PETROS HOLDINGS LTD

CRAFTSTONE

Real Stone Made Easy

REAL STONE VENEER SYSTEM

TECHNICAL MANUAL
Product Description and Installation Details
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GENERAL

The **CRAFTSTONE REAL-STONE VENEER SYSTEM** is comprised of decorative natural stone veneers installed over approved construction substrates. The stone elements are supplied in natural form, as individual (singular), or panelised modules. The adhesive bond between the stone and substrate is provided by a pre-bagged adhesive mortar called Craftbond.

The Craftstone Real-Stone Veneer Systems are generally installed over suitably qualified fibre-cement boards, and masonry substrates such as concrete, concrete block, brick, AAC panel, or AAC block; although other substrates may be used with suitable preparation techniques. These include polystyrene sheets, polystyrene insulated concrete forms (ICF or "polyblock") and some polyisocyanurate panels.

Note: The BRANZ Appraisal for the Craftstone Real-Stone Veneer System (793 (2019)) allows for installation over fibre cement substrates only.

The use of the System over other substrates relies upon historic use and alternative solutions. We have documented supporting arguments for each of the systems described above which provide evidence of Code compliance and we are yet to have any of them declined by any Council or regulatory body.

The System can be installed over approved substrates on timber framing. Whilst not covered by the BRANZ Appraisal, we are now also able to instal over light steel framing in most circumstances, subject to engineering approval for weight loadings.

All components of the Craftstone Real-Stone Veneer System are proprietary items and cannot be substituted. They include the stone veneer, mortar adhesive, sealer, jointing tapes, adhesive spray, oxide tints and PVC flashings.

As a requirement of the terms and conditions of the Petros Holdings Ltd warranty, and as a requirement of the BRANZ Appraisal, 793(2019), the System must be installed by Approved Installers who are registered members of the Petros Holdings Ltd Installers network.

BUILDING REGULATIONS

When installed and maintained in accordance with the technical literature provided by Petros Holdings Ltd, the Craftstone Real-Stone Veneer System will meet, or contribute to meeting, the provisions of the New Zealand Building Code as required by:

Clause B1 Structure
B2 Durability
E2 External Moisture
F2 Hazardous Building Materials.

TECHNICAL SPECIFICATION

SCOPE: TIMBER FRAME CONSTRUCTION

The BRANZ Appraised Craftstone Real Stone Veneer System has been verified 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 Craftstone Real-Stone Veneer System has also been verified as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, with regards to building height and floor plan area; and
- constructed with timber framing 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.

SUBSTRATES

FIBRE-CEMENT

The BRANZ Appraised Craftstone Real-Stone Veneer System has been specifically tested for installation over 9mm thick fibre cement sheet and incorporates a specially designed mechanical anchor and fixing screw which anchors the mortar layer to the underlying timber frame structure. The anchor removes sole dependence on the durability of the substrate and will also assist with retention of the stone during seismic activity.

Correct installation and preparation of the fibre-cement substrate is the responsibility of the builder, and must be carried out in strict accordance with the manufacturers' technical instructions to ensure strict compliance with the requirements of NZBC Clause E2 External Moisture.

Correct preparation notes for the substrate sheets are provided in the Installation section of this document and in the “Craftstone FCB Technical Manual”.

Fibre cement sheets must comply with AS/NZS2908.2 and be approved for use by Petros Holdings Limited. We select our sheets by the following criteria:

- Face-load rating
- Method of manufacture
- Warranty for use with the rough side facing outward
- Compliance with AS/NZS2908.2

CONCRETE BLOCK/CONCRETE PANELS (TILT-SLAB)

Concrete masonry materials must comply with NZS 4210, and concrete must comply with NZS 3109. Accurate vertical and horizontal alignment of masonry modules during installation is imperative to achieve a consistent and level plane for stone application. Maximum surface deflections must be in accordance with the limitations given in NZS 3604, i.e., 2.0mm over 1200mm, and 3.0mm over 3000mm. Mortar joints must be tooled to reconsolidate the mortar, after initial water-loss, to make them water-tight.

Mortar should not be applied in damp conditions, or when rain is likely.

Excessive misalignment of masonry modules may be corrected by applying Mineral Plaster Technology’s Bondcoat and / or Stonecoat renders. Refer to Petros Holdings Ltd for further information if this is required.

Ensure the concrete substrate is clean and free of surplus mortar/blockfill. Masonry surfaces must be dust-free prior to application of the Craftbond adhesive mortar, and free of any contaminants which may inhibit adhesion of the mortar.

Note: A specialised cleaning solution must be used to remove release-agent coatings or deposits from tilt slab or in-situ poured concrete surfaces.

