



James Hardie Claddings

Installation to Steel Framing – MARCH 2016

GENERAL

This information must be read in conjunction with the technical specifications produced for James Hardie cladding product.

This information is developed to facilitate the installation of James Hardie claddings to steel frame. For general information regarding their installation refer to James Hardie's current technical specifications for products such as Linea™ Weatherboard, Monotek™ Sheet, Axon™ Panel, EasyLap™ Panel, Stria™ Cladding, Titan™ Façade Panel etc.

This information is for use by architects, builders, cladding installers and other contractors who may be involved with the installation of James Hardie claddings to steel frame. It contains information aligned with good building practice.

James Hardie product technical specifications along with product warranties and maintenance requirements are available at www.jameshardie.co.nz or Ask James Hardie™ on 0800 808 868.

STEEL FRAMING

Steel frame is used as an alternate to timber frame construction for residential or commercial buildings. Refer to NASH Handbook, 'The Best Practice for Design and Construction of Residential and Low-Rise Steel Framing' for general information of steel frame construction.

A steel frame structure shall be in accordance with a steel framing guidance document published by National Association of Steel Housing (NASH). Refer to www.nashnz.org.nz for further information regarding steel framing. The stud spacing must not exceed 600mm centres in any circumstance for fixing James Hardie claddings.

The steel framing shall meet the Durability requirements of clause B2 of the New Zealand Building Code (NZBC). Refer to framing supplier for durability statement.

A typical section size 89mm × 39mm × 0.75mm BMT is recommended to be used to facilitate the installation of James Hardie claddings.

The steel sections are generally available in the market supplied under different brand names by various manufacturers / suppliers. For further guidance on the steel frame suppliers/construction refer to www.nashnz.org.nz.

For Fire Rated Wall Systems, refer to Clause 6.4 in the Fire and Acoustic Design Manual for further guidance.

Refer to product specific technical specifications for extra framing requirements that may be needed for internal corners, control joints etc.

THERMAL BREAK

Thermal bridging is a term used for heat loss through a conductive path that generally connects the inner surface to the exterior. Steel frame has higher conductivity and acts as a thermal bridge between the interior and exterior face of a building.

The thermal bridging can result in the following:

- down grade the overall thermal resistance of external walls significantly.
- moisture accumulation in the wall cavity due to condensation.
- allows mould to grow on inner surface of wall and within the wall cavity.

In order to comply with Clause E3 and H1 of the NZBC, an insulating material (Thermal Break) is required to be fixed to the exterior steel surface to avoid/minimise thermal bridging. This can be achieved by using materials like 10mm thick (XPS) extruded polystyrene or other materials which achieve the R-Value (thermal resistance) $\geq 0.25 \text{ m}^2 \text{ }^\circ\text{C/W}$.

For further guidance on how to achieve thermal break, refer to NASH Handbook at www.nashnz.org.nz or BRANZ Building Basics Steel Framing.

Thermal break is fixed over the entire external surface of steel framing, i.e. over studs, nogs, bottom and top plates. Other proprietary materials e.g. treated timber or uPVC in different thicknesses which provide similar thermal resistance can also be used over steel framing.

XPS is most practical/economical and common material that is used as thermal break. A 10mm thick XPS grade battens are generally adhered using an adhesive or a two sided adhesive tape applied over the face of the steel frame.

Extruded high density polystyrene thermal battens are available in the market. One of the suppliers of these thermal battens is Insulation Wholesalers Ltd. Phone: (06) 329 8065 or visit www.insulationwholesalers.co.nz.

When building a fire rated wall the thermal break must be replaced with a Thermal Fire Batten. Refer to Clause 7.18 of the James Hardie Fire and Acoustic Design Manual for further information.

FLEXIBLE UNDERLAY

A flexible underlay complying with Table 23 of clause E2/AS1 must be used. An absorbent type flexible underlay shall be used as it is suitable for both absorbent and non-absorbent types of claddings. It is recommended that the flexible underlay is fixed using adhesive tapes. Flexible underlay is applied over the thermal break. Refer Figure 1. Refer to flexible underlay manufacturers for further information regarding its installation over steel frame.

RIGID AIR BARRIER

A rigid air barrier can also be used in lieu of a flexible underlay. When in EH wind zone or the wind pressures are higher than 1.5kPa, James Hardie RAB™ Board 6mm thick must be used. This rigid air barrier is fixed over the thermal break. Use a 30mm 6-8g class 3 or class 4 wafer head steel screw or a proprietary 30 x 2.5mm screw shank nail to fix rigid air barriers to steel studs.

FLASHING

All wall openings, penetrations, intersections, connections, window sills, heads and jambs etc. must be flashed suitably to ensure that the required weathertightness is achieved. Refer to E2/AS1 for further information.

Window openings must be flashed in similar way as the practice is for a timber framed building. A flexible underlay or any other building material must be lapped in such a way that the moisture tracks down to the exterior of the building.

FASTENER DURABILITY

The fasteners used for fixing James Hardie claddings to steel frame must meet minimum 15 year durability requirements of NZBC.

Refer to Table 1 for the type of coating required on the fasteners to be used to fix cladding into steel framing.

Zone	Coating Required
Zone C and B	Class-3
Zone D and Sea Spray Zone or Geothermal Areas	Class-4

FIXINGS

Refer to Table 2 regarding the fasteners required for James Hardie claddings. The length of the fasteners required to fix a cladding will vary depending upon different thickness of proprietary materials used to achieve the thermal break and thickness of cladding. Generally the length of the screw is calculated by allowing a 15mm minimum penetration into steel framing ensuring a minimum of 5 threads through the steel.

The sheet material products should be fixed starting from inside and work toward edges. This will ensure sheets are hard against the frame and avoid drumminess. Do not overdrive the fasteners. The cladding fastener spacing must be similar to nail or screw spacing as specified in the technical specification developed by James Hardie for each product.

For Linea Weatherboard the screws can be finished flush with surface when fixed under the lap (concealed fixing method). For face fixing the screws must be finished 2mm below the surface and then filled with an exterior grade two part filler eg. CRC Builders Fill

Table 2: Fasteners

Linea Weatherboard	Direct Fixed	Concealed fixing	8-10g x 40mm self embedding steel wingtek screw class 3 or 4
		Face fixing	8-10g x 60mm self embedding steel wingtek screw class 3 or 4
	Timber Cavity Batten Construction	Concealed fixing	8-10g x 60mm self embedding steel wingtek screw class 3 or 4
		Face fixing	8-10g x 75mm self embedding steel wingtek screw class 3 or 4
Axon Panel, HardieFlex Sheet 7.5mm	Direct Fixed		8-10g x 40mm self embedding steel wingtek screw class 3 or 4
	Timber Cavity Batten Construction		8-10g x 60mm self embedding steel wingtek screw class 3 or 4
Monotek Sheet	Timber Cavity Batten Construction		8-10g x 60mm self embedding steel wingtek screw class 3 or 4
CLD™ Structural Cavity Batten	10g x 50mm steel self embedding wingtek screw class 3 or 4. Fixing centres as per Titan Façade Panel, Stria Cladding, EasyLap Panel or Axon Panel Technical Specification.		

Notes:

- The length of the fasteners specified above is based on using a 10mm thick thermal break on the face of the steel frame. If the thickness of the thermal break / thermal fire batten is increased, the length of the fastener must be increased accordingly.
- The screw must be coated to class 3 or 4 to comply with the durability requirements. Refer to Table 1 for guidance.
- Fixing centres must be similar to what is specified in the product technical specification.
- It is recommended that the screw selected for cladding installation is evaluated to achieve the required penetration into steel frame.

INSTALLATION

The cladding installation and flashing requirements for a steel frame are similar to the installation to timber frame, except for the type of fixings to be used and the inclusion of a thermal break. The construction method requiring the cladding to be fixed direct to framing or using a cavity batten must be determined on the basis of risk matrix analysis as per E2/AS1. The details provided in this technical supplement are for Linea Weatherboard but the following James Hardie products can be also installed to steel frame as per this technical supplement information.

- Titan Façade Panel
- Stria Cladding
- Axon Panel
- EasyLap Panel
- Monotek Sheet
- HardieFlex Sheet 7.5mm

The simplest way to install these claddings over steel frame is to use CLD Structural Cavity Batten and then fix cladding into the CLD Structural Cavity Batten as per standard James Hardie technical specification.

Opening flashings, junction or penetration flashings must be provided as per the details provided in the relevant technical specifications.

MAINTENANCE

It is the responsibility of the designer/specifier to determine normal maintenance requirements for a cladding and to ensure that its effectiveness is being maintained. Cleaning of the paint, finished surface, sealants, joints, junctions, penetrations, etc. must be carried out at regular intervals. Also refer to maintenance requirements of accessory manufacturers / suppliers.

As a guide, it is recommended that the following basic normal maintenance tasks shall include, but not be limited to:

- Washing down exterior surfaces every 6-12 months*.
- Re-coating exterior protective finishes*.
- Regular inspection and repair if necessary of cladding and sealants etc.







- Cleaning out gutters, down pipes and overflow pipes as required.
- Pruning back vegetation which is close to or touching the building as well as ensuring NZBC ground clearance requirements are maintained especially where gardens are concerned.
- The clearance between the bottom edge of a cladding and the finished / unfinished ground must always be maintained.
- Refilling the countersunk holes where the cracks start appearing in the paint film around epoxy fillers or where fastener head through becomes significant.

* Do not use a water blaster to wash down the cladding.

* In extreme coastal conditions or sea spray zones, wash every 3-4 months.






** Refer to your paint manufacturer for washing down and recoating requirements related to paint performance.

Table 3: Accessories supplied by James Hardie for Linea Weatherboard

Product	Accessory and Material Number	Size	Code	Material / Appearance
	External Slimline Box Corner Mould	2700 long	301195	Etch Primed Aluminium
	Internal 'W' Mould 900	2700 long	301184	Etch Primed Aluminium
	Vent Strip	3000 long	302490	uPVC white
	James Hardie Corner Underflashing 50 x 50mm	3000 long	303745	uPVC white
	HardieBlade Saw Blade	4 tooth 184mm	300660	Diamond Tipped
	HardieBlade Saw Blade	6 tooth 254mm	303375	Diamond Tipped

For other claddings refer to relevant James Hardie technical specification

Table 4: Accessories NOT supplied by James Hardie

Product	Accessory and Material Number
	Thermal Batten supplied by Insulation Wholesalers Ltd (06) 329 8065
	Flexible Underlay Must comply with Table 23 of E2/AS1 of the NZBC.
	Joint Sealing Tape Used to seal the vertical joints of RAB Board e.g. Marshall Innovation or 3M®
	Bostik - 'Seal N Flex - 1" adhesive or Silkaflex 11FC adhesive
	Countersunk Fasteners: 8 – 10g x 40mm, 60mm or 75mm countersunk head self embedding wingtek screws – Class 3 or 4 coating. Fasteners must be fully compatible with all other material that it is in contact with to ensure the durability and integrity of assembly. Supplied by EDL Fasteners.

DETAILS

Various details outlined in the following table are available on pages 5 to 36.

Description		Figure	Page
Linea Weatherboard direct fix	Foundation and soffit	1	5
Linea Weatherboard direct fix	Weatherboard fixing	2	6
Linea Weatherboard direct fix	External mitre corner	3	7
Linea Weatherboard direct fix	Aluminum box corner	4	7
Linea Weatherboard direct fix	External corner soaker	5	8
Linea Weatherboard direct fix	Internal scribed corner	6	8
Linea Weatherboard direct fix	135° internal corner	7	9
Linea Weatherboard direct fix	Internal W mould	8	9
Linea Weatherboard direct fix	Window sill	9	10
Linea Weatherboard direct fix	Window head	10	11
Linea Weatherboard direct fix	Window jamb	11	11
Linea Weatherboard direct fix	Window head	12	12
Linea Weatherboard direct fix	Metre box head	13	13
Linea Weatherboard direct fix	Metre box sill	14	13
Linea Weatherboard direct fix	Metre box jamb	15	14
Linea Weatherboard timber cavity batten	Foundation and soffit	16	15
Linea Weatherboard timber cavity batten	Weatherboard fixing	17	16
Linea Weatherboard timber cavity batten	External mitre corner	18	17
Linea Weatherboard timber cavity batten	Aluminum box corner	19	17
Linea Weatherboard timber cavity batten	External corner soaker	20	18
Linea Weatherboard timber cavity batten	Internal scribed corner	21	18
Linea Weatherboard timber cavity batten	135° internal corner	22	19
Linea Weatherboard timber cavity batten	Internal W mould	23	19
Linea Weatherboard timber cavity batten	Window sill	24	20
Linea Weatherboard timber cavity batten	Window head	25	21
Linea Weatherboard timber cavity batten	Window jamb	26	21
Linea Weatherboard timber cavity batten	Window head	27	22
Linea Weatherboard timber cavity batten	Metre box head	28	23
Linea Weatherboard timber cavity batten	Metre box sill	29	23
Linea Weatherboard timber cavity batten	Metre box jamb	30	24
Linea Weatherboard timber cavity batten	Apron flashing	31	25
Linea Weatherboard timber cavity batten	Pipe foundation	32	26
Titan Facade Panel / Axon Panel	Framing setout	33	27
Titan Facade Panel / Axon Panel / Stria Cladding / EasyLap Panel	Foundation detail	34	28
Titan Facade Panel	Vertical expressed joint	35	29
Axon Panel	Shiplap joint	36	30
Titan Facade Panel / Axon Panel / EasyLap Panel	Intermediate stud fixing	37	31
Stria Cladding	Vertical joint	38	32
Villaboard Lining	Vertical flush joint	39	33
Villaboard Lining	Vertical butt joint	40	34
Villaboard Lining	Vertical sealant butt joint	41	35
Villaboard Lining	Vertical internal corner	42	36

Figure 1: Foundation and soffit

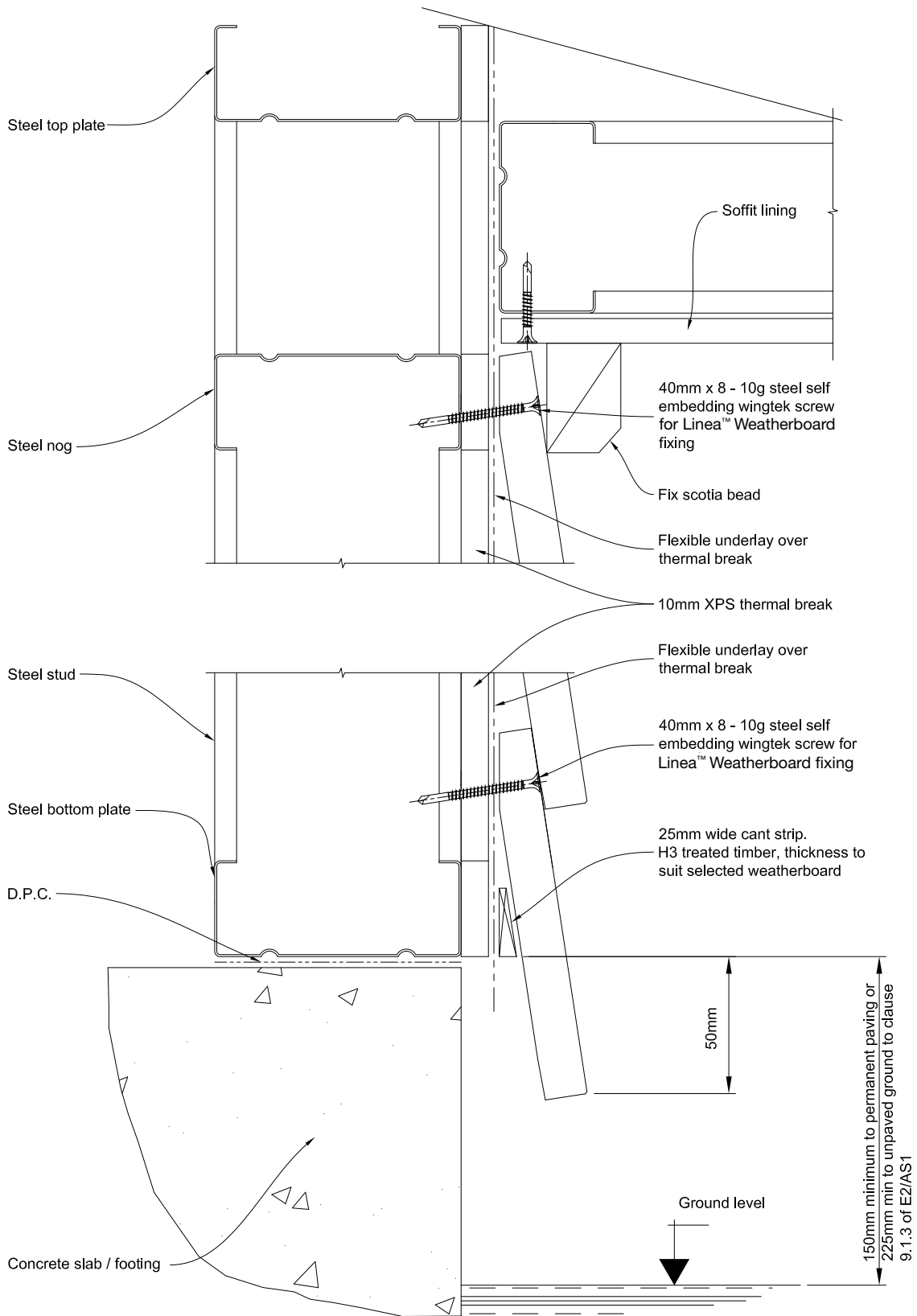
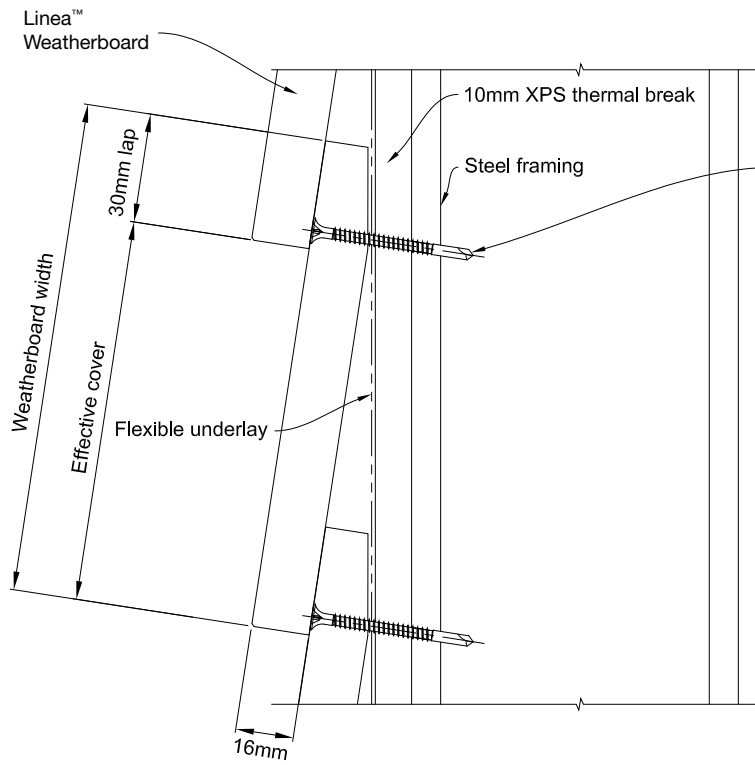
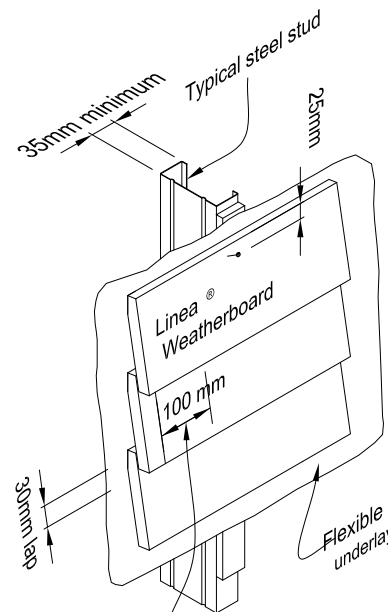


