

INTRODUCTION TO WAIRAU STONE WALL FACING SYSTEM

For Domestic, Industrial and Commercial Application

GENERAL DESCRIPTION

The Wairau Stone facing system is maintenance free wall sheathing designed for industrial and domestic application. The system comprises cast stone facing units, Hardiflex, backing sheets, jointing, Wairau Stone bonding mortar, pointing and ancillary trim.

The cast stone facings are cast concrete components moulded and colored to simulate the appearance of a variety of natural stone facings, such as sedimentary sandstone and various forms of split stone. The mix contains fine and coarse sands, pumice, and mould inhibiting agents and is designed to a minimum compressive strength at 28 days: 25MPa.

The facings vary in length to a maximum of 600mm; in width to a maximum of 14mm. Depending on the style of facings chosen dead load weight is from 30kg to 35kg per m².

The facings can be applied to a variety of wall surfaces including concrete block, brick and treated plywood, but the norm used in this system is a backing sheet of 6mm or 7,5mm thick Hardiflex flat sheet.

PURPOSE & ADVANTAGES

The system is available nationwide in Indonesia. Wairau Stone is a decorative and protective maintenance free wall sheathing system, which is fixed either directly to framing or over existing cladding. It offers the following exclusive advantages:

1. Whilst producing the same appearance as conventional brick or stone veneer, the weight factor is less than one-third the conventional brick or stone alternatives.
2. In standard timber framed construction no perimeter footing is required. The system can be applied to normal light timber framed buildings.
3. Price: with the savings in footing and framing there is a definite price advantages over normal stone or brick veneer. In high-rise construction there is even more considerable savings in foundations and structural load bearing columns and walls.
4. The system utilizes the bracing effect of Hardiflex sheets; consequently structural panels can be built to cover most infill situations.
5. The savings in time are considerable and most buildings can be closed in with at least 75% savings in time over conventional stone or brick cladding.
6. Weather proofing qualities of the stone are superior to natural stone due to the addition of waterproof and mould inhibitive additives. There is none of the interior

dampness sometimes associated with conventional brick or stone veneer.

7. More living space for less floor area: because there is no gap between the stone work and the framing there is more useful floor area available from the same external measurements.
8. As the system employs standard timber framing there is a ready surface available for the interior lining and normal insulation can be installed in the panels. Industrial infill panels make it extremely easy to account for earthquake joints.

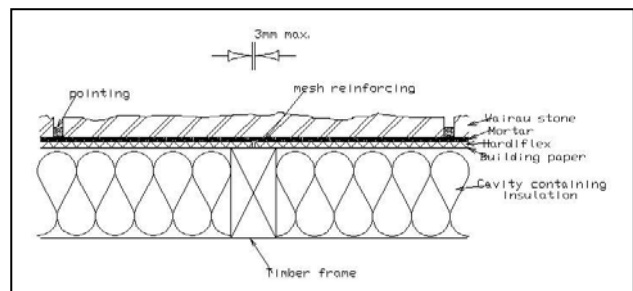
INSTALLATION

Fixing direct to timber wall framing. The studs shall be at 600mm maximum centers. Sub floor bracing, wall bracing and general details below a wall clad with Wairau Stone shall be as described in NZS 3604 for a heavy roof, or as specifically designed or detailed.

A heavyweight breather type building paper shall be used over framing.

Detail 1

PLAN SHOWING FIXING DIRECT TO STUD



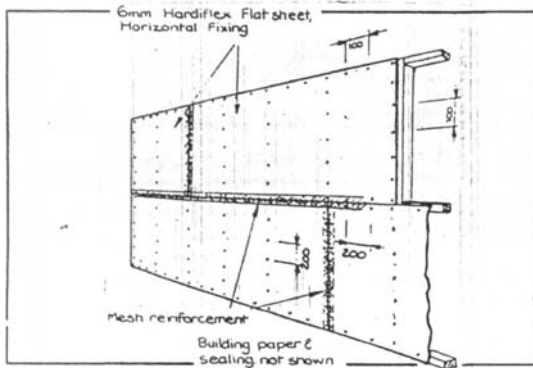
BACKING SHEET INSTALLATION.

Handling and working Hardiflex shall be carried out in accordance with Hardie's Technical Bulletin "Working Instruction for Asbestos Cement Building Products". 6mm or 7.5mm Hardiflex sheets shall be fixed as shown in details 3,4 and 5 with the rough (dimpled) side outwards. Joints between sheets shall be 3mm maximum. Hardiflex backing sheets shall be fixed with 40 x 2.8mm hot dipped galvanized nails. 'Direct to Framing', the nails shall be at 100mm crs around perimeter of sheet and 200mm crs at intermediate studs and dwangs (nogs).

