



TECHNICAL MANUAL

BICEP Ventilated Rainscreen Façade System

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1.1 About This Manual:

This manual has been developed to effectively assist fabricators and contractors to work with BICEP. Due to the uncontrollable conditions onsite and different methods of job scope, as well as the variable skills and judgment of installers and the quality of equipment, tools, etc, the suggestions and recommendations contained in this manual are provided without warranty. The information and recommendations herein are believed to be correct at time of publishing.

BLUECHIP reserves the right to revise the contents of this manual without prior notice. Any construction or use of the product must be in accordance with all local zoning and/or building codes and in accordance with the current NCC at the time of use. Except as contained in a written warranty certificate, the supplier does not provide any other warranty, either express or implied, and shall not be liable for any damages, including consequential damages.

1.2 Company Background:

Founded in 2003 by five brothers, BLUECHIP has grown every year since to become one of Australia's leading suppliers of architectural building envelopes. BLUECHIP's product range covers the complete system from the structure out including all types of cladding materials, composite decking, sub-framing, insulation, waterproofing and fixings.

With offices in Sydney, Melbourne and Perth, BLUECHIP has supplied more than 3,000,000m² of materials to Australian projects since 2003. Our commitment to innovation and ongoing investment in R&D ensures BLUECHIP will continue to lead the market with BCA/NCC compliant facade solutions in the years ahead.

For architects and consultants, BLUECHIP's wide range of different materials and 'complete-system' approach enables the creation of inspiring high-performance facades. For builders and contractors, BLUECHIP's large local stock, well established supply chains and genuine appreciation for our clients means you can trust us to deliver as promised every time.

1.3 Company Details:

Company: Blue Chip Group Pty Ltd
ABN: 98 162 282 064
Locations: Sydney | Melbourne | Brisbane | Perth
Phone: 1300 945 123
Email: sales@bluechipgroup.net.au



1.4 Product Description:

Ventilated Façade System

The BICEP ventilated facade system includes brackets, rails and secret fixing options offering exceptional versatility in both vertical and horizontal configuration. Available in aluminium (AL), coated steel (CS) and stainless steel (SS) for different applications, the BICEP facade system provides excellent usability and unrivalled structural strength resulting in a cost-effective ventilated facade system ideal for suspending all cladding types. An added benefit is that the BICEP brackets can be thermally broken and supplied in conjunction with IROCK insulation and ULTRAPERM membrane for a fully integrated solution.

Non-combustible

Made wholly of aluminium (AL), coated steel (CS) and stainless steel (SS) the BICEP ventilated facade system is Deemed-to-Satisfy non-combustible in accordance with NCC 2022, Clauses C2D10(4)(f)(ii), C2D10(5) & C2D10(6)(e).

A Complete System

The BICEP Ventilated Façade System has been designed as a complete solution which along with IROCK insulation and ULTRAPERM membrane, provides a complete system achieving the required structural, thermal and weatherproofing outcomes.

All Cladding Types

As one of Australia's largest cladding suppliers, we are in the ideal position to design a compliant ventilated facade system that suits all different possible cladding types. BICEP is this system.

Unrivalled Versatility

With excellent ease of use in both vertical and horizontal configuration and bracket sizes from 40mm up to 900mm, BICEP is also available in aluminium (AL), coated steel (CS) and stainless steel (SS) for unrivalled versatility.

Engineering Support

The BICEP ventilated facade system is supported by proprietary structural engineering software to assist in the design and specification of facades in all applications and locations with all different loads as required.

From the Structure Out

Our company slogan is; from the structure out, we've got it covered! The BICEP system along with STUDTEK, IROCK, ULTRAPERM and our wide range of cladding materials means you can specify the entire facade from one local supplier.

Ventilation Benefits

Used in Europe and the Americas for many years, ventilated facade systems like BICEP offer many benefits and advantages over traditional sealed facades - superior energy efficiency, weatherproofing and building durability.

Excellent Value

The incredible strength of the patented BICEP bracket design (meaning less are required) along with manufacturer to industry direct supply chain means the BICEP system can offer exceptional value-for-money to building owners.

