



Solid Aluminium Cladding Guide





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Introduction

FIREFLY Solid Aluminium Panels

FIREFLY Solid Aluminium (FSA) panels, which are highly corrosion resistant, are made from 5052 marinegrade aluminium.

Additionally, the FSA panels are extremely durable, thanks to their three layers of superior PVDF coating. As such, they offer an ideal solution for a vast range of applications.

In addition to their high performance, our panels are available in a diverse range of colours that complement any landscape. Whether you prefer bold and contemporary hues, sophisticated pearlescent metallics, or subtle and understated shades, our panels will elevate the appearance of any building facade.

Our panels offer an eco-friendly solution with 100% recyclable panels that can be repurposed into limitless future possibilities.

Aluminium Alloy 5052

Alloy 5052 is an aluminium-magnesium alloy primarily alloyed with magnesium and chromium. Typical applications of this alloy include marine, aircraft, architecture, general sheet metal work, heat exchangers, fuel lines and tanks, flooring and facade panels, street lights, appliances, rivets and wire.

Alloy 5052 exhibits exceptional corrosion resistance against seawater and salt spray, making it a preferred choice for use in coastal areas, and in chemically aggressive environments.

The National Construction Code 2022, on F3D5, references AS 1562.1 in relation to metal wall and roof cladding. AS 1562.1 then calls for aluminium grade 5251 or 5052 and conformance with AS/NZS 1734 to comply with the Performance Requirements of F3P1 - Weatherproofing in the NCC 2022 through a Deemed-to-Satisfy (DtS) pathway.

FIREFLY Solid Aluminium panels are made of aluminium alloy 5052, have a thickness of 3 mm and a temper grade H32, complying with clause F3P1 through the DtS provision F3D5.

Key Features

Material	Pre-finished 3mm marine grade aluminium
Finish	FIREFLY panels incorporate three layers of superior PVDF coating, ensuring exceptional corrosion resistance
Fixing System	Can be folded or pressed to suit the requirements of your project
Application	Type A and B constructions where non-combustible materials are required such as mixed-use developments and large-scale infrastructure projects such as hospitals
Warranty	20 year warranty subject to standard terms and conditions



**NCC
Compliant**



**100%
Recyclable**



**20 Year
Warranty**

Tools & Equipment (of your choice)

Stage Fabrication
Purpose Cutting machine
Tool/Equipment Circular Plunge Saw (for linear cutting) or CNC Machine



Stage Fabrication
Purpose Cutting machine
Tool/Equipment Jigsaw (for curves) or CNC Machine



Stage Fabrication
Purpose Routing machine
Tool/Equipment Hand Router or CNC Machine



Stage Fabrication
Purpose Bending
Tool/Equipment Aluminium H profile (for bending the routed panels) or Folding Jig



Stage Installation/Fabrication
Purpose Screw fixing & fastening
Tool/Equipment Screw Driver & Bits



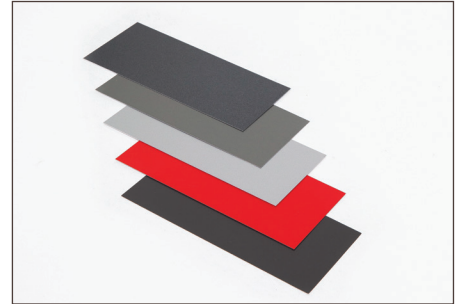
Stage Fabrication/Installation
Purpose Dispensing sealant
Tool/Equipment Caulking Gun



Hardware

FIREFLY Solid Aluminium Cladding panels

Solid 3 mm aluminium panels, highly corrosion resistant, made from 5052 marine grade aluminium, with three layers of superior PVDF coating.



FIREFLY VapourSafe

Heavy duty vapour permeable membrane for walls and roofs, fabricated to serve as a pliable, non-combustible barrier in Type A & B fire resistant constructions, as well as across various construction types, where superior fire safety and vapour permeability are desired.



FIREFLY Aluminium Foil Reinforced Tape

Used for sealing non-combustible sarking / building membrane joints. Comprised of fire-retardant acrylic adhesive and reinforced with two non-combustible layers - a layer of Fortaglas and a layer of aluminium foil.



FIREFLY Non-Combustible Backing Rod

Vapour permeable, non-combustible backing rod comprised of Fortaglas rope overbraided with a continuous filament. Available in six roll sizes, it is used in between the cladding panel and other joints to fill voids in building facades.



FIREFLY Vulcan R0.2 Non-Combustible Thermal Break

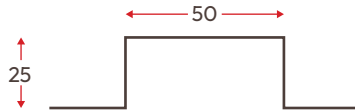
Used in between metal frame and external cladding in building facades to minimise heat leakage and thermal bridging. Comprised of Fortaglas and aluminium foil. It contains no binders or adhesives. Available in a 10 m roll or 6 mm x 90 mm pads or can be supplied, cut into individual 6 mm x 90 mm pads.



Hardware

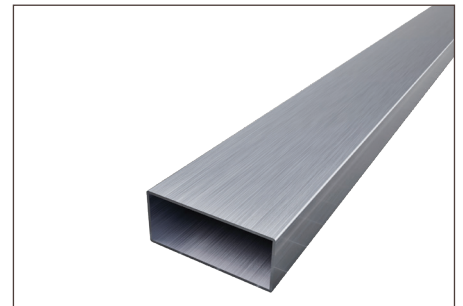
Galvanised Top Hats

Available in 25 x 50 x 1.15 mm, 35 x 50 x 1.15 mm or 50 x 50 x 1.15 mm. Galvanised top hats to create the frame/support for the cladding panel installation.



38 x 19 x 2.0 mm Aluminium Stiffener

Used to stiffen the aluminium panels being installed to the back of it.



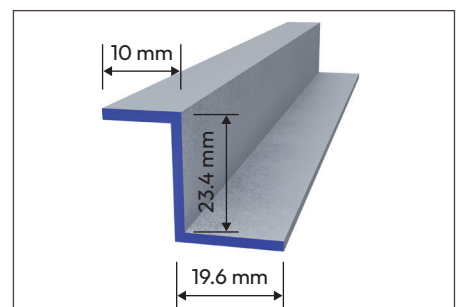
3 mm Aluminium Angle Cleat

Used to mechanically fix the aluminium stiffener to the aluminium facade panels.



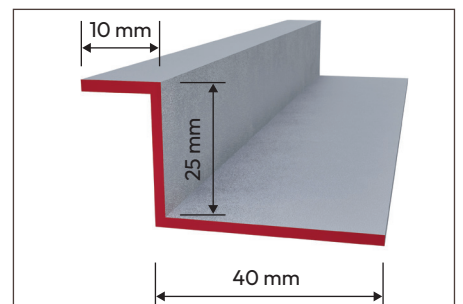
Low profile Z Angle

Used in the construction of the cassette type of facades, by attaching it to the facade panels and joining them with high profile Z Angles.



High profile Z Angle

Used in the construction of the cassette type of facades, by attaching it to the facade panels and joining them with low profile Z Angles.



Hardware

Self-drilling Hex Head screws 10 g x 16 mm

For fixing Z angles to top hats.



Self-drilling Wafer Head screws 10 g x 16 mm Phillips drive, galvanised

For fixing Z angles and stiffeners to aluminium facade panels.



3M VHB™ B90F Architectural Panel Tape 24 mm or equivalent

Used to bond the stiffener to the back of the aluminium facade panel.



3M VHB™ GPH-160 Series Tape 10 mm or equivalent

Used to bond the Z angles to the back of the aluminium facade panel.



AS 1288 Structural Silicone

Used to bond the stiffener to the back of the aluminium facade panel.



Hardware

Low modulus, Architectural grade Silicone Sealant

Used for weather sealing cladding expansion joints.



Electrolysis and Galvanic Corrosion Protective Isolation Tape, with PVC or Polyethylene layer

Used to reduce galvanic corrosion from contact between the aluminium and galvanised members (Z angle - top hat interface).



3M Maroon Grade Scotch-Brite Abrasive or equivalent

Used to abrade surfaces, promoting adhesion.



Isopropyl Alcohol

Used to clean surfaces, promoting adhesion.



3M AP-111 Adhesion promoter or equivalent

Used to promote adhesion between surfaces.



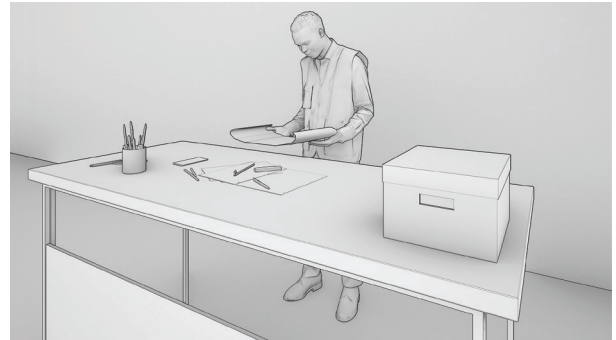
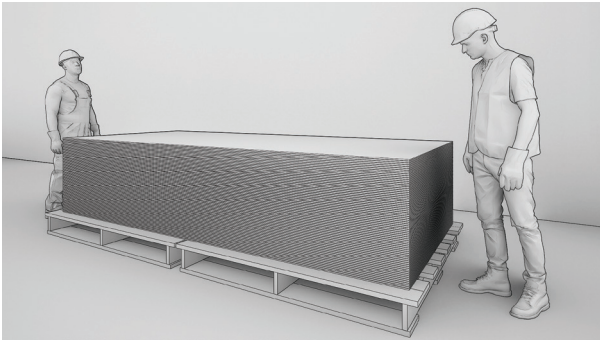
Fabrication

Step 1 | Works preparation

Check the fabrication drawings and confirm the fabrication details.

Confirm the panels' colour, size and quantity.

Confirm that all the tools required for the fabrication process are available.



Step 2 | Cutting and routing

Note: Ensure that the panels are oriented with the arrows on all panels pointing in the same direction on each elevation of the building. Failure to orient panels in this way can result in small differences in appearance from adjacent panels.

Mark cutting and grooving lines on the back of the panels, based on the drawings.

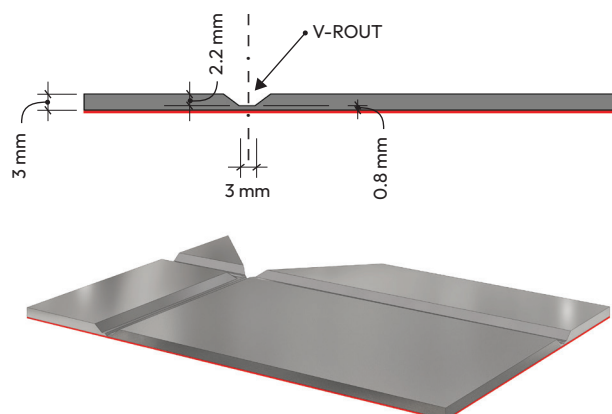
If using CNC manufacturing technology, the marking process can be skipped as the equipment will have all this information loaded to it.

Cut the panel to size and route the grooves to the back of the panel where the folding will take place.

When routing a V-groove, ensure that there is a minimum of 0.8 mm of aluminium left under the base of the groove.

It is recommended to create a V-groove with a flat base of 3 mm to a maximum depth of 2.2 mm.

For optimum fabrication results use a lubricant mister.



Step 3 | Folding

Fold the panel edges where the panel grooves are.

To fold the panels a folding jig should be used, to ensure a uniform folding to the edge. Check that the angle is at 90° after folding.



