MASONS PASSIVE ROOF VENTILATION SYSTEM

DESIGN AND INSTALLATION GUIDE

MASONS
Designed Smart, Built Tough.

V1.0 April 2025

General and product information

Purpose - Masons Passive Roof Ventilation System

A passive ventilated roof system uses the stack effect and wind movement and is designed to ensure proper airflow in a long run metal roof space helping to regulate temperature and moisture levels and ultimately improving the longevity and performance of the roof. The design should provide for air to enter the roof space at the eaves and to exit at the ridge. Eave vents may be sized slightly larger than the ridge vents and must always be used in conjunction. This system can be installed to long run metal roofs with and will suit most profiles. This system typically incorporates several key components: ridge vents, ventilated roof battens, and insulation spacers.

1. **Roof Vents:** Are typically installed at the ridge (highest point) or eaves (lowest point) of the roof. The MASONS RIDGE VENT is a crucial element of the system, allowing warm, moist air to escape from the roof void. Ridge vents allow warm air to rise and exit through the top of the roof, while eave vents provide an intake of cooler air from below. These ridge vents can be cut in half to accommodate a mono pitch ridge / barge vent. MASONS VENTILATED ROOF BATTENS are used to form the eave vent in conjunction with an eave flashing sized to suit the roof pitch and the required gap for air flow. Eave flashing to be supplied by roofer. Together, these vents create a natural airflow that helps regulate temperature and humidity, reducing the risk of condensation and heat buildup in the roof space.

2. **Ventilated Roof Battens:** MASONS VENTILATED ROOF BATTENS are specially designed battens that allow air to circulate beneath the roof cladding. These battens create a gap between the roof cladding and underlay layers and the roof framing facilitating airflow. This ventilation gap helps prevent moisture buildup in the roof structure, which can lead to mould growth, timber rot, or damage to the roof covering. The ventilated battens promote consistent airflow, helping to keep the roof space dry and cool, even during hot weather.

3. **Insulation Spacer:** MASONS INSUL-BAFFLE spacers are used to maintain an air gap between the insulation material and the roof cladding. These spacers are typically placed on top of the insulation to ensure there is adequate airflow between the insulation and the roof structure at the low point of the roof space. The spacer ensures that the insulation doesn't protrude into the required roof space, allowing the ventilation system to work efficiently.

How It Works Together: In a well-designed ventilated roof system, the roof vents create an intake and outlet for air, while the ventilated battens allow this air to flow freely under the roof cladding. The insulation spacers keep the insulation in the right position while maintaining the required airflow. This system works together to regulate the temperature in the roof space, reduce condensation, and ensure longevity and performance of the insulation, and other roof space elements by reducing or removing the effects of condensation.

Components

1.	MASONS RIDGE VENT
2.	MASONS VENTILATED ROOF BATTENS
3.	MASONS INSUL-BAFFLE

Masons Ridge Vent

MASONS Ridge Vents are made of tough non-absorbent polypropylene and are used to form a cavity allowing the free flow of air and moisture, assisting with effective ventilation of a roof space. The cellular construction is nonconductive, capillary action resistant and dimensionally stable and assists with reducing thermal bridging. They are robust with a high compressive strength so are effective packers. MASONS Ridge Vents, for roof applications, should be covered within 21 days. This is to match the maximum UV exposure time of Masons Roof Underlays or similar. Check the UV exposure of the roof underlay used and conform to that. MASONS recommends same day cover for MASONS roofing underlay and MASONS Ridge Vent.

MASONS Ridge Vents can be cut in half to accommodate a mono pitch ridge or barge vent and are suitable for long run metal roofs with a maximum trough depth of 34mm. MASONS Ridge Vents blend seamlessly with the roof's design and function by allowing air to naturally rise and exit through the top of the roof ensuring continuous airflow.

MASONS Ridge Vents feature a flexible, adhesive aluminium flashing that conforms to most cladding profiles, effectively preventing water ingress on roofs of any pitch.

Purpose

A MASONS Ridge Vent is an essential component in a passive roofing system designed to promote proper airflow and ventilation within the roof space. Installed at the highest point of the roof, typically along the ridge, the vent allows warm, moist air to escape from the attic or roof void. This helps to regulate temperature and humidity levels which build up under the cladding, preventing issues such as condensation and mould growth which can damage the roof structure over time.

Masons Roof Vent:

Ridge Vent product code:	MRV1200x300x20
Dimensions:	1200 L x 300 W x 20mm H
Colour:	Black
Box Quantity:	Sold as a box of 6

Note: the Mono Pitch Ridge / Barge Vent is formed by halving the Ridge Vent.

Cross Ventilation/Airflow Rates:

Ridge Vent:	6500mm^2/ lm each side of ridge vent	(13000mm^2 total / lm)
Mono Ridge / Barge:	6500mm^2 / lm one side only	(6500mm^2 / lm)

Installation

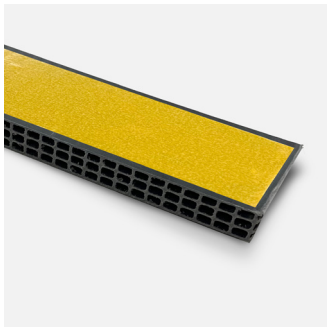
STEP 1:	Install MASONS Roof Vent centrally over the apex of the roof with the additional flashing length to one side. Do not walk on roof vent.
STEP 2:	Remove protective paper from the flashing tape and proceed to mould flashing to the roofing profile
STEP 3:	To ensure the ridge vent is flat against the roof it should be fixed temporarily in place with either tape or screws.
STEP 4:	Trim as required at the end of the ridge.
STEP 5:	Hip Roof - Install hip flashing first then trim the vent at the flashing intersection
STEP 6:	Gable Roof - Install barge flashing then fix vent over to the end of the roof
STEP 7:	A ridge flashing of 200mm should be sufficient to conceal the soft edge.
STEP 8:	Place and fix ridge flashing over.