Figure 2: Weatherboard fixing



Concealed Fixing

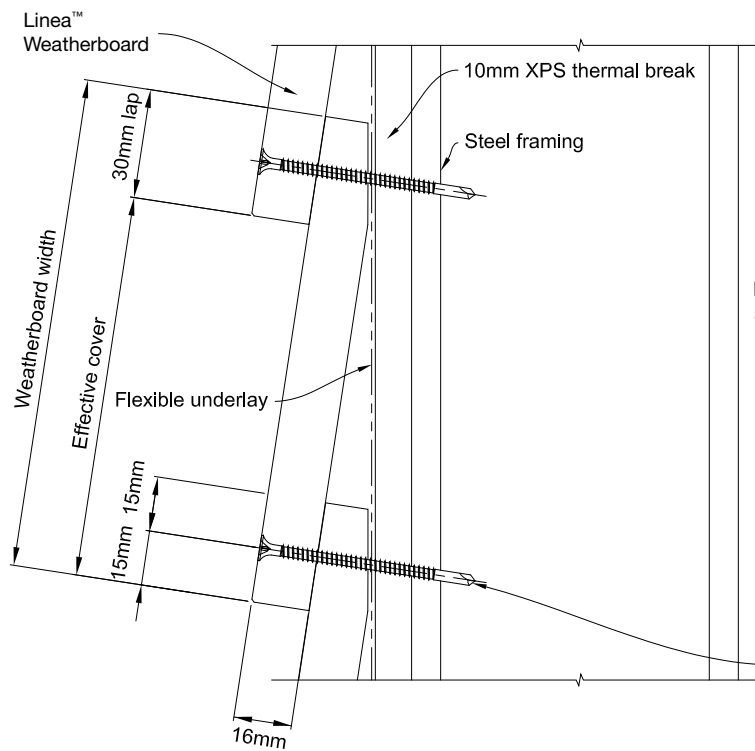
Boards to be concealed fixed using 40mm x 8 - 10g steel self embedding wingtek screw at 90° to face, finish flush.



Tongue and groove join in weatherboard to be 100mm minimum from side of stud. Joints must be staggered by 600mm minimum

Jointing Off Stud

Before pushing end joint together apply a bead of flexible sealant to mating surfaces.



Exposed Fixing

Boards to be face fixed at corners and down window and door openings using 60mm x 8 - 10g steel self embedding wingtek screw at 90° to face, finish 2mm below surface and fill.

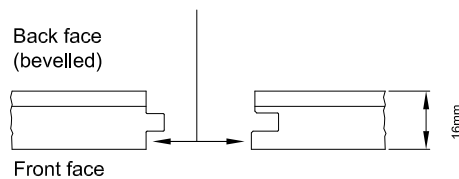


Figure 3: External mitre corner

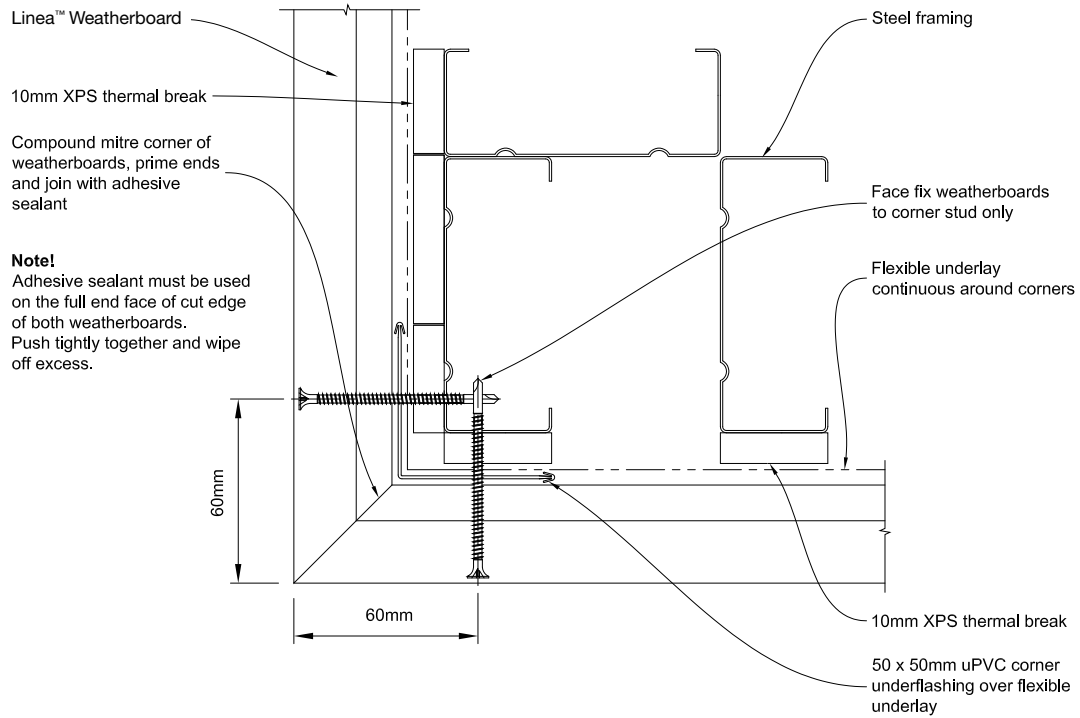


Figure 4: Aluminium box corner

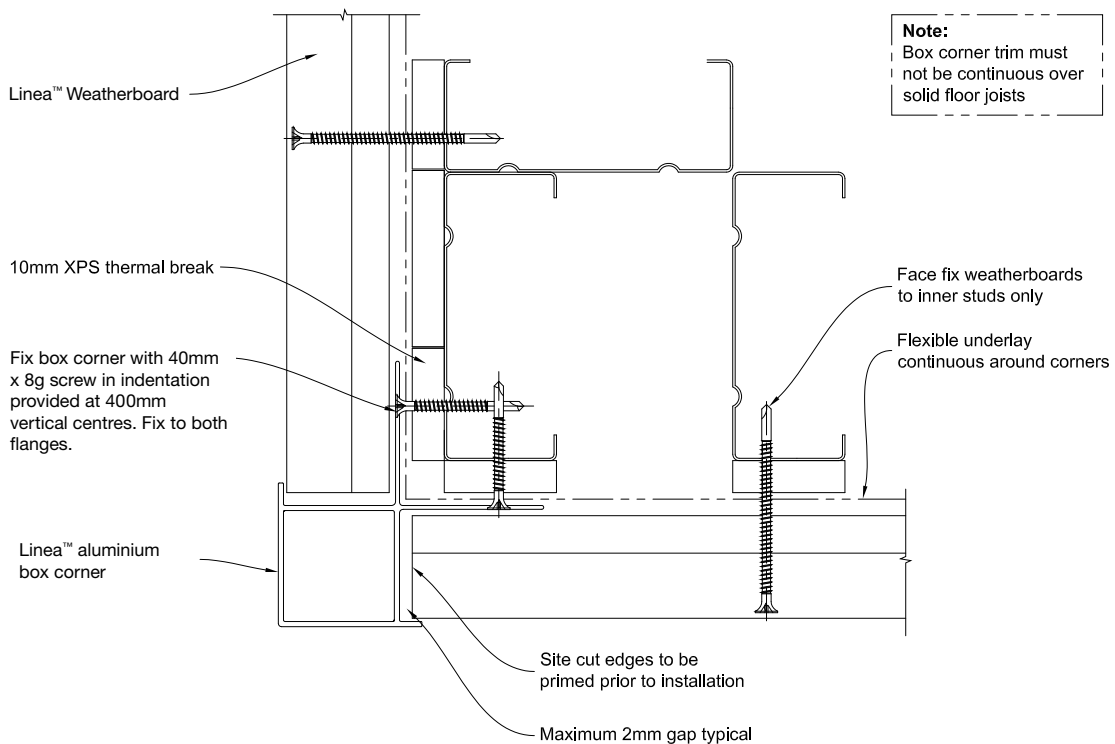
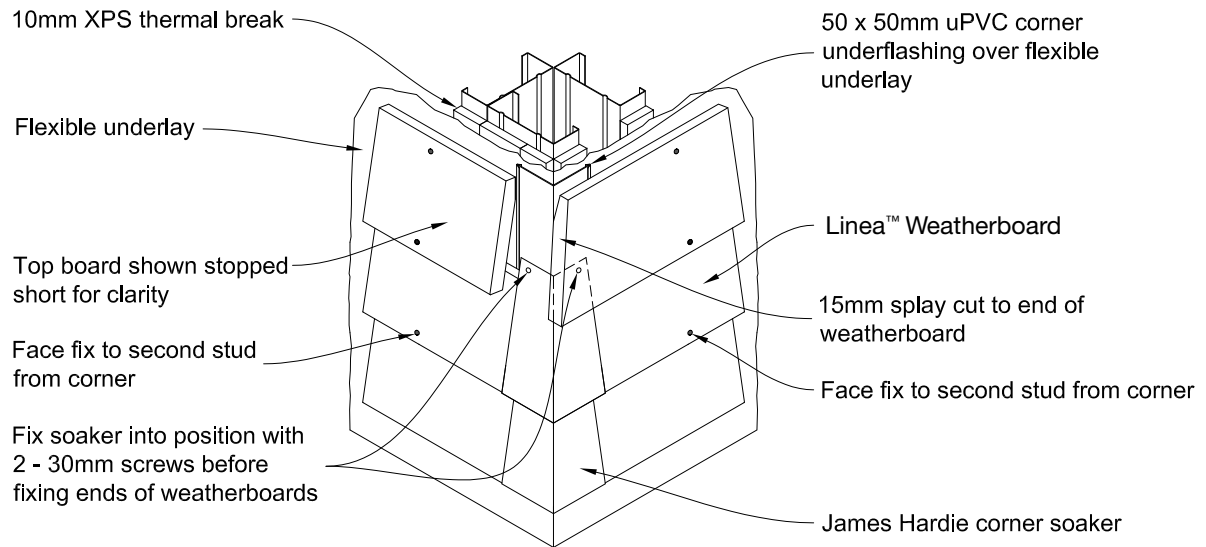


Figure 5: External corner soaker



Soaker material	Fixing material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised / Stainless steel
Stainless steel	Stainless steel