Step 4 | Z angles attachment

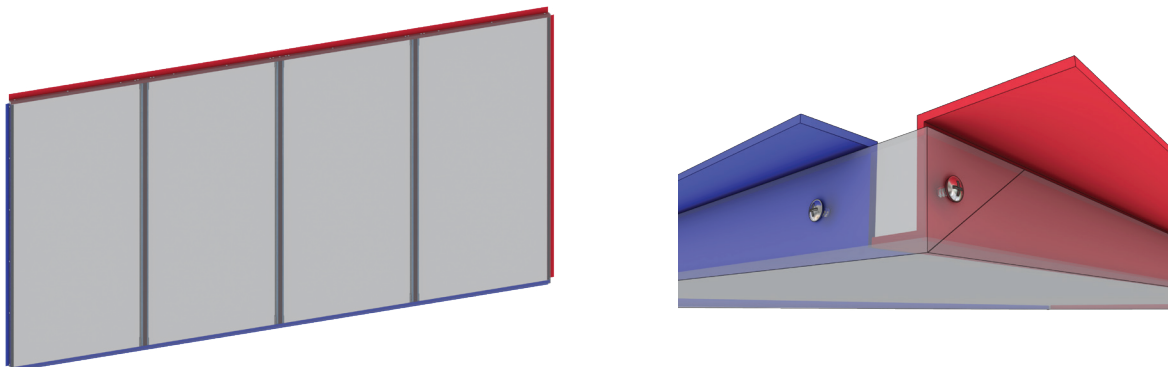
Prepare the surfaces of the panel and the Z angle for the application of the tape, as per described in Appendix A - Surface Preparation for Tape Application.

Attach the bonding tape to the Z angle as described in Appendix B - Bonding Tape Application and attach the angle to the rear of the panel. Alternatively, you can attach the bonding tape to the rear of the panel first.

Attach the Z angles to the edges of the panel as per described in Appendix C - Attachment of Extrusions (Z and RHS Stiffener) to the panel - as per the diagram, using self-drilling wafer head 10 g x 16 mm Philips drive galvanised screws, at 200 mm centres.

There are two types of Z angles to be attached to the panel; high profile Z angle (marked in red), and low profile Z angle (marked in blue).

The low profile Z angle is 1.6 mm shorter in height than the high profile Z angle.



Step 5 | Holes to the Z angles

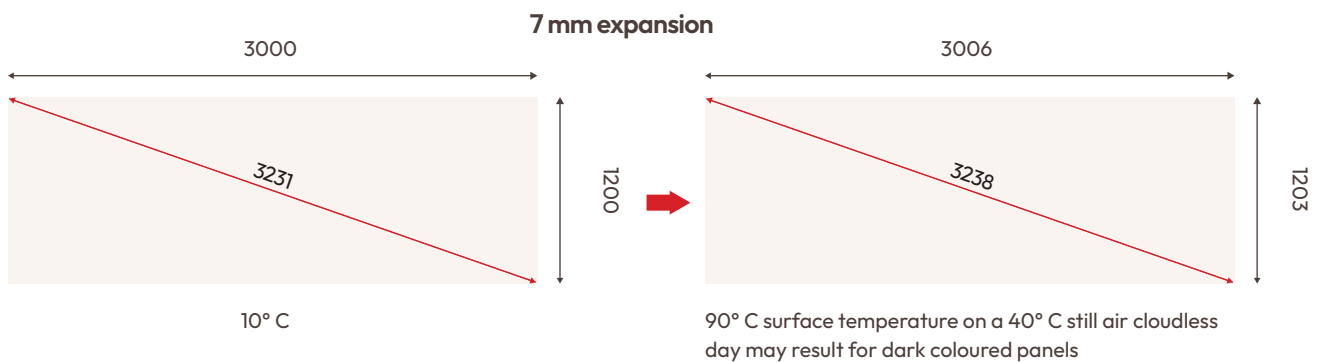
Create a static hole, as well as oversized holes, on the Z angles for the attachment of the panel to the top hats, as per the project design, at maximum 600 mm centres.

A static hole is required to pin the panel to a fixed location.

Oversized holes are required to account for the potential thermal expansion/contraction, preventing panel bowing.

The hole size is to be determined based on the panel size and the expected temperature differential.

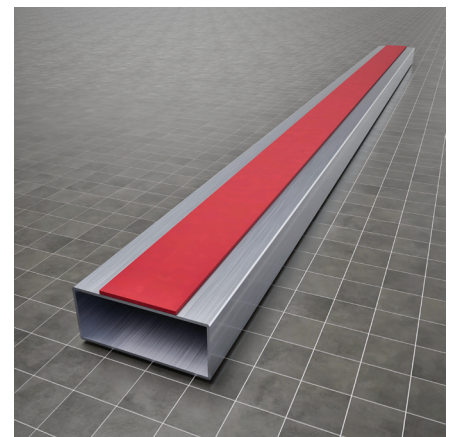
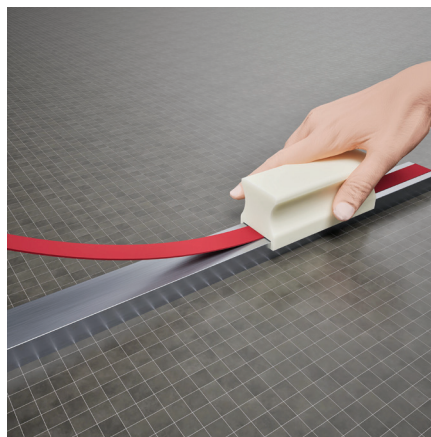
An example for a 3.0 x 1.2 m panel subjected to a temperature differential of 80°C is shown, for reference (considering the average CTE for commercially pure metal is 24×10^{-6} mm/K/m).



Step 6 | Stiffener preparation

Prepare the stiffener surface as per detailed in Appendix A – Surface Preparation for Tape Application.

Apply bonding tape to the stiffener as per described in Appendix B – Bonding Tape Application – Stiffener.



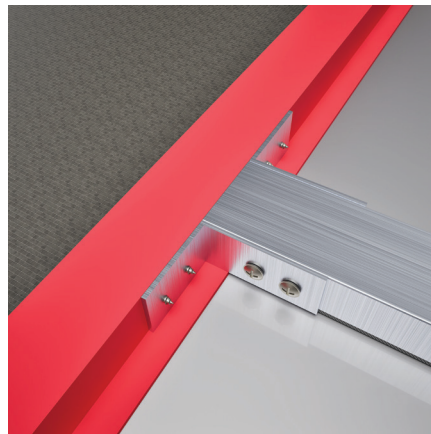
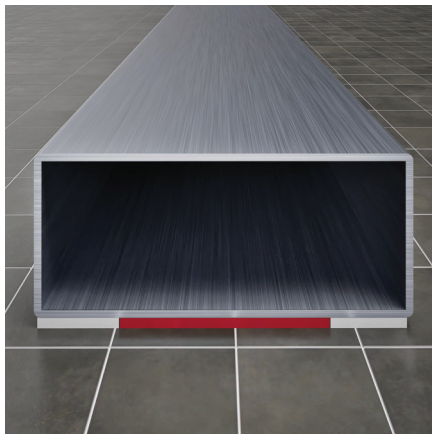
Step 7 | Stiffener installation to the panel

Panel surface preparation

1. Prepare the panel as detailed in Appendix A - Surface Preparation for Tape Application.

Install stiffeners to the back of the panel as per described in Appendix C - Attachment of Extrusions (Z and RHS Stiffener) to the panel - as per the diagram.

1. Install the stiffener to the back of the panel, at maximum 600 mm spacing (for up to 3.0 kPa ultimate limit state wind load), in the pre-determined locations, by securing it with the tape. Apply a 10 kg point/rolling pressure to promote adequate bonding.
2. Apply structural silicone to AS 1288 (0.21 Mpa) to either side of the stiffener, ensuring the silicone penetrates to the full depth of the gap, bonding the stiffener to the panel.
3. Mechanically fix the stiffener to the panel / Z angles, at each end by using L brackets, and self-drilling wafer head 10 g x 16 mm Philips Drive galvanised screws.



Installation

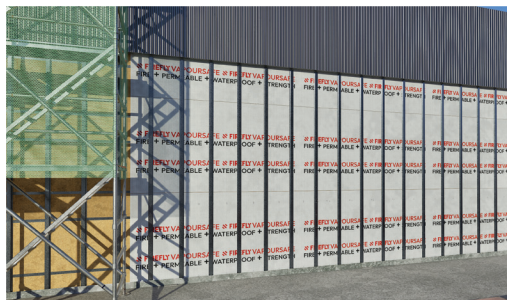
Note: An appropriate secondary weatherproofing layer or membrane complying with AS4200.1 and AS4200.2 is to be included in front of any moisture sensitive components, such as insulation. Normally, this layer would be installed underneath the top-hat subframe.

FIREFLY VapourSafe is a non-combustible and class 4 vapour permeable sarking that is ideal for most applications behind FIREFLY FSA. Please refer to the VapourSafe installation guide.

Step 1 | Top hat installation

Install the top hats to the external wall, using 25, 35 or 50 mm steel top hats, ensuring appropriate spacing between the top hats is maintained, as per the projects' design.

For applications requiring thermal breaking to minimise heat flow and thermal bridging, install FIREFLY Vulcan R0.2 Thermal Break. Please consult the Vulcan R0.2 Thermal Break installation guide for details.



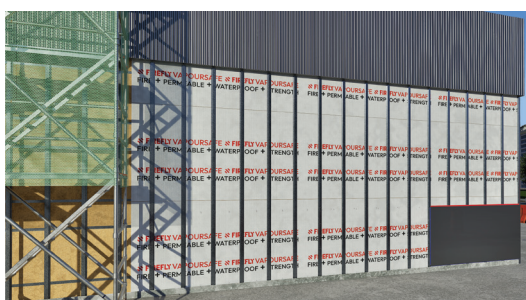
Step 2 | Installation of the first panel

Note: Install isolation tape over the top hats. The isolation tape separates the aluminium from the galvanised steel to prevent galvanic corrosion.

Fix the first cassette to the top hat sub-frame by fixing the high profile Z angles, using self-drilling hex head 10g x 16 mm screws.

Ensure the use of the correct torque on the screws to allow for panel movement. Do not over-tighten.

Protective isolation tape is to be installed where there is contact between the Z angles and the top hats, to prevent galvanic corrosion.



Step 3 | Installation of following panels

Note: Ensure a minimum spacing of 12 mm between panel edges when fixing it, to achieve a minimum 12 mm wide joint and meet the joint size criteria (12 mm to 45mm).

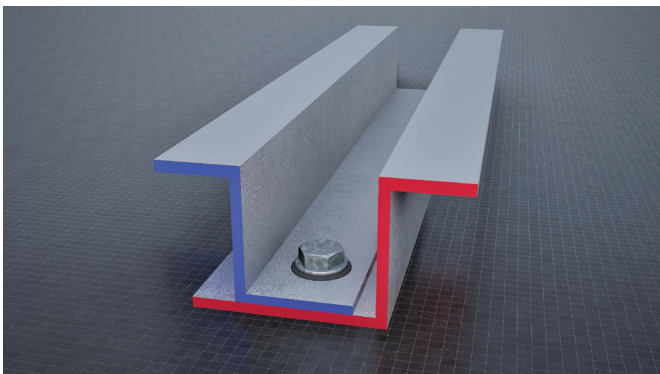
Place and fasten the following cassette to the top hat sub-frame, fixing the high profile Z angles, using self-drilling hex head 10g x 16 mm screws.

Ensure the use of the correct torque on the screws to allow for panel movement. Do not over-tighten.