Note: Where Hardiflex sheets are being used for bracing, they shall be fixed in accordance with Hardie's Technical Bulletin.

SPECIAL NOTE: When constructing the wall framing, noggings must be positioned so that when the first course of hardiflex is run horizontally around the base, the top edge of the sheet centers on the noggings, after allowing the bottom edge of the sheet to position 30 mm below the bottom plate. See details 3,4 and 5.

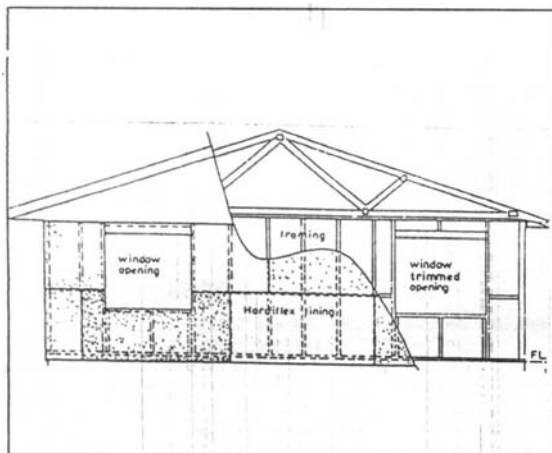
Detail 3
DIRECT TO FRAMING FIXING – HARDIFLEX SHEETS HORIZONTAL



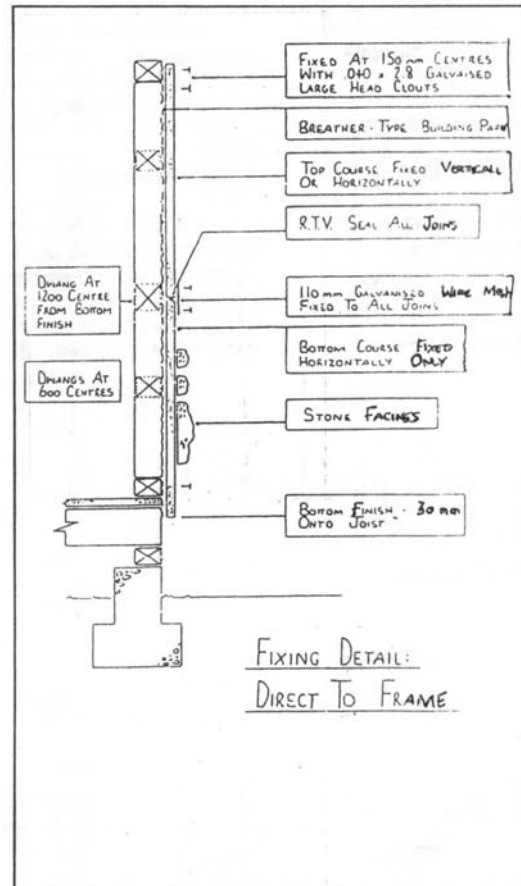
PLACEMENT OF HARDIFLEX AROUND WINDOWS AND OPENINGS

Stress areas in exterior sheathing exist below windows and openings, in particular where the sill is in the lower 1200mm of the wall. To minimize this, special fixing standards apply: all windows 2200mm or less in width will be cut from full sheets. These will be either plotted or fixed, first. Windows over 2200mm wide: No vertical joint will be less than 400mm inside (and below) on outside (and below) window face. No vertical joint will be in the area 400mm either side of a centerline below middle of window.

Detail 4
TYPICAL PLACEMENT OF HARDIFLEX AROUND WINDOWS AND OPENINGS



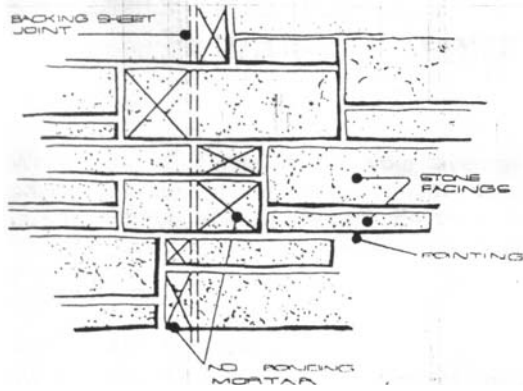
Detail 5
FIXING DETAIL: DIRECT TO FRAME



BACKING SHEET JOINTING

Joints are of two types:

- (a) Reinforced
 - (b) Thermal movement control
- (a) Reinforced Joint – 110mm hot dipped galvanized mesh shall be applied over horizontal and vertical joints. Wairau Stone Bonding Mortars shall be applied to the joint as the stone facings are applied. This will provide a rigid backing to the stone facings. See details 3 and 4.
- (b) Thermal movement control joints – this should be used on long walls where thermal movement is likely to cause stone facing cracks. Generally they should be at approximately 4.8m centers. In infill panels between columns there would be a thermal movement joint between panel and column. The joints should be located at the smallest cross section of stone cladding, such as at a door or window. Detail 7 shows a typical joint.