Figure 6: Internal scribed corner

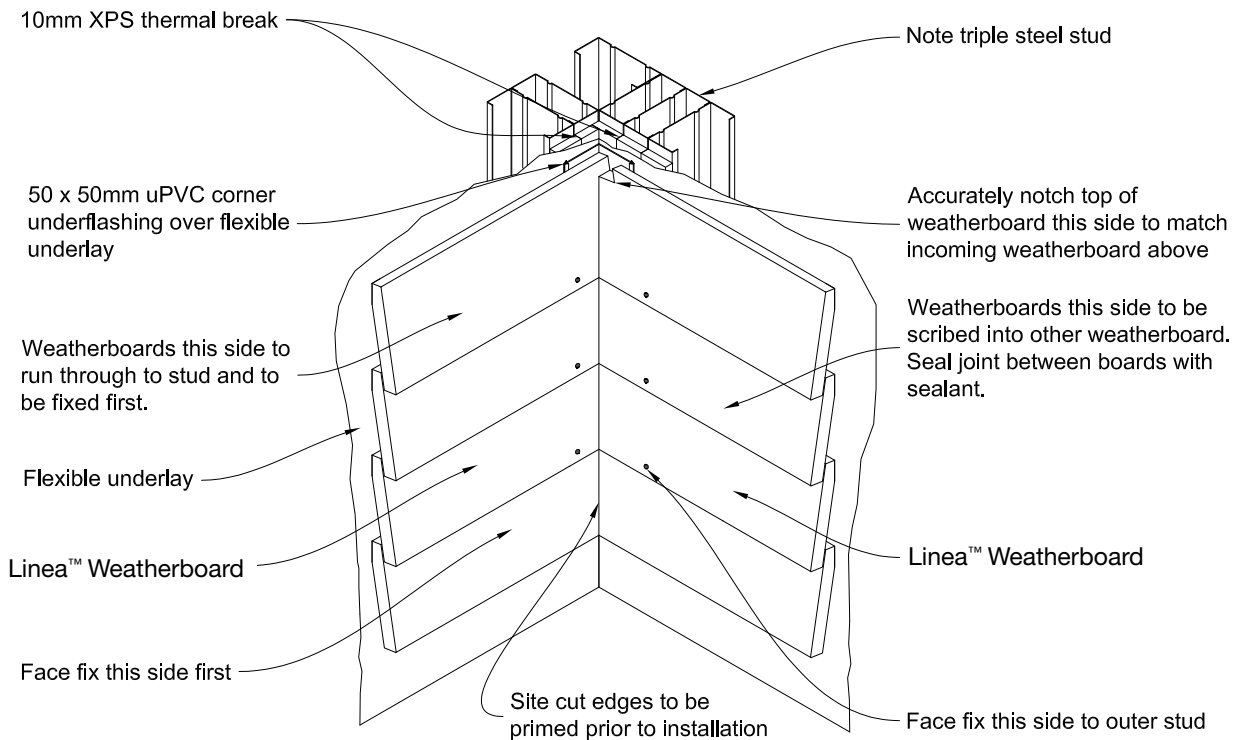


Figure 7: 135° internal corner

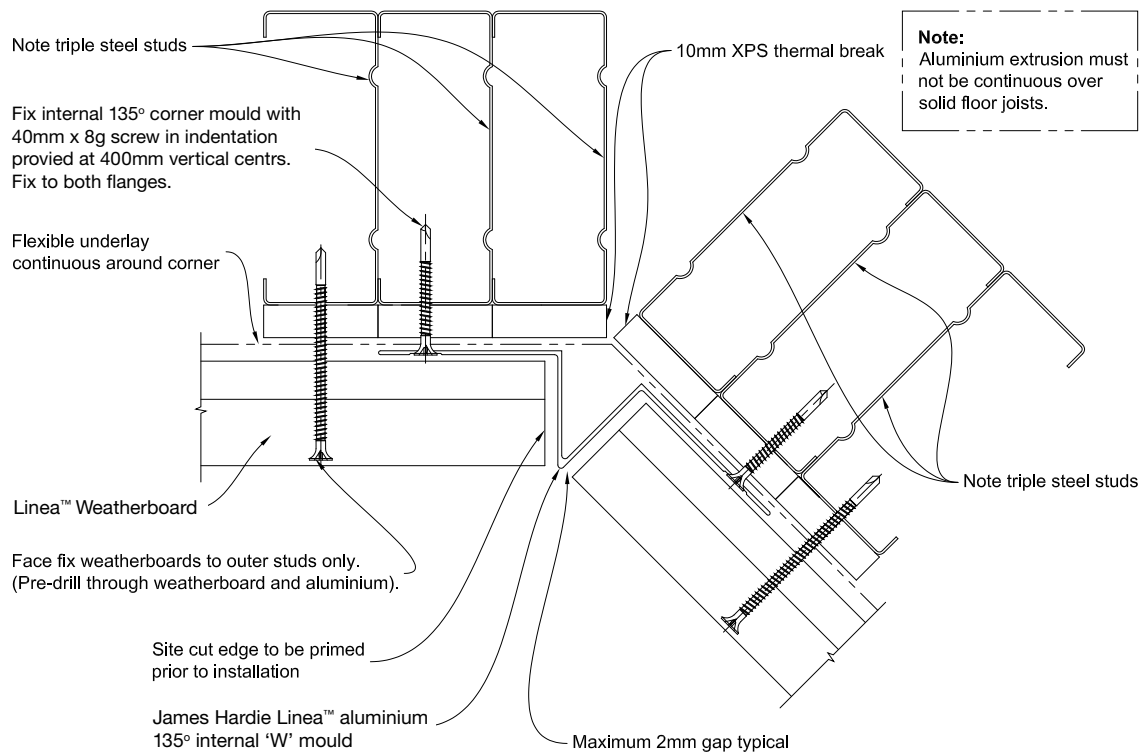


Figure 8: Internal W mould

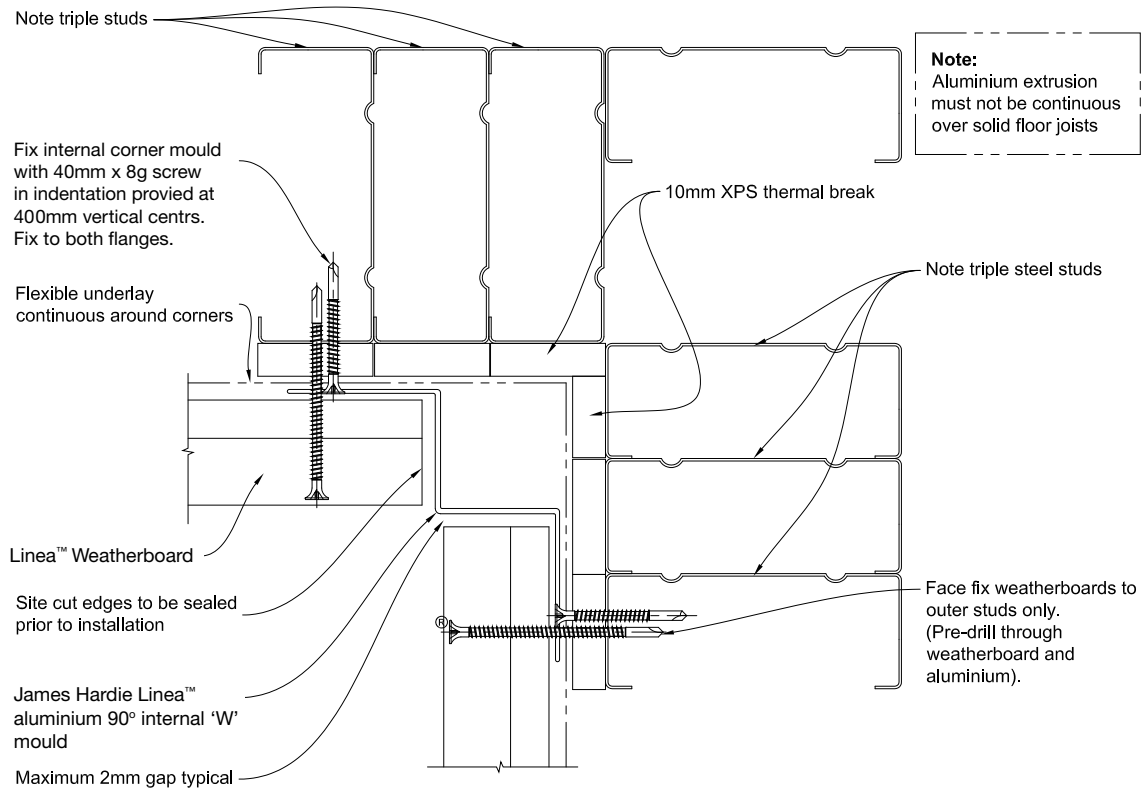
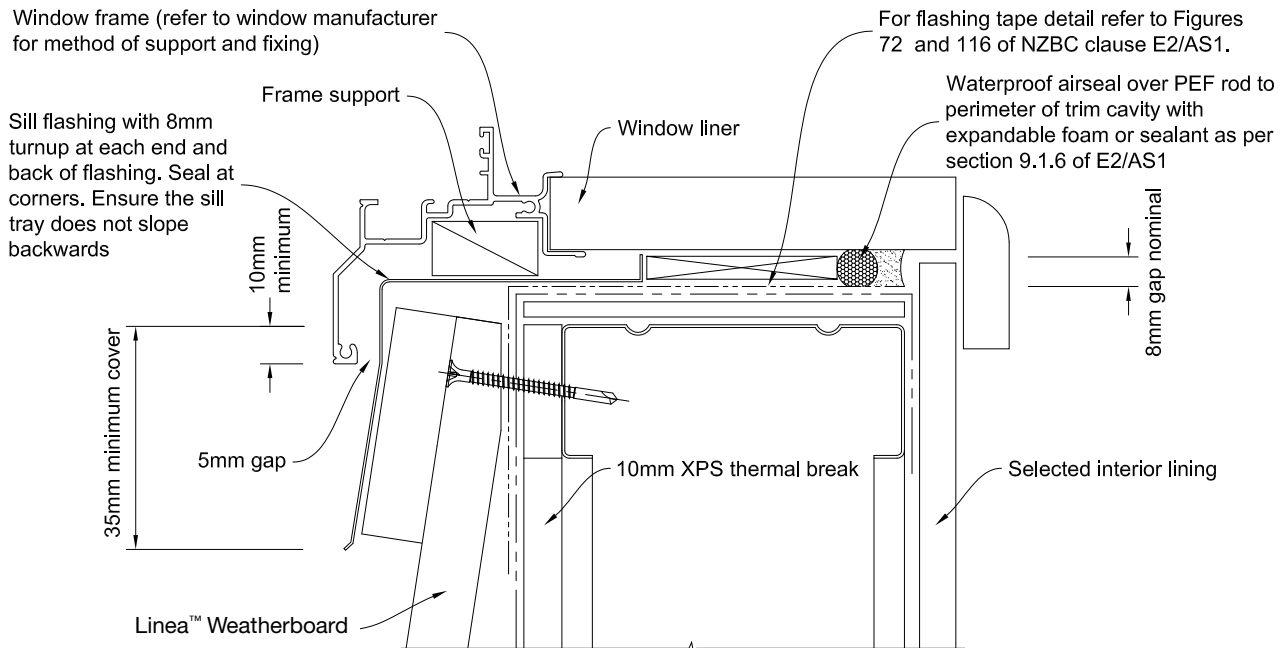


Figure 9: Window sill



General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC clause E2/AS1.
2. Building underlay must comply with acceptable solution NZBC clause E2/AS1.
3. Flashing tape must have proven compatibility with the selected flexible underlay and other materials with which it comes into contact.

Refer to the manufacturer or supplier for technical information for these materials.

Figure 10: Window head

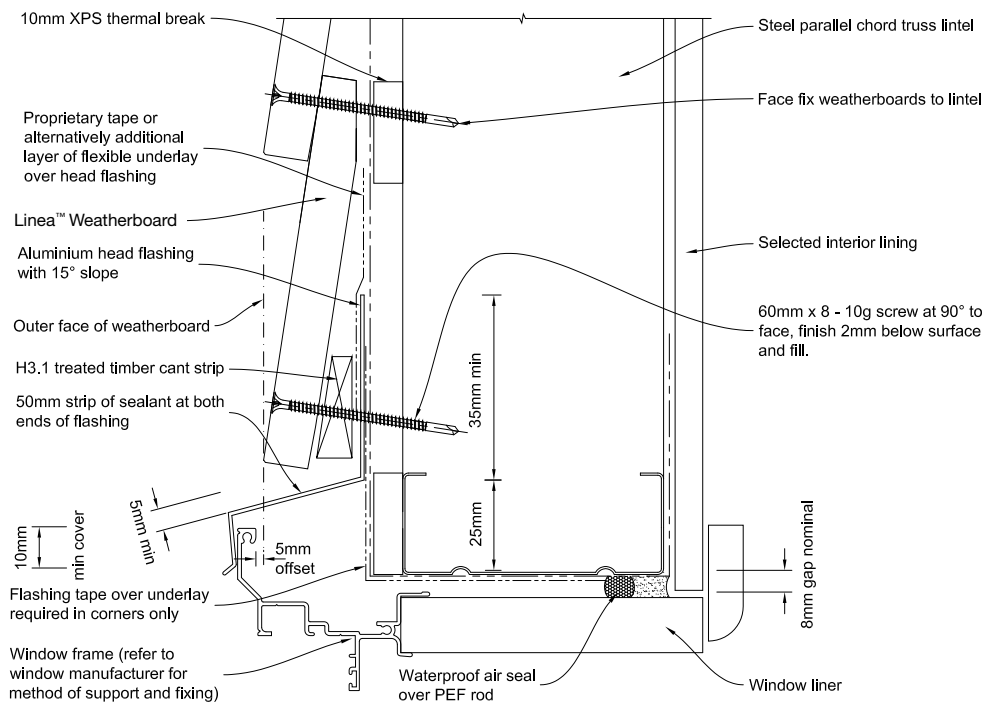


Figure 11: Window jamb

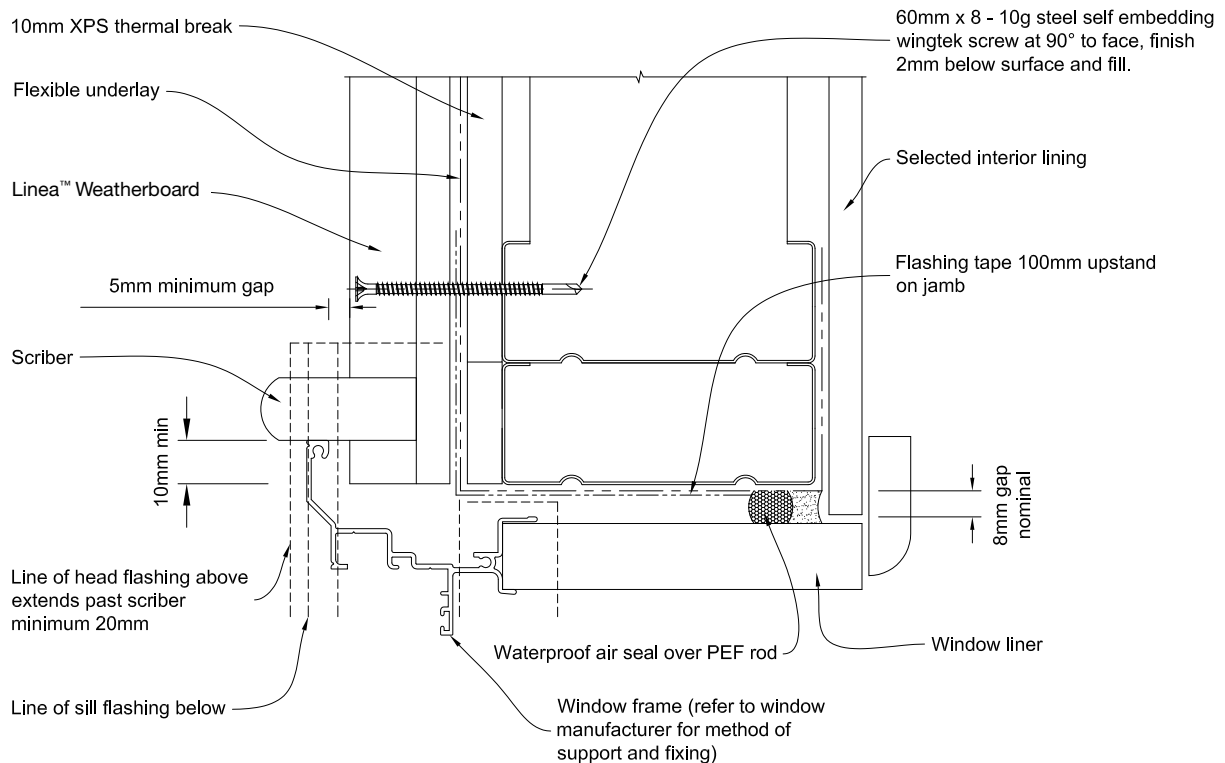


Figure 12: Window head

Note: Accurate slot to be cut in weatherboard to enable fit around head flashing. Prevent moisture ingress at end of slot by sealing gap.

