



FAÇADE MATERIALS

TEA KHABELASHVILI

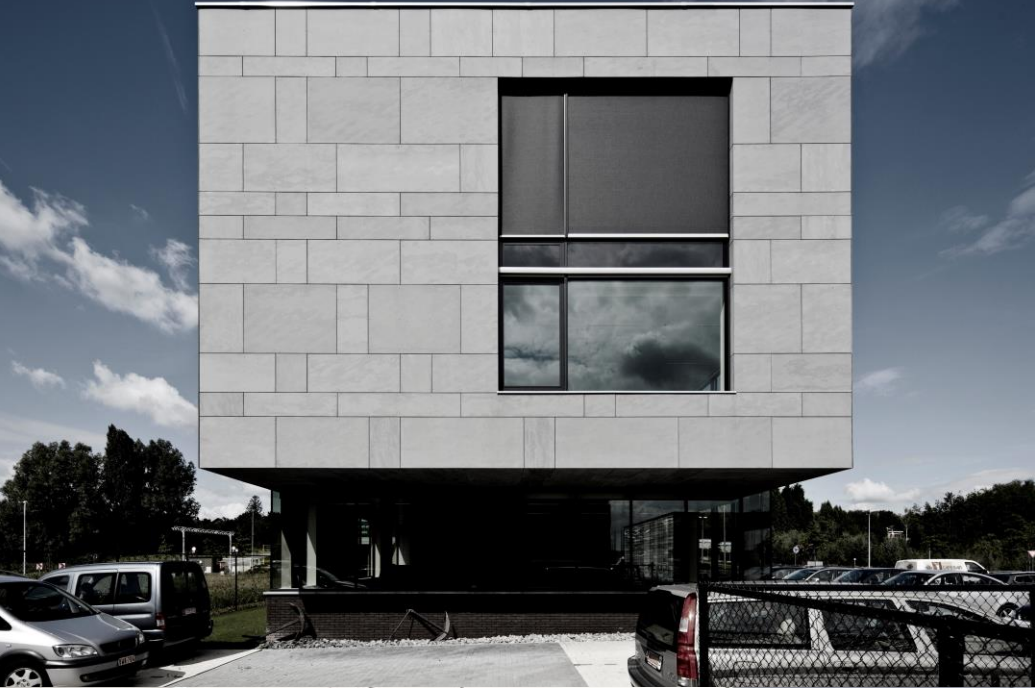
ARCH 2431. BUILDING TECHNOLOGY III. PROF. KING. SPRING 2020



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OPAQUE MATERIAL - DETAIL INFORMATION

Technical specifications



Touch: Fine sanding lines.
Visual: Dry, lively, dynamic.

Natural color differences, possibly accentuated by the orientation of the sheet, the viewing angle and the effects of light and moisture.

Advantages:

- fire safe (no fire ignition, no spread of fire)
- sound insulating
- resistant to extreme temperatures and frost
- water resistant (if in compliance with application guideline)
- resistant to many living organisms (fungi, bacteria, insects, vermin, etc.)
- resistant to many chemicals
- environmentally friendly, no harmful gas emissions
- strong, rigid panels

Thickness	Panel Sizes	Weight
8 mm	2500 x 1220 mm	14,9 kg/m2
	3050 x 1220 mm	



Case Study: Office building Temse
RDBM Architects,
Antwerpen – Belgium
Material: **EQUITONE**
[tectiva] TE 20

Metal supporting frame and profiles

Specification

Table below summarises the common metal sections that are available.

Position	Section
Vertical joint profiles	Rectangular or square hollow
	T-profile
	Top hat, furring channel or Omega profile
Intermediate profiles	Rectangular or square hollow
	L-profile
	C-profile
	Top hat, furring channel or Omega profile
	Z-profile

The Panels can be rivet fixed to metal supporting frames using stainless steel fixings and fasteners. minimum of 13/16 in (20 mm) be added to the planned cavity and insulation thickness between the wall and cladding, to allow for dimensional variations in the substrate.

Metal supporting frames: vertical metal profiles. Vertical profiles ensure the air flow in the cavity space ,that helps to eliminate moisture.

Vertical metal profile is anchored to the back wall with frame screws.



Specification

Wider profiles are used behind vertical joints between panels while a narrower profile is used as intermediate profiles in the middle of the panel. It is advisable to use a vertical profile that allows for tolerance and any discrepancy in component layout and installation dimensions.

Minimum profile thickness	Aluminium	≥ 2.0mm
	Galvanised/stainless steel	≥ 1.15mm
Minimal depth of profile		≥ 35mm
Minimal width of intermediate profile		≥ 40mm
Minimal width of vertical joint profile		≥ 90mm
Recommended width of joint profile		≥ 120mm
Maximum buckle under influence of strain		≤ Span/250
Safety factor calculation of strength		3
Maximum length of vertical profile		6m
Movement joints between adjacent profiles		20mm
Maximum unsupported length from last bracket/anchor		250mm

“Hat” channels are typically mounted where panel joints will exist. minimum of 4 in. (100 mm) while 4-1/2 in. (115 mm) is recommended.

“Z” channels are used at the façade edges and all other intermediate locations

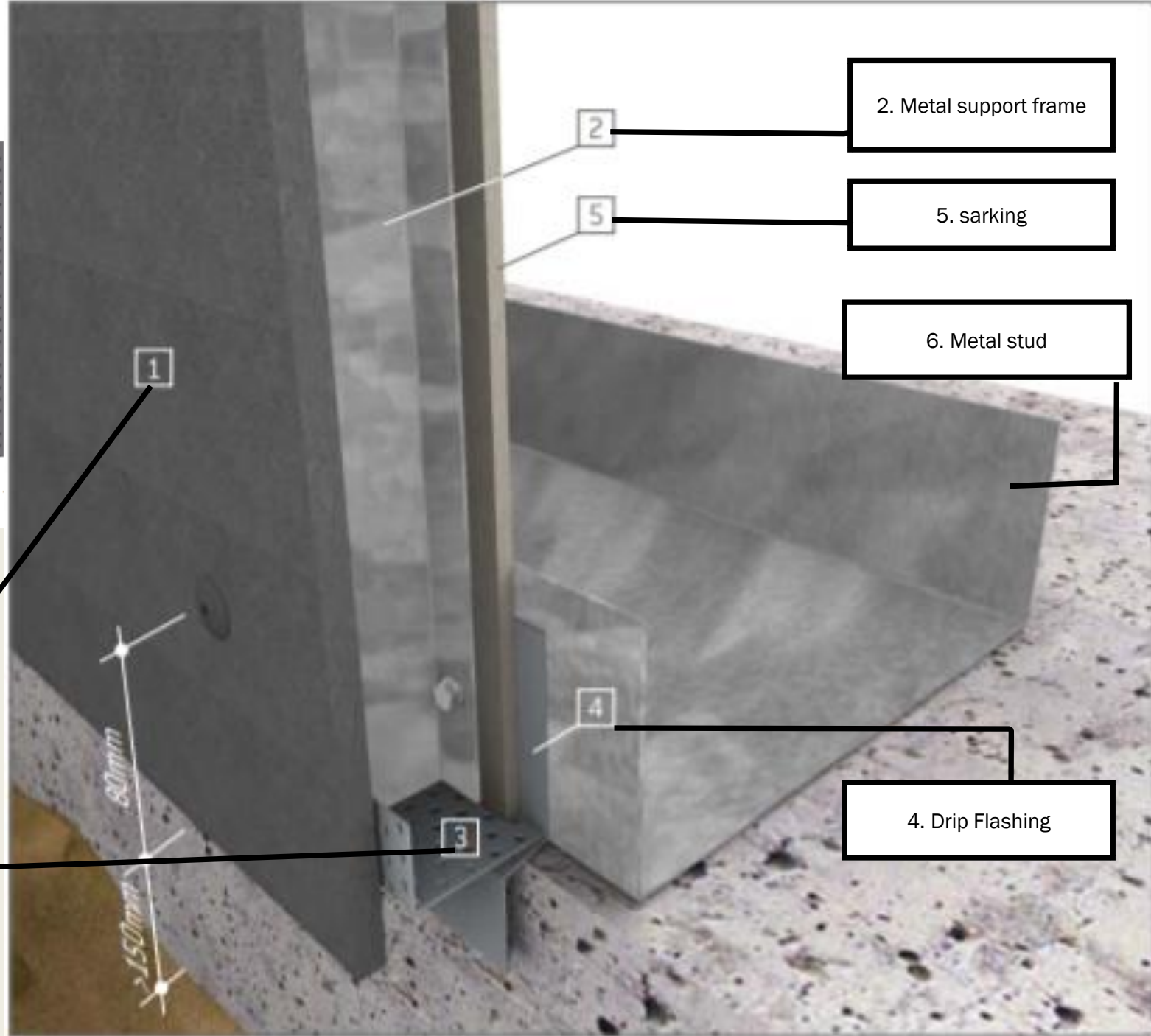
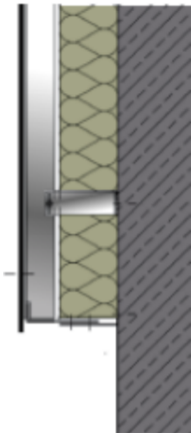
Metal Supporting Frame Details

Base Detail

Normally, the ends of the panels are best positioned above the finished ground level, a minimum 6 in. (153 mm), 12 in. for EQUITONE [material]. This will help prevent rain splash-back from the ground while maintaining enough space for the air to enter the cavity. No planting should be sowed near the air inlet as over time the plants may block the air inlets.

The space between the panels and the wall must have a perforated profile fitted. This piece allows air to enter the cavity space while preventing the entry of birds or vermin. Fasten the perforated profile to the wall and ensure it extends to within 3/16 in. (5 mm) of the back of the panel. If the cladding panel is further away from the wall, a combination of profiles is advised. These must be fastened together.

It is recommended the panel overhangs the perforated profile between 3/4 - 2 in. (19 - 50 mm) to form a drip to allow rainwater to fall away from the building. The bottom row of panel fasteners should be between 2 3/4 (70 - 102 mm) up from panel's bottom edge.



