



IndiNature®
Bio-based construction systems

IndiBreathe

NEW BUILD SYSTEM INSTALL GUIDE

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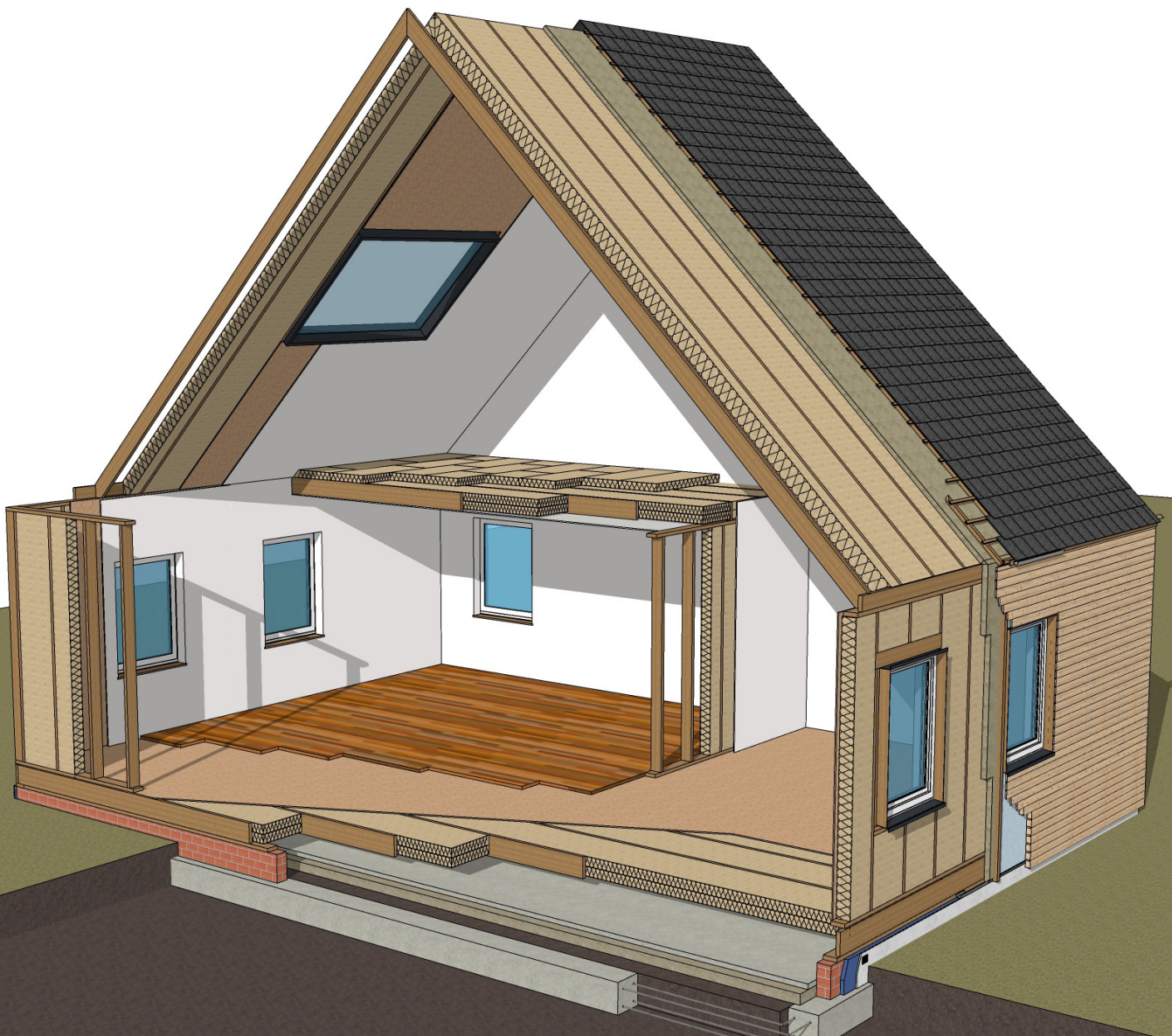
Installation Guide: IndiBreathe System for New Build

Timber Frame Buildings

This chapter provides the detailing guidelines to ensure the correct installation and optimal performance of the IndiBreathe insulation system in new build timber frame buildings.

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IndiBreathe System Overview

IndiBreathe is a complete insulation system comprising two parts: **IndiTherm** flexible insulation batts, and **IndiBoard** rigid insulation board. These two products work together to create a high performance, natural and breathable insulation system. To be clear, this is not an External Wall Insulation (EWI) system – the system requires external rainscreens.

IndiTherm is a low density insulation batt, design to be fitted between wall stud-work, floor joists and ceiling/roof joists. The physical properties of the material allow it to be installed snugly between studs without the need for additional support to stop it from slumping over time. It is a highly breathable material meaning that excess water vapour generated inside the building will be ‘carried’ from inside and released to the outside, without being ‘held’ within the wall build up.