Fix the overlapped Z angles, where the panels join together, using self-drilling hex head 10g x 16 mm screws.

Ensure the use of the correct torque on the screws to allow for panel movement, ensuring you don't over-tighten.

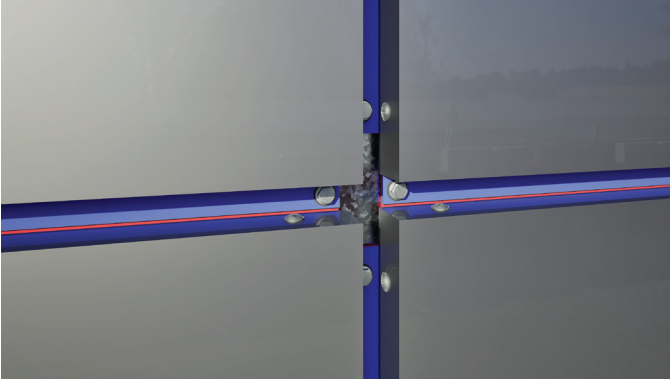
There are two types of Z angles on each cassette, a high profile Z angle (marked in red) to be fixed against the top hat, and a low profile Z angle (marked in blue) to be fixed against the high profile Z angle and the top hat.



Step 4 | Joint sealing

Friction fit the FIREFLY Non-Combustible Backing Rod to the full depth of the panel joints.

Install a low modulus, architectural grade silicone sealant on top of the backing rod, to seal the panel joints.



Installation Details, Masonry Substrates

Reference to NSW Project Remediate

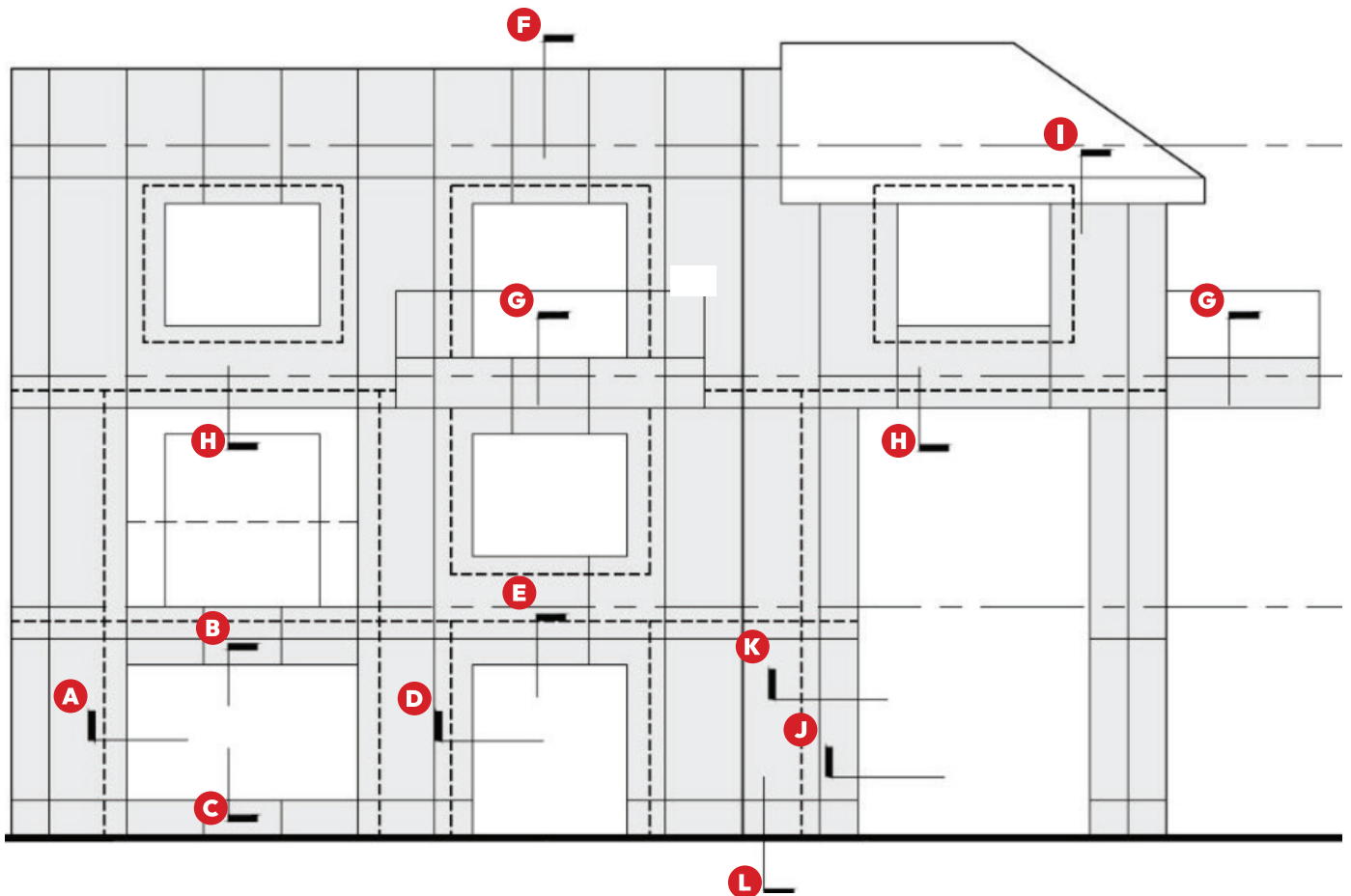
FIREFLY Solid Aluminium Panels installation guide follows the installation details of the Pattern Book used on Project Remediate, in New South Wales (NSW).

Project Remediate is a program that helps replace combustible cladding on high-risk apartment buildings. The program was introduced in 2020 by the NSW Government with the intent of protecting NSW residents from high-rise building fires while following Australian legislative changes, in response to incidents like the Grenfell Tower fire, in London.

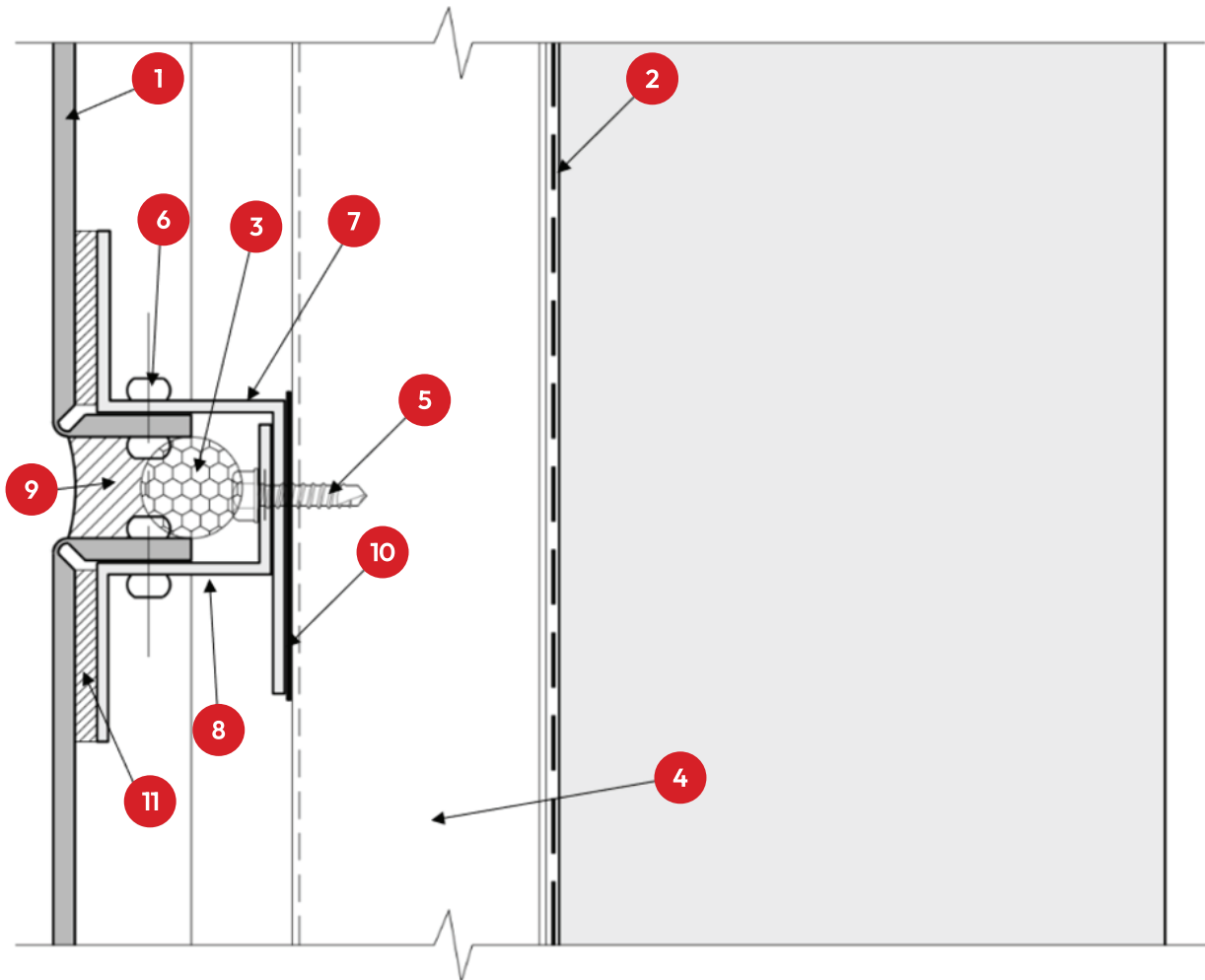
The Pattern Book has been designed by the Project Remediate Global Facade Consultant to guide the consideration and design of remediation works for buildings participating in Project Remediate. It is used by all design teams and building contractors on Project Remediate, facilitating standard solutions and minimising redundant re-design work.

The Pattern Book's designs are considered to be best-practice on designs and systems, addressing common cladding situations.

