

James Hardie Claddings Installation to Steel Framing

GENERAL

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

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

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.

A steel frame structure can be designed either in accordance to [NZS 3404](#) 'Steel Framing Buildings', a steel framing guidance document published by National Association of Steel Housing or be as per the specific engineering design carried out by the designer / engineer. The stud spacing must not exceed 600mm c/c in any case for fixing James Hardie claddings.

When used for Fire Rated Systems the stud spacing must not exceed 400mm c/c and nogs / dwangs 800mm c/c. Refer to Clause 6.4 in the Fire and Acoustic Design Manual for further guidance on fire rating.

The steel framing must be suitably coated to satisfy the Durability requirements of clause B2 of the New Zealand Building Code (NZBC) and other applicable building standards.

A typical section of size 89mm x 39mm x 0.75mm BMT is to be used to facilitate the installation of James Hardie claddings. These steel sections are generally available in the market supplied under different brand names by various manufacturers / suppliers. For further guidance on the steel frames refer to www.nashnz.org.nz.

Double studs are required for the following installations:

- Vertical control joint in Monotek Sheet
- Vertical joint in Titan Façade Panel, HardieFlex Sheet or a control joint in Villaboard Lining
- Internal corners in Monotek Sheet, Titan Façade Panel or Axon Panel claddings
- Refer to product specific technical specifications for extra framing requirements

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 framing acts as a thermal bridge between the interior and exterior portions of the building.

The thermal bridging can cause the following:

- down grade the overall thermal resistance of external walls significantly
- can cause moisture accumulation in the wall cavity due to condensation on cold steel surface and thus corroding steel
- allows mould to grow on the inner surface of the wall due to excessive dampness.

In order to comply with clause E3 and clause H1 of NZBC, an insulating material (a thermal break) is required to be fixed to the exterior steel surface to avoid thermal bridging. This can be achieved by using materials like 10mm thick (HDP) high density extruded polystyrene or other materials which have the R-Value (thermal resistance) $\geq 0.3 \text{ m}^2 \text{ }^\circ\text{C/W}$.

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

XPS grade battens are generally adhered to the frame using adhesive or a two sided adhesive tape applied over the face of the steel frame.

For further information and guidance on the requirements of a thermal break, refer to BRANZ or NASH guidance document.

Extruded high density polystyrene thermal batten is available in the market. One of the suppliers of these thermal battens is ACIS (A Class Industry Supply Ltd.) Phone: (06) 329 8065 or visit www.acis.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

BUILDING WRAP

A building wrap complying with Table 23 of clause E2/AS1 must be used. An absorbent type building wrap shall be used as it is suitable for both absorbent and non-absorbent types of cladding. It is recommended that the building wrap is fixed using adhesive tapes.

Refer to building wrap 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 building wrap. When 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 x 6g class 3 or class 4 wafer head steel screw or a proprietary 30x 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.

Window openings must be flashed in similar way as the practice is for a timber framed building. The building wraps 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.

Table 1:	
Zone	Coating Required
Zone 1, 2 and 3	Class-3
Zone 4 and Sea Spray Zone	Class-4

FIXINGS

Refer to Table 2 over page 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. Generally the length of the screw is calculated by allowing a 15mm minimum penetration into steel framing.

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 fixing to timber frame.

Drive screws 2mm below the surface for Axon Panel, Monotek Sheet and Titan Façade Panel and then filled with an exterior grade two part filler e.g. CRC Builders Fill.

For Linea Weatherboard the screws can be finished flush with surface when fixed under the lap (concealed fixing method).

INSTALLATION

The cladding installation to steel frame is 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
- Axon Panel
- Monotek Sheet
- HardieFlex Sheet 7.5mm

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.

*Refer to the paint manufacturer for washing down and recoating requirements related to ongoing paint performance

Table 2: Fasteners			
Product	Fixing Option		Fastener
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
	Cavity 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, Monotek Sheet, HardieFlex Sheet, Titan Façade Panel	Direct Fixed		8-10g x 40mm self embedding steel wingtek screw class 3 or 4
	Timber Cavity Batten Construction		8-10g x 60mm steel self embedding 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 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 should be changed 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.

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Table 3: Accessories supplied by James Hardie

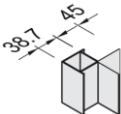
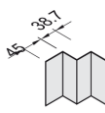







