

## VIBLOCK BRICK CLADDING SYSTEM – SPECIFICATION VB-B1

### GENERAL SPECIFICATION

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#### PRELIMINARY

This document is a generic bricklaying specification used for the construction of single storey, running-bonded brick veneers. It is an 'Alternative Solution' to E2/AS1 applicable only when Viblock concrete bricks, as mentioned in this document, are used in a masonry brick veneer. If any aspect of design has not been specifically addressed, then E2/AS1 Masonry and NZS 4210 will apply. This general specification also applies to the following specifications:

- VB-B2: Two-storey running bonded specification.
- VB-B3: Three-storey running bonded specification.
- VB-S1: Single storey stack bonded specification.
- VB-S2: Two-storey stack bonded specification.
- VB-S3: Three-storey running bond specification.

#### DESIGNER

The 'Architectural Designer' is responsible for ensuring that the brick veneer, as detailed on the Building Consent Plans and Specification, complies with all aspects of this 'Specific Design'.

The designer must clearly mark on the plans submitted for Building Consent – '*Viblock Brick Cladding System – Specification VB-B1*' – *no substitution*.

Where taller panels or stack bonded panels are required, refer to the appropriate specifications for drawing notes

#### RELATED DOCUMENTS

All Relevant NZ Standards shall apply in their latest revisions for all items NOT covered by this 'Specific Design'. The following documents are of particular relevance:

- NZS 4210                Materials and workmanship
- NZS 4229                Masonry buildings not requiring Specific Design
- NZSHB 4236            All standards relating to masonry veneers – summary
- NZS 3604                Timber-framed buildings

Conditional upon the Viblock brick veneer being installed in accordance with this specification, the following provisions of the NZ Building Code must also be met.

- B1                        Structure
- B2                        Durability
- C3                        Spread of Fire
- E2                        External Moisture
- F2                        Hazardous Building Materials



## DESIGN LIMITATIONS

The Viblock single storey brick veneer shall be subject to the following limitations:

- The maximum height for a single storey veneer is 4m from the foundation. At a gable wall or pier (see figure 1 below), the maximum height may extend to 5.5m.
- Single storey construction only.
- Residential or commercial buildings up to an importance level of 2 according to AS/NZS 1170.
- Concrete slab-on-grade construction to NZS 3604.
- Bricks must be laid to a running-bond pattern. Small areas of Soldier Courses and Stack-Bonding are permitted, but should not exceed 5% of the total surface of the veneer.
- The supporting structure may be timber framing to NZS 3604 or concrete block/precast in accordance with NZS 4229. Alternatively, an SED masonry or concrete wall may be designed by a suitably qualified engineer.
- Unless otherwise stated, all aspects regarding the installation of the brick veneer will conform to the requirements of NZS 3604, NZS 4229 and NZS 4210.
- A veneer thickness of 70mm with an addition of up to a 10mm thick plaster coating if specified.
- A maximum veneer weight (including plaster if specified) of up to 145kg/m<sup>2</sup>.
- Maximum size of brick unit height to length ratio of 0.7.
- Situated in NZS 3604 wind zones up to and including 'Extra High'.
- Dwelling to be situated within earthquake zones 1-3 in accordance with NZS 3604.
- Residential buildings to comply with NZS 3604. Commercial buildings must be assessed to have a period of not more than 1.5s in accordance to NZS 1170.
- The fundamentals outlined in VB-B1 may be adopted when building using steel studs and framing, however, 'Specific Engineering Design' of the supporting structure would be required from a suitably qualified engineer knowledgeable with this form of construction.
- Should the design of the building fall outside the scope and requirements of Specification VB-B1, then additional 'Specific Engineering Design' would be required.