Typical elevation | generic

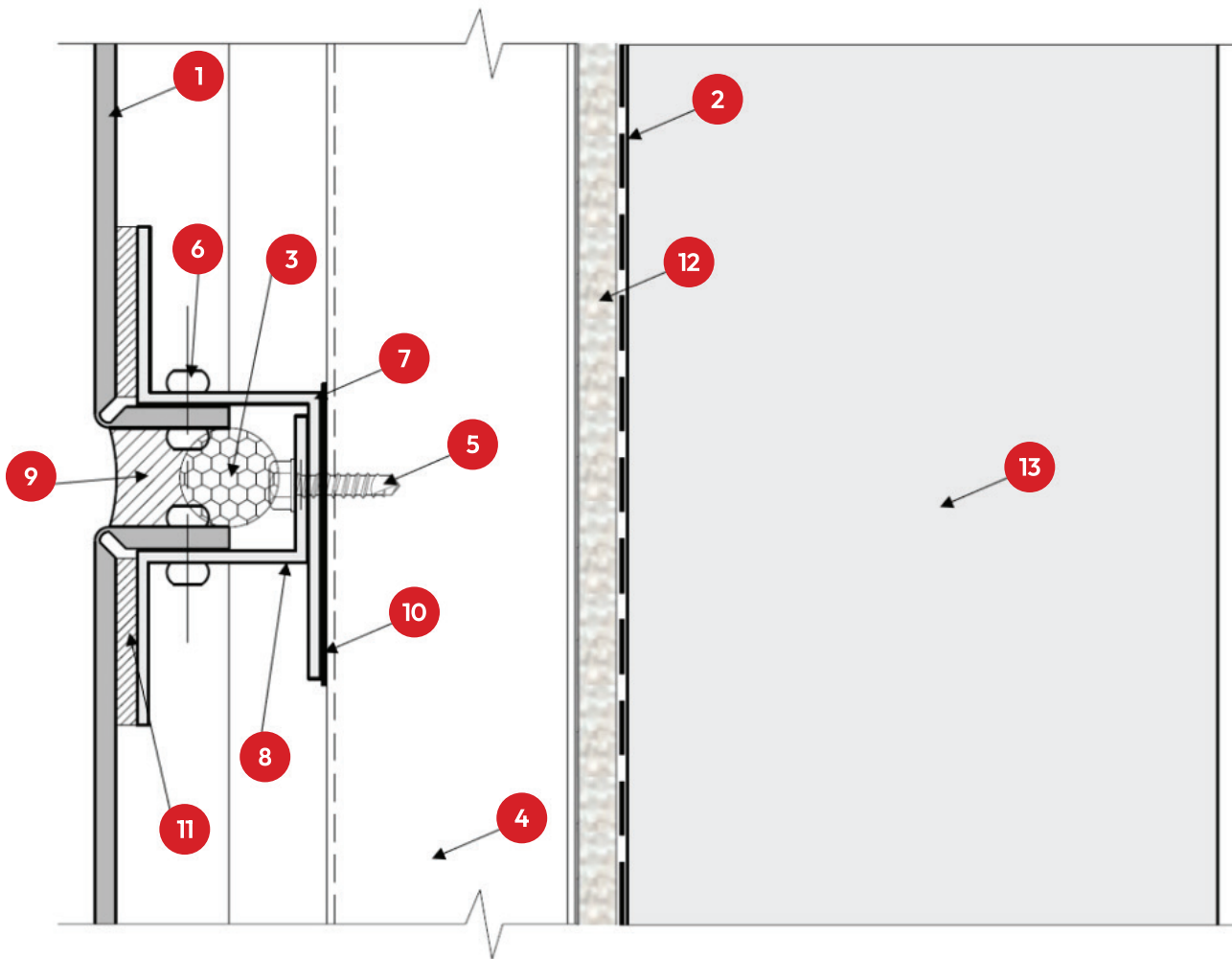


General joint Detail | vertical section | Masonry



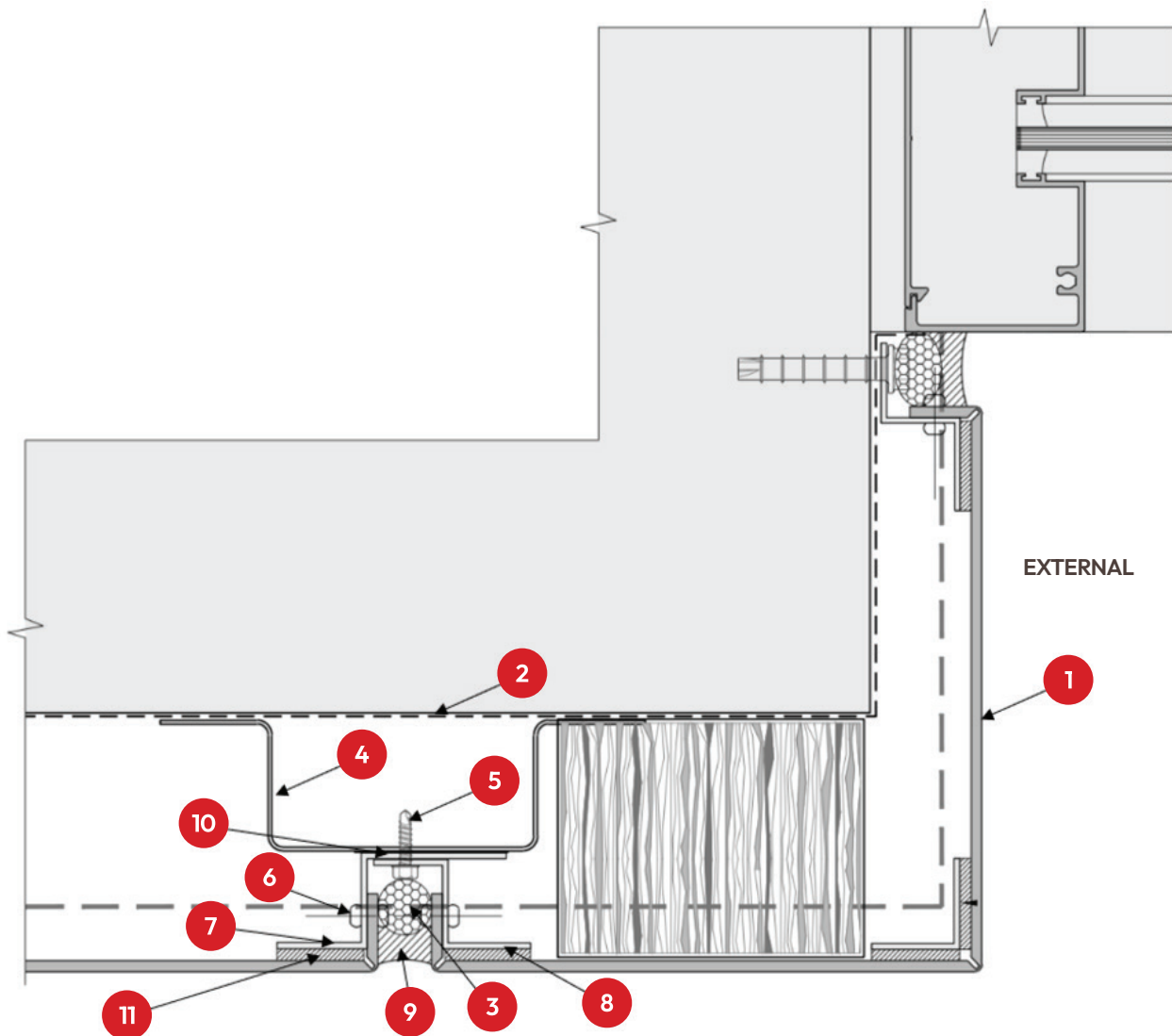
1. FIREFLY Solid Aluminium Cladding panels
2. FIREFLY VapourSafe sarking/membrane
3. Backing rod
4. Top hat
5. Self-drilling hex head screws
6. Self-drilling wafer head screws, galvinised
7. High Z angle
8. Low Z angle
9. Low modulus architectural grade silicone sealant
10. Isolation tape
11. Bonding tape, 12 mm

General joint Detail | vertical section | Steel structure



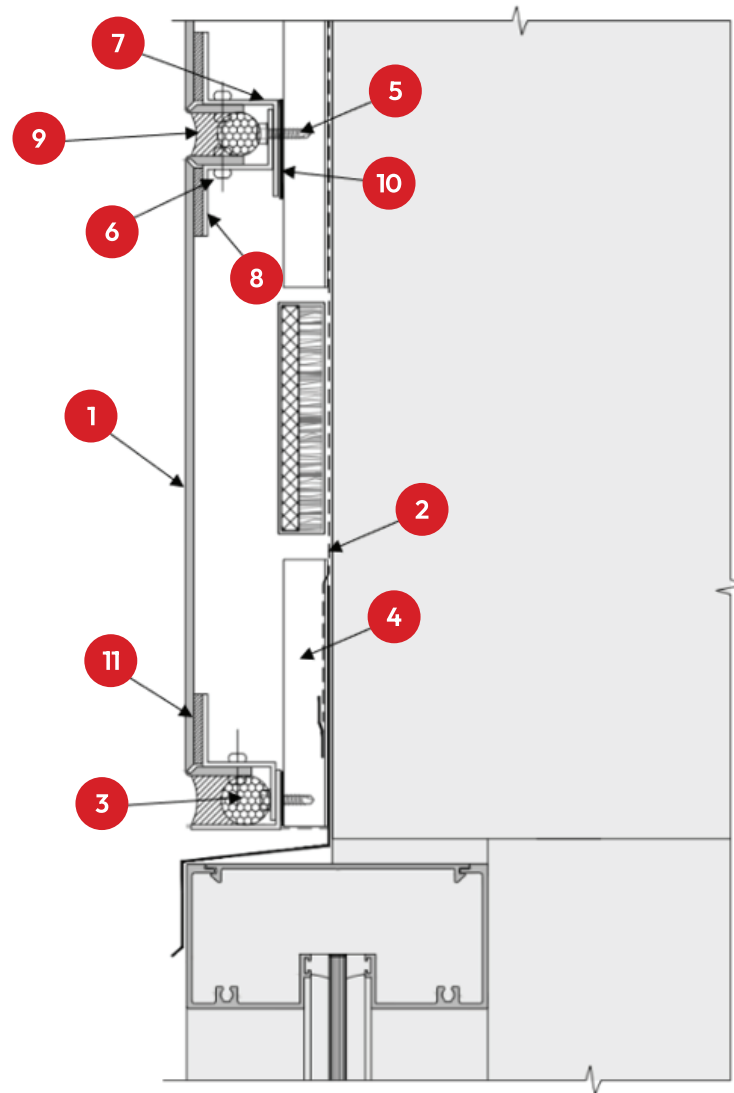
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11. Bonding tape, 12 mm
12. FIREFLY Vulcan RO.2 Thermal Break
13. Steel substrate

Window jam Section Detail (a)



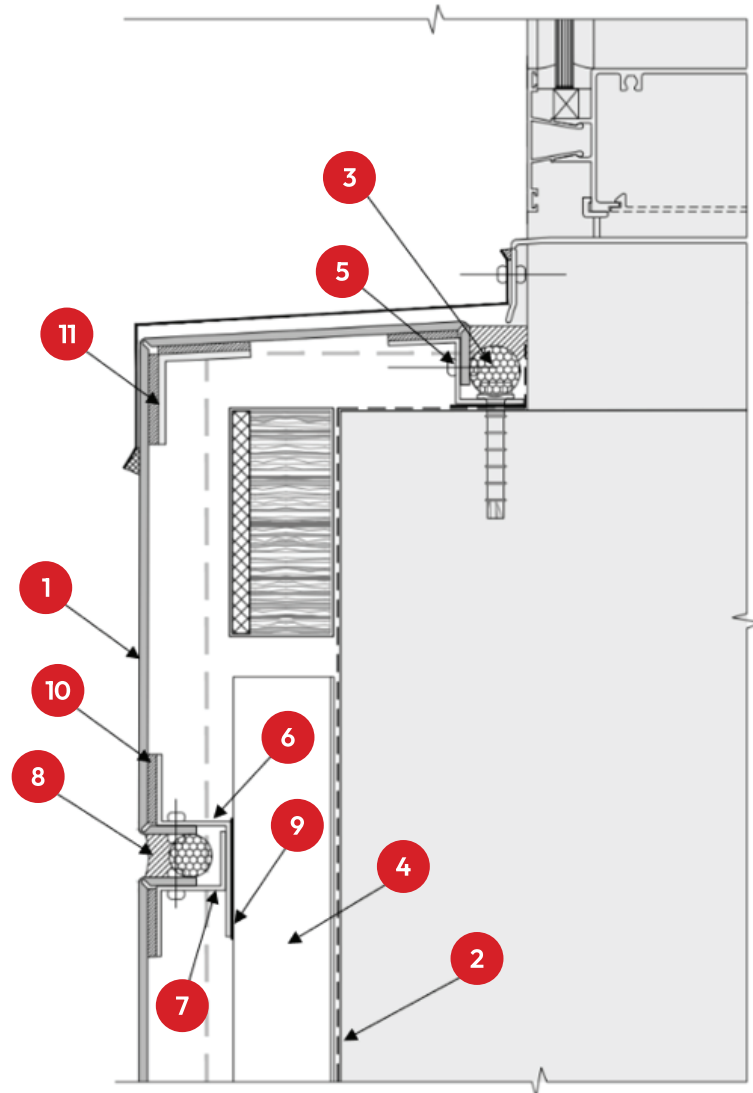
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Window jam Section Detail (b)