IndiBoard is a medium density insulating board. Can be fixed to the external face of a building’s structure in order to create a continuous insulative layer. This layer of insulation is helpful to break all thermal bridging through the fabric of the building. It should be fixed directly to stud-work using insulation-specific fixings (see following section on auxiliary products).

Natural fibre insulation has unique benefits

IndiBreathe systems are designed to act just like traditional building materials did for centuries. By safely and naturally ‘breathing’ excess vapour through walls to the outside, IndiBreathe helps keep building structures dry and adds longevity to them just like historic buildings continue to do.

Your building will benefit from added longevity and you will experience improved indoor air quality from the proper installation of natural fibre insulation – it will keep you comfortably warm in winter and cool in summer, with naturally regulated humidity all year long. Plus of course energy costs will be reduced.

To ensure these benefits and reduce risks to your building it is important to follow guidance carefully.

Auxiliary Products

IndiBoard Fixings - Thermally ‘broken’ sleeves for screws and masonry nails, with a specifically shaped flange designed to better support and fix the material.

- screw fixings for timber frame
- screw fixings for masonry
- we recommend edge fixings only unless pre drilled boards are used
- pre drilled boards available if required

Insulation Saws - An appropriate insulation-specific saw with wavy (not serrated) blade should be used. Sharpening often makes a big difference – handheld sharpeners are available. For example Bahco handsaw and sharpener. Please see cutting guide (p.12).

Internal Finishes -Gypsum plaster can be used for internal wall finish, however for maximum breathability a breathable plaster is recommended. (eg. Breathaplasta by Adaptavate)

Insulation Fixings - Thermally ‘broken’ sleeves for screws and masonry nails, with a specifically shaped flange designed to better support and fix the material.

1.0 System Overview, Glossary, Auxiliary Products

Introduction

Important - read prior to install

Allow vapour movement

IndiBreathe systems are designed for vapour open build-ups to allow some water vapour transport out of buildings. They should not be installed in vapour closed systems.

If installed correctly, vapour open systems will work in sympathy with existing structures to keep buildings healthy and add longevity by preventing moisture from being trapped in materials. When buildings are heated, vapour naturally moves from the inside to the outside of building structures.

IndiBreathe systems must be designed and installed with care – correct materials, thicknesses, system build-ups and detailing must be applied. Expert guidance should be sought from architectural technicians for example. The use of modelling using WUFI software is recommended to reduce risks of interstitial condensation. If this guidance is not followed you may be putting your building at risk.

As a rule of thumb when designing wall build-ups, place materials with the higher vapour resistance on the inside of systems – so as vapour is naturally transported toward the exterior it encounters less and less resistance until it reaches the outside.

Glossary

Friction Fit - IndiTherm insulation batts perform optimally when they are 'friction fit' between stud-work. This is achieved by cutting the batt 10-20mm larger than the space is it to fill. The limited compressibility of the batt will allow it to be installed with light force, without leaving gaps along the edges. IndiTherm batts are supplied at 570mm wide as standard. This is the ideal width to achieve a good friction fit between stud-work at 600mm centers. 370mm wide batts are also supplied for studs or joists at 400mm centres.

Breather membrane - A breather membrane is a waterproof but vapour permeable membrane used to improve weather protection of the walls and roof. It is typically the last layer before the cladding and roofing. It is recommended that a breather membrane is used in conjunction with IndiBreathe as it will greatly improve weather protection without compromising the breathability of the insulation. It is important that there is a sufficient ventilation gap (at least 50mm) between the membrane and cladding/roofing. This will help ensure that excess water vapour has a means to exit the wall/floor/roof build up.

Vapour control layer membrane - A VCL membrane is designed to resist some water vapour flow but should let some water vapour through. Different VCLs offer different levels of permeability. Some also act as an air barrier – those type are recommended because significant heat loss can occur through air convection. It is recommended to install a VCL on the interior side of the system to allow some vapour out and at the same time resist too much water vapour entering at once.(eg. Pro Clima Intello Plus Vapour Check Membrane)

Do:

