



**ELDORADO STONE™ VENEER AND HARD AS ROCKS APPLICATION
SYSTEM TECHNICAL MANUAL
PRODUCT DESCRIPTION AND INSTALLATION DETAILS
VERSION 1.4 May 2017**

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Eldorado Stone™ and the Hard as Rocks Application System

1. PRODUCT DESCRIPTION

Eldorado Stone™ veneer and Hard as Rocks Application System is a simulated stone veneer cladding system designed to imitate the look of natural stone. The materials used in the manufacture of Eldorado Stone™ veneer are lightweight aggregates, Portland cement and iron oxide pigments that are cast to mimic different styles of stone. The weight of the cladding system in total does not exceed 80kg/m².

Hard as Rocks' New Zealand installation procedure of this stone veneer cladding is generally over conventional timber framing with studs at not more than 400 mm centres, a nominal 20mm drained and ventilated cavity and a fibre-cement backing sheet sealed with a proprietary moisture resistant coating. Proprietary stainless steel ties are used as a mechanical fixing between the timber framing and the mortar/stone veneer. This cast stone veneer and its New Zealand installation system can be used on domestic and light commercial buildings where domestic construction techniques are used as well as solid construction buildings as detailed below.

2. SCOPE OF USE

No substitutions are permitted for Eldorado Stone Veneer & Hard as Rocks Application System.

The Eldorado Stone™ veneer and Hard as Rocks Application System has been appraised as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- constructed with timber framing complying with the NZBC; and,
- with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

The Eldorado Stone™ veneer and Hard as Rocks Application System has also been appraised for weather tightness and structural wind loading when used as an external wall cladding for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to floor area and building height; and
- constructed with timber complying with the NZBC; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

The Eldorado Stone™ veneer and Hard as Rocks Application System must only be installed on vertical surfaces (except for sills which must have a minimum 10° slope and be waterproofed in accordance with the Technical Literature).

The system is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. (*The Appraisal of the Eldorado Stone™ veneer and Hard as Rocks Application System relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or design wind pressure.*)

Builder Requirements:

The builder is to supply and install the fibre cement board, all relevant watertight flashings, sealant between the sheet joints and sealing around joinery.

Installation of the stone veneer must only be carried out by Hard as Rocks Ltd licensed applicators.

3. RESPONSIBILITIES

- Hard as Rocks is responsible for the quality of Eldorado Stone™ veneer and its installation system including all associated accessories and fixing elements supplied as part of the cladding system.
- Quality on site is the responsibility of Hard as Rocks registered installers.
- Building designers are responsible for all components of the building and substrate design, to comply with NZBC, and for the incorporation of the *Hard as Rocks Application System* into their design in accordance with the instructions of Hard as Rocks literature.
- Building owners are responsible for the maintenance of *Eldorado Stone™ veneer and Hard as Rocks Application System* in accordance with the instructions of Hard as Rocks literature.

4. BUILDING REGULATIONS

Eldorado Stone™ veneer and Hard as Rocks Application System, when installed in accordance with the Hard as Rocks technical literature, will meet or contribute to meeting the provisions of the New Zealand Building Code requirements for the following Clauses:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Loads arising from self-weight, earthquake, wind, impact and creep and shrinkage [i.e. B1.3.3 (a), (f), (h), (j) and (q)]

Clause B2 DURABILITY: Performance B2.3.1 (a), not less than 50 years, and (b) not less than 15 years.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1.
Reference: Eldorado Stone™ Veneer MSDS 01 (Material Safety Data Sheet)

Additional Compliance and Manufacturing Quality Control Documents and References:

International Code Council Compliance assessment of Eldorado Stone™ ICC-ES 1215

5. SUBSTRATES AND SUPPORT BACKINGS & OTHER COMPONENTS

Building Underlays

All external walls of buildings must have barriers to airflow in the form of interior linings with all joints stopped for wind zones up to and including Very High. Unlined gables and walls must incorporate a rigid sheathing or an air barrier which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the fixing lengths must be increased by a minimum of the thickness of the underlay.

BUILDING UNDERLAY AND FLEXIBLE SILL AND JAMB TAPE INSTALLATION

The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the Eldorado Stone Veneer System. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75mm minimum at horizontal joints and 150mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

ALUMINIUM JOINERY INSTALLATION

Aluminium joinery and associated head flashings must be installed in accordance with the Technical Literature. A 7.5-10 mm nominal gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

CAVITY BATTENS

The cavity vent strip must be in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3. The vent strip must be manufactured from PVC, aluminium or stainless steel, and be punched with 3 - 5 mm holes or slots which provide a minimum ventilation opening area of 1000 mm² per lineal metre of wall. The selected cavity vent strip must be installed with the bottom of the vent strip flush with the underside of the cavity battens. Note: A minimum 15 mm drip edge to the bottom of the fibre cement sheet must be maintained at all times.

Minimum 45 mm wide x 18 mm thick H3.1 treated timber cavity battens, or proprietary cavity battens covered by a valid BRANZ Appraisal must be installed over the building underlay to the studs at maximum 400 mm centres. The battens must be fixed in place with 30 x 2.5 mm hot-dipped galvanised flat head nails at maximum 800 mm centres.

Substrates: FIBRE-CEMENT SHEET

Minimum 7.5 mm thick fibre cement sheets complying with AS/NZS 2908 Part 2 may be installed vertically or horizontally. All vertical sheet edges must be supported and fixed through the cavity battens to the wall framing. At the base of the wall, the sheets must hang 50 mm below the supporting framing.

BGC Fibre Cement Board

Eldorado Stone™ and the Hard as Rocks Installation System specify installation over BGC Stonesheet 7.5mm and 9mm sheets.

Installation of the BGC Stonesheet fibre cement board and relevant flashings is the responsibility of the builder and must be carried out in accordance with the manufacturer's technical instructions to ensure compliance with the requirements set out in E2 *External Moisture* of the New Zealand Building Code.