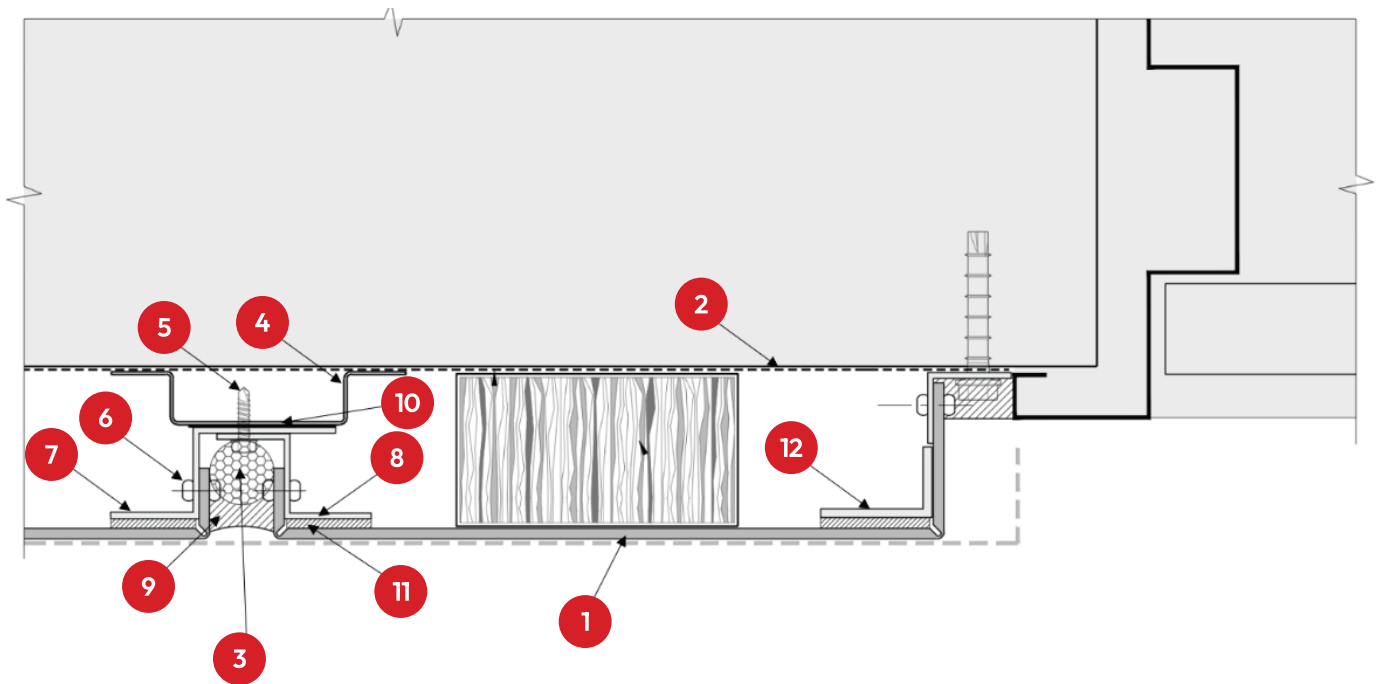
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11. Bonding tape, 12 mm

Window jam Section Detail (c)



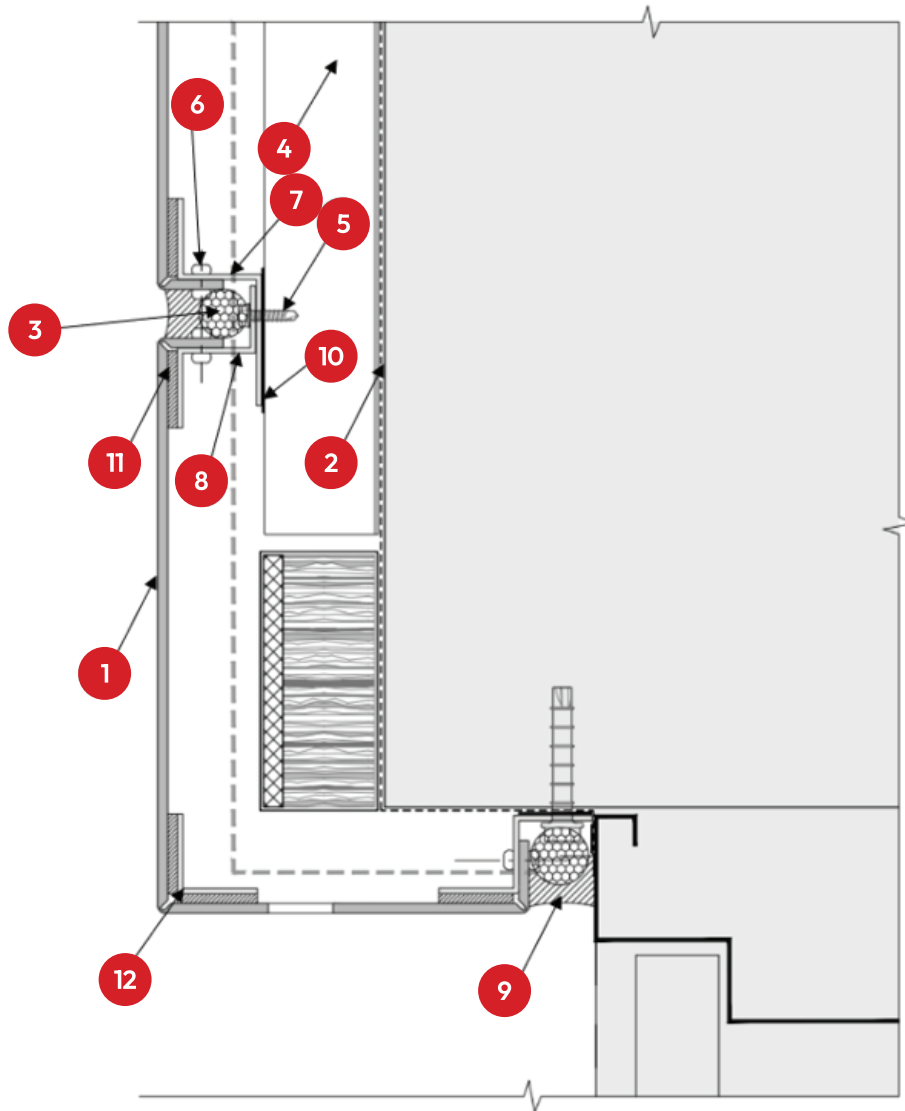
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7. Low Z angle
8. Low modulus architectural grade silicone sealant
9. Isolation tape
10. Bonding tape, 12 mm
11. Corner stiffener

Door jam Section Detail



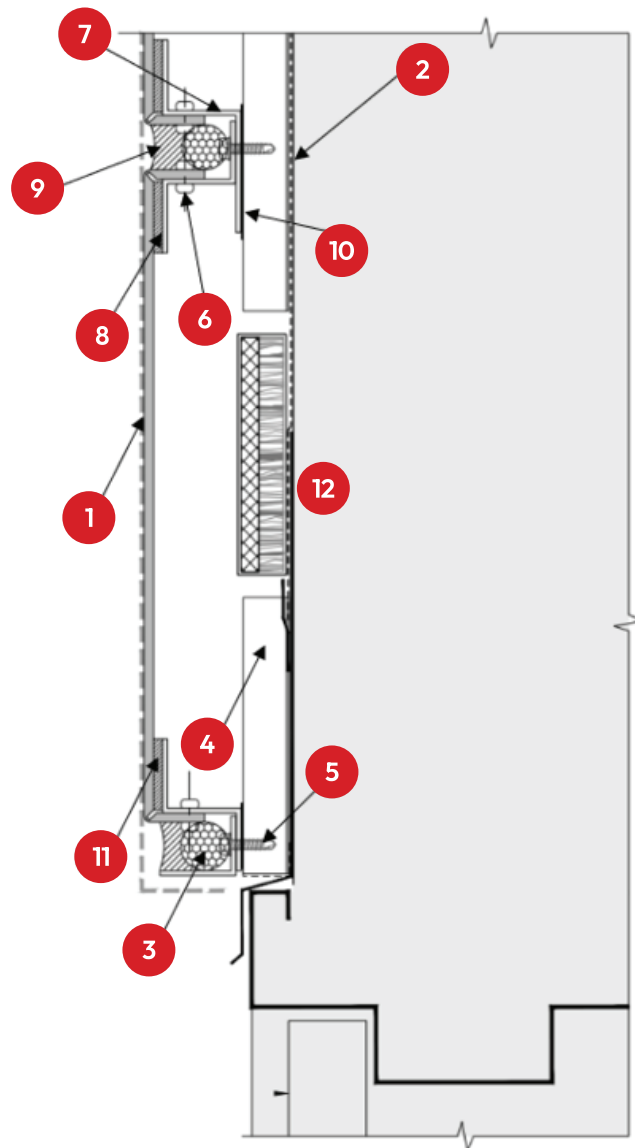
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12. Corner stiffener

Door head Section Detail (a)



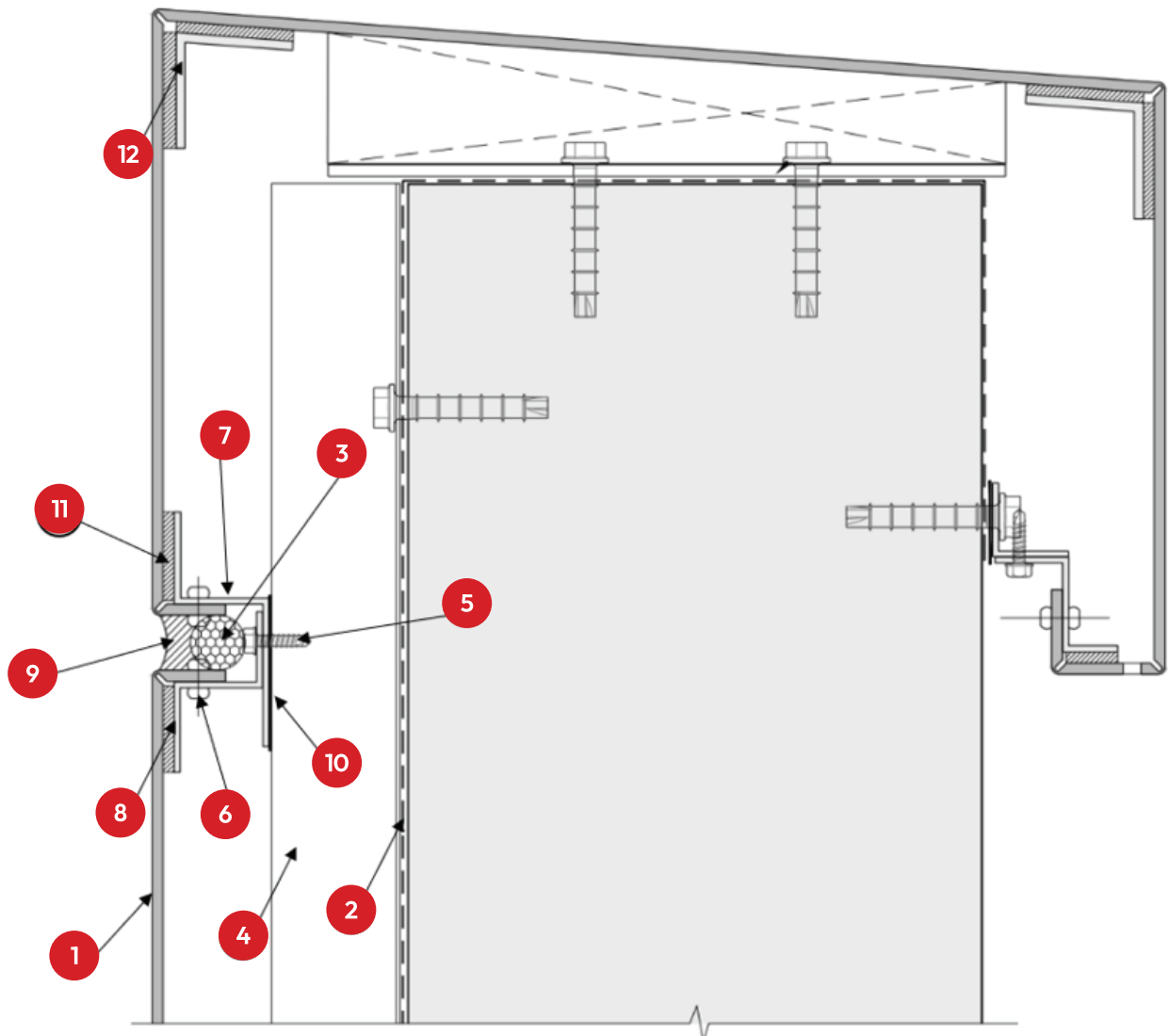
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Door head Section Detail (b)