General:

1.	Masons Ridge Vent may be used with all MASONS roofing underlay products for roof application. They are likely to be suitable for use with many other underlays except where specified otherwise by the manufacturer.
2.	Ensure roof cladding is clean and dry prior to commencing and laying of the ridge vent
3.	Fix ridge flashing as per manufacturers instructions over ridge vent ensuring screw lengths are increased to accommodate for additional height of vent.
4.	When dressing down the aluminium soft edge care should be taken, notching where required and starting at the outer edge and working in.
5.	Installation should be carried out at minimum +5º
6.	Check compatibility of ridge vent with roofing/flashing manufacturer.
7.	Check the UV exposure of the roof underlay used and conform to that for the ridge vent.

Masons Ventilated Plastic Roof Battens





Available in two sizes Masons Ventilated Battens are made of tough non-absorbent polypropylene and have a self-adhesive strip for convenient placement prior to nailing off. Ventilated battens are used to form a cavity allowing the free flow of air and moisture, assisting with effective ventilation of a roof cavity. The cellular construction is non-conductive, capillary action resistant and dimensionally stable and assists with reducing thermal bridging. They are robust with a high compressive strength so are effective packers. They are not suitable to be used as structural battens. Masons Ventilated Battens for roof applications should be covered within 21 days. This is to match the maximum UV exposure time of Masons Roof Underlays. Check the UV exposure of the roof underlay used and conform to that. Masons recommends same day cover for Masons roof underlay and roof ventilation battens.

Masons Ventilated Battens may also be used to form the eave vent in conjunction with a customised eave flashing to suit the roof pitch and the required gap for air flow. Eave flashing to be supplied by roofer.

Available sizes:

Product code	BATNVENT 45x11x1800	Sold as a Box of 50 battens
Product code	BATNVENT 45X18X1800	Sold as a box of 25 battens

Cross Ventilation/Airflow Rates:

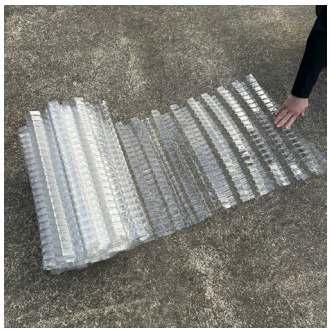
BATNVENT 45x11x1800:	6,800mm^2 / lm or 12240mm^2 / 1.8m length
BATNVENT 45x18x1800:	12,300mm^2 / lm or 22140mm^2 / 1.8m length

Use of a Redway Cavity Closer as a baffle will regulate net free open areas to 1000mm^2 / lm if additional baffling is required in higher wind zones.

Installation

STEP 1:	Install Masons Ventilated Cavity Battens over the timber purlins using the self-adhesive strip to temporarily fix. Do not walk on or traffic battens held only by self-adhesive tape.
STEP 2:	If the battens are to be trafficked, use flat Galv or SS head nails or screws fitted flush (avoid breaking the top surface of the batten) of sufficient length to penetrate the batten depth, plus at least 35mm with sufficient gauge to fix battens firmly for light foot traffic whilst the underlay is being laid. Where used, adjust nail guns to seat nails flush, or just proud, avoid over driving and rupturing the top layer. Adjust fixing spacings to be firm underfoot, 400mm fixing spacing suggested, this may be adjusted by the installer but in all cases must be secure under foot if to be trafficked.
STEP 3:	Install Masons underlay or other as specified to manufacturers instructions. MASONS Ventilated Battens may be used with all MASONS roofing underlay products for roof application. They are likely to be suitable for use with many other underlays except where specified otherwise by the manufacturer.
STEP 4:	Install and fix roof cladding to manufacturers instructions

Masons Insul-Baffle (BFFL.5X650X6)



Masons Insul-Baffle is a crenelated semi-rigid synthetic spacer. Made from clear plastic it is installed over the rafters or truss top chords typically near the eaves where it is likely bulk thermal insulation may push up against the roof underlay.

Purpose

Masons Insul-Baffle is designed to separate roof underlay from bulk insulation where these elements may come into contact, or the required minimum 25mm gap between them cannot be maintained. It assists in meeting the requirements of NZS 4246:2016.6.2.10. It also allows a path for air movement as part of a passive – stack ventilated roof space design. Masons Insul-Baffle incorporates 'Dragon Channels' to increase rigidity and aid air to cross flow.

Masons Insul-Baffle:

Insul-Baffle product code:	BFFL.5x650x6
Dimensions:	45mm H x 650mm W x 6Lm
Box Quantity:	Sold in a roll 650mm wide by 6m long in a 2-roll carton

Open area

A minimum 25mm air gap between insulation and the roof underlay is required, this equates to an open area of 25,000mm^2 per Lm. Masons Insul-Baffle meets this requirement.

Scope of use:

- Preserves an air gap. Typically used to ensure roof insulation is separated from bulk insulation where the roof underlay and insulation may be pressed together near the eaves.
- Contributes to air flow. When used as part of a passive roof space ventilation design.
- Suitable to be used in long run or metal tile clad truss framed pitched roofs, either timber or light steel framed. It may be used in new roof or re-roof installations with either trusses or rafters.
- Not suitable for use in Skillion roofs, these require different design solutions.