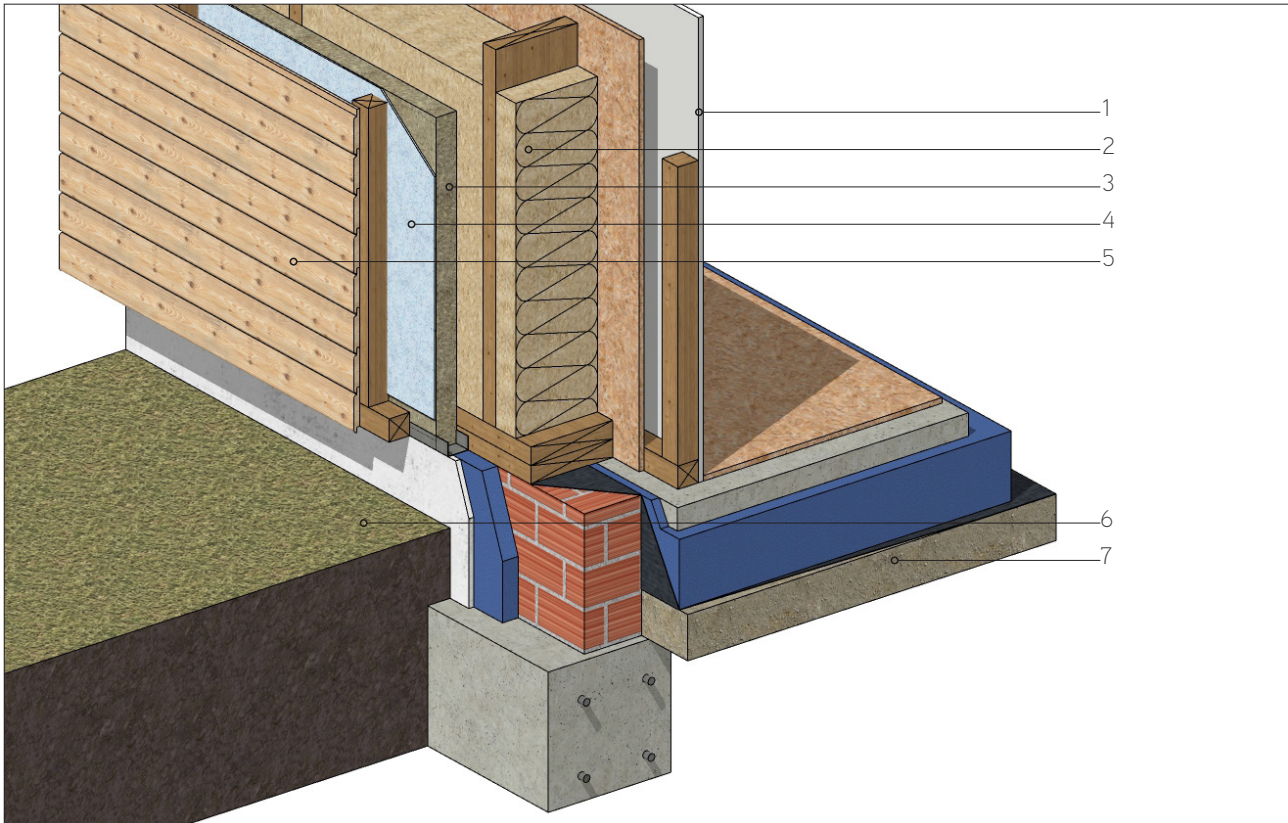
- Follow this guide.
- Seek expert guidance on design and installation.
- Use WUFI modelling.
- Add a vapour control barrier on the inside of the system - this limits the amount of vapour which will naturally pass through the open system.
- Ventilate right – always allow excess water vapour to escape a building. Ensure continuous airflow on the exterior of a system so transported vapour can be released (e.g. minimum 50mm air gap behind a rain screen)
- Remove any exterior concrete render or pointing. Unlike lime mortar - concrete traps moisture in walls and increases the risk of wall damage.
- Always clean and apply an anti-fungal wash to existing masonry walls and let dry prior to install.
- Store insulation dry.
- Use a wavy bladed insulation saw and sharpen often – natural fibres will cut easily with the correct sharp blades.
- Keep buildings heated, even at low grade temperatures when not in use - so cold spots don't lead to surface or interstitial condensation.

Don't

- Install in a damp space.
- Timber and masonry must be dry and protected and free from leaks.
- Solums should never have standing water, flooding or leaks.
- Block continuous cross airflow where it is required, specifically:
 - Vertically travelling up the exterior of a wall build up (min 50mm behind a rain screen)
 - Crossing from eaves up and along roof sarking (min 50mm)
 - Crossing under a suspended ground floor
- Leave unnecessary gaps in insulation - this can create a risk point for cold spots which can lead to surface condensation.
- Install insulation if wet - if wet, it will dry out naturally if left in a warm ventilated space prior to install.
- Combine with materials which are not vapour open - this risks condensation build-up.
- Avoid drilling with a conventional drill bit – fibres will bind. Ask us about specialised insulation drill bits if required

1.1 Insulating external walls and detailing for where the wall meets the foundation

External Walls



1 - Internal finish to Architects specifications. Shown here is an OSB racking board, 50mm service void, finished with plasterboard.

