

Supercrete™

Sustainable Cost Effective Construction & Coating Systems



Commercial & Industrial Wall Systems Brochure

Sound Insulation • Fire Resistant



Supercoat™

100% NZ
Owned & Operated

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What are Supercrete™ Commercial and Industrial Wall Systems (CIWS)

Supercrete™ Commercial and Industrial Wall Panels are precast reinforced autoclaved aerated concrete (AAC) panels for construction of walls. Panels are a very fast way of cladding a structure where thermal, fire and soundproofing properties are desired. They are an ideal complement to steel frame construction in commercial applications and panels are individually manufactured in varying thicknesses and lengths for specific projects.

Benefits

- Supercrete™ Commercial and Industrial Wall Panels are approximately one quarter of the density of standard reinforced concrete. Therefore, bracing demand is substantially reduced, as are freight costs to site. Crane capacity required for placement of panels is also reduced, with resultant cost savings.
- Fastening methods using Supercrete™ Tension Ties are very simple and quick and require only a few minutes instruction
- Panels can be easily cut or drilled on site, if required, to form openings for services.
- Panels have all the inherent thermal and acoustic advantages of AAC.

- Panels have a minimum fire rating of 240/240/240 minutes for structural adequacy, integrity, and insulation requirements.
- Installed wall panels provide a perfect substrate for acrylic coating and plaster systems.

Panel Details

All Supercrete™ Commercial and Industrial Wall Panels are manufactured in 600mm widths. If narrower panels at the top of a wall are required, these can easily be site cut. Panels are manufactured to specified lengths to exactly fit a building frame. Shipping constraints, at present, can limit panel length to 5.85 metres.

Panels are available in thicknesses of 120, 150, 200 and 250mm.

Panels are manufactured with a tongue on the top and a groove on the underside to lock them together for lateral load transference between panels. All panels are manufactured with two layers of reinforcing welded into a mesh, which is dipped in an anti-corrosive agent before placing in moulds.

Panels are attached to steel frames using stainless steel Supercrete™ Tension Ties which hook around the flanges of the steel columns. One tie is normally used at each end of the panel. These are fastened into the top of each wall panel using stainless steel V nails driven through shaped holes in the Tension Ties. See Details 1 and 2.

Tension Ties are available from Superbuild International Ltd and its National Supercrete Distribution Network, in varying lengths depending on panel thickness.



Structural Design

Supercrete™ Commercial and Industrial Wall Panels are designed primarily for wind loading, to transfer horizontal wind loads to structural steel frames. Table 1 shows the recommended maximum clear spans of panels for varying wind pressures and panel thicknesses. Panels are not assumed to contribute to the bracing of the structure due to the way they are clipped to the structural steel.

The load capacity of the Supercrete™ Tension Ties is shown in Table 2. For high wind loads, it may be necessary to install intermediate columns to enable the use of additional Tension Ties to reduce the loading on each tie.

All Supercrete™ Commercial and Industrial Wall Panels have a fire rating in excess of 240 minutes so specific design of reinforcing cover is not required.

Thermal resistance and the Sound transmission Class (STC) for varying thicknesses of panel are shown in Table 3.

