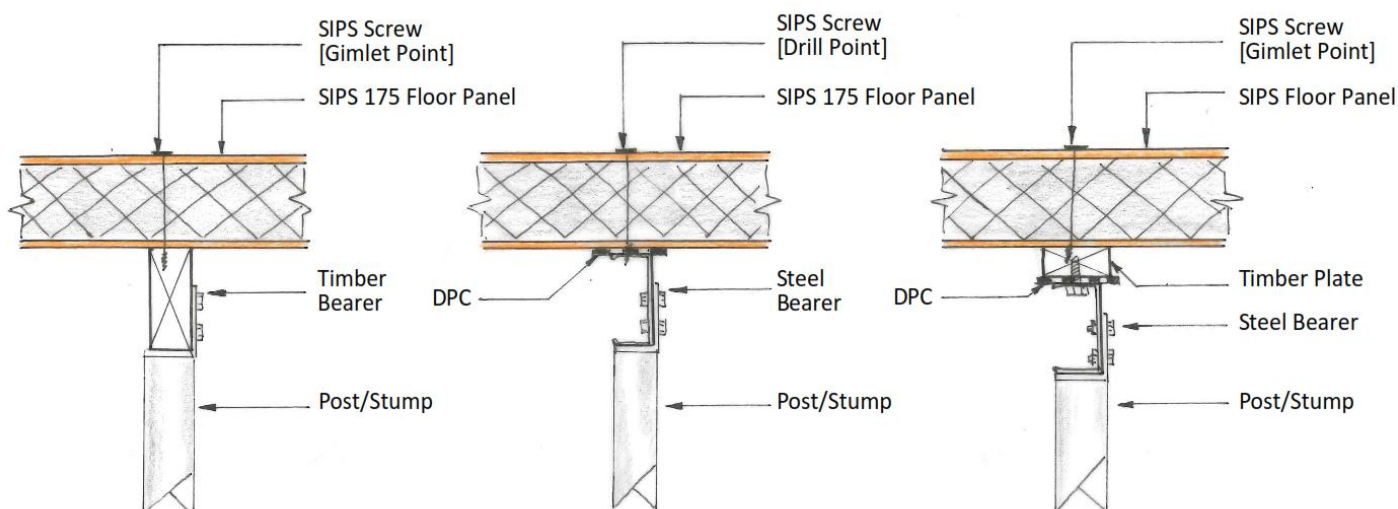
## INSTALLATION PROCESSES

### SIPS FLOOR PANEL INSTALLATION PROCESS

1. SIPS Industries Floor Panels are positioned over a post and bearer subfloor structure. Your engineer will design the bearers for structural adequacy and bearers will not be more than 2.7m apart. The bearer set out will largely depend on the SIPS panel lengths being used and should be in accordance with the floor panel sizes, or the SIPS layout drawings if applicable.
2. The bearers must be level and square to receive the SIPS Floor panels
3. Generally, SIPS Floor panels are installed on top of the bearer joists. The bearer joists are typically timber but can also be steel. If the bearers are steel, ensure a DPC is placed between the panel and the top of the steel bearer, this will prevent condensation built up on the steel from contacting the Panel.
4. SIPS Floor Panels as shown in section above, are 175mm thick and have a 153mm EPS (expanded polystyrene) core. Each floor panel is jointed with a 150x63 LVL which also forms a joist within the floor panel, partly adding to the floors strength. As timber is an inherently natural material, it is subject to size changes due to weather and such. Therefore it is important to check the LVL size and ensure it fits within the floor panel core – prior to beginning the floor install. If the LVL is more than 152mm, it should be planed to suit the panel core and fit snug.
5. The floor panel core is to be sprayed with expanding foam in a zig zag along the EPS prior to fitting the LVL. Don't delay in fitting the LVL as the expanding foam will give a limited amount of time before it starts to go hard.



6. The LVL forming the panel joint, once fitted, should be nailed from beneath, through the OSB of each panel at 150mm centers. After the nailing is completed beneath the panel, begin to nail the top OSB skins to the LVL at 150 c/c. Ensure there is NO additional load on the floor during this process, as this may cause any deflection to be fixed into place.
7. Refer to SIPS Industries typical details or project specific details for more install and construction information. Refer to fixing schedules and refer to the engineers' drawings and specifications. The engineers' drawings and specifications shall take precedence over SIPS construction and fixing information.
8. SIPS Floor panels are not a finished floor, it is required that a flooring of minimum substrate of 10mm is applied over the SIPS panel floor.