We recommend specifying an exposed aggregate finish on tilt slab walls ordered from commercial manufacturers. This provides a better keying surface for the Craftbond mortar adhesive.

Before application, concrete masonry must be dry with a measured RH (relative humidity) level of 70% or less. AS/NZS 2311 recommended drying times for recently constructed masonry are:

- 8 weeks for solid-filled construction
- 4 weeks for partially-filled construction

To prevent moisture absorption into the masonry surface, Craftstone Penetrating Sealer must be applied by low-pressure sprayer prior to application of Craftbond mortar adhesive. **MEMBRANE SEALERS ARE NOT SUITABLE FOR STONE VENEER SYSTEMS.** All weather-tightness considerations, including penetrations, are to be provided and installed by others.

BRICK

Brick work requires similar preparation to concrete/masonry, and in line with revised face-loading requirements with regard to seismic activity, Petros Holdings Ltd have instituted a specification to increase the fixing-centres of the typical brick-ties in areas designated for Craftstone Real Stone Veneer, i.e., 400mm horizontally, 300mm vertically and 200mm around openings.

A coat of Craftstone Penetrating Sealer must be applied directly to the brick substrate prior to installation of the Craftstone system. Highly porous surfaces may require a generous application. The Craftstone Penetrating Sealer will act as a surface equaliser, preventing rapid moisture loss from the mortar.

Typical brick installation would require that all weather-tightness considerations, including penetrations, have been provided and installed by others.

AAC (Autoclaved Aerated Concrete)

Autoclaved Aerated Concrete panels must be installed in accordance with the system for which they are approved. We recommend the BRANZ Appraised Petrapanel AAC System distributed by Petros Holdings Limited (Appraisal 1111 (2020)).

Once installed (and before application of any renders) the AAC Panels must be sealed using the Craftstone Penetrating Sealer or MPT Amberseal. As AAC is a very porous surface, a generous coat should be applied to ensure that the AAC is sufficiently sealed to prevent rapid moisture loss from the initial gluecoat.

In accordance with the early stages of the Petrapanel AAC System, the panels should be coated in a layer of Mineral Plaster Technology Bondcoat, into which a 4mm x 4mm alkali-resistant fibreglass mesh is to be embedded. Allow to cure for a minimum of 48 hours (72 hours in winter) prior to application of the Craftbond mortar adhesive.

Polystyrene Sheet, Insulated Concrete Forms (Polyblock), or Polyisocyanurate

Polystyrene and Polyisocyanurate sheets must be installed as required by the manufacturer or supplier of that product and be warranted for use by the manufacturer to carry the weight of the Craftstone System. We recommend the Mineral Plaster Technology “Meshclad” cavity system (BRANZ Appraisal 445 (2016)).

Similarly, ICF (Polyblock) systems must also be installed in accordance with their manufacturer’s specifications. If the polyblock deforms during the pour, a layer of MPT Bondcoat, followed by a layer of MPT Stonecoat (high-build render) may be applied to the wall to straighten out the surface.

As specified in the MPT Meshclad Cavity System, a layer of MPT Bondcoat, reinforced with 4mm x 4mm alkali-resistant fibreglass mesh is to be applied to the surface of the substrate. Once dried (48 hours) this must be sealed using the Craftstone Penetrating Sealer. Before applying the stone veneer, this layer of Bondcoat should be allowed to cure for at least 1 week.

SYSTEM COMPONENTS

PROPRIETARY COMPONENTS

The following are proprietary components of the Craftstone Real-Stone Veneer System and must be supplied by Petros Holdings Ltd:

- Craftbond Mortar Adhesive
- Craftstone Penetrating Sealer
- Craftstone Butyl Tape & Adhesive Spray Primer
- Craftstone Anchors & Fixings (s/steel)
- Craftbond Mortar Adhesive Tints
- Craftstone PVC Finishing Trims

CRAFTSTONE PENETRATING SEALER

Craftstone Penetrating Sealer is a penetrating silane/siloxane sealer and water-proofer, formulated specifically to prevent moisture absorption into masonry and fibre-cement substrates. By penetrating the substrate, rather than remaining on the surface, Craftstone Penetrating Sealer ensures that the surface texture remains unchanged, providing a better adhesion key for subsequent Craftbond application.

Craftstone Penetrating Sealer can be applied by brush or low-pressure spray-pack. It is supplied as a liquid concentrate in 1 litre plastic containers and when diluted with water to a ratio of 1:9 will make up 10 litres of ready-to-use solution. This product is also supplied in 1 litre and 5 litre plastic containers of “Ready-to-use” solution, so be careful to read the label.