2 - IndiTherm insulation batts to be **friction** fit between the stud-work. The batts should be 5-10mm wider than the gap between studs to ensure a good friction fit. No fixings are needed to keep the batts in place. batt thickness should be within 10mm of the stud thickness (e.g. a 140mm batt should be used between 145x45mm timbers).

3 - IndiBoard should be fixed to the outside of the Stud-work using insulation fastenings. Care should be take to minimise gaps between boards.

4 - A suitable breather membrane should be fixed to the outside of the insulation, to provide a second layer of weather protection without hindering breathability.

5 - External cladding to Architect's specification. A minimum of 50mm ventilation gap should be left between the breather membrane and cladding. Shown here is a timber cladding fixed to 50mm battens. Battens should be fixed through the insulation to the stud-work. IndiBoard is **not** rated to support cladding.

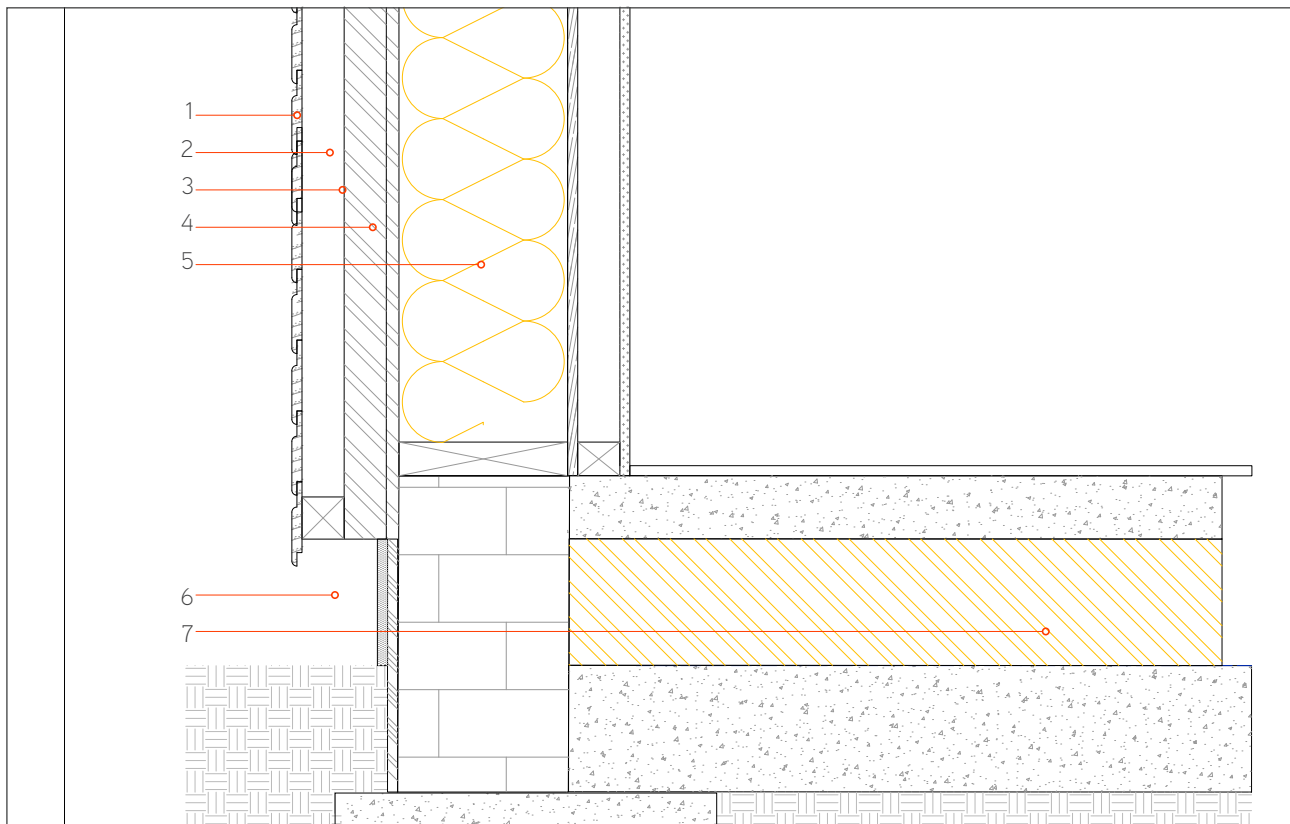
6 - A minimum gap of 150mm should be left between ground level and the bottom of the insulation. This is to avoid splash from heavy rain.

7 - Neither IndiTherm nor IndiBoard is suitable to be used to insulate under concrete slab floors.

Insulating external walls and detailing for where the wall meets the foundation

1.1

External Walls



1 - Cladding to Architect's specification. - Shown here, shiplap timber cladding fixed to 50mm battens. Battens fixed **through** the rigid insulation to stud-work.

2 - Minimum 50mm Ventilation gap.

3 - Breather membrane, with taped seams.