Installation

STEP 1:	Plan for Insul-Baffle to be run parallel with, and for the full length of the building eaves. It is placed over the truss chords or rafters near the eaves. The edge of the Insul-Baffle should align with the top plate of the wall frames, or may over hang slightly.
STEP 2:	Install Insul-Baffle placing a crenelation over the first truss chord or rafter in the run. Secure it with staples, flat head clouts or wafer head screws.
STEP 3:	Unroll the roll fully, arrange and place Insul-Baffle crenelations over the roof framing to suit the framing centres. Ensure the Insul-Baffle edge is running parallel with the eaves and finishes at the outer edge of the top plate as a minimum.
STEP 4:	Do not stretch the Insul-Baffle out – use light tension only to prevent sagging, but be sure to avoid deformation of the crenelations through stretching out excessively.
STEP 5:	Fix using staples, flat head clouts or wafer heads screws.
STEP 6:	If there is delay installing other roof elements, insulation, in windy conditions or where trusses or rafters are widely spaced, then additional restraint may be required. Masons Wrap Strap 19 or 25mm may optionally be installed over the Insul-Baffle and fastened to the roof framing.
STEP 7:	Where Insul-Baffle rolls are joined, overlap by at least 1 full crenelation and make the join on framing.
STEP 8:	When two parallel runs of Insul-Baffle are specified to create a 1200mm wide separation – install with crenelations aligned between rolls so air can flow unimpeded.

Limitations

Install roof cover within 21 days of installing Insul-Baffle.

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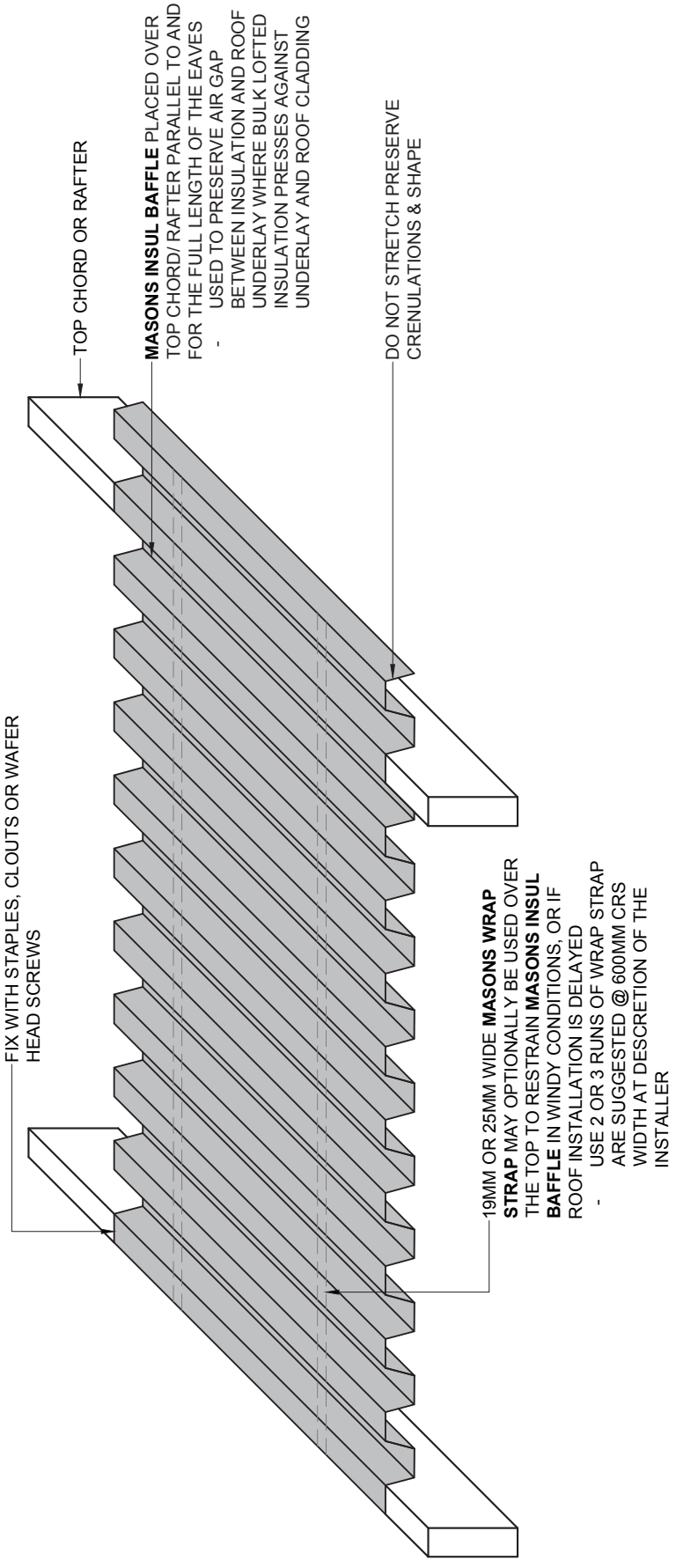
Masons Insul Baffle 50mm H x 650mm W x 6m L

Open Area > 25,000mm2
Masons code: BFFL.5 x 650 x 6

Scale N.T.S

Date 19/08/2024

Drawing No. **MIB.01**



Design of the Roof Ventilation System

Passive roof space ventilation uses the stack effect and wind movement to create air movement through the roof space carrying out moisture laden air. The design should provide for air to enter at the eaves and exit at the ridge. Eave vents may be sized slightly larger than the ridge vents and must always be used together. Care should be taken when designing passive type roof ventilation in corrosion zones such as geothermal or salt spray. In these zones passive-stack ventilation may need to be avoided. Attention should be given to blocking vapour entering the roof space, and or increased ventilation for the occupied space among other design choices.

The roof pitch and the wind zone of the building should be considered when selecting passive roof space ventilation. Mono pitch (Skillion) roofs and trussed/duo-pitch roof pitches below 15° benefit less from the 'stack effect' and require more passive ventilation free open area - consider using the 18mm Masons Vent Batten in this situation. The amount of wind the roof is exposed to substantially affects roof passive ventilation effectiveness. For windy sites with duo pitched roofs steeper than 15° less ventilation may be adequate. Masons Redway Cavity Closers may be used to provide additional wind baffling on lower double pitched roofs or for roofs in wind zones High and above.