1. panel

Perforated profile

2. Metal support frame

5. sarking

6. Metal stud

4. Drip Flashing

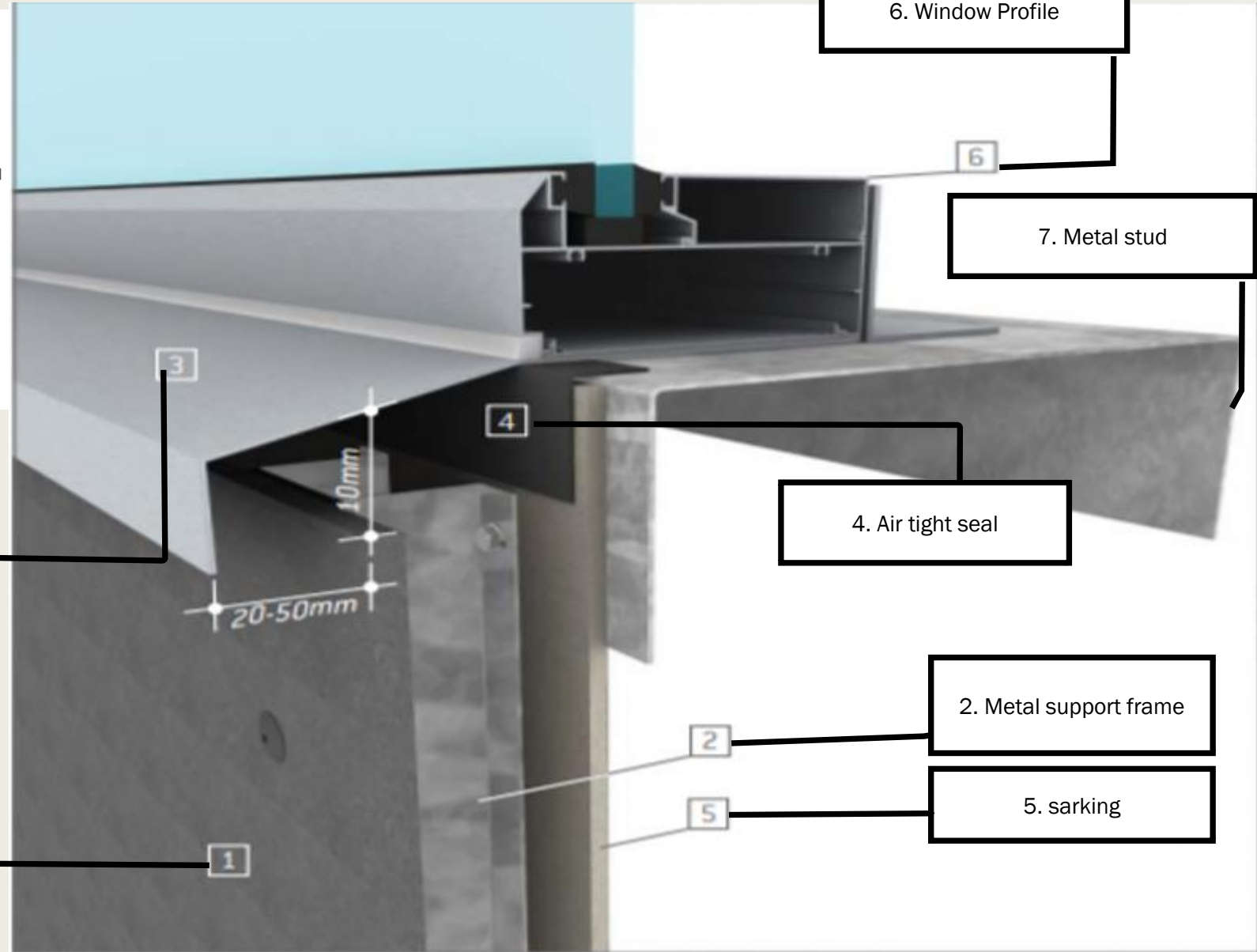
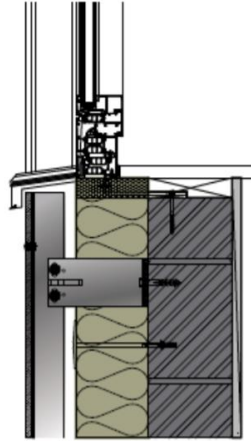
Window Sill

Air from the cavity must be allowed to exit under the metal sill. A minimum of a 3/8 in. (10 mm) gap should be left between the panel and the base of the sill. A perforated profile can be used for wider gaps to prevent entry of birds or vermin.

The front edge of the sill must be between 3/4 - 2 in. (19 - 50 mm) away from the face of the panel and offer adequate cover to the panels.

The sill should extend down over the panels by a minimum of 2 in. (50 mm).

The panel fasteners can be placed between 2 3/4 - 4 in. (70 - 102 mm) from the top edge of the panel.

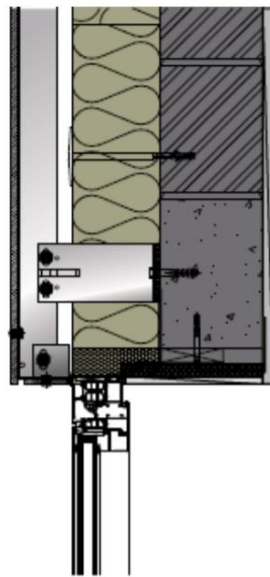


Window Head

Air must be allowed to enter the cavity above the heads of windows, doors, or other openings. A perforated profile can be used to protect the opening from the entry of birds or vermin. For recessed window frames, a narrow strip of panel can be used as the reveal. For narrow reveals, flashings are best suited.

The panel can overhang the ends of the rails to form a drip by $\frac{3}{4}$ - 2 in. (19 - 50 mm). The panel fasteners should be between $2\frac{3}{4}$ - 4 in. (70 - 102 mm) up from bottom edge of the panel.

To help conceal the perforated profile, the installer can paint it black prior to fitting.

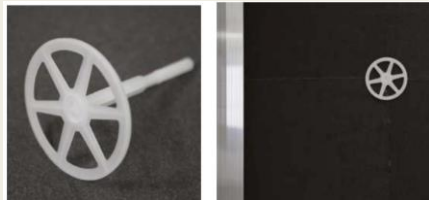


1. panel

2. Metal support frame

5. sarking

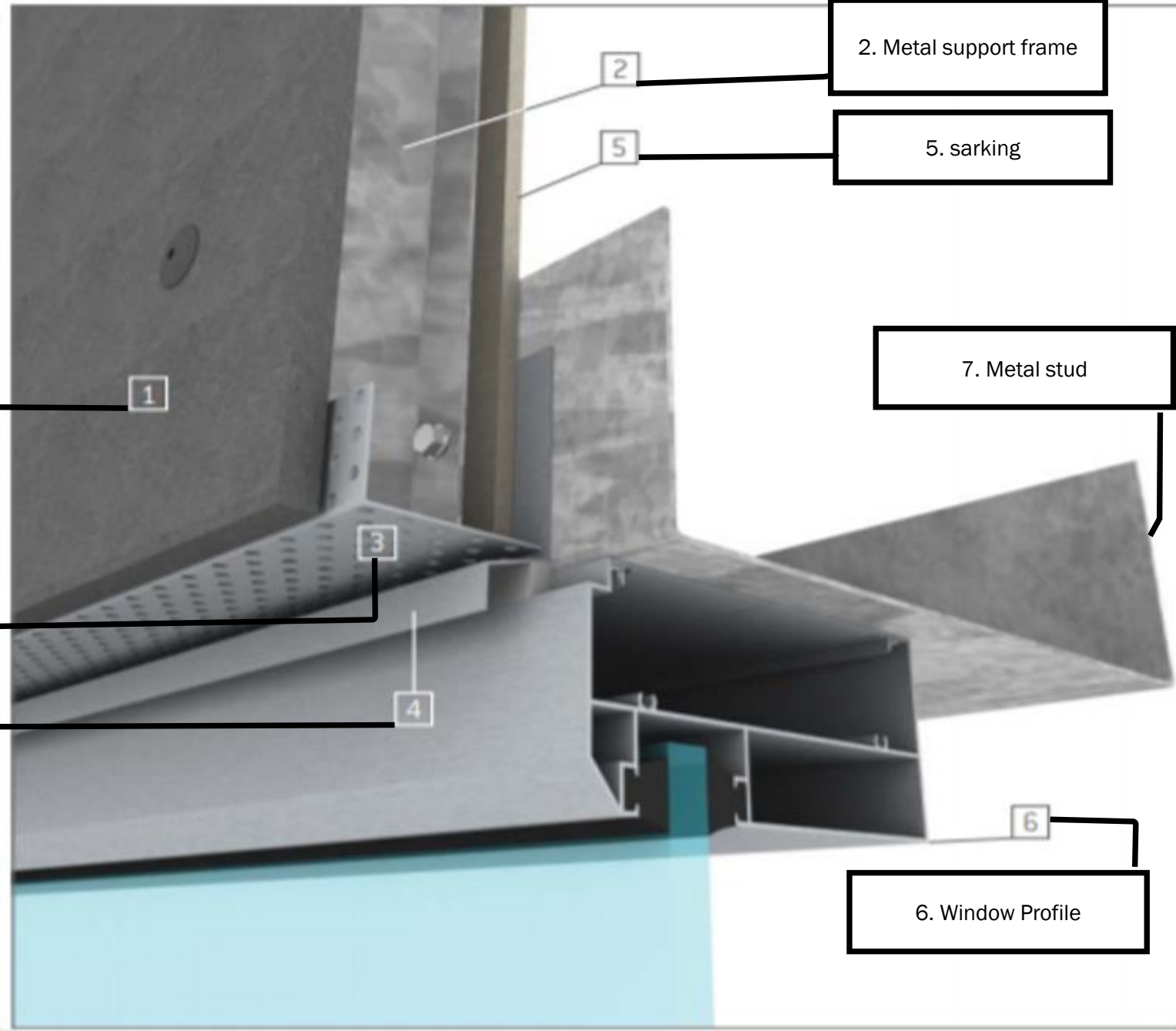
7. Metal stud



3. Perforated Profile

4. Drip Flashing

6. Window Profile

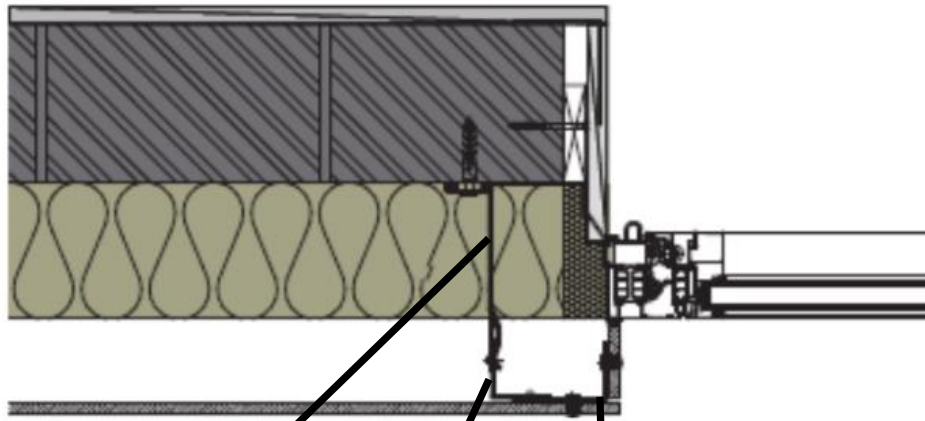


Window/Opening Jamb

The ends of the window sill must be returned up, behind the panel, or the flashing at the reveals, to offer protection from moisture ingress.