4 - IndiBoard rigid insulation, fixed to stud-work with appropriate rigid insulation fixings. See auxiliary products document for further information.

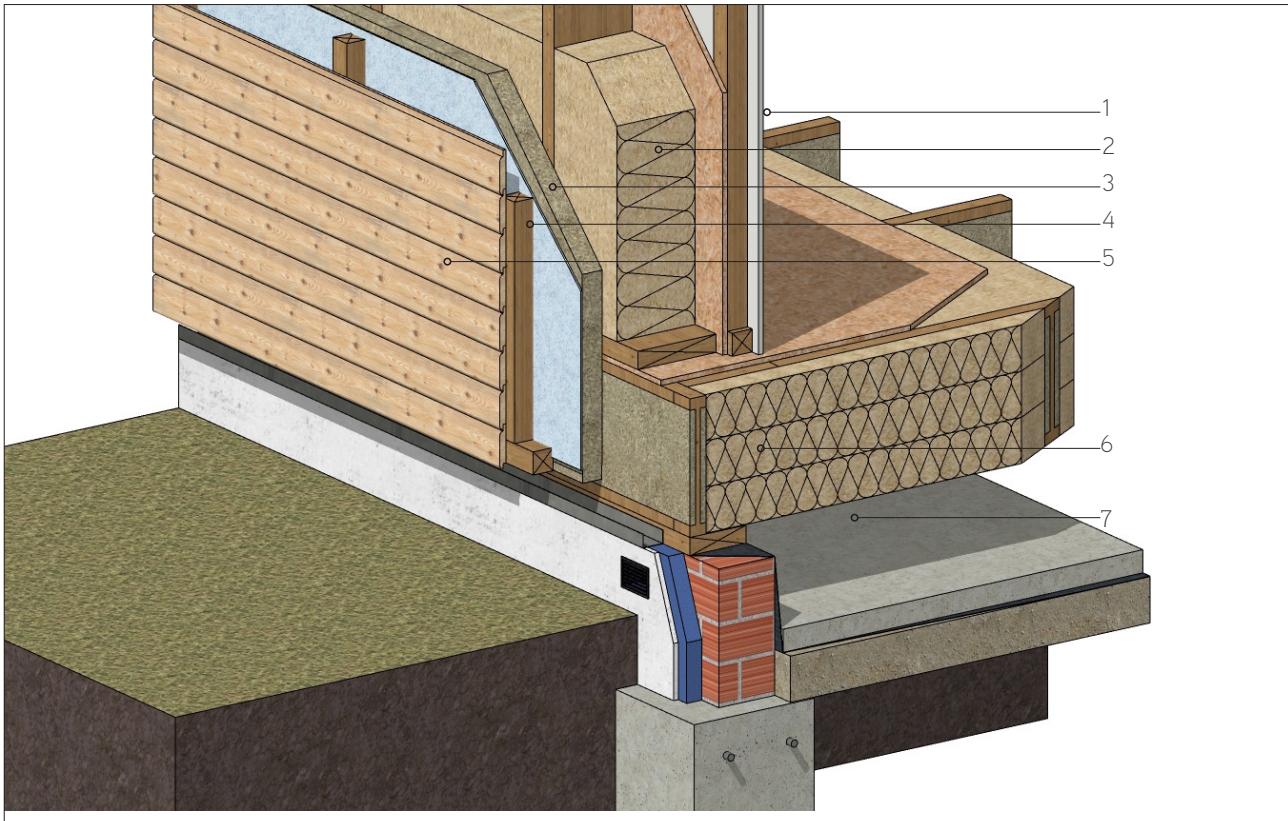
5 - IndiTherm insulation batts, friction fit between timber stud-work, to the full depth of the studs.

6 - Base of rigid insulation a minimum of 150mm above ground level.

7 - Rigid PIR insulation to insulate below concrete slab.

1.2 Insulating suspended ground floors with a ventilated crawl space

Suspended Floor



1 - Internal finish to Architects specifications, guidance in relation to IndiNature Insulation as above in section 1.1.

2 - IndiTherm insulation batts to be **friction** fit between the stud-work. The batts should be 5-10mm wider than the gap between studs to ensure a good friction fit. No fixings are needed to keep the batts in place. batt thickness should be within 10mm of the stud thickness (e.g. a 140mm batt should be used between 145x45mm timbers).

3 - IndiBoard should be fixed to the outside of the Stud-work using proprietary IndiNature Insulation fastenings. Care should be take to minimise gaps between boards.

4 - A suitable breather membrane should be fixed to the outside of the insulation, to provide a second layer of weather protection without hindering breathability.

5 - External cladding to Architect's specification. Guidance on cladding in relation to IndiNature Insulation as above in section 1.1.