THE MRM COP 4.6 2003 HAS THIS TO SAY:

To prevent moisture accumulation and to remove excess moisture in buildings with metal roof cladding, attic spaces should be ventilated using static, balanced ventilation systems with a total of 1m^2 net free venting area per every 150m^2 of ceiling area (0.6%)

While this agrees with the building codes of some countries others opt for ½ of that value @ 1/300. Ventilation designs within these parameters will in most instances provide air movement sufficient to avoid condensation problems. But it will not stop condensation forming on the underside of metal roofing

It can be seen from the two examples below that the calculation of the amount of NFA required is not an exact science but requires the input of the designer to assess the site and construction. The broad parameters for design are recommended to be any NFA between 1/150 and 1/300 of the flat roof area of an insulated roof.

Generally skillion and trussed roofs < 10º require more free vent area as shown below.

MASONS recommends designers read the MRM COP Ventilation of attic spaces https://www.metalroofing.org.nz/technical/ventilation-attic-spaces, MRM COP Clause 10 and BRANZ have several guides or articles about cold roof ventilation and design- Branz Bulletin 610 & 630, Build 157 pgs 57 & 58. Google search 'BRANZ roof ventilation'.
The details and advice offered by MASONS are of a general nature based on industry knowledge and practise. The building designer must always satisfy themselves that their design meets all requirements and are responsible for the final design.

When calculating the net free open area required for adequate passive ventilation the following ratios are suggested:

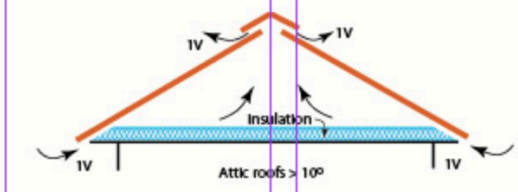
- For Duo pitched roofs with a roof slope of less than 10°, and all skillion / mono pitched roofs – 1/150 ratio – more ventilation.
- For Duo pitched roofs 10° roof slope and greater – 1/300 ratio – less ventilation.
- For Duo pitched roofs Ridge and Eaves Lm are added together and doubled.
- For Mono pitch and skillion roofs Ridge and Eaves Lm are added together (not doubled).

The formula for calculating the open area and selection of the Masons Ventilated Batten for a duo pitched roof with a roof slope greater than 10° is as follows:

- Measure the length of Eaves and Ridges in Lm x 2 (do not double for Skillion roofs).
- Calculate the m^2 of Ceiling including soffits in m^2.
- Divide the ceiling area in m2/300 for a 1/300 passive ventilation ratio (if using a 1/300 ratio) to achieve m^2 of ventilation open area required.
- Multiply by 1000,000 to convert to mm2 of net free open area.
- Divide this figure by the Net free open area of the Masons Ventilated Batten to determine the Masons Batten thickness that is required to provide ventilation at the eaves and ridge.

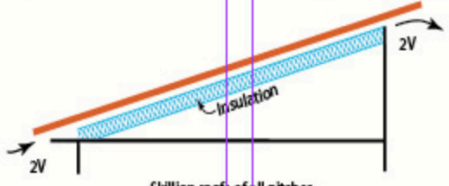
Worked examples as follows.

A.
Exposed marine environment. Duo-pitch =25°.
Residence = 10m width and 18m long.



Eave + ridge perimeter length x 2 = 72m
Ceiling area (+ eaves) = 180m2.
Ventilation requirement 1/300 of ceiling area = .6m2
NFA (Net Free Area) = 600,000mm2.
NFA (Net Free Area)/m = 8333mm2.
Use TVES 25 eave ventilation strip or equiv. = 9500mm2
N.B. This strip should have the marine membrane adhered to the inside of the ventilation strip to inhibit any salt ingress.

B.
Protected environment. Moncpitch Skillion =120.
Residence = 7m width and 15m long.



Skillion roofs of all pitches
Eave + ridge perimeter length = 30m
Ceiling area (+ eaves) = 105m2.
Ventilation requirement 1/150 of ceiling area = .7m2
NFA (Net Free Area) = 700,000mm2.
NFA (Net Free Area)/m = 23,333mm2
Use TVES 50 eave ventilation strip or equiv. = 17,500mm2

Building Regulations, NZBC

When designed, installed, and maintained in accordance with the guidelines outlined in this Design and Installation Guide, MASONS Ridge Vents will meet or contribute to meeting the following clauses of the New Zealand Building Code (NZBC):

- **B1 STRUCTURE:** Performance B1.3.1, B1.3.2 and B1.3.4.
- **B2 DURABILITY:** Performance B2.3.1 (b) 15 years and B2.3.2.
- **E2 EXTERNAL MOISTURE:** Performance E2.3.2.
- **E3 INTERNAL MOISTURE:** Functional Requirement E3.2 (c).
- **F2 HAZARDOUS BUILDING:** Performance F2.3.1.

Scope of Use:

- Suitable for Skillion or Trussed roofs in accordance with MRM COP and BRANZ guidelines
- Can be installed in wind zones up to and including Extra High - NZS3604
- Compatible with corrugated or trapezoidal roofs and will suit most profiles
- Ideal for both new builds and renovation projects
- For very windy sites the designer should take the wind zone and roof pitch into consideration and may need to reduce the flow. The amount of wind the roof is exposed to can substantially alter the effectiveness of the roof passive ventilation.
- MASONS Ventilated Battens are used to form the eave vent in conjunction with an eave flashing sized to suit the roof pitch and the required gap for air flow. Eave flashing to be supplied by roofer.

Recyclability:

Masons recommend contacting the local council or waste stream recycling providers in your locality for advice on who can accept clean, dry, fixing free Masons roof vent products for recycling.

Storage:

Store in cool dry conditions in original cardboard boxes until installation.