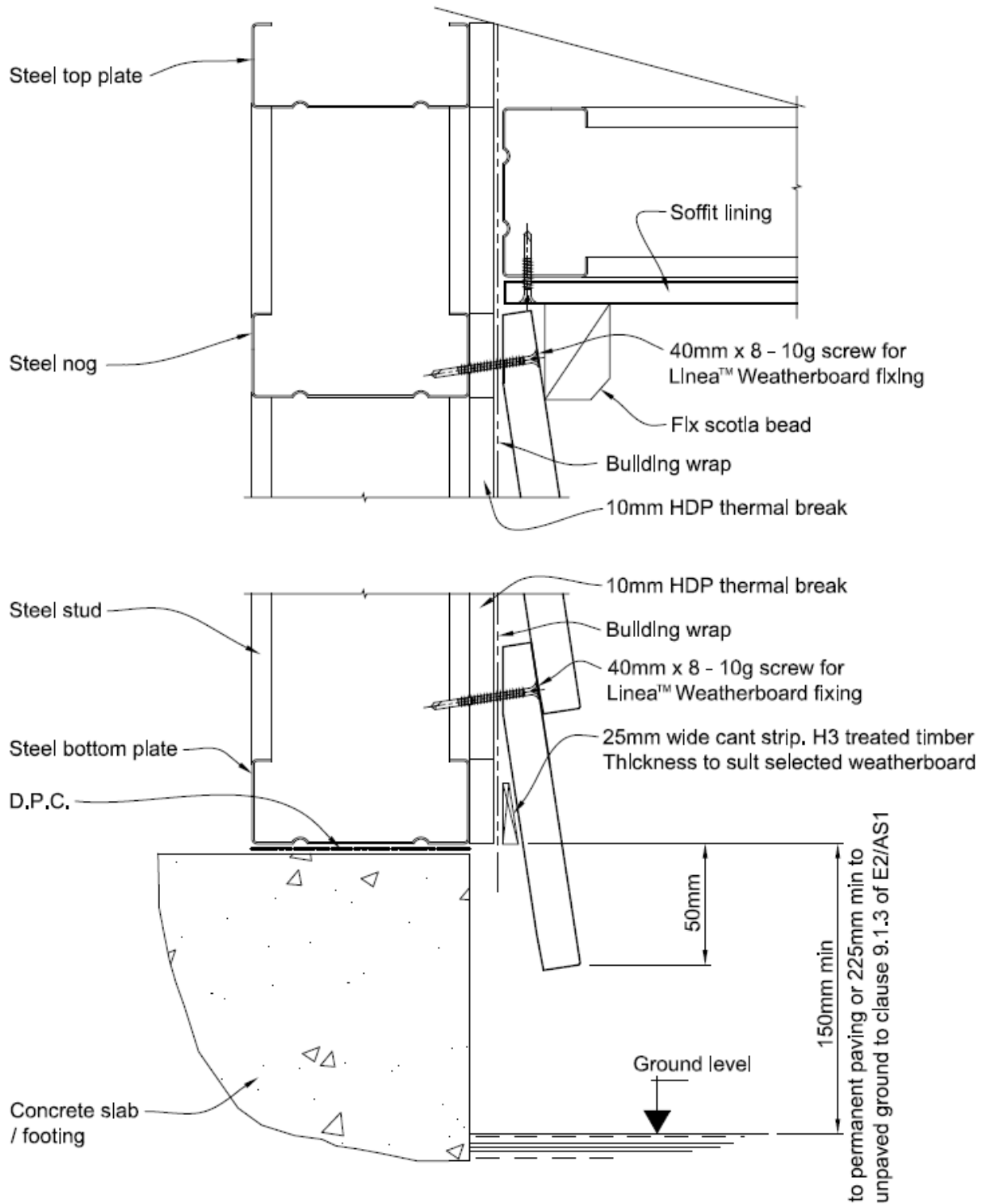
Product	Accessory and Material Number	Size	Material / Appearance
	External Slimline Box Corner Mould 301195	2700 long	Etch Primed Aluminium
	Internal 'W' Mould 90° 301184	2700 long	Etch Primed Aluminium
	Vent Strip 302490	3000 long	uPVC white
	JH Corner Under Flashing 50 x 50 303745	3000 long	uPVC white
	HardieBlade Saw Blade 300660	4 tooth 184mm	Diamond Tipped

Table 4: Accessories NOT supplied by James Hardie

Product	Accessory and Material Number	Material / Appearance
	Thermal Batten Supplied by ACIS (06) 329 8065	White Polystyrene
	Building wrap Must comply with Table 23 of E2/AS1 of NZBC.	Etch Primed Aluminium
	Joint sealing tape Used to seal the vertical joints of RAB Board. e.g. Protecto, Thermakraft or Tyvek®	Etch Primed Aluminium
	Bostik - 'Seal N Flex -1' Adhesive or Sikaflex 11FC adhesive	uPVC white
	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	uPVC white

This technical supplement must be read in conjunction with the current technical specification supplied by James Hardie New Zealand Ltd. and the product must be installed in accordance with this technical supplement. All components and accessories must be installed in accordance with the respective manufacturer's specifications. Product warranties and safe working practices information are also available in the James Hardie technical product literature which is available for download at www.jameshardie.co.nz.

DETAILS

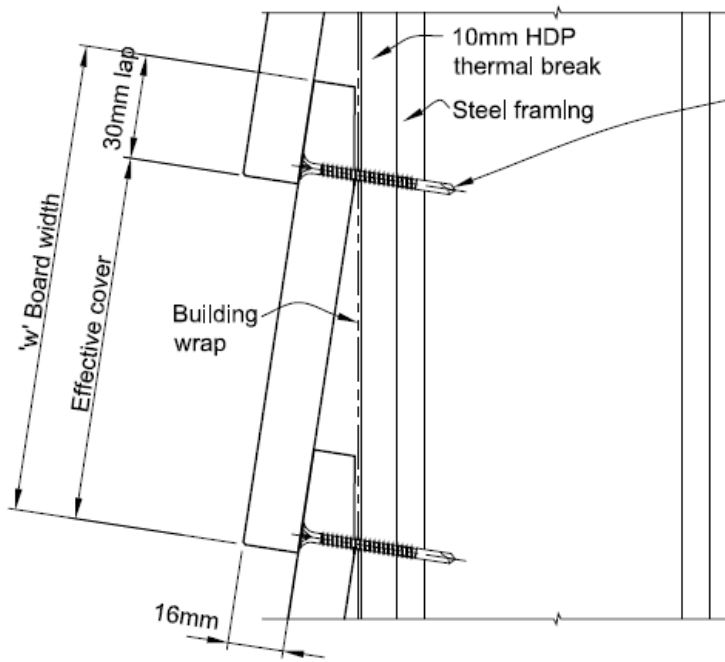


Detail 1: Foundation and Soffit

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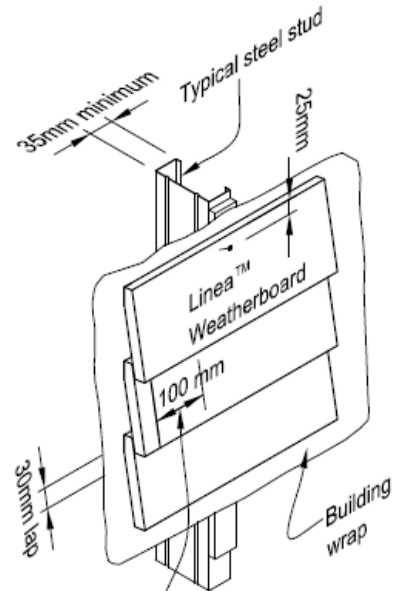
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Concealed Fixing