1.5 More Information:

[BICEP Ventilated Rainscreen Façade System](#)

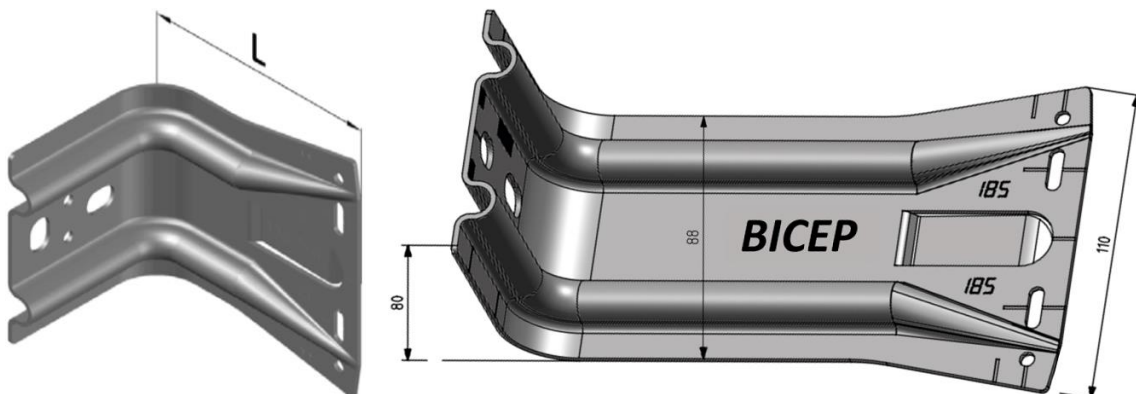


2.1 Physical Properties – Technical Data:

ITEM	MATERIAL / TECHNICAL DATA
Bracket Material Options: Note: All BICEP brackets include a 6mm Thermal Stop as standard*	Aluminium (AL): Band Almg 2,5/H12, WNr: EN AW-5052 according to DIN EN 573-3, tolerances according to DIN EN 485-3 – <i>Item No. BCBA***</i> Coated Steel (CS): Band S250GD+ZA255-A-C, WNr: 1.0242, according to DIN EN 10346, tolerances according to DIN EN 10143 + KTL black – <i>Item No. BCBC***</i> Stainless Steel (SS): Band V4A, WNr: 1.4404, according to DIN EN 10088-2, tolerances according to DIN EN ISO 9445 – <i>Item No. BCBS***</i>
Elastic Modulus	Aluminium (AL): 70,000 n/mm ² Coated Steel (CS): 210,000 n/mm ² Stainless Steel (SS): 200,000 n/mm ²
Coefficient of Thermal Expansion	Aluminium (AL): 0.024 mm/m/°C Coated Steel (CS): 0.012 mm/m/°C Stainless Steel (SS): 0.017 mm/m/°C
System Depth Including Thermal Stop*	Aluminium (AL): 55mm-945mm Coated Steel (CS): 80mm-945mm Stainless Steel (SS): 80mm-645mm
*Thermal Stop / Break	Material: Hard Foamed PVC Thermal Conductivity: 0.06 W/mK Thickness / R-value: <ul style="list-style-type: none"> - 6mm thick R0.1 as standard with all brackets - 12mm thick R0.2 with added <i>Item No. BCTBS6</i> Compressive Strength: 10 N/mm ² Impact Resistance: 15 kJ/m ²
Support Profiles	Aluminium (AL): 60 x 40mm L-profile, 6.0m Lengths – <i>Item No. BCLA6060</i> 100 x 40mm T-profile, 6.0m Lengths – <i>Item No. BCTA6060</i> Coated Steel (CS): 60 x 40mm L-profile, 6.0m Lengths – <i>Item No. BCLC6060</i>

2.2 Physical Properties – Dimension Drawings:

All BICEP brackets have the following dimensions: Height (H) = 80mm, Width (W) = 88mm, Fixing Area Width = 110mm and Length (L) is variable from 40mm up to 900mm.





