TECHNICAL BULLETIN # 05

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Formance
Fixing cladding & roofing to SIPs

"How to fix roofing & cladding to Formance SIPs" is one of the most asked questions in the industry and it is easier than it looks.

Roof & wall claddings rely on the connection to the OSB (via a batten or purlin), rather than the timber framing. While the 11mm thickness does not provide the same depth of fixing as timber framing, being a sheet product, fixings can be placed anywhere. Fixing strength is achieved by more frequent fixings than required for timber framing.

General Wall claddings

A wide variety of wall claddings can be used in conjunction with Formance SIPs. This bulletin covers generic fixing requirements of battens. Please check with your cladding manufacturer for any specific requirements when using their product over Formance SIPs.

When fixing cladding to SIP's, the cavity batten becomes a structural element. The connection of batten to the panel is covered by Table 21 in the Formance Design Guide. Batten material must be a minimum structural grade of SG6, therefore packers such as CAVIBAT or EPS are not suitable as a batten.

It is a 2-step procedure

1. The batten is fixed to the Formance SIP panel (in accordance with table 21 of the Formance Design Guide - pg. 47), then,
2. the cladding is fixed to the batten (in accordance with the manufacturer's specifications).

The thickness of the cavity batten is determined by the required embedment depth of the cladding fixing. It is acceptable for the thickness of the strand board (11mm) to be added to the batten when considering embedment depths.

Follow the below steps for an example of how to arrive at a solution.

1. Choose the spacing of the cavity batten to suit the cladding (with reference to the cladding manufacturer's specifications - for this example we will say 600mm centres).

2. Find the site-specific wind zone (for this example we will use Very High).
3. Determine the cladding weight (for this example we will say 'light')

Wall Cladding - Table 21

WEIGHT	WIND	HIGH	VERY H	EXTRA H
LIGHT		A	B	C
MEDIUM		B	B	C
HEAVY		D	D	D
	Spacing Direction			
M2	**900**	**600**	**450**	**300**	**Square**
A	287	430	574	861	508
B	~~222~~	333	444	667	447
C	184	275	367	551	407
D	154	232	309	463	373

5. In this example the cavity battens need to be fixed to the panel at a maximum of 333mm centres. (It may be more practical to round it down to 300mm) – This is with a fully threaded & embedded 10g screw.

Example photo of wall cavity battens

Brick Veneer

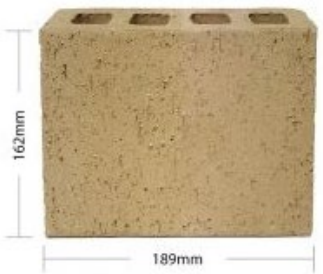
Brick Veneer is a popular cost-effective cladding that works well with Formance SIP's. Brick tie fixings must be in accordance with NZS 4236:2002, except with respect to spacing, in which case use Table 21 in the Formance Design Guide referenced below.

Wall Cladding - Table 21

WEIGHT	WIND	HIGH	VERY H	EXTRA H
LIGHT		A	B	C
MEDIUM		B	B	C
HEAVY		D	D	D
	Spacing Direction			
M2	**900**	**600**	**450**	**300**	**Square**
A	287	430	574	861	508
B	222	333	444	667	447
C	184	275	367	551	407
D	~~154~~	~~232~~	~~309~~	~~463~~	373

(This is the maximum, there may be specific requirements for reduced spacing dues to seismic zones & proximity to openings, etc. Please check the brick manufacturers installation guidelines.)

Generically the maximum spacing for brick ties is 373mm vertically and horizontally. Practically the spacing in the Brick Cladding Ties Table below can be utilised.

Brick Height	Max vertical tie spacing	Max horizontal tie spacing
76mm 	Every 4th course	Every 400mm
119mm 	Every 2nd course	Every 500mm
162mm 	Every 4th course	Every 400mm

Brick Cladding Ties Table

Roofing

For best practice we recommend a vented air gap between the purlin & the panel. This is to prevent any damming of moisture and to ensure a good air movement for keeping the cavity dry. This is especially important when the roof slope is below 15˚. A design review may be required by a ventilation specialist.

There are two common ways to create air gaps for roof pitches above 15˚,

1) Run 45mm x 20mm H3 counter battens under the purlins, running 90˚ to the purlins.
2) Run 'Cavibat' underneath and in line with the purlins. (Not suitable for roof pitches under 3˚).

The purlins are then fixed down through the batten into the roof panel.

There are two purlin hold-down options with Formance SIP,

1) fix to the timber splines or,
2) fix to the panel itself using table 22 on pg. 47 in the Formance Design Guide.

OPTION 1: Fixing purlins to the timber splines

Because most roofs are reinforced with timber splines running up the roof, this provides a double timber 'rafter' every 1220mm. This would be in accordance with NZS 3604 or an alternative solution such as Lumberlok provide: https://miteknz.co.nz/wp-content/uploads/2021/06/Purlin-And-Batten-Fixing-Chart.pdf

OPTION 2: Fixing purlins to the panel

By using table 22 on page 47 of the Formance Design Guide, purlins can be fixed to the panel. Follow the below steps.

1. Ascertain the site-specific wind zone (for this example we will use Very High).
2. Determine the spacing of the purlins (for this example we will say 900mm centres).
3. Use these figures as shown on the right, table 22 of pg. 47 of the Formance Design Guide

Roofing - Table 22

Location	Wind	High	Very H	Extra H
General		A	B	C
Corner*		D	E	F
Spacing direction				
M2	**900**	**600**	**450**	**300**	**Square**
A	207	311	414	622	432
B	160	241	321	481	380
C	133	199	265	398	346
D	138	207	276	414	353
E	107	160	214	321	310
F	88	133	177	265	282

4. This indicates that the purlins need to be fixed at a maximum of 160mm centres, using 10g screw – fully threaded & embedded.

Other general notes regarding fixing purlins to the panel

The category 'General' on table 22 applies to the main roof area. The category 'Corner' has a higher fixing requirement due to the increased loads in the corner – re-apply the same principles as in category general.

Use the below table as a guide when calculating the size of area 'A.

Roofing - Table 22

Location	Wind	High	Very H	Extra H
General		A	B	C
Corner*		D	E	F
Spacing direction				
M2	**900**	**600**	**450**	**300**	**Square**
A	207	311	414	622	432
B	160	241	321	481	380
C	133	199	265	398	346
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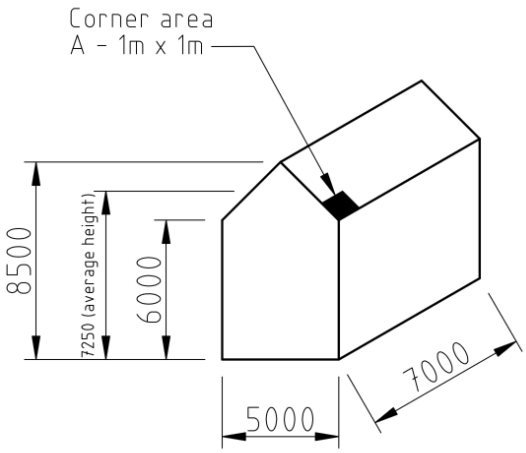

Width: 0.2 x 5m = 1m
Length: 0.2 x 7m = 1.4m
Average height: 7.25m
So smallest of these 3 is 1m
So 'A' is 1m