10 litres of diluted solution will cover 60-80m2 of surface area for a 1 coat application depending on the porosity and texture of the substrate surface. If a second coat is required, it must be applied wet -on-wet. If the sealer has begun to dry before application of a second coat, the second coat will not penetrate, leaving a varnish-like film on the surface. Wherever possible, a single coat should be preferred. If the work area is less than the maximum coverage area of a 10 litre mix, a pro-rata mixture can be made to suit.

Undiluted Craftstone Penetrating Sealer has a shelf life of 12 months from the date of delivery if stored in tightly closed containers out of direct sunlight and under 25 degrees Celsius. Excessive heat or exposure to sunlight may cause the sealer to curdle. If the sealer has curdled, it should be discarded.

CRAFTSTONE BUTYL TAPE & ADHESIVE SPRAY PRIMER

Craftstone Butyl Tape is a flexible, mortar adhesive-compatible waterproofing tape, installed over fibre-cement sheet joints and external corners. When used with the Adhesive Spray Primer, the tape will readily adhere to dry, clean and debris-free fibre-cement or masonry surfaces and is designed for external use as a medium over which mortar adhesive, plaster or render can be applied.

The tape is installed following the application of the Adhesive Spray Primer. Care must be taken to ensure the adhesive spray is also applied to the surface of underlying tape wherever they overlap, such as horizontal/vertical junctions, or where tape continuations begin.

Installation is carried out following application of the Craftstone Penetrating Sealer water-proofer. The sealer must have dried before application of the spray adhesive (5 to 20 minutes depending on the weather).

The tapes are supplied in two sizes:

- 70mm wide x 20 metres long for the sheet joints.
- 150mm wide x 20 metres long for external corners.

Note: Internal corners on fibre-cement structures are expansion joints and must not be bridged. The expansion joint extrusion and/or sealant are supplied and installed by others.

CRAFTBOND MORTAR ADHESIVE

Craftbond is a factory-mixed proprietary mortar adhesive, exclusive to Petros Holdings Ltd. It is a tough, durable and crack-resistant mortar, with a very high flexural-strength. It has been historically tested and used as an adhesive coating on all masonry substrates, fibre-cement, AAC concrete and extruded or expanded polystyrene.

For correct application texture;

- Add 1 kg of Petralastic and 3 litres of clean, potable water to each 20kg bag of Craftbond and mix well with a mixing-drill and whisk.
- Allow to stand for 3 to 4 minutes to hydrate, then lightly re-mix before using.
- The mix will last up to 2 hours, but may require a light re-mix every 30 — 40 minutes in hot or dry conditions. DO NOT add more water if the mix begins to cure in the bucket. That will weaken the adhesive bond.

Craftbond will cure to a medium-grey colour and may require appropriate tinting with Craftstone's range of liquid tints for some applications. We do not recommend the use of powdered oxides for this purpose.

Depending on the substrate and selected stone veneer, a 20kg bag of Craftbond will cover approximately 1.3 to 1.5m^2.

The mortar is packed in 20kg plastic-lined paper bags and can be stored in a dry place for up to 6 months. All Craftbond more than 6 months beyond the date of manufacture should be discarded. The batch number is clearly stamped on all bags and expiry dates can be obtained from Petros Holdings Ltd upon request.

CRAFTSTONE ANCHORS

The Craftstone anchor has been designed to anchor the BRANZ Appraised stone-veneer system directly through the fibre cement substrate and cavity batten, into the structural framing, thereby removing undue reliance on the fibre-cement substrate for support.

The anchor is also designed to limit separation of the stone veneer from framing support during seismic movement, and to assist with the prevention of wholesale collapse during severe seismic activity, especially in areas of foot-traffic and high public usage.

In order to accommodate the function and profile of the anchor, embedment will require a continuous mortar-bed of 8-10mm thickness over the substrate during installation of the stone (i.e. more Craftbond will be required).

The anchors and screw fixings are supplied by Petros Holdings Ltd as grade 304 stainless steel for use in NZS defined Corrosion Zones B, C and D.

The screw fixing is 65mm long, with a hex head. Fixing centres are maximum 300 mm vertically on studs at 400 mm centres maximum.

Where an AS/NZS2908.2 compliant fibre cement board, approved by Petros Holdings Ltd. and made using *'flow-on technology'* has been used, Craftstone Anchors are not required where stone is installed below 3 metres from ground level. This method of manufacture and the face-load rating of these approved fibre cement boards, eliminate any risk of intra-board delamination. The addition of Petralastic to the Craftbond mix and the keying surface of those approved boards significantly reduce the risk of stone delamination during seismic activity. NOTE: The BRANZ Appraised system still requires the use of the Craftstone Anchor in all situations and at all heights, however most Councils do not require its use at all.

Craftstone Anchors are not required on masonry, brick, concrete block, AAC, or polystyrene substrates.