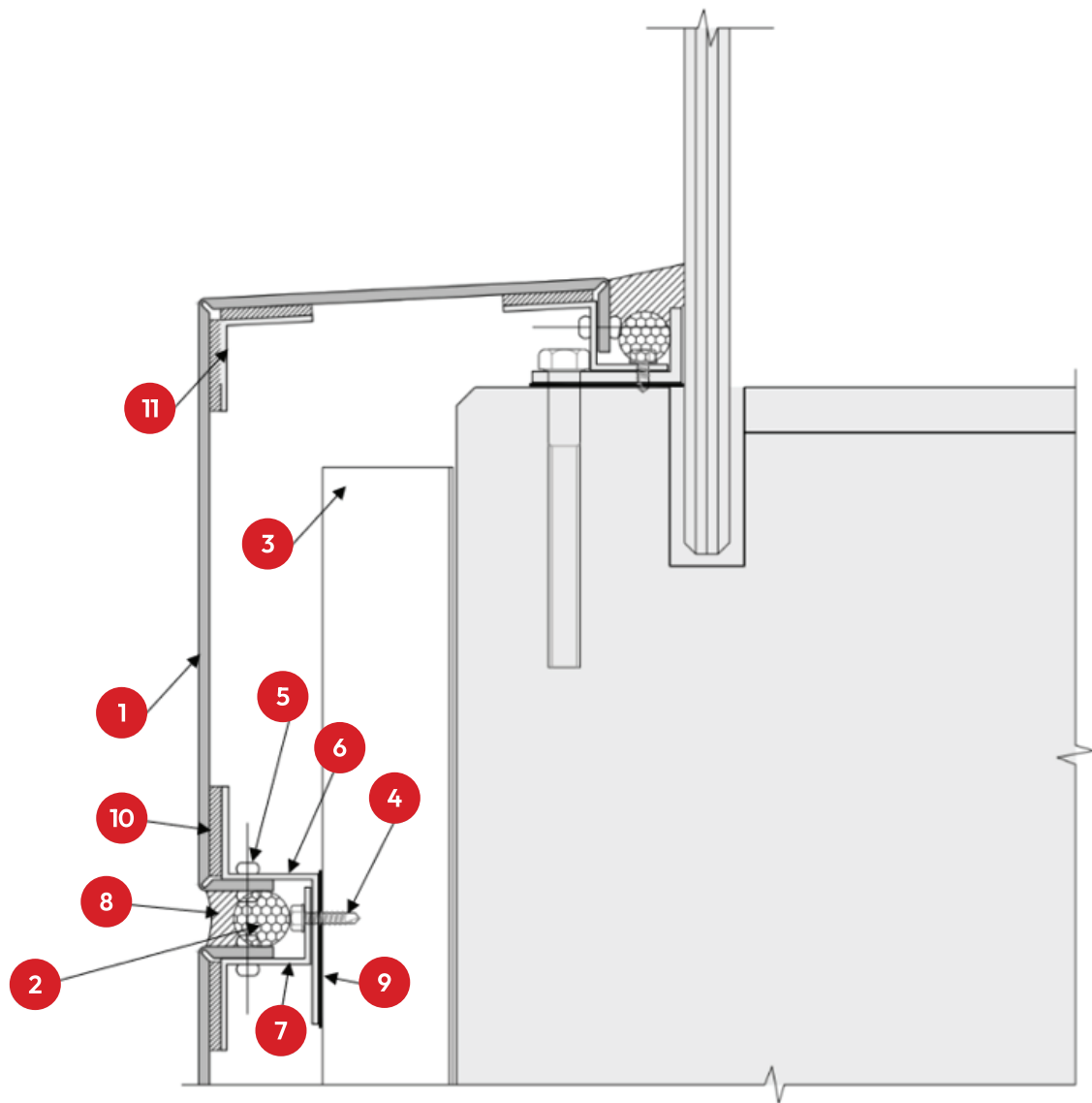
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11. Bonding tape, 12 mm

Top of parapet Section Detail



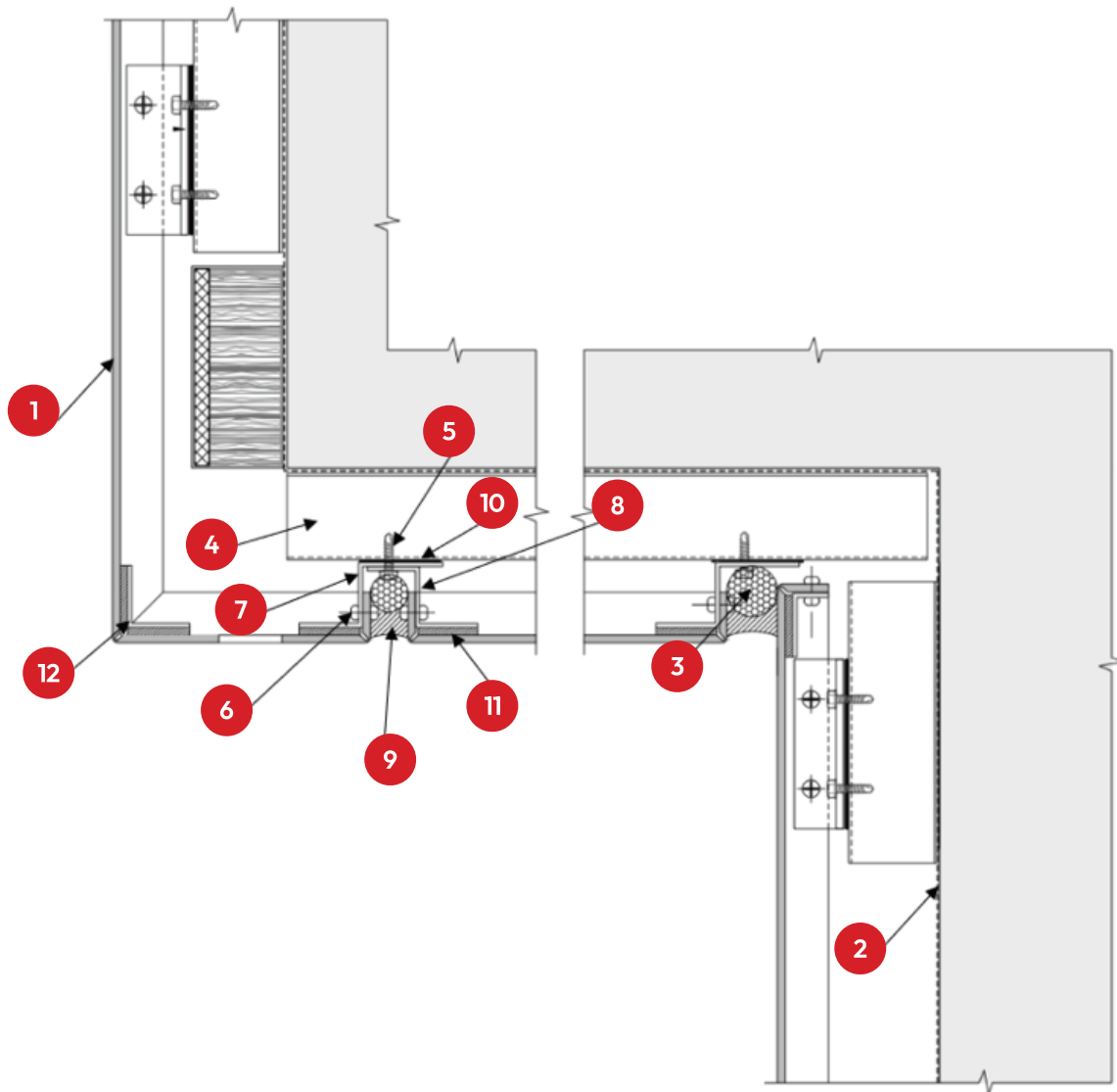
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Balcony edge Section Detail



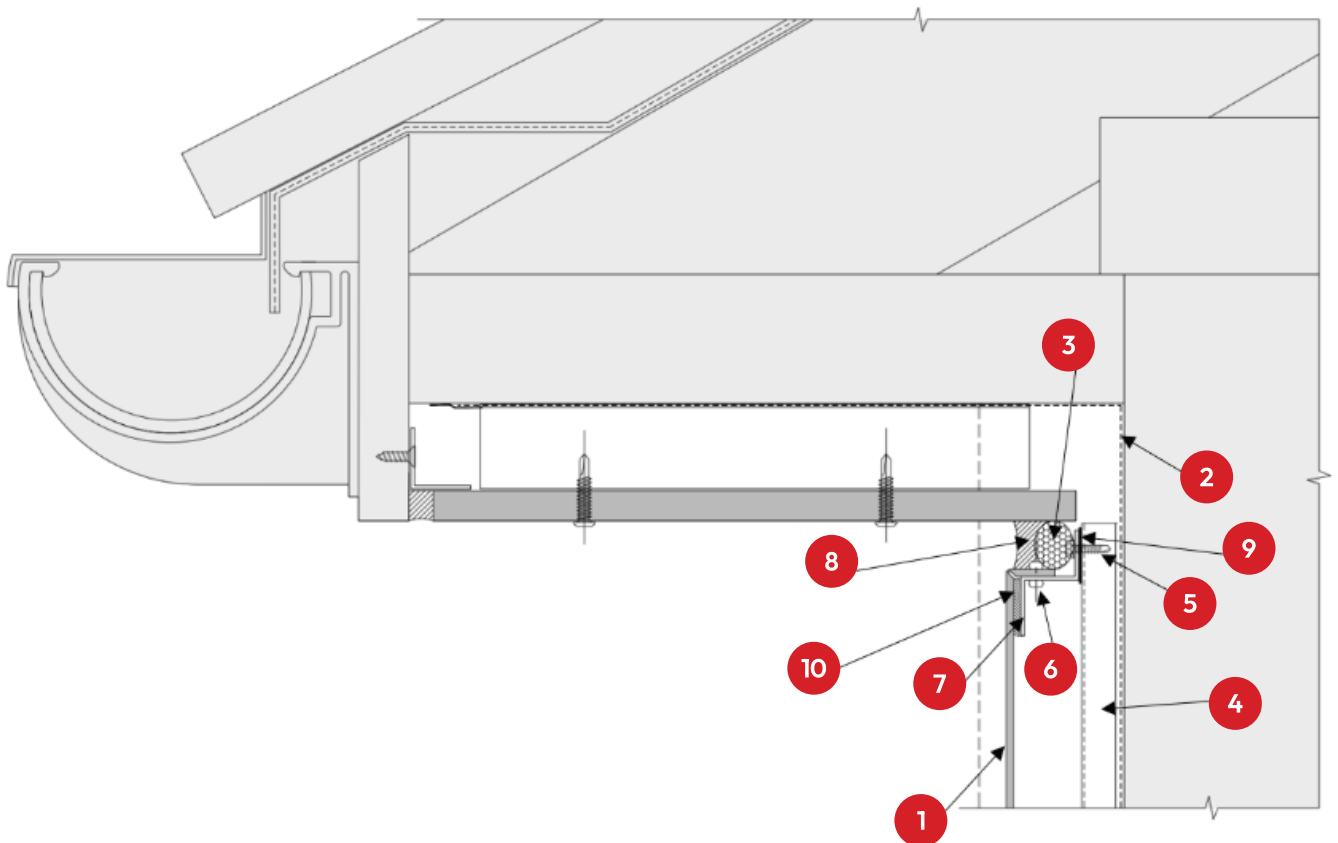
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Recessed facade Section Detail