For recessed window frames, a narrow strip of panel can be used as the reveal. For wide reveals, an F-profile accessory can be fastened to the window frame to hold the end of panel secure. The front edge of the reveal panel can be fastened to the support frame corner profile.

For narrow reveals, specialist flashings are best suited. The fasteners can be positioned between 1-5/32 – 4 in. (30 – 100 mm) in from any side edge.



L bracket

Metal support
frame

Corner
profile

1. EQUITONE panel

2. Metal support frame

3. Flashing

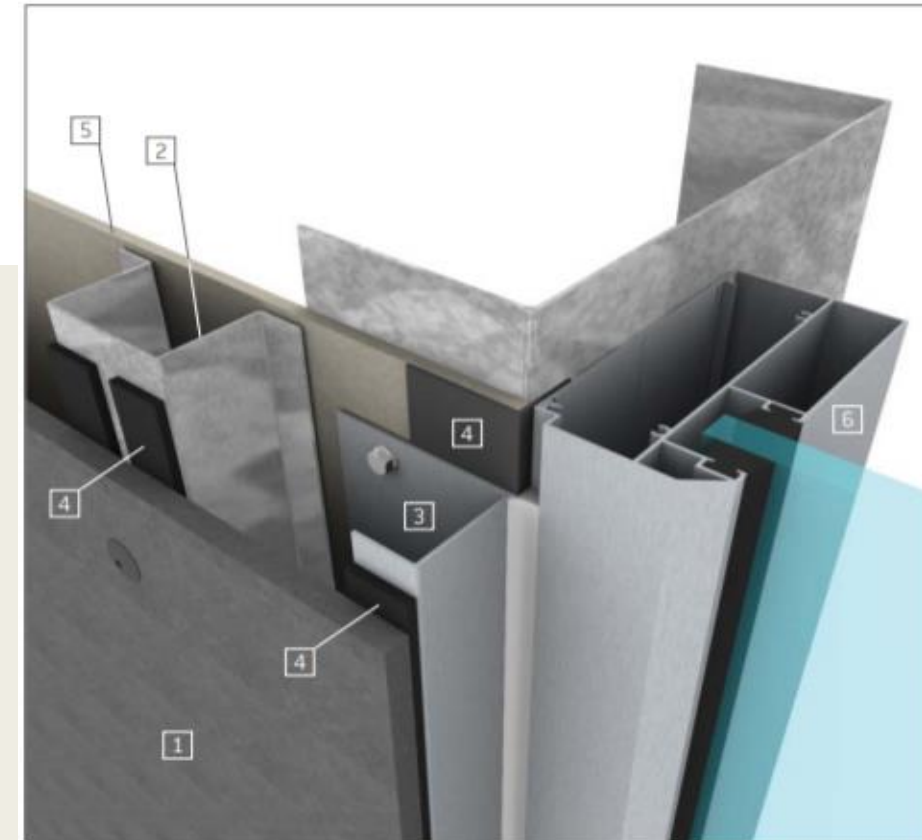
The ends of the window sill must be returned up behind the panel or the flashing at the reveals to offer adequate protection from moisture ingress. For wide reveals an F-profile accessory can be fixed to window frame to hold end of panel secure; the front edge of the reveal panel can be fixed to the support frame corner profile. For narrow reveals, specialist flashings as part of the window are generally considered to be the best option.

4. Air tight seal

Use appropriate seals between the window and the flashing piece.

5. Sarking

6. Window profile

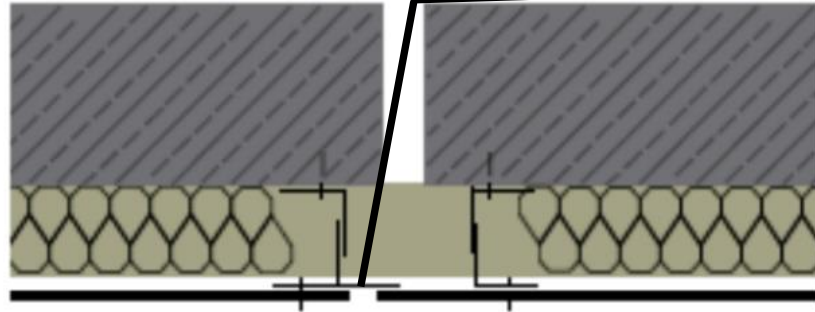


Expansion Joint

There is no special requirement for expansion joints with the panels as there is a gap on all sides and the fasteners allow for movement.

For building structural expansion joints, the panel must not be installed crossing over this expansion joint.

Coordinate vertical joints in façade panels with the position of the expansion/movement joint. An additional profile is used to support one of the panels. An adjustable "T" profile may be used, which allows the panel to slide.



T profile

Parapet

Air must be allowed to exit the cavity behind the parapet capping. A perforated profile can be used to prevent entry of birds or vermin.

A $\frac{3}{4}$ - 2 in. (19 – 50 mm) gap should be left between the face of the panel and the rear edge of the capping, depending on what height of wall that is vented.

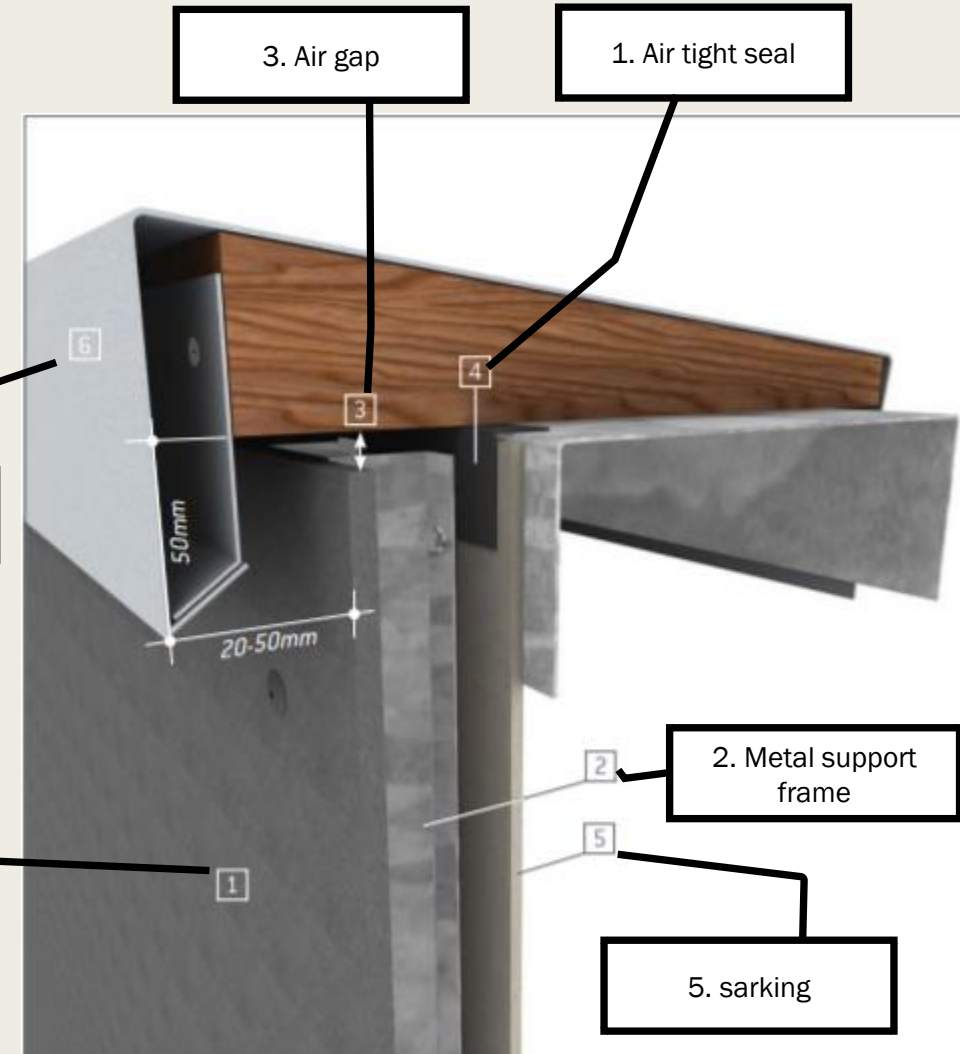
The front edge of the capping must offer adequate cover to the panels and provide a minimum of 2 in. (50 mm) overhang protection.

The panel fasteners can be installed between 2 $\frac{3}{4}$ - 4 in. (70 – 102 mm) from the top edge of the panel.