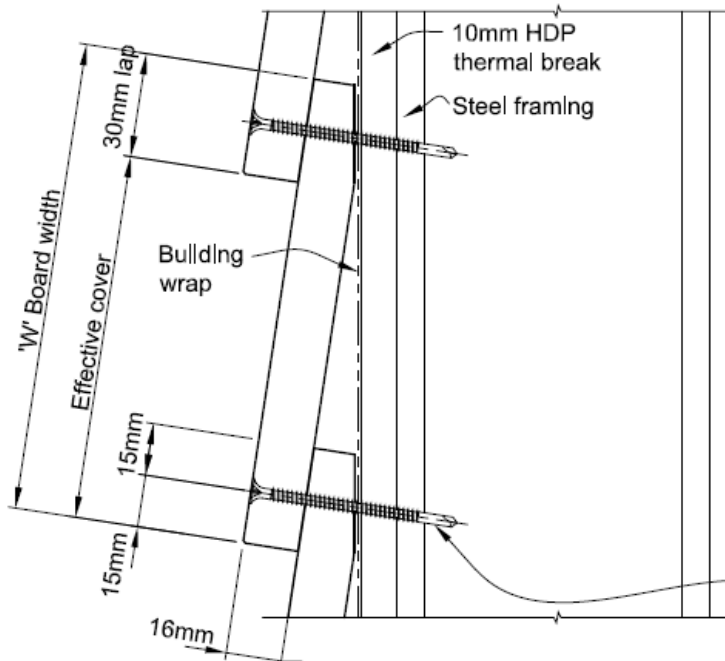
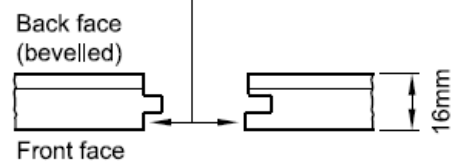
Boards to be concealed fixed using 40mm x 8 - 10g screw at 90° to face, finish flush.



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

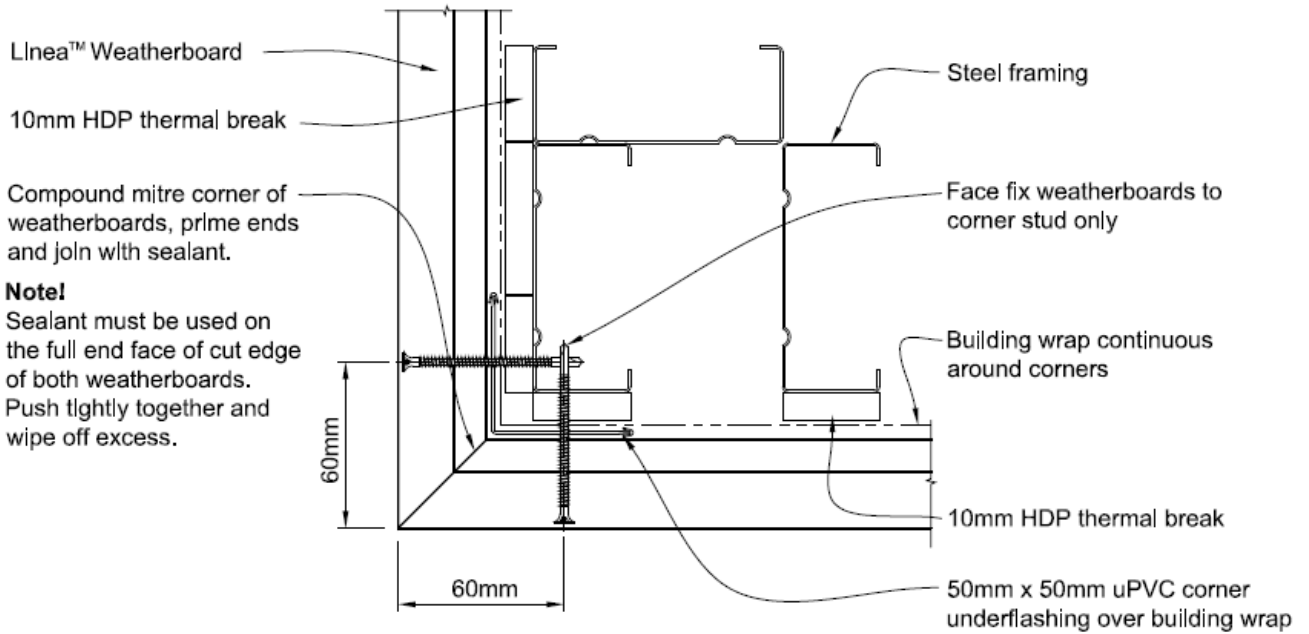
Boards to be face fixed at corners and down window and door openings using 60mm x 8 - 10g screw at 90° to face, finish 2mm below surface and fill.

Detail 2: Weatherboard Fixing

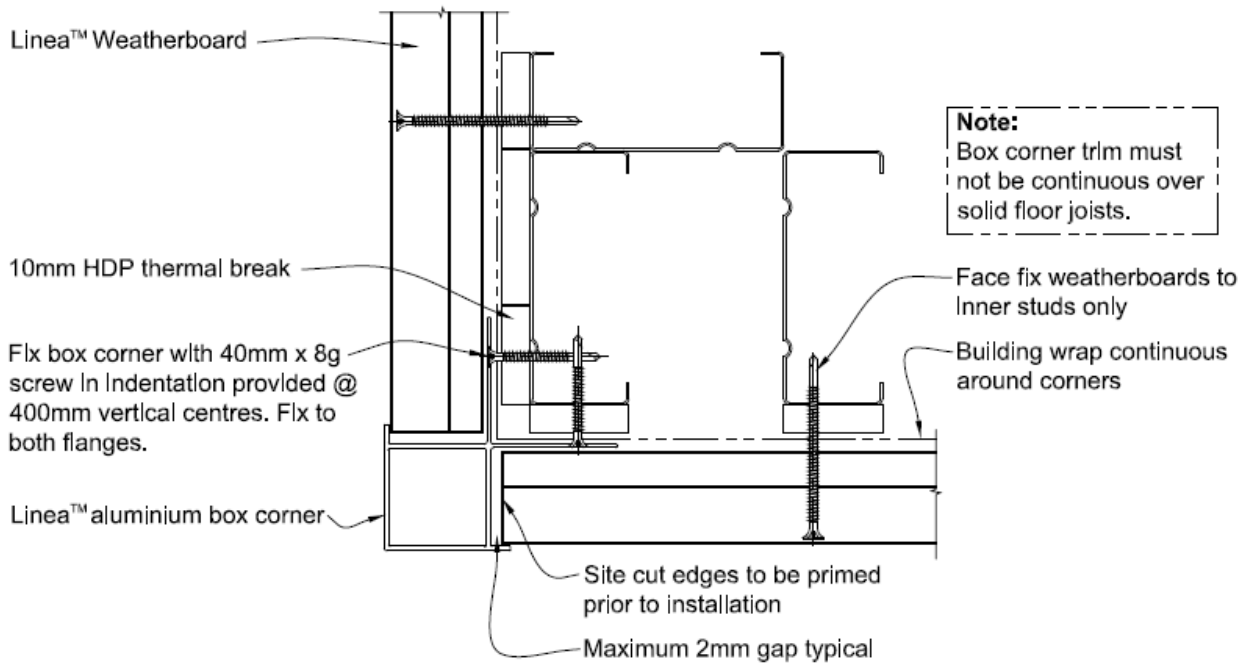
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Detail 3: External Miter Corner

