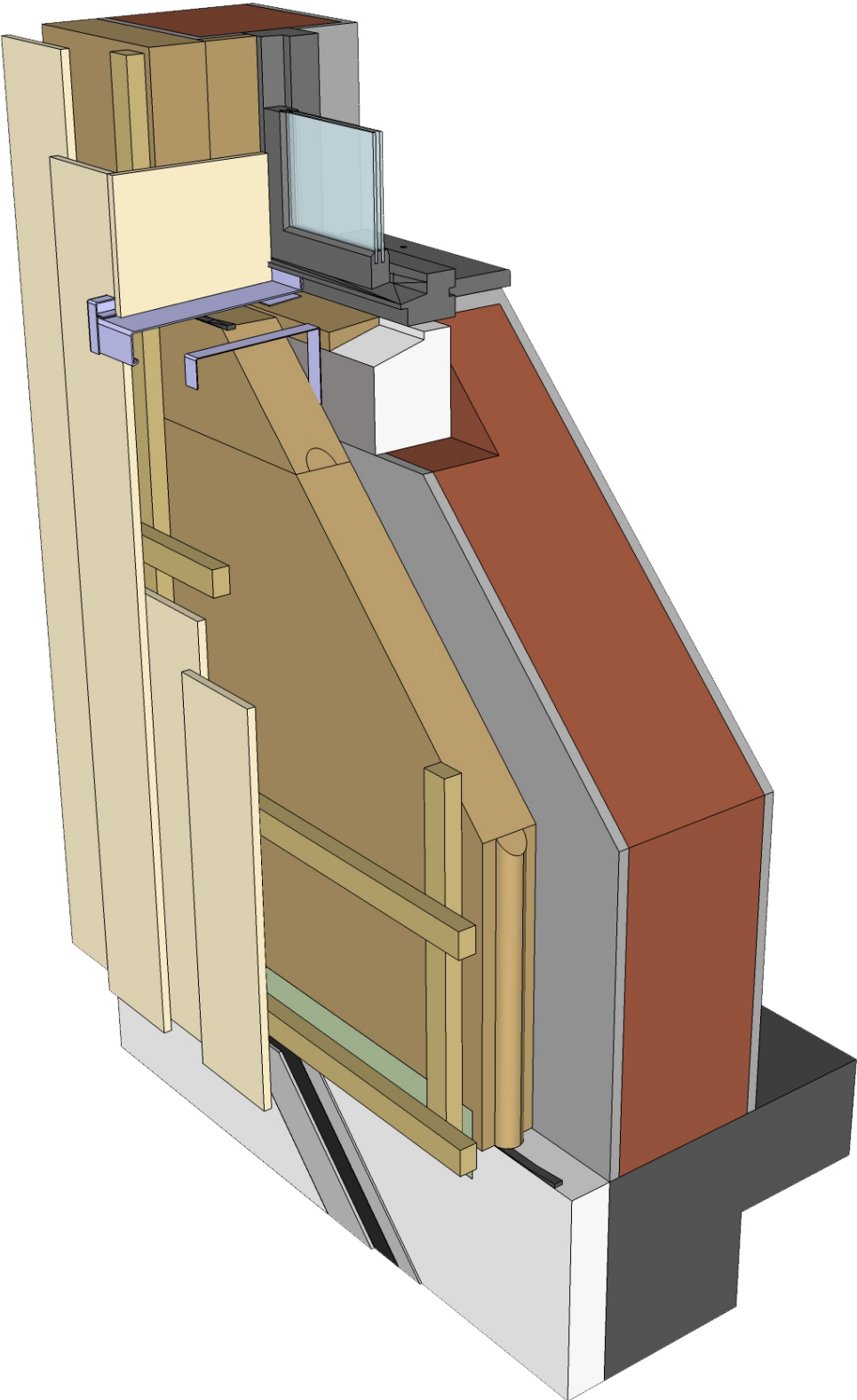




Natural
Building
Technologies

Technical Manual, Masonry EWI Clad System



NBT MASONRY EWI - Clad

Introduction

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NBT CLAD System

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No limits to architectural design: NBT CLAD System and NBT RENDER System facades interact together

NBT Masonry Clad Systems

The building system is masonry structure insulated externally with woodfibre (ISOROOF or PavathermPlus respectively) and finished with either timber clad, brick clad, metal etc.

Made from over 95 % waste softwood and under 5 % inert water-proofing additives, NBT PAVATEX ISOROOF OR PAVATHERM-PLUS, are a genuinely sustainable non-toxic building material.

To produce NBT PAVATEX boards, waste wood fibres are pulped and mixed with water. The pulp is heated to activate the natural lignin they contain in order to glue the fibres together. The pulp is then pressed into boards, dried, and cut to size.

The advanced manufacturing process uses the inherent properties of wood fibres to produce boards with many excellent technical qualities for thermal and acoustic insulation, thermal storage capacity, vapour permeability and moisture control.

Performance Guide

A modern wall insulation system must do more than just protect building occupants from cold. It must create a comfortable and healthy environment in all possible combinations of external and internal conditions and control the effects of external heat, cold, noise and internal moisture generation.

NBT Building Systems

Keep the building warm for longer in cold weather:

Low thermal conductivity and high vapour permeability provide high thermal insulation with no risk of interstitial condensation. Vapour barriers are unnecessary. Woodfibre boards reduce the effect of thermal bridging and the interlocking board design easily achieves good windtightness, so increasing thermal performance. Energy use for heating is significantly reduced leading to lower CO2 emissions and running costs.

Keep the building quieter:

The high mass and the fibrous texture of NBT PAVATEX woodfibre boards give excellent acoustic performance to buildings.

Keep the building cooler in hot weather:

The unique combination of high density, high specific heat capacity and low thermal conductivity gives External Wall Insulation (EWI) solutions the effect of thermal mass that would normally be associated with render onto masonry. Compared to conventional EWI material the risk of condensation behind the render during cold nights is minimized as the boards will store the day's heat.

Keep the building dry and breathable:

NBT PAVATEX woodfibre boards are very vapour permeable and hygroscopic. This allows them to disperse accumulating short term moisture and protect vulnerable elements of the building fabric, with no reduction in the performance of the boards themselves. The boards allow moisture from within the structure to pass easily to the outside. This provides a safeguard against high moisture content. This is vital for the long-term health of the building fabric, and is completely overlooked by most conventional insulation systems.

NBT Natural Insulation Products for:

Simple and robust
Improved heat storage
Excellent sound insulation
Highly vapour permeable constructions that do not need membranes to control interstitial condensation
Substantial saving of build cost compared with conventional timber frame construction
Simple robust construction has few skilled operations and is easily adapted for off site manufacture
Reduced thermal bridging - ideal to achieve high standard and beyond



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Airtightness

Principle

A building envelope should be airtight when all ventilation openings are closed. The design requirement for air changes has to be provided by opening the windows manually, other controllable ventilation openings or suitable mechanical ventilation systems.

When assessing the air permeability of the building envelope, the following aspects must be considered separately:

- Individual building components must exhibit the necessary airtightness in accordance with building component standards
- The overall air permeability of the building envelope must meet the limiting and target values of building regulations
- Local air permeability (leaks, primarily on the inside) can lead to moisture damage because they allow moist interior air to infiltrate the construction
- Local air permeability and associated draughts can have a detrimental effect on the thermal comfort of the occupants and can also lead to increased energy consumption

Air permeability

The air permeability of the building envelope is specified by the ratio of surface area of the building to the hourly air exchange rate for a 50 Pa pressure difference. In Part L Building Regulations an air permeability of 10.0 m³/m²/h is allowed. 0.6 Air changes/hour at 50 Pa pressure for Passivhaus .

Design and construction

To ensure that the building envelope has the necessary degree of airtightness, an airtightness layer is required over all parts of the construction on the warm side of the thermal insulation. Generally, the vapour control layer and airtight layer functions are combined and provided by one membrane, sheeting or a board type material (OSB, multi-ply board, plywood, gypsum fibreboard, etc.). Such materials require fixings and permanent air tight seals at joints and junctions in the form of adhesive tape, glue, mechanical fasteners etc., or may need to be held in place with battens.

Rock wool and glass-fibre boards, wood fibreboards, wooden panelling, planking, acoustic linings, building papers, plaster board etc. cannot achieve the degree of

airtightness required for modern buildings.