Apprailsals:

PASS Certificate

Warranty:

15 years when installed in accordance with manufacturers instructions.

Maintenance:

N/A

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Option 1 - 6800mm2 / lm Cross Ventilation

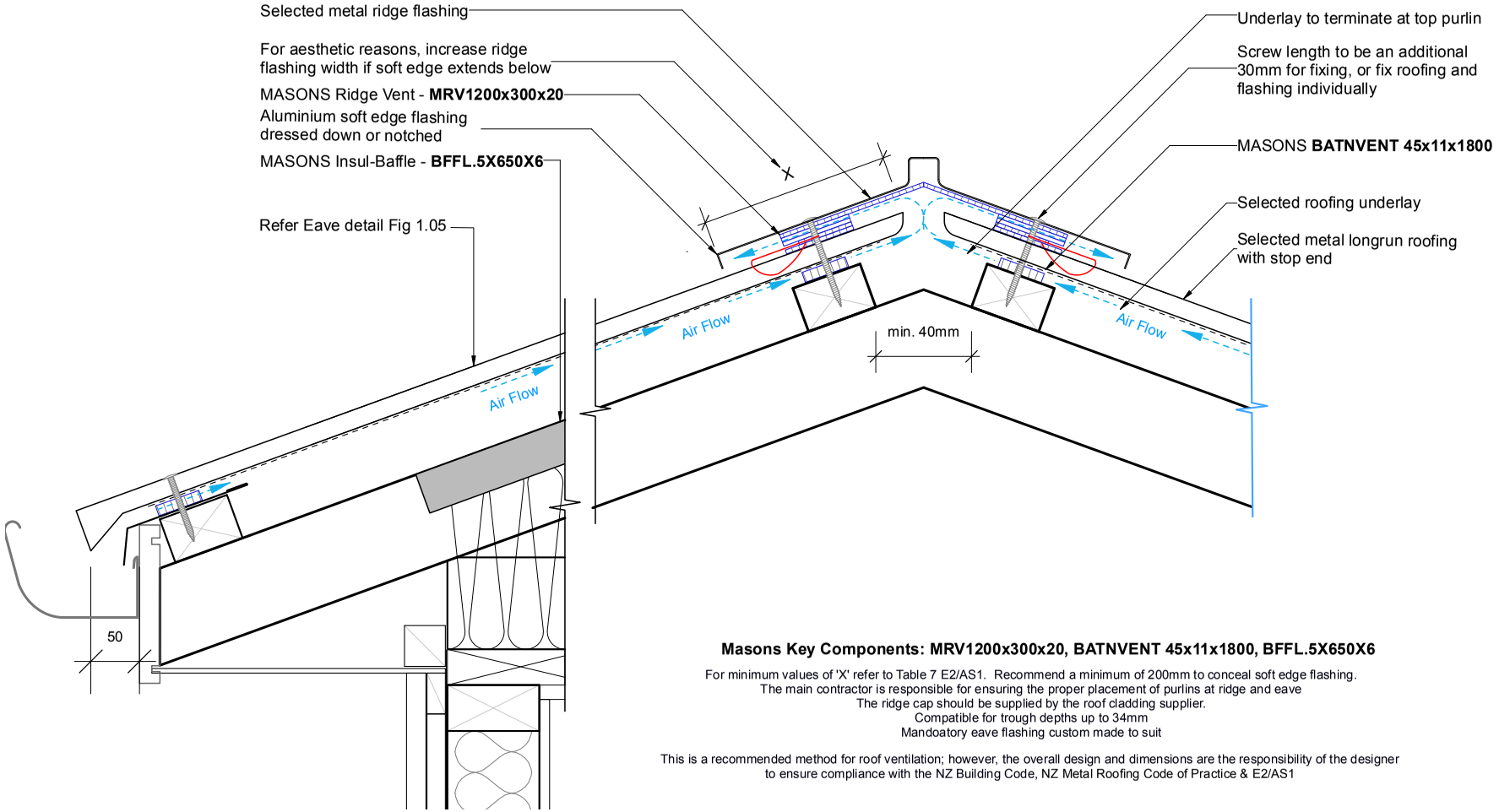
Masons Ridge Vent

Trussed Roof- Steel Longrun

Scale: 1:5

Date: 02/04/25

Drawing No. **Fig.1.03**



Masons Key Components: MRV1200x300x20, BATNVENT 45x11x1800, BFFL.5X650X6

For minimum values of 'X' refer to Table 7 E2/AS1. Recommend a minimum of 200mm to conceal soft edge flashing.
The main contractor is responsible for ensuring the proper placement of purlins at ridge and eave
The ridge cap should be supplied by the roof cladding supplier.
Compatible for trough depths up to 34mm
Mandoatory eave flashing custom made to suit

This is a recommended method for roof ventilation; however, the overall design and dimensions are the responsibility of the designer to ensure compliance with the NZ Building Code, NZ Metal Roofing Code of Practice & E2/AS1

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Option 1 - 6800mm2 / lm Cross Ventilation