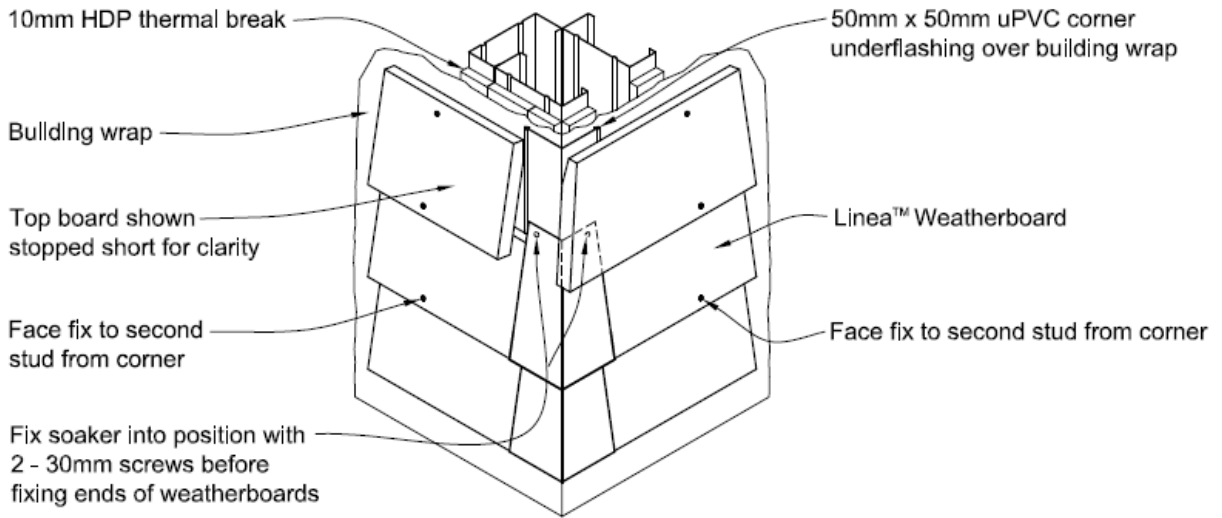


Detail 4: External Aluminium Box Corner

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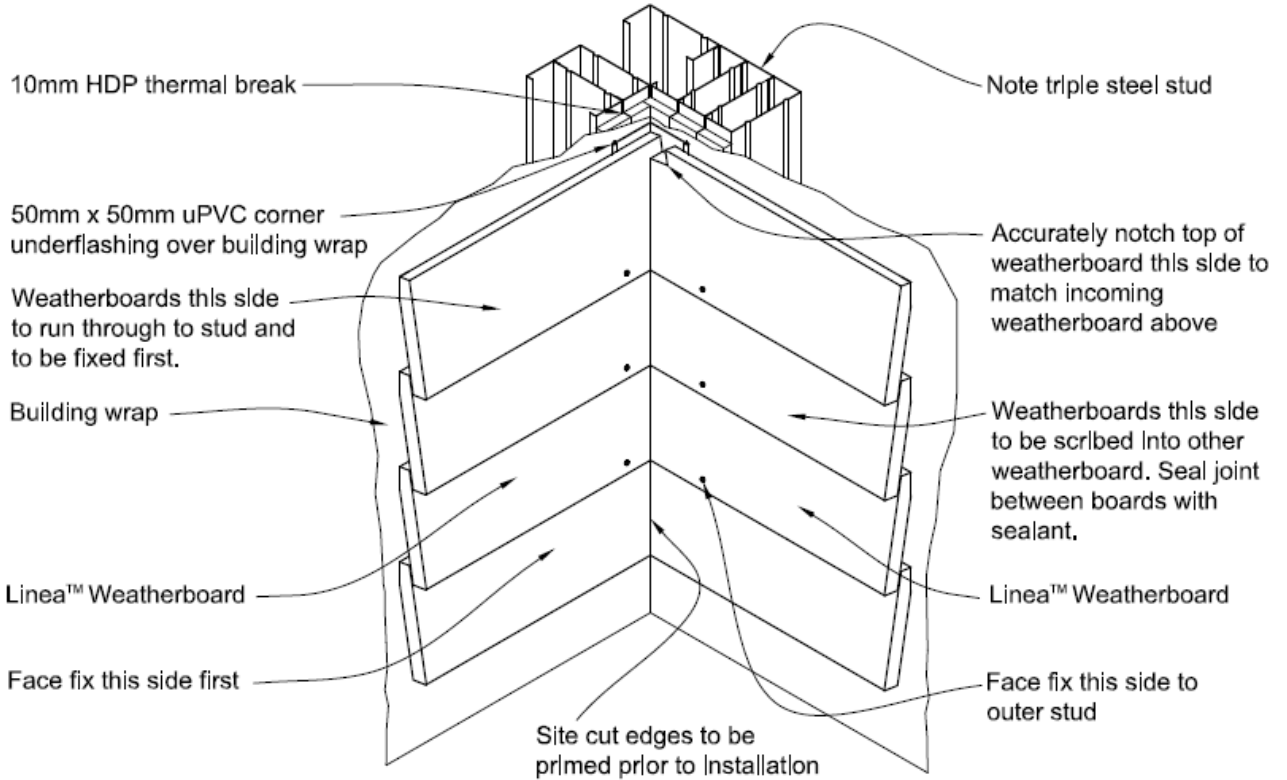
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Soaker material	Fixing material
Copper	Copper or phosphor bronze
Aluminium	Hot dlp galvanised / Stainless steel
Stainless steel	Stainless steel