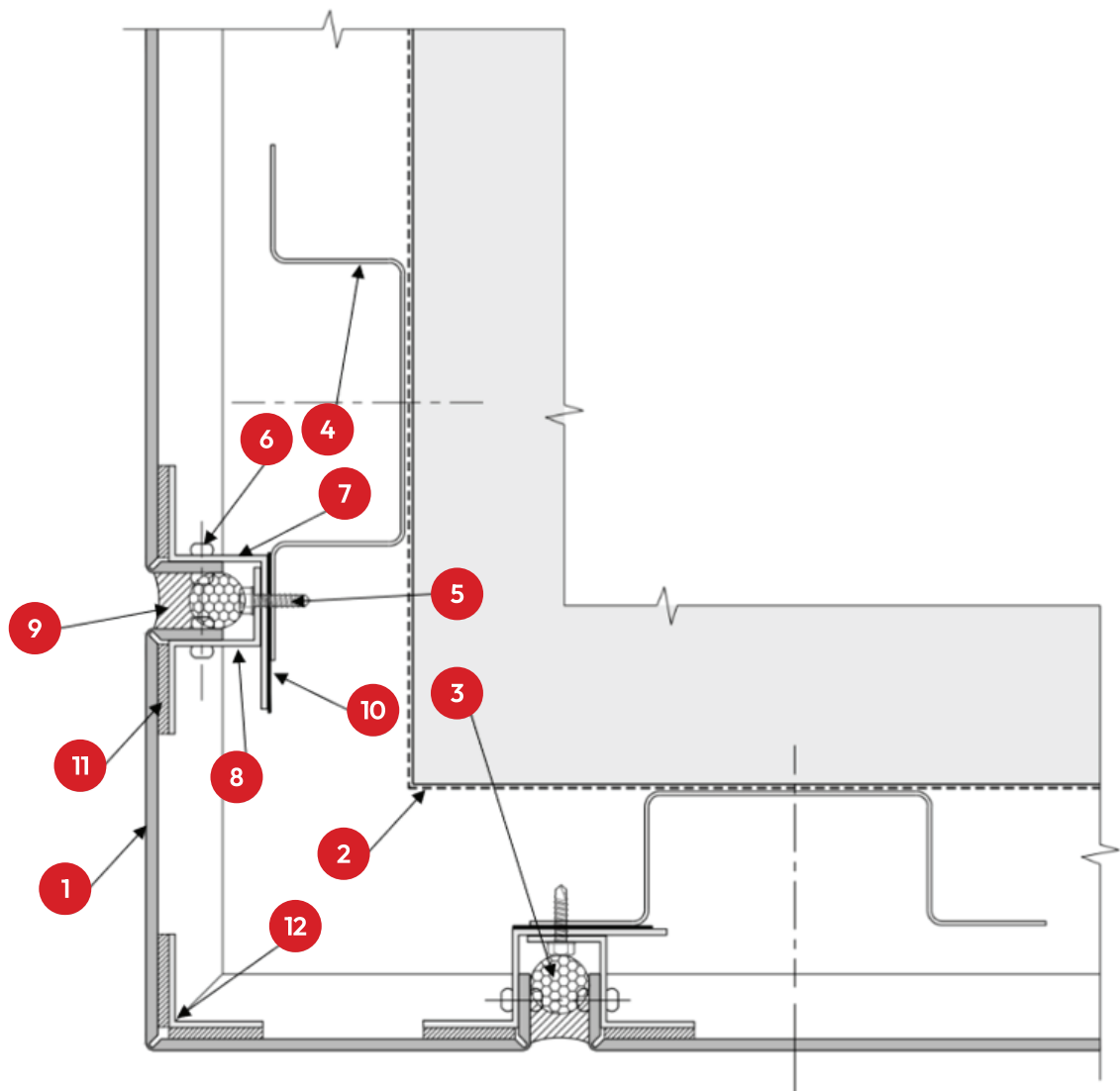
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12. Corner stiffener

Roof soffit Section Detail



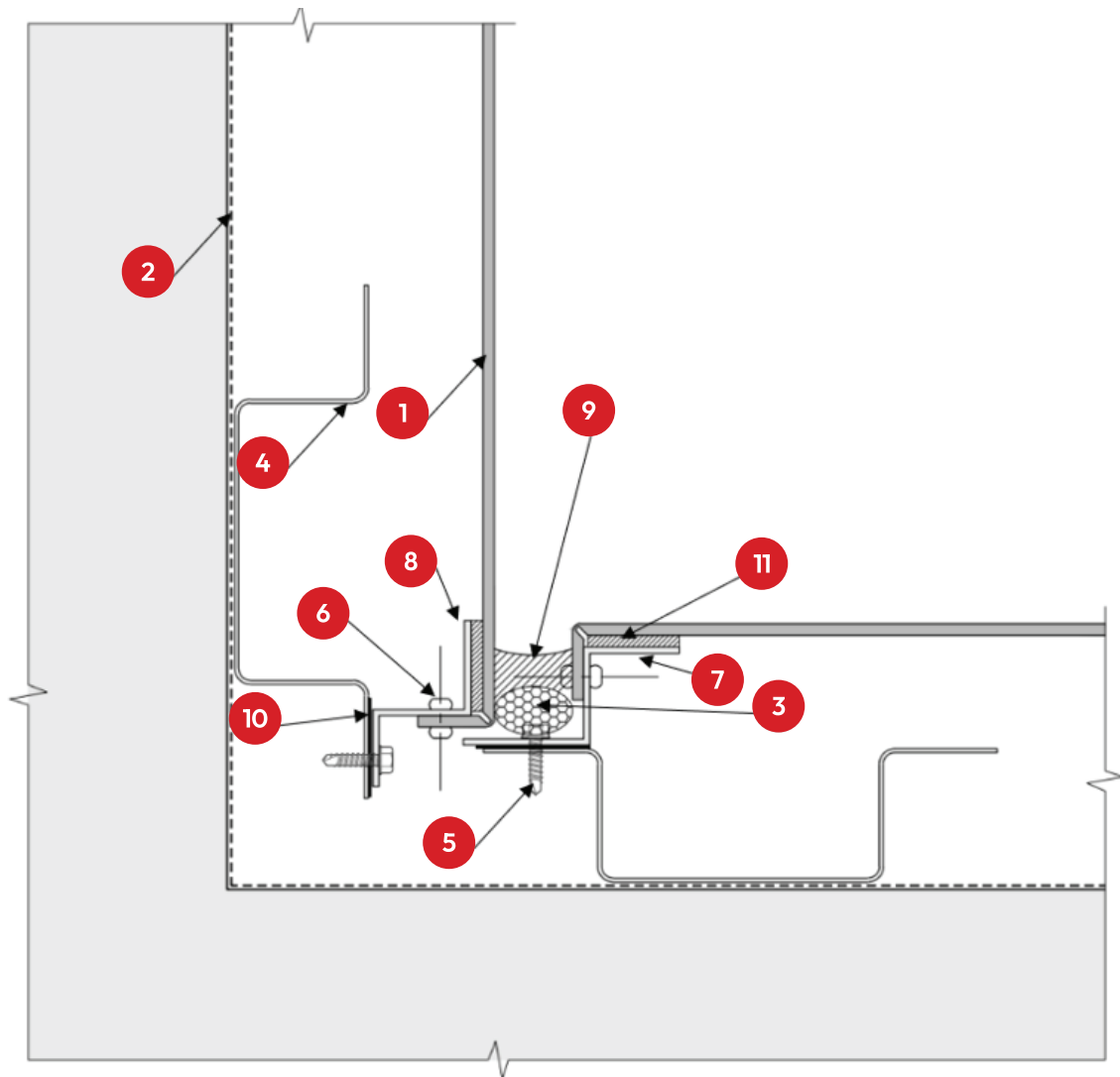
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External corner Section Detail



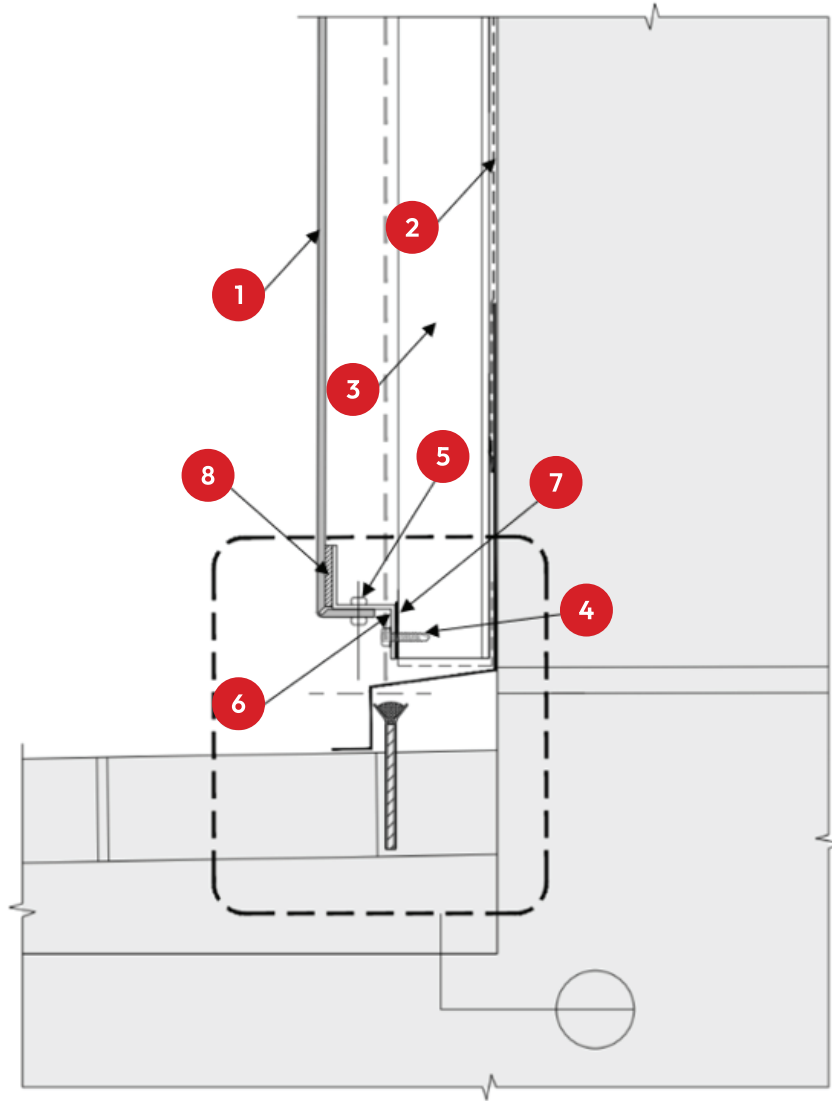
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12. Corner stiffener