The airtightness layer must be conceived at the design stage as a “seamless” layer over the entire building envelope, planned with its practical installation in mind, and shown as a separate layer on all drawings. Good planning includes corresponding information in the tender documents and detail in the working and fabrication drawings. The materials used to achieve the airtight-



▲ Sketch of the principle of an airtightness layer: Build tight, ventilate right.

ness must be sealed airtight at junctions with adjoining elements such as windows, doors and foundations. The installation of several layers each of which are only partially airtight will not result in a building with an adequate degree of sealing.

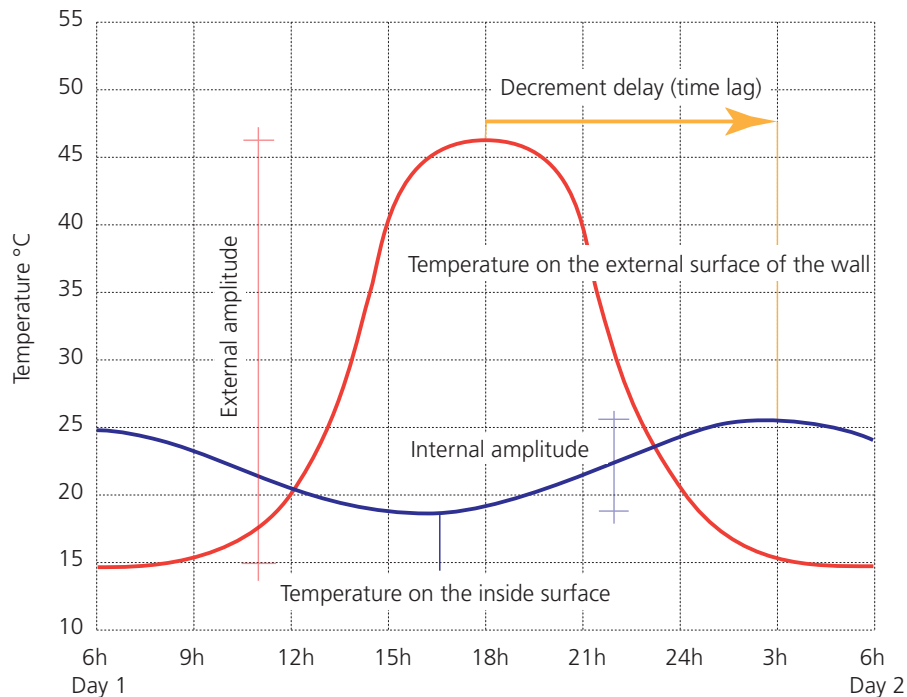
Testing

In order to achieve an airtight building envelope, measures and checks during construction and after completion of the building are necessary. If the airtightness layer has been properly designed and planned, expensive blower door measurements, leak detection by means of smoke tests or IR thermography, and unnecessary costs of repairs can be saved.

A properly designed and constructed building will fulfil airtightness requirements without the need for further special work. NBT systems provide proper design and site support to ensure that the correct levels of airtightness are achieved.

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Summer Overheating



Selecting the right insulation

As part of a building's design it is important to consider the effects of summer overheating control, particularly when there are rooms in roofs or where the construction system is lightweight such as steel or timber frame.

Summer overheating is caused by any or a combination of three reasons:

- high internal gains from appliances, people, machines etc.
- high solar gain through windows due to poor summer shading
- heat passing directly through the walls

The solution to the first is to reduce the gains or ventilate, the second requires better shading, and the third is solved by reducing peak heat gain to the room by changing the decrement delay and factor.

Decrement delay and factor can be thought of as the amount a peak external surface temperature is smoothed out by the structure, and the time that the peak is delayed before it reaches the inside.

To reduce the solar heat passing through a roof or a wall, a low decrement factor is needed, and more impor-

tantly, it should delay the passage of heat by between 6 - 12 hours after the external solar radiation peak – this means that the decrement delay of a wall or roof construction should be between 6 - 12 hours.

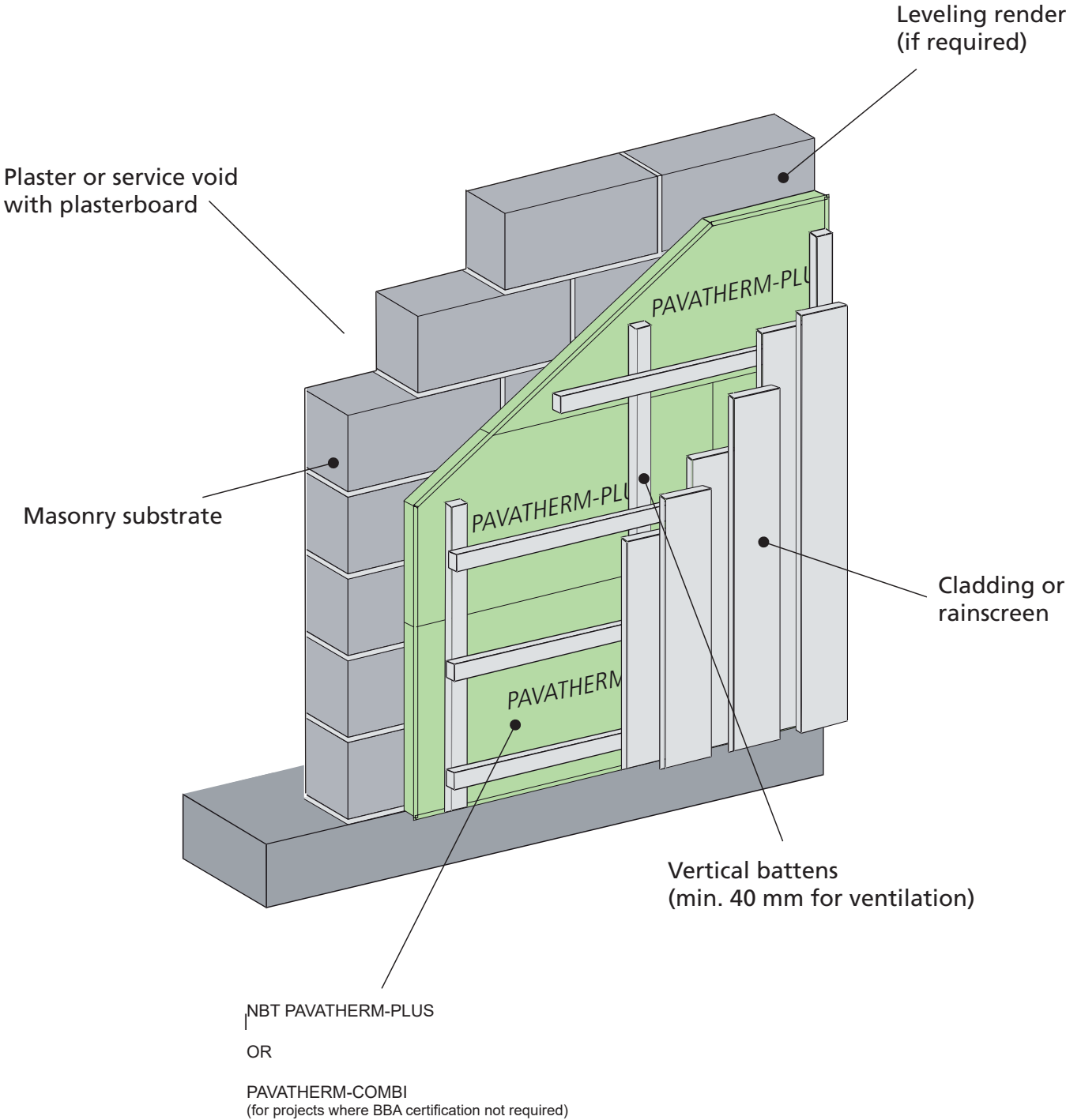
In terms of achieving these satisfactory values, an insulation material that has a high thermal mass is needed to produce better values. A combination of density, thermal conductivity and specific heat capacity is required.

NBT PAVATEX woodfibre boards have an excellent combination of low λ (k-value) (0.038 - 0.047 W/m²K), high specific heat capacity (2100J/kgK) and for insulation boards a high density (140 - 240 kg/m³). These values far exceed any conventional insulation material. This means that with NBT PAVATEX woodfibre insulation a roof or "lightweight" structure such as lightweight frame building can perform as though it was a much more massive structure.