## Bricks

This specification is only applicable to the following brick types manufactured by Viblock:

**Table 1 – Viblock bricks applicable to this specification**

Bricks applicable to this specification				
Viblock Brick Product	Size (LxHxW)	No/m <sup>2</sup>	Weight (kg) Per brick	Weight (kg/m <sup>2</sup> )
Dunstan	220 x 136 x 70mm	33	3.6	125
Shotover	220 x 73 x 70mm	60	1.9	120

*Note: Table 1 includes a 4% allowance for wastage in the number of bricks per m<sup>2</sup>, for ordering purposes*

## BRICK VENEER CONSTRUCTION

### Maximum Veneer Heights

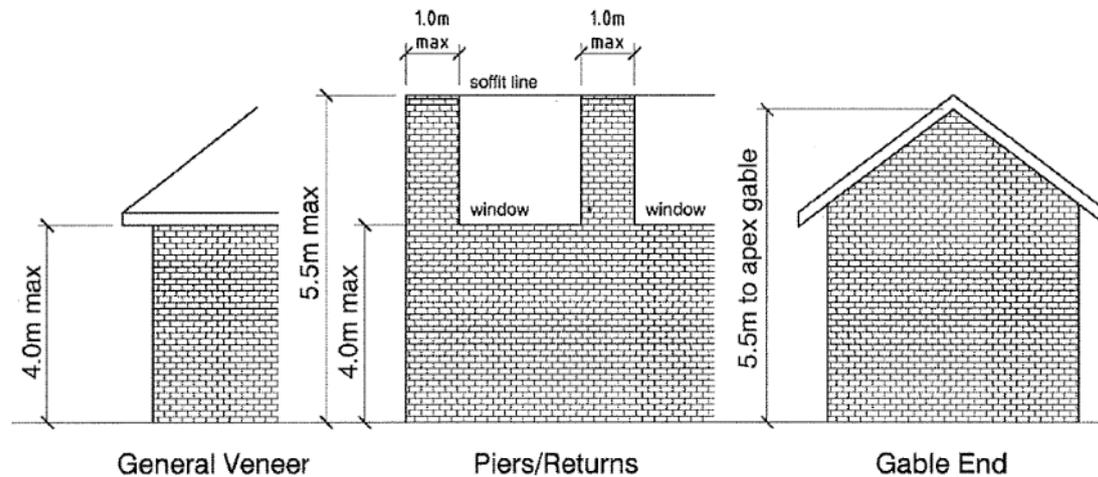


Figure 1 – Maximum veneer heights for single storey, running-bonded construction

#### Panels

- Bricks may be laid in one panel to a maximum height of 4.0m.
- No slip joints or shelf angles required.

#### Gable Ends and Piers

- Brick veneer may be laid to a maximum height of 5.5m with a gable end.
- A pier is defined as a brick panel not exceeding 1.0m in width and not supporting a brick steel lintel in any way.
- A pier must not exceed 5.5m in height.

### Supporting Structure

#### Timber Framing

- Where the brick veneer is supported by timber framing, the framing must be constructed in accordance with NZS 3604 to a maximum stud spacing of 600mm crs (refer to Table 2 for specific conditions).

#### Concrete/Pre-cast Panels

- Where the brick veneer is supported by concrete or pre-cast panels, these must be constructed in accordance with NZS 4229. Alternatively, a masonry or concrete support may be designed by a suitably qualified engineer.

#### Rigid Air Barrier (RAB)

- Rigid air barriers may be placed either inside or outside of the timber framing.
- Where the RAB is placed on the outside of the framing, then the brick tie screw length must increase to a minimum of 40mm.
- A 40mm minimum cavity must be maintained.

**Bracing**

- Bracing requirements of walls may be calculated using the prescribed tables in NZS 3604 or by a suitably qualified engineer.

**Brick Cavity**

- The recommended brick cavity is 50mm, but should remain within the limits 40mm-75mm.
- The cavity must be kept free of mortar droppings.
- Washouts are to be installed every 10<sup>th</sup> brick and one on each corner.

**Weep and Vent Holes**

- Weep, or vent holes, formed by removing mortar from the perpend joint, are to be installed every 800mm to achieve a minimum of 1000mm<sup>2</sup> of weep/vent hole per lineal metre at the base of the veneer and on a shelf angle.
- Install vent holes to match in the *second row of bricks* from the top of the veneer panel, or leave a 5mm gap at the top of the veneer for ventilation.