3.1 Fire Performance – Brackets, Support Profiles & Accessories:

Items	Fire Performance
Brackets Support Profiles Carrier Rails Pressure Plates All Hangers All Fixings	<p>Aluminium (AL): Deemed-to-satisfy non-combustible in accordance with NCC 2022, Clause C2D10(5)(d), being entirely composed of aluminium, including aluminium alloys.</p> <p>Coated Steel (CS): Deemed-to-satisfy non-combustible in accordance with NCC 2022, Clause C2D10(6)(e), being a prefinished metal with a coating thickness <1mm and spread-of-flame index of 0 when tested to AS 1530.3.</p> <p>Stainless Steel (SS): Deemed-to-satisfy non-combustible in accordance with NCC 2022, Clause C2D10(5)(b), being entirely composed of steel including metallic coated steel.</p>

3.2 Fire Performance – Thermal Stops + Thermal Break Spacers:

Items	Fire Performance
Thermal Stops Thermal Break Spacers	The PVC thermal stops and thermal break spacers are exempted from the requirement to be non-combustible as per Clause C2D10(4)(f)(ii) when used in isolation as per the BICEP façade system (ie. They are not a continuous product spanning across multiple storeys or fire compartments). See NCC extract below.

NCC 2022, Clause C2D10(4)(f)(ii), specifically exempts thermal breaks associated with external wall systems from the requirement to be non-combustible, when criteria (A), (B) and (C) are complied with as is the case with isolated, non-continuous thermal stops and thermal break spacers used only at each bracket location in the BICEP façade system:

- (4) The requirements of (1) and (2) do not apply to the following:
- (a) Gaskets.
 - (b) Caulking.
 - (c) Sealants.
 - (d) Termite management systems.
 - (e) Glass, including laminated glass, and associated adhesives, including tapes.
 - (f) Thermal breaks associated with—
 - (i) glazing systems; or
 - (ii) *external wall* systems, where the thermal breaks—
 - (A) are no larger than necessary to achieve thermal objectives; and
 - (B) do not extend beyond one *storey*; and
 - (C) do not extend beyond one *fire compartment*.



4.1 Thermal Performance:

NCC 2022 Section J, Clause J3D6 requires thermal breaks in building envelopes to achieve an R-value of not less than R0.2. To achieve this the BICEP façade brackets with built-in thermal stop (6mm thick R0.1), are installed in combination with the *BCTBS6 Thermal Break Spacer* (6mm thick R0.1) to achieve the required total of R0.2 for section J compliance.

5.1 Bracket Sizes, System Depths & R-values:

All the below depth adjustment measurements are taken from the structural wall (steel frame, tilt-panel etc) to the outside edge of the support profile and include the 6mm thermal stop which comes with all brackets, the exterior insulation zone and the ventilated cavity depth.

All depth measurements assume the use of the below bracket sizes + 6mm thermal stop and in conjunction with the *BCL*6060 BICEP 60 x 40mm L-profile* in the below configurations:

- **Min. depths** are achieved by inserting the L-profile 40mm leg into the bracket
- **Max. depths** are achieved by inserting the L-profile 60mm leg into the bracket

BICEP BRACKET SIZE	DEPTH ADJUSTMENT	MAX. IROCK* THICKNESS	MAX. IROCK* R-VALUE
40mm Bracket + Thermal Stop	55 - 85mm	60mm	R1.67
65mm Bracket + Thermal Stop	80 - 110mm	80mm	R2.22
85mm Bracket + Thermal Stop	100 - 130mm	100mm	R2.78
110mm Bracket + Thermal Stop	125 - 155mm	130mm	R3.61
135mm Bracket + Thermal Stop	150 - 180mm	150mm	R4.17
160mm Bracket + Thermal Stop	175 - 205mm	180mm	R5.00
170mm Bracket + Thermal Stop	185 - 215mm	190mm	R5.28
185mm Bracket + Thermal Stop	200 - 230mm	200mm	R5.56
210mm Bracket + Thermal Stop	225 - 255mm	230mm	R6.39
240mm Bracket + Thermal Stop	255 - 285mm	260mm	R7.22
270mm Bracket + Thermal Stop	285 - 315mm	290mm	R8.06
300mm Bracket + Thermal Stop	315 - 345mm	320mm	R8.89
330mm Bracket + Thermal Stop	345 - 375mm	350mm	R9.72
360mm Bracket + Thermal Stop	375 - 405mm	380mm	R10.56
390mm Bracket + Thermal Stop	405 - 435mm	410mm	R11.39
420mm Bracket + Thermal Stop	435 - 465mm	440mm	R12.22
450mm Bracket + Thermal Stop	465 - 495mm	470mm	R13.06
480mm Bracket + Thermal Stop	495 - 525mm	500mm	R13.89
510mm Bracket + Thermal Stop	525 - 555mm	530mm	R14.72
540mm Bracket + Thermal Stop	555 - 585mm	560mm	R15.56
570mm Bracket + Thermal Stop	585 - 615mm	590mm	R16.39
600mm Bracket + Thermal Stop	615 - 645mm	620mm	R17.22
630-900mm (AL) & (CS) Only	645 - 945mm	-	-

