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FAÇADE CONTRACTOR'S TOOLBOX

This information has been adapted from the original source: 'A Facade Contractor's Toolbox of MUSTS', www.awci.org.au

A façade contractor is faced with a range of challenges, from the façade design through to building code requirements and actual construction of the façade system.

The following has been prepared to help façade contractors make sense of the maze of challenges they face.

Wind pressures

A common question asked is:

Who's responsible for determining the façade wind pressures?

Generally it's the project or façade engineer.

Many contractors see it upon themselves to determine the maximum wind pressures for a façade. These wind pressures are used to determine the top hat spacing and span and necessary façade panel fastener intervals.

There are times the project engineer may state a non-factored wind pressure in kilopascals (kPa), or even a wind speed in metres per second, but this is not the information a façade contractor requires. The contractor should not be made to calculate the final façade wind pressures, which involve multiplying factors including building height, terrain category and topography that are typically only known to the project engineer. Always insist that the project engineer states the façades 'maximum ultimate state design wind pressure' for both the general areas and 1200mm from the edge of the building. Wind pressures within a certain distance from a building corner are greater than the general areas of the façade.

Is the rear of the façade exposed to wind pressures?

If there are no internal or external linings on the rear side of the façade, the actual combined wind effect will increase the total wind pressure on the façade. Not exactly knowing the actual wind pressures on the façade is dangerous.

Slab junctions

All concrete slabs deflect. The issue comes when the façade system bridges this deflection and does not accommodate for the movement while maintaining a watertight junction.

In a façade wall infill where the façade starts and stops under each floor junction, an allowance in slab deflection is made by leaving a gap under the slab, with both the top hats and façade panel. Ensure a drip groove is scored into the underside of the concrete slab edge to shed water away from the façade concrete slab junction.

In the case where the façade system bridges over the slab edge, with the top hats effectively tying together the concrete slab and sub frame, it is recommended that you cantilever the top hat over the slabedge from the upper and lower storey allowing for movement.

Some top hats are allowed to cantilever one-quarter of the back span distance. When not correctly detailed or constructed, it can lead to failure such as the buckling of top hats, façade panels becoming damaged and allowing excess water inside the cavity.

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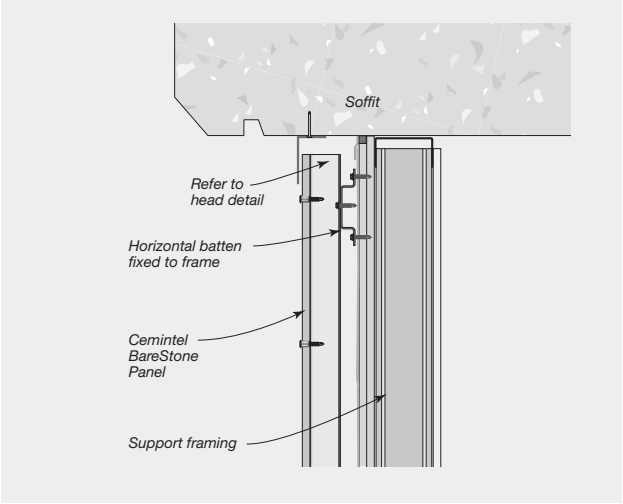
Soffit junctions



The junction between the wall and soffit can lead to wind and moisture ingress issues that need to be managed. A soffit junction typically means a discontinuation in the wall; therefore, you need to allow any unforeseen trapped moisture in the cavity to freely drain out as well as diverting moisture from travelling down the façade. The above wall to soffit detail provides one suggestion.

Efficient and effective façade panel geometry set out

If the designer allows for it, the following will dramatically increase the speed of installation, reduce the need for cutting panels, lessen the risk of workmanship issues and reduce install costs.

- line up your panel edges with openings such as windows and doors. Avoid cutting panels around openings.
- select panel sizes compatible with floor heights, under windows , fascia heights and equalised spaced to suit wall run length
- position openings to suit panel sizes
- use a laser level to project panel grid pattern and maintain panel grid straightness

Cutting and sealing

For a faster, sharper and cleaner cut with fibre cement panels, cut outdoors using a Makita fibre cement saw blade connected to a dust extractor. It is compatible with a 165mm circular saw and the blade has four diamond tipped teeth.

Always cut the board with the external face facing down for a cleaner and sharper cut and with the wind blowing the dust away from the contractor. Always wear an appropriate and well fitting dust mask in accordance with AS/NZS 1715 to reduce exposure to respirable crystalline silica.It's generally recommended to seal any cut panel edges with Cemintel sealer.

For more information on installing the relevant façade system, always refer to the manufacturer's façade system install guide.

Condensation management

When a vapour permeable membrane (air barrier) is specified behind the vertical top hats, ensure that it has the following ratings in accordance to AS/NZS 4200.1. You can check either on the roll packaging or in the manufacturer's technical data sheet

- Vapour barrier = Low.
  Which means that it can breathe to allow potentially trapped moisture to escape
- Water barrier = High.
  This is to help prevent the moisture from penetrating through the membrane and into the wall frame.

Note in hot humid climates, a vapour permeable membrane may not be suitable.

Most façade systems consist of façade panels installed onto a cavity eg. top hats. This cavity allows moisture to drain down between the vapour permeable membrane and façade panels. However, it is important for the top hats to be installed vertically to allow trapped moisture to freely drain down and escape. Horizontal top hats can cause the moisture to pond on top of each top hat. If the sub frame behind the vertical top hats is laid out horizontally, the vapour permeable membrane must be installed in front of the horizontal girts and behind the vertical top hats.