6. Metal capping

1. panel



3. Air gap

1. Air tight seal

6

4

3

50mm

20-50mm

2

2. Metal support frame

5

5. sarking

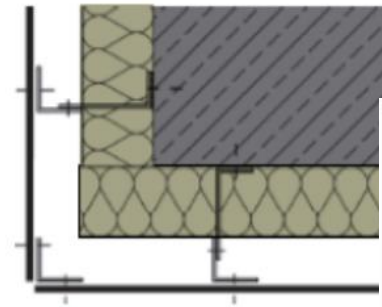
1

External Corner

External corners may be left as open joints or fitted with a proprietary trim profile.

Normally, for open joints, a 2 11/32 x 2 11/32 in. (60 x 60 mm) angle profile is used to support the panel edges. Where this angle cannot be fastened back to the wall, provide panel support within 14 in. (355 mm) of the corner. Joints in the corner profiles must coincide with the support frame expansion joints.

Some support frame suppliers have special structural corner profiles in their range.



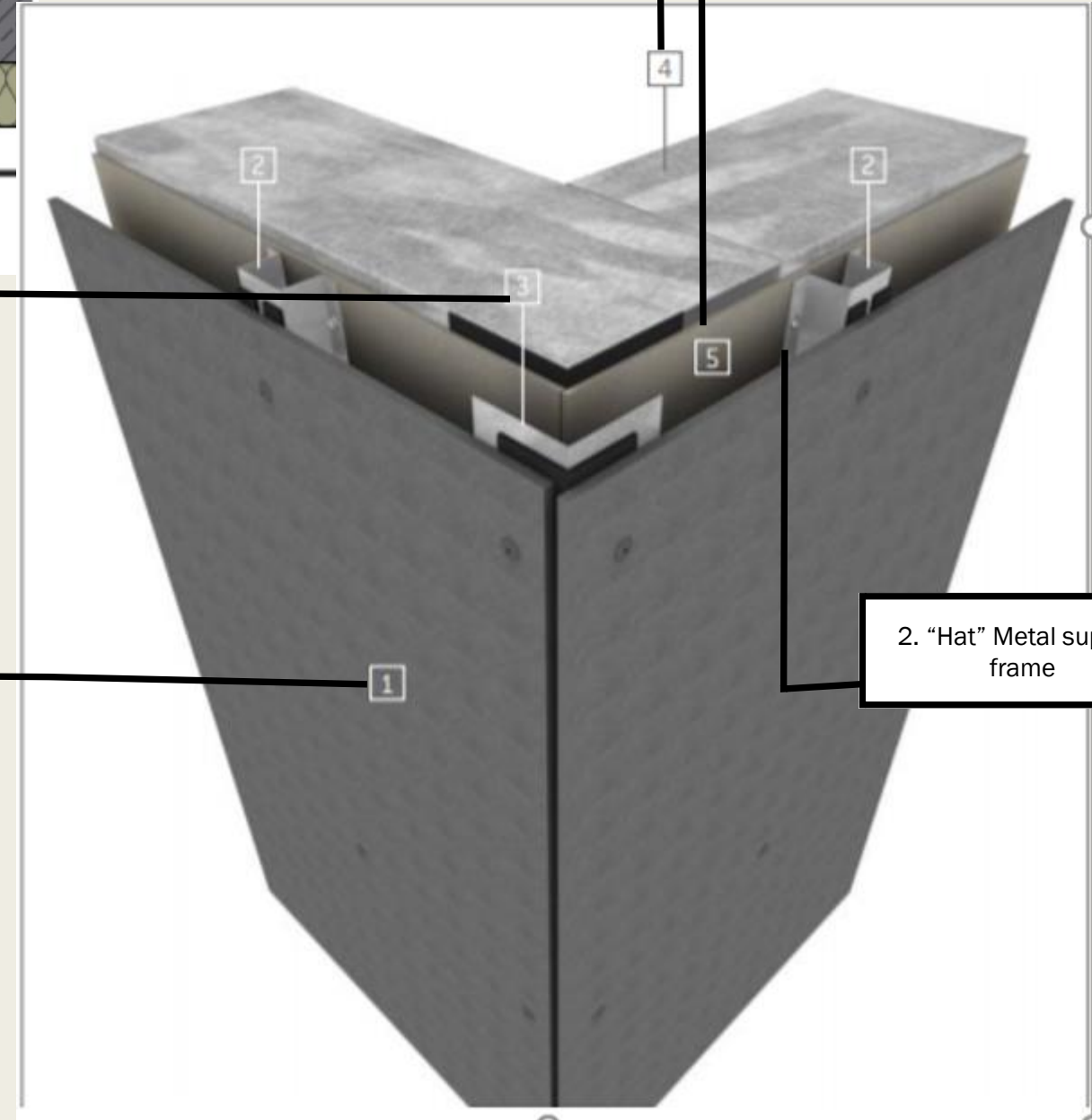
4. Wall Profile

5. sarking

3. Metal corner support

1. panel

2. "Hat" Metal support frame

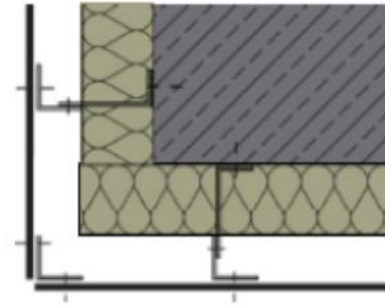


External Corner

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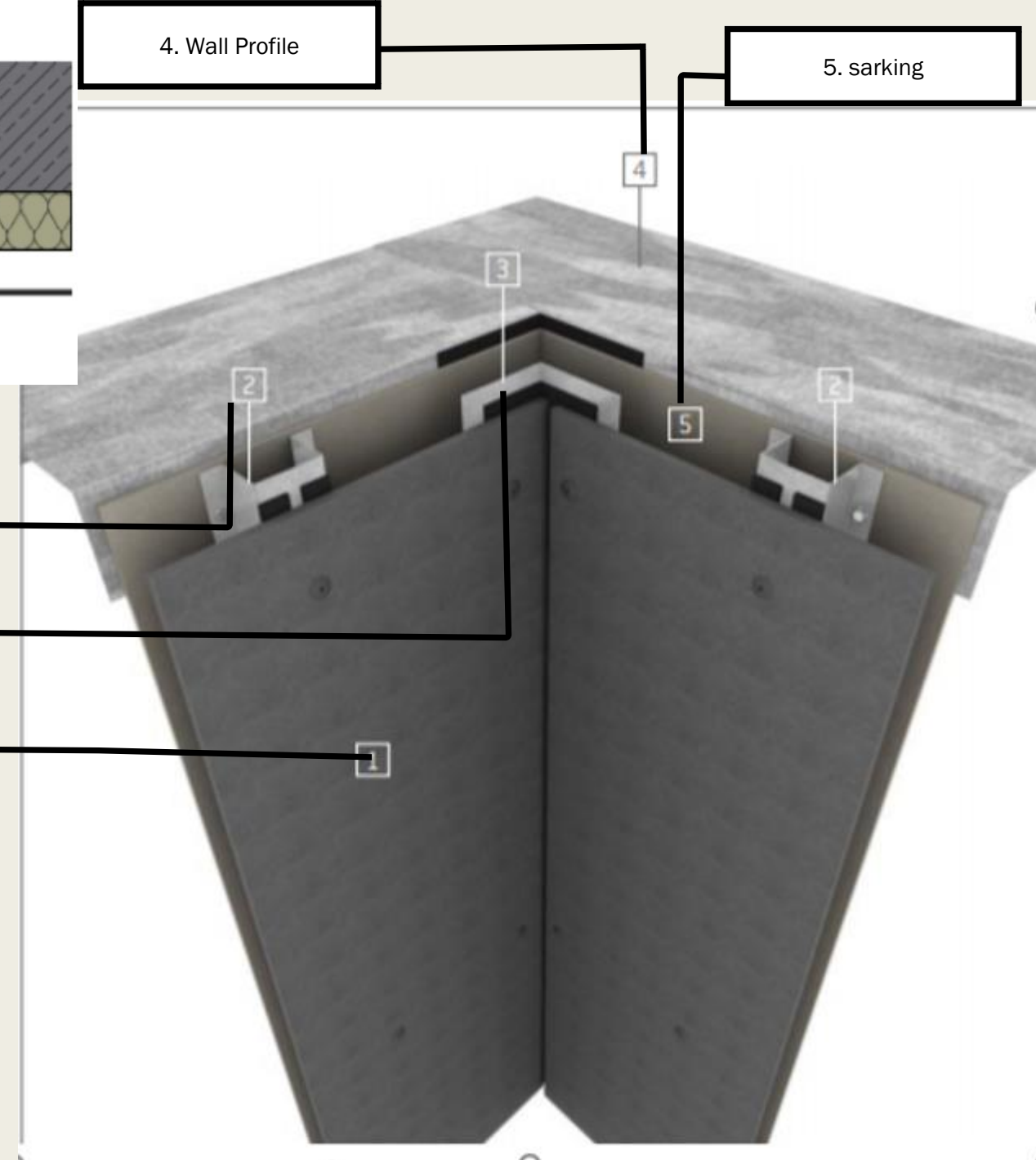
4. Wall Profile