*R-values are calculated on the thermal performance of the IROCK based on the **maximum thickness** that will fit within the system depth including the ventilated cavity and the required space to insert and fix the support profile. For more information visit the IROCK webpage [here](#).

Important Note: To achieve a thermally broken system as per section 4.1 above, it is necessary to use all the above brackets in combination with the *BCTBS6 Thermal Break Spacer* which is 6mm thick. In this case, add 6mm to all the above depth measurements.



5.2 Depth Adjustment Calculations:

Based on using the brackets in conjunction with the *BCL*6060 BICEP 60 x 40mm L-profile*, the distance of possible adjustment inwards-and-outwards with any given BICEP bracket size is approx. 30mm total (conservatively). This requires the L-profile support rail to be used in two (2) different configuration options as below:

1. **L-profile 40mm leg inserted into the bracket:**
 Min. depth = Bracket Length (B) + 6mm Thermal Stop (T) + 9mm of Support Profile (L)
 Max. depth = Bracket Length (B) + 6mm Thermal Stop (T) + 19mm of Support Profile (L)
2. **L-profile 60mm leg inserted into the bracket:**
 Min. depth = Bracket Length (B) + 6mm Thermal Stop (T) + 29mm of Support Profile (L)
 Max. depth = Bracket Length (B) + 6mm Thermal Stop (T) + 39mm of Support Profile (L)

Example Formula:

Using a BICEP **65mm** bracket (B) with thermal stop (T) and the 60 x 40mm L-profile (L):

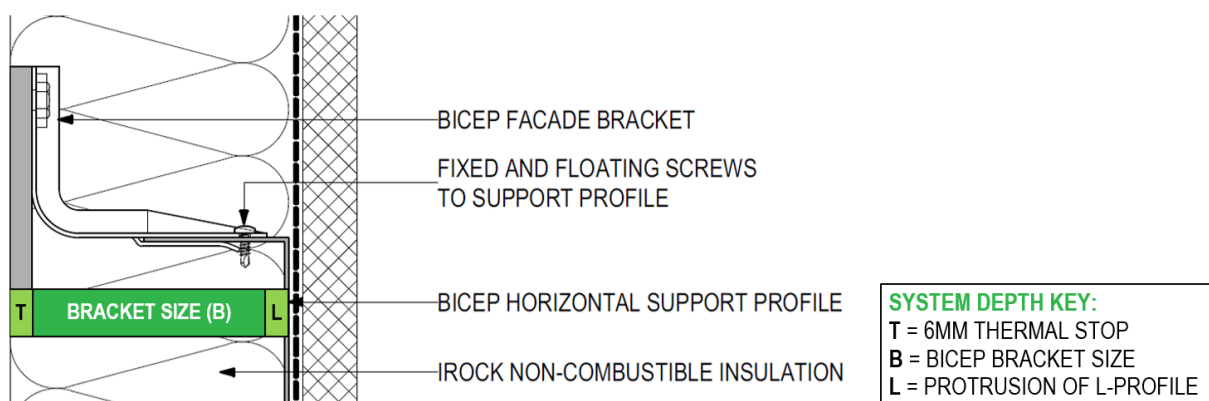
1. **L-profile 40mm leg inserted into the bracket:**
 Min. depth = **65mm** (B) + 6mm (T) + 9mm (L) = 75mm
 Max. depth = **65mm** (B) + 6mm (T) + 19mm (L) = 85mm
2. **L-profile 60mm leg inserted into the bracket:**
 Min. depth = **65mm** (B) + 6mm (T) + 29mm (L) = 95mm
 Max. depth = **65mm** (B) + 6mm (T) + 39mm (L) = 105mm