The consequence is the reduction of internal temperatures by 4° C or more in summer compared to a room which may have the same U-value but conventional insulation.

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Clad System

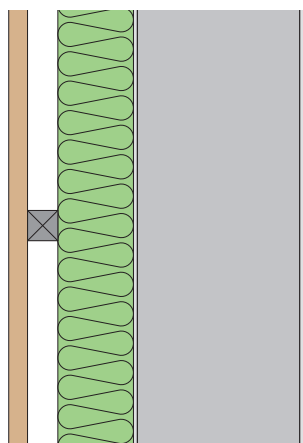


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Physical Properties

* Contact NBT for bespoke U-value calculations. Specially for Pavatherm-Combi system

Physical Properties NBT PAVACLAD



1. Cladding system (timber, brick, screen etc.)
2. Vertical battens 40 x 40 mm
3. NBT PAVATHERM-PLUS+ 60/80/100/120 mm
4. Masonry (brick work $\lambda_D = 0.75$ W/mK; concrete block work $\lambda_D = 0.61$ W/mK)
5. Plaster (≥ 5 mm for airtightness)

1. 2. 3. 4. 5.

215 mm brick work

(10 mm horizontal mortar bed)

Insulation onto substrate	NBT PAVATHERM-PLUS ⁺					
	100 mm	120 mm	140 mm	160 mm	180 mm	200 mm
U-Value [W/m ² K]	0.35	0.30	0.25	0.22	0.20	0.18
Admittance [W/m ² K]	4.24	4.24	4.24	4.24	4.24	4.24
Sound insulation ca. [dB]	52	53	53	54	54	55
Decrement delay [h]	13.9	14.2	15.3	16.6	18.0	19.3

215 mm concrete block work

(10 mm horizontal mortar bed)

Insulation onto substrate	NBT PAVATHERM-PLUS ⁺					
	100 mm	120 mm	140 mm	160 mm	180 mm	200 mm
U-Value [W/m ² K]	0.34	0.29	0.24	0.22	0.20	0.18
Admittance [W/m ² K]	4.02	4.02	4.02	4.02	4.02	4.02
Sound insulation ca. [dB]	52	53	53	54	54	55
Decrement delay [h]	14.9	15.4	16.8	18.2	19.5	20.9

Note: Calculations are done according to BS EN ISO 6946:1997 and BR 443. 140 mm insulation layer onto masonry is made of NBT PAVATHERM-PLUS⁺ 60 mm & NBT PAVATHERM 80 mm; 160 mm insulation layer onto masonry is made of NBT PAVATHERM-PLUS⁺ 80 mm & NBT PAVATHERM 80 mm; 180 mm insulation layer onto masonry is made of NBT PAVATHERM-PLUS⁺ 80 mm & NBT PAVATHERM 100 mm; 200 mm insulation layer onto masonry is made of NBT PAVATHERM-PLUS⁺ 100 mm & NBT PAVATHERM 100 mm.

NBT MASONRY EWI - Clad

Designers: Key Considerations

General:

The NBT CLAD System must only be installed by competent contractors. Provide the contractor with full and complete details for all critical areas of the system including those listed below - leave nothing to be agreed "on site".

System Guarantee:

The system is guaranteed only if boards and accessories approved by NBT are used. NBT CLAD System has LABC (Local Authority Building Control) approval and BBA (British Board of Agrément) approval (BBA CERTIFICATE No 08/4549).

DPC-Level:

Do not use NBT ISOROOF or NBT PAVATHERM-PLUS⁺ boards below DPC level.

Building Height:

The NBT CLAD System is certified for use in buildings where the height to the top floor is ≤ 18 m. If intended for use in higher buildings, contact NBT for advice.

Non Load Bearing:

The NBT CLAD System must be designed so that no loads from the structure are carried by the boards or cladding system.

Ensure that any cladding system/protection screens are securely fixed back to the structure.

Carefully plan the location of down-pipes, lights, security systems etc. Attach fixing discs screwed directly to the substrate where the attachment is more than that can be carried directly by the cladding (i.e. cast iron guttering). Contact NBT for further advice on fixings.

Expansion joints:

Expansion joints must be provided for wall elevations ≥ 18 m. After the whole wall section has been fitted cut a 5 mm wide groove through the board on the centre line of a stud. Seal over the groove with NBT PAVATAPE to form a sealed air gap.

System Movement Joint:

Where structural movement joints or change in substrate occur a system movement bead should be incorporated into the NBT CLAD System to prevent break due to differential movement. Use strip of mineral wool or similar flexible insulation between the board and tape it (Pavatape + primer) over for weather protection.

Weather tightness:

For weather tightness seal the boards against the substrate at all joints, intersections, openings and penetrations and along all edges using NBT PAVATAPE + PAVABASE primer. As a thumb rule, tape all junctions where there's no T&G. T&G joists need not to be taped.

Allow for ISO-BLOCO sealing foam as second seal around window/door or similar openings. ISO-BLOCO is sandwiched between the substrate and the board edge. Tape it over as a first seal.

(Installation Procedure NBT CLAD System, page 12 - 14).

Rain Penetration:

Design a positive strategy for avoiding rain penetration of the NBT CLAD System. This will include:

- Generous overhangs for roofs, cills and copings (in no case ≤ 30 mm)
- Drip details on all overhangs
- Careful detailing of flashings at critical areas e.g. balconies, decks, walkways, parapets, copings, service penetrations, roof abutments, intersecting and adjoining buildings, etc.
- Window and door frames set back from the external face of the wall by at least the thickness of the insulation boards.

Airtightness:

If refitting window and doors, carefully seal the junctions using ISO-BLOCO ONE around the frame as a three layer seal.

Ventilation:

Ventilation cavity is important for system performance. Min 25, 40 and 50mm vertical counter battens to provide continuous ventilation for timber vertical cladding, timber horizontal cladding and closed cladding (metal or brick) respectively.

Fire Break:

Detail fire stop as required by Building Regulations while maintaining the ventilation.

NBT MASONRY EWI - Clad

Installers: Key Considerations

General:

The NBT CLAD System must only be installed by competent contractors.

The details and specifications in this guide and from the designer should be followed as the basis of a successful installation.

The system can be guaranteed only if boards and accessories approved by NBT are used in the specified manner.

Masonry substrate should be flat (unevenness not greater than 8mm) or otherwise apply a NBT levelling coat prior to application.

Movement joints in the substrate must be incorporated into the NBT CLAD System.

Carefully plan the location of down-pipes, lights, security systems etc. Attach fixing discs screwed directly to the substrate where the attachment is more than that can be carried directly by the cladding (i.e. cast iron guttering). Contact NBT for further advice on fixings.

Boards:

Plan board layout to reduce wastage prior to commencing installation.

Minimum bond overlap is 200 mm between courses.

Boards must not be wet or damaged and board edges must be tightly butted together.

Tightly fill all gaps/damage between boards with woodfibre and seal area with NBT PRIMER and NBT PAVATAPE (Installation Procedure NBT CLAD System, page 12 - 14).

For weather tightness seal the boards against the structure at all joints, intersections, openings and

penetrations and along all edges using NBT PAVATAPE + PAVABASE primer. As a thumb rule, tape all junctions where there's no T&G. T&G need not to be taped.

Allow for ISO-BLOCO sealing foam as second seal around window/door or similar openings. ISO-BLOCO is sandwiched between the substrate and the board edge. Tape it over as a first seal.

Do not use the NBT CLAD System below DPC level.

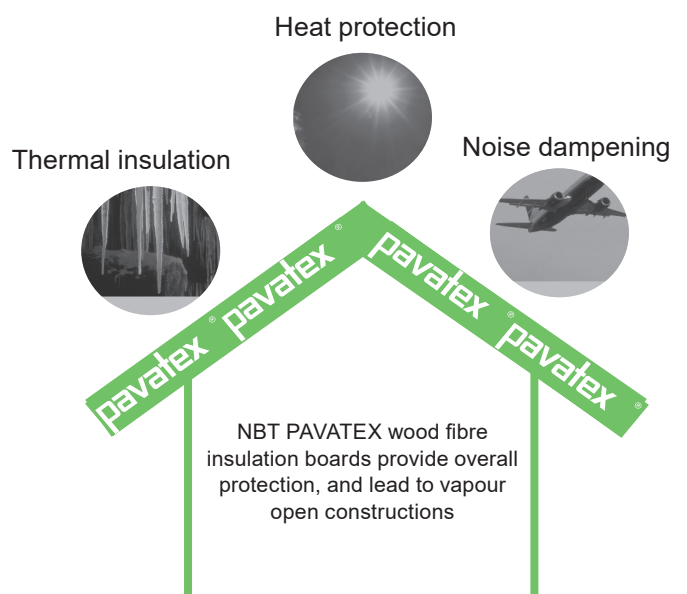
Do not allow the boards to stand exposed to weather for more than 60 days after fixing and before applying the cladding system.