Detail 5: External Corner Soaker

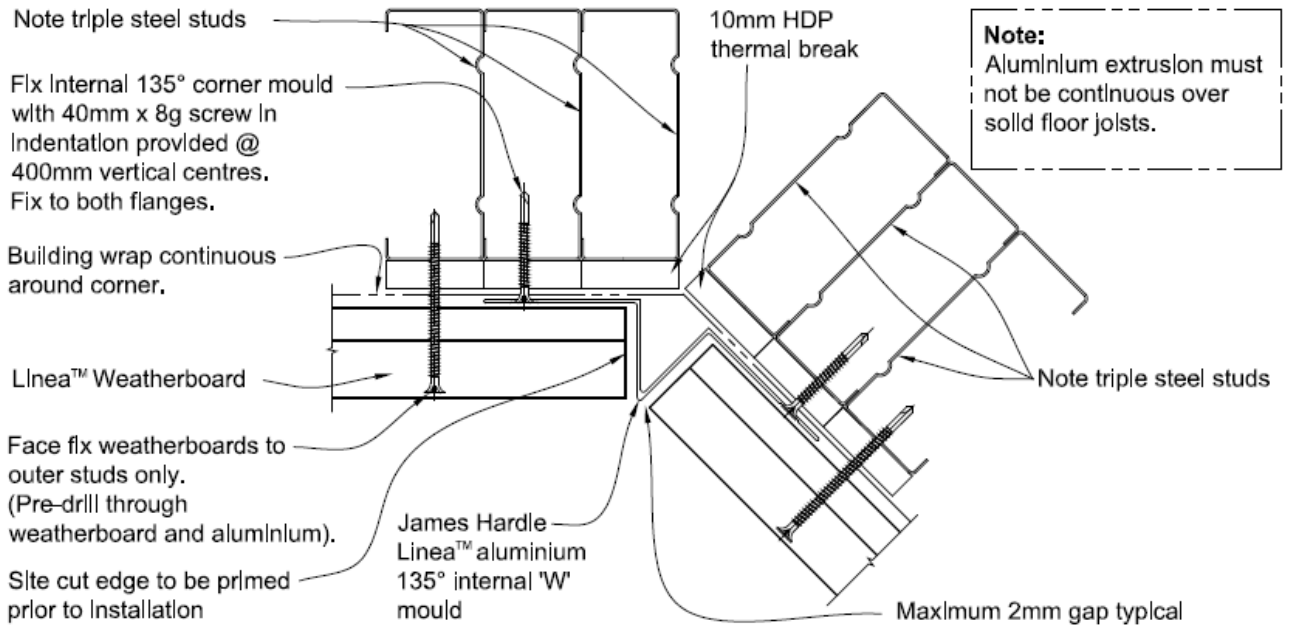


Detail 6: Internal Corner

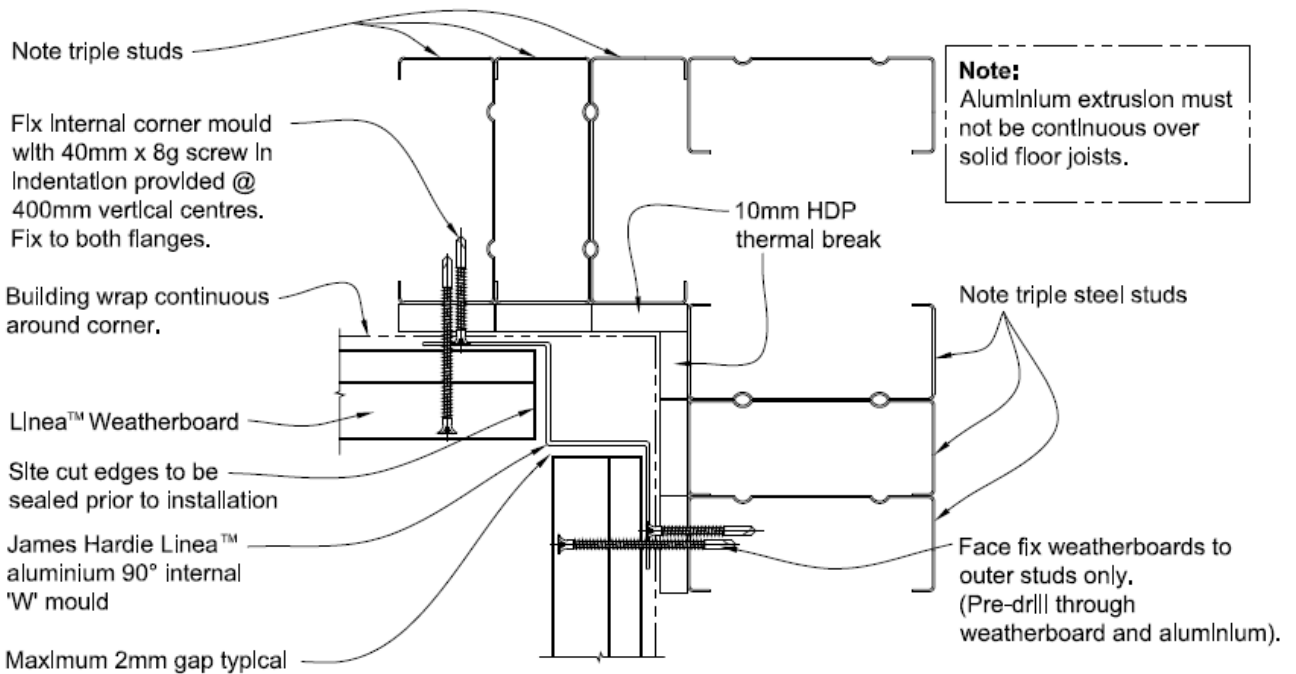
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Detail 7: 135° Internal Corner