Adjustment Calculations for above Example:

1. Option 1 single configuration adjustment is: $85\text{mm} - 75\text{mm} = 10\text{mm}$
2. Option 2 single configuration adjustment is: $105\text{mm} - 95\text{mm} = 10\text{mm}$
3. **Total adjustment across both configurations: $105\text{mm} - 75\text{mm} = 30\text{mm}$**

Example Diagram:

Showing above formula: bracket size (B), 6mm thermal stop (T), L-profile protrusion (L):



Important Note: To achieve a thermally broken system as per section 4.1 above, it is necessary to use all the above brackets in combination with the *BCTBS6 Thermal Break Spacer* which is 6mm thick. In this case, add 6mm to all the above depth measurements.



6.1 Installation Instructions – General:

General Principles:

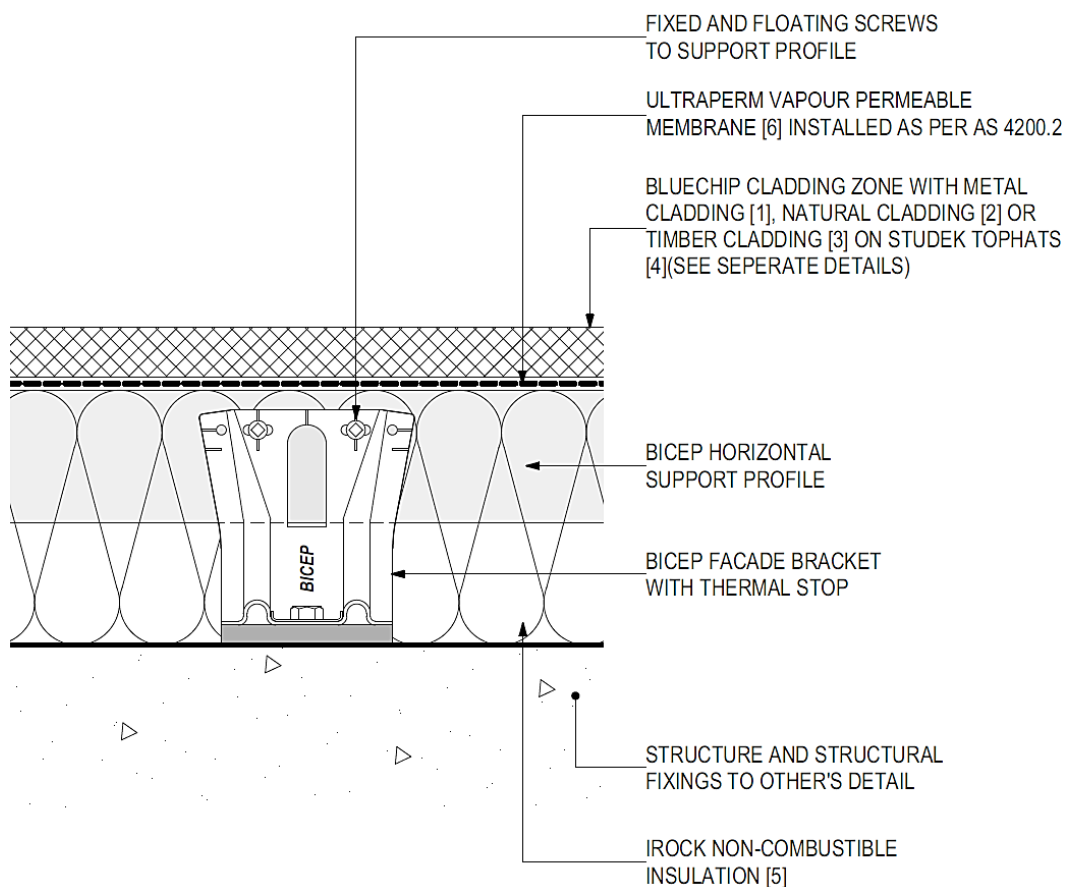
BICEP brackets have 2 large elongated holes for the purpose of fixing the bracket to the structural wall (steel frame, tilt-panel etc). They also have 4 holes in the fixing area for fixing the support profile to the bracket: 2 of which have are round (fixed points) and the other 2 which are elongated slots (floating points). The brackets also include a unique clamp to hold the support profile in place whilst it is being adjusted for alignment before it is fixed into place.