Cladding:

Ensure that any cladding system/rain screens are securely fixed back to the substrate. In general cladding is fixed to the counter batten which is fixed back to the structure.

Only use the fixings recommended by NBT.

The cladding system should offer weather protection to the system and it should be detailed so as to allow an unobstructed flow of air ventilation to the void between the cladding and to the face of the NBT CLAD System boards.



NBT MASONRY EWI - Clad

Installation Procedures

General:

The system comprises NBT ISOROOF or NBT PAVATHERM-PLUS⁺ boards supplied together with all accessories by NBT

Access:

Scaffolding and access to the work must be carried out in accordance with current CDM and Health and Safety Regulations

Adverse Weather/Storage:

Application of the system must only take place in suitable weather conditions in accordance with NBT recommendations, protecting the works if necessary. Boards should be clad within 2 months. Boards should be stored flat and dry. Edges should be protected to prevent damage to tongue & groove.

Board System:

Do not use the NBT CLAD system below DPC. Board edges should be adequately protected at DPC level to prevent water ingress.

Cutting:

The boards are easily cut with any of the following tools:

- NBT PAVATEX jigsaw blades (bayonet fitting to suit most makes of jigsaw)
- Standard wave edge insulation knife
- Circular saw, hand-held or bench mounted with a fine, cross-cut, tungsten tipped blade

Safety goggles and dust mask must be worn during cutting to protect the user from the small, non hazardous, dust particles.

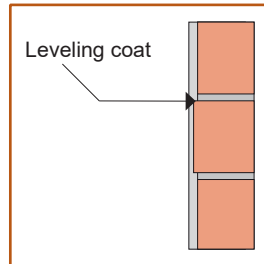
Fitting and fixing:

Locate the 1st course of boards with grooved side down and edge tongue and groove joints fully engaged. Initially fix through the boards into the substrate using 1 - 2 fixings per stud/board.

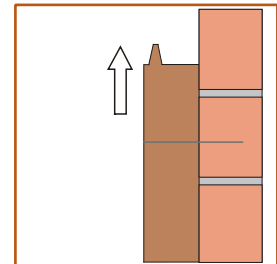
Install 2nd course in ½ bond pattern with overlap \geq 200 mm, over-lapping board ends at vertical corners, ensuring all board joints are fully engaged and tightly joined. Fix to studs as for 1st course. Fill any gaps and areas of damaged boards with loose woodfibres and apply a "patch" of NBT PRIMER and NBT PAVATAPE.

The final fixing will be through the counter batten or thermally broken washer fixings subject to type of

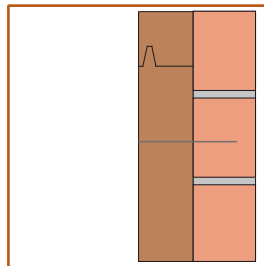
cladding. See page 12.



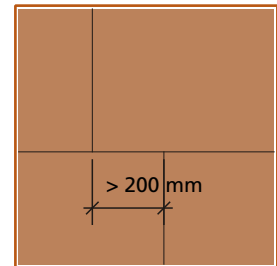
If surface is uneven, level substrate using a compatible render



Fix first row of boards with tongue uppermost using 1 - 2 fixings per board. Final fixing occurs through batten except with brick clad



Fix subsequent rows ensuring that the tongue is fully engaged. Fix as first row



Boards must be installed with a minimum 200 mm staggered bond

Damaged boards and butt edged joints:

Any damaged areas and "butt edged" joints should be filled tightly with woodfibre offcuts - primed and taped with NBT PAVATAPE to ensure the integrity of the layer and to prevent water ingress (see using NBT PAVATAPE section on the right page).

Openings, corners, penetrations & abutment:

All openings, corners and penetrations and cut/exposed edges should be primed and taped with NBT PAVATAPE to ensure the integrity of the layer and to prevent water ingress (see using NBT PAVATAPE section on the right page).

NBT MASONRY EWI - Clad

Installation Procedures

Expansion joints:

Expansion joints must be provided for wall elevations \geq 18 m. After the whole wall section has been fitted cut a 5 mm wide groove through the board on the centre line of a stud. Seal over the groove with NBT PAVATAPE to form a sealed air gap.

Cladding System:

Ensure that any cladding system/protection rain screens are securely fixed back to the substrate .

Only use the fixings in accordance with NBT's recommendations or manufacturer's instructions.

The cladding system should offer weather protection to the NBT CLAD System.

The cladding system should be detailed to offer adequate weather protection to the NBT CLAD System at all openings and abutments.

The cladding system should be detailed so as to allow an unobstructed flow of ventilation in the void behind the cladding and to the face of the NBT CLAD System boards.

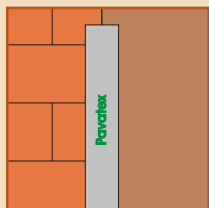
Using NBT PAVATAPE

Guidelines for use

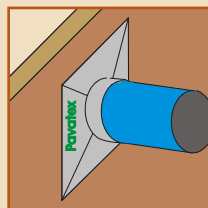
- Only use NBT PAVATAPE on dry, clean and dust-free substrates
- Use after fitting boards and always before installing battens
- Two priming solutions are available dependent on weather conditions and drying time:
 1. PAVABASE - minimum processing temperature for the substrate and air +5°C. Drying time at 20°C and +5°C are ~ 20min and 50min respectively.
 2. PAVAPRIM - minimum processing temperature for the substrate and air -10°C. Drying time at 20°C and +5°C are ~ 15min and 30min respectively.
- NBT PAVATAPE, PAVABASE AND PAVAPRIM should not be applied if the temperature of the product is below 5°C or above 40°C
- Apply NBT PRIMER with a brush or roller onto the board and abutments and allow to dry
- Store NBT PAVATAPE rolls on a flat surface in a dry, cool and dust-free environment.
- Shelf life when stored at around 20°C is unlimited for NBT PAVATAPE. NBT PAVABASE AND PAVAPRIM needs to be used within 15 and 24 months respectively after manufacture.

Using NBT PAVATAPE

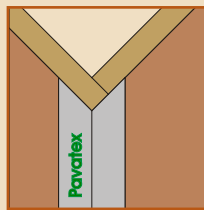
When to use



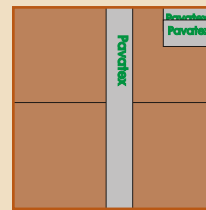
System change



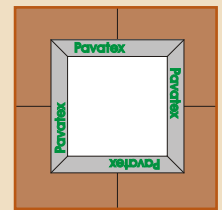
Penetrations



Angles, corners

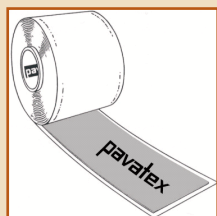


Butt edge joints and

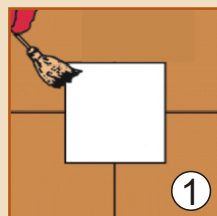


Exposed Openings

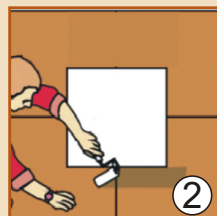
How to install



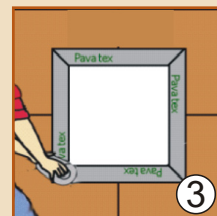
NBT PAVATAPE self adhesive butyl tape 15 m long x 150 mm wide



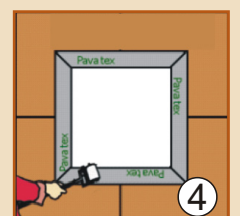
1 Clean surface with a brush. Surface MUST be dry to ensure good adhesion (use of hot air gun to dry board)



2 Apply NBT PRIMER with a brush or a roller and allow to dry



3 Roll out NBT PAVATAPE and press down with other hand. Avoid creases



4 Press NBT PAVATAPE on firmly using a hard faced decorator's seam roller or similar

NBT MASONRY EWI - Clad

Installation Procedures

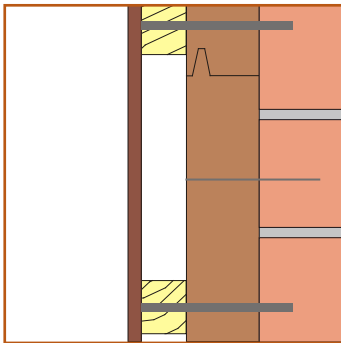
Fixing Cladding:

- Only use fixings in accordance with NBT's recommendations or manufactures instructions
- Batten/rail system should applied AFTER taping/ sealing the board surface
- In general fixings should be at 200 mm centres - for exposed areas/buildings ≥ 18 m high please contact NBT or the fixing manufacturer for advice
- In all fixings method NBT strongly recommend to seek structural engineer or the fixing manufacturer for advice.