CRAFTSTONE SILL & JAMB FLASHINGS

Petros Holdings Ltd supply optional PVC sill and jamb flashings for flush-mounted door and window joinery. They are designed to provide a curved weather-seal-edge which locates between the substrate and joinery fin, a sealant track, and an up-stand which the stonework butts to.
Installation requires a gap of 2 to 3mm between the fin and substrate. This is achieved by correctly sizing the width of the internal joinery liners. Details are provided in the Craftstone Technical literature.

The flashings have been tested under E2/VM1 test criteria.

CRAFTBOND TINT

Tinting of the Craftbond mortar to achieve a colour-match or contrast can be achieved with our range of dispersed liquid-oxides. Petros Holdings Ltd currently provides a basic range of four colours, ranging from black, to deep grey, an earthy adobe colour and off-white.

Each plastic container of Tint has been formulated for dilution in 3 x litres of clean water, to achieve the selected colour and to correspond with the 3 litres of water required to mix a 20kg bag of Craftbond. Pro-rata applications are acceptable.

Other colours can be arranged as special orders, if required.

ADHESIVES AND SEALANTS

For adhering or sealing of additional detail, Petros Holdings Ltd recommends the use of BRANZ appraised products such as those manufactured by Maxilam, Sika or Holdfast. Petros Holdings Ltd supply Maxilam products.

PVC FLASHINGS AND ACCESSORIES

Petros Holdings Ltd supply a range of UV-resistant PVC flashings, cavity closures, trims, and sealant support accessories, and can generally source other specialist profiles to accommodate alternative details.

DESIGN INFORMATION

FRAMING STRUCTURE

Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings that are outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and the AS/NZS 1170 series. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604.

In all cases the studs supporting the Craftstone Real-Stone Veneer System must be at maximum 400 mm centres.

Nogs must be fitted flush between the studs at maximum 800mm centres.

E2 EXTERNAL MOISTURE

When installed in accordance with the directions and provisions of Petros Holdings Ltd, the Craftstone Real-Stone Veneer System will meet the performance requirements of NZBC E2.3.2.

Junctions between the cladding substrate and the external joinery, at control joints and around window penetrations must be detailed to ensure the cladding system is installed and maintained weather-tight.

Sills and copings must be sloped a minimum of 15˚ from horizontal.

Weather-tightness Principles:

- Weather-proofing around aluminium joinery openings, penetrations, construction and expansion joints, and base and wall junctions, must be given particular attention by designers and substrate installers.
- Joinery heads must be protected by a metal head-flashing installed by others.
- If required, mechanical sill and jamb flashings can be supplied by Petros Holdings Ltd and fitted by the Licenced Building Practitioner. For flush mounted joinery, a gap of 3-5mm is required between the substrate surface and the back of the joinery flange. Timber jamb-scribers can be used as an alternative where joinery has been set further off the framing to accommodate other adjacent cladding types. In this situation, sills can either be of a custom-made mechanical or stone profile.
- Designers must provide detailed drawings of all weather-tightness design features that are outside the scope of the technical literature of the substrate manufacturer or Petros Holdings Ltd.

Penetrations

- All penetrations, including doors and windows, are to be flashed or made waterproof in accordance with the technical literature of the substrate manufacturer or supplier, as well as the weather-tightness requirements of clause E2 of the New Zealand Building Code. This work must be carried out by the builder or respective trades-people.
- The Petros Holdings Ltd approved installers are not responsible for weather-tightness detailing. That is part of the substrate system and is the responsibility of other LBP-qualified trades.

Drainage Planes

- Designers must ensure that structures do not contain detail or design features where water ponding may occur.
- A minimum slope of 15 degrees is required to all sills and copings, and where required by the installation details, a water-proof membrane system or water management facility is to be specified.

Ground Clearances

Ground clearances for supporting substrate boards must be maintained in accordance with the requirements of NZS 3604. Bottoms of sheets are to finish minimum **35mm** clear of finished deck surfaces and roof flashings, minimum **100mm** clear of paved surfaces, and minimum **175mm** clear of unpaved ground.

Stone cladding may bridge the cavity drainage level and continue onto concrete foundations so long as the minimum required drainage weep-hole area is maintained below the substrate (i.e. 1000mm^2 per lineal metre). For the best aesthetic appearance, weep-holes should be formed by clearing mortar adhesive from the vertical gaps between stones in front of the substrate – foundation gap.

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, to ensure adequate screw penetration into the studs.

Water Vapour

The Craftstone Real-Stone Veneer System is not a barrier to the passage of water vapour, and when correctly installed, will not create or increase the risk of damage resulting from condensation.