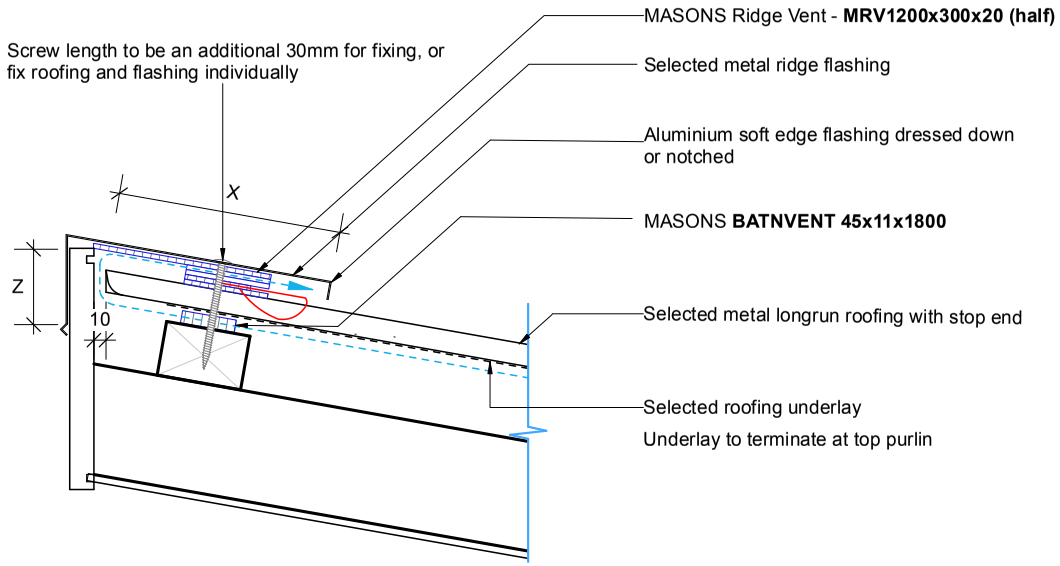
Masons Mono Ridge/Barge Vent

Trussed Roof - Steel Longrun

Scale: 1:5

Date: 02/04/25

Drawing No. **Fig.1.04**



Masons Key Components: MRV1200x300x20 (half), BATNVENT 45x11x1800

For minimum values of 'X' & 'Z' refer to Table 7 E2/AS1. Recommend a minimum of 200mm for 'X' to conceal soft edge flashing
The main contractor is responsible for ensuring the proper placement of purlins for fixing of the ridge vent.
The ridge cap should be supplied by the roof cladding supplier.

This is a recommended method for roof ventilation; however, the overall design and dimensions are the responsibility of the designer to ensure compliance with the NZ Building Code, NZ Metal Roofing Code of Practice & E2/AS1

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Option 1 - 6800mm2 / lm Cross Ventilation