5. sarking

2. "Hat" Metal support frame

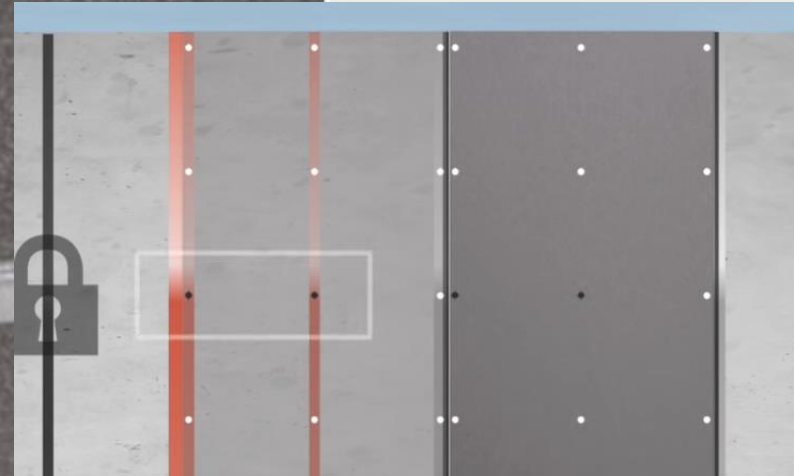
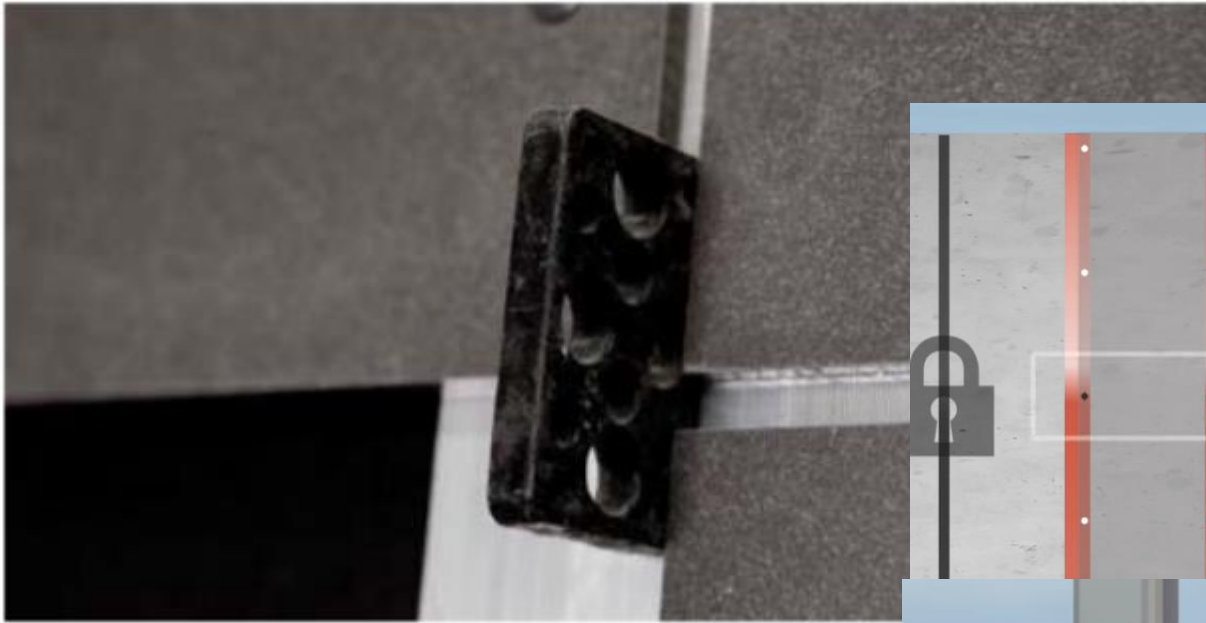
3. Metal corner support

1. panel



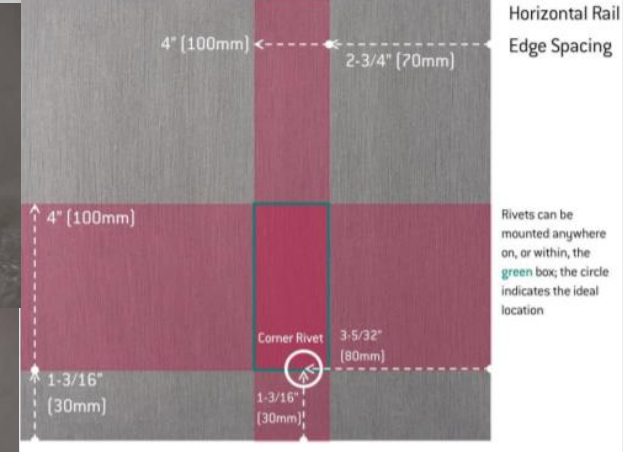
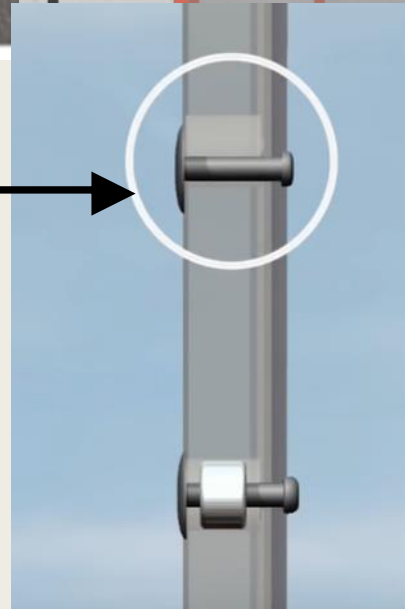
Open joints – gap width between large panels - 3/8 in.

Vertical Joints - are mostly backed with a continuous profile (“hat” or “Z” channel), which is visible between the gaps.

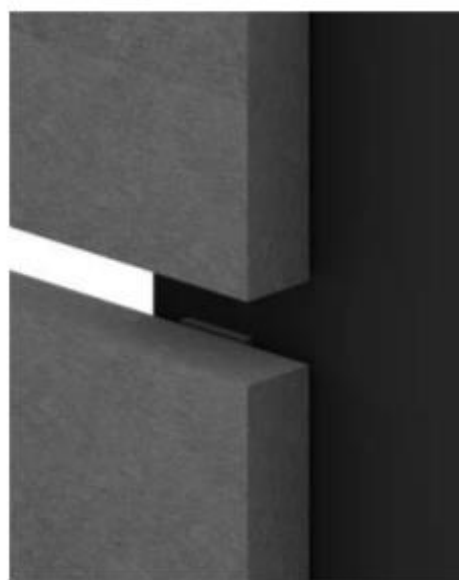


The EQUITONE panels can be rivet-fastened Joints (for galvanized steel frame)

2 fixed points- rivet with sleeve and the rest are gliding points rivet without sleeve



Joints can be concealed using black profiles, paint, tape

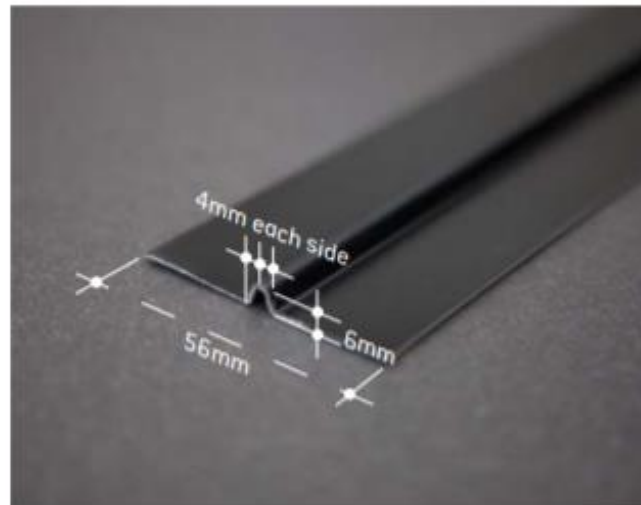


1) Open joints in which there is a clear open gap between edges of adjoining panels.



2) Closed joints where a horizontal joint profile is used to block the direct line through the joint.

Closed horizontal joints



being deposited behind the panels. In the case of kindergartens, baffles will prevent small fingers from getting stuck in the joints.

When a horizontal joint required to be closed, a metal joint profile of maximum 0.8mm thickness can be inserted behind panels.

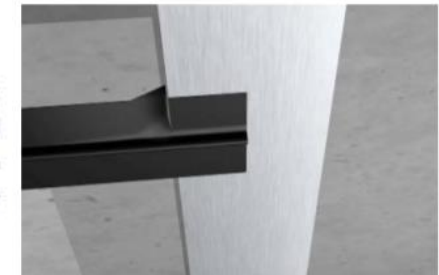
By using a joint profile the majority of water is prevented from entering the cavity. In some buildings it is advisable to have closed joints, such as the low areas of public or educational buildings. The joint profile will prevent debris from

Closed horizontal joints



1) Before final fixing of the lowest rivets on a panel, the profile is slid up under the panel.

2) When fasteners are tightened, the profile is held in place. At the junction with a vertical joint the profile can be trimmed to maintain a pleasing vertical joint appearance. The profile can be cut approximately 4mm narrower than the width of the panel, leaving the profile 2mm shorter at each side.



3) To prevent sideways movement of the joint profile, and exposing that movement at vertical joints, cut and bend top or bottom edges of the profile at both sides of one of the vertical support profiles or battens.

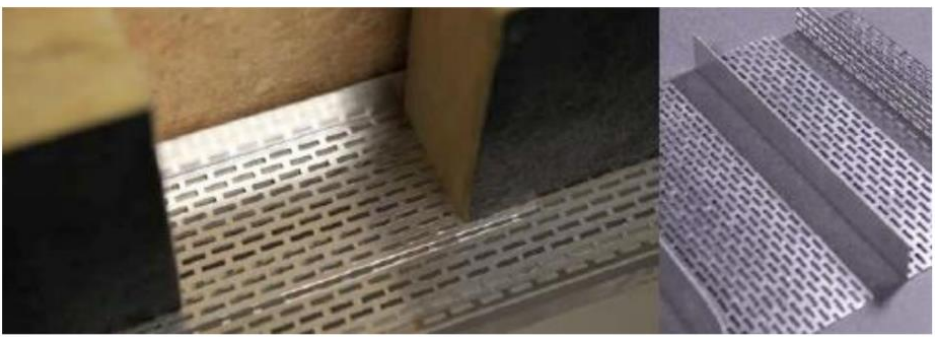
Foam tape

The Cavity prevents water from reaching the insulation or substrate. By ventilating the cavity, moisture arising from water passing the rainscreen, moisture migrating from the inner surface of the wall, or condensation will be removed by either evaporation or simply by running down the back of the panel and escaping out and away from the substrate.

Building Height	Minimum Cavity Depth
0 – 33 ft. (10 m) —————→	¾ in. (20 mm)
33 – 66 ft. (10 – 20 m)————→	1 in.(25 mm)
66 – 165 ft.* (20 – 50 m)————→	1-3/16 in. (30 mm)

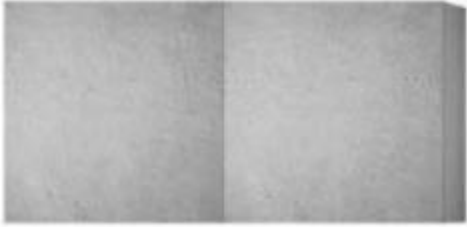
The type of joint influence the cavity depth. Open, horizontal joints will allow more air movement than baffled joints, and, therefore, a deeper cavity may be considered with baffled joints.