Timber Batten onto Stud:

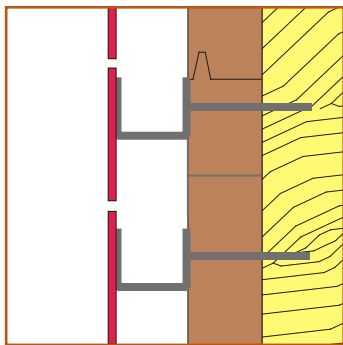
Initially fix the boards as described. Final fixing occurs through the counter battens. For fixing of timber battens over the NBT CLAD System onto masonry substrate, NBT recommends the use of:

- EJOT SDF-S-8 (embedment ≥ 70 mm) or
- Mungo MBR ST or Mungo MQL-St for soft substrate



Rain Screen onto Stud:

Initially fix the boards as described. Final fixing of the system occurs on installation of the rail system - fixings as specified by the rain screen supplier.



Ventilation for Timber Clad & Rain Screen-

Min 25, 40 and 50mm vertical counter battens to provide continuous ventilation for timber vertical cladding, timber horizontal cladding and closed cladding (metal or brick)

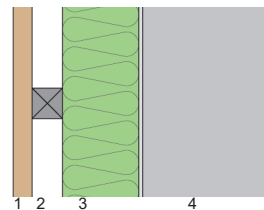
Brick Facade onto Stud:

For brick facade NBT suggest two options. Option 1 avoids excessive thermal bridging from through fixing as in option 2 below.

Option 1 (preferred)

Fix the boards through the counter batten as explained in 'Timber Batten onto Studs' section.

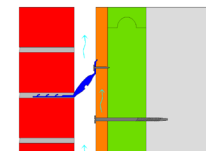
Tie the bricks using Ancon Staifix STF6 Timber Ties, or similar fixed back to the counter batten.



1. Cladding System (timber, brick, screen etc.)
2. Vertical batten 40 x 40 mm
3. NBT PAVATHERM-PLUS
4. Masonry Substrate
5. Plaster (>5mm for airtightness)

Plan View

1 2 3 4 5 6 7 8



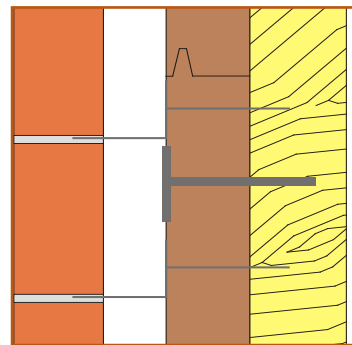
Section View

Option 2

Use 6 fixings per m²; final fixing of the system occurs at this stage:

- EJOT NTU or STR-U (embedment ≥ 35 mm)

Brick clad then can be fixed with Ancon Teplo resin fixed ties or similar. Ties penetration into the board must be sealed with NBT PAVACOLL system glue. Apply the glue on the ties once it is hammered in.



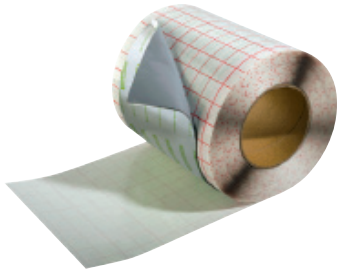
Ventilation for Brick Clad Option 1 & 2 -

min 50mm properly vented cavity, every fourth brick in a course should be air brick and vents at the top to maintain the flow.

NBT MASONRY EWI - Clad

Components & Accessories

NBT PAVATAPE:



- High adhesive force
- Resistant to ageing, weather and UV
- Robust and tear resistant
- Contains no solvent or bitumen

Delivery form

	Roll weight [kg]	Roll length [m]	Roll width [mm]	Box contents [units]
PAVATAPE 75	13.0	15	75	6
PAVATAPE 150	13.3	15	150	4

NBT PAVABASE:



- Solvent-free
- Simple, reliable installation
- Primed area is easily visible
- Cleaning when still liquid with water

Delivery form

	Contents per container [ml]	Box contents [units]
Tub	5000	–

NBT PAVAPRIM:



- Solvent-free and without odour
- Can be used at temperatures down to -10°C
- High self-adhesive force after a short drying time
- Convenient spray bottle with non-blocking nozzle

Delivery form

	Contents per container [ml]	Box contents [units]
Bottle	1000	6

NBT MASONRY EWI - Clad

Components & Accessories

NBT PAVACOLL:



- Solvent-free and without odour
- Fast, controlled hardening
- Adheres to moist surfaces
- Strong, elastic and resistant adhesive joints instead of hard, brittle bonds

Delivery form

	Contents per container (ml/ g)	Box contents [units]	Accessories included
Cartridge	310/443	12	12 snap-off nozzles
Tubular bag	600/858	10	10 large conical nozzles



EJOT The Quality Connection

EJOT NTU

Universal hammer in action fixings to fix insulation onto solid masonry substrate. Min. embedment into timber 35 mm.

NTU are available in wide range of thickness starting from 95mm to 295mm.



EJOT The Quality Connection

EJOT STR-U

Screw in fixings to fix insulation onto soft masonry substrate. Min. embedment into timber 35 mm.

STR-U are available in wide range of thickness starting from 115mm to 455mm.

Requires STR-U plugs, which comes separate. Order with the fixings.

Saw Blades for Woodfibre



Jig saw



Reciprocating saw

- With special serrated blade for cutting the woodfibre boards. Fit all regular makes (Bosch, AEG, ELU, Festo, Metabo, Makita, etc.).

Delivery form

Version	Value
Length for jig saws	152 mm
Box content jig saws	15 saw blades
Length for reciprocating saws	225 mm
Box content reciprocating saws	3 saw blades

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Roof with Extended Eaves (or New Sproket)

THERMAL PERFORMANCE OF JUNCTION

- Ensure insulation is well fixed to the substrate
- Ensure the continuity of the insulation throughout the junction. make sure to apply insulation around the external corner of base plate (wall plate).