Internal corner Section Detail



1. FIREFLY Solid Aluminium Cladding panels
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3. Backing rod
4. Top hat
5. Self-drilling hex head screws
6. Self-drilling wafer head screws, galvinised
7. High Z angle
8. Low Z angle
9. Low modulus architectural grade silicone sealant
10. Isolation tape
11. Bonding tape, 12 mm

Bottom of cladding Section Detail



1. FIREFLY Solid Aluminium Cladding panels
2. FIREFLY VapourSafe sarking/membrane
3. Top hat
4. Self-drilling hex head screws
5. Self-drilling wafer head screws, galvanised
6. High Z angle
7. Isolation tape
8. Bonding tape, 12 mm

Technical Data

Panel Specifications

Property	Unit	Value
Panel Weight	kg	8.1
Raw Density	kg/m ³	2,690
Alloy Grade	Grade	5052
Temper Grade	Grade	H32
Tensile Yield Strength	MPa/psi	193/28,000
Ultimate Yield Strength	MPa/psi	228/33,000
Elongation Break	%	12
Coat Layers	Un.	3

Panel Dimensions

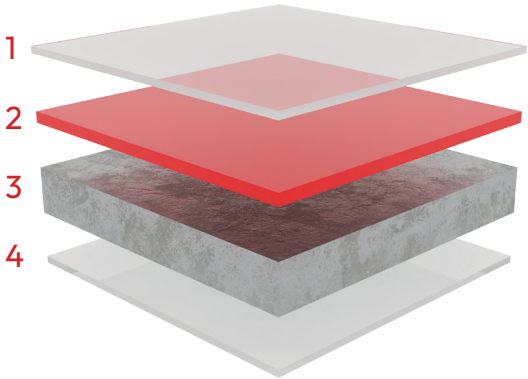
Property	Unit	Unit	Value
Width	mm	1,250/1,575	± 2.0 mm
Length	mm	2,500/3,200	± 4.0 mm
Thickness	mm	3	± 2.0 %
Bow - maximum	mm	-	0.5 % of the length and or width
Square - maximum	mm	-	5 mm

Width Minimum width 800 mm. Minimum quantity 500 m². Custom lengths can be arranged.

Length Maximum length 6,000 mm. Minimum quantity 500 m². Custom lengths can be arranged.

Composition

- 1. Protective film
- 2. PVDF coating
- 3. 3mm aluminium core
- 4. Protective rear coating



Product Technical Statement

Type and/or use of product	Description of product
FIREFLY panels are used in external wall cladding, in all building types.	FIREFLY panels are 3 mm thick PVDF coil coated solid aluminium panels installed with metal fixing system. Standard panel sizes include widths of 1,250 mm and 1,575 mm and lengths of 2,500 mm and 3,200 mm. Custom panel sizes are also available.
Meets the following National Construction Code Provision (Volume One)	
Deemed to Satisfy Provisions	C2D10 (6)(e) Non-Combustible Material (6) The following materials may be used wherever a non-combustible material is required (e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where Spread-of-Flame Index of the products is not greater than 0. F3D5 (Wall Cladding) (1) External wall cladding must comply with one or a combination of the following: - Masonry, including veneer, unreinforced and reinforced masonry: AS 3700 - Autoclaved aerated concrete AS 5146.3. - Metal wall cladding: AS 1562.1.

Product Technical Statement

Tested to the following Australian and International Standards			
Australian		International	
AS/NZS4284 Clause 8.2, 8.5 & 8.6	Waterproof & Wind Loading Serviceability limit state - 2500pa to +2500pa FPI1.4 Compliant	ASTM D523	Gloss 60% minimum ^80%
AS1530.1	Combustibility Test for Materials Non-combustible	ASTM D3363 (05 (201) e2	Pencil Hardness 33 microns F 3H
AS1530.3	Methods for fire tests on building materials, components and structures Pass - Ignitability Index - 0 Pass - Heat evolved - 0 Pass - Spread of flame - 0 Pass - Smoke developed - 1	ASTM D2247	Humidity Test Passes 4000 hrs
AS5637.1	Determination of fire hazard properties - Wall and Ceiling Linings Pass - Group - 1	ASTM D714 100% Relative Humidity @36C	Degree of Blistering of Paints No 8 Blisters
		ASTM D3359	Adhesion Dry: Class 5B Wet: Class 5B Boiling Water: Class 5B
		ASTM D968	Abrasion Resistance 70
		AAMA 2605 ASTM D1308	Acid test (Muriatic Acid Resistance 15 minute spot) No blistering and no change in appearance
		AAMA 2605-17a Section 8.3	Nitric Acid Resistance Æ=0.26
		ASTM D2794	Reverse Impact 1.5 x Metal Thickness (Alloy) No cracking or adhesion loss
		AAMA 620 AMMA 2605	Coating Kynar 500 PVDF 70%
		ASTM D1400	Dry Film Thickness 0.20-0.30 mil primer 0.70-0.80 mil topcoat

Relevant Reports & Documents

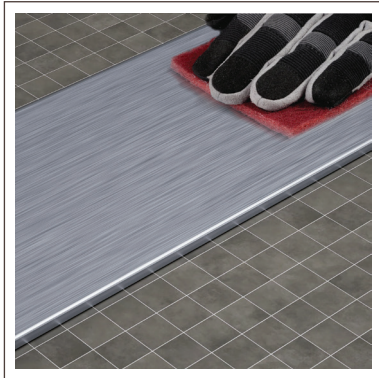
Panel Specifications

Author	Reference	Date	Comment
Warringtonfire	RTF200112 R2.0 Combustibility performance of a building material in accordance with AS1530.1:1994 (2016)	30.04.2020	Reaction to fire test report
AWTA	20-002348 Test on Solid Aluminium Panel with 33 micron metallic silver paint on one side, according to AS/NZ1530.3:1999 Methods of Fire Tests on Building Materials, Components and Structures, Part 3: Simultaneous Determination of Ignitability, Flame Propagation, Heat Release and Smoke Release.	20.05.2020	Test Report
Ian Bennie & Associates	2020-077-S1 FIREFLY Solid Aluminium Panel with FIREFLY Non-Combustible Breathable Sarking, FIREFLY Thermal Break R0.2, FIREFLY NCBR. Specimen tests to NCC-2019 VERIFICATION METHODS FV1 and V2.2.1	11.2020	Test Report
Ian Bennie & Associates	2020-088-S1 3mm AFP Solid Aluminium 5052 H32 Hail Impact Test	12.2020	Test Report
PPG	PPG Duranar Coil Coating AAMA 2605 Certification	-	Certificate
Intertek	190814003SHF-001 FIREFLY Pre-Painted Solid Aluminium Panel tested to AAMA 2605-17a, ASTM D2244-11, ASTM D523-08, ASTM D3363-05(2011)e2, ASTM D3359-17, ASTM D968-05(2010)	10.03.2020	Test Report

Appendix A

Surface Preparation for Tape Application

1. Abrade the surface to which the tape (3M VHB™ B90F Architectural Panel Tape 24 mm, 3M VHB™ GPH-160 Series Tape 12 mm), or equivalent, is to be applied, using a Maroon Grade Scotch Brite.



2. Clean the surface with a 50:50 mix of Isopropyl Alcohol and water. **Do not use any other cleaner.**



3. Wipe the abraded and cleaned surface with 3M AP-111 Adhesion Promoter, or equivalent, using a clean cloth.

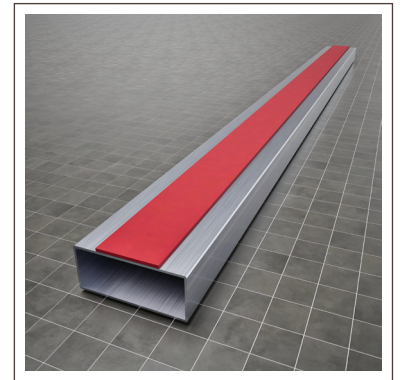
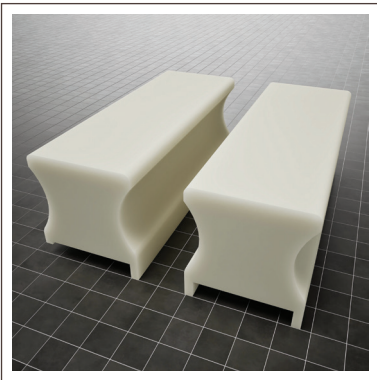


Appendix B

Bonding Tape Application, Stiffener

Apply the 3M VHB™ B90F Architectural Panel Tape 24 mm, or equivalent, to the stiffener in a smooth and precise way, ensuring nominal 7 mm on either side of the tape to allow for the silicone provision.

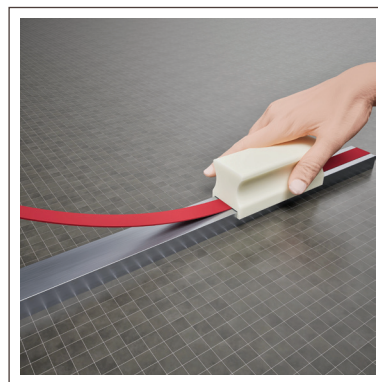
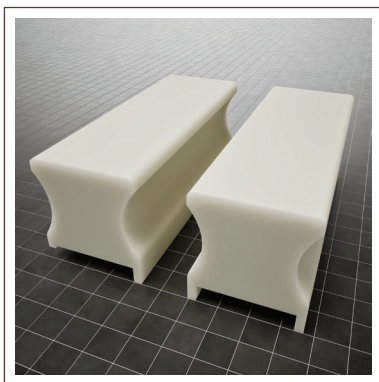
Consider the use of a hand tape applicator (eg Block of Delrin® or similar plastic block customised to fit the profile of the 38 x 19 x 2.0 mm stiffener).



Bonding Tape Application, Z angle

Apply the 3M VHB™ GPH-160 Series Tape 12 mm, or equivalent, to the Z angle in a smooth and precise way.

Consider the use of a hand tape applicator (eg Block of Delrin® or similar plastic block customised to fit the profile of the Z angle).



Appendix C

Attachment of Extrusions (Z and RHS Stiffener) to the Panel

1. Remove the red release liner from the tape to expose the adhesive.
2. Place the extrusion in the exact location on the panel rear surface, allowing the adhesive to contact the panel. **Do not** attempt to remove / reposition if incorrectly positioned. in the case that the extrusion is incorrectly positioned, prise the stiffener from the surface and start again with re-application of primer and new tape on the extrusion.
3. Ensure that the panel is on a flat, smooth, swarf free surface with the protective film face down. Apply a minimum of 10 kg.f with a heavy duty roller to the back extrusion, such that the entire surface of the tape underneath experiences adequate pressure to initiate bonding. Failure to apply uniform pressure over the entire bond line will result in inadequate bonds.



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