Ventilation: current of air enters at the base of the cladding and exits at the top. As well as cavities being ventilated at the top and bottom of the façade, it is also important air is allowed to enter and exit under and over openings such as windows.



The cavity space is protected by perforated profile.
Perforation size: 3/8 in. (20 mm)

Structural Wall



A few insulation boards to consider are:

Mineral Fiber



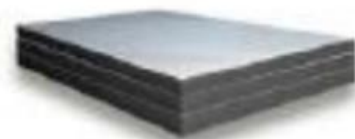
Polyurethane (PUR, PIR)



Phenolic Foam



Cellular glass



9.0 Detailing

Ground Level

General Principles:

- Position the ends of the panels a minimum 150 mm above the finished ground level to
 - To help prevent rain splashback
 - Ensure entry of air into cavity
 - Protect opening with a perforated profile to prevent entry of vermin into the cavity.
 - End of panel to form a drip to prevent water running back to wall.
- No planting should be grown near the air inlet as over time the plants may block the air flow.

Only EQUITONE [textura] and [pictura] can be used for this arrangement of allowing the panel to run into the ground. Position a 10 mm open continuous joint within 600 mm of the finished ground. Form a drainage trench at the base of the panels to prevent water build-up.

EXTRA NOTE:
For EQUITONE [materia] finish panels ends 300 mm above finished ground level.

Figure 1: Ground Level

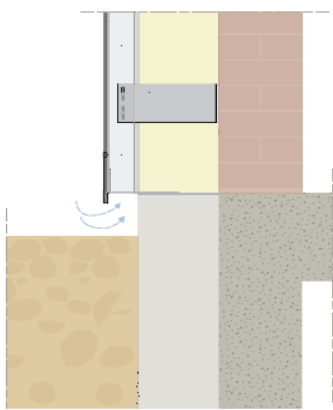
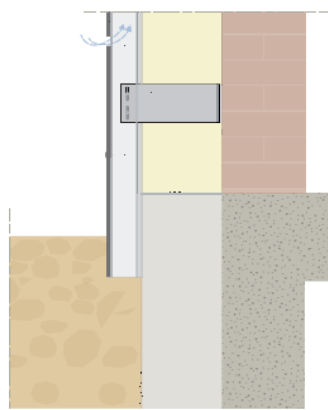


Figure 2: Ground Level



Internal Corners

General Principles:

- Similar to external corners, Internal corners can be left as open joints or fitted with a trim profile.
- Any trim profile must be less than 0.8mm thick to prevent distortion of panel. Trim profiles need to be fully supported on angle profiles.

Figure 7:
Robust Internal Corner Detail
Metal

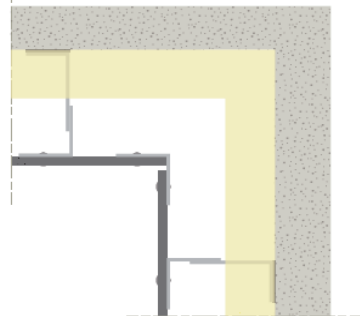


Figure 8:
Internal corner trim
Could be metal or plastic

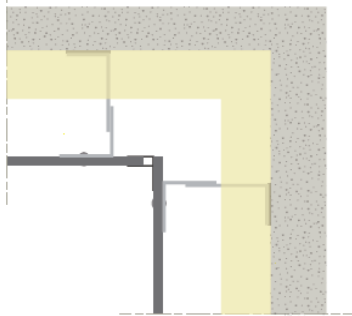
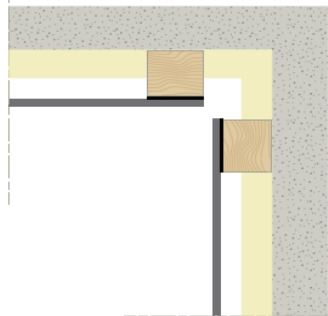


Figure 9:
Alternative Internal corner trim
Timber



Corner detail

External Corners

General Principles:

- The edges of the panels can be open joints or fitted with a decorative trim profile.
- Supporting the corners of the panels is critical.
- A continuous vertical cavity closer can be introduced so that the wind pressures are separated from one side to the other.

Figure 3:
Open Joint External Corner

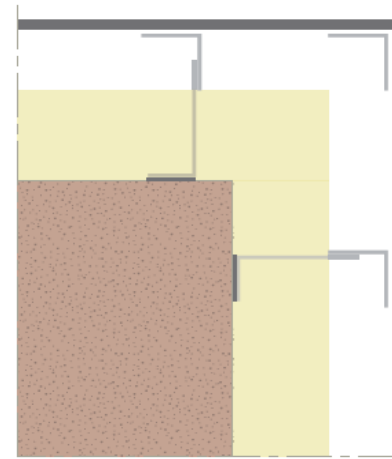


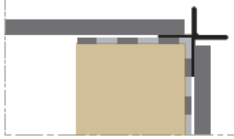
Figure 4:
Standard External Corner Detail



Figure 5:
Mitred External Corner Detail



Figure 6:
External Corner with trim
Timber subframe

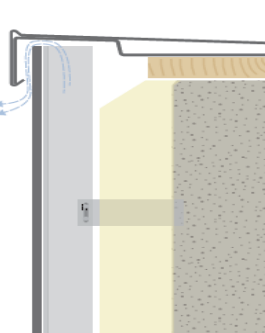


Parapet

General Principles:

- Protect the top of the cavity against water ingress.
- Ensure sufficient air flow is maintained out under the coping.
- For wider gaps a perforated profile can be used to prevent entry of birds.

Figure 10: Parapet Detail

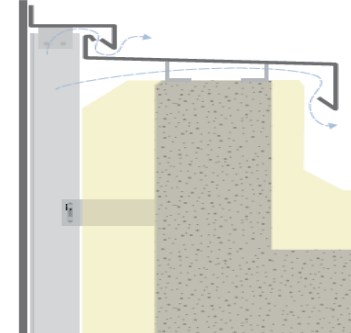


Flush Parapet Detail:

- Where a parapet is desired without an overhanging coping it is important to;
- Protect the top of the cavity against water ingress.

Seal back of panel to the metal flashing.

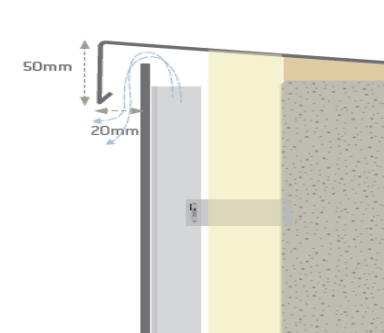
Figure 11: Flush Parapet Detail



EXTRA NOTE:

For EQUITONE [materia] the following capping dimensions should be followed. A minimal 20mm (50mm in case of copper) should be left between the front of the panel and rear of the capping. The front edge of the capping must offer adequate cover to the panels and provide a minimum of 50mm by buildings up to 8m and a minimum of 80mm by buildings up to 20m and a minimum of 100mm by buildings over 20m protection.

Figure 12: EQUITONE [materia] Capping Detail



Roof detail

Recessed Window

The ends of the window cill must be returned up behind the panel or the flashing at the reveals to offer protection from moisture ingress.

Figure 13: Window Jamb

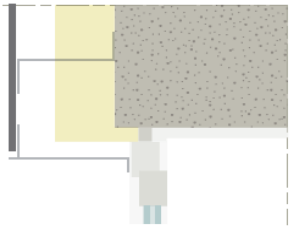


Figure 14: Jamb Detail

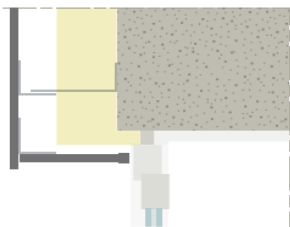


Figure 16: Window Head

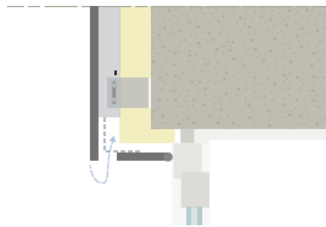
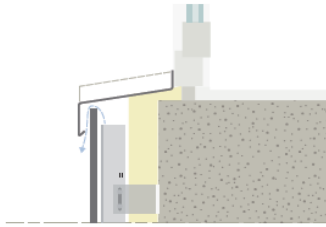
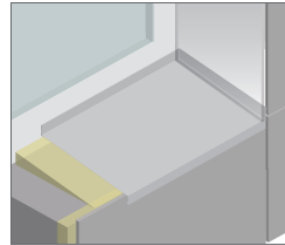


Figure 15: Window Cill



See Figure 15.

For Narrow Window Reveals Specialist flashings as part of the window are best suited. The ends of the window cill must be returned up behind the panel or the flashing at the reveals to offer protection from moisture ingress.

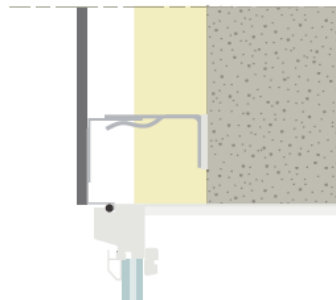


Flush Window

General Principles:

Typically formed using an Aluminium profile or similar to create the closer to cavity and cover to the window abutments. The maximum unsupported edge of the panel must be respected.

Figure 17: Flush Window



Structural Movement Joint

General Principles:

For the building structural expansion joints the panel must not be fixed crossing over this expansion joint.