Installation Details:

The system shall be designed and installed in accordance with the most recent version of the BICEP Installation Details which are available online at www.bluechipgroup.net.au or by emailing sales@bluechipgroup.net.au or by calling **1300 945 123**. (Only PDF installation details are available online. For CAD/DWG installation details email or call as above).

6.2 Horizontal Installation – Plan Detail:

This is when the support profiles run horizontally which is best suited to pick-up vertical top-hats or cladding products that run vertically.

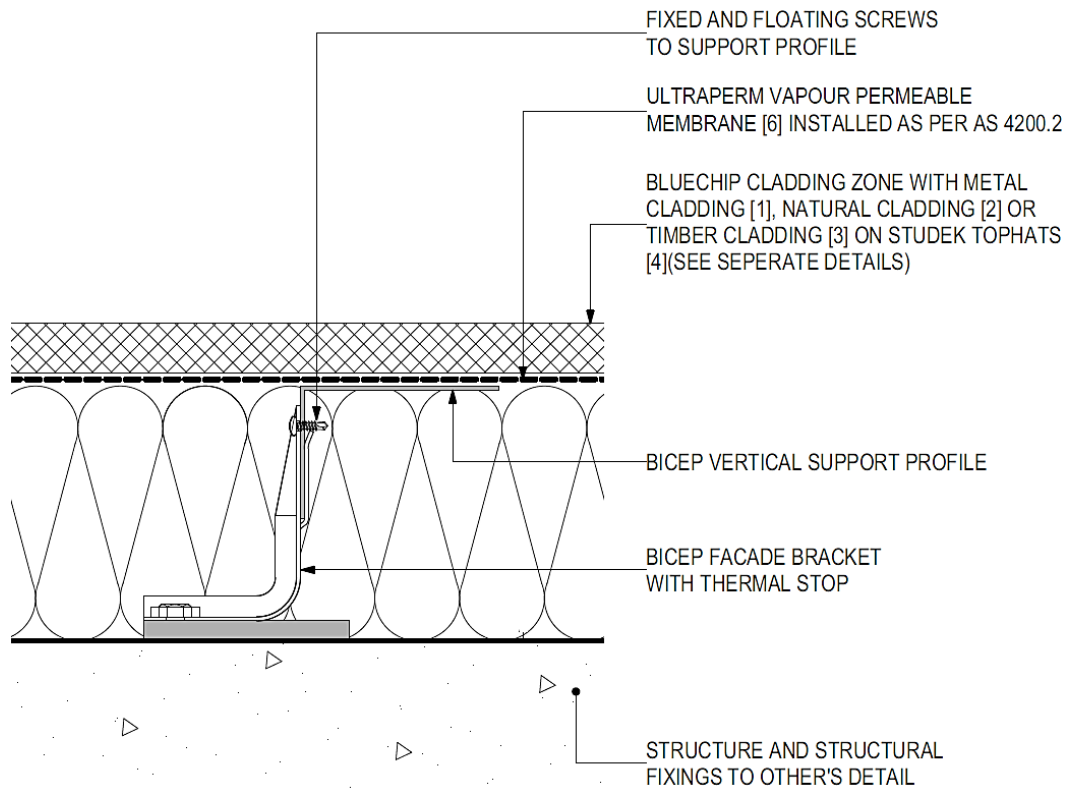


Important Note: The location of the ULTRAPERM membrane on the outside of the insulation (as shown here) or the inside between the bracket and the structure will depend on the project climate zone, the wall-build up, the cladding system and other project specific considerations.