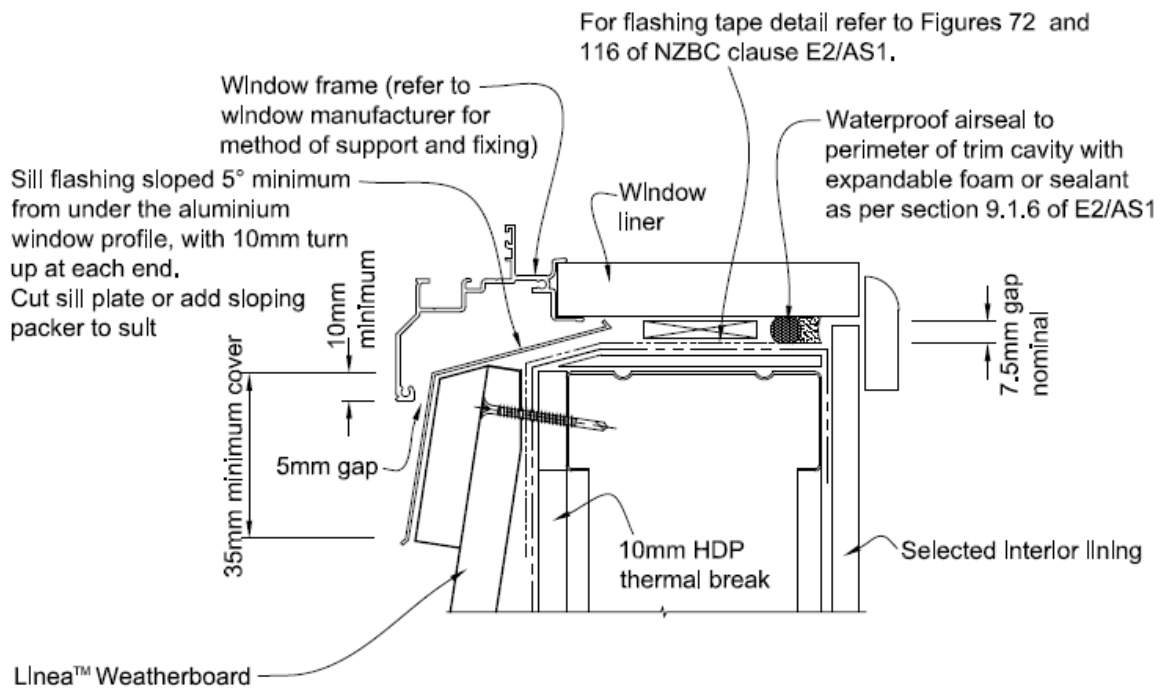


Detail 8: Internal W Mould

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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 wrap must comply with acceptable solution NZBC clause E2/AS1 and NZS 3604.
3. Flashing tape must have proven compatibility with the selected building wrap and other materials with which it comes into contact as per Table 21 of NZBC clause E2/AS1.

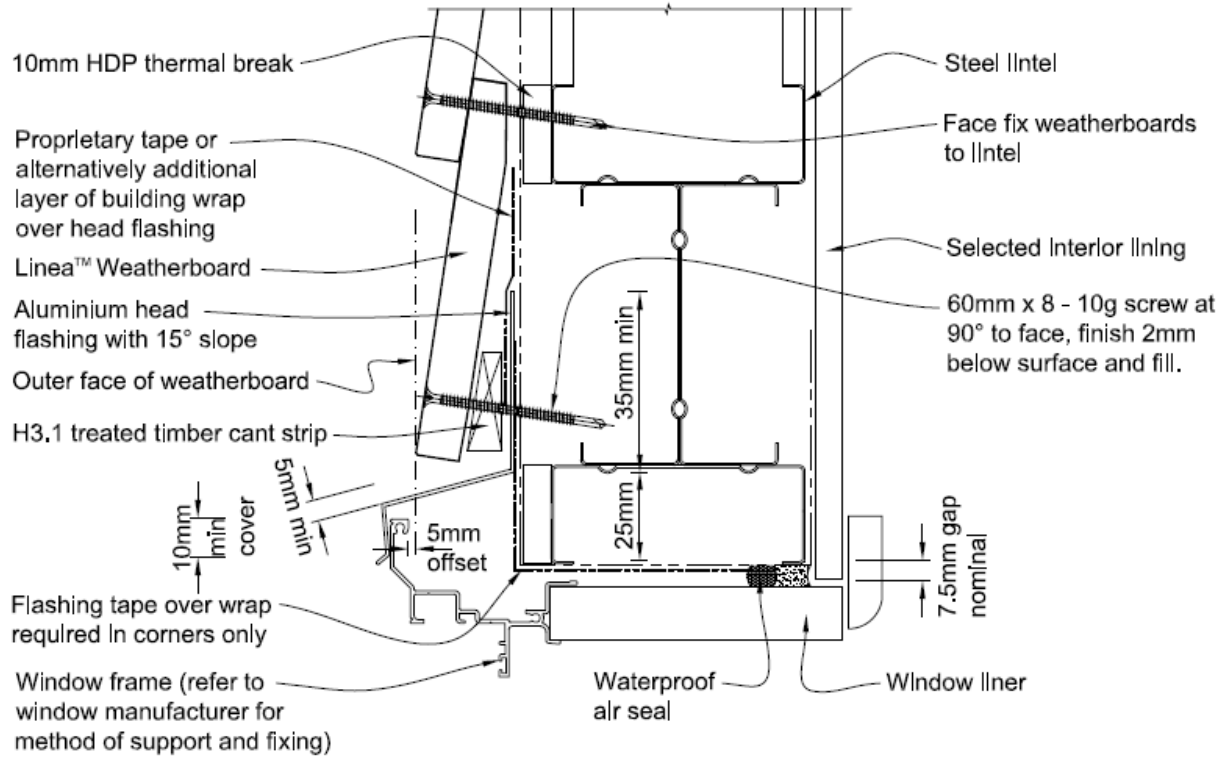
Refer to the manufacturer or supplier for technical information for these materials .

Detail 9: Window Sill

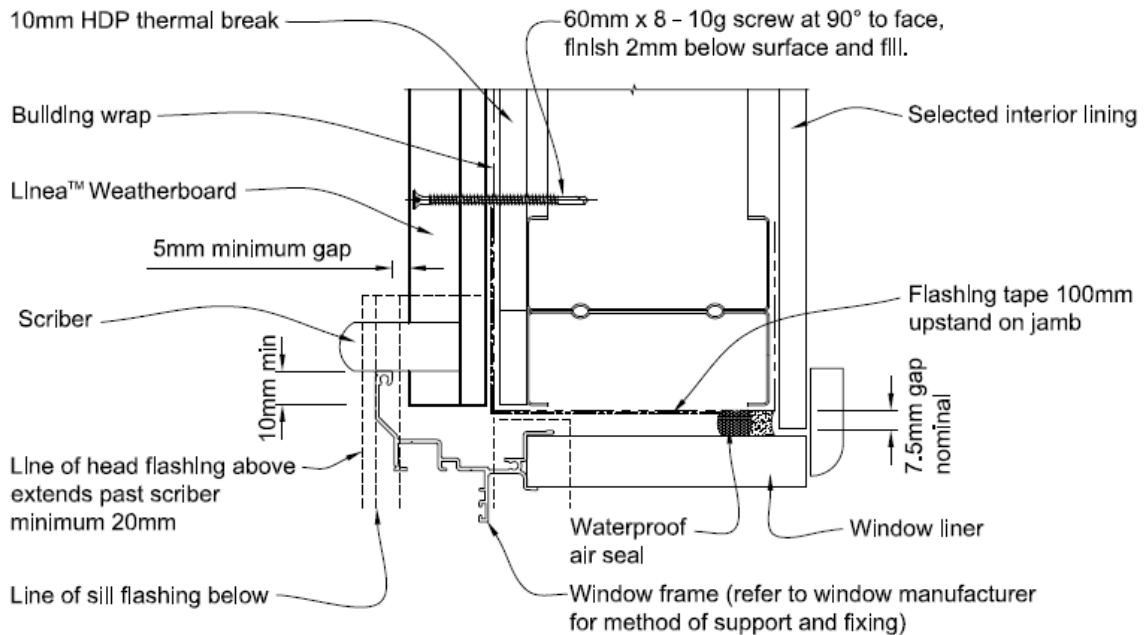
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Detail 10: Window Head



