10.0 External & Internal Finishing & Surface Textures

10.1 External plaster and coatings

The smooth exterior surface of the panel (F5) is produced off a steel casting bed. This means that once installed the panels are ready be painted. In this instance the V-joints between the panels are "expressed" and become a feature. If a plaster finish is specified to hide the joints, they would be filled in and treated as "control joints" - to cope with any seismic movement - *(see detail R18)*. However, any paint or plaster system should be of the vapour-permeable variety. We recommend systems that have been BRANZ appraised and/or meet the NZBC requirements. There are numerous proprietary exterior plaster/paint/stain systems available. In all cases the manufacturers' application and maintenance instructions must be followed, with particular attention given to the following areas:

- Weathering, flashing and sealing systems at door and window openings, junctions with other materials and any other penetrations of the exterior envelope. The ground/foundation/floor/wall interface. Particular care needs to be given to ensure that minimum distances between ground and floor level, as stated in NZS 3604:2011, are met.
- External plaster systems are installed and cured within the temperature limitations, climatic and curing conditions set by the manufacturer. The finished external plaster system is sealed and protected from the weather with a vapour-permeable coating system.

10.2 "Clear" Concrete External Finish

Where a clear natural concrete look is specified for Litecrete panels we recommend the application of a matt finish clear sealer after installation; eg: Markham NZ's "Aquron 2000" or STO NZ's "StoPur", both of which comply with *CCANZ CP 01:2014 – Code of Practice for Weathertight Concrete and Concrete Masonry Construction, Section 4.4 Clear Coating System, when tested in accordance with AS/NZS 4456.16:2003.* The following aspects should also be considered:

10.2.1 The pumice aggregate contains minerals which can sometimes cause yellowing and result in heavier surface figuring than is the case with normal precast. On rare occasions mafic (iron-bearing) particles can also occur. This can present as small rust spots on the panel surface. It does not have any effect on the structural integrity of the panels and is not considered a defect. They can be flicked off with a sharp blade.

10.2.2 As with any type of concrete, the Litecrete mix can vary in colour from batch to batch. We recommend that designers and their clients visit the Wilco factory and view typical Litecrete panel surfaces prior to the start of manufacture.

Photo shows typical surface figuring on a Litecrete panel.

10.2.3 Any transit or site damage (chips) to panels can be repaired but the remedial material, being of a different composition, usually apparent, particularly if a clear sealer is being used.

There is the propensity for hairline cracking to occur from the corners of any openings in ALL precast concrete when the panels are stressed during craneage in the plant, transportation to or during installation on site. Even when temporary steel bracing is installed in panels with large openings prior to leaving the factory, surface cracks from corners of openings may occur despite all precautions being taken to prevent them. While these cracks do not affect the panel's structural integrity - typically not more than 1 mm deep - they are often a concern to the client and remedial work will in most cases be visible.

10.3 Exterior maintenance

External coating systems must be maintained in accordance with the respective manufacturer's instructions and all damage repaired promptly to ensure the ongoing weathertight properties of the coating system and thermal performance of the Litecrete wall. The following general maintenance procedures must also be implemented:

- Any dirt accumulation or organic growth that may occur should be regularly removed from the external surface by cleaning with warm water and detergent and a soft bristled broom.
- Solvent-based cleaners must not be used.
- The external cladding system should be checked yearly for damage to the system itself, deterioration of seals and possible water entry at junctions and joints.
- Any damage to the coatings which does occur must be repaired in accordance with the manufacturer's instructions. Where exterior plaster finish systems are used, it may be necessary to recoat the top paint coating, after 8-15 years, in accordance with the manufacturer's instructions, to restore the visual appearance.

10.4 Internal Surface finishing

Some designers specify Litecrete panels also for interior walls to achieve an "industrial" or "honest" ambiance. Be aware that the interior face of the panel has a rougher, trowelled finish (U3) as opposed to the exterior face, which is off a smooth steel

mould. Because Litecrete is manufactured from natural materials no one panel is exactly the same colour and variations must be accepted from one batch of concrete to another. Litecrete recommend that the trowelled exposed interior panel surface has a 1-2 mm thick cementitious skim coat (eg Mapei *Planitop* 200) as the base, which can then be finished with paint or plaster systems. If the panels are to be plastered, control joints should be installed over each vertical panel joint so that they can cope with any seismic or structural movements without fracturing the plaster *(see detail R18)*. We strongly recommend that designers and their clients visit the Wilco factory and view typical Litecrete panel surface finishes prior to the start of panel manufacture. If the Litecrete panels are to be left exposed on the internal face a clear matt finish sealer (Aquron 1000) should be applied to prevent dusting of the surface and prevent grime build-up, particularly around light switches, etc.