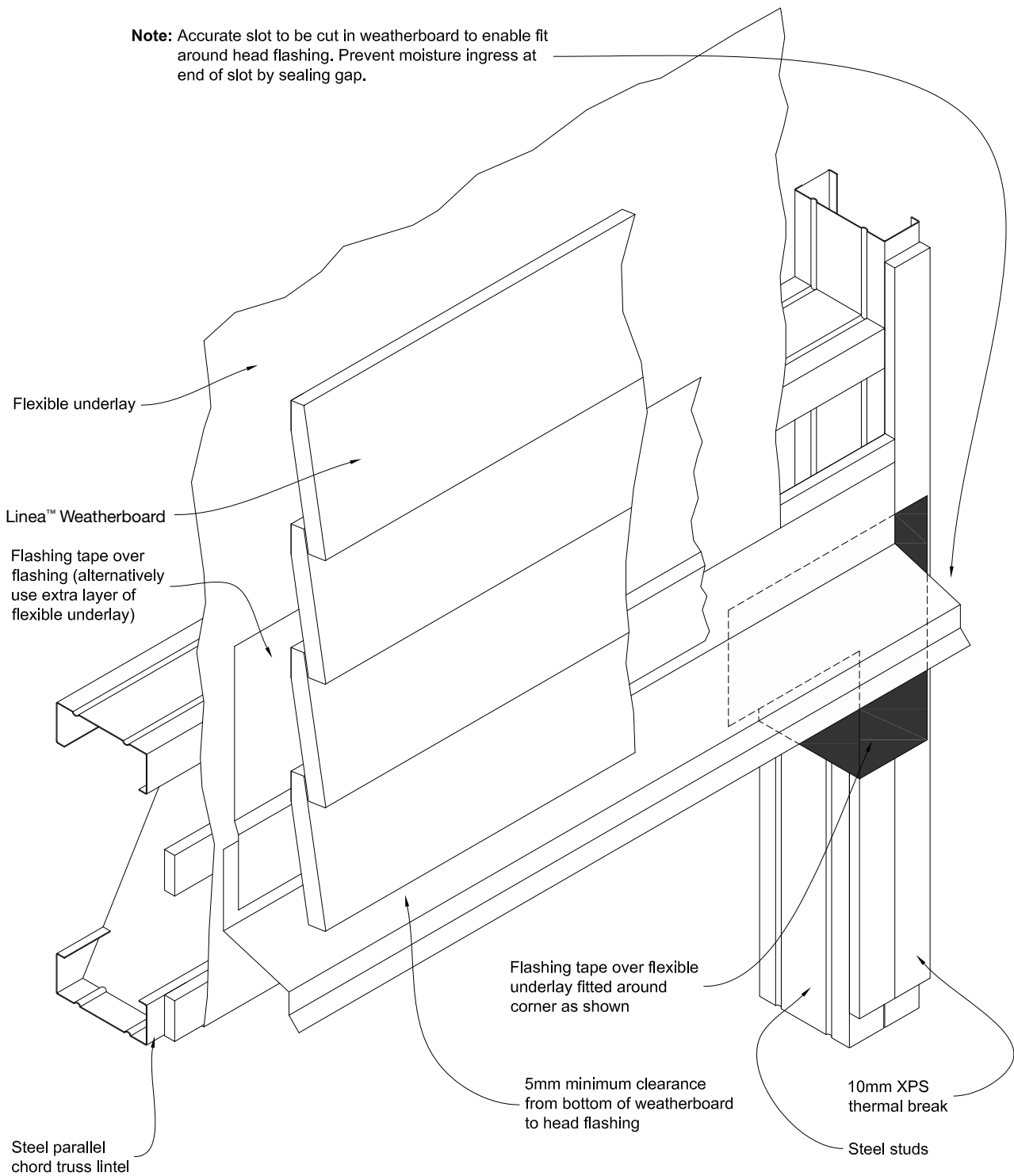


Figure 13: Metre box head

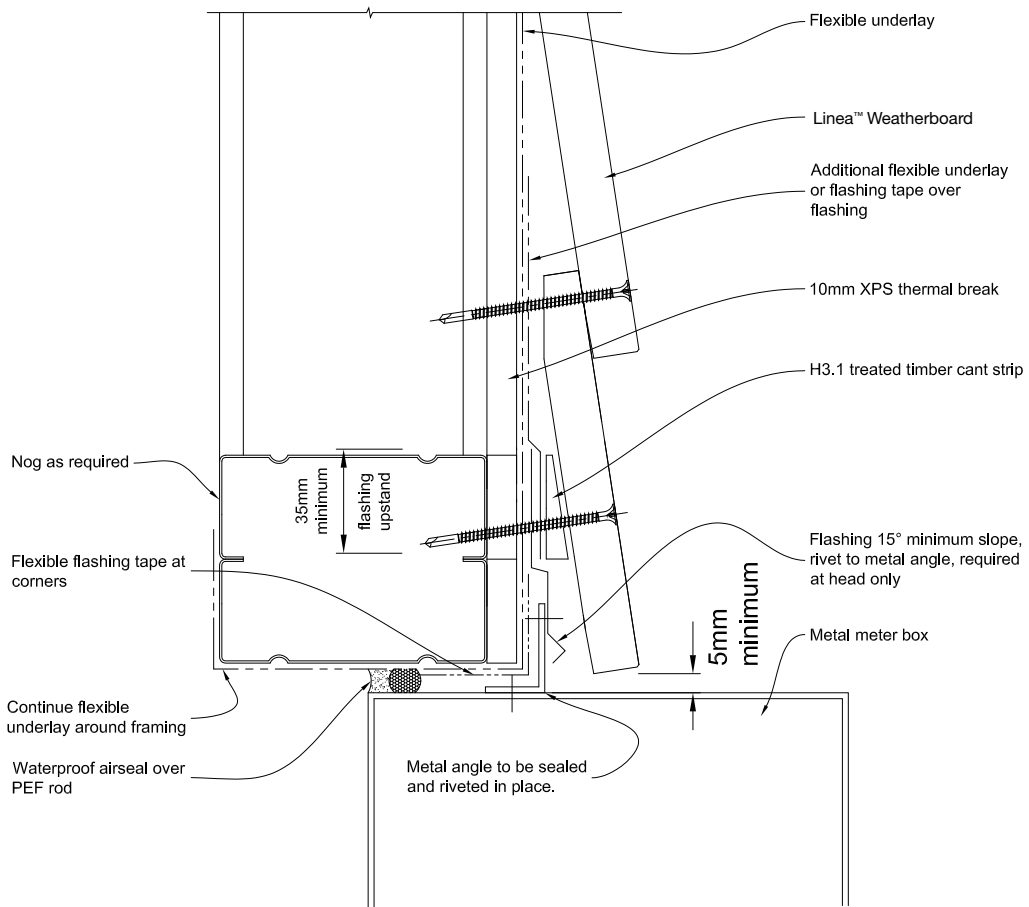


Figure 14: Metre box sill

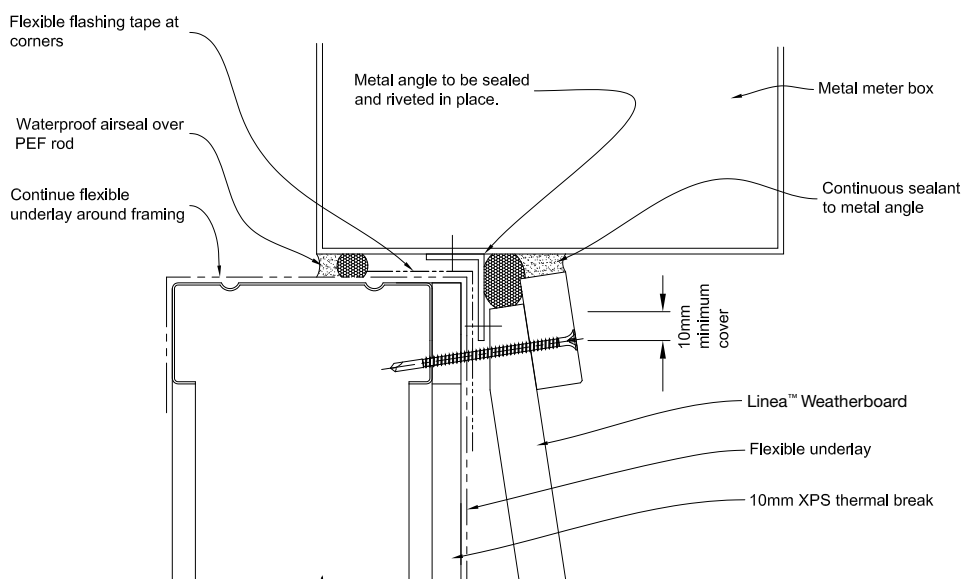


Figure 15: Metre box jamb

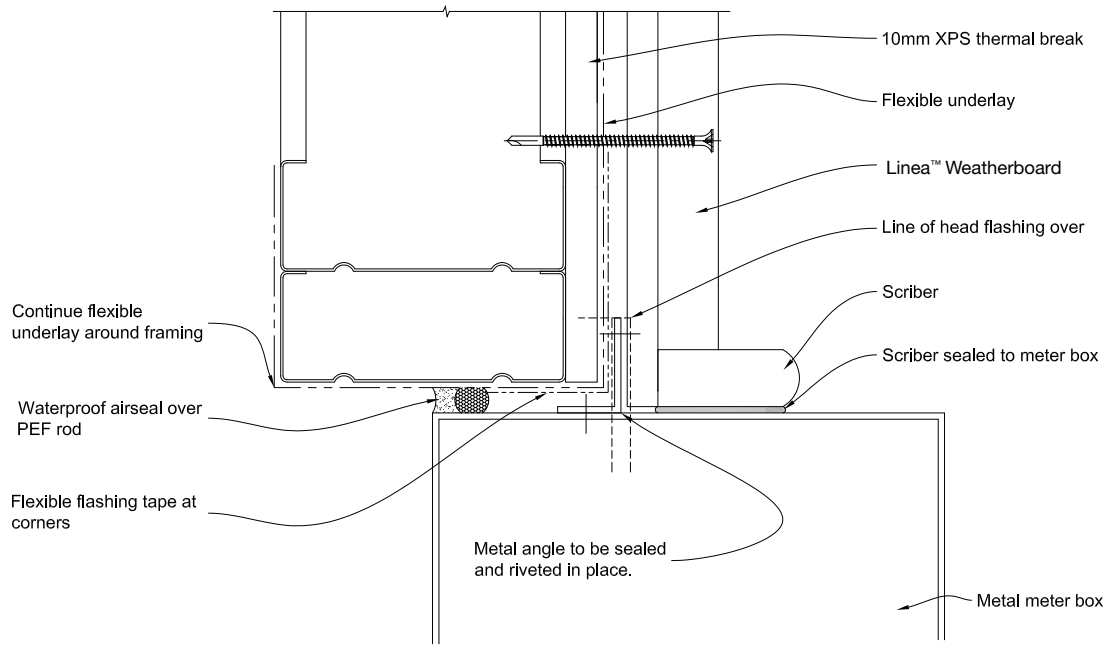


Figure 16: Foundation and soffit

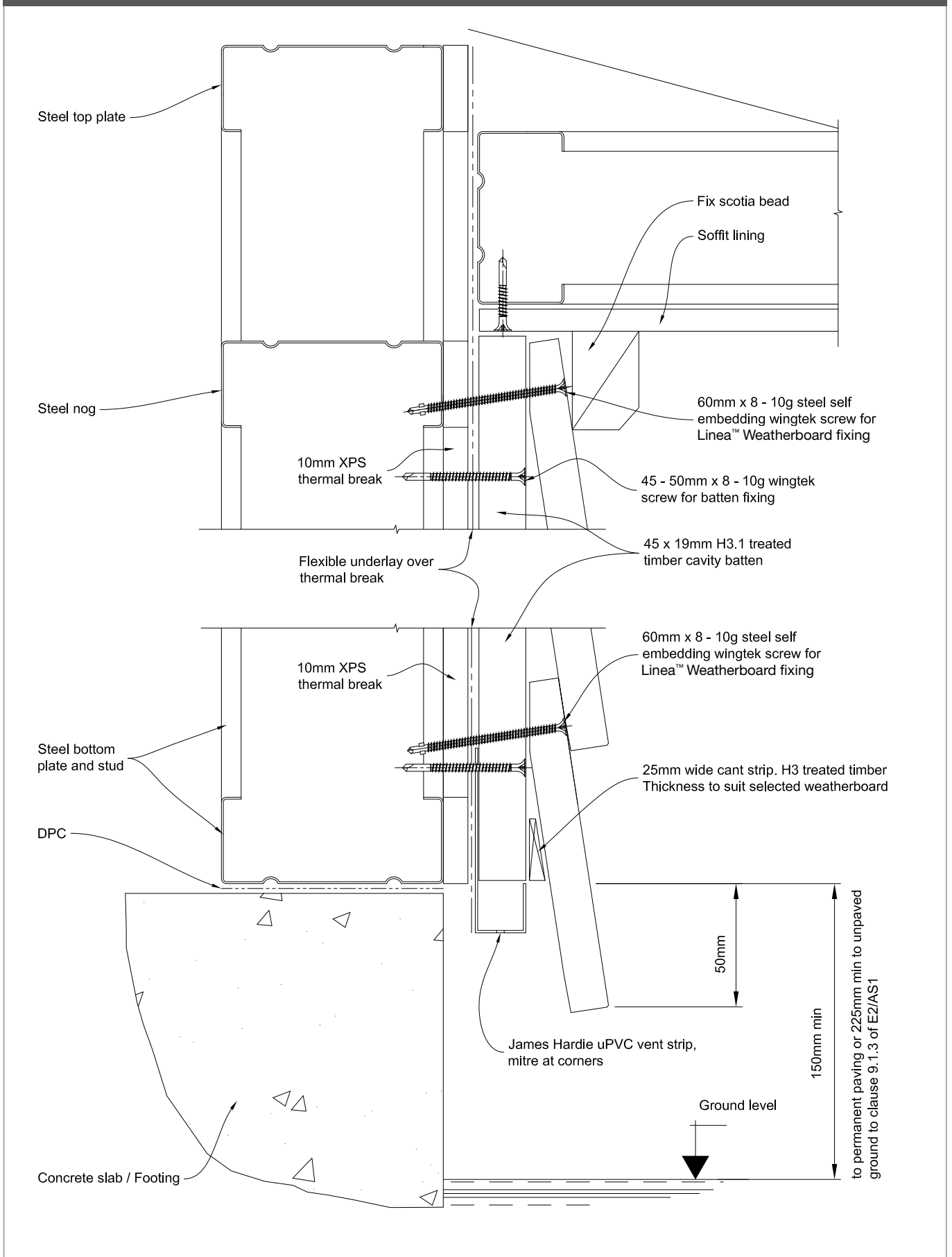


Figure 17: Weatherboard fixing

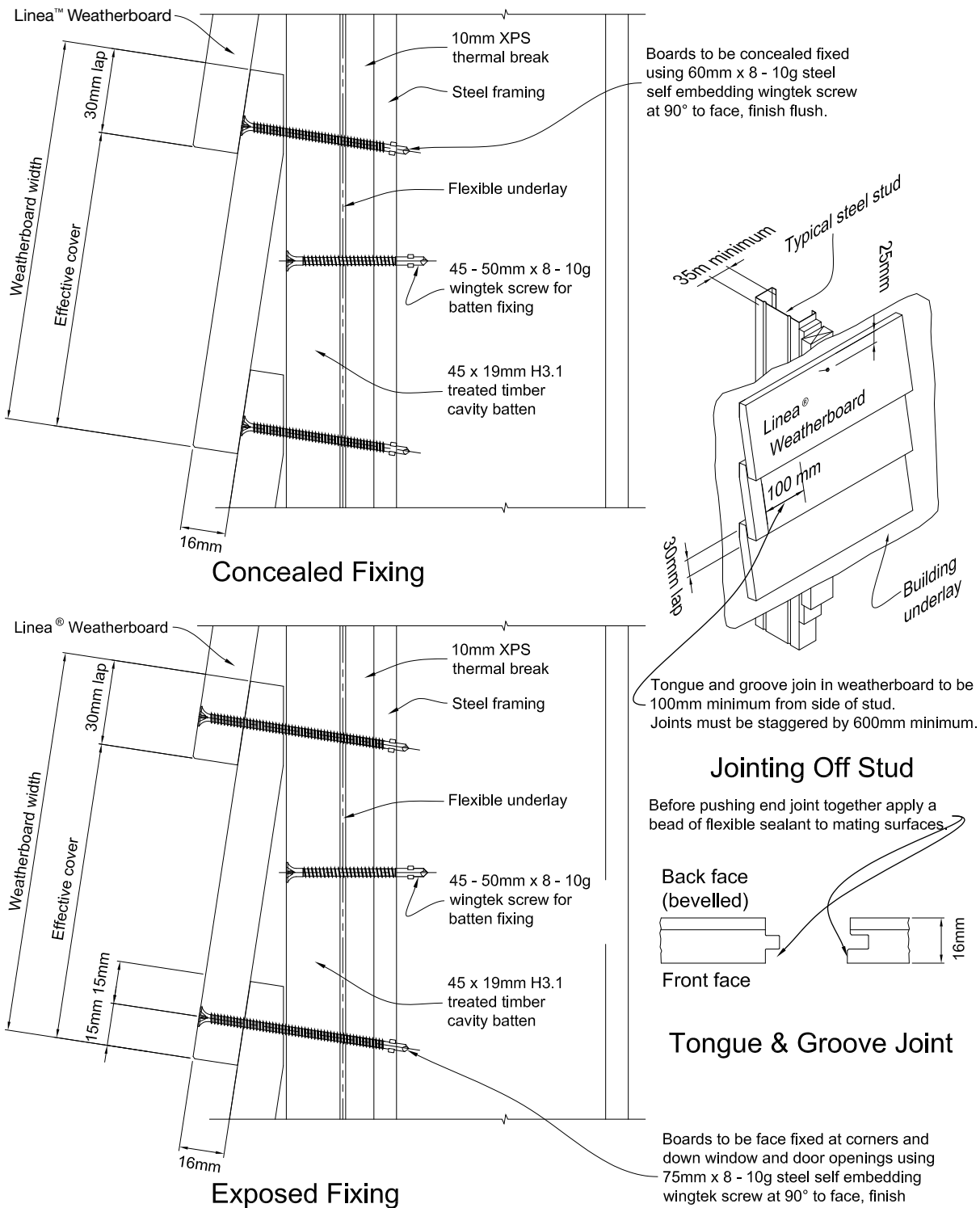


Figure 18: External mitre corner

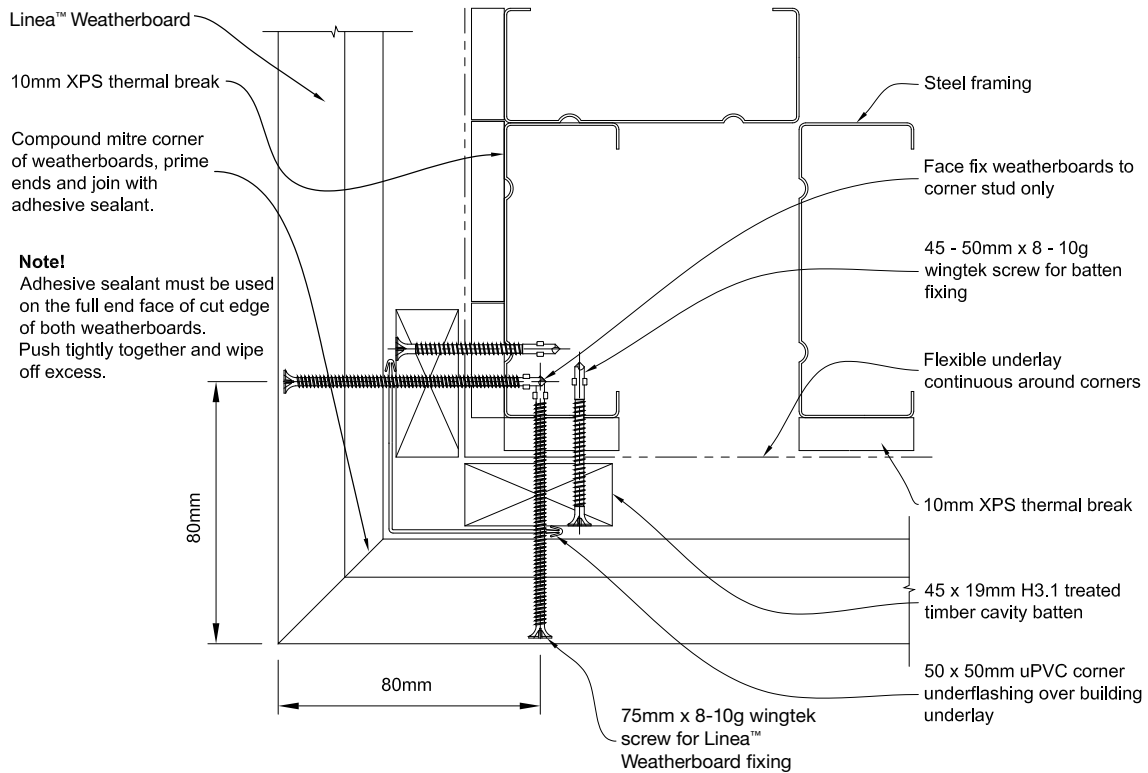


Figure 19: Aluminum box corner

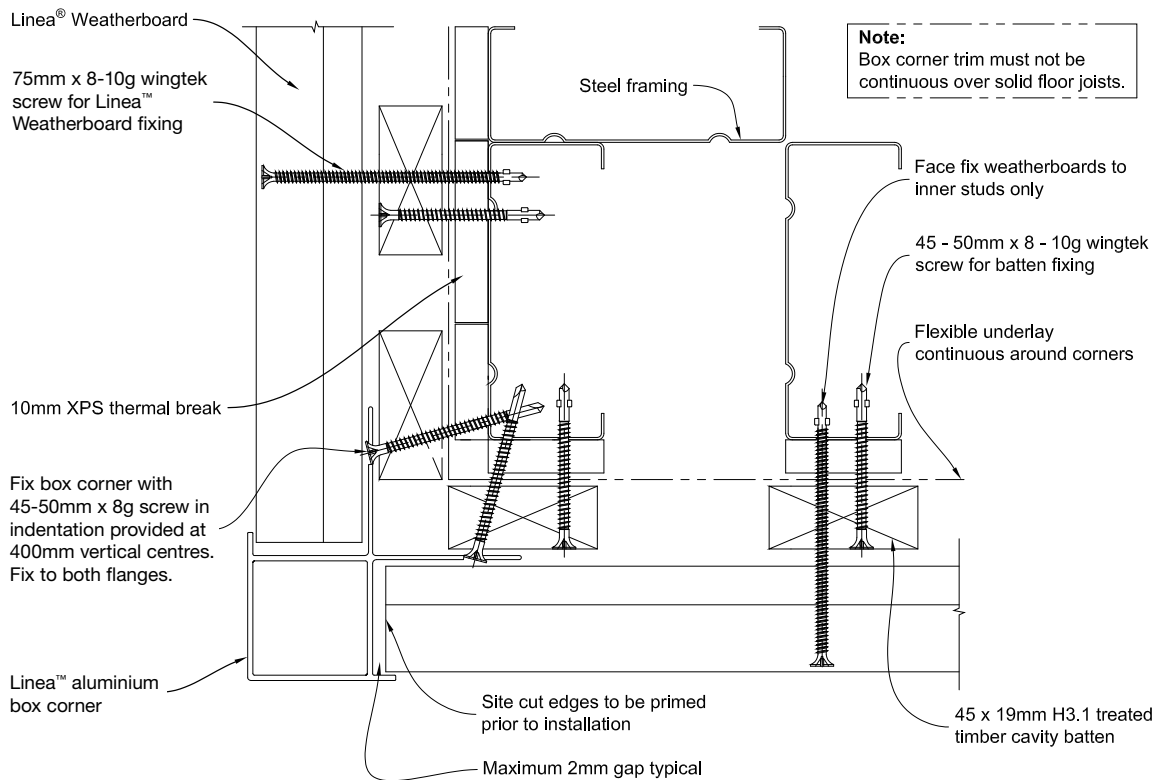
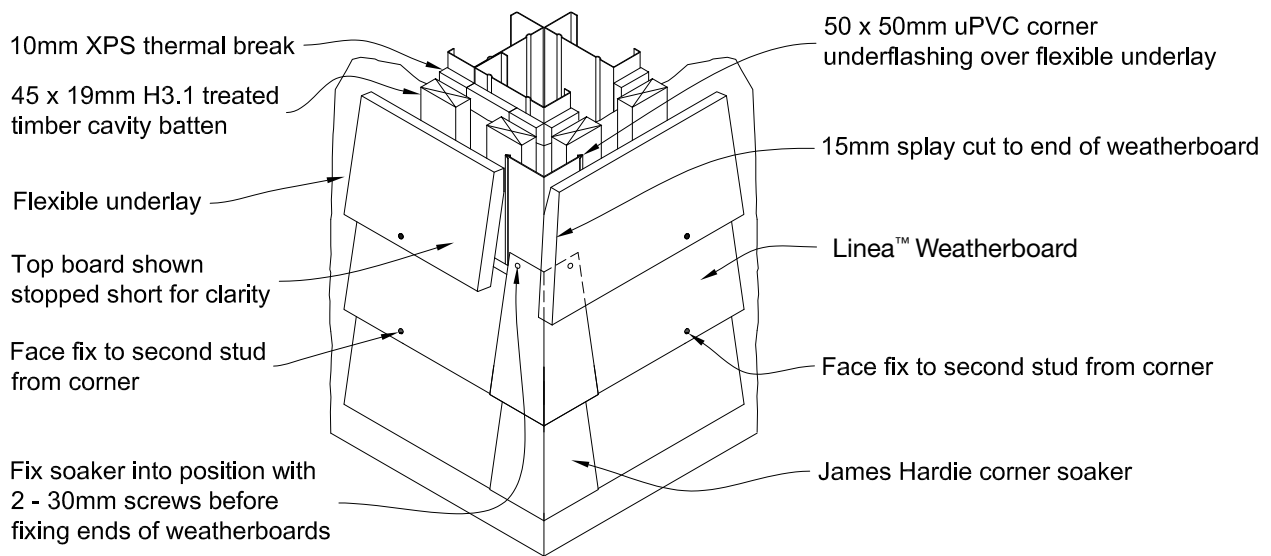