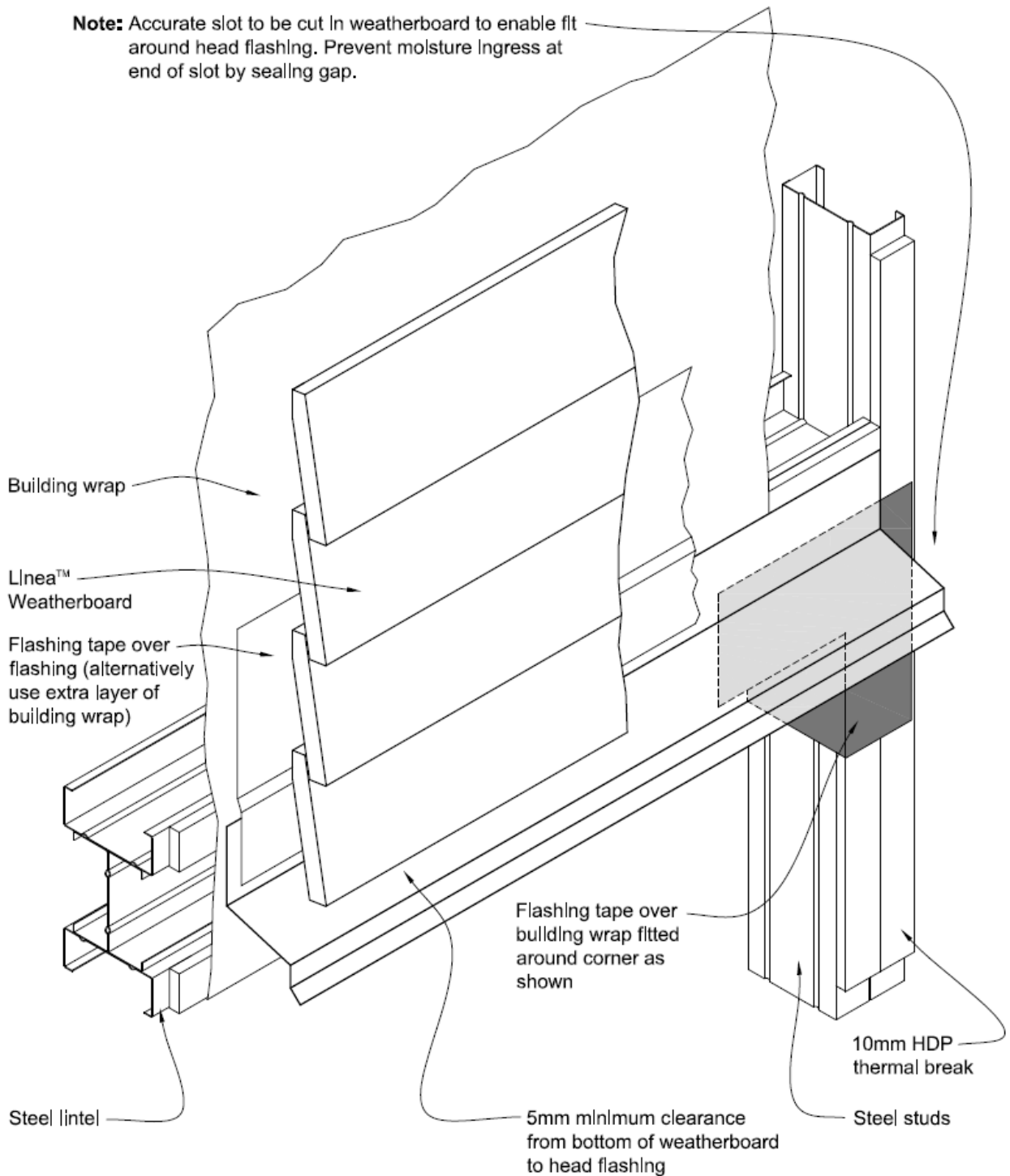
Detail 11: Window Jamb

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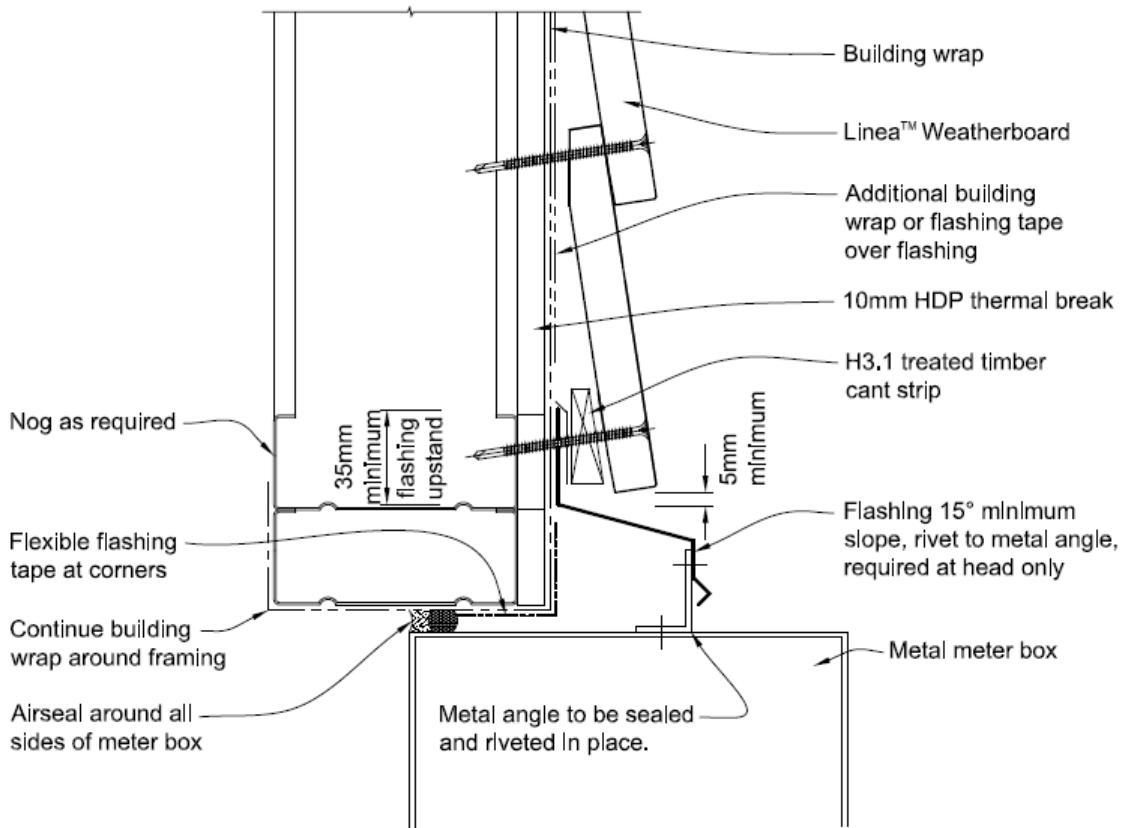
Note: Accurate slot to be cut in weatherboard to enable fit around head flashing. Prevent moisture ingress at end of slot by sealing gap.



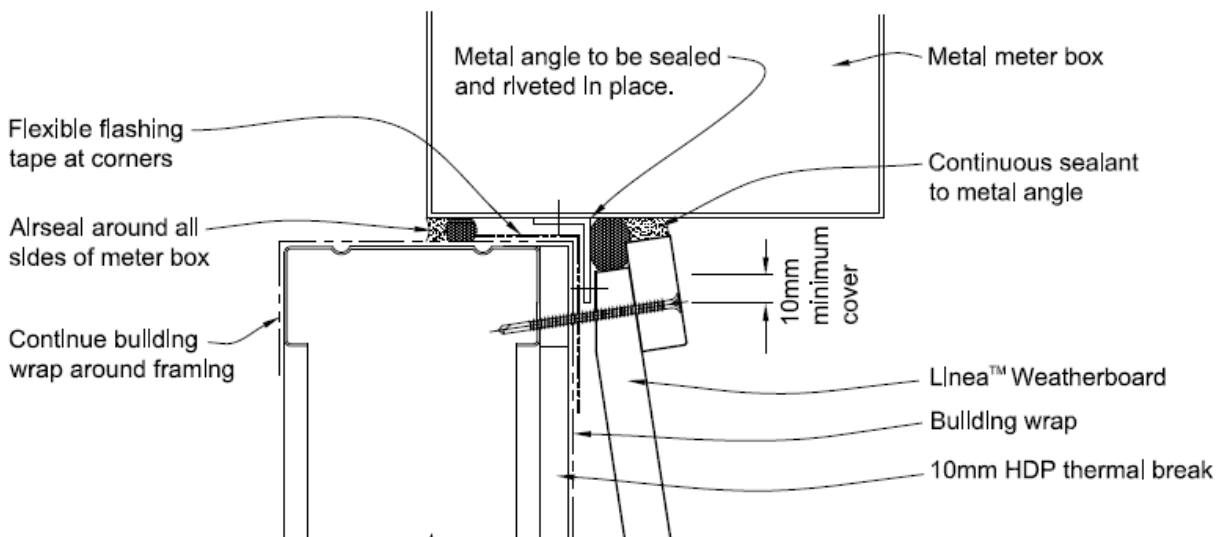