**Mortar**

The mortar used conform with the following

- Manufactured and bagged, or site mixed.
- Sand/cement ratio of 4:1. For sea spray zones and NZS 3604 corrosion zones 1 and 4, the ratio should be increased to 3:1 sand/cement.
- All requirements as set out in NZS 4210.
- The same mortar must be used throughout the entire veneer.
- The mortar mix should be as wet as practically possible.

**Mortar Joints**

- Mortar joints shall be as close to 10mm as possible.
- Minimum permitted joint thickness of 7mm.
- Maximum permitted joint thickness of 16mm.
- All mortar joints shall be within  $\pm 2$ mm of the specified thickness.
- Unless otherwise specified, all mortar joints are to be raked to a depth of 4mm.
- The maximum permitted raked depth is 6mm.
- All bed and perpend joints are to contain a full spread of mortar.
- Any holes in the finished joints are to be minimal and filled on completion.

**Control Joints**

There are two options available for installing 'Control Joints'

- A vertical saw cut to a depth of 30mm, filled with a foam backing rod and flexible sealant.
- A vertical or zig-zag 10mm gap with a foam backing rod and flexible sealant.

*Location of Control Joints:*

SNZ HB 4236, in accordance with NZS 4229, recommends control joints are installed at no greater than 6m centres. Where the veneer will not be subject to repeated cyclic wetting

and drying or large changes in ambient temperature, it is possible to construct longer panels using the Viblock products.

It is recommended that, where control joints are deemed necessary, these are installed in the following locations of the veneer:

- Window openings less than 1.8m wide – Control Joint one side (may be omitted where the above conditions are met).
- Window openings greater than 1.8m wide – Control Joint both sides (one side only where the above conditions are met, up to a max of 3.0m).
- Where no openings are present, no greater than 6.0m spacing (8.5m where the above conditions are met).

Control joint locations shall be specified by the architect/client adhering to the above requirements. Where control joints are not installed in accordance with this specification will cause the veneer to become non-compliant. *Viblock will not be responsible for any issues/failures (for example, cracking) which may arise as a result of failure to install control joints.*

### Brick Ties

All brick ties must comply with the requirements of AS/NZS 2699.1. The following requirements apply to all brick ties on Viblock brick veneers:

- Stainless steel brick ties and screws are to be used if the building is within 500m of the high water mark of the sea (corrosion zone D).
- A minimum of 12g, type 17x35mm long screws must be used with the brick ties. If the ties are being fixed through a RAB, increase the screw length to 40mm min.
- Brick ties are to have a minimum seating length of 50% of the brick width.
- Brick ties must slope 5 degrees down from the stud.
- EH Masons or MSL Ultimate brick ties are to be used.
- If masonry block or pre-cast panels are being used to support the brick veneer, the tie fixings must be ICCONS Strike Mushroom Head 5mmx38mm stainless steel (STMH05038SS). Alternative fixings designed by a suitably qualified engineer are permitted.
- Where bricks are laid on a shelf angle, ensure the first row of ties is within 300mm of the shelf angle.
- Ensure the final row of brick ties is installed along the second bed joint down from a sill, or from the top of a veneer panel.

**Brick tie spacing**

Brick ties must be fixed to the studs horizontally at a maximum spacing of 400mm, and vertically as per the following table:

**Table 2 – Brick tie vertical spacing**

Placement of Brick ties in Mortar Courses			
Viblock Brick Product	Height of Brick	Studs at 600mm crs.	Studs at 400mm crs.
Dunstan Brick	136mm	Every 2 <sup>nd</sup> course	Every 3 <sup>rd</sup> course
Shotover Brick	73mm	Every 4 <sup>th</sup> course	Every 5 <sup>th</sup> course

*NOTE: Where the brick ties are fixed to a precast concrete or masonry wall, horizontal spacing of 400 or 600mm are to be used in accordance with Table 2*