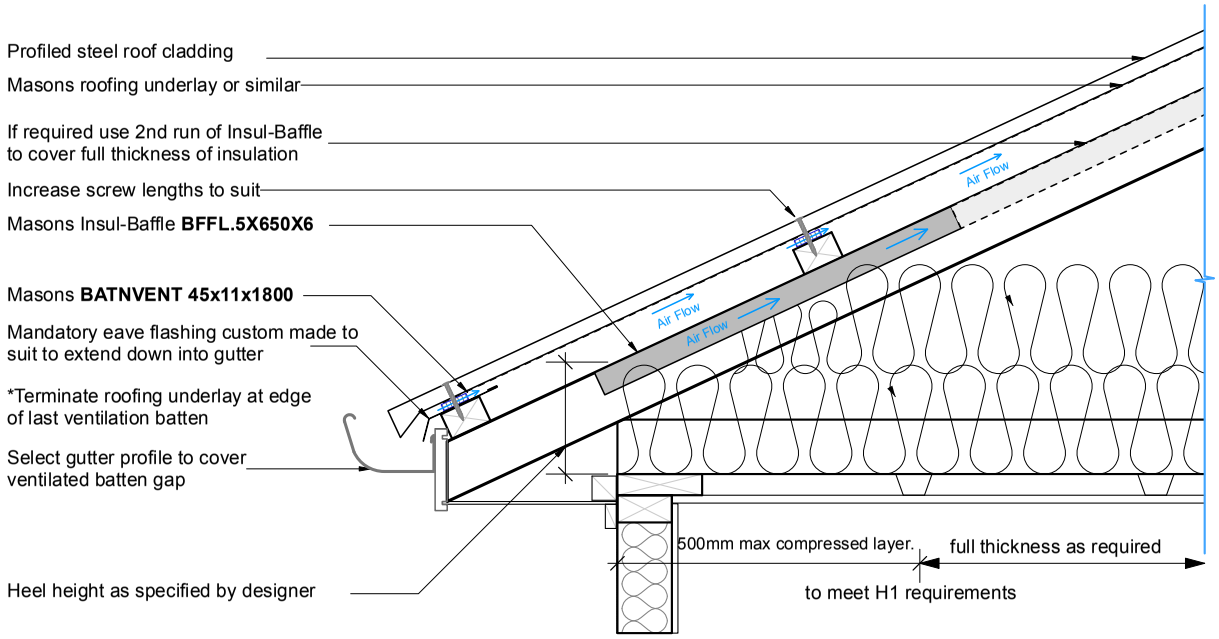
Masons Eave Ventilation

Trussed Roof - Steel Longrun

Scale: 1:10

Date: 02/04/25

Drawing No. **Fig.1.05**



Masons Key Components: BFFL.5X650X6, BATNVENT 45x11x1800

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Option 2 - 12300mm2 / lm

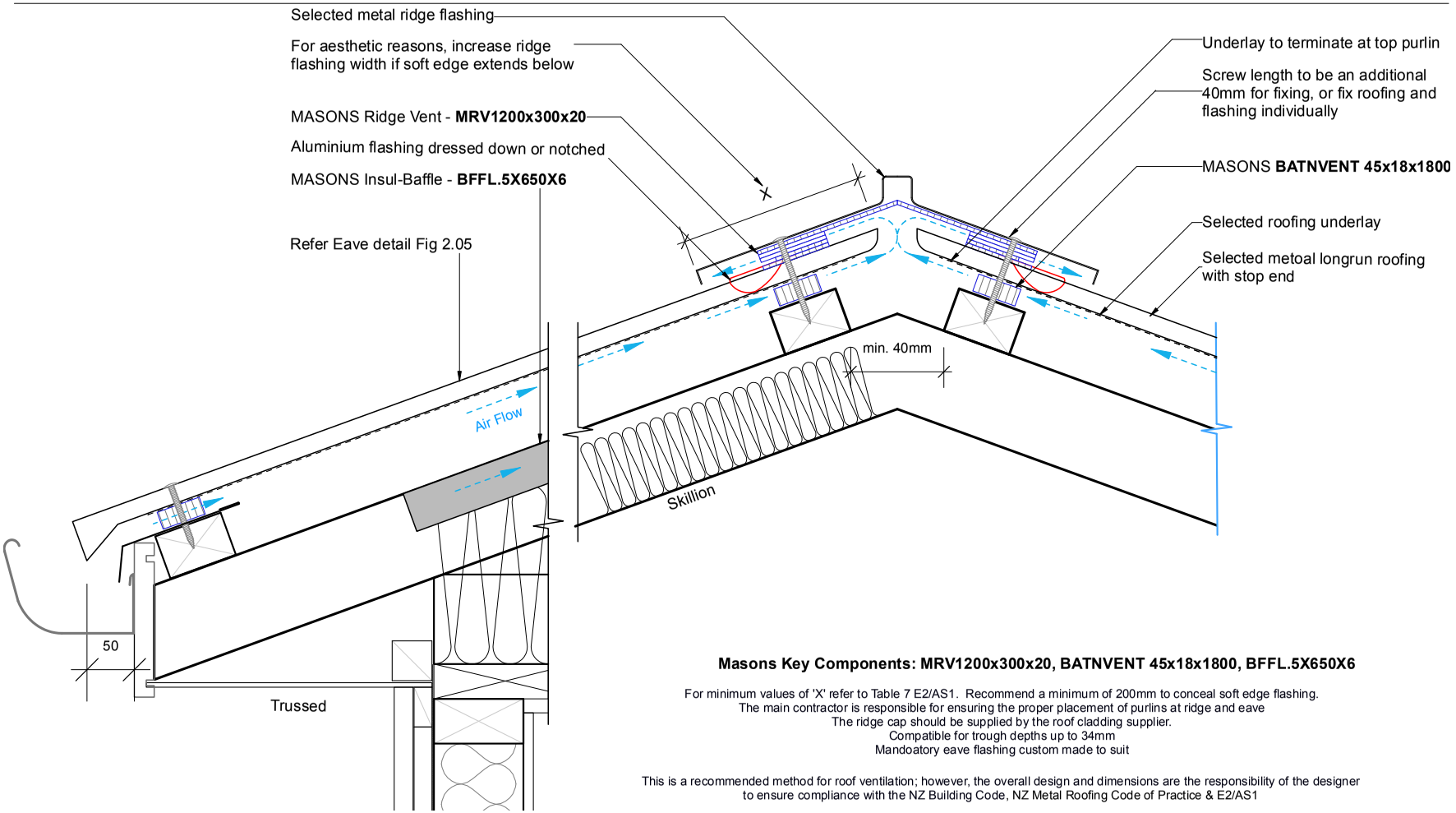
Masons Ridge Vent

Trussed / Skillion Roof - Steel Longrun

Scale: 1:5

Date: 02/04/25

Drawing No. **Fig.2.03**



Masons Key Components: MRV1200x300x20, BATNVENT 45x18x1800, BFFL.5X650X6

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The ridge cap should be supplied by the roof cladding supplier.
Compatible for trough depths up to 34mm
Mandoatory eave flashing custom made to suit

This is a recommended method for roof ventilation; however, the overall design and dimensions are the responsibility of the designer to ensure compliance with the NZ Building Code, NZ Metal Roofing Code of Practice & E2/AS1

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Option 2 - 12300mm2 / lm

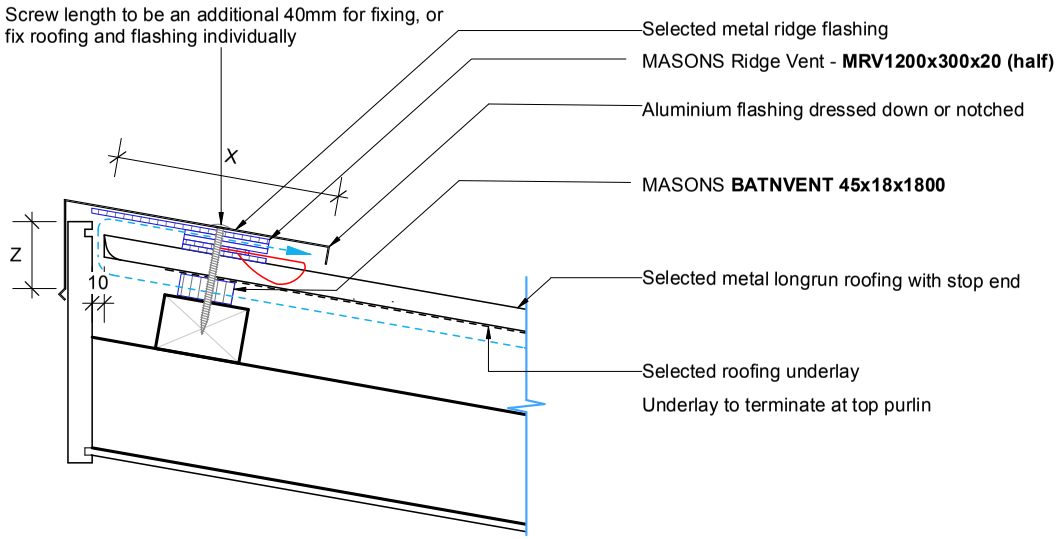
Masons Ridge/Barge Vent

Trussed / Skillion Roof - Steel Longrun

Scale: 1:5

Date: 02/04/25

Drawing No. **Fig.2.04**



Masons Key Components: MRV1200x300x20 (half), BATNVENT 45x18x1800

For minimum values of 'X' & 'Z' refer to Table 7 E2/AS1. Recommend a minimum of 200mm for 'X' to conceal soft edge flashing
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Option 2 - 12300mm2 / lm Cross Ventilation