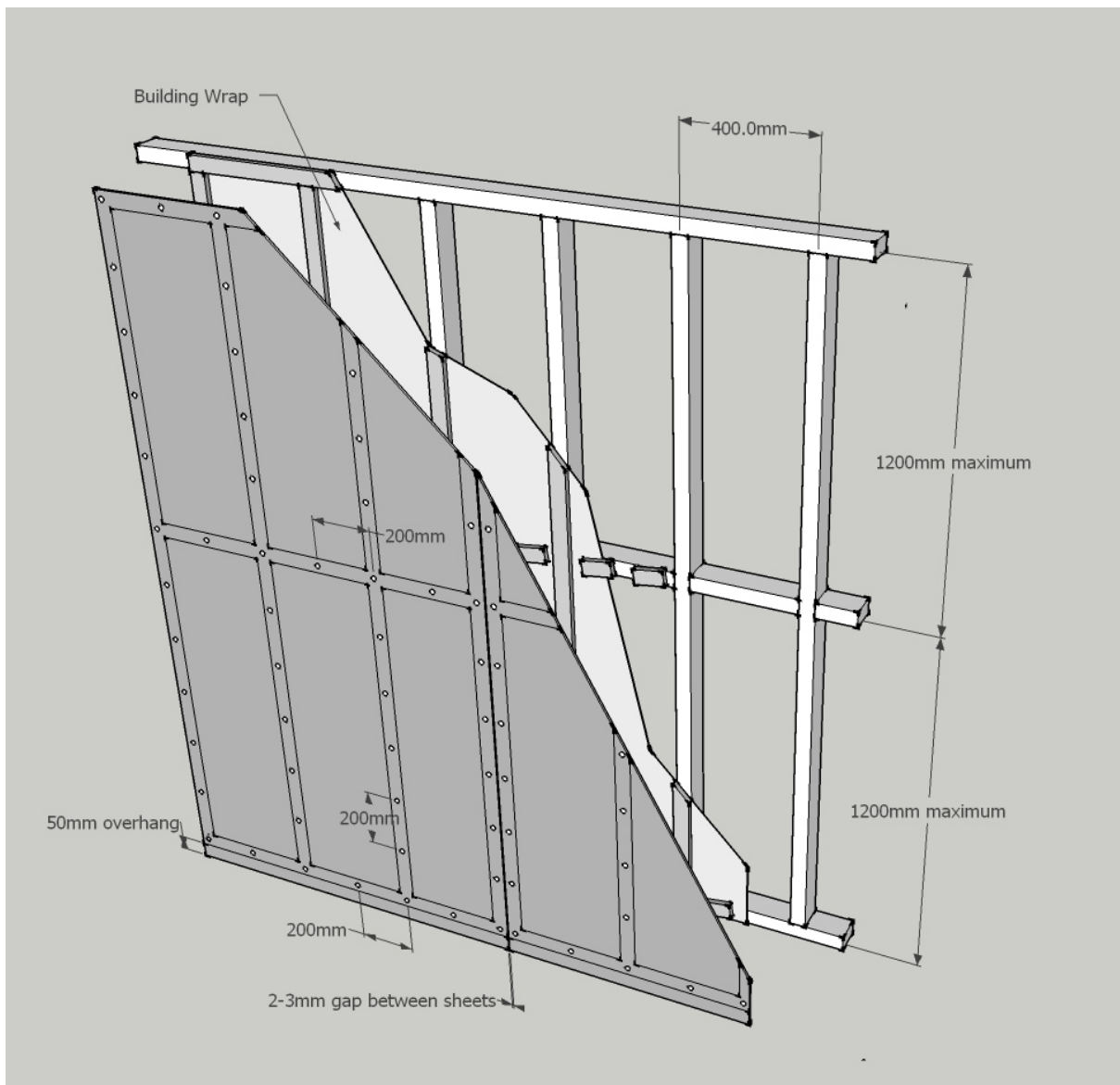
INSTALLATION OF FIBRE CEMENT BOARD

Use 10g x 65mm Stainless Steel Screws with 60mm Stainless Steel Hard as Rocks Tags where applicable.

Use 10g x 65mm Stainless Steel Screws with 19mm x 1.6mm Stainless steel Washers where applicable

All flashings must be installed in accordance with building code requirements. To maintain the weather-resistance of the exterior wall on which the stone products are installed, rigid, corrosion-resistant flashings and a means of drainage shall be installed at all penetrations and terminations of the stone cladding. Flashing type and locations shall be in accordance with the requirements of the applicable code.

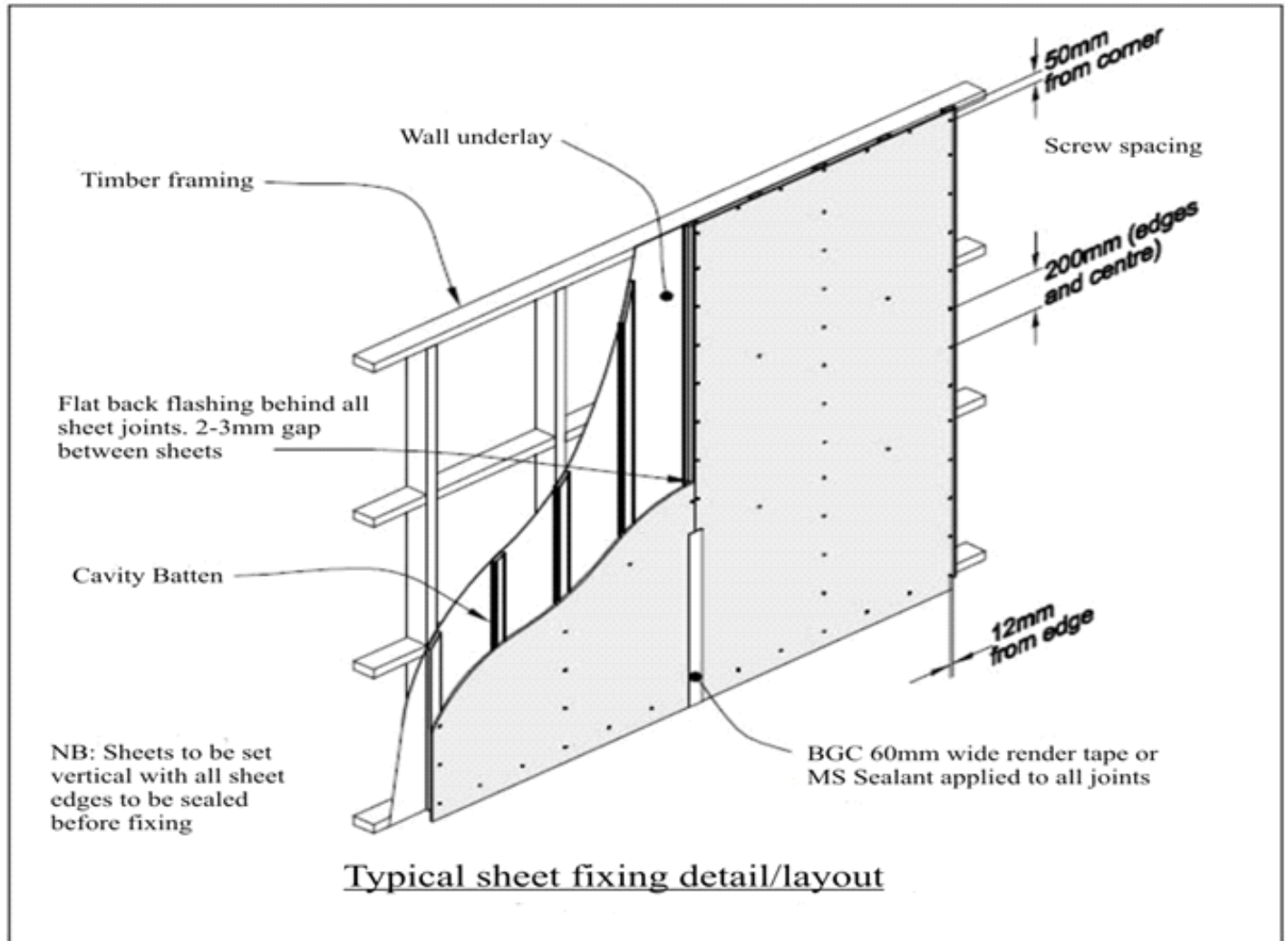
Diagram: Batten and Fibre Cement board set-out