AIRTIGHTNESS LAYER CONTINUITY

- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with Iso-Bloco expanding foam tape
- Ensure internal airtightness continuity between the wall and the floor.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

WEATHER TIGHTNESS CONTINUITY

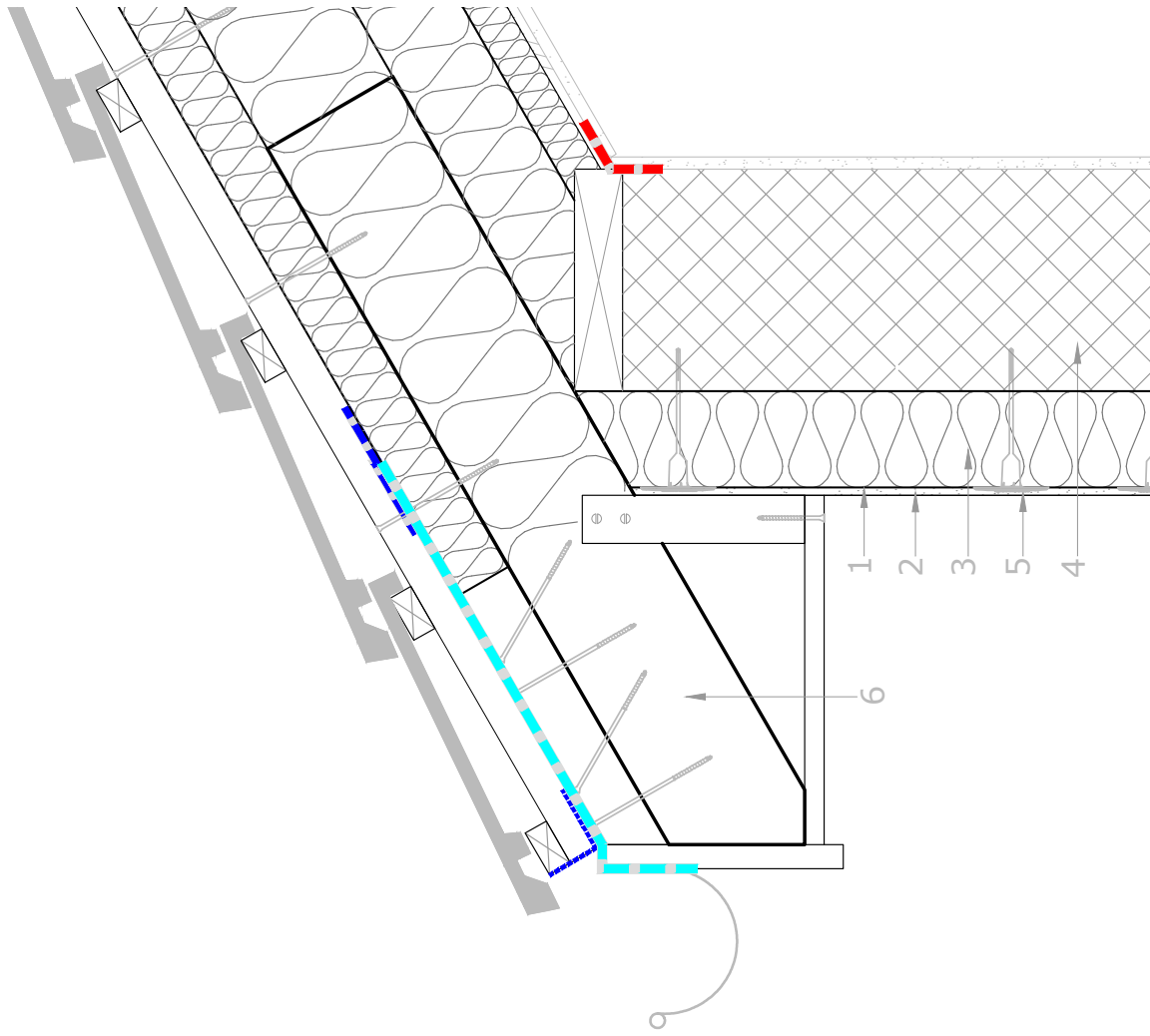
- Ensure the Diffutherm board top edge butt tight to the roof insulation (ISOROOF).
- Ensure Diffutherm is rendered or sealed with appropriate stop-profile at all exposed junctions
- Ensure all penetrations through Diffutherm/plinth board are sealed with iso-bloco expanding foam tape (prior to application of base coat) and secondary mastic seal (following application of base coat and prior to finish coat)

NOTES

- For exposed soffit extend the Diffutherm board to the underside of flashing membrane butt to roof insulation and render to finish.
- Please refer NBT Retrofit Roof Detail Manual for roof specifications.

KEY TO COMPONENTS

1. NBT Top coat (options available)
2. NBT MC55 6mm base coat render (meshed)
3. NBT Diffutherm T&G boards
4. Existing Substrate
5. NBT recommended fixings (NTU or STRU)
6. New roof extension sprocket.



NBT MASONRY EWI - Clad

Plinth Detail

Re-EWI-C-WF-0'1

Standard Plinth Horizontal Clad- 150mm Plinth height with drip

THERMAL PERFORMANCE OF JUNCTION

- Extend plinth board well below interior floor level where possible to minimise thermal bridging through foundations
- Ensure insulation is well fixed to substrate
- Ensure plinth board butts closely to the underside of PavathermPlus board. Allow NBT expanding foam tape at the junction as a second seal.

AIRTIGHTNESS LAYER CONTINUITY

- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with Iso-Blocco expanding foam tape
- Ensure internal airtightness continuity between the wall and the floor.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

WEATHER TIGHTNESS CONTINUITY

- Ensure weather tightness continuity between the NBT PavathermPlus and NBT Plinth boards. Use NBT Pavatape + primer and NBT expansion sealing tape at the interface as shown.
- Ensure PavathermPlus boards are protected by Pavatape and expansion sealing tape (where applicable) at all the corners, butt ends, cut edges, exposed boards and around penetrations. Check other details for reference.
- Undertake drainage measure at wall base to ensure water falls away from wall (French drain with soak away, ground surface inclined away from wall)

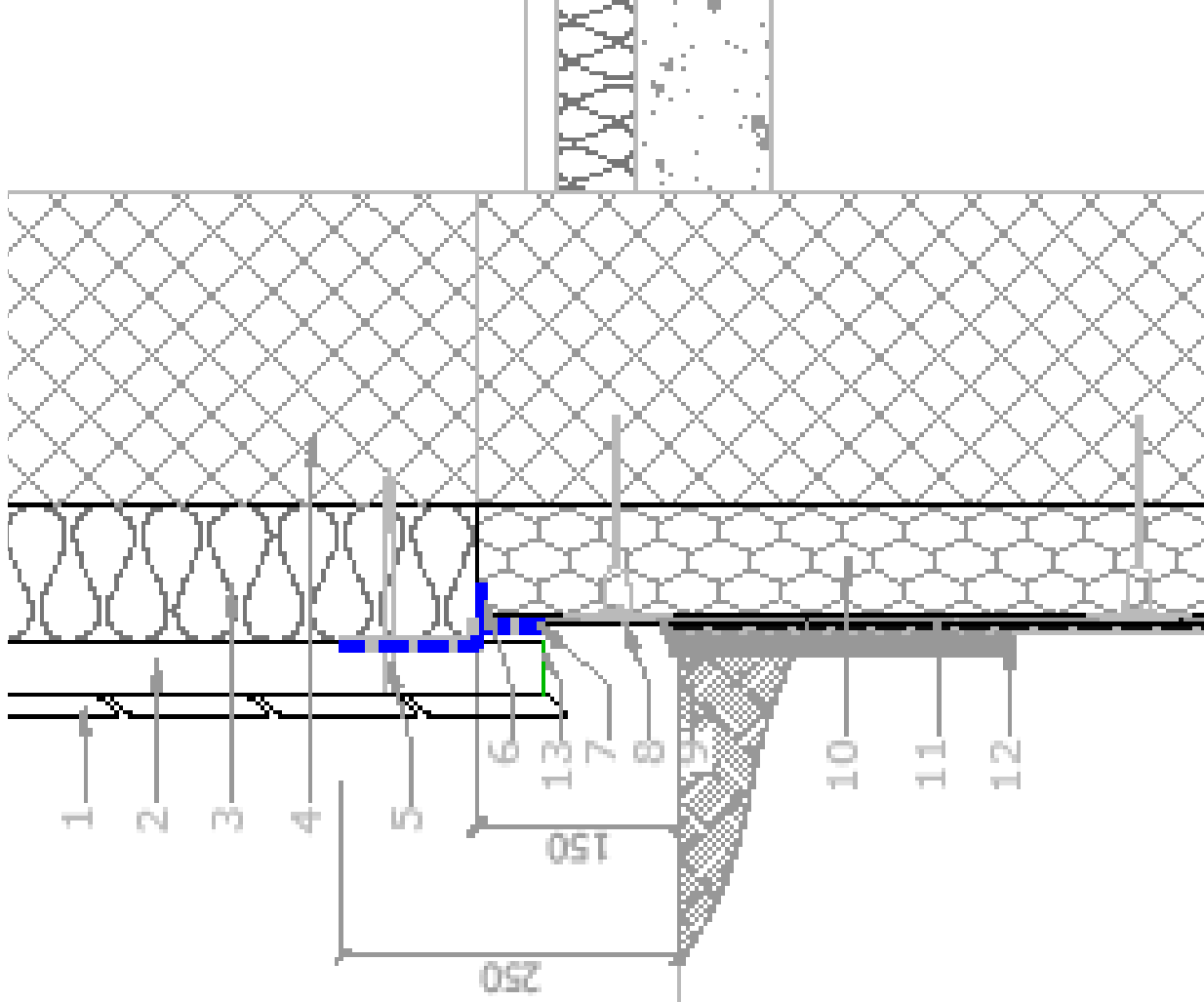
NOTES

- Do not block existing airbricks to underfloor voids under suspended timber floors - add airbrick extensions where required. Conversely, ensure airbricks to heated internal spaces are blocked (providing they are not necessary for Building Regs. Requirements) and adopt appropriate internal ventilation strategy.
- Use Insect mesh at ventilation openings where required.