B1 STRUCTURE

Mass - For structural design purposes, the Craftstone Real-Stone Veneer System has a mass of approximately 60 kg/m², excluding the mortar and substrate, although some stones in our range are as light as 32 kg/m^2.

Impact Resistance - The Craftstone Real-Stone Veneer System has good resistance to soft and hard-body impacts likely to be encountered in normal residential use.

Wind Zones - The Craftstone Real-Stone Veneer System is suitable for installation in all NZS 3604 defined Wind Zones, up to and including Extra High.

The System has also been tested for weather-tightness and structural wind loading when used for buildings subject to specific design up to a design differential ultimate limit state (ULS) wind pressure of 2.5 kPa.

F2 HAZARDOUS BUILDING MATERIALS

When the Craftstone Real-Stone Veneer System is used and installed in accordance with the instructions and technical literature of Petros Holdings Ltd, the product will not present a health hazard to people; therefore the provisions of NZBC F2.3.1 will be met.

B2 DURABILITY

When installed and maintained in accordance with the instructions and recommendations of Petros Holdings Ltd, the Craftstone Real-Stone Veneer System will have a serviceable life of 50 years.

The assessment of durability of the System to meet the requirements of the NZBC is based on the difficulty of access and replacement, and the ability to detect failure of the System both during normal use and maintenance of the building.

OUTBREAK OF FIRE

The Craftstone Real-Stone Veneer System does not require separation from chimneys and flues. However, when used in conjunction with heat sensitive materials, the heat sensitive material must be separated from chimneys and flues in accordance with the requirements of NZBC Acceptable Solution C/AS1, Part 9 for the protection of combustible materials. All elements of the BRANZ Appraised Real Stone Veneer System are considered masonry products and are classed as *'heat shields'* under AS/NZS 2918 (Fireplace Installation Standard)

METER BOX AND ELECTRICAL CABLES

PVC-sheathed electrical cables must be prevented from direct contact with the cladding substrate. When cables must penetrate the substrate for exterior electrical connections, the cable must be supported immediately behind the board by passing through a hole drilled in a framing member. When required, fit the meter box flashing option as per the Craftstone technical information (K1 Detail), or other suitably approved flashing method.

CONTROL JOINTS

- Design requirements for the formation and location of control joints are provided in the Craftstone technical literature.
- Due to the framing or substrate requirements for construction joints to function correctly, designers must specify the location of the joints, at planning stage.
- For sheet claddings over timber framing, a double-stud sub-structure for vertical control joints with maximum spacing of 5.4m centres must be specified.
- Horizontal control joints are required to accommodate movement caused by joist shrinkage and deflection and must be provided at all floor joists and wall-frame-to-truss connections.

Elsewhere, horizontal control joints are required at a maximum spacing of 5.4m where the studs are running continuous to full height.

Control and expansion joint installation in the substrate is outside the scope of the Craftstone Real-Stone Veneer System and must be installed by the substrate installer or builder in accordance with the technical instructions of the substrate manufacturer or supplier.

INTER-STOREY DRAINED JOINTS

Inter-storey drained joints must be provided to limit continuous cavities to 2 storeys in height or 7 m maximum in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4.

HANDLING AND STORAGE

Handling and storage of all materials on site is the responsibility of the Craftstone Approved Installer. Bags of mortar require storage in dry conditions, preferably off the floor on pallets or dunnage. Crates and boxes of stone product should be stored under shelter or under protective covers if stored in the open.

SHELF LIFE

Due to the eventual static reaction of the additive components in modified mortar formulations, all Craftbond mortar adhesive which is six (6) months beyond manufacture date should be discarded. The batch-number is clearly stamped on all bags of Craftbond. If in doubt, Petros Holdings Ltd should be consulted to determine the product's age.

STONE VENEERS

CRAFTSTONE PANELS (FEATURE-SCHIST & SCHISTCLAD PANELS)

Craftstone natural stone panels are made up of hand selected pieces of natural stone fixed together to form modular panels. This allows the panels to be dry-stacked in a streamlined plane in both interior and exterior applications.

The panels are generally suitable for feature walls, entranceways, fireplace surrounds, pillars, barbeques, letter- boxes, garden walls, water features, general cladding and new construction or renovations. Craftstone Penetrating Sealer must be applied over the supporting substrate and completed stonework.

Due to their streamlined profile, installation is significantly faster than conventional stone installations of comparable style as cutting and surface preparation is reduced, as is waste and noise. External corner panels are also available in most colours and stone options.

The stone panels are available in a variety of colours.
550mm wide x 200mm high; or 600mm wide x 150mm high (depending on the style chosen)
Average stone thickness: 20-30mm
Average weight psm: 32 to 60kgs

The various panel styles can be viewed in the company's advertising brochures or on the website.