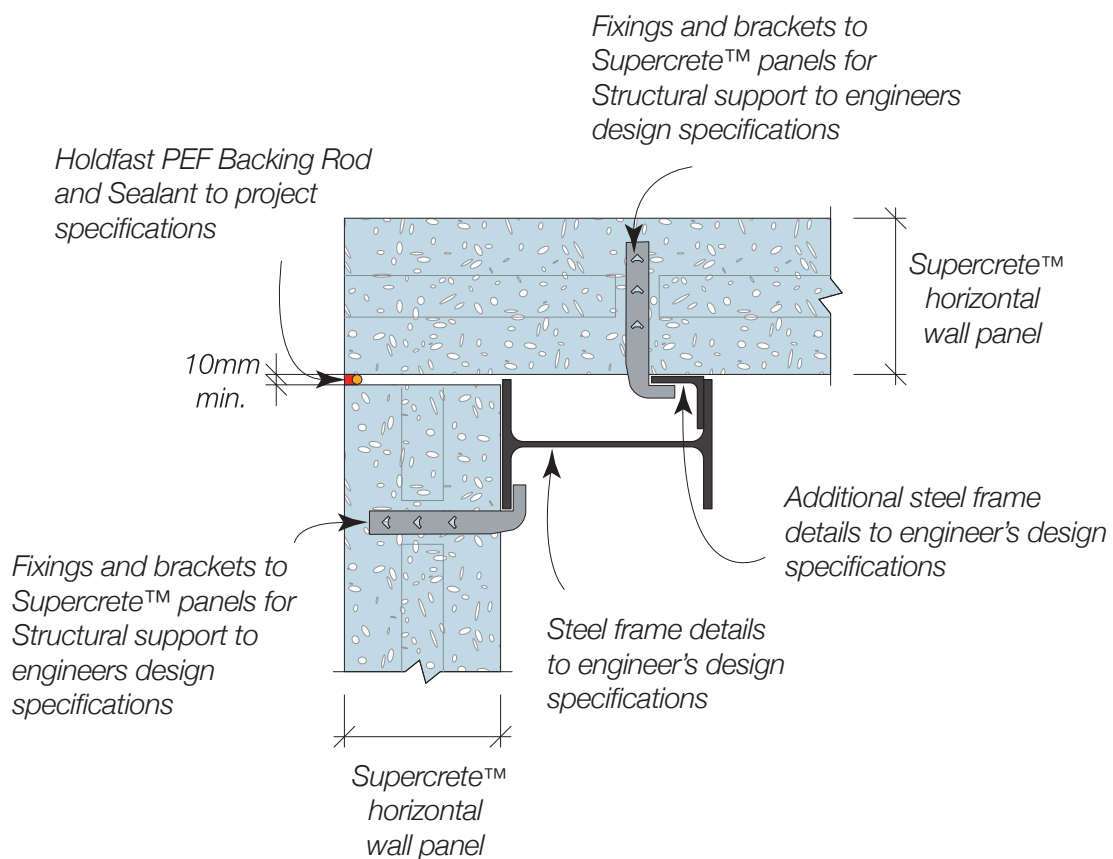
Where openings are required in panels that will necessitate the cutting of reinforcing, these openings must be detailed prior to panel manufacture to enable additional reinforcing to be placed around the opening.

Where panels are interrupted by door or window openings, a steel channel frame is required to frame the opening, into which the ends of the panels are slotted. A typical door arrangement is shown in Detail 3. Door frame steel needs to be installed prior to placing panels. Window steel can be installed when panels reach the sill height. These steel frames can be constructed using rolled steel channel sections or bent up from flat steel, depending on thickness required from design loadings. Panels can be used as lintels over their full length providing the bearing pressure at supports is acceptable.

In some type of structures (eg. sound barriers), the wall panels can be slotted between the flanges of universal columns, and the flanges used to laterally restrain the panels. Care is required in detailing this type of construction to ensure that the ends of panels are snug between the flanges without any lateral movement possible. Also, consideration must be given to how waterproofing the ends of panels will be achieved.

For economic design, the size and location of openings should be based on 600mm modules of panel height, to avoid site cutting of panels. Locating openings adjacent to columns can also reduce the number of short panel lengths.

Detail 1. Corner Junction Detail



Ordering of Panels

Supercrete™ Commercial and Industrial Wall Panels are designed and manufactured for specific designs and locations. To ensure that this is done to the clients requirements, clients are required to sign off a panel schedule at the time of order. This details panel lengths, thickness, quantity, location and wind loading.

Panels are supplied stacked vertically on pallets, one panel high.

Panel Installation

Prior to installation, locate the pallets of panels around the site with panels as close to their final position in the structure as possible.

