Framing & Masonry Veneers

Masonry Installation Guide

1. Specification	Obtain any relevant product specifications
2. Waterproofing rebate	Use a suitable tanking membrane to waterproof the concrete rebate on which the first course of blocks sit. Mortar should be able to bond to this membrane.
3. Mixing the mortar	Use a bagged mortar to enhance quality control. Follow manufacturer's instructions.
4. Dry Mortar installation	Bagged Waterproofed mortar recommended if specified.
5. Tolerances	Construct within the tolerances set out in NZS 4210. Lay blocks with jointing of consistent 10 mm nominal thickness throughout.
6. Laying bond	Lay the bond pattern that has been specified. Plastered Masonry - Stretcher bond Architectural Masonry - Stretcher bond or stack bond, as specified
7. Architectural Masonry	Architectural Masonry will require extra attention to detail during blocklaying to achieve an acceptable Architectural Masonry finish. In this application the masonry finish forms part of the final surface.
8. Laying the first course	The first course of blocks is laid on a concrete base clean and free of any dirt or loose material. Any variance in the foundation that would cause the base mortar joint to be less than 7mm or more than 15mm thick should be corrected before blocklaying. Make sure the first course is properly aligned, level and plumb by using a level and string line. Allow for 75 x 10mm weep holes at 800mm centers at the base of the veneer. Allow for the specified cavity width.
9. Clean out openings	Allow for clean-out openings to clean mortar droppings and debris from the cavity.
10. Laying blocks	When filling in the wall between the corners, a mason's line is stretched from corner to corner. The blocks are laid to this line and tapped into place while the mortar is still plastic. The use of the mason's level at this stage is generally limited to checking face alignment. As each block is laid, excess mortar extruding from the joints is cut-off with the trowel.
11. Installing block ties	Build in block veneer ties at the specified spacing. Ties should have an embedded length of at least half the width of the veneer, with an end cover at least 15mm. Use suitable screws or non-impact fasteners for fixing ties to structural timber framing. For masonry installation Ramset™ Shuredrive Anchors are recommended.

Masonry Installation Guide continued

12. In-joint reinforcing

Install in-joint reinforcing (Blocklock) as specified. Blocklock is galvanized or stainless steel in the more aggressive sea spray durability zones. Blocklock to be discontinuous at control joints. Joints in Blocklock should be minimised, but if required should be suitably tied. Blocklock should be covered from the exterior by at least 10-15 mm of mortar.

13. Control joints

Build control joints as specified, or where required.

14. Tooling the mortar

Tooling is very important as it closes up gaps, reduces shrinkage and produces a sharp, uniform appearance. When the mortar has stiffened and can resist thumb pressure, horizontal and vertical joints should be compacted by tooling and burnishing. Mortar joints around joinery in openings can be flush finished.

Architectural Masonry veneers	Concave or Raked *
Plastered / bagged masonry veneers	Concave

* Raked joints are an option for masonry veneers, however they will increase the wetted surface area of the veneer.

After joints have been tooled, any mortar burrs should be trimmed off with a trowel. Blocks should not be moved once the mortar has stiffened.

15. Lintels

Build in lintels as specified.

16. Inspection

All masonry veneers require inspection by the masonry supervisor who shall be a mason complying with the competency requirements of NZS 4210. Arrange inspection by the engineer or their nominated representative, for specifically designed masonry veneers.

17. Sills

Build sills as specified. Typically 10-Series blocks are cut to size and laid on their sides to form a suitable slope and overhang. Using a suitable bonding agent in the mortar assists in bonding the sill to the veneer.

18. Progressive cleaning - Architectural Masonry

Clean mortar droppings/smears off walls before they dry. Clean efflorescence and/or stains off walls regularly until the roof and sealer system is in place.

19. Clean out cavity

Clean out by removing mortar droppings from ties and from the cavity. Remove any other loose material from the cavity.

20. Ventilation

Allow for 75 x 10mm ventilation holes at 800mm centers at the top of the veneer.

21. Clean-up

Clean-up site as required. For Architectural Masonry follow progressive cleaning protocols and protect masonry from damage.

System Specification Considerations

Reference Standards

NZS3604; NZS4229; NZS4210, and any other applicable standards.

Block Series

The 10-Series block is the masonry veneer block (90mm width x 390mm length x 190mm height). Half high blocks are available in limited block types in this series.

Block modules

Block module dimensioning will reduce block cutting on site. This is beneficial as it speeds up construction and reduces construction costs. It is a key part of the architectural design and applies to wall heights and lengths, as well as opening heights, lengths and locations. A block module is typically 200mm, so designing dimensions in multiples of 200mm is recommended. There are some applications including wall and opening heights where dimension multiples of 100mm is suitable. Architectural Masonry requires particular attention to detail with block module layout, as laid blocks are viewed as part of the final finish.