Figure 20: External corner soaker



Soaker material	Fixing material
Copper	Copper or phosphor bronze
Aluminium	Hot dip galvanised / Stainless steel
Stainless steel	Stainless steel

Figure 21: Internal scribed corner

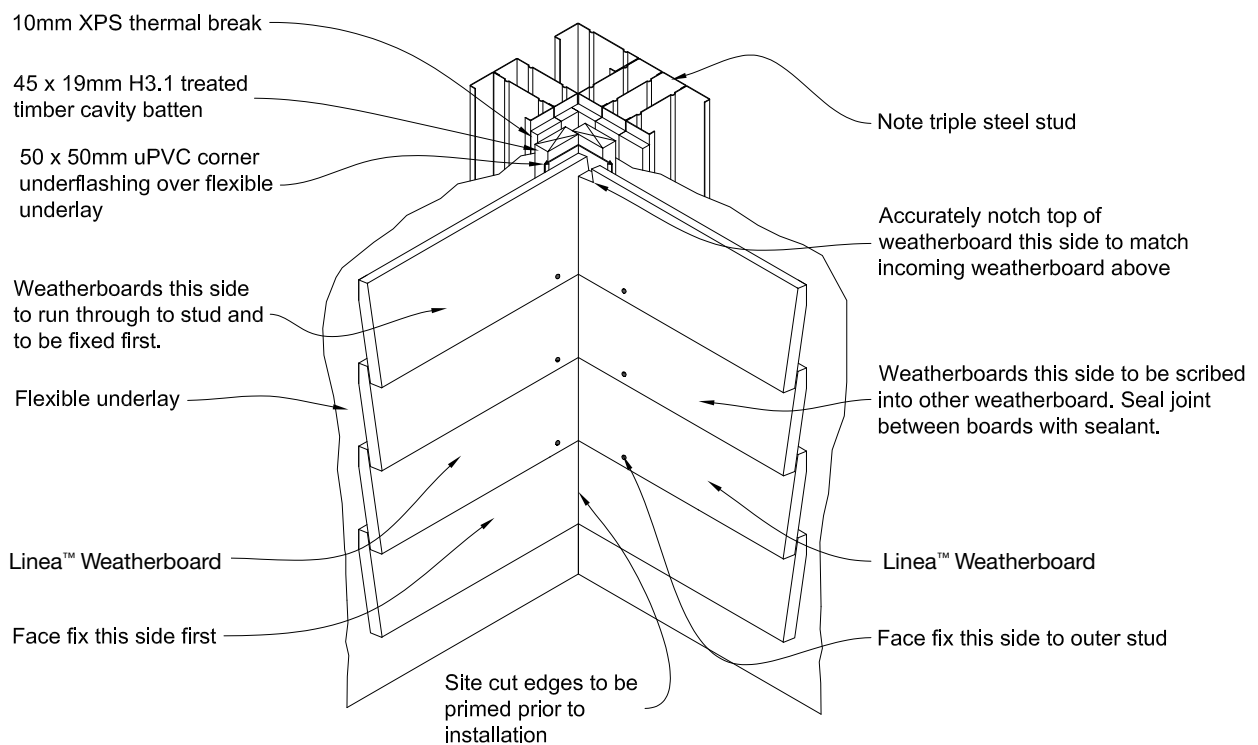


Figure 22: 135° internal corner

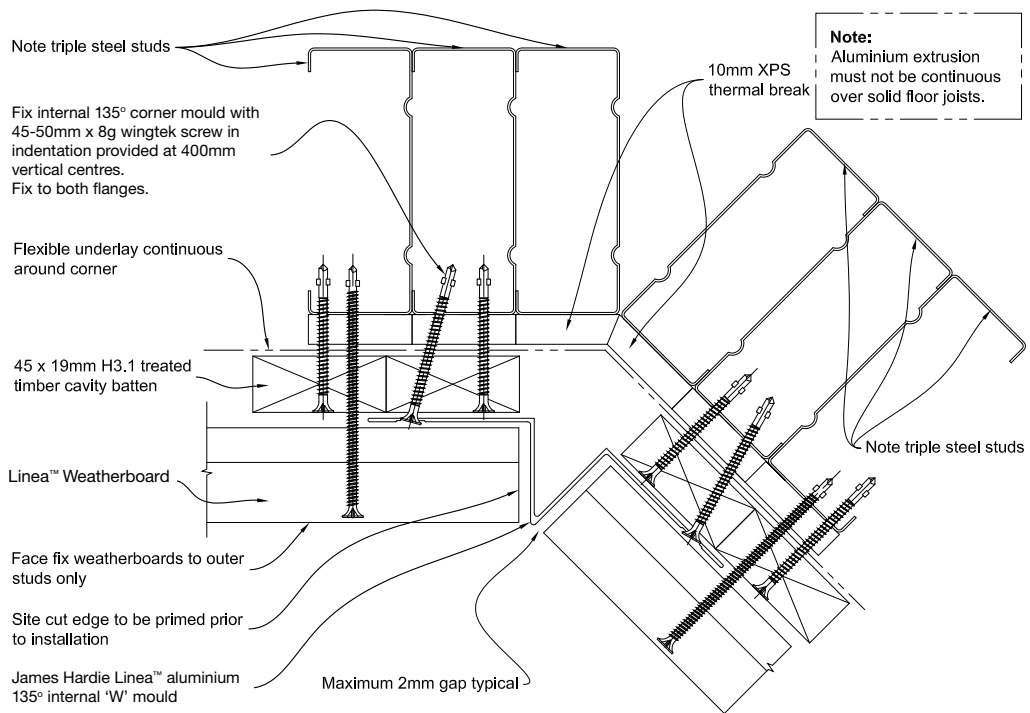


Figure 23: Internal W mould

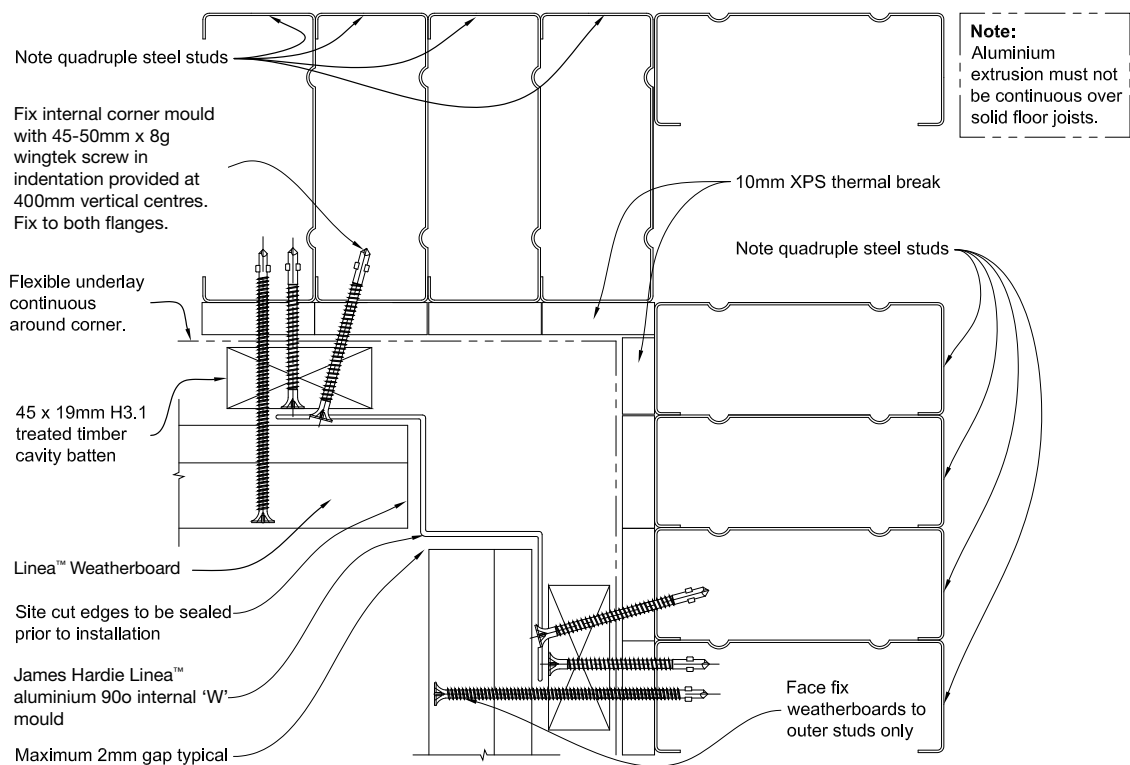
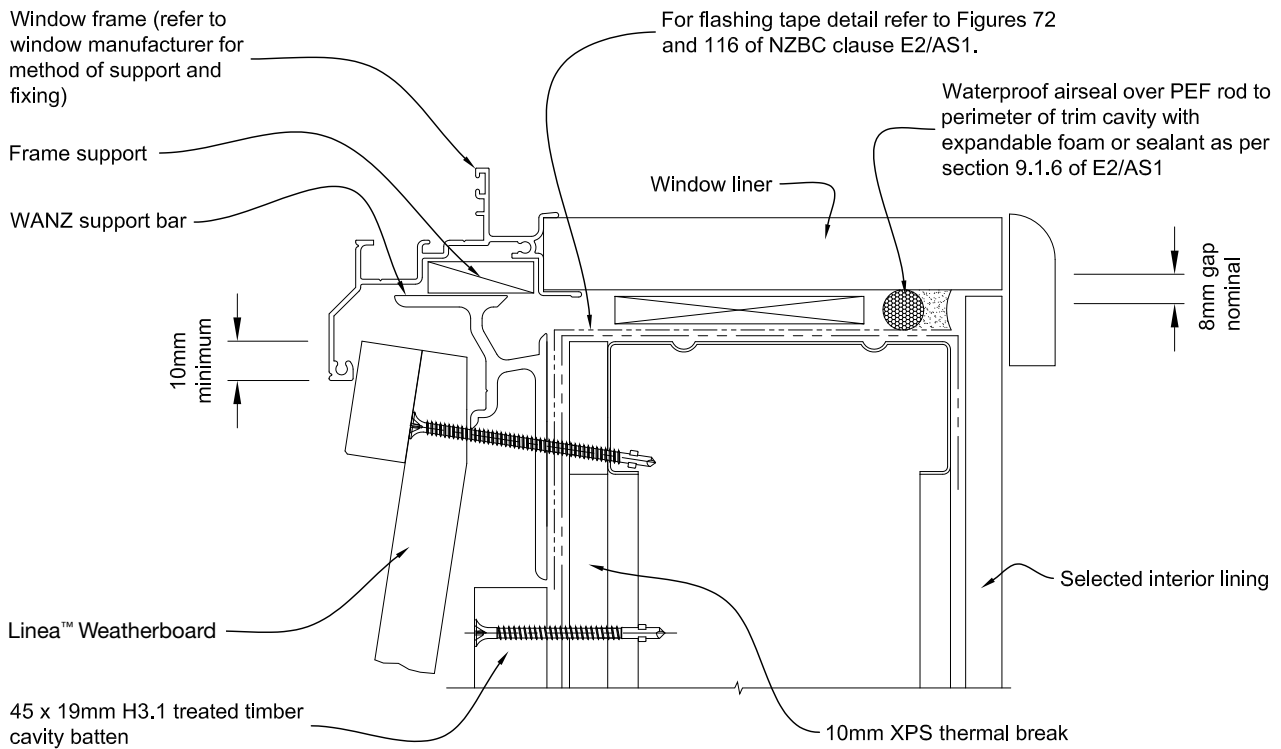


Figure 24: Window sill



General notes for materials selection

1. Flashing materials must be selected based on environmental exposure, refer to NZS 3604 and Table 20 of NZBC clause E2/AS1.
2. Flexible underlay must comply with acceptable solution NZBC clause E2/AS.
3. Flashing tape must have proven compatibility with the selected building underlay and other materials with which it comes into contact.

Refer to the manufacturer or supplier for technical information for these materials.

Figure 25: Window head

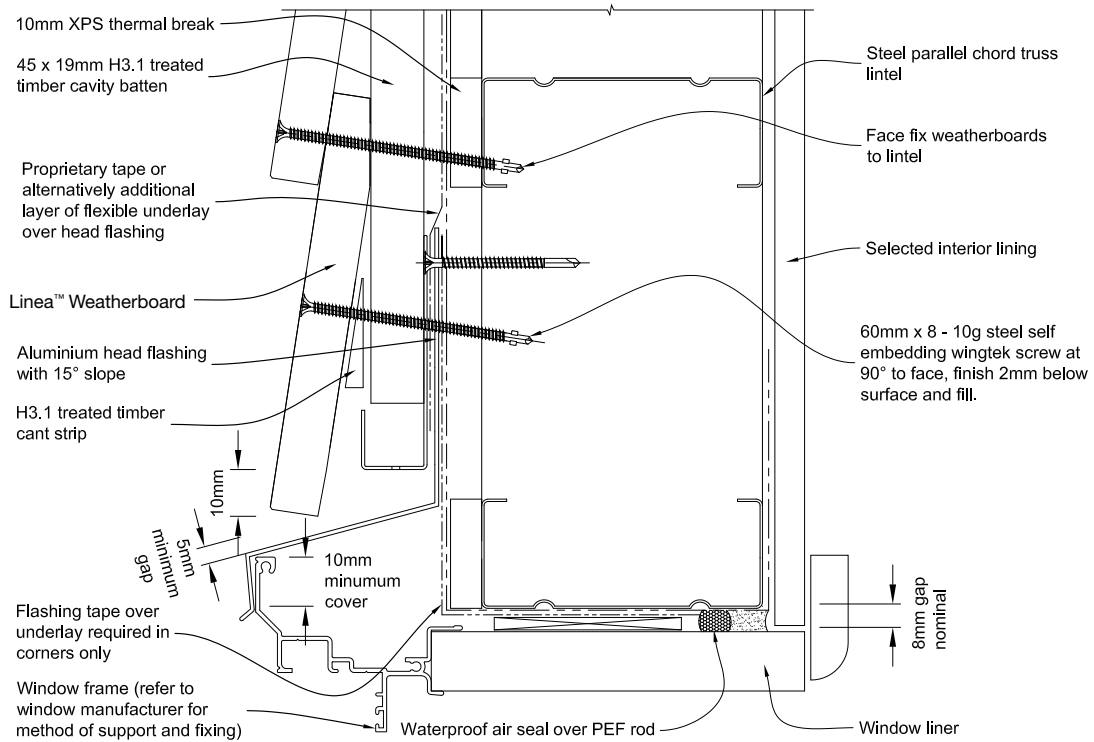


Figure 26: Window jamb

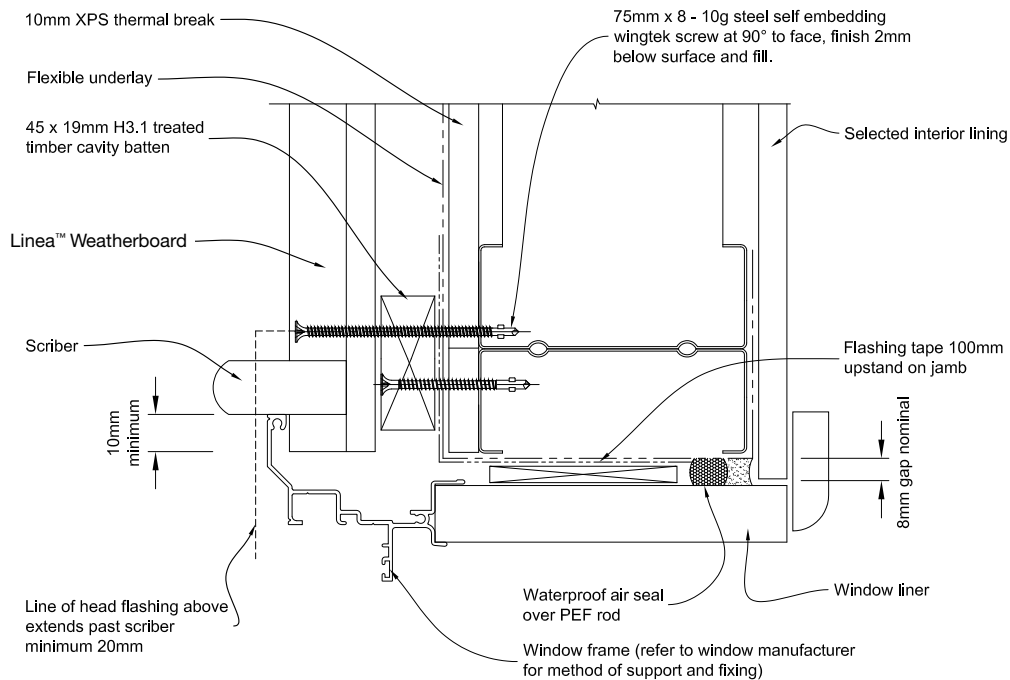


Figure 27: Window head

Note: Accurate slot to be cut in weatherboard to enable fit around head flashing. Prevent moisture ingress at end of slot by sealing gap.