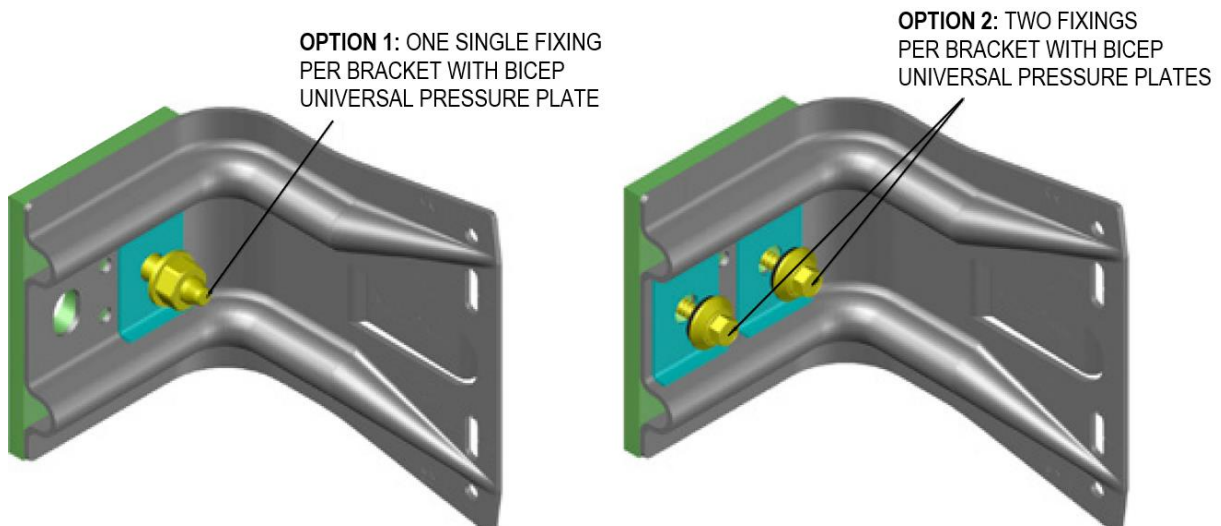
6.3 Vertical Installation – Plan Detail:

This is when the support profiles run vertically which is best suited to pick-up horizontal top-hats or cladding products that run horizontally.



6.3 Fixing to the Structure - General:

BICEP brackets are fixed with 1 or 2 fixings per bracket as shown below. In all cases, it is always recommended to use the *BCUPP BICEP Universal Pressure Plates* for maximum strength. The specification of these fixings should be determined by a qualified structural engineer.





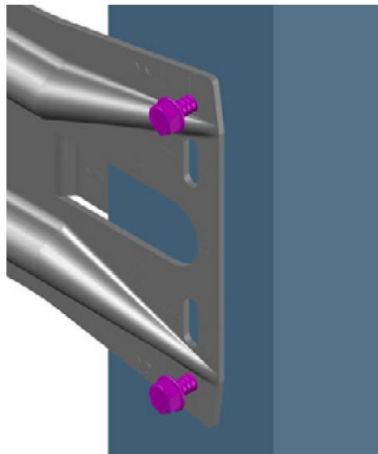
6.4 Fixed & Floating Points - General:

All materials experience thermal movement making it critical to take this into account when designing any façade system. The concept of fixed and floating points refers to the location and function of the fixings (typically screws) which attach the support profiles to the BICEP brackets. In simple terms, this is set out in the table below:

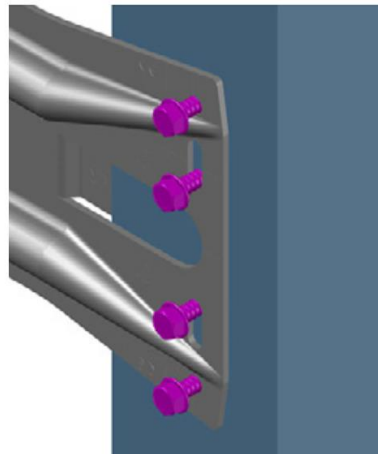
FIXING TYPE	LOCATION/S	FUNCTION
Fixed Points	See diagrams below	To hold the support profile in position parallel to the brackets and eliminate creep whilst providing load-bearing structural support perpendicular to the brackets.
Floating Points	See diagrams below	To allow the profile to expand and contract as required parallel to the brackets whilst still providing load-bearing structural support perpendicular to the brackets.