10.5 Weld Plates

Often weld plates will be specified by the engineer to connect panels at corners**,** or to attach suspended panels, such as garage door lintels, between walls. The plates are installed on the internal face of the panels and in most cases are hidden by insulation, ceilings, etc. However, sometimes for structural design or aesthetic reasons they will be visible. See detail *R20 Typical Cast-in Weld Plates.* Where the plates are to be exposed as a feature, they can be treated with a proprietary rust inhibitor such as Brunox, which turns the rust black, ready to be sprayed with a can of satin finish metal lacquer (EG: Rustoleum). The left-hand side of the photo shows where the application of Brunox has blackened the rust. This occurs in a variegated pattern, depending on the depth of the rust, providing what one architect described as “a very acceptable patina effect”.

10.6 Internal Linings

Kingspan Kooltherm K17 Insulated Plasterboard
The most cost-effective method of installing Kooltherm K17 to the internal face of Litecrete panels is construction-adhesive bonding method. Alternatively, the K17 can be mechanically fixed to the Litecrete. The tapered edge to the plasterboard enables a flat seamless surface equal to traditional plaster finishes after the correct jointing procedures as per the plasterboard manufacturer’s recommendations have been completed.

10.6.1. Kooltherm K17 Insulated Plasterboard can be applied utilising variety of traditional or modern dry-lining techniques. Ensure that the wall surface to be bonded to is free from oil, grease, paint, release agent, or any contaminate that may affect the bond of the adhesive to the wall.
10.6.2. Gun-apply a continuous line of construction adhesive around perimeter wall and ceiling junctions, and around any openings, such as windows and doors, in order to provide a seal.
10.6.3. Gun-apply dabs of construction adhesive to the wall or the back of the board approximately 25 mm in diameter (single squeeze), at 300 mm centres in both directions or to specific adhesive manufacturers’ instructions. Ensure that the dabs adjacent to a board joint are approximately 25 mm in from the edge to avoid bridging the joint.
10.6.4. Tap the board back firmly using a straightedge, ensuring that the vertical edge is plumb.
10.6.5. Continue dry lining in the same manner.
10.6.6. Appropriate mechanical fixings are recommended to complement the adhesive bond. Apply two per board after the adhesive has set, positioned 15 mm in from the board edge and at mid height with a nominal 25 mm embedment into the wall. (Refer to fixing manufacturers’ instructions for more information).
10.6.7. For boards 3 metres and longer, four fixings should be used.
10.6.8. It is recommended that mechanical fixings are positioned in the tapered edge of the boards so that they are covered when the board is finished, (e.g. joints taped and skim coating) at mid height. Boards should be fitted tight to the ceiling/joists. For the Kooltherm manufacturer’s installation instructions click on:

https://www.kingspan.com/nz/en/products/insulation/wall-insulation/kooltherm-k17-insulated-plasterboard/?s=d

Plasterboard.
Plasterboard can be either glue-fixed direct to internal Litecrete panels, or attached to timber battens fixed to the walls.

Adhesives
Adhesives used for the fixing of internal linings must be suitable for use on lightweight concrete surfaces. Approved products are: *Sikacil C*, Fullers *Maxbond*, Gib® *Allbond*, Holdfast *Gorilla Glue* and Selleys *Liquid Nails*.

Ceramic tiles
Litecrete provides an excellent surface for the direct fix of ceramic tiles for wet areas, etc.

10.7 Attaching Fittings/Cabinets to Walls

When attaching such items as mirrors, towel rails, picture supports, shelves or light fittings to any Litecrete wall, mechanical fasteners should be used. Do not use nails. We suggest fasteners such as Mungo brand (or similar) MN10 x 50 mm long metric screw, from Powers Fasteners Ltd. For mounting timber framing, or heavier objects such as kitchen cabinets, use Wurth timber anchor screw AW40 with 21 mm head, or similar, 90/100 mm long (www.wurth.co.nz). These fixings should be installed strictly in accordance with their respective manufacturers’ recommendations.

11.0 Surface Textures

11.1 Surface Textures

Surface textures can be incorporated into the panel during the manufacturing process which can add character to the external or internal panel surfaces.

11.2 Rebates

The simple vertical rebates shown in this photo at right, set at random distances apart, are very cost-effective and can help to break up the solid wall surface. In this case the rebates mimic the typical panel joint and give the appearance of one solid wall rather than three panels.

11.3 Band-sawn timber

Band-sawn timber textures are currently in vogue.
The photo below right shows a close-up of band-sawn timber finish. This was developed from 150 mm wide American Ash band-sawn timber planks from which urethane rubber moulds 8 metres x 4 metres were produced and are available in both a vertical and horizontal orientation. Note that surface
textures can be applied to one side of the panel only, not to both sides.

The photos below shows rough-sawn pine (below left) and American Ash band-sawn finish (below right)