**Window and Door sills**

- All window sills are to be consistent throughout the veneer.
- It is *recommended* (unless detailed on the plans otherwise) that the slope of sill bricks should be 15 degrees +/- 2 degree.
- It is recommended that bricks overhang the sills by 35mm with a +/- 5mm maximum tolerance.
- All bricks are to be of a similar width, as are mortar joints

**Steel Lintels***Durability*

- Metal shelf angles are to be hot-dip galvanised.
- Where holes are cut after the angle has been galvanised, these areas are to be sprayed using 'cold galvanising' spray.
- Where the structure is situated within the 'sea spray' zone (within 500m of the high-water mark of the sea), the lintel must be either stainless steel, or hot-dip galvanized with an epoxy powder coating to NZS 3604.

Lintels may be installed by one of the two methods as described below:

*Seated lintel*

- The lintel must be seated at least 100mm onto the veneer at each end for spans up to 2m, and 200mm at each end for spans >2m.
- The lintel must be kept 20mm behind the brick face.

The following lintels may be used with this method:



Table 3 – Steel lintel sizes for the traditional method

Lintel sizes – traditional method (Galvanized)	
Maximum Span	Size of Angle (V x H x t), Min Grade 250MPa
3.0m	80x80x6mm
3.5m	100x100x6mm or 125x75x6mm
4.5m	125x75x8mm
4.8m	125x75x10mm

Note: Equivalent or greater sizes in stainless steel may be used where required.

#### Shelf angle fixed to framing

Supporting lintel shall adhere to the following:

- The steel is kept completely free of the brick at each end (total length of the shelf angle is 10mm less than the width of the opening).
- The timber/steel lintel that the shelf angle is being fixed to has been sized in accordance with NZS 3604 or specifically designed by a suitably engineer for a heavy cladding.
- Where longer spans are required, torsion imparted on the lintel shall be considered in the design of both the lintel and it's fixings to the structure.

#### Shelf angles

Shelf angles are **NOT** lintels and must not be relied on to span over any opening.

- Shelf angles must be direct-fixed to the framing or a timber/steel lintel.
- The maximum height of veneer above a shelf angle is 4m.
- Vertical spacing between shelf angles shall not exceed 4m.
- Shelf angle are to be assess by a suitably qualified engineer may be installed horizontally or at up to a maximum slope of 60 degrees.
- The shelf angle may be a mild steel angle, or a proprietary system.
- The fixings back to the support structure are to be assessed by a suitably qualified engineer, with a minimum of using M10 x 75mm coach screws/ structural bolts at 400crs.

The following table shall be used for the size of shelf angle:

Table 4 – Shelf angle sizing:

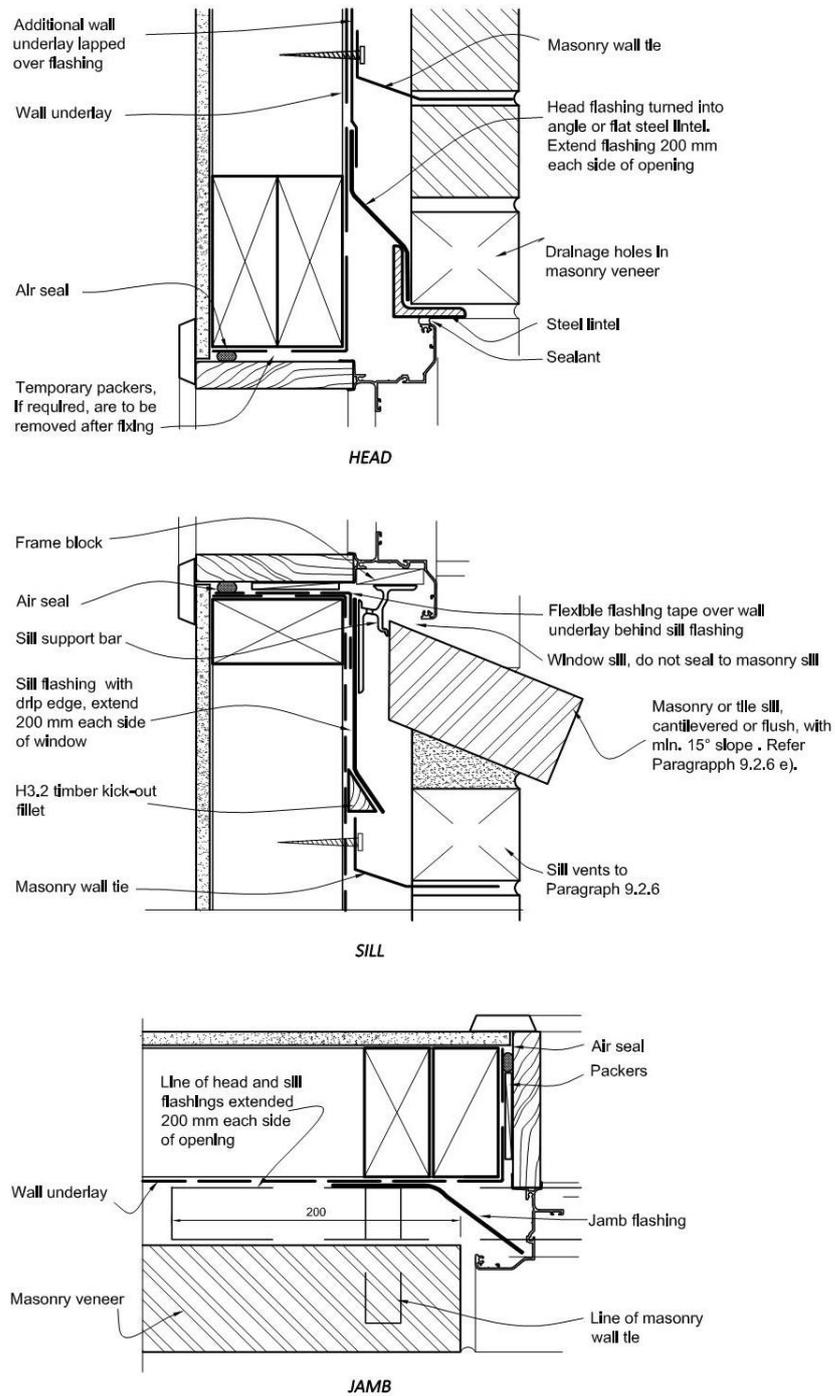
Shelf angle sizes (Galvanized)	
Cavity Width (mm):	Size of Angle (V x H x t), Min Grade 250MPa
40-55mm	75x100x6mm
60-75mm	75x125x6mm

NB: Equivalent or greater sizes in stainless steel may be used where required.

- Where shelf angles are installed above a deck area, ensure there is a 35mm clearance under the angle.
- Bricks may be laid directly onto the angle. Where bricks have been cut (as in the case with a sloping angle), a 10mm mortar bed is recommended.

**Flashings**

Head, jamb, and sill flashings around all openings are to be installed as acceptable solution E2/AS1, paragraphs 9.24 and figure 73C (shown below).



- NOTE:
- (1) Window profile to be selected to achieve cover shown in details.
  - (2) Architraves are shown for consistency only, detail may be used with rebated liner.
  - (3) Window support brackets required conforming with EM6 and Paragraph 9.1.10.5 not shown on detail, refer Figure 72B.

Figure 2 – Figure 73C of acceptable solution E2/AS1; recommended head, sill, and jamb flashing detail.

**BRICKLAYING REQUIREMENTS:****Bricklaying – Workmanship**

The veneer is to be installed by a ‘qualified’ tradesman with LBP (Licensed Building Practitioner) or supervised by a LBP. The LBP will be responsible for the brick veneer, and for certifying that the veneer meets all the requirements of this document and/or E2/AS1 and NZS 4210.

**Brick Delivery**

The bricklayer is responsible for checking that the correct bricks and quantity have been delivered to site, and that the quality is acceptable on all pallets. Ensure that one batch number has been supplied. Any issues regarding brick quality is to be raised immediately with the contracts manager and is to be taken up with the supplier prior to laying any bricks. Viblock do not except responsibility for quality of brick once they have been laid.