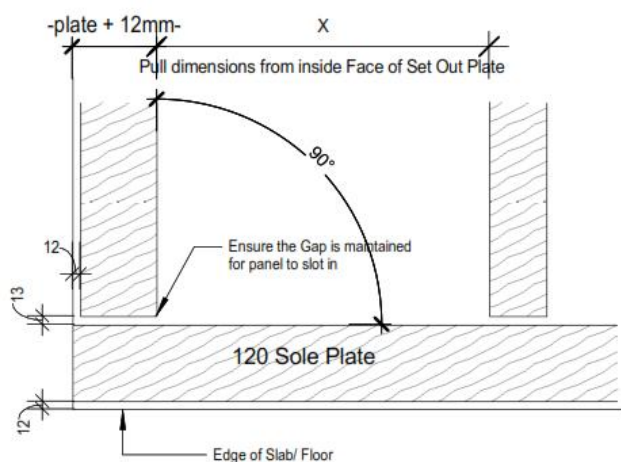


## WALL PANEL INSTALLATION PROCESS

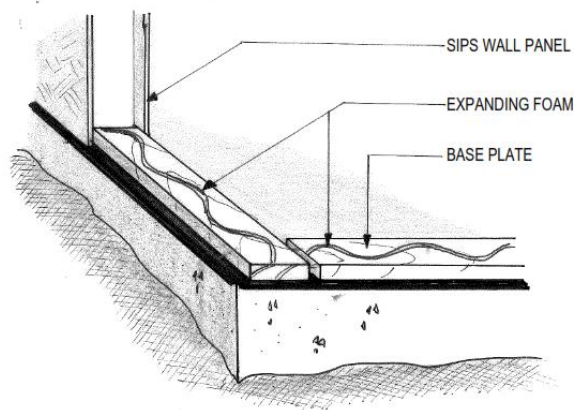
1. Ensure concrete perimeter wall or slab is free of dust and debris. Ensure there are no high points created by mortar or concrete which would keep the sole plate from being installed properly.



2. Check the level and dimensions of slab and alter the sole plate if feasible to square and level any discrepancies. Chalk line markings are snapped to the inside edge of the sole plate to assist in positioning plates.
3. Attach DPC into the underside of the sole plate with stainless staples. Set the DPC flush to the inside edge of the sole plate so there is an overhand on the outside edge. This will allow the installer to follow chalk lines on the sub structure.
4. Fix base plate to the sub structure according to the shop drawings ensuring the corner overlaps are orientated correctly and adequate space is left between the plates to allow the SIPs to be fitted.



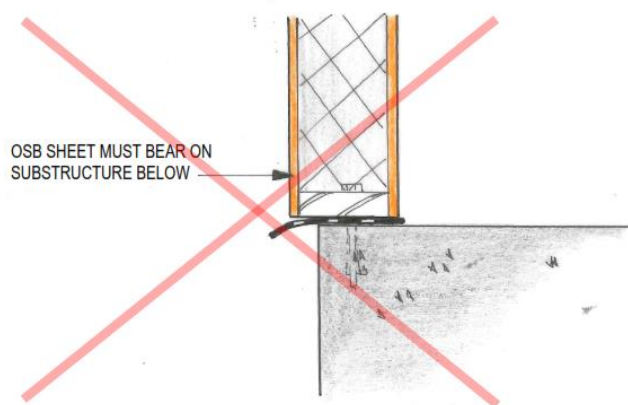
5. Base plates should be fixed according to the Engineer's design and specification. Ensure that the base plate is installed in a straight line by using a laser line or string lines/chalk line where a laser is not available. It is critical that the base plates are installed in a straight line or SIP installation will be extremely difficult, inaccurate and cause dimensional discrepancies further into the



check the plates installed are level and square to each other.

6. Apply a bead of mastic or expandable foam to the top of the sole plate before lifting the first wall SIPS panels into position to ensure an air tight seal. Ensure expandable foam is always applied to any exposed EPS surface prior to installation.  
Note - external walls are numbered on the external faces - check the drawings for the internal SIPs walls.

7. Ensure there is sufficient bearing for OSB skins when setting out the sole plates. SIPs OSB Skins are structural and require bearing beneath.



8. Lift the first SIPs panel into position, working from one corner of the structure. Panels are usually lifted into place by mechanical means, smaller SIPs can be man handled according to the guidelines set out by OH&S on manual lifting.