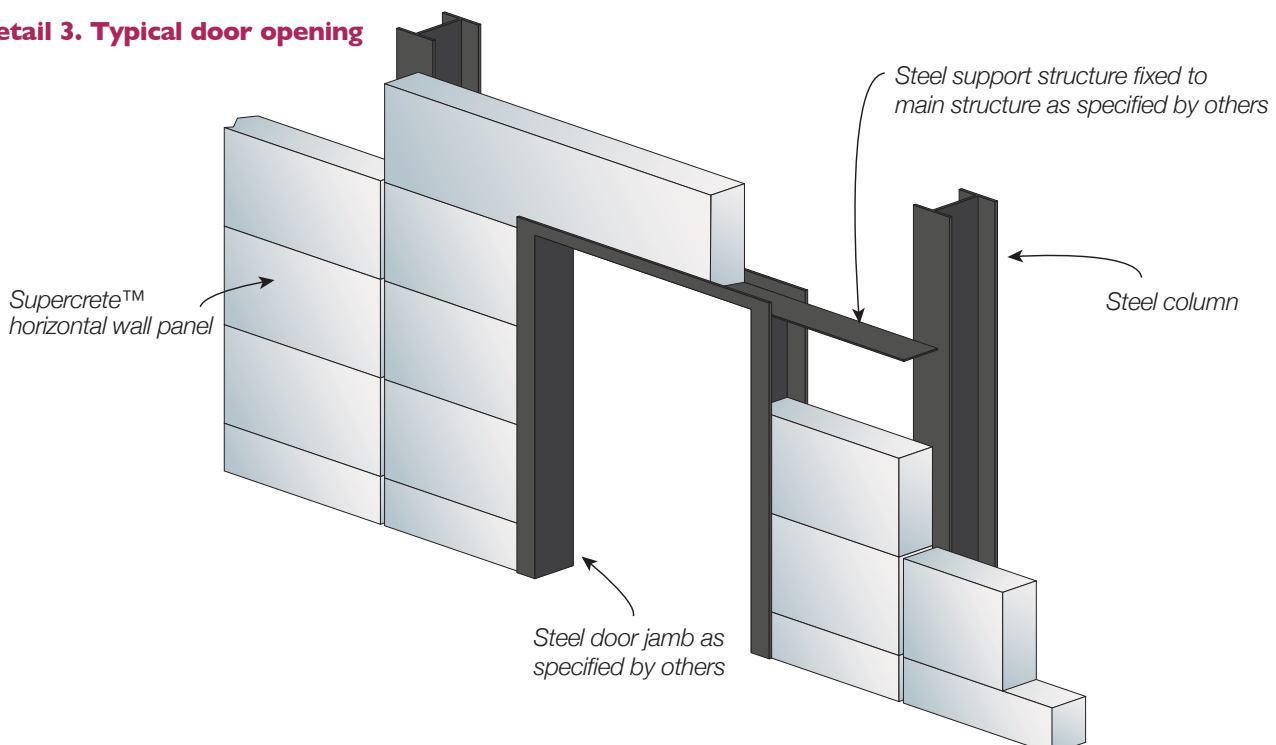
The bottom panel in a wall has to be fixed in position at the base as fastening of a tension tie at the bottom of the first panel is not possible. On a full foundation, this is normally done with the installation of stainless steel pins set in the foundation, as shown in Detail 4. Holes are drilled in the underside of the panel to locate over the rods.

A layer of DPC is laid along the foundation under the panel location to provide a slip joint between the AAC and the concrete foundation. A nominal 10mm layer of sand/cement mortar is then placed on top of the DPC for bedding the bottom of the panel.

The panels are lifted into place using a scissor lift which is available on loan from Superbuild International Ltd and its National Distribution Network. This lifts the panels vertically in the centre straight from the delivery pallets.

With the panel located in the correct position lengthwise, the Tension Ties are hooked around the flange of the steel columns, and the location marked on the upstanding tongue. A slot is quickly chiseled out in the tongue for the tie and the V nails are then driven down through the holes in the ties, into the panel.

Detail 3. Typical door opening



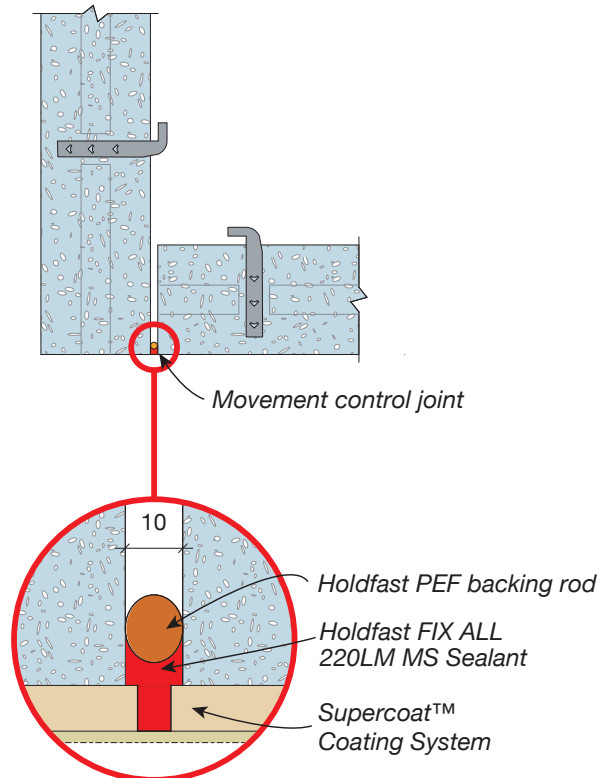
Supercoat™ AAC Superbond Adhesive is spread along the top of each panel, before the next panel is lowered into place. Excess adhesive should be removed before it has set.