**Protection of Bricks**

All exposed bricks are to be protected during rain and overnight. Care should be taken around the site so as to not damage the veneer or any bricks. Any damaged veneer or bricks will be replaced at the bricklayer’s expense.

**Hot Weather & drying winds**

During the bricklaying process, when the air temperature is above 25 degrees Celsius and/or hot drying winds are present, the newly laid brick veneer must be properly cured for the first 24 hours by adding moisture to the veneer and protecting it from direct sunlight and drying winds. It is critical that proper ‘hydration’ takes place and the mortar sets firmly.

**Tolerances**

All bricks are to be laid plumb and level, and within the tolerances given in Table 2.2 of NZS 4210 (refer Table 5 below).

Table 5 – Table 2.2 of NZS 4210; acceptable maximum tolerances for the brick veneer

Table 2.2 – Maximum tolerances

Item	Tolerances
Deviation from the position shown on plan for a building more than one storey in height	15 mm
Deviation from vertical within a storey	10 mm per 3 m of height
Deviation from vertical in total height of building	20 mm
Relative vertical displacement between masonry courses (a) Nominated fair face (one side only) (b) Structural face	3 mm 5 mm
Relative displacement between loadbearing walls in adjacent storeys intended to be in vertical alignment	5 mm
Deviation from line in plan (a) In any length up to 10 m (b) In any length over 10 m	5 mm 10 mm total
Deviation of bed joint from horizontal (a) In any length up to 10 m (b) In any length over 10 m	5 mm 10 mm total
Average thickness of bed joint, cross joint, or perpend	± 3 mm on thickness specified

NOTE – Tolerances shall not breach minimum cavity widths.

### Bonding of bricks

- The bricks, unless otherwise specified, are to be laid half-bonded.
- All perpend joints are to be in vertical alignment (+/- 5mm). Any 'Stack-bonding' requires 'Specific Design' as specified in Specification VB-S1, VB-S2, & VB-S3 (as appropriate).

### Blending of bricks

- Bricks are to be thoroughly blended, selecting and laying from a minimum of 5 pallets (less is acceptable for small areas) to ensure an even spread of colour throughout the veneer.
- Laying of bricks is to stop immediately if it becomes apparent that these will run out before completion. This will allow new bricks, which may be from a different batch, to be blended in properly.

### Cleaning

- Viblock recommends the Kiwibricks are cleaned annually or as required depending on conditions. It is important to **not use high pressure (water blasters)** as they can mark the bricks. A low pressure water wash with a natural detergent and soft brush is recommended.

### Efflorescence (Salting)

- Efflorescence is a naturally occurring phenomena associated with all concrete products.
- There steps to reduce the chance of efflorescence occurring;
  - Products must be stored correctly before laying.
  - Laying of bricks should be completed by a licensed trade professional.
  - Sealing should also be carried out by a trade professional.

- If efflorescence is found on the bricks the salts can be removed by dry brushing, if still present a light acidic wash in accordance with the cleaning recommendation above will remove the affected area. Refer to suppliers for application details.

#### Sealing the Veneer

- Viblock recommends all products exposed to weather are sealed to ensure a long-lasting, high durability finish. Refer to sealer suppliers for application details.

#### Inspections and Completion:

- It is the bricklayer's responsibility to ensure that all flashings have been installed correctly, and inspected, prior to being covered by the brickwork.
- A half-height inspection is to be called for at the appropriate times as the job progresses along with a final inspection upon completion.
- The veneer is to be 'Certified' in the Record of Works, held by the appropriate building authority, as compliant with the Specification: VB-B1, upon completion by a Licenced Building Practitioner for Bricklaying.

#### Plastering Viblock veneers

- Use a professional who has experience plastering concrete surfaces.

#### TECHNICAL SUPPORT

Should you require any technical support on the Viblock Brick Veneer System, please contact Viblock on:

**T: (03) 343 0394**

**Email: [sales@viblock.co.nz](mailto:sales@viblock.co.nz)**

**Website: <https://www.viblock.co.nz/contact-us/>**