CRAFTSTONE SELECT (INDIVIDUAL STONES)

Craftstone Select individual stones are randomly selected pieces of natural stone. The stone pieces are back-cut to an average thickness of 20-30mm, producing a flat surface on the back of the stone for mortar application, and a natural surface on the face. The stones are installed individually and can be dry-stacked or pointed.

The Schistclad individual stones are available in a wide variety of colours.
Typical dimensions depending on colour vary from 100mm-600mm (long) x 20mm-160mm (high)
Average stone thickness: 20-30mm
Average weight psm: 60kgs.
The various stone types and colours can be mixed to the client's preference and can be viewed in the company's advertising brochures or on the website.

INSTALLATION

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 manufacturers' instructions prior to the installation of the cavity battens and the rest of the Craftstone Real-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. These are available from Petros Holdings Ltd. 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 1000mm^2 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 45mm wide x 18mm 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.

FIBRE CEMENT SHEET

Minimum 9 mm thick fibre cement sheets complying with AS/NZS 2908 Part 2 and approved for use by Petros Holdings Limited may be installed vertically or horizontally. These sheets

must be installed with the rough side facing outward to provide a better keying surface for the Craftbond mortar adhesive. All fixings must be a minimum 12mm from the sheet edges. Fixings using the screws provided by Petros Holdings Ltd are at 150mm centres on the vertical on each stud. Where Craftstone Anchors are being used, every second fixing screw may be substituted with the Craftstone Anchor and screw.

Sheets should be separated by about 3mm (a nail width) at all edges to allow for expansion and contraction.

All 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.

The structural and weather-tightness integrity of the fibre cement substrate is dependent on the correct installation of the system in strict accordance with the installation instructions provided in the Craftstone technical literature and the literature of the fibre cement sheet manufacturer or supplier.

STONE INSTALLATION (Fibre Cement Substrates)

1. Clean the board surface with a stiff brush or broom to remove dust or any other contaminants which may impede adhesion of the mortar.

2. Apply a liberal coating of Craftstone Penetrating Sealer with roller, brush or spray-pack. All exposed board must be coated including joint recesses and the bottom sheet-edge. Allow to dry.

3. Apply Spray Adhesive to all areas where Craftstone Butyl Joint Tapes are to be installed and allow it to dry to a tack stage. Then remove the release tape and apply 70mm Butyl Tape to the sheet joints, and 150mm Butyl Tape to external corners. Roll or press the tape firmly into place.

4. If required, set construction joint extrusions and mechanical sill and jamb flashings into place with fibreglass reinforcing mesh embedded in a layer of Craftbond.

5. If required, temporary timber supports for the bottom course can be set up. Alternatively, Petros Holdings Ltd provide 20mm x 32mm aluminium angles in 2.5m lengths for lower edge support.

6. Mark out the framing lines (studs) and install stainless steel Craftstone Anchors. Fixings are to be at maximum 300mm centres vertically on maximum 400mm stud spacing. Ideally, the wings of the anchor should be positioned on a horizontal plane, however in some internal corner situations they may need to be positioned vertically or on an angle.

7. The fixings are 12 gauge self-drilling stainless steel screws, with a hex head for easier installation. Socket drives for the hex head are 8mm or 5/16".

8. Thoroughly wash the back of the stone to remove any residual dust from the manufacturing process. It is imperative that the backs of the stone modules are washed to remove any dust or contaminants which may inhibit the adhesive bond.

9. Mix the Craftbond mortar adhesive at a ratio of 1 kg of Petralastic and 3 litres of clean water to each 20kg bag, using a mixing drill and whisk, and allow to set for 4-5 minutes before lightly remixing. Do not make up more than can be used in 2 hours.

9. Craftstone veneers can be cut with any masonry blade attached to a suitable stone saw, angle grinder or tile saw etc. To avoid the spread of harmful silica dust, we recommend the use of a wet saw. If you do not have a wet saw, use a P2 respirator whilst cutting.

10. Press mortar under the anchor wings, and then apply a scratch coat of mortar adhesive across the surrounding area, being sure to cover all of the area you are about to apply the stone to,

but not much more. This layer (about 2mm thick) should be worked into the surface of the fibre cement board using a steel trowel. Using the same method, apply a scratch coat of Craftbond to the rear of the entire surface of the stone that is about to be applied, scratching the mortar into the surface of the stone to ensure a strong bond. Then 'butter' the back of the stone with about 10-12mm of Craftbond before pressing the stone into place over the prepared substrate, while moving the stone from side to side slightly to ensure a strong bubble-free bond. The extent of application should be limited to an area which can be covered with stone within a 5 to 10 minute period. This ensures that the mortar on the stone and the mortar on the board are forming a wet-to-wet bond. Ensure a mortar tail of appropriate thickness is remaining after stone installation so the next bedding application can be blended for continuity.

