



Finance Technical Guideline

TG012 Fibre Cement (FC) and Compressed Fibre Cement (CFC) Cladding

1.0 Purpose

This guideline sets out Finance's requirements for the use of Fibre cement (FC) and Compressed fibre cement (CFC) cladding on government building and aids agency representatives, consultants and project managers to appropriately select, specify and install the material to reduce maintenance and repair.

2.0 Background

Failure to correctly select or undertake proven procedures for selection, transport, storage, preparation and installation of fibre cement may result in defects, resulting in both aesthetic and structural failure.

Fibre cement cladding at several Government buildings has been reported with damage, cracking, efflorescence and failure of the cladding. Upon review, it was found that there were recurring issues including:

- Inappropriate selection of products relating to location, panel thickness, etc
- Incorrect documentation
- Incorrect installation
- Insufficient quality control

3.0 Product Selection

Fibre cement is a composite material made up of sand, cement and cellulose fibres and is available in two main options: compressed and non-compressed. Non compressed is an air cured product and Compressed fibre cement is manufactured under extreme pressures, resulting in a higher-density, heavier-duty product.

FC and CFC are useful materials for soffit linings, internal wall linings, external wall facings, substrate flooring and external decks. Performance will vary significantly depending upon a variety of circumstances including the support system, fixing method and the live loads (including wind) to which they are subject.

The FC and CFC products are produced by Australian and overseas manufacturers. The designer is to take care to ensure any product selected complies with Australian Standards and NCC requirements, and that all products, including any imported product, is free of asbestos.

Many products are sold by the manufacturer as pre-sealed or primed, ready to accept decorative, pre-finished and through-colour CFC panels.

Some of these products require the application of a decorative finish to meet the manufacturer's warranty requirements. This decorative finish could be applied during or after installation while others can use third party finishes. Applied finishes vary from painted surfaces to laminations of timber and metal or other materials. Depending upon the finish, they can add considerable resilience to the selected cladding and may be suitable for uses including curtain-wall infill panels, sunscreens, x-ray proof doors and bench tops. All decorative finishes, including anti-graffiti coatings should be selected and applied to the cladding in accordance with the manufacturer's best recommendations.

4.0 Requirements for Finance Projects

The following requirements are to be applied to all Finance projects.

4.1 Selection Considerations

The designer should ensure the selected product is appropriate to the project, observing the specific site conditions (e.g. wind pressure loads, proximity to salt, water, and sun exposure, bushfire attack levels, internal or external application etc), intended use on the building (e.g. wall cladding, soffit, balustrade etc), extent, quantity and cost of materials, intended operation and management of the proposed facility.

For initial installation and during the life span of the building the designer should consider product availability, the skills and equipment available for maintenance and repair. These are particularly important considerations for regional projects. For the initial construction readily available equipment and specialist installation contractors is important. When the building is operational, maintenance requirements and material availability is to be considered noting repairs often require only small quantities.

The designer should also check the availability of the specific thickness in WA and reliability of supply of the product. A number of products (typically 12mm and 15mm thick products) have been discontinued in WA in recent years.

Please note that following severe efflorescence on two projects constructed prior to 2018, no *Equitone Natura* panels manufactured prior to 2020 may be installed on WA State Government buildings. As of December 2022, Finance understands there is little such stock available in the State. Consultants and other inspectors should visibly check the manufacturing date on their products, the date code is found on the back of each panel.

4.2 Design Considerations

When designing, consider the location of the FC and CFC cladding to minimise repair. Generally, avoid positioning FC and CFC cladding at low levels in and on all buildings where likely to be subject to impact, whether deliberate or accidental.

For educational projects, avoid positioning FC and CFC cladding at “student-accessible” levels. This will normally translate to an avoidance of FC and CFC within 1.8m of a floor surface. In addition to these student accessible levels, avoid positioning FC and CFC cladding where likely to be subject to impact by sports balls.

Should the above not be possible and for demanding environments, other methods can be adopted to reduce incidents of repair, such as increasing panel thickness, added sub-framing (and not just additional fixings) or metal backing to enhance the manufacturer’s recommendations for normal installations.