Technical Specification: Timber Framing

Timber framing is completed to comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604, or to specific design in accordance with NZS 3603 and AS/NZS 1170. Stud interval is set at a maximum 400mm centres.

See table, page 9 for fixing centres for relevant 'Wind Zone' and 'Earthquake Zone' requirements.



Vertical Control Joints

Vertical control joints to be formed at maximum 5.4m centres, aligned with any control joint in the structural framing, or where the Eldorado Stone Veneer System abuts to different cladding types, in accordance with Hard as Rocks requirements and to the locations and details shown on the drawings. Confirm the location of all control joints prior to installation.

Unless noted otherwise, fibre cement sheets shall be gapped 10mm apart at vertical control joints.

Unless shown otherwise; finish stonework along the length of the vertical control joint with a movement control gap between finger-jointed stones over the control joint. Leave the vertical control joint open and free of mortar in accordance with Hard as Rocks requirements.

Internal corner control joints: fibre cement sheets at internal corners shall be gapped 10mm apart and flush-sealed with the specified flexible sealant and over-sealed with BGC Render Tape centred over the joint.

Finger-joint stonework along the length of internal corner control joints.

Horizontal Control Joints

Horizontal control joints to be formed on cavity batten framing at maximum 5.4m or at inter-storey floor levels in accordance with Hard as Rocks requirements and as shown on the drawings. Back-flash fibre cement sheets and gap sheets 10mm apart and flush-seal joint with the specified flexible sealant and over-seal with BGC Render Tape centred over the joint. Ensure that the fibre cement sheets are not fixed to inter-storey floor joists.

Finish stonework along the joint with a horizontal gap, as detailed, between stones; gap to be level and true. Leave the control joint open and free of mortar in accordance with Hard as Rocks requirements.

Horizontal Drainage Joints

Horizontal drainage joints to be formed with folded Z-flashing bridging the drained cavity and cavity closure strip, as per E2/AS1 requirements on facades over two storeys or 7 meters high, and in accordance with Hard as Rocks requirements and as shown on the drawings. Ensure that the fibre cement sheets are not fixed to inter-storey floor joists.

Finish stonework along the drainage joint with a 5mm, or as detailed, wide horizontal gap between the fibre cement sheets and upper stonework and the Z-flashing, gap to be level and true. Leave the horizontal drainage joint open and free of mortar in accordance with Hard as Rocks requirements.

Window & Door Openings

Ensure that the window fabricator sizes window and door joinery to the correct joinery set-out and depth in accordance with the Hard as Rocks Technical Literature and as shown on the drawings.

Ensure that pre-finished aluminium window and door joinery and head flashings are installed correctly before installing Eldorado Stone Veneer wall cladding and stonework.

Finish fibre cement sheets and stonework at window and door openings as shown on the drawings. Finish window and door heads with a minimum 5mm, or as detailed, wide horizontal gap between the fibre cement sheets and upper stonework and the head flashing, gap to be level and true. Seal jambs and sills with the specified flexible sealant to the fibre cement substrate.

6. System Components

Components supplied by Eldorado Stone™ LLC, USA Component	Material
Simulated stone veneer. (Multiple “stone” styles).	Portland cement, lightweight aggregates & pigments.
Components	Material
Fibre-cement Sheet (builder to install - available from hardware merchants, i.e. Placemakers, ITM, Carters or directly from BGC Fibre Cement.)	BGC Stonesheet 7.5mm
Proprietary Fixing - Hard as Rocks “Tag”	Stainless Steel, 20mm wide
StoneTite as a sealant	Styrene-butadiene co-polymer latex
StoneTite as a mortar additive (20L Pail)	Styrene-butadiene co-polymer latex
StoneTite mortar-mix (25kg bags)	5:2 mix of fine washed sand and Portland cement
Accessories	Portland cement, aggregates and pigments

6.1 STONETITE™ ADDITIVE & SEALER

Hard as Rocks StoneTite Additive and Sealer is an aqueous emulsion of styrene-butadiene copolymer latex which will improve durability, bonding, waterproofing and wear resistance.

Substrates must be prepared and sealed with StoneTite™ Sealer prior to installing stone veneer. StoneTite is used both in the form of a waterproofing and bonding slurry applied to the surface and is also added to the StoneTite Mortar mix for stone application.

Benefits :

- Improved flexibility
- Greatly reduced shrinkage
- Earlier hardening
- Increased durability and toughness
- High resistance to water penetration

6.2 STONETITE™ MORTAR

Available in 25kg bags, StoneTite™ mortar is a pre-mixed blend that ensures the perfect ratio of ingredients that forms part of the tested installation system.

Mixing Instructions:

Mix 3 litres of clean, fresh water with 600ml of StoneTite™ Additive. Add one bag of 25kg StoneTite™ Mortar to this solution and mix with a mixing drill. Mix to a workable consistency adding additional clean, fresh water to suit. The mortar should stick to the trowel when turned on its side but slide off easily when given a quick shake.

Each 25kg bag of mixed StoneTite™ Mortar will cover 1 – 1.5m² of substrate with 8mm of mortar.

Adding Oxide

Tinting the StoneTite™ Mortar can be achieved by adding oxide colouring as recommended by the manufacturer's instructions.

Handling and Storage

Eldorado Stone™ veneer is available in pallets of 12 boxes each. Each box can weigh up to 70kg and requires a two-man lift to avoid injury.