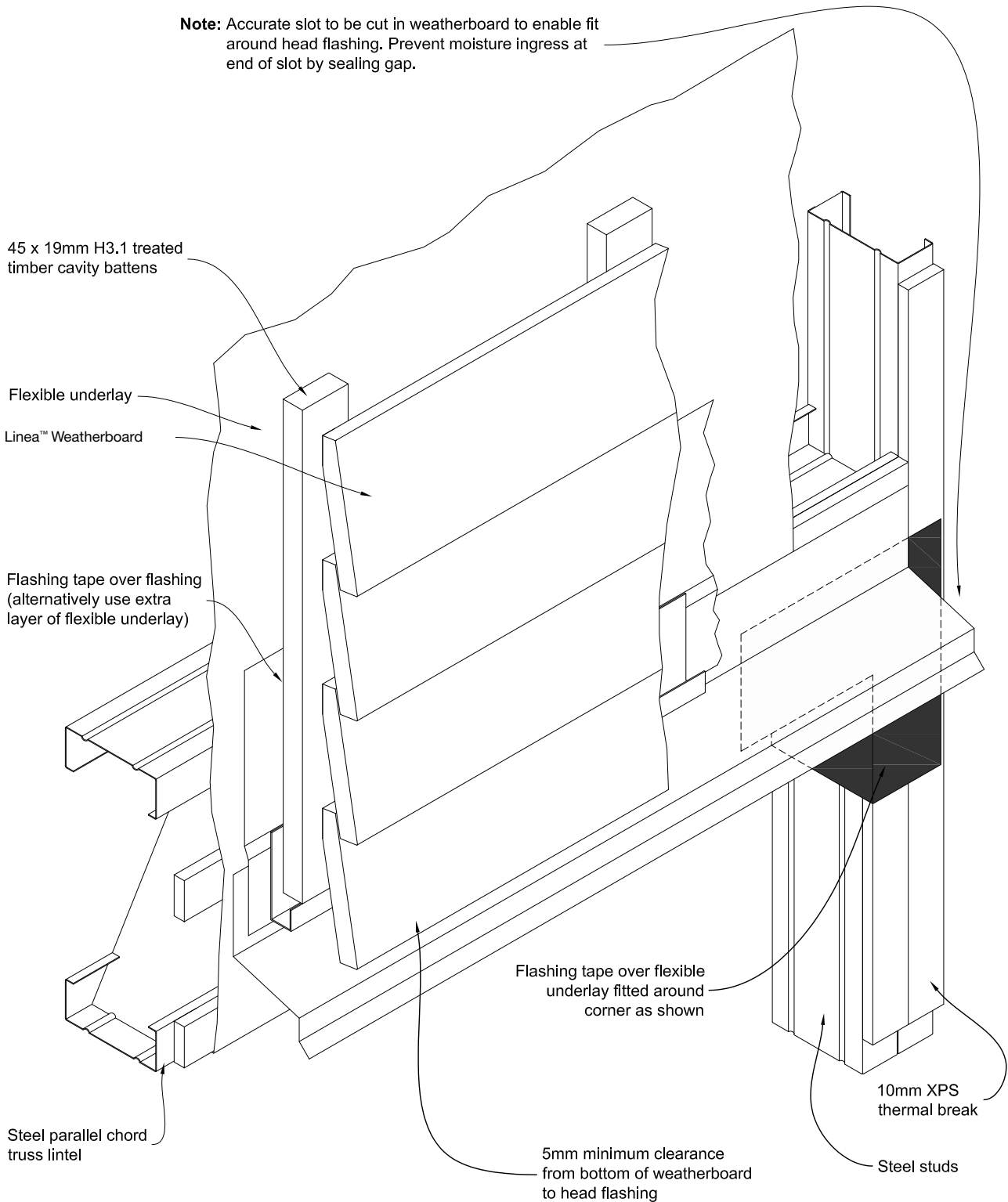


Figure 28: Metre box head

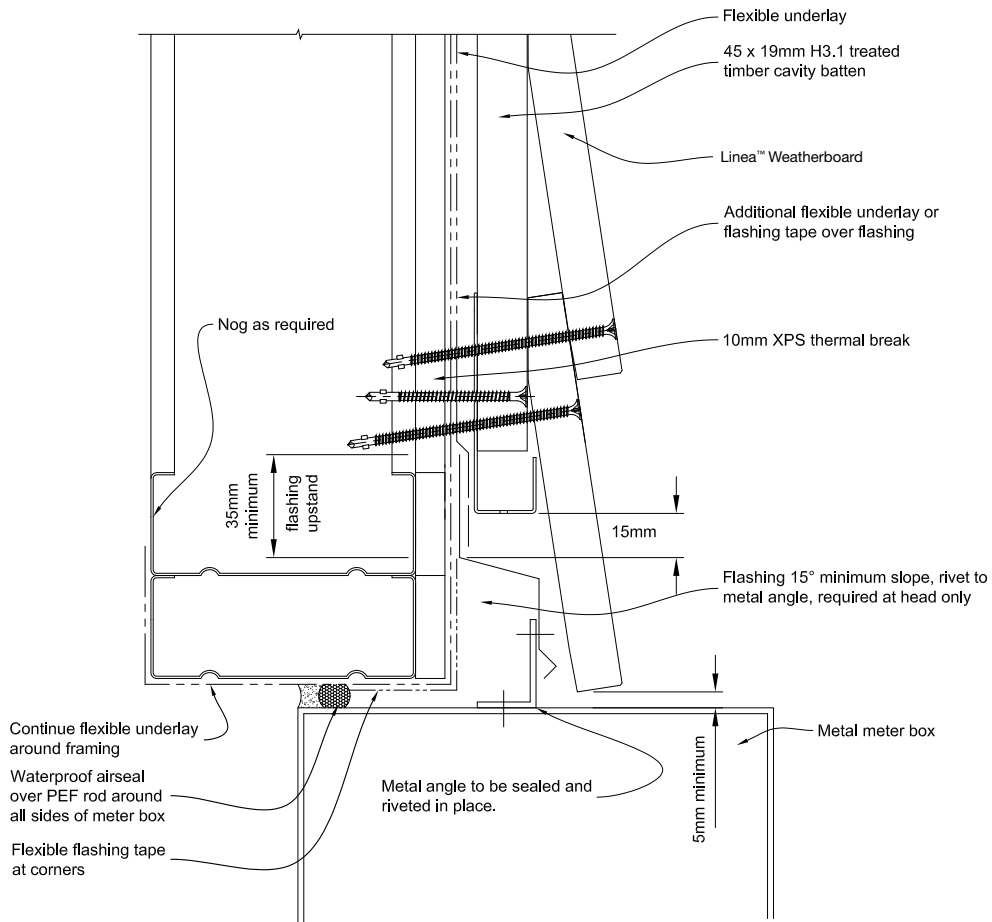


Figure 29: Metre box sill

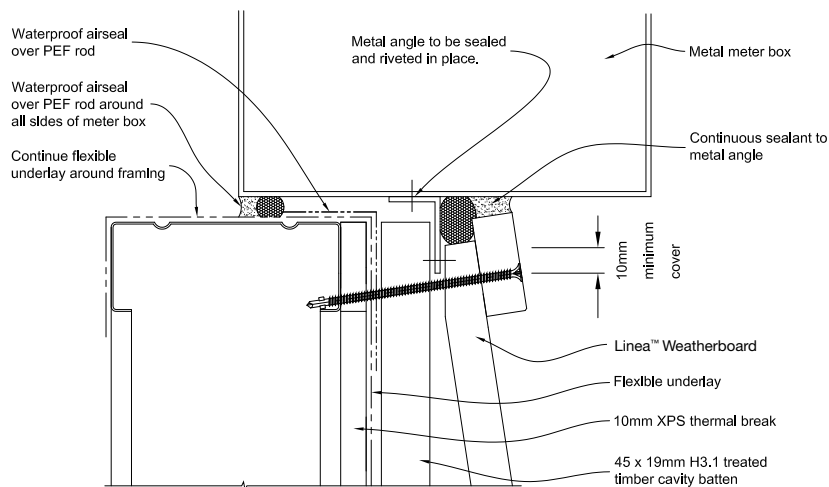


Figure 30: Metre box jamb

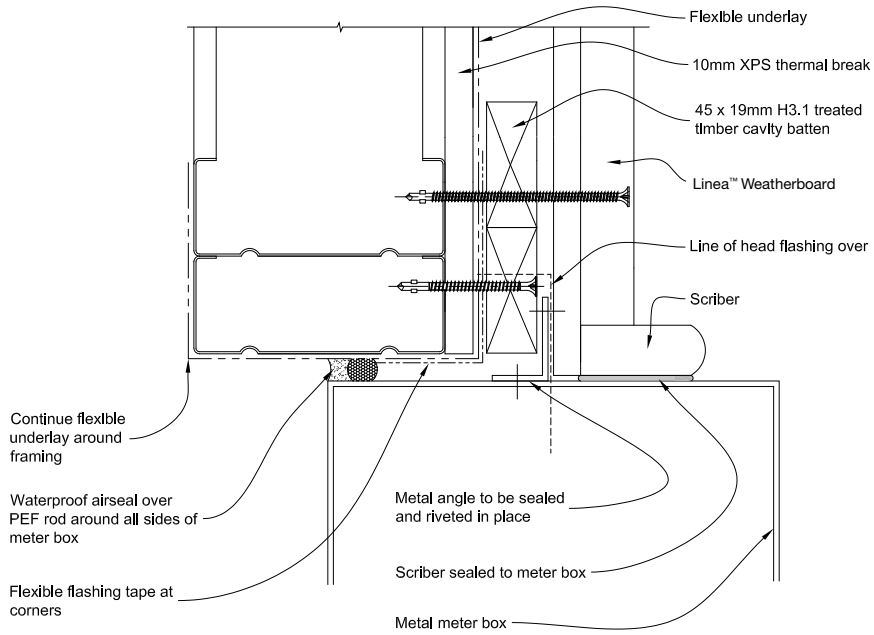


Figure 31: Apron flashing

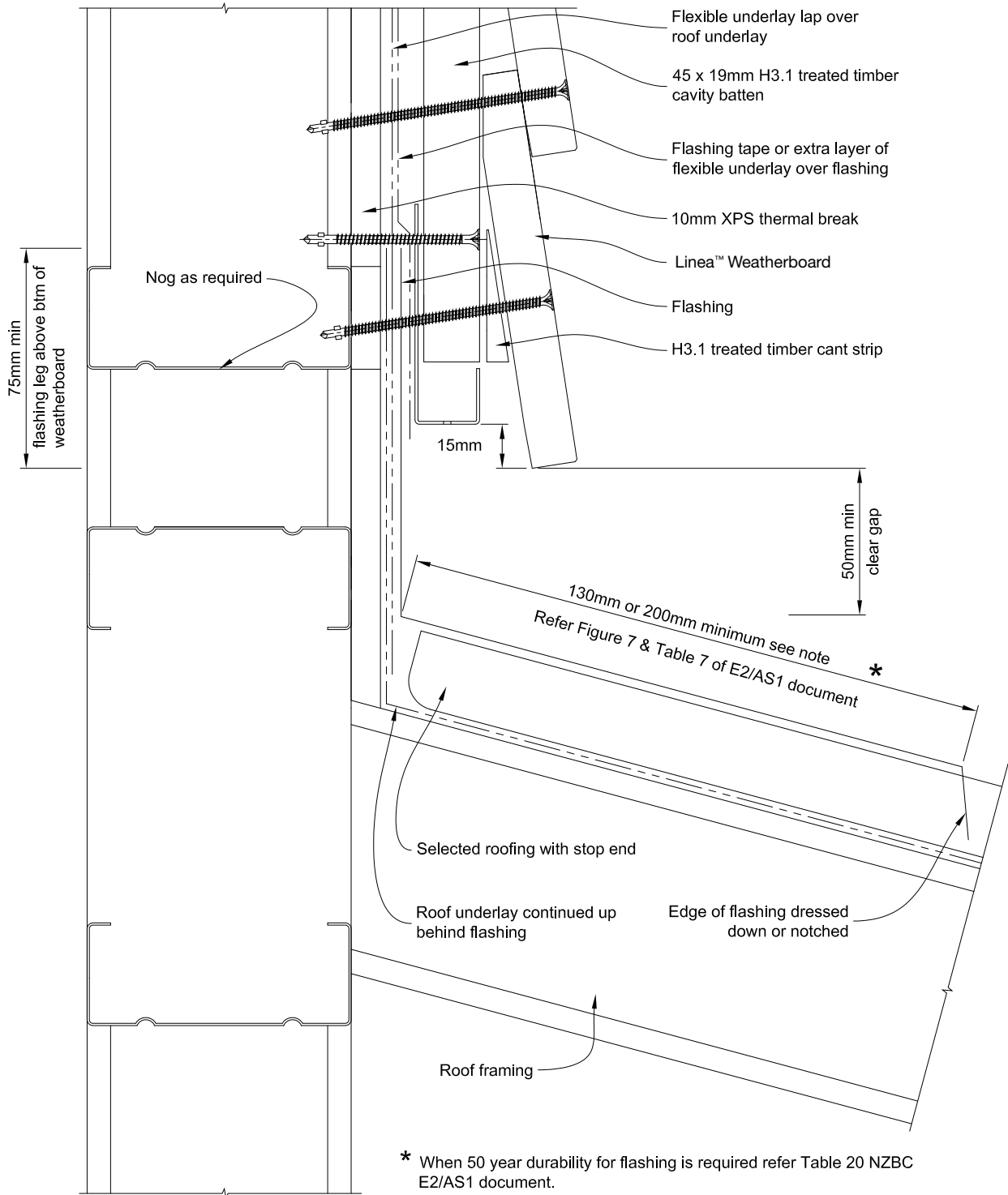


Figure 32: Pipe foundation

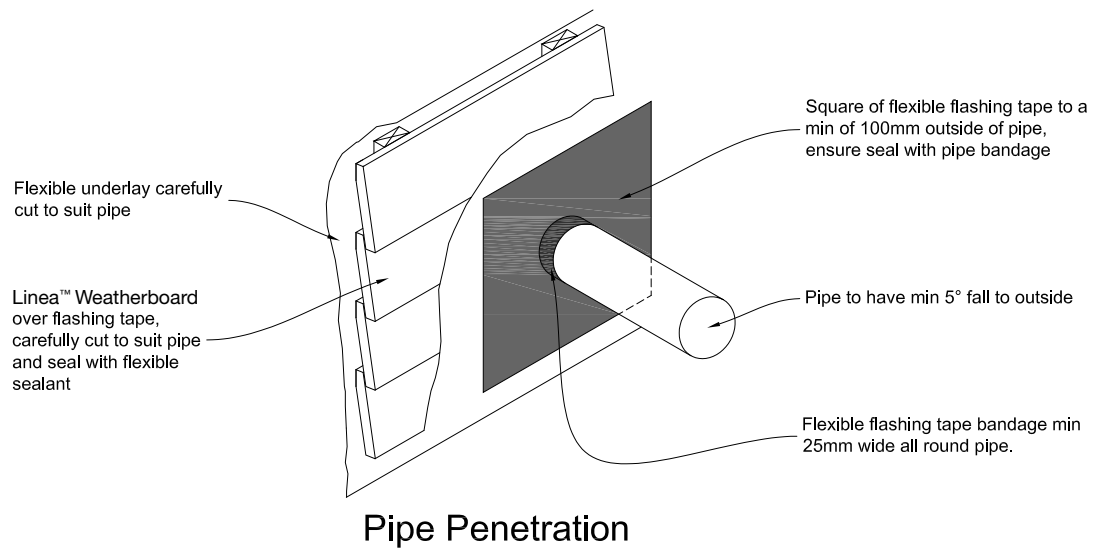


Figure 33: Titan™ Facade Panel / Axon™ Panel Framing setout

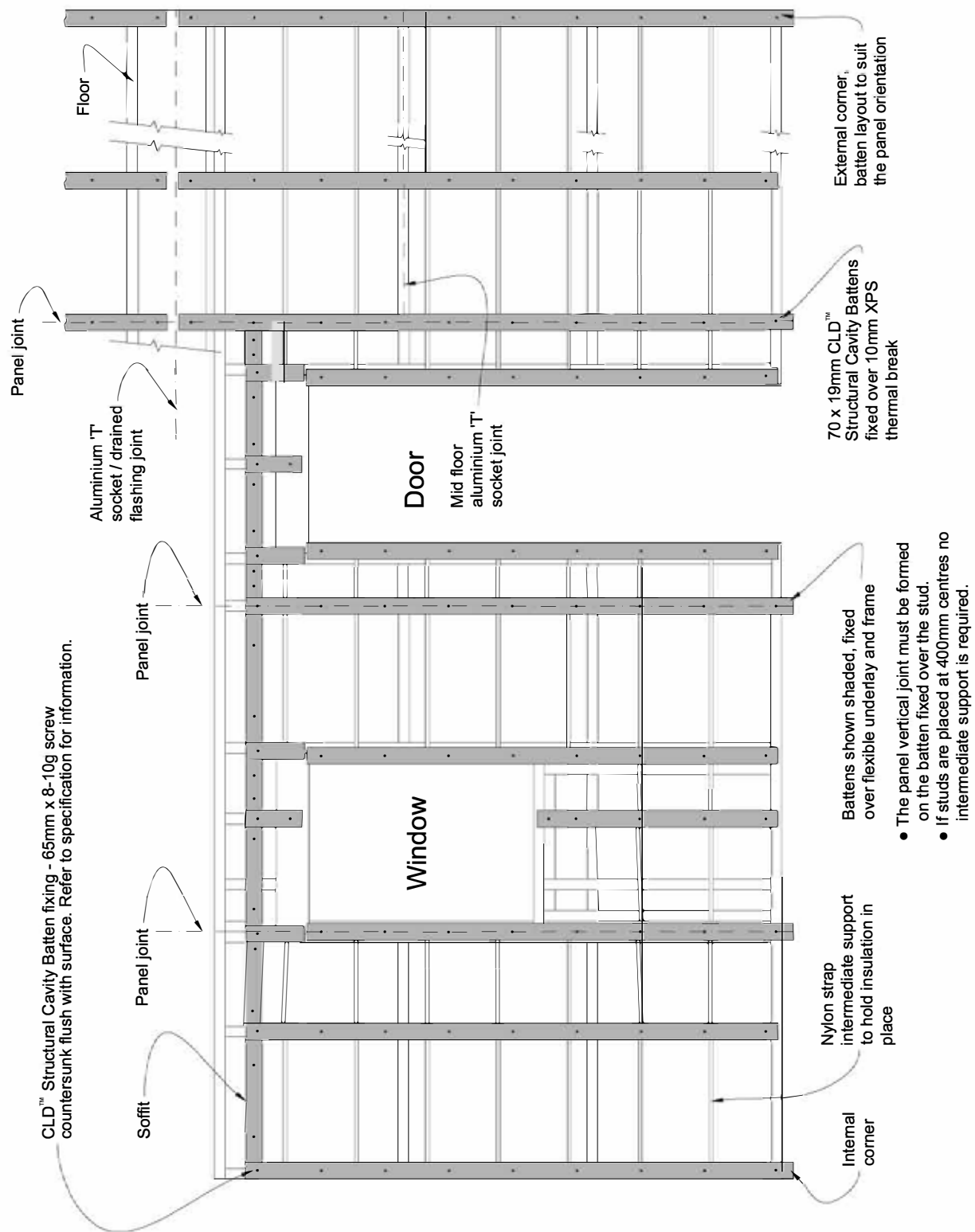
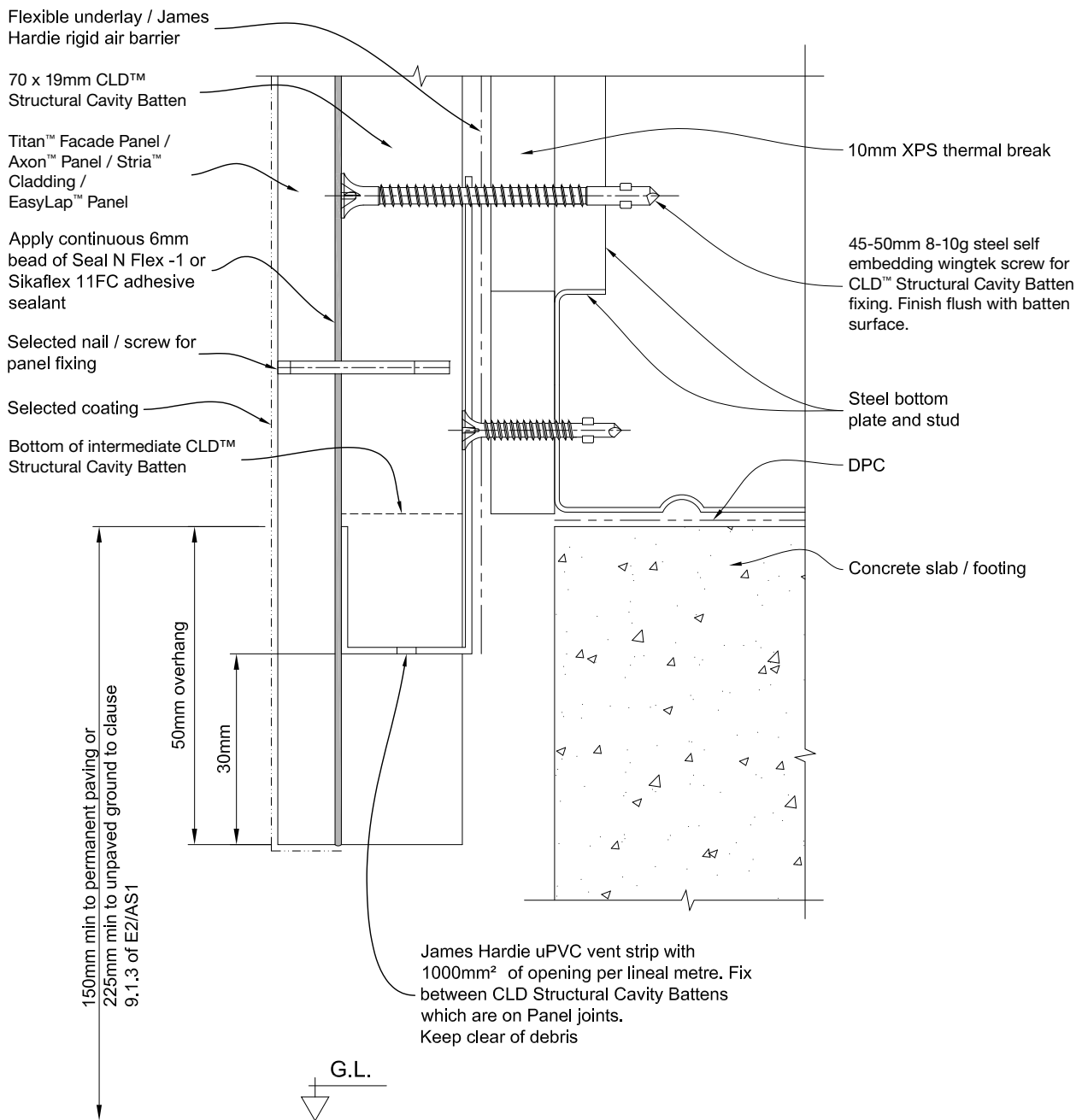