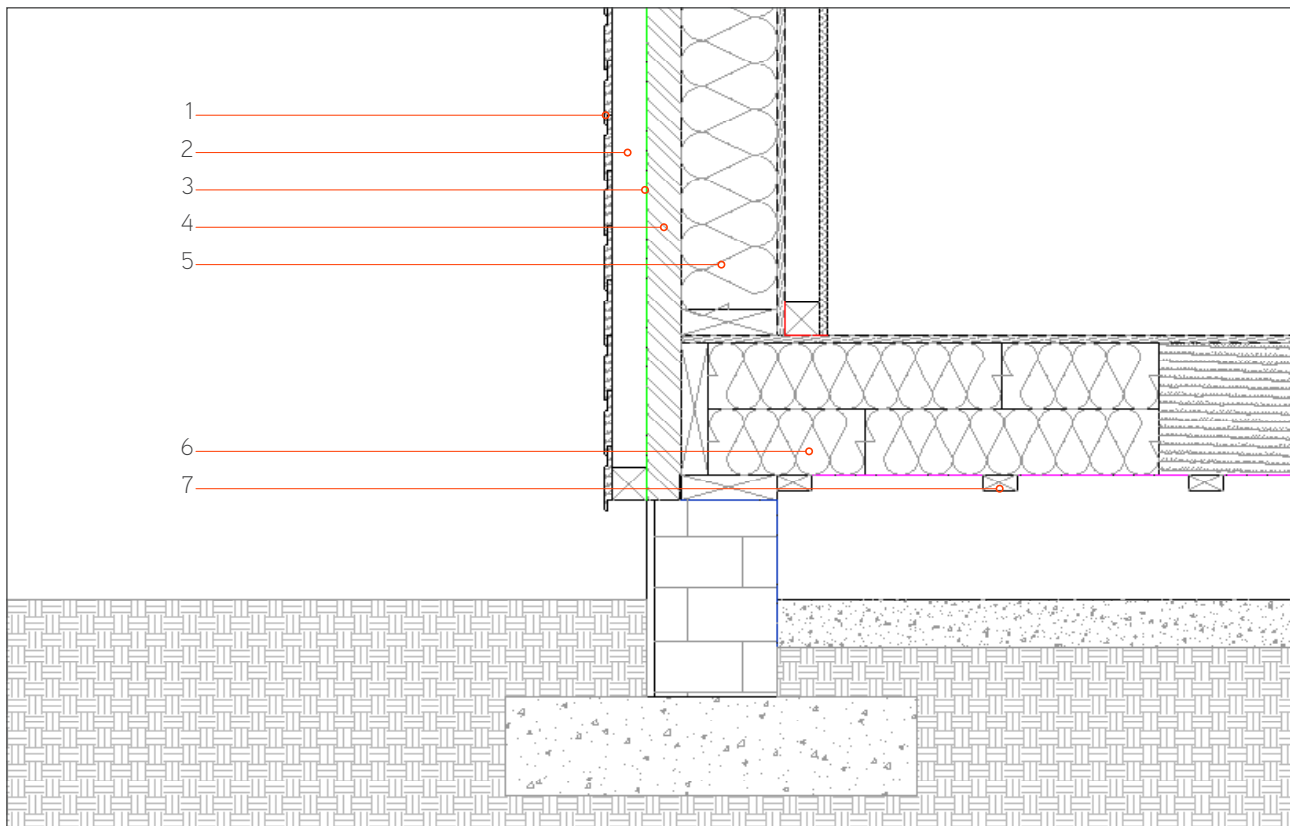
6 - IndiTherm insulation friction fitted between floor joists. As with wall insulation, the full depth of the joist should be filled so as to eliminate open spaces between the flooring and insulation. The insulation should also be supported from below using timber battens and a breathable membrane. See detail on the following page.

7 - The crawl space **must** be well ventilated, so as to be able to effectively remove excess humidity. Failure to do so may result in damage to the insulation, causing it to deteriorate and underperform.

Insulating suspended ground floors with a ventilated crawl space

1.2

Suspended Floor



1 - Cladding to Architect's specification. - Shown here, shiplap timber cladding fixed to 50mm battens. Battens fixed **through** the rigid insulation to stud-work.

2 - Minimum 50mm Ventilation gap.

3 - Breather membrane, with taped seams.

4 - IndiBoard rigid insulation, fixed to stud-work with appropriate rigid insulation fixings. See auxiliary products document for further information.

5 - IndiTherm insulation batts, friction fit between timber stud-work, to the full depth of the studs.