It is recommended that pallets and boxes be stored in a dry environment protected from the elements.

6.3 HARD AS ROCKS TAGS

A proprietary Hard as Rocks Ltd stainless steel fixing anchor (tag) and screw, providing mechanical fixing between timber frame and mortar/stone veneer layer, is to be used with this application system. The anchor is approximately 60 mm x 20 mm pre-formed from 304 stainless steel 1.6mm thick (16 gauge) and pre-punched with a 5mm hole for the screw.

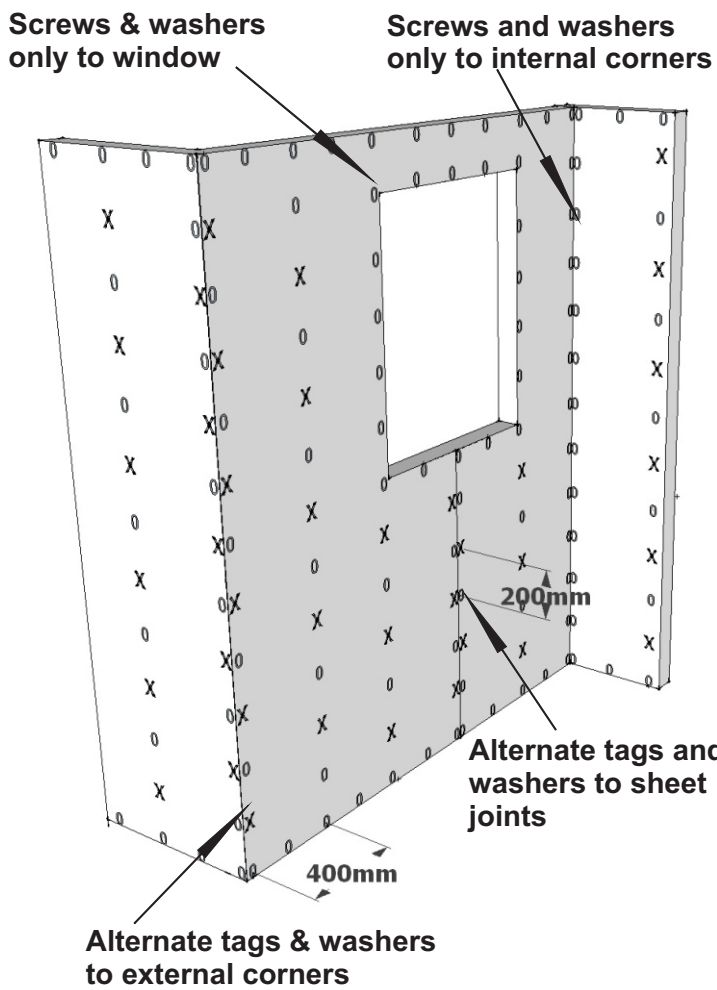
Screws are 12 Gauge 65 mm 304 stainless steel square drive.

HARD AS ROCKS TAG SPACING

Note: Fibre cement fixings should not exceed 200mm spacings. So where Tag spacings are 300-400mm spacings on the table a 65mm stainless steel screw and 19mm stainless steel washer should be installed in between tags.

The fixing is designed to allow sufficient purchase into the timber stud and a 8 mm purchase into the mortar layer when the subsequent mortar and stone is applied The fibre-cement sheet is sealed using a 1.5:1 ratio of Stonetite & Portland cement to form a 'StoneTite' slurry mix as a sealant. The sealing /bonding coat is not more than 2mm thick.

The stone veneer component in a wide variety of cast shapes, but with an approximately uniform depth is then mortared in place (maintaining a 8mm mortar depth) using a proprietary mortar-mix incorporating 'StoneTite' as a mortar additive. The average thickness of the stone veneer itself is approximately 40mm. Joints between the veneer elements can be pointed, or raked back depending on the style and look of laying required. The over-all visual effect of the finished cladding is an imitation of natural stone construction.



Screw Fixings at 200mm centres to all studs alternate with tags and washers

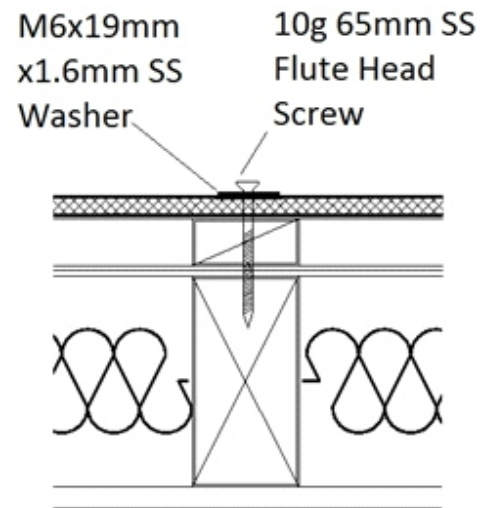
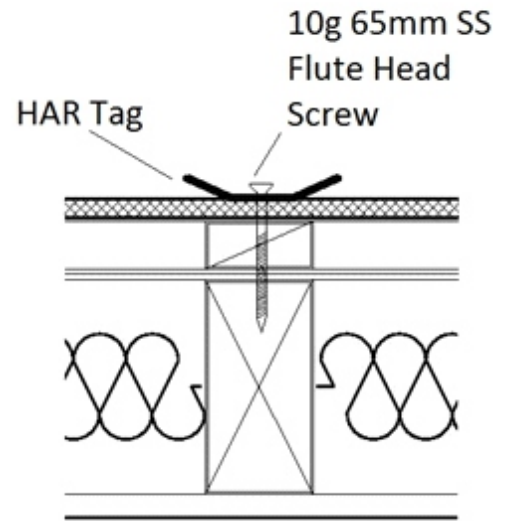
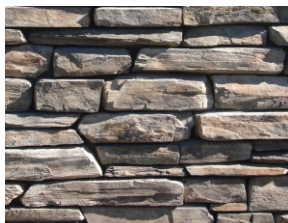


Diagram: Alternating positions of screws and washers with Hard as Rocks Tags both fixed using 10g x 65mm Stainless steel screws

6.4 ELDORADO STONE™ ARCHITECTURAL STONE VENEER

MANUFACTURED INDIVIDUAL STONE Core Range

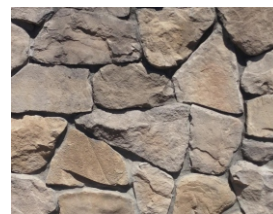
Stone type: Rustic Ledge Flats 1.3m²/box Corners 3lm/box
Colour: West Coast - Predominantly grey with highlights of brown and rust
Alexandra - Brown, grey and rust colours with hints of gold
Cambridge - Pale creams, greys and yellows
Weight: Approximately 45 kg/m²
Size: 25 -125mm in height and 150 - 500mm in length
Thickness: Varies with each piece, 50mm average
Corner pieces: Matching corner stones