9. Check the plumb of the panels on all sides, adjust if necessary and fix into place by fixing the SIP to the base plate.  
Continue to check your levels throughout the build.



10. Nail the SIP panel through the OSB skins into the base plate at no more than 150mm centre with a minimum 51mm galvanized ring shank nails on both inside and outside of the building. Check with engineer's detail for nail schedule and grade, particularly for coastal regions. Nails are also used to nail the SIP panels together on the vertical joining splines on both inside and outside of the building as per engineers spec. (see block spine connection drawing in the typical details drawings)

11. Repeat the process for the next and subsequent SIP panels ensuring that either mastic or expanding foam is applied to any exposed EPS prior to fitment. Nail the joining spline at the same centres as the sole plate on both inside and outside of the building.



When the first wall is complete, the next wall SIP panel for the next wall will be placed into position at 90°(or whatever the angle) and they are fastened together at the corner with the specified SIP screws at centres as specified by the engineer.

12. Continue to install the SIPS until all the SIPs walls are in position, continually checking the plumb and level of the panels as you progress.

13. Install the top plate timber into the top of the SIP panel. The top plate is installed so it is flush with the top of the SIP and must be installed with sealant and nails.



14. If there are first floor joists, these are usually laid over the top of ground floor SIP walls. The joists or flooring system is installed in accordance with instructions and plans provided by the suppliers as these may differ from supplier to supplier. Once the floor joists are in place repeat the process as before by installing a base plate for the first floor SIP panels onto the top of the floor joists using fixings at specified centres. (see floor joist intersection drawing in the typical details drawings)



15. First floor SIP wall panels are installed in the same manner as the ground floor SIP panels, over the base plate and fixed into position, continually checking the plumb and level of the panels as you progress. Install the top plate timber into the top of the panel. The top plate is installed so it is flush with the top of the SIP and must be installed with sealant and nails.
16. For the gables of the building, fix a base plate to the top of the floor joist configuration. The gable SIPS are fixed in the same manner as the ground and first floor SIP panels.
17. If the tops of the SIP walls do not have an angle cut to suit the roof pitch a tilting fillet is fixed to the top plate (at the intersection of the roof SIP and wall SIP) and ridge timber plate is also fixed to the top of the roof beams to suit the angle of the SIP roof. For a cut roof or truss roof angle fillets are not required because the rafters are cut to suit the walls.





## ROOF PANEL INSTALLATION PROCESS

1. Roof panels are generally lifted into place using a crane. Ensuring that dogman has positioned the lifting slings in such a manner to allow the panel to be positioned. Depending on the size of the roof SIPS, they are generally installed by mechanical means.

### LIFTING ROOF PANELS

Roof Panels are generally large, and can weigh up to 23kg/m<sup>2</sup>. Therefore it is normal to lift the panels into place by mechanical means. First choice is to use a crane to lift the panels, and on rare occasions, due to site access, alternative means of lifting need to be considered such as Genie Lift, material lifter.

Crane lifting panel requires lifting straps attached to either a metal rated lifting plate or secured around a timber attached to the panel. See Sketches below. Ensure all lifting materials are rated and suitable for the application.

2. Ridge beams or mid span beams are generally lifted into position by mechanical means and secure to the gable panels in accordance with engineer's specification.
3. Before fixing the first roof panel into place, check eaves/verge overhangs to ensure the roof panel is positioned correctly then fix this roof panel onto the ridge beam, gable and eaves wall head timber closures, using the specialised fasteners specified by the engineer. (see the typical ridge detail drawing & Wall Roof intersection drawing in the typical details drawings)
4. Lift the next roof SIP panel into position and check overhangs as above, apply mastic or expanding foam to joining splines then position and fix the SIPS panels together. Fix along the joining splines with 51x2.8mm nails at 150mm centres on both the inside and outside. Fix the SIP panel to the ridge and the wall head using specialised panel fasteners. Repeat the process, continually checking the overhangs etc until the roof is fully installed.

5. The SIPS structure must be papered with a breathable membrane and this must be installed as per the manufacturer's guidelines. The breathable paper must be fixed to the kit as per the manufacturer's guidelines. Ensure adequate fixings or high winds may cause damage the paper. The green membrane is to be fixed to roof and the grey grade membrane is to be fixed to walls. When installing roof battens over membrane, ideally install small packers (2-10mm) under battens in order to leave a gap between membrane and panel for any moisture to run off.