KEY TO COMPONENTS

1. External Cladding or similar (rainscreen)
2. 40mm vertical counter batten for ventilation
3. NBT PavathermPlus T&G boards
4. Existing substrate (Brick, Stone or other)
5. NBT recommended fixings
6. NBT expansion sealing tape. (ISO-BLOCCO 600)
7. NBT Pavatape with Pavabase primer
8. NBT HM50 6mm base coat (meshed)
9. NBT HM50 2mm top coat, finish - NBT Silicon or NBT Nanopor paint)
10. NBT Plinth & Perimeter board
11. Damp proof membrane
12. Combined drainage and protection layer

RETROFIT EWI - NBT CLAD SYSTEM - PLINTH



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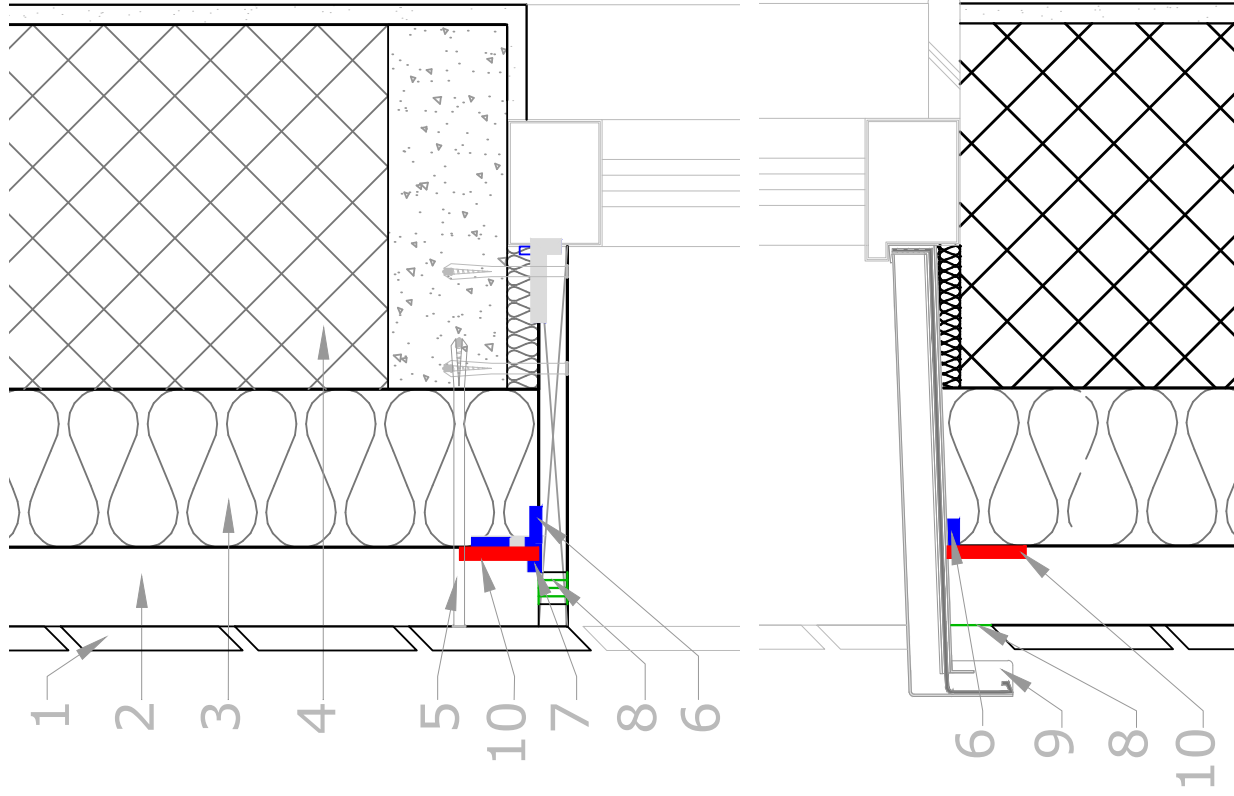
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NBT MASONRY EWI - Clad

External Window Detail

Re-EWI-C-WO-01

RETROFIT EWI - NBT CLAD SYSTEM - Opening Detail



Standard Head & Sill

THERMAL PERFORMANCE OF JUNCTION

- Ensure insulation is well fixed to the substrate
- Ensure the continuity of the insulation throughout the junction
- Ensure reveal is insulated with min. 20mm Diffutherm reveal board. Please contact NBT if 20mm reveal insulation is not possible (exposed fixed frame width <30mm).

AIRTIGHTNESS LAYER CONTINUITY

- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with iso-bloco expanding foam tape
- Ensure internal airtightness continuity between the wall and the window frame. If fitting new windows, seal/tape the frame to the window/door reveals.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

WEATHER TIGHTNESS CONTINUITY

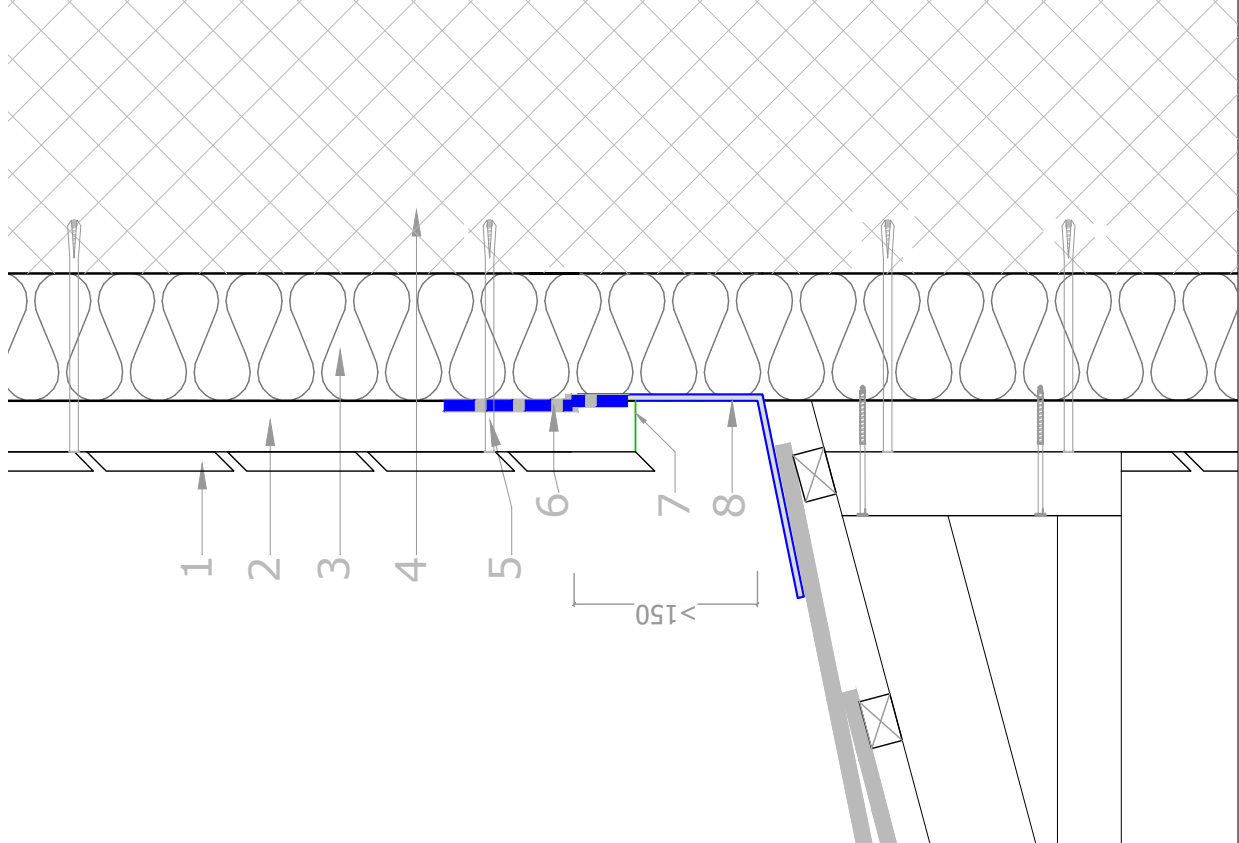
- Ensure the reveal board butt tight to the PavathermPlus boards.
- Ensure weather tightness continuity between the reveal board and the frame. Use NBT expansion sealing tape and NBT External tape at the interface as shown.
- Ensure all the joints/overlaps, corners, edges and penetrations are sealed with NBT airtightness tapes & sealant. Use recommended primer on the woodfibre board and masonry prior to tape.