Stone type: River Rock Flats 1.3m²/box Corners 4.2lm/box
Colour: Alpine - Predominantly grey with highlights of brown and rust
Weight: Approximately 48 kg/m²
Size: 100 – 380mm
Thickness: Varies with each piece, 50mm average
Corner pieces: Matching corner stones



Stone type: Country Rubble Flats 1.3m²/box Corners 4lm/box
Colour: Serrano - Brown, grey and tan hues
Weight: Approximately 44 kg/m²
Size: 50 - 100mm in height and 100 - 450mm in length
Thickness: Varies with each piece, 50mm average
Corner pieces: Matching corner stones



Stone type: Hillstone Flats 1.3m²/box Corners 3lm/box
Colour: Molano – Sage, hints of tan and ochre
Weight: Approximately 53kg/m²
Size: 25 - 300mm in height and 75 - 450mm in length
Thickness: Varies with each piece, 50mm average
Corner pieces: Matching corner stones



Stone type: Cliffstone Flats 1.3m²/box Corners 3.3 lm/box
Colour: Montecito – Fawn and grey with highlights of brown and rust
Weight: Approximately 53kg/m²
Size: 25 - 300mm in height and 75 - 450mm in length
Thickness: Varies with each piece, 50mm average
Corner pieces: Matching corner stones



Stone type: Pahoehoe Flats 1.1m²/box Corners 4 lm/box
 Colour: Kona
 Weight: Approximately 56 kg/m²
 Size: 25 -125mm in height and 150 - 500mm in length
 Thickness: 50mm
 Corner pieces: Matching corner stones



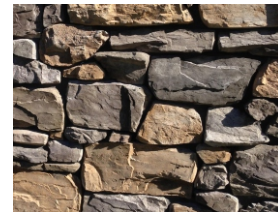
Stone type: Field Rock Flats 0.9m²/box Corners 3lm/box
 Colour: Mauka
 Weight: Approximately 62 kg/m²
 Size: 25 -125mm in height and 150 - 500mm in length
 Thickness: Varies with each piece, 50mm average
 Corner pieces: Matching corner stones



Stone type: Lava Rock 0.9 m²/box Corners 3lm/box
 Weight: Approximately 60kg/m²
 Size: 25 -125mm in height and 150 - 500mm in length
 Thickness: Varies with each piece, 50mm average
 Corner pieces: Matching corner stones



Stone type: Shadow Rock 1.3m²/box Corners 2.4 lm/box
 Colour: Teton, Mountain Blend -
 Weight: Approximately 48kg/m²
 Size: 50 - 250mm in height and 130 - 600mm in length
 Thickness: Varies with each piece, 50mm average
 Corner pieces: Matching corner stones



Stone type: Coastal Reef 1.4 m²/box Corners 4lm/box
 Colour: Sanibel – Off white/ecru.
 Weight: Approximately 45 kg/m²
 Size: 100 - 300mm in height and 100 - 300mm in length
 Thickness: Varies with each piece, 50mm average
 Corner pieces: Matching corner stones



6.4.2 MANUFACTURED STONE PANELS

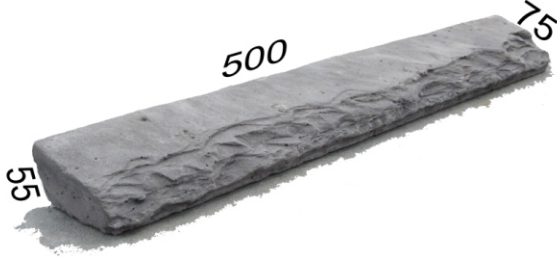


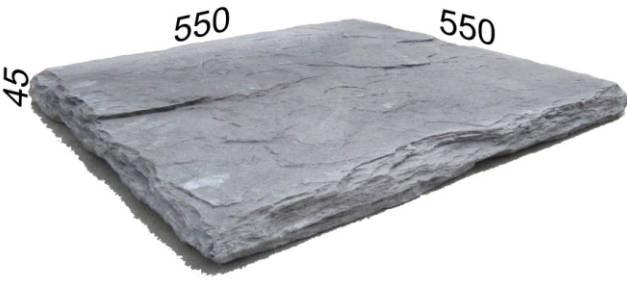
Stone type: Stacked Stone 1.3m²/box Corners 3.6 lm/box
 Colour: Slate Grey - various shades of blueish grey, odd touch of rose
 Old English - white, creams and touches of grey
 and amber

Bluestone – Grey and Charcoal
 Weight: Approximately 42 kg/m²
 Size: 3 panel sizes – 100mm high panels
 200mm/300mm/500mm long
 Thickness: Varies with each piece, 50mm average
 Corner pieces: Matching corner stones