Detail 12: Window head

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Detail 13: Meter Box Head

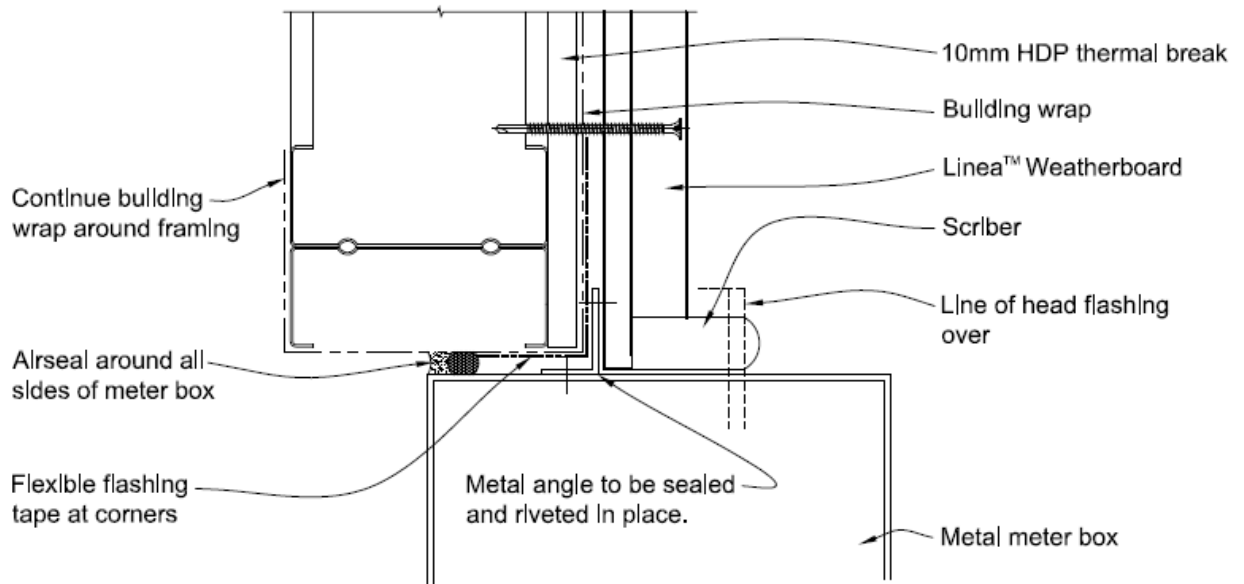


Detail 14: Meter Box Sill

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Detail 15: Meter Box Jamb

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