11. Extra care must be taken to ensure mortar does not contaminate the surface of the stones.

12. Install the bottom course and corner stones first and then fill the spaces in between with appropriate random or cut pieces. It is advisable to mark the wall with chalk-line at suitable intervals to assist with straight and level placement of the stones.

13. Where stone crosses control or construction joints, the stone-work must be finger-jointed at the intersection of the joint by applying mortar to the longest side of the stone only, allowing the remainder to float across the joint. Schistclad individual stone installations would require specific selection of stones of suitable length to achieve this. As a general rule, Craftstone recommends a ratio of a minimum of 75% mortared, to 25% floating.

14. At joinery and meter-box heads allow for a minimum 5mm drainage and ventilation gap between the top of the head flashing and the bottom edge of the stone.

15. Mortar splashes or overflows must be cleaned off the stone face on the same day, or preferably as soon as the mortar/stone installation has reached a suitably stable level.

16. Following a minimum of overnight curing, the completed stonework is to be washed thoroughly, allowed to dry, and then liberally coated with Craftstone Penetrating Sealer.

STONE INSTALLATION (Masonry Substrates (Concrete, Block and Brick))

1. Clean the surface with a stiff brush or broom to remove dust or any other contaminants which may impede adhesion of the mortar. If the substrate has had any release agents used on it during manufacture (Tilt slab or in-situ shuttered pours), this must be fully removed using a suitable cleaner, then allowed to dry.

2. Apply a liberal coating of Craftstone Penetrating Sealer with roller, brush or low-pressure spray pack. Allow to dry.

3. If required, temporary timber supports for the bottom course can be set up. Alternatively, Petros Holdings Ltd provide 20mm x 32mm aluminium angles in 2.5m lengths for lower edge support.

4. Thoroughly wash the back of the stone to remove any residual dust from the manufacturing process. It is imperative that the backs of the stone modules are washed to remove any dust or contaminants which may inhibit the adhesive bond.

5. Mix the Craftbond mortar adhesive at a ratio of 1 kg of Petralastic and 3 litres of clean water to each 20kg bag, using a mixing drill and whisk, and allow to hydrate for 4-5 minutes before lightly remixing. Do not make up more than can be used in 2 hours.

6. Craftstone veneers can be cut with any masonry blade attached to a suitable stone saw, angle grinder or tile saw etc. To avoid the spread of harmful silica dust, we recommend the use of a wet saw. If you do not have a wet saw, use a P2 respirator whilst cutting.

7. Apply a scratch coat of mortar adhesive across the immediate area to be covered, being sure to cover all the area you are about to apply the stone to, but not much more. The extent of

application should be limited to an area which can be covered with stone within a 5 to 10 minute period. This ensures that the mortar on the stone and the mortar on the board are forming a wet-to-wet bond. This layer (about 2mm thick) should be worked into the surface of the masonry using a steel trowel. Using the same method, apply a scratch coat of Craftbond to the rear of the entire surface of the stone that is about to be applied, scratching the mortar into the surface of the stone to ensure a strong bond. Then 'butter' the back of the stone with about 10-12mm of Craftbond before pressing the stone into place over the prepared substrate, while moving the stone from side to side slightly to ensure a strong bubble-free bond. Ensure a mortar tail of appropriate thickness is remaining after stone installation so the next bedding application can be blended for continuity.

8. Extra care must be taken to ensure mortar does not contaminate the surface of the stones.

9. Install the bottom course and corner stones first and then fill the spaces in between with appropriate random or shaped pieces. It is advisable to mark the wall with chalk-line at suitable intervals to assist with straight and level placement of the stones.

10. Where stone crosses control or construction joints, the stone-work must be finger-jointed at the intersection of the joint by applying mortar to the longest side of the stone only, allowing the remainder to float across the joint. Schistclad individual stone installations would require specific selection of stones of suitable length to achieve this. As a general rule, Craftstone recommends a ratio of a minimum of 75% mortared, to 25% floating. Alternatively, stone can be cut to follow the construction joint, allowing for full-surface bonding to the substrate.

11. Mortar splashes or overflows must be cleaned off the stone face on the same day, or preferably as soon as the mortar/stone installation has reached a suitably stable level.

12. Following a minimum of overnight curing, the completed stonework is to be washed thoroughly, allowed to dry, and then liberally coated with Craftstone Penetrating Sealer.

STONE INSTALLATION (Polystyrene Panel, ICF & Polyisocyanurate Panel))

1. Scratch the surface of the panel or ICF block to open the pores of the substrate. Clean the surface with a stiff brush or broom to remove dust and any loose material. This is particularly important if polystyrene has been left exposed to ultra-violet light for long periods of time.