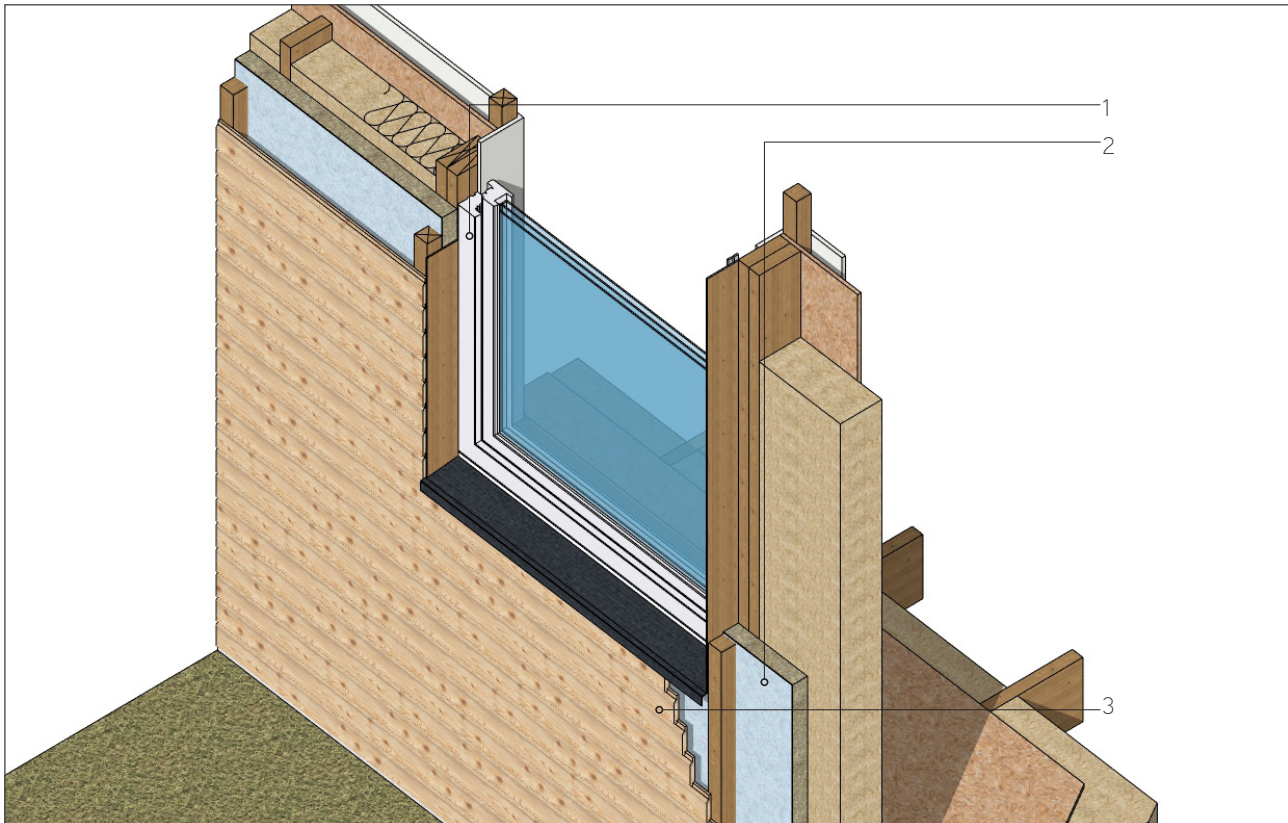
6 - IndiTherm insulation batts, friction fit between floor joists, to the full depth of the joist. Offset joins between the layers of insulation to minimise thermal bypass at the join. The crawl space below must be ventilated.

7 - Insulation between floor joists should be supported from below using battens and a breathable membrane.