6.5 STONE CAPPING/SILL OPTION

Stone Capping Options

<p>80mm Sill</p>	 <p>500 75 55</p>	<table border="1"> <thead> <tr> <th>Available in:</th> <th>Cost Price:</th> </tr> </thead> <tbody> <tr> <td>White</td> <td>\$12.50 ea</td> </tr> <tr> <td>Natural</td> <td>\$12.50 ea</td> </tr> <tr> <td>Alexandra</td> <td>\$12.50 ea</td> </tr> <tr> <td>West Coast</td> <td>\$12.50 ea</td> </tr> </tbody> </table>	Available in:	Cost Price:	White	\$12.50 ea	Natural	\$12.50 ea	Alexandra	\$12.50 ea	West Coast	\$12.50 ea
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<p>150mm Sills</p>	 <p>550 150 40</p>	<table border="1"> <tbody> <tr> <td>White</td> <td>\$15.00 ea</td> </tr> <tr> <td>Natural</td> <td>\$15.00 ea</td> </tr> <tr> <td>Alexandra</td> <td>\$15.00 ea</td> </tr> <tr> <td>West Coast</td> <td>\$15.00 ea</td> </tr> </tbody> </table>	White	\$15.00 ea	Natural	\$15.00 ea	Alexandra	\$15.00 ea	West Coast	\$15.00 ea		
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<p>550x300 Wall Cap</p>	 <p>550 300 45</p>	<table border="1"> <tbody> <tr> <td>White</td> <td>\$22.00 ea</td> </tr> <tr> <td>Natural</td> <td>\$22.00 ea</td> </tr> <tr> <td>Alexandra</td> <td>\$22.00 ea</td> </tr> <tr> <td>West Coast</td> <td>\$22.00 ea</td> </tr> </tbody> </table>	White	\$22.00 ea	Natural	\$22.00 ea	Alexandra	\$22.00 ea	West Coast	\$22.00 ea		
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<p>550x550 Pillar Cap</p>	 <p>550 550 45</p>	<table border="1"> <tbody> <tr> <td>White</td> <td>\$34.00 ea</td> </tr> <tr> <td>Natural</td> <td>\$34.00 ea</td> </tr> <tr> <td>Alexandra</td> <td>\$34.00 ea</td> </tr> <tr> <td>West Coast</td> <td>\$34.00 ea</td> </tr> </tbody> </table>	White	\$34.00 ea	Natural	\$34.00 ea	Alexandra	\$34.00 ea	West Coast	\$34.00 ea		
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<p>600x600x45 Pillar Cap</p>	<p>Please note this option is by special order only, and you will need to allow 3 weeks for manufacture</p>	<table border="1"> <tbody> <tr> <td>White</td> <td>\$38.00</td> </tr> <tr> <td>Natural</td> <td>\$38.00</td> </tr> <tr> <td>Alexandra</td> <td>\$38.00</td> </tr> <tr> <td>West Coast</td> <td>\$38.00</td> </tr> </tbody> </table>	White	\$38.00	Natural	\$38.00	Alexandra	\$38.00	West Coast	\$38.00		
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7. APPLICATION

7.1 WATERPROOFING AND PRIMING THE SUBSTRATE

Substrates must be prepared and sealed with StoneTite™ Additive prior to installing stone veneer. Wet down absorbent surfaces such as concrete, brick and stone, etc., ensuring that they are saturated, but free of surface water. Prepare a bonding slurry of 1 parts powdered cement to 1.5 part StoneTite Additive, mixed to a lump free, creamy consistency. Using a brush or paint roller, work the bonding slurry well into the damp surface, ensuring that no pinholes are visible. Do not apply bonding slurry at a thickness in excess of 2mm. If a second coat is necessary, it must be applied after the first coat is touch-dry. The second coat must be applied at right angles to the first to ensure complete coverage.

7.2 MIXING THE STONETITE MORTAR

Mix 3 litres of clean, fresh water with 600ml of StoneTite™ Additive. Add one bag of 25kg StoneTite™ Mortar to this solution and mix with a mixing drill. Mix to a workable consistency adding additional clean, fresh water to suit. The mortar should stick to the trowel when turned on its side but slide off easily when given a quick shake.

7.3 WETTING THE STONE AND/OR SUBSTRATE

Under certain conditions the stone and substrate may need to be wetted. If the stone is being installed onto a very hot/dry surface or in a hot/dry climate, the stone and wall surface should be wet to prevent excessive absorption of moisture from the mortar. This can be done by spraying water onto the wall surface and back of the stone (you may also dip the stone into a container of water). In either case the stone and the wall surface should not be allowed to dry for a few minutes after wetting to eliminate excess surface water. For cold weather installations, applications should be protected from temperatures below freezing so the mortar may set properly.

7.4 STONE APPLICATION

Once substrate is fully waterproofed and has a bonding slurry coat applied, you can begin laying.

Note: where possible lay flats out of 2-3 boxes to ensure colour and size mix. Lift lids on all boxes prior to starting to gauge any differences with colours etc this will enable you to mix the variations in.

Install corners first for easiest fitting. Corner pieces have a long and short return, these should be alternated in opposite directions on the wall corner. Using a masons trowel apply 30mm thick even layer of mortar to the entire back of the stone then press the stone firmly into place on the prepared wall surface, squeezing the mortar out around all edges to ensure 'blanket' coverage. Using a gentle 'wiggling' action while pressing the stone onto the wall will ensure a good bond. Continue laying, selecting appropriate stones leaving excess mortar in place to ensure all gaps are filled and entire substrate area has a minimum 10mm mortar coverage.

Note: For panel installation, where no visible mortar joints are required, once the stone has been pressed onto the wall clean off excess mortar or smear excess mortar up the wall enabling the next stone to have a tight fit against all edges.

Chalk lines should be snapped every 100mm-200mm as a guide for keeping the installation level. It is of particular importance to frequently stagger the joint lines both vertically and horizontally.

For best fit, stone can be cut or shaped using a hatchet, wide-mouthed nippers or masons trowel edge. Straight cuts can be made with a diamond or carbide saw blade. Cut edges should be turned so they are not visible (down when below eye-level and up when above eye-level). To conceal cut or broken edges, colour them by smearing mortar on the cut edge (back-cutting the stone edges with also help with concealment).

Note: Eye protection should be worn when cutting stone. If cutting with a blade a dust mask should be worn as well.

When the mortar joints between stones become tacky, but not too firm (normally 20-40 minutes), strike away excess mortar with a pointing tool or narrow bristled brush to smooth the joints and clean away any loose mortar from the joints and the stone face.

Note: Finished pointing is a major component of the stones finished look as well as ensuring blanket wall coverage for further waterproofing. The utmost attention should be paid to ensuring that a high quality standard of finish is achieved. If necessary a piping bag can be used to squirt mortar into voids or to fill holes.

7.5 CONTROL JOINTS

Where control joints are in place in either fibre cement board or masonry substrates, careful attention should be paid to ensure that stonework is finger jointed over the control joint to allow for any expansion or contraction. This is achieved by mortaring 75% of the back of the stone to the wall leaving 25% of stone floating where it crosses the control joint. Alternating this application as you go up in layers will ensure that the control joint is concealed but still allowed to move freely if necessary preventing any cracking in stone.

7.6 CLEAN UP

Use a brush or whisk broom to clean away any loose and dry mortar from the joints and stone face. Loose mortar and mortar spots, which have set for only a few hours, clean up easily and should never be allowed to set overnight.

Caution: Do not use wet brushed or sponges to wipe the joints or clean mortar off the face the stone as it will smear and stain. Also, never use wire brushes or acid on the stone surfaces.

7.7 KEY NOTES

Eldorado Stone™ should only be installed on substrates that are structurally sound and conform to all NZBC requirements.

Eldorado Stone™ must not be used inside the firebox of fireplaces or be exposed to extreme heat.

Retaining walls must be waterproofed on the fill side and incorporate provisions for adequate drainage

8. MAINTENANCE

Regular maintenance is required to ensure the finished system performs to meet the NZBC.