If panels have to be cut, a diamond blade is required to cut through the reinforcing. Panels are cut dry.

Where panels meet longitudinally at a steel column, a 10mm gap is left between panels for movement control joints. These consist of a foam backing rod pushed into the gap and the surface joint filled with polyurethane sealer, after first removing all dust, for good adhesion.

See Detail 2.

Detail 2. Typical column fixing and control joint



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A layer of DPC is laid along the foundation under the panel location to provide a slip joint between the AAC and the concrete foundation. A nominal 10mm layer of sand/cement mortar is then placed on top of the DPC for bedding the bottom of the panel.

The panels are lifted into place using a scissor lift which is available on loan from Superbuild International Ltd and its National Distribution Network. This lifts the panes vertically in the centre straight from the delivery pallets.

With the panel located in the correct position lengthwise, the Tension Ties are hooked around the flange of the steel columns, and the location marked on the upstanding

tongue. A slot is quickly chiseled out in the tongue for the tie and the V nails are then driven down through the holes in the ties, into the panel.

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Detail 4. Typical base fixing of panels

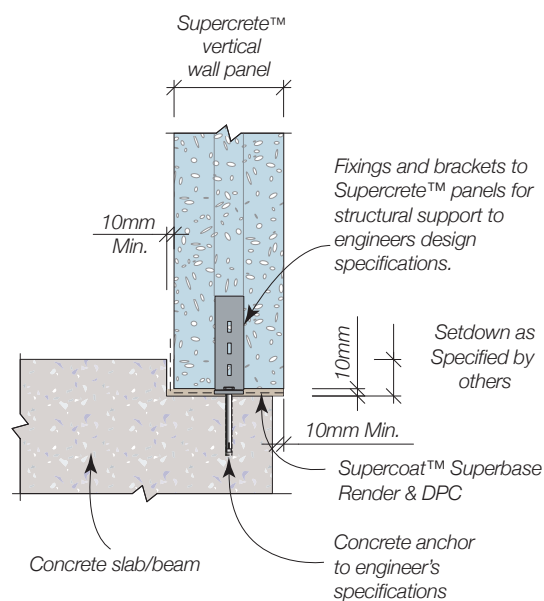


Table 1. Supercrete™ Commercial and Industrial Wall Panels

Thickness (mm)	Recommended Maximum Clear Span (m)									
	Ultimate Design Action Effect (kPa)									
	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00
100*	3.00	3.00	3.00	3.00	2.85	2.70	2.55	2.40	2.30	2.20
120	4.50	4.50	4.50	4.25	4.00	3.85	3.70	3.55	3.45	3.30
150	5.85	5.85	5.85	5.45	5.20	4.95	4.75	4.60	4.45	4.30
200	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85	5.85

NOTE

- (1) *Tongue and groove profile for this thickness is currently not available.
- (2) Panels with a thickness 120mm and greater have a fire resistance rating (FRR) of 240/240/240. 100mm thick panel has a FRR of 240/120/90.
- (3) For purposes of this table it is assumed that the chosen connections for the panels have the strength required to support the selected load.
- (4) Design Action Effects above 3.00kPa to be referred to Superbuild International Ltd for specific design.

Where the panels have been installed between the flanges of the columns, Supercrete™ facing blocks or panel can be used to cover the steel to give a uniform coating/plastering surface. These can also be used over movement control joints, but care must be exercised to ensure that the Supercrete™ facing is only glued to one side of the joint, so that relative movement between the panels on either side of the joint is still possible.

Supercoat™ Coating Systems

The surface of the wall panels should be coated for waterproofing. Please contact your local Distributor for information on the various Supercoat™ Coating Systems. A list of Distributors can be found at www.superbuild.co.nz.