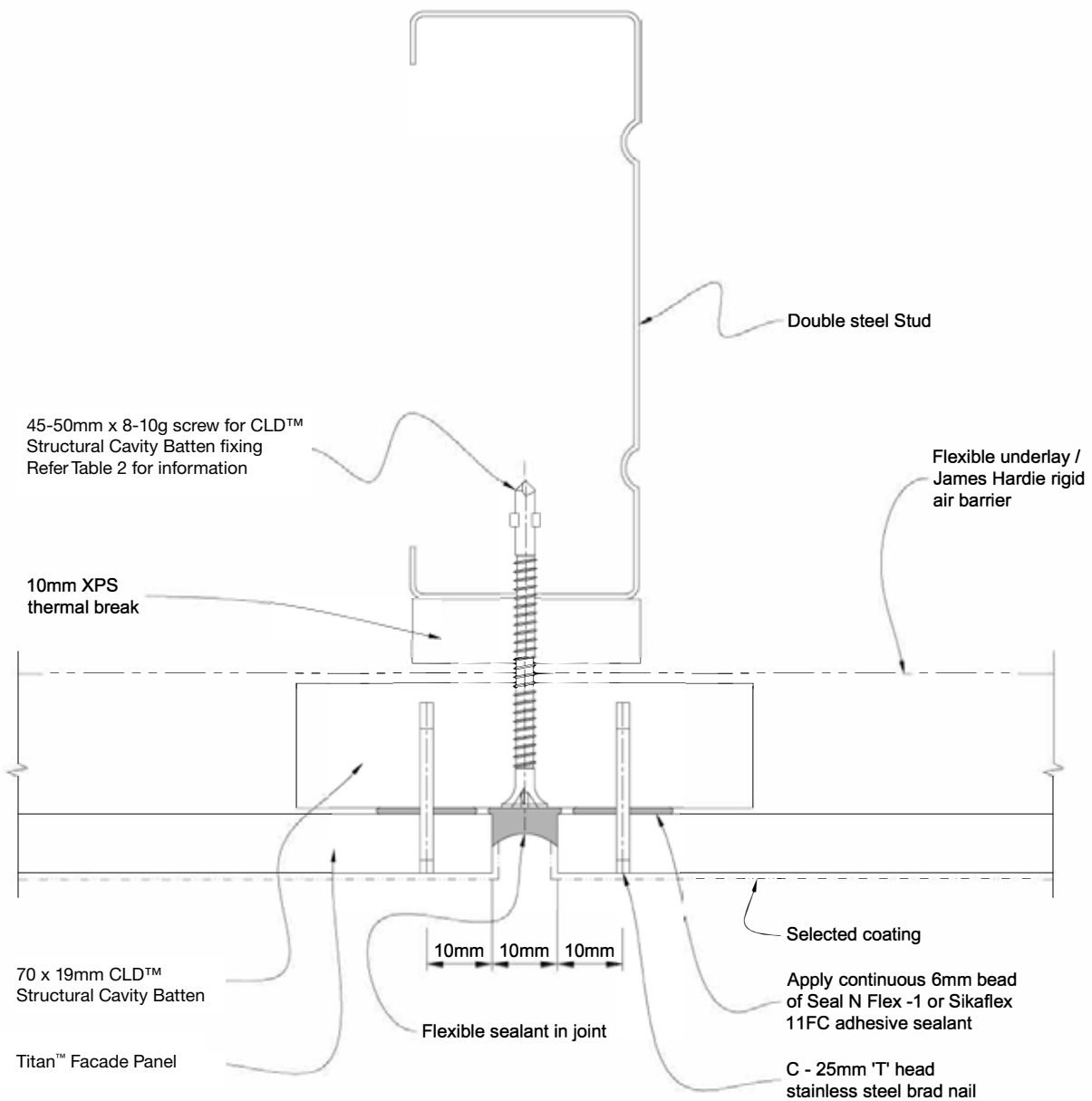
Figure 34: Titan™ Facade Panel / Axon™ Panel / Stria™ Cladding/EasyLap™ Panel Foundation detail



Notes:

- Check panel extends past bottom plate as specified in Technical Specification (50mm min).
- uPVC Vent strip must remain level and secure during construction. Cut and fix uPVC vent strip between CLD Structural Cavity Battens fixed under the panel vertical joints.
- Check vent strip is free from site debris.
- Refer to Table 2 for selected cladding fixing.
- Ensure batten fixing is flush with batten surface.

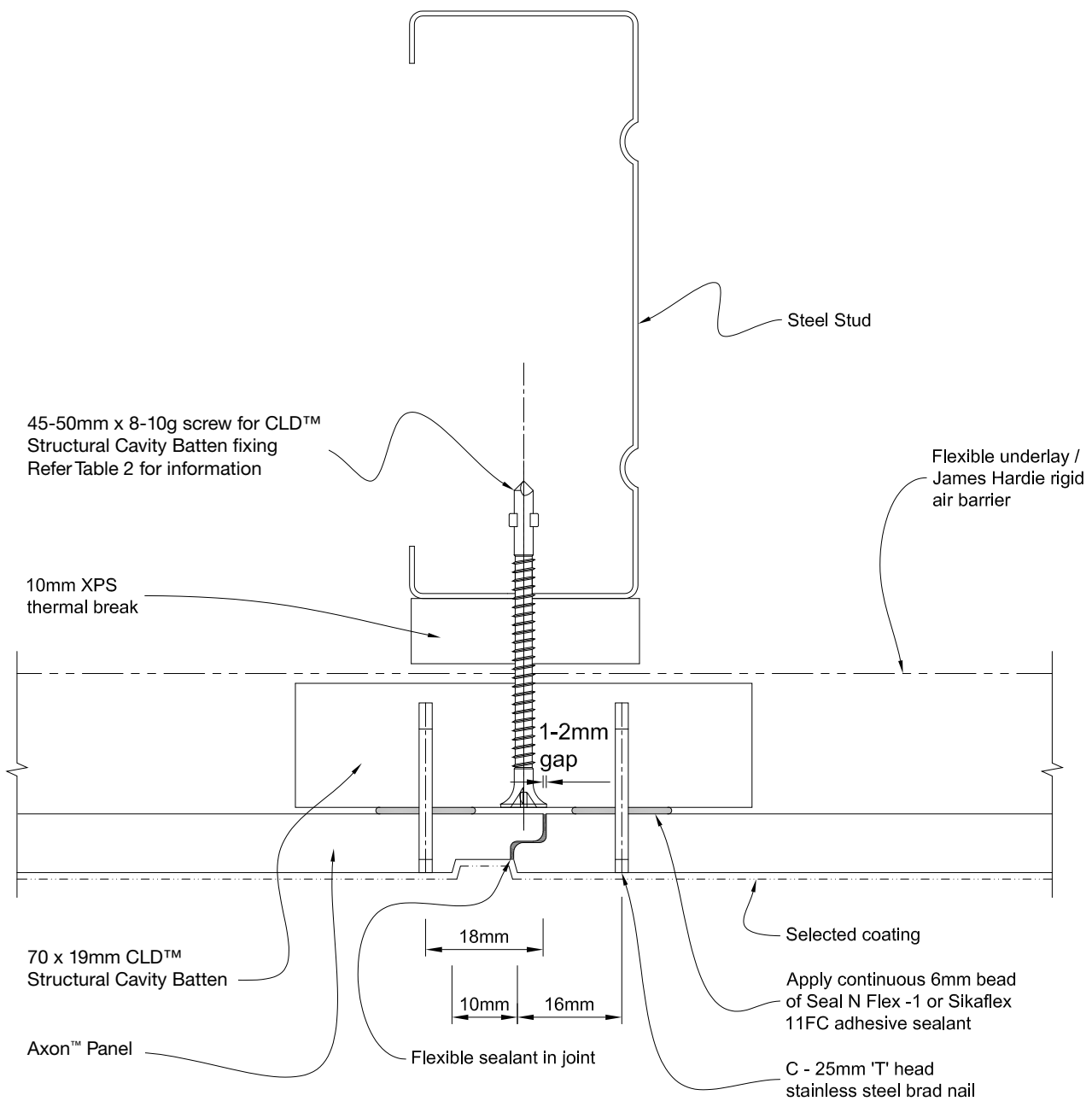
Figure 35: Titan™ Facade Panel Vertical expressed joint



Notes:

- Ensure that a continuous 6mm bead of adhesive sealant is applied between CLD™ Structural Cavity Batten and Titan™ Facade Panel.
- Ensure that the required Panel edge distance is maintained when fixing nails or screws.
- Seal site cut edges with a primer compatible with final coatings.
- Refer to Table 2 for Titan™ Facade Panel fixing options.
- Ensure batten fixing is flush with batten surface.

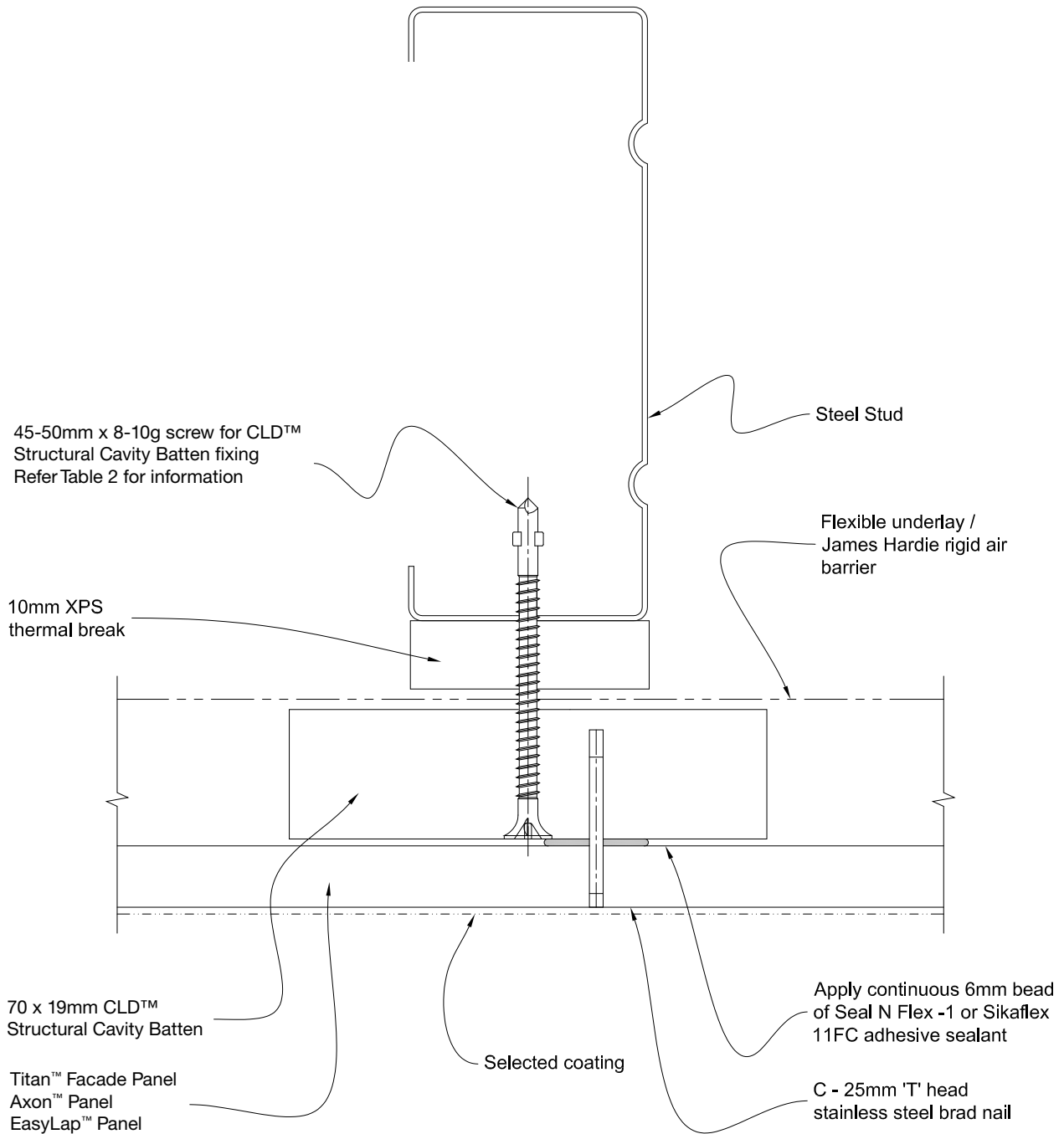
Figure 36: Axon™ Panel Shiplap joint



Notes:

- Ensure that a continuous 6mm bead of adhesive sealant is applied between CLD™ Structural Cavity Batten and Axon™ Panel.
- Ensure that the required Panel edge distance is maintained when fixing nails or screws.
- Seal site cut edges with a primer compatible with final coatings.
- Refer to Table 2 for Axon™ Panel fixing options.
- Ensure batten fixing is flush with batten surface.

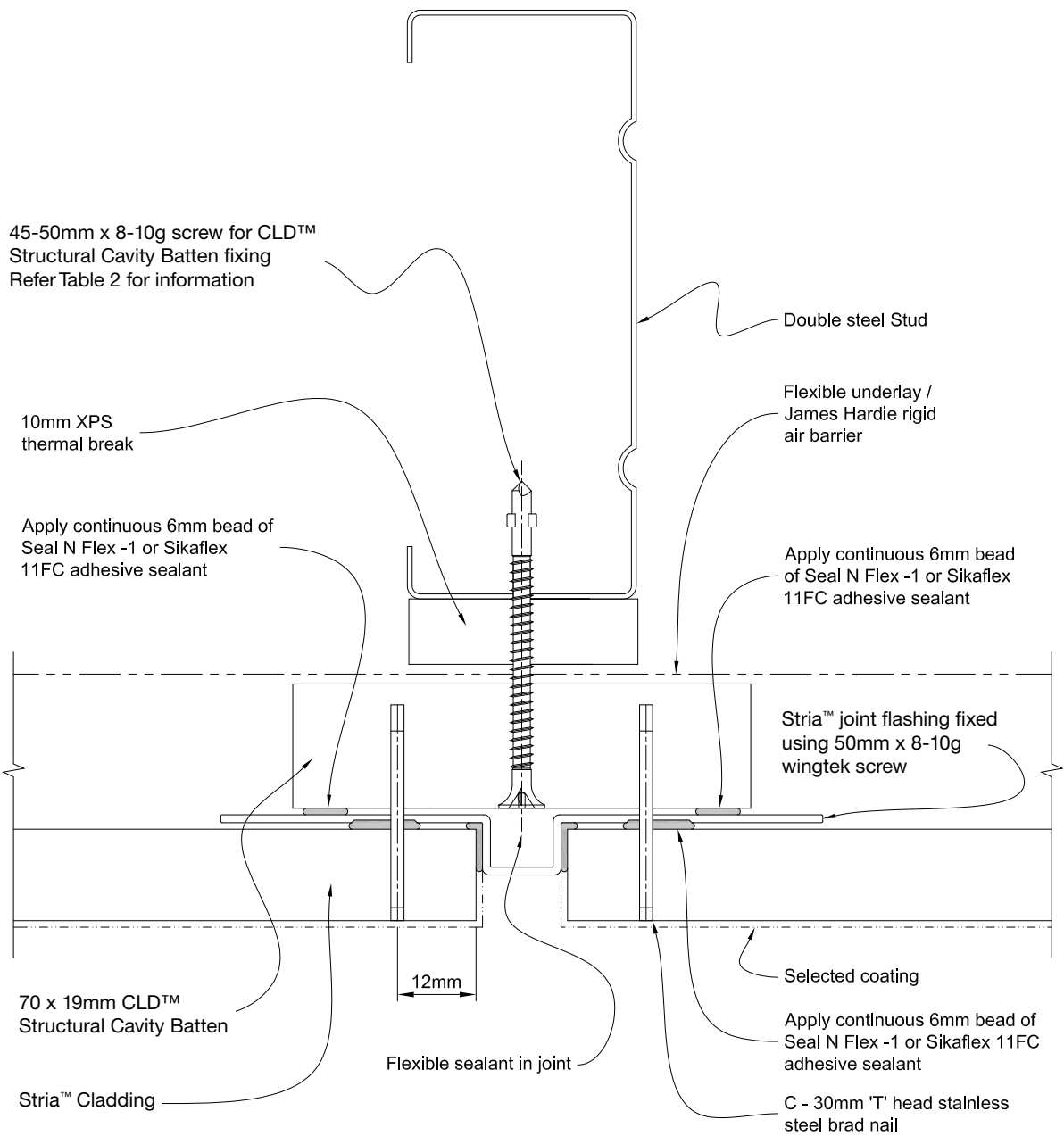
Figure 37: Titan™ Facade Panel / Axon™ Panel/EasyLap™ Panel Intermediate stud fixing



Notes:

- Fix panel from the middle of the panel outwards.
- Refer to Titan™ Facade Panel or Axon™ Panel or EasyLap™ Panel and CLD™ Structural Cavity Batten Technical Specification for Panel fixing.
- Ensure batten fixing is flush with batten surface.

