WEATHERPROOFING CONCRETE BLOCK WALLS

A waterproof coating is essential to maintain the weathertightness of single skin concrete block walls since concrete masonry, and particularly the mortar joints, have little resistance to water penetration.

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Single-skin concrete masonry construction is not covered as an Acceptable Solution in the compliance document E2/AS1. However, NZS 4229:1999 *Concrete masonry buildings not requiring specific engineering design* requires that construction is in accordance with Building Code clause E2 *External moisture* to prevent damage to building components through the absorption or transmission of moisture through the walls.

Waterproofing options

NZS 4229 describes how masonry walls can be waterproofed using an alkali-resistant, water-based dispersion coating system between 180–250 microns thick applied in two or three coats. Typically, this means an acrylic paint finish to the exterior face of the wall to give compliance with clauses E2.3.2 and E2.3.3.

High-build acrylic or elastomeric coatings are similar to ordinary paint finishes but have the ability to bridge gaps and cracks in the surface and have more flexibility to resist movement. They have a greater finished film thickness, excellent adhesion and resistance to UV and weathering, but are less vapour-permeable than an ordinary acrylic house paint. They are typically applied to blockwork in three coats at 90 microns per dry coat.

There are clear weatherproofing options available, but these must be consented as an Alternative Solution. Always consult the manufacturer and confirm the ability of the coating to meet the performance requirements of the New Zealand Building Code, in particular for durability and weatherproofing.

Plastering systems

Concrete blockwork may be finished with a solid plaster finish or a proprietary plaster finish which will need to be consented as an Alternative Solution. Options include:

- an acrylic plaster
- a polymer-modified cement-based plaster
- a mineral plaster
- an insulating plaster system.

Solid plaster is typically applied in two or three coats with a finished thickness between 14–22 mm. Requirements for solid plastering are given in NZS 4251.

Proprietary plaster systems may range in thickness from 6–18 mm depending on whether they are light-weight, polymer-modified systems or insulating plaster systems containing polystyrene bead. They should be applied according to the manufacturer's specifications.

Plastering offers a wide selection of surface finishes ranging from very fine, almost smooth finishes to quite rough textured finishes. Whichever system is used, a waterproof coating such as an acrylic paint *must* be applied, as cement-based plaster systems are not waterproof in their own right (see Table 1).

EIFS (exterior insulation and finishing system)

An EIFS system offers another option for finishing concrete block walls. These systems consist of rigid polystyrene sheets fixed to the exterior face of the concrete blockwork by:

- trowelled-on plaster base coat
- proprietary adhesive
- polypropylene fasteners inserted into predrilled holes in the concrete masonry
- a combination of all three fixing types above. →

Table 1: Summary of requirements for concrete masonry plaster finishes.

System	Total thickness	No. of plaster coats	Substrate coating	Waterproof coating required
Solid plaster	14–22 mm	2 or 3	Cement slurry or scratch coat to masonry to even out porosity and provide a bonding layer	Yes
Proprietary plaster systems	6–18 mm	Varies according to system	Bond coat, e.g. cement slurry over masonry face to provide bonding layer	Yes
EIFS	40–60 mm (according to polystyrene sheet thickness)	Varies according to system	System plaster base coat or proprietary adhesive to fix polystyrene to the masonry or mechanical fixings	Yes

Proprietary uPVC trims are installed to openings and the bottom edge of the EIFS system should finish 50 mm below the lowest mortar course.

A proprietary, reinforced, modified-cement plaster coat, typically 4–7 mm thick, is applied to the polystyrene sheet. Plastering should be carried out within 3 weeks