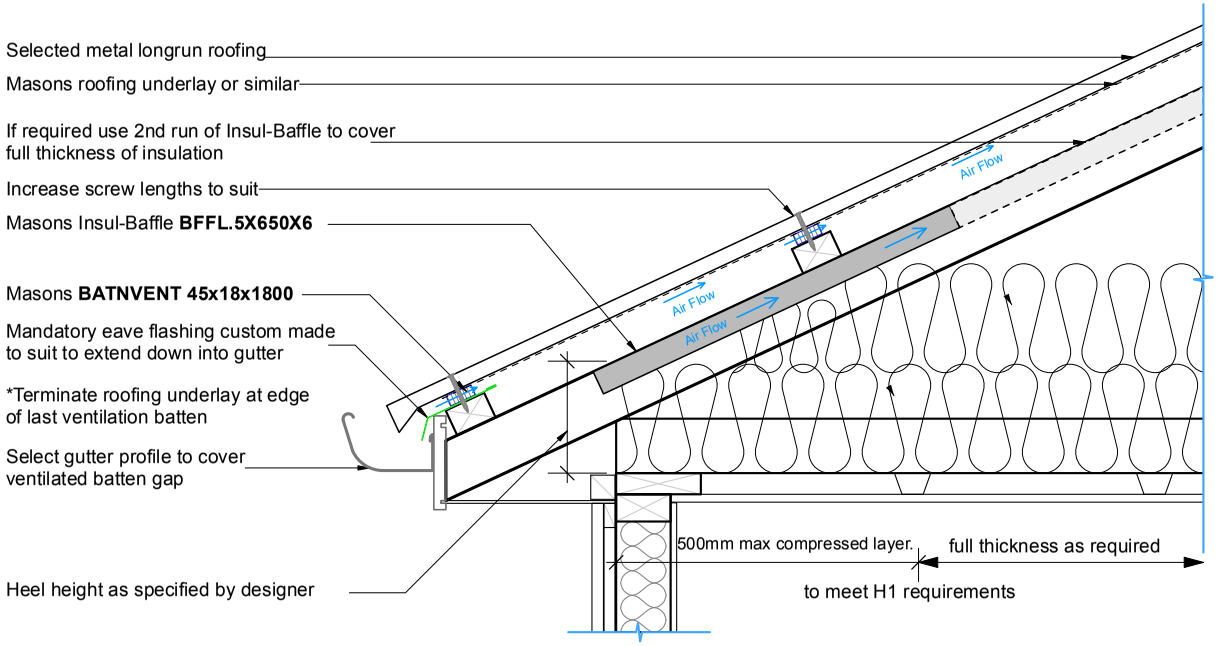
Masons Eave Ventilation

Trussed Roof - Steel Longrun

Scale: 1:5

Date: 02/04/25

Drawing No. **Fig.2.05**



Masons Key Components: BFFL.5X650X6, BATNVENT 45x18x1800

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Option 2 - 12300mm2 / Im Cross Ventilation

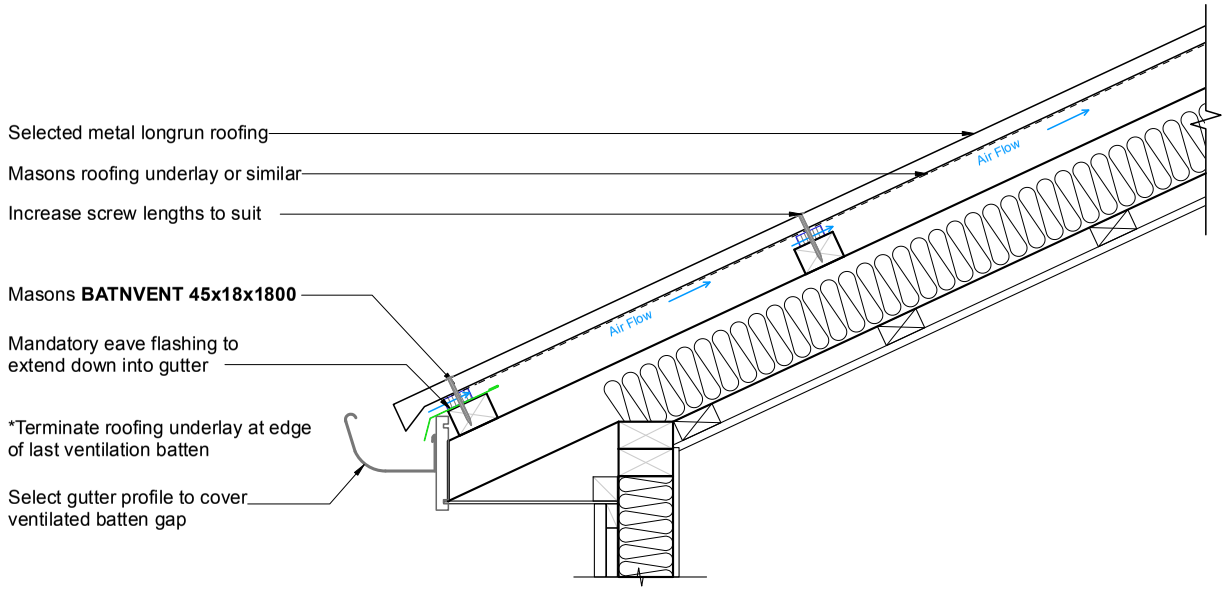
Masons Eave Ventilation

Skillion Roof - Steel Longrun

Scale: 1:5

Date: 02/04/25

Drawing No. **Fig.2.06**



Masons Key Components: BATNVENT 45x18x1800