Figure 38: Stria™ Cladding Vertical joint



Notes:

- Ensure that a continuous 6mm bead of adhesive sealant is applied between CLD™ Structural Cavity Batten and Stria™ Cladding.
- Ensure that the required Cladding edge distance is maintained when fixing nails or screws.
- Seal site cut edges with a primer compatible with final coatings.
- Refer to Table 2 for Stria™ Cladding fixing options.
- Ensure batten fixing is flush with batten surface.

Figure 39: Villaboard™ Lining Vertical flush joint

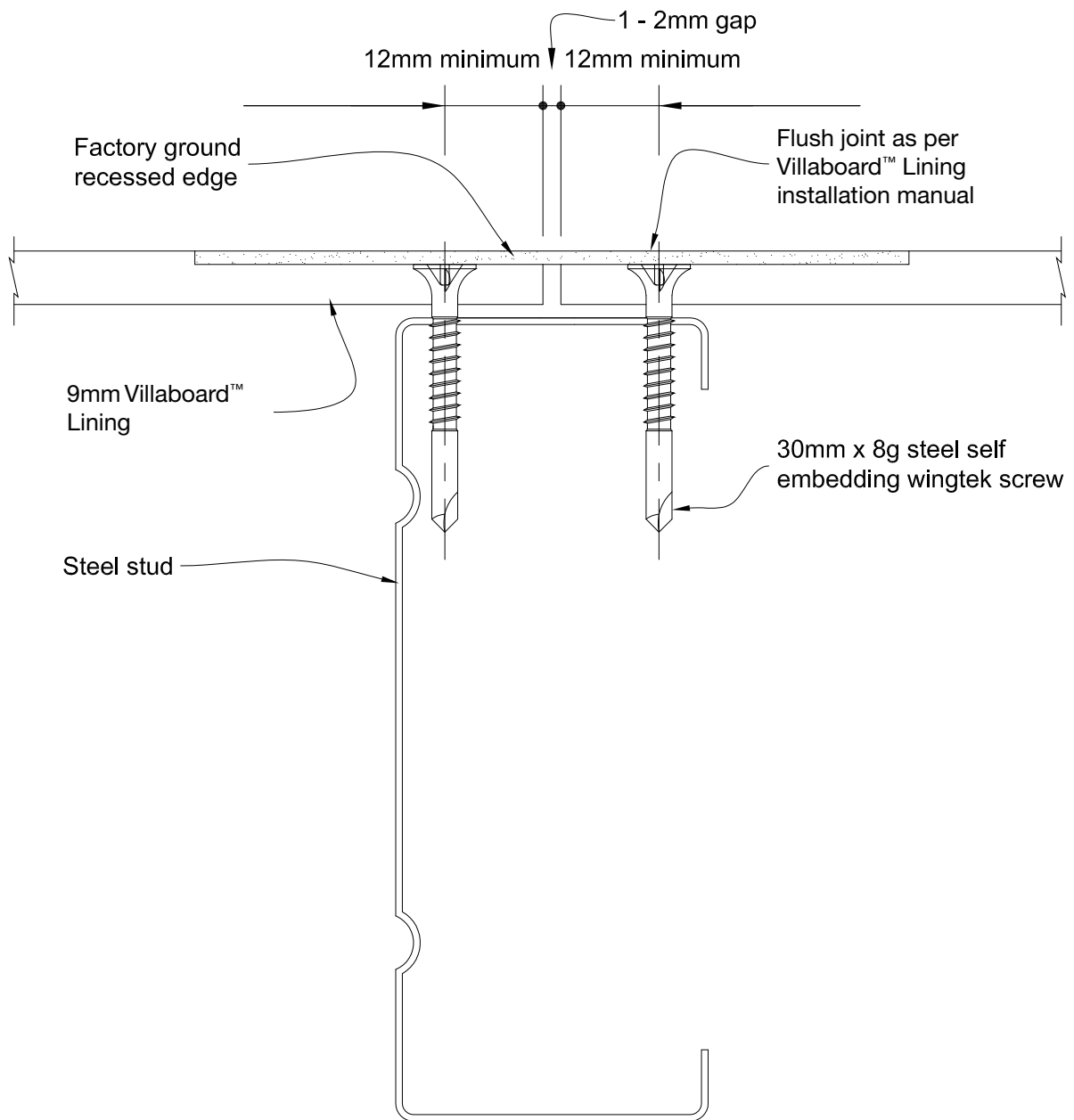


Figure 40: Villaboard™ Lining Vertical butt joint

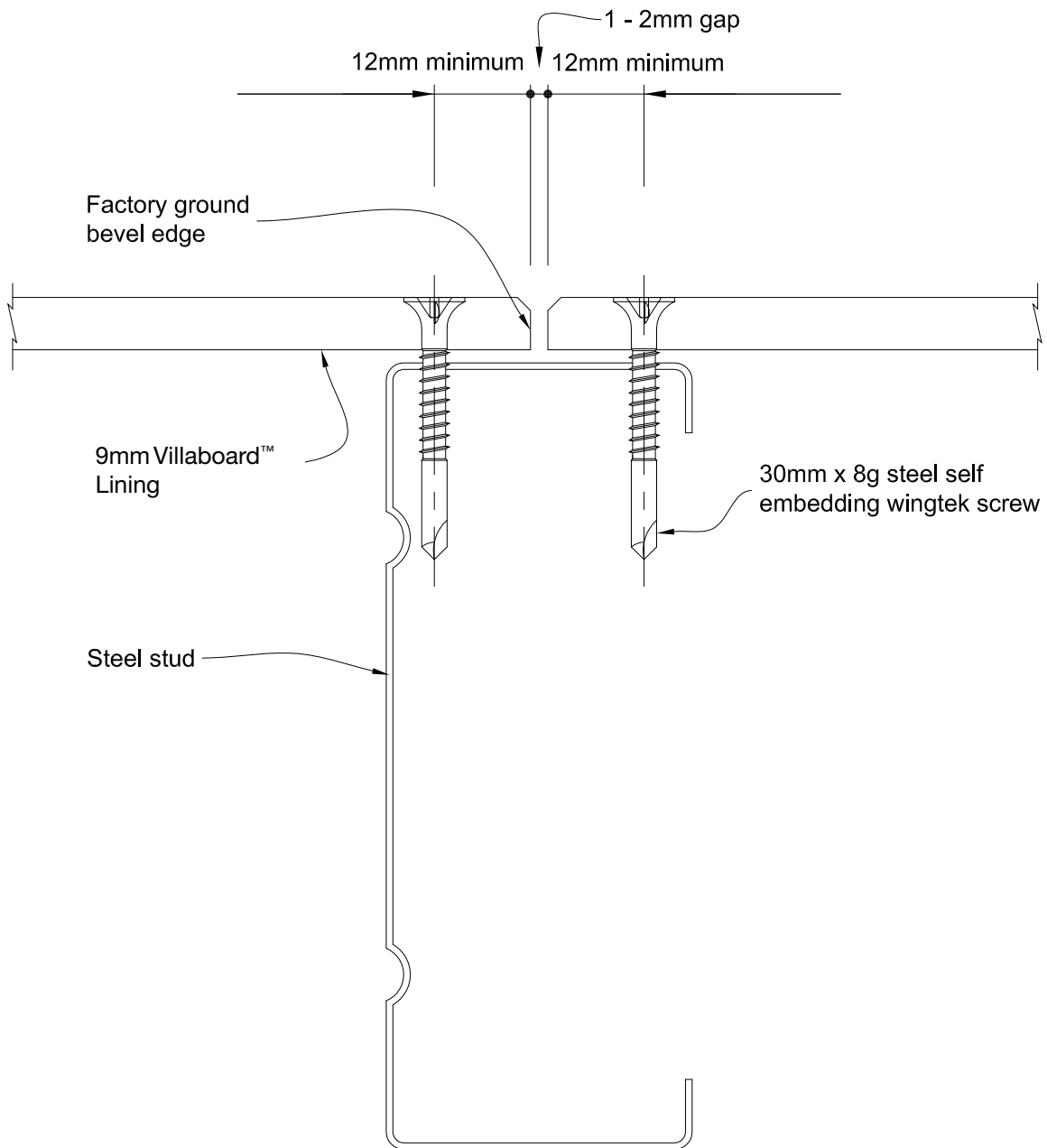


Figure 41: Villaboard™ Lining Vertical sealant butt joint

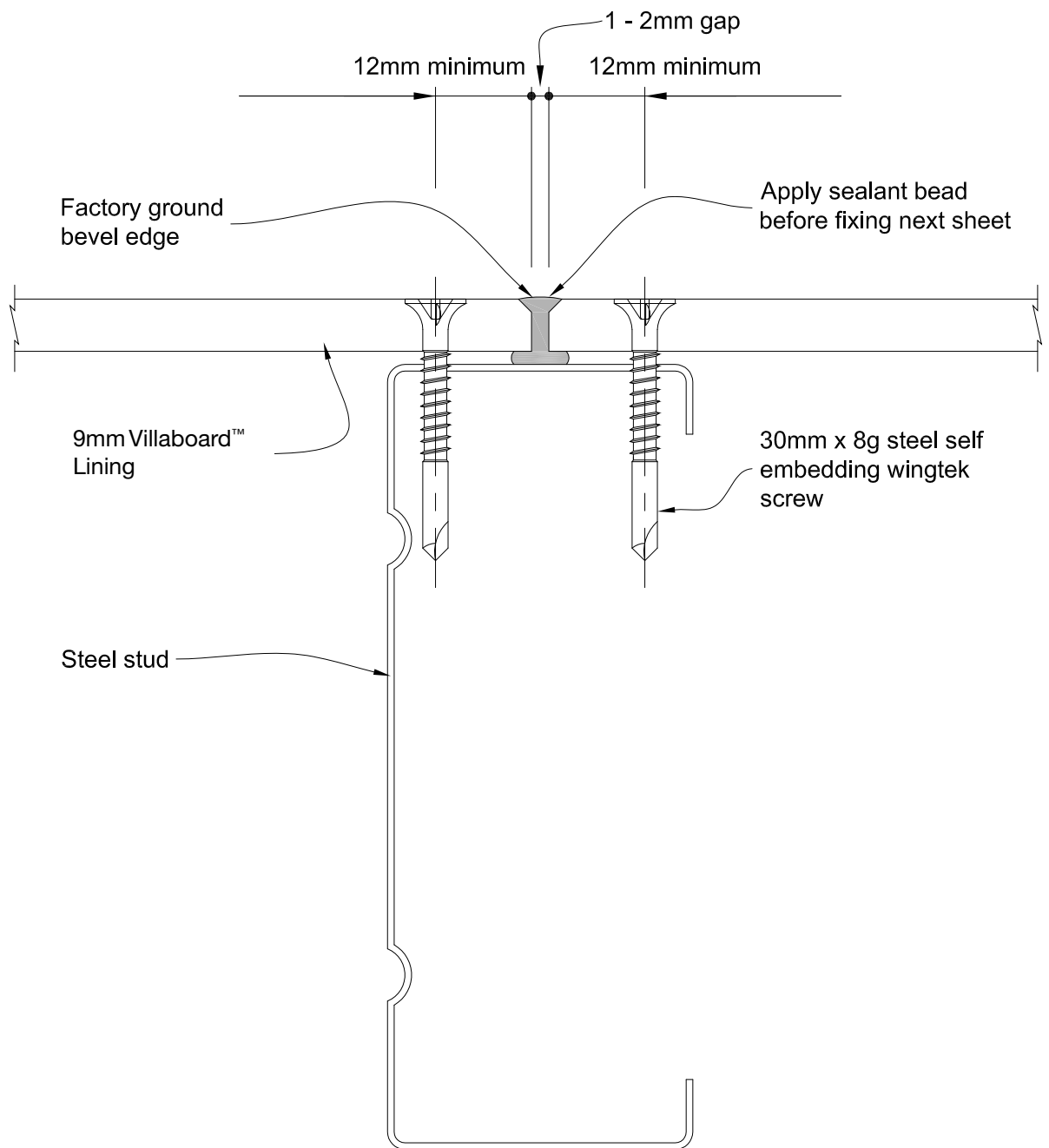
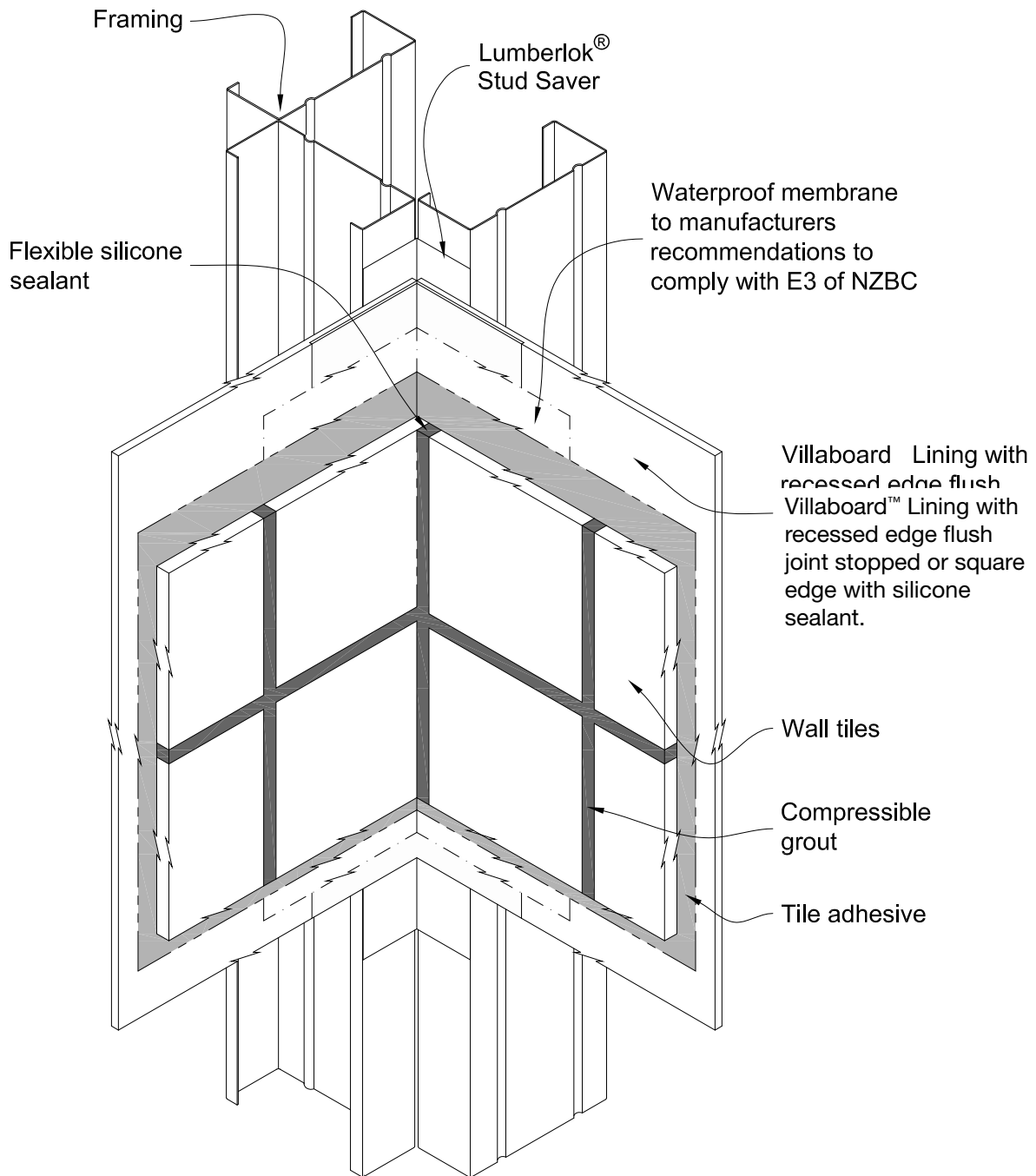


Figure 42: Villaboard™ Lining Vertical internal corner



Copyright April 2019. © James Hardie New Zealand Limited. TM and © denotes a Trademark or Registered Mark owned by James Hardie Technology Limited.

Ask James Hardie™ | Call 0800 808 868 | jameshardie.co.nz

James Hardie 

This technical supplement must be read in conjunction with the current technical product literature. James Hardie building products must be installed in accordance with the applicable technical product literature. All components and accessories must be installed in accordance with the respective manufacturer's specifications. For the product warranty, terms and conditions refer to the applicable James Hardie technical product literature.