## DEMOLITIONS AND ALTERATIONS

### ALTERATIONS

Hazards - uncontrolled collapse of the structural insulated panels. In the event of alteration, temporary bracing may be necessary and a competent structural engineer should be appointed to advise and certify.

### DEMOLITION

Hazards - uncontrolled collapse of structural insulated panels. The building could be taken down elementally, in which case the construction sequence would be reversed, but particular care would be necessary to ensure that as the sips and frame components are removed, the frame would become unstable and temporary bracing would be necessary. A competent structural engineer should be appointed to advise.

## FINAL CHECKS AND HANDOVER

### CHECKLIST

SIPS INDUSTRIES installers will be completing the SIPs Installation Checklists as the install progresses. This checklist is to be approved by the builder/client upon completion of the project.

In the event other SIPS Industries do not install the product, the builder is responsible for installing the product as set out in SIPS Industries Install guide, Typical details, Project Specific SIPs Drawings, Architectural Drawings, Design Compliance and Engineering.

---

## SIPS Panel Specification

### OSB (Orientated Strand Board)

11mm Thick OSB3 forms the external and internal skin of the structural panel. OSB used in SIPs Industries panels is **OSB3 H2** and is manufactured under ISO9001 from sustainably managed forest plantations under chain of custody (CoC). The board is termite treated to H2 levels all the way through, specific for the Australian environment. The OSB used in SIPS Industries panels is non-toxic Emissions Class E1.

### EPS (Expanded Polystyrene)

Locally sourced EPS can be provided in different grades of strength. This document covers SL Grade EPS. The EPS use by SIPS Industries is Fire Retardant and the fire retardant used is HBCD Free, HFC Free and HCFC Free (non-ozone depleting – ODP=0).

### Fixing Specifications

Refer to SIPS Industries Fixing Schedules for detailed information.

### Assembly Details

Refer to SIPS Industries Typical Details and Project specific engineering and detailing for information.

### SIPS Floor, Wall and Roof Panel Thickness

Location	Thickness
Floor	175mm
Walls	115, 145 & 165mm
Roof	175mm

### Airtight

SIPS Panels are inherently Air-Tight and tested to <0.25ACH @50Pa – Extremely suitable for Air-Tight and Passivhaus construction. SIPS Industries panels are often applied for Passivhaus Certification.

### Applications

Structural Insulated Panels are engineered for use as Floor, Walls and Roof Panels. The panels are structural and suitable for use in all regions of Australia and New Zealand, even suitable for cyclone region D.

SIPS Industries Panels are Cyclone Rated, Fire Retardant, Termite Resistant, Highly Insulated, Structural, and Air-Tight.

### Membrane and resistance to Mould

SIPS Industries detailing specifies a breathable vapour permeable membrane to the outside of the panel with a ventilated batten space behind the cladding finish. This ventilation space is possibly the most important part of detailing any building, without this space, and the membrane to permit vapour to pass out of the building, the structure will most likely lock in vapour which then turns to moisture and causes mould, and decay of the structure and insulation. There are many “finished” framing products on the Australian market, which do not permit vapour to pass through the structure and will ultimately cause serious problems in the future. It is important to understand the condensation risk.

## CERTIFICATION

SIPS INDUSTRIES Products are Codemark Certified. The CodeMark Certification Scheme (the Scheme) is a voluntary third-party building product certification scheme that authorises the use of new and innovative products in specified circumstances in order to facilitate compliance with Volumes One and Two of the NCC, also known as the Building Code of Australia or BCA.

The certifiers have questioned and checked over every technical document, our fabrication procedures and audited our full processes. This gives confidence to our customers, certifiers, builders and also to ourselves. CodeMark provides confidence and certainty to regulatory authorities and the market through the issue of a Certificate of Conformity, which is one of several options available for meeting the 'evidence of suitability' requirements of the BCA.

## ENGINEERING

SIPS Panels have been tested for performance in all Australian Conditions by Independent Structural Engineering Consultants. This information is specific to SIPS Industries Products and Systems. Thanks to Lexus Engineers and Engenuity Engineering.



## LEXUS ENGINEERS

### SIPS – Ready Cut



READY-CUT is a SIPS INDUSTRIES patent pending product which is a standard set of SIPS Panel sizes. Ready Cut Panel dimensions are to be used at the design stage where standard panel sizes can be used to determine the building dimensions, and thus reduce the cost of the build by utilizing standard panel sizes and omitting wastage. This document is relevant for SIPS Ready Cut.