In general, each support profile will have one or two fixed point brackets per length whilst all the rest will be floating point brackets to allow for the required thermal movement within the façade system on any given project. Some examples of fixed and floating points are shown below:

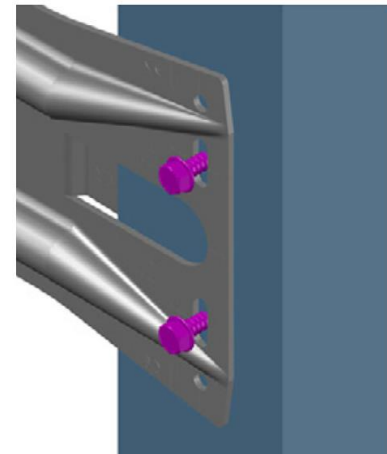
FIXED POINT OPTION 1:
2 X SCREWS PER BRACKET INTO SUPPORT PROFILE THROUGH THE FIXED POINT HOLES



FIXED POINT OPTION 2:
4 X SCREWS PER BRACKET INTO SUPPORT PROFILE THROUGH ALL HOLES & SLOTS AS SHOWN



FLOATING POINTS:
2 X SCREWS PER BRACKET INTO SUPPORT PROFILE THROUGH THE CENTRE OF THE FLOATING SLOTS



6.5 Project Engineering Support:

Further to the general installation points above, the BICEP ventilated facade system is supported by proprietary structural engineering software to assist in the design and specification of the system. To receive an engineered project-specific design layout please provide the following information:

Chosen material, (AL), (CS), (SS): _____
 Support profile direction & centres: _____
 Cladding type and weight per m2: _____
 Project wind-load requirements: _____
 Depth of insulation zone required: _____



7.1 Acceptable System Components:

Exterior Insulation:

The exterior insulation within the BICEP façade system shall be IROCK non-combustible rigid insulation in the chosen thickness (select from the table below), installed on the outside of the primary structure to provide a ventilated, weatherproof, thermal and acoustic insulation zone.

CODE	R-VALUE	DESCRIPTION
IR401260	R1.11	IROCK 40mm Insulation, 1200 x 600mm Board
IR601260	R1.67	IROCK 60mm Insulation, 1200 x 600mm Board
IR801260	R2.22	IROCK 80mm Insulation, 1200 x 600mm Board
IR1001260	R2.78	IROCK 100mm Insulation, 1200 x 600mm Board
IR1201260	R3.33	IROCK 120mm Insulation, 1200 x 600mm Board
IR***1260	R****	Other sizes available supply to order on request



Sarking:

The sarking shall be ULTRAPERME vapour permeable membrane which is; deemed-to-satisfy 'non-combustible' as per NCC 2022 Clause C2D10(6)(f), is AS 4200.1 compliant and classified as a 'water barrier' as per NCC 2022 Clauses F3D3 and F8D3(1), is classified as 'class 4 vapour permeable' for compliant use in all climate zones 1-8 as per NCC 2022 Clauses F8P1 and F8D3(2), and is installed in accordance with AS 4200.2 for deemed-to-satisfy weatherproofing.



Top-hat Sub-framing System (if required):

The sub-framing system shall be STUDTEK steel top-hats attached to the main structure (or BICEP Façade System) in a manner to ensure all applied loadings to the cladding is transferred back to the main structure. Size and spacing of top hat members shall be determined according to applied loads and deflection limitations for any given project. Top-hat centres shall be maximum 600mm or installed in a matrix layout to provide full perimeter support to each panel as required to adequately support the cladding system.