2. Apply a layer of Mineral Plaster Technology ("MPT") Bondcoat about 2mm thick and lay alkali-resistant fibreglass mesh (4 x 4mm 160gsm) into the Bondcoat while still wet.

3. Apply a second layer of MPT Bondcoat over the fibreglass mesh to fully encase the mesh. This layer should be finished with a horizontal notch trowelled finish. Allow to cure (72 hours minimum).

4. Generously coat the Bondcoat with Craftstone Penetrating Sealer applied by low-pressure spray pack. Allow to dry.

5. If required, temporary timber supports for the bottom course can be set up.

6. Thoroughly wash the back of the stone to remove any residual dust from the manufacturing process. It is imperative that the backs of the stone modules are washed to remove any dust or contaminants which may inhibit the adhesive bond.

7. Mix the Craftbond mortar adhesive at a ratio of 1 kg of Petralastic and 3 litres of clean water to each 20kg bag, using a mixing drill and whisk, and allow to hydrate for 4-5 minutes before lightly remixing. Do not make up more than can be used in 2 hours.

13. Craftstone veneers can be cut with any masonry blade attached to a suitable stone saw, angle grinder or tile saw etc. To avoid the spread of harmful silica dust, we recommend the use of a wet saw. If you do not have a wet saw, use a P2 respirator whilst cutting.

14. Apply a scratch coat of mortar adhesive across the immediate area to be covered, being sure to cover all the area you are about to apply the stone to, but not much more. The extent of application should be limited to an area which can be covered with stone within a 5 to 10 minute period. This ensures that the mortar on the stone and the mortar on the substrate are forming a wet-to-wet bond. This layer (about 2mm thick) should be worked into the surface of the notch-trowelled Bondcoat using a steel trowel. Using the same method, apply a scratch coat of Craftbond to the rear of the entire surface of the stone that is about to be applied, scratching the mortar into the surface of the stone to ensure a strong bond. Then 'butter' the back of the stone with about 10-12mm of Craftbond before pressing the stone into place over the prepared substrate, while moving the stone from side to side slightly to ensure a strong bubble-free bond. Ensure a mortar tail of appropriate thickness is remaining after stone installation so the next bedding application can be blended for continuity.

15. Extra care must be taken to ensure mortar does not contaminate the surface of the stones.

16. Install the bottom course and corner stones first and then fill the spaces in between with appropriate random or shaped pieces. It is advisable to mark the wall with chalk-line at suitable intervals to assist with straight and level placement of the stones.

17. Where stone crosses control or construction joints, the stone-work must be finger-jointed at the intersection of the joint by applying mortar to the longest side of the stone only, allowing the remainder to float across the joint. Schistclad individual stone installations would require specific selection of stones of suitable length to achieve this. As a general rule, Craftstone recommends a ratio of a minimum of 75% mortared, to 25% floating. Alternatively, stone can be cut to follow the construction joint, allowing for full-surface bonding to the substrate.

18. Mortar splashes or overflows must be cleaned off the stone face on the same day, or preferably as soon as the mortar/stone installation has reached a suitably stable level.

19. Following a minimum of overnight curing, the completed stonework is to be washed thoroughly, allowed to dry, and then liberally coated with Craftstone Penetrating Sealer.

MAINTENANCE

Regular maintenance is essential to ensure that the system continually performs to the requirements of the New Zealand Building Code and to ensure the maximum serviceability of the Craftstone system.

Annual inspections must be made to ensure that all aspects of the stone veneer and selected substrate systems remain in a weatherproof condition.

Any cracks, damaged areas or areas showing signs of deterioration which could allow water ingress or dislodgement of the stone, must be repaired immediately.

Regular cleaning (at least annually) of the stone is recommended to remove grime, dirt and organic growth and oxide leaching, to maximize the life and appearance of the stone.

Grime may be removed by brushing with a soft brush, warm water and detergent. Do not use high-pressure water-blasting systems, or acids.

PRODUCT & WORKMANSHIP WARRANTIES

The material components of the Craftstone system described in this manual are warranted for a period of (15) fifteen years from the date of practical completion. This is compliant with the relevant clauses of the New Zealand Building Code (NZBC) B1 Structure, B2 Durability, E2 External Moisture and F2 Hazardous Building Materials, for this type of building element, provided that the normal maintenance requirements as outlined in the maintenance section of this manual are

followed and the installation has been carried out by an Approved Installer who has been approved for the purpose by Petros Holdings Limited.

A (5) Five-year guarantee of workmanship will be provided by the Approved Installer who guarantees the correct preparation and installation of the Craftstone system.