Yearly inspections should be made to ensure that there are no cracks or damage to the system that could allow water ingress or the system to lose its structural integrity. Weep holes should be checked to make sure they are unobstructed and ground clearance regulations must be maintained at all times. Damaged areas of the stonework must be replaced or repaired immediately.

Every 6 months the stone surface should be cleaned from dirt, grime and organic growth.

To clean dirt or other particles from the stone, use a granulated type detergent mixed with water and a soft bristle brush.

If efflorescence occurs, as it does with most masonry products, it is usually caused by moisture migration through the masonry substrate when the stone is saturated. Once the moisture is on the masonry surface, it evaporates, depositing the dissolved salts in the form of efflorescence. The efflorescence will disappear gradually with time. To clean the efflorescence right away, scrub the surface with a soft bristle brush and a solution of 1 part white household vinegar mixed with 5 parts water.

9. WARRANTY

The materials and components used in the Hard as Rocks Application system have a minimum warranty of (15) fifteen years from date of producer statement issuance by a Hard as Rocks certified applicator.

This is compliant with the standard set by the NZBC for external cladding.

Independent applicators that have been certified by Hard as Rocks Ltd will offer an independent minimum 5 year warranty for application.

Half-high Pillars

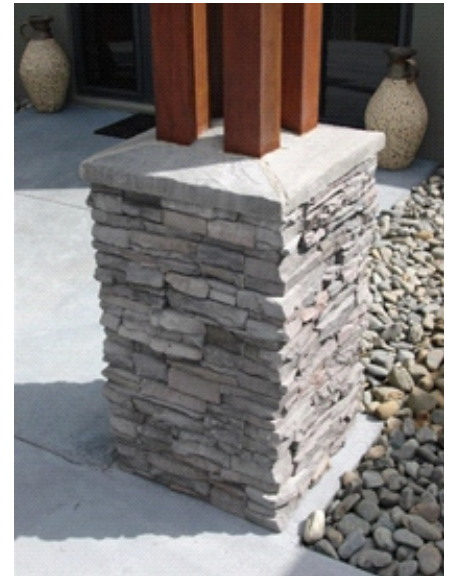
Half -high pillars can be problematic in that they have a history of the corners cracking due to water ingress or movement. We stress to builders about taking the time and effort to ensure that the framing is protected by waterproofing flashings etc but as they tend to use kiln dried timber for the framing, any moisture that gets in down from the top causes the timber to swell and crack the stone corners.

This can be a real hassle for the installer as the builder will insist you come back to fix it even though our warranty excludes movement cracking as it is quite a difficult argument to explain that.

Therefore we strongly recommend that all pillars that do not have a soffit or full one piece capping or flashing above them... and all pillars where there is possible movement, to have the corners 'floating' 'Floating' means glueing the long side of the corner to the substrate and leaving the short side of the corner with no adhesive.

You will need to smear a 4-5mm screed of mortar up corners as you work upwards so that the fibre cement board is covered and protected. You can then apply your mortar to the long side of the corner making sure you keep at least 30mm away from the back internal corner so that as you push it on the substrate the mortar doesn't ooze into this area. As long as the mortar does not encroach on the corner and the short piece of the corner is not stuck to the board then any movement or swelling in the framing can be absorbed by this technique allowing some movement.

Care should also be taken to fully cover the top of the pillar with waterproofing slurry as well as mortar under your capping to try and prevent any moisture getting in.



Rustic Ledge



West Coast

Steel grey with hint of rust



Alexandra

Earthy brown and greys



Cambridge

Chalky whites, greys and camel

Box Quantities Rustic Ledge: 48kg/m² Flats 1.3m² 63kg/box, Corners 3lm 60kg/box

Pillars:

- Optimum size for balance finish is framing and BGC board to 400mm giving a 500mm finish.
- 300mm sq framing is also an option which allows using mostly corner stones finishing at 400mm Sq.
- Avoid pillar framing 320-370mm as this leaves a 20-0mm gap between corners and the slithers required as fillers look crap.
- Adjust the quantity of mortar used depending on the thickness of each corner to try and ensure a straight plumb line finish i.e. corners lining up top to bottom. The in and out of corners is a poor finish.
- Lay corners first making sure tails are horizontal and line up with adjacent corners.

Laying:

- Chalk lines approx. every 200-300mm. You can lay stone using a line above as a guide to ensure horizontal laying.
- Make sure the mortar coverage covers all of the board and to not scrape out too much.
- Dry stack is the standard laying style unless otherwise asked for. Ensure all joints are as tight as possible.
- Open 2-3 boxes at start of job and check for colour variation. Always lay out of more than one box

Cutting:

- Angle and back cut stones to try and eliminate square 'brick like' joints.
- Smear cuts with mortar and dress accordingly to hide inside of cut.



Stacked Stone



Bluestone

Gunmetal greys with highlights of charcoal



Slate Grey

Steel grey with hints of rusts and rose tones



Old English

Predominantly white stone with highlights of chalky grey and amber

Box Quantities Stacked Stone: 46kg/m²

Flats 1.3m² (60kg box), 100mm high panels, 3 x lengths 200, 300 and 500mm long

Corners 3.6m (43kg box) 2 x Corner sizes only: 100mm high and 50x250mm and 50x150mm 'L shaped' measurements taken from back of corners.

Pillars:

- 300mm sq framing is best option which allows using mainly corner stones (and one 200mm flat per course) finishing at 380mm Sq. Builders need to be accurate with overall size finishing (including BGC at 290-300mm sq)
- Avoid pillar framing 310-390mm as this leaves a 10-90mm gap between corners and requires cut fillers in every course
- 400mm pillars are also an option needing a 2x 300mm fillers per 100mm high course.

Laying:

- Chalk lines approx. every 200-300mm. You can lay stone using the line above as a guide to ensure horizontal laying. Use cardboard packers to pack stones and trim stones on the wall or before you lay them to ensure each line is straight. Once a wave appears it is hard to get rid of.
- Use a slightly wetter mix than normal. Make sure the mortar coverage covers all of the board smearing excess mortar up wall.
- Dry stack is the standard laying style unless otherwise asked for. Ensure all joints are as tight as possible. Use white trade mortar for Old English and let mortar ooze around edges to hide gaps and shadow lines.