Detail 7
THERMAL MOVEMENT CONTROL JOINT

Wairau Stone Bonding Mortar shall be applied to one side (largest) of the stone facing only. The pointing will locate and support the non-bonded portion of stone facing. When thermal movement takes place cracking will occur at the pointing. Joints may also be made with a vertical joint between stone facings. This may be filled with either mortar or sealant.

STONE FACING FIXING

For direct to framing installations, application of the stone facings shall not take place until the moisture content of the timber framing is below 20%. Using Wairau Stone waterproof Bonding Mortar, apply selected stone facings appropriate to the area being stone clad. Mortar should be applied to the back of each piece of stone in sufficient quantity so that when the stone is worked into place, the mortar film is 2mm thick and covers at least 75% of the surface area of the stone. Care must be taken to ensure that each stone is set level and that the gaps between each stone are as regular as possible and do not exceed 15mm. The selection of stone must be made so as to ensure that the color tonings and the sizes used are harmonious and in good tradesman like manner. Set all stone facings 10mm away from all window and door openings except in-dances of recessed windows or doorways.

POINTING

Point between stones and also at window and door jambs using a mortar mix consisting of 3 parts of clean sand to one part of cement and waterproofing additive to the manufacturer's instructions. Recess pointing without exposing the edge of the stone. All pointing shall be firmly trowelled and smoothed – and excess or loose mortar shall be brushed from the surface.

DESIGN INFORMATION

Dead load weight of Wairau Stone wall facing system is inclusive of Hardiflex 40kgs M².

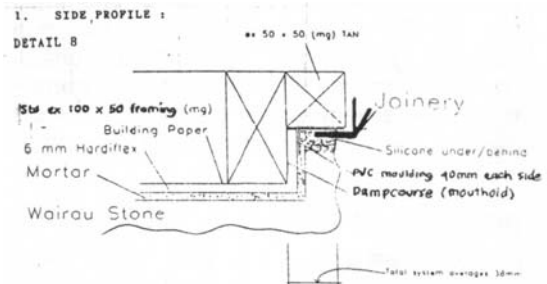
STABILITY

The following test has been carried out: Cast Stone Facing – Hardiflex, shear bond. Bond achieved is in excess of the

delimitation limit of Hardiflex. For bonded areas 60mm x 59mm. Loaded failure was between 8 and 11 kms. Cast Stone Facing – compressive strength. The minimum achieved was 25 MPa considerably harder ridges. Resistance to hard and soft body impact tests: these have been done and been approved by BRANZ for the purposes for which the product is being used. **Colorfastness:** BRANZ statement from No.67/1981. Little appreciable color change will occur due to fading. **Durability:** from the same source. The stone facings will resist deterioration by adverse weather conditions such as freeze / thaw cycling. Under the normal conditions of exposure the system can be expected to have a life similar to that of a supporting wall.

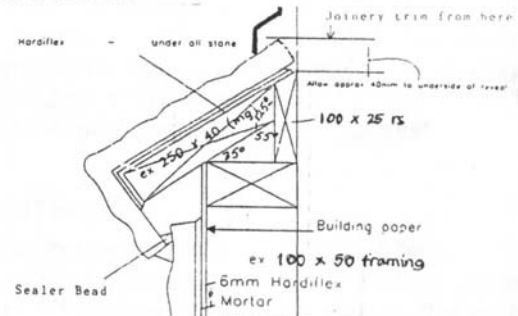
Maintenance and Repair: the system requires no special treatment.

Detail 8
SIDE PROFILE

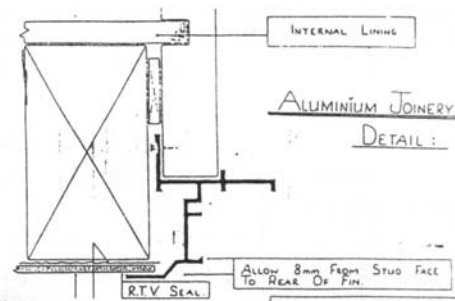


Detail 9

SIDE PROFILE



SILL PROFILE – USING WAIRAU STONE CORNERS



Detail 10
ALUMINIUM JOINERY DETAIL

STONE DOES NOT RETURN BEHIND WINDOW FIN