Table 2. Tension Tie Capacity

End Distance mm	Flange Thickness mm	V Nail Location mm	Maximum Safe Load mm
50	15	B & C	1.40
100	15	B & C	2.70

Note: Hole A is provided for cases where nail hits reinforcing mesh

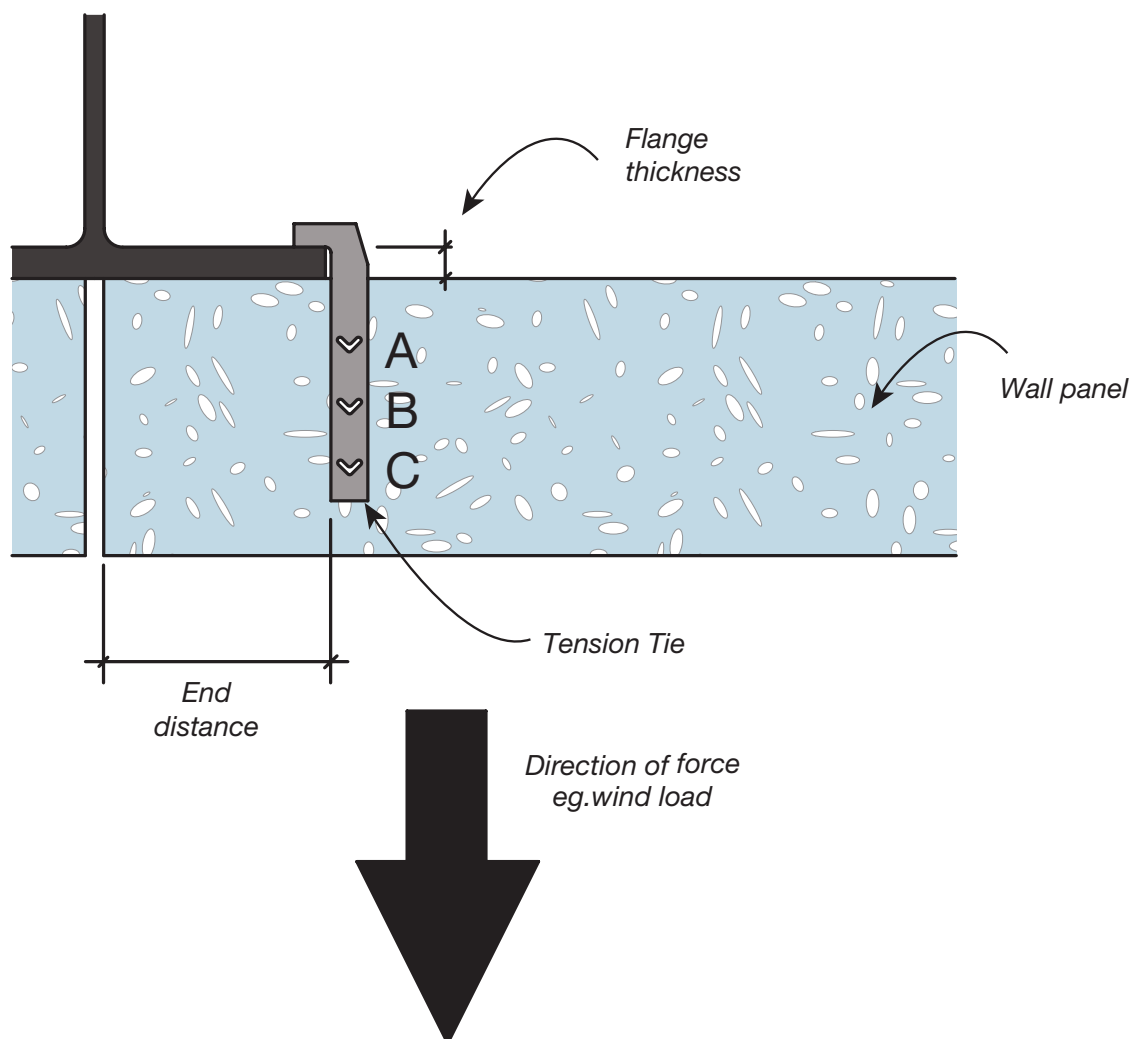


Table 3. Thermal and Acoustic Properties

	Panel only		Render on both sides	
Panel Thickness mm	R Value m2k/W	STC rating decibels	R Value m2k/W	STC rating decibels
120	0.80	39	1.12	45
150	0.93	40	1.25	46
200	1.19	43	1.51	48

Note: R Value & STC Values are for dry state

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Authorised Distributor



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