Cutting:

- Angle and back cut stones to try and eliminate square 'brick like' joints.
- Smear cuts with mortar and dress accordingly to hide inside of cut.
- When trimming horizontal courses cut bottom of stones up to eye level and then top of stones above eye level to conceal cuts



Hillstone



Molano

A range of Amber and tans

Box Quantities Molano:43kg/m²

Flats 1.3m² 56kg/box, Corners 3lm 44kg/box

Box Quantities Teton:49kg/m²

Flats 1.3m² 63kg/box Corners 2.4lm 44kg/box

Pillars:

- 400mm sq framing is best option which allows for minimal wastage and utilising most of the stone sizes as fillers, while still giving a solid look

Laying:

- Make sure the mortar coverage covers all of the board. Use plenty of mortar to ooze between gaps, and smear excess up wall to make sure all fibre cement board is covered
- Use a double shot of black oxide in a mix for Shadow Rock.
- Best to use coloured mortar 'sand' or 'golden' coloured or trade mortar 'Buff' or 'Cream' for Hillstone Molano.
- Can use the grey mortar to lay stone and then 'pipe' or over grout the trade mortar using piping bags.
- When brushing out be careful not to rake out too much mortar, if you can see the edge of the back of the stone you will have issues with delamination.

Cutting:

- Smear cuts with mortar and dress accordingly to hide inside of cut.

Shadow Rock



Teton

A mix of browns, grey and orange



Hillstone Molano finished with Buff Overgrout option



Shadow Rock Teton completed as drystack wall

Country Rubble



Serrano

A range of earthy browns & greys

Box Quantities Molano:43kg/m²

Flats 1.3m² 56kg/box, Corners 3lm 44kg/box

Box Quantities Teton:49kg/m²

Flats 1.3m² 63kg/box Corners 2.4lm 44kg/box

Pillars:

- 400mm sq framing is best option which allows for minimal wastage and utilising most of the stone sizes as fillers, while still giving a solid look

Laying:

- Make sure the mortar coverage covers all of the board. Use plenty of mortar to ooze between gaps, and smear excess up wall to make sure all fibre cement board is covered
- Use a double shot of black oxide in a mix for Shadow Rock.
- Best to use coloured mortar 'sand' or 'golden' coloured or trade mortar 'Buff' or 'Cream' for Hillstone Molano.
- Can use the grey mortar to lay stone and then 'pipe' or over grout the trade mortar using piping bags.
- When brushing out be careful not to rake out too much mortar, if you can see the edge of the back of the stone you will have issues with delamination.

Cutting:

- Smear cuts with mortar and dress accordingly to hide inside of cut.



River Rock



Alpine

A range of greys to replicate the feel of Nzs riverbeds



Field Rock



Mauka

Predominantly charcoal with the odd highlight of brown

Lava Rock



Nu'u

Charcoal tones with irregular edges

Pahoehoe



Kona

Charcoal colour with textures taken from cooling lava

Box Quantities Mauka: 72kg/m² Flats .9m² 65kg/box, Corners 3lm 45kg/box

Box Quantities Nu'u: 54kg/m² Flats .9m² 49kg/box, Corners 3lm 45kg/box

Box Quantities Kona: 51kg/m² Flats 1.1m² 56kg/box, Corners 4lm 37kg/box

Pillars:

- 400mm sq framing or bigger is best option which allows for minimal wastage and utilising most of the stone sizes as fillers, while still giving a solid look

Laying:

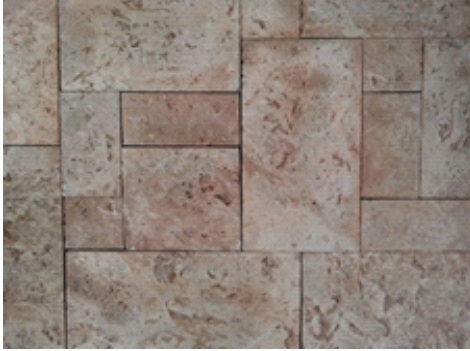
- Make sure the mortar coverage covers all of the board. Use plenty of mortar to ooze between gaps, and smear excess up wall to make sure all fibre cement board is covered
- Use a 'Black' trade mortar to lay. Adding oxide to normal stonetite bags dries back grey.
- Don't let mortar get wet/rained on before completely dry as the mortar will 'silver off' and need piping over. Add anti-efflorescence additive to mixes
- When brushing out be careful not to rack out too much mortar, if you can see the edge of the back of the stone you will have issues with delamination.

Cutting:

- Smear cuts with black mortar and dress accordingly to hide inside of cut.



Coastal Reef



Sanibel

Fawn with amber accents

Box Quantities:45kg/m2

Flats 1.4m2 62kg/box, modules of 100, 200 300 high and 100,200,300 and 400mm long

Corners 4lm 54kg/box (backs 70mmx170mm, 70x270mm heights 100,200,300mm)

Pillars:

- 320mm sq framing is best option this allows the use which allows using mainly corner stones finishing at 400mm Sq. Builders need to be accurate with overall size finishing (including BGC at 315-325mm sq)

Laying:

- Use slightly wetter mix than normal. Run fingers around the edges to ensure flush finish with other stones.
- Trim where necessary as the pattern is modular.
- Make sure the mortar coverage covers all of the board.
- Dry stack is the standard laying style unless otherwise asked for. Ensure all joints are as tight as possible.

Cutting:

- Square cut stones or use drop saw to make all cuts as square and straight as possible.
- Don't smear cuts with mortar as best to leave natural to hide inside of cut.



Corner pieces (19 per box)



Flats per box

Over-grout



WC Alex with White pointing



WC Alex with White Overgrout



HS Molano with Cream pointing

Laying:

- With any profile (except Stacked stone) the client may ask for an 'over-grout' also referred to as a 'bagged look' or the 'Arrowtown look'. You will need to discuss 'how much mortar' they wish to see as the further you bring the mortar to the front of the stone the wider the mortar lines/gaps will be
- Application allows for the stones to be spaced slightly further apart but the substrate must still be covered with mortar in order to waterproof. You can use packers to space your stones until set to stop them sagging.
- Once the client has confirmed the colour (Dricon offer a bagged Colour range or you can do a custom blend as long as the mixture is constant to ensure no colour variation). There are two options for placing the coloured mortar between the stones:
 1. You can mix a slightly wetter brew (than normal) and use a piping bag to squirt mortar in between the stones. You may need to add a bit of mortar improver or dishwashing liquid to the brew to allow it to flow through the bag properly. You may need to use your fingers to push into place once it has 'tacked' off. Be careful not to smear wet mortar over the fronts of the stone. You can then 'strike' using a wooden tool or a brush to finish the surface.
 2. You can make a dryer mix and push the mortar in between the stones using a 'small tool' or similar. This prevents smearing wet mortar on the stone front and enables you to finish as you go. Care needs to be taken to firmly push the mortar in so that it is compact and will dry hard and stay in place. Loos placed mortar will fall out.