NOTES

- Detail fire stop as required, maintaining the ventilation.
- Incorporate expansion resistance sill, please contact NBT for details
- Minimise thermal bridge through sill by cutting back existing sill flush with masonry or rebating back of diffutherm boards to enable front face of sill to be insulated. Where possible insulate the upper face of

KEY TO COMPONENTS

1. External Cladding or similar (rainscreen)
2. 40mm vertical counter batten for ventilation
3. NBT PavathermPlus T&G boards
4. Existing substrate (Brick, Stone or other)
5. NBT recommended fixings
6. NBT expansion sealing tape. (ISO-BLOCO 600)
7. NBT Pavatape with Pavabase primer
8. Insect Mesh
9. NBT expansion resistance sill, please contact NBT for details
10. Fire Stop



Porch/Canopy Detail

Thermal Performance of Junction

- Ensure insulation is well fixed to the substrate

Airtightness Layer Continuity

- External wall insulation reduces air infiltration through walls, however, if possible –
- Ensure all penetrations through woodfibre/plinth board are sealed with iso-bloco expanding foam tape
- Ensure internal airtightness continuity between the wall and the floor.
- Where exceptional airtightness levels are required, consider a continuous lime plaster parge coat with additional taping of penetrations and openings, prior to application of EWI.

Weather Tightness Continuity

- Ensure the min. height of flashing on the boards should be 150mm.
- Tape the flashing on the boards as shown. Do not use hot torch weld.

NOTES

-

KEY TO COMPONENTS

1. External Cladding or similar (rainscreen)
2. 40mm vertical counter batten for ventilation
3. NBT PavathermPlus or ISOROOF T&G boards
4. NBT Pavaflex between studs
5. NBT recommended fixings
6. NBT Pavatape with Pavabase primer
7. Insect mesh
8. Lead Flashing

NBT Product Overview: Insulation

ISOROOF sarking board



PAVATEX wood fibre board for breathable roof & wall constructions

Size: 770 x 2500 mm
 Cover area: 750 x 2480 mm
 Thicknesses: 20* & 35 mm
 k-value / I_D: 0.046 W/(mK)
 Density: 230 kg/m³
 Compr. strength: 150 kPa (at 10 % compression)

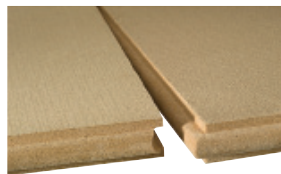
PAVATEX DIFFUTHERM external wall insulation



Wood fibre board for rendered external walls

Size: 580 x 1450 mm
 Cover: 560 x 1430 mm
 Thicknesses: 60, 80, 100 & 120 mm
 k-value / I_D: 0.043 W/(mK)
 Density: 190 kg/m³
 Compr. strength: 80 kPa (at 10 % compression)

PAVATHERM-PLUS sarking board



Composite wood board for roof & wall insulation

Size: 580 x 1800 mm
 Cover area: 560 x 1780 mm
 Thicknesses: 60, 80, 100, 120 mm
 k-value / I_D: 0.043 W/(mK)
 Density: 180 kg/m³
 Compr. strength: 100 kPa (at 10 % compression)

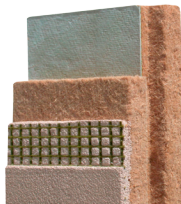
PAVATHERM-COMBI multipurpose



Composite wood board for roof & wall insulation

Size: 580 x 1800 mm
 Cover area: 560 x 1780 mm
 Thicknesses: 60, 80, 100, 120 mm
 k-value / I_D: 0.041 W/(mK)
 Density: 145 kg/m³
 Compr. strength: 100 kPa (at 10 % compression)

PAVADENTRO internal wall insulation



Innovative wood fibre insulation board for refurbishment

Size: 600 x 1020 mm
 Cover area: 590 x 1010 mm
 Thicknesses: 40, 60, 80 & 100 mm
 k-value / I_D: 0.043 W/(mK)
 Density: 175 kg/m³
 Compr. strength: 70 kPa (at 10 % compression)

PAVADRY internal wall insulation



Innovative wood fibre insulation board for refurbishment

Size: 600 x 1020 mm
 Cover area: 590 x 1010 mm
 Thicknesses: 52, 72 & 92 mm
 (Pavadentro/Hardboard) k-value / I_D: 0.043 / 0.14 W/(mK)
 (Pavadentro/Hardboard) Density: 175/740 kg/m³
 (Pavadentro) Compr. strength: 70 kPa (at 10 % compression)

PAVATHERM-PROFIL wall & floor board



Wood fibre board for insulating floors or internal walls with plaster

Size: 600 x 1020 cm
 Cover: 590 x 1010 mm
 Thicknesses: 40 & 60 mm
 k-value / I_D: 0.043 W/(mK)
 Density: 175 kg/m³
 Compr. strength: 70 kPa (at 10 % compression)

PAVATHERM general purpose insulation board



Universal wood fibre board for use in external & internal walls, floors & roofs

Sizes/Cover: 600 x 1020 mm
 Thicknesses: 20 -140 mm
 k-value / I_D: 0.038 W/(mK)
 Density: 110 kg/m³
 Compr. strength: 50 kPa (at 10 % compression)

NBT Pavaflex



Flexible woodfibre insulation batts for loft, walls, floors & ceilings

Size I: 375 x 1350 mm
 Size II: 575 x 1350 mm
 Thicknesses: 50, 80, 100 & 140 mm
 k-value / I_D: 0.038 W/(mK)
 Density: 55 kg/m³
 Compr. strength: -

PAVABOARD load bearing insulation



Wood fibre board for highly insulated floors that have to carry loads

Size/Cover: 600 x 1020 mm
 Thicknesses: 40 & 60 mm
 k-value / I_D: 0.046 W/(mK)
 Density: 220 kg/m³
 Compr. strength: 150 kPa (at 10 % compression)

PAVAFLOC - cellulose fibres



Packaging: Bags of 12.5 kg (compressed)
 Cover area: e.g. 30-60 kg/m³
 k-value / I_D: 0.038 W/(mK)



Natural
Building
Technologies



Natural Building Materials and Systems



high performance systems NBT PAVATEX woodfibre systems provide exceptional thermal & acoustic insulation, summer overheating protection and moisture control for the whole building in wall roof and floor



low carbon, renewable products NBT PAVATEX boards are made of waste wood and lock up the equivalent of ca. 11 tonnes of CO₂ per building. Raw material resources are entirely renewable, unlimited and FSC certified



healthy housing NBT PAVATEX insulation boards are certified by natureplus as non-polluting and the NBT systems lead to breathable constructions; NBT PAVATEX insulation is specified exclusively by the Sentinal Haus Institute for healthy housing



tried & tested systems NBT PAVATEX woodfibre insulation are widely used across Europe in all climates and conditions; physical values are 3rd party tested and guaranteed and production is according to BS EN



local service & support Pavatex's partner in the UK is Natural Building Technologies (NBT) who are a Technical Sales Company with nationwide coverage based in Oakley, Bucks. NBT lead the UK sustainable materials & systems for high performance building shells



Swiss Made

swiss quality & know-how for the UK produced and developed in Switzerland for more than 70 years by the world's most innovative woodfibre insulation manufacturer

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