Non-specific Engineering design

NZS3604 and NZS4229 allows designers to freely design masonry veneers,and only use the expertise of a registered structural engineer (specific design) if components in the structure fall outside of the scope of the standard. The structural engineer is only required to design those specific elements. Examples of veneers falling outside the scope of NZS3604 & NZS4229 include stack-bond Architectural Masonry.

Specific Engineering Design

Specific design of veneers falling outside the scope of NZS3604 & NZS4229 is required. Specific design is also recommended for veneers higher than the height limitations set out in this manual, and for any stack-bonded veneers. Use this manual in conjunction with the appropriate standards to achieve an appropriate engineering solution

Height limitations

The Block Shop NZ recommends limiting any un-reinforced veneers to single storey construction ie. A height of 3m (5m for gable ends), unless specific design will prevent them from breaking up and dislodging in a significant earthquake. This is more conservative than NZS4229 which allows masonry veneers up to a height of i) 6m (10m for gable ends) or ii) 7m (4m veneer component) for 2-storey veneers on a solid masonry substructure.

Laying bond

Application	Bond
Architectural Masonry Veneers	Stretcher bond or Stack bond
Plastered/Bagged masonry veneers	Stretcher bond

System Specification Considerations continued

Mortar joints

Application	Joint Finish
Architectural Masonry veneers	Concave or Raked*
Plastered/Bagged masonry veneers	Concave

*Raked joints are an option for masonry veneers, however they will increase the wetted surface area of the veneer.

Rebate See Ground Floors and Foundations

Cavity The width of the cavity between the framing and the inside edge of the block is typically 40-60mm when using 105mm block ties.

Overhang The block veneer shall not overhang its supporting foundation by more than 20mm.

Ties Typically 105mm ties as per NZS4210. Ties should have an embedded length of at least half the width of the veneer, with an end cover of at least 15mm. Use suitable screws to fix ties to structural timber framing.

Tie Spacing	
Laying Bond Stretcher Bond	Max Tie spacing 600mm (horizontal) x 400mm (vertical)
Stack Bond	As per specific design

Weep / Ventilation holes As per NZS4210. Weep holes allow water to drain from the cavity, while ventilation holes allow drying of the cavity.

Hole Function	Size Location	Location
Weep	75mm x 10mm	Placed at the bottom of all veneers at 800mm centres
Ventilation	75mm x 10mm	Placed at the top of all veneers at 800mm centres

In-Joint reinforcing The Block Shop NZ block in-joint reinforcing (Blocklock) shall be used in conjunction with control joints, as per the examples from Diagram 35 and 36. Blocklock is used in the horizontal bed joints to introduce a horizontal tensile strength into the veneer to minimise vertical cracking. It is used in joints away from ties where possible. Joints in this reinforcing must be minimised. It is either galvanized or a stainless steel option is available for the more aggressive sea spray durability zones.

In-Joint reinforcing				
Product	Block	Width	Length	Description
Blocklock Strgal	10 series	70mm	4m or as required	3.15mm galvanized welded Wire ladder configuration

System Specification Considerations continued

Durability

As per NZS4229 and NZS3604. Typically ties, lintels and in-joint reinforcing are galvanized, but do need to be stainless steel in the more aggressive sea spray durability zones. Geothermal hot spots will require specific design.

Inspection

All masonry veneers require inspection by the masonry supervisor who shall be a mason complying with the competency requirements of NZS 4210. Specifically designed masonry veneers require inspection by the engineer or their nominated representative.

Insulation

Typically interior insulated by insulating within the structural frame and/or lining. See Wall finishes for more information.

Finishing

Exterior:

Options include:

- Architectural Masonry - Various clear sealed exposed finishes including honed, split-face and fair face.
- Plastered / Bagged / Painted Masonry - Standard plaster systems

Interior

Options include:

- Lining

Overhanging Eaves

Masonry veneers are intended to be used with adequate protection to the top of the walls, such as overhanging eaves. Eaves have a number of functions including:

- Reducing the wetted surface area of the wall
- Preventing a large quantity of rain from striking above openings in certain applications

Recommended minimum eaves sizes are as follows:

1. Traditional roof and lower side of sloping roof – 400mm
2. Flat roof – 450mm
3. Higher side of sloping roof – 900mm

If you have an application that does not have eaves, please seek technical advice.

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Features

The system offers a number of features including:

- Cavity system
- Cost-effective
- Low-maintenance exterior
- Multiple finish options (Architectural Masonry, plastered, bagged etc.)

Technical Description

External single-storey cavity walls using an un-reinforced 10-Series masonry block veneer cladding attached to a structural timber or steel frame by steel ties. Exterior surface finishes include Architectural Masonry with a clear sealer, as well as plaster and/or painted options including bagged finishes.