Where the panel will be routed to incorporate a design or pattern, a thicker panel should be selected.

If located externally, the designer should consider protection of the cladded elevation. Review of FC and CFC clad buildings noted FC and CFC cladding on south and west elevations developing the most defects, except where the cladding is protected by effective overhangs.

Wherever the cladding is located, accessibility for maintenance and/or replacement of panels should also be considered, particularly in demanding environments. Panel replacement where obstructed by fencing or fixtures will be more costly and potentially disruptive than in locations with clear easy access.

4.3 Documentation

As a minimum, the tender and construction documents must follow the manufacturers’ recommendations *in all respects* for design and installation. Important aspects include:

- a. Site storage and handling requirements prior to installation.
- b. Clearances required for ventilation (for cavity air flow).
- c. Sealing requirements for cut panel edges.
- d. Spacing of subframe (Finance recommends that the Manufacturer and Structural Engineer review and comment).
- e. Fixing location/details to follow manufacturer’s instructions to prevent cracking including, but not limited to, from differential movement, expansion, incorrect fixings and over tightening. Some manufacturers have specific sequences for the installation of fixings, using particular tools and proprietary fixings.
- f. Panel size including incorporation of structural construction joints to allow for movement.

- g. Detailing for water and moisture exclusion, preventing water tracking back into the building (e.g. through drip grooves, flashings, separation of external/internal materials, selection of the right window heads and sills etc.).
- h. Panels to be installed plumb, true and square.

Finance strongly recommends that the drawings and specifications be reviewed and approved by the manufacturer prior to construction starting to ensure the documentation follows the manufacturer's best recommendations and their warranties are not voided.

4.3.1 Construction drawings

Care should be taken with detailing the selected cladding. Construction details must clearly show the installation requirements recommended by the manufacturer. This may include:

- The recommended cavity ventilation behind the cladding, if required by the selected FC and CFC system, is not compromised at the base of a wall (e.g. by anti-termite treatments, bushfire construction seals etc), nor at the top of a wall (e.g. by soffit lining, packers, cappings or the like).
- Offset of the cladding from adjacent paving surfaces.
- Panel sizes and construction joints to reflect structural framing and joints

Should the designer details vary from the manufacturer's details, it is strongly recommended that a project specific warranty is obtained from the manufacturer accepting the variation to their details.

4.3.2 Construction Specification

It is strongly recommended that the construction specification clearly articulates the following:

- a. Provision of shop drawings, complete with proposed cappings, flashings, fixing locations, adjacent framing, all edge conditions etc.
- b. Subcontractors shall be experienced with the proposed system and details and shall have been trained by the manufacturer. Subcontractors providing adjacent materials such as sub-framing, cappings, aluminium framing, waterproofing, termite barriers etc shall also be experienced with the proposed cladding system requirements.
- c. Hold points to inspect the sub-framing, proposed cappings and flashings, cladding etc. by the Superintendent's Representative and if available, by the Manufacturer.

- d. The installed system shall be warranted correctly to the Minister of Works and not have terms and conditions that cannot be complied with (e.g. having proof of purchase, requiring excessive and/or approved maintenance).
- e. Any product substitution requires review of all details and specifications such that Warrantees will be achieved.
- f. Inspections by the Manufacturer during construction to ensure everything is done to their requirements.
- g. Warranties to include the system as a whole, including fixings, cappings, applied finishes etc.

The designer is to consider specifying quality control measures in the construction documents and conduct all the specified reviews and inspections to check that installations of FC and CFC follow the documented requirements.

The specification should also include cleaning and maintenance requirements in the Handover Manual obligations, with the cleaning and repair recommendations to be provided to the building occupants as part of the handover process.

5.0 References

- AS/ NZS 2908.2-2000 Cellulose-cement products - Flat sheet
- CSR Cemintel White paper – Fibre Cement: The new choice for Contemporary Construction
- James Hardie Scyon Cladding Solutions - <https://www.jameshardie.com.au/scyon-cladding-solutions>
- Bulletin to Architects, dated 01 December 2022.

6.0 Document Control

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8.0 Document Approval

This guideline was endorsed and approved for use on 04/11/22 by:
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