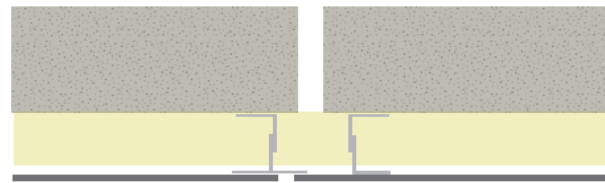


Figure 18: Vertical Movement Joint

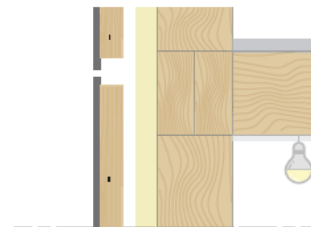


Figure 19: Horizontal Movement Joint

Soffit/Junctions

General Principles:

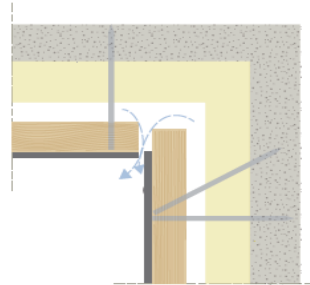
EQUITONE to Flat Soffit

EQUITONE materials can be used for a soffit application either as a small soffit and fascia or a large soffit/ceiling. When used in this application it is recommended to ventilate the rear of the material and to reduce the framing/fixing centres.

Please contact your local EQUITONE Service team for more assistance.

A clear ventilation path must be provided at the head of any façade panel/framing where it abuts a soffit. Depending upon the soffit type and finish this may require ventilation as well.

Figure 20: Soffit Detail



Junction with other Façade Materials

EQUITONE to Render

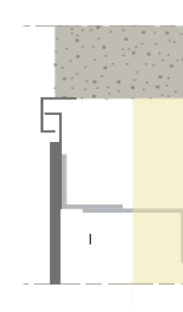


Figure 21:
EQUITONE to render side abutment

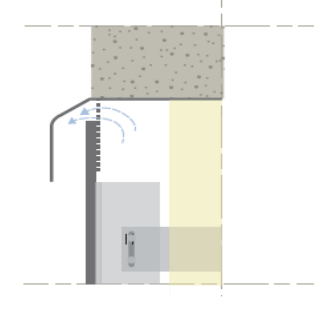


Figure 22:
EQUITONE to render top abutment

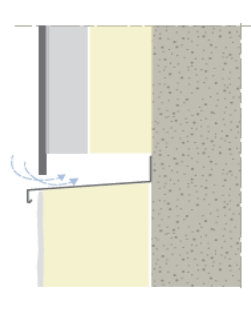


Figure 23:
EQUITONE to render base detail

Window detail

Glass Curtain Wall Material

Case Study



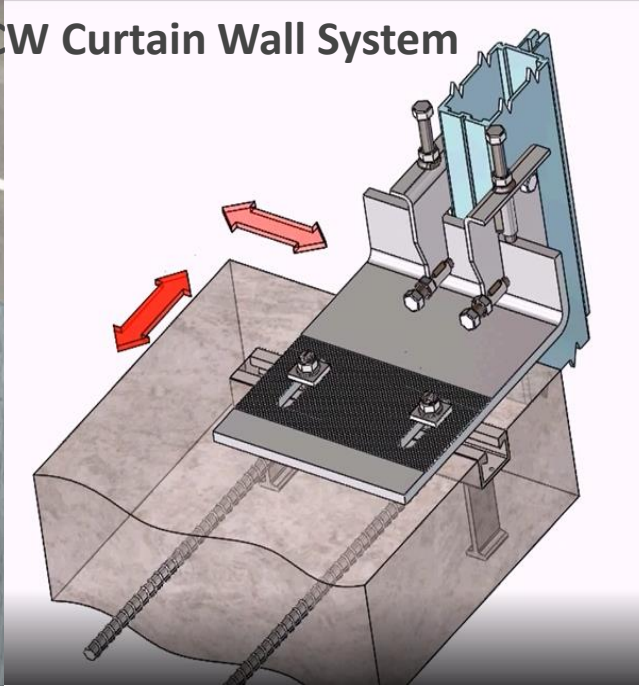
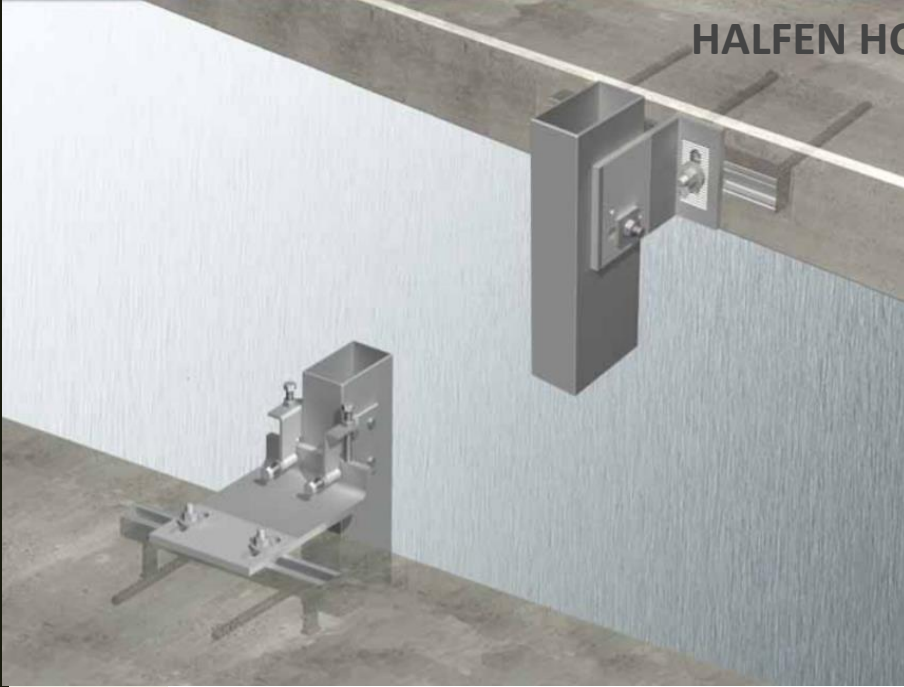
THE FORUM AT MARVIN HALL

Architect:
Studio 804

Location:
Lawrence, KS

Featured Products
Curtain Wall, Entrances

HALFEN HCW Curtain Wall System



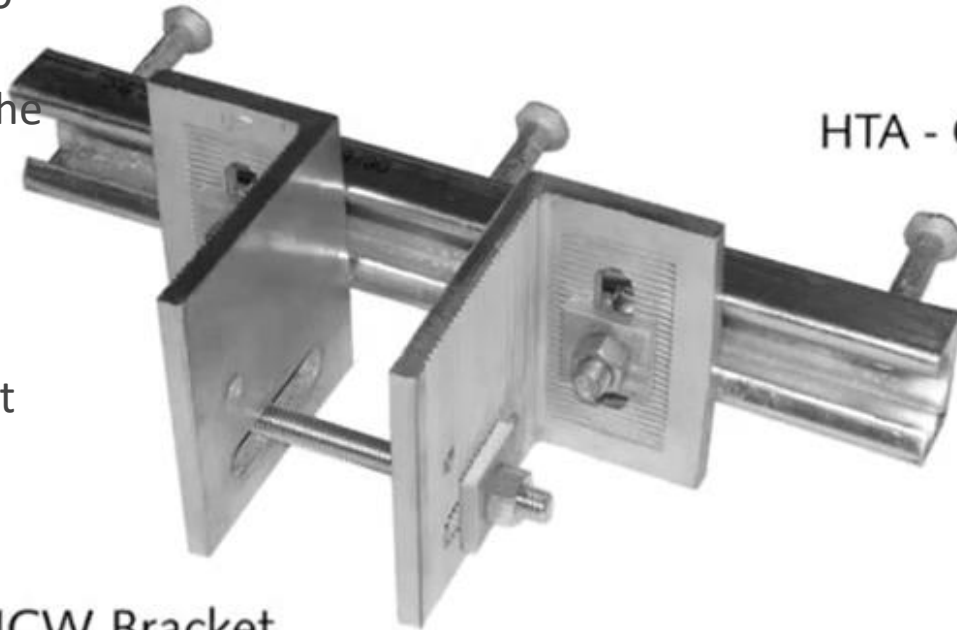
Halfen Channel Curtain Wall - HCW installation



The System is used to attach curtain wall façade elements to the main structure of a building.

There are different types of brackets that allow assembly either on the top or on the edge of concrete slabs.

HCW Bracket



HTA - Channel

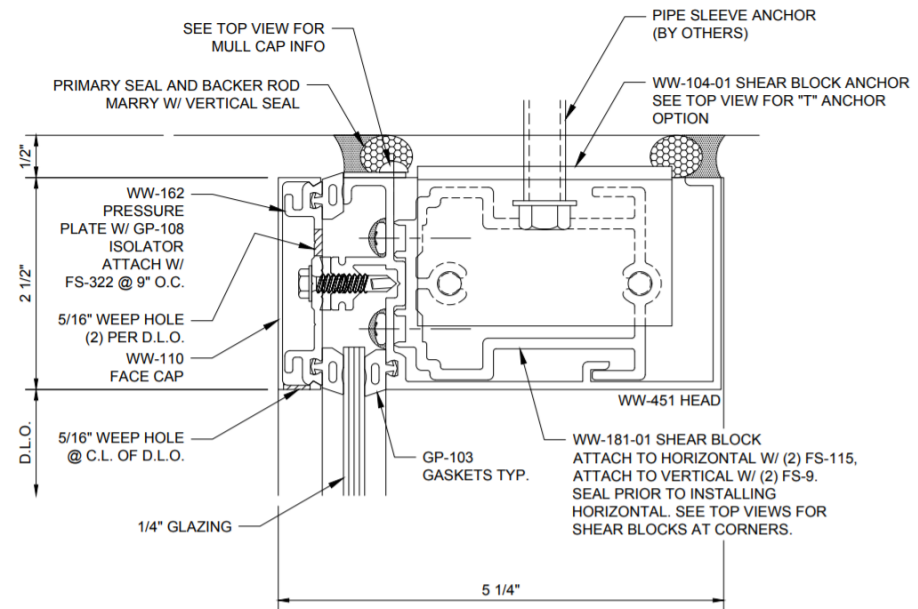


Reliance™ Curtain Wall—outside glazed, high performance pressure equalized curtain wall system by Oldcastle BuildingEnvelope®