1.3

Detailing for insulating around window openings

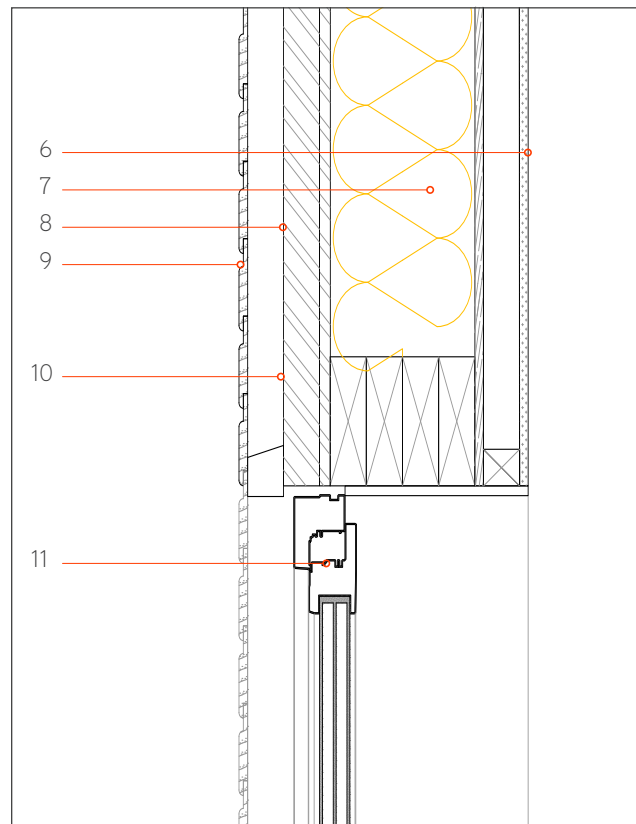
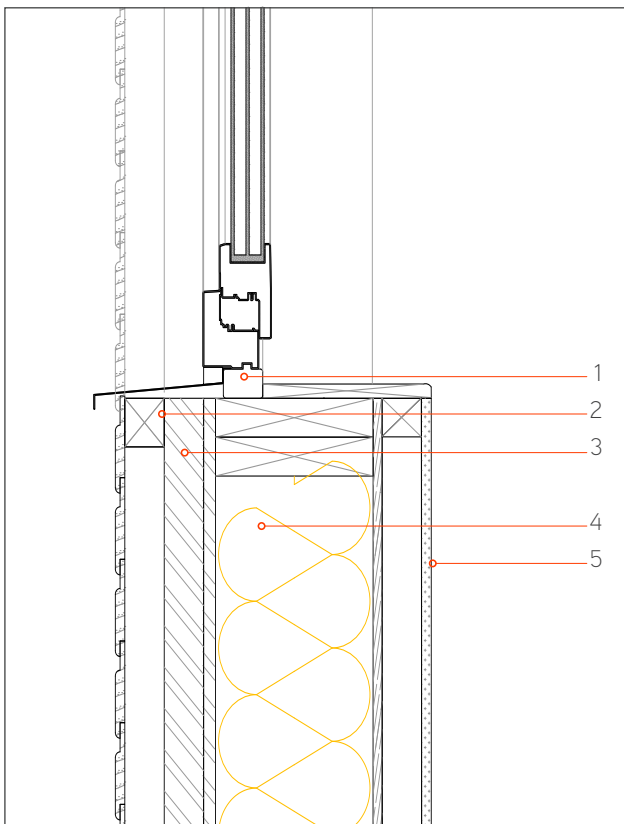
Windows



1 - Window and frame installed to manufacturer's specification.

2 - Breather membrane should come up to the window frame and taped to form an air and water tight seal. Extra care should be taken here to eliminate any potential points of water ingress.

3 - Window sill with drip channel is important to ensure water run off from the window doesn't travel back to the taped joint between breather membrane and window sill.



1 - Window installed to manufacturers specification.

2 - Vapour membrane taped at the join with the window. This taping should carry round the whole frame in order to ensure best air-tightness and weather-proofing.

3 - IndiBoard rigid insulation fixed to stud-work using appropriate fixings

4 - IndiTherm insulation batts friction fit between stud-work to the full depth of the studs.

5 - Internal finish to architect's specification.

6 - Internal finish to architect's specification.

7 - IndiTherm insulation batts friction fit between stud-work to the full depth of the studs.

8 - IndiBoard rigid insulation fixed to stud-work using appropriate fixings

9 - Cladding to Architect's specification.

10 - Breather membrane taped at the join with the window frame. A tapered block is added to guide moisture run-off away from the window and the insulation.

11 - Window to Architect's specification.

Equipment: Product Cutting guide

IndiNature's products can be cut to size using a number different tools.

This sheet provides guidance and examples of recommended tools for cutting easily and quickly. Other tools are available.

Bahco Insulation Specific Hand Saw & Knife

Bahco manufacture a hand saw with 'wave-formed' blade which are specifically designed to cut insulation and is preferable to dulled hand saws while still being and inexpensive solution. This saw can easily be found in online trade stores.

Maintenance: blade sharpener supplied separately and recommended before each installation. Silica in the hemp will dull blades over time.



DeWalt Cordless Alligator Saw

DeWalt manufacture a cordless saw capable of cutting a range of materials. This solution is a more expensive one, but is worth considering for larger projects or tradesmen who will be working frequently with insulation materials. This tool can easily be found in online trade stores.



Festool Cordless Insulation Saw

The Festool Insulation Material saw is specifically designed for cutting insulation materials quickly, with minimal effort, and maximum precision. It can be bought with a range of guides and accessories to ensure a precise cutting. It is much more compact than the DeWalt alligator saw which increases its convenience in both transport and use. It is the most expensive tool on this list, and as such we would only recommend this for very large projects or trade use.



End cutting

Product widths are designed to fit 400, 470 & 600 joists for tight friction fit.

If cutting the edge or end of a flexi-batt:

- **Less than 20mm** – No need to cut. The material should compress for a good friction fit.
- **Up to 50mm** – draw a line or compress with timber board on top of the batt and cut along the edge to help accuracy and avoid an uneven cut.