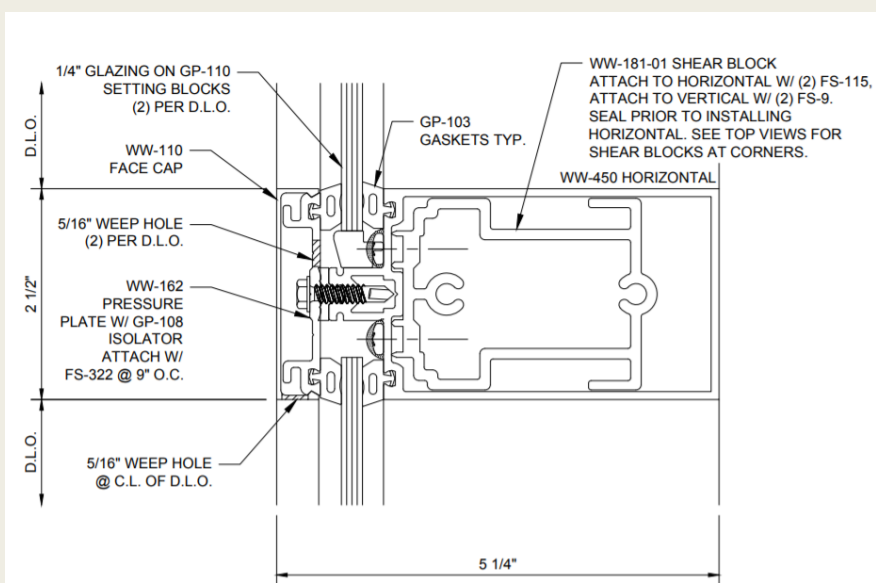


The Reliance™ Curtain Wall zone-glazed system is easy to install and features **exceptional water control** and outstanding thermal performance. 1" and 1-1/4" typical infill systems are offered with snap-in glazing adaptors to accommodate 1/4" spandrel glazing. In addition, a complete system for 1/4" infill is available. Reliance™ provides two gasket options: EPDM dense gaskets on both the interior and exterior, or EPDM sponge gaskets on the interior to accommodate molded corners. Other installation features include roll-over and roll-under horizontals to simplify typical field stick erection. Reliance™ Curtain Wall is thermally broken utilizing an EPDM push-in isolator, and an FRP pressure plate is available for the 1" and 1-1/4" systems to take thermal performance to the next level.

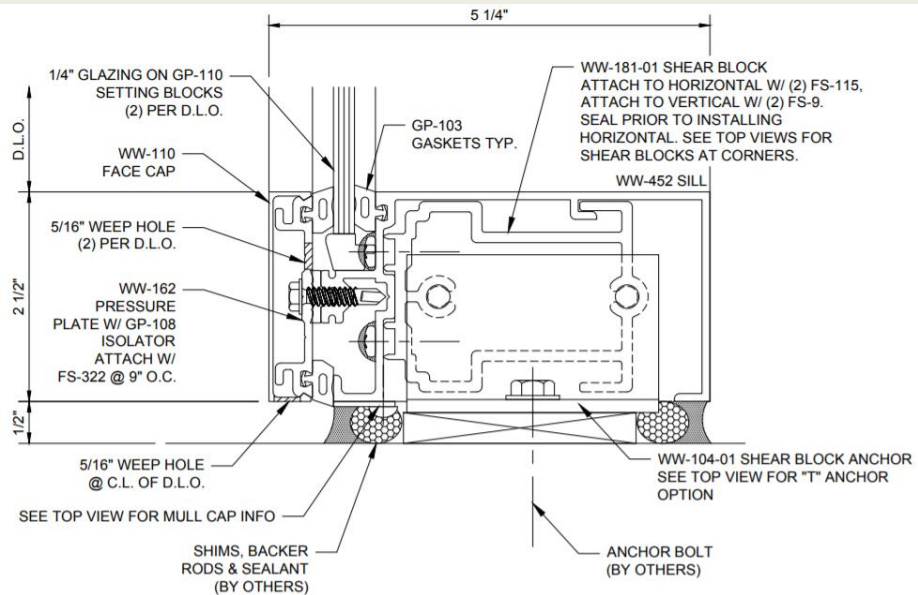
RELIANCE CURTAIN WALL 2-1/2" X 5-1/4" - 1/4" GLAZING



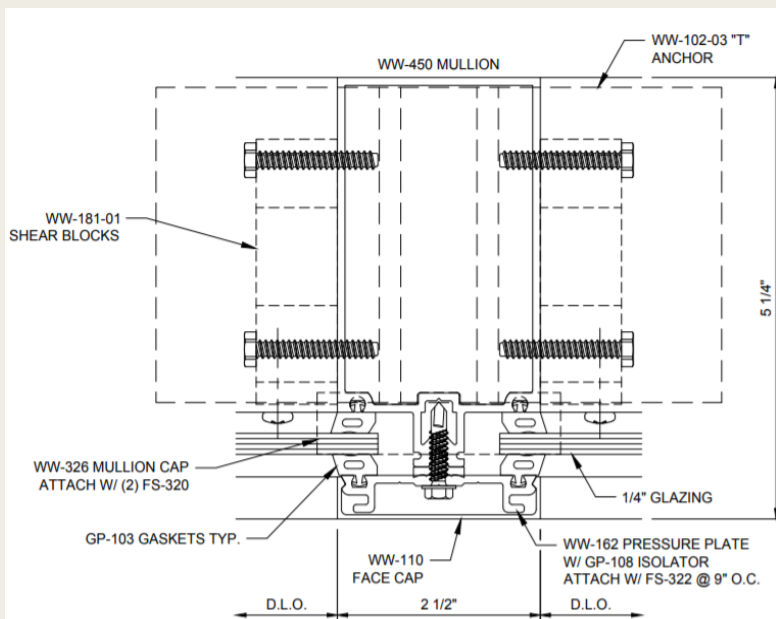
Reliance™ Curtain Wall
Head Horizontal at Vision - H3801



Reliance™ Curtain Wall
Intermediate Horizontal at Vision - H3805

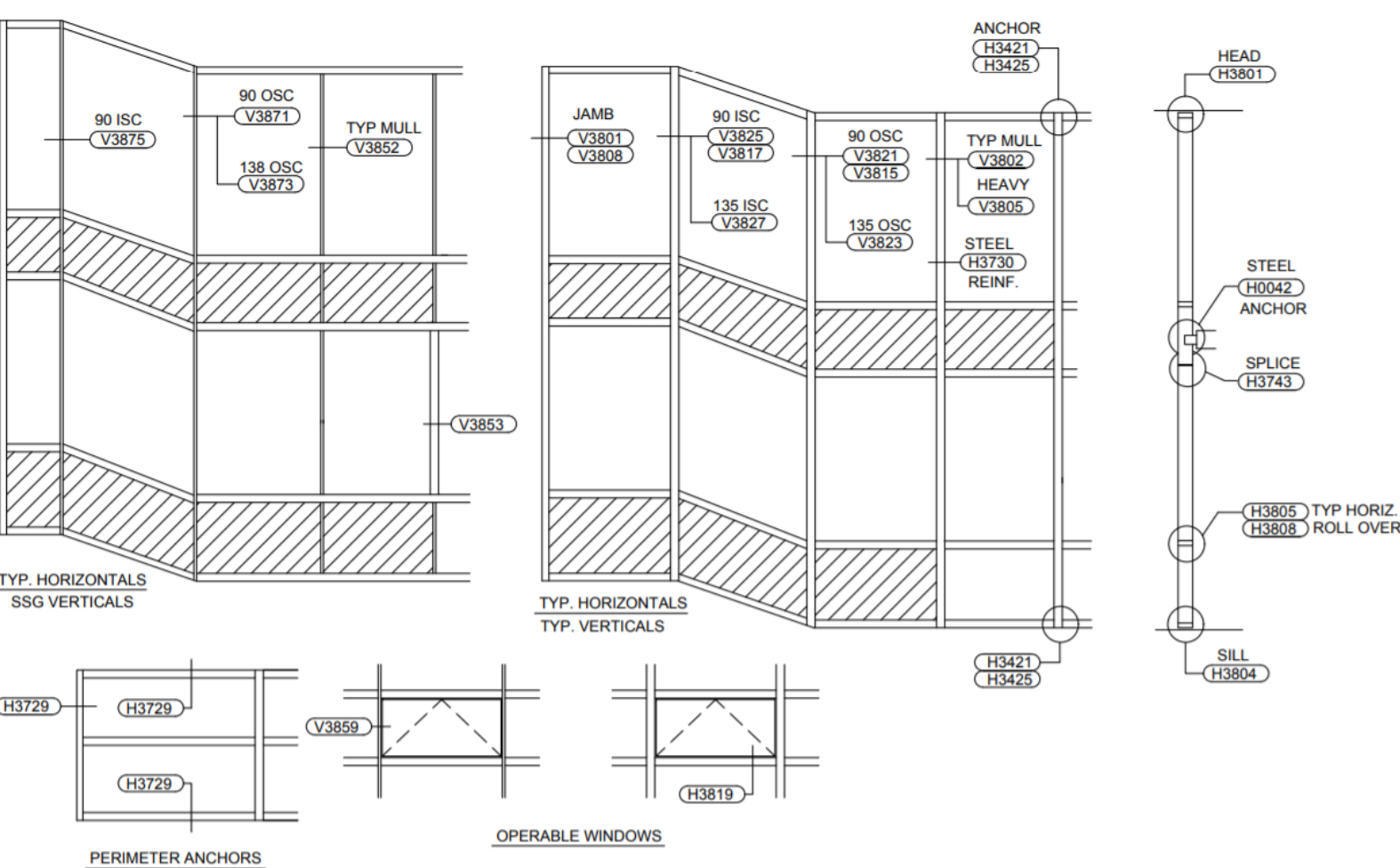


Reliance™ Curtain Wall
Sill Horizontal at Vision - H3804



Reliance™ Curtain Wall
Typical Vertical Mullion - V3802

RELIANCE CURTAIN WALL 2-1/2" X 5-1/4" - 1/4" GLAZING



Reliance™ Curtain Wall
2-1/2" x 5-1/4" w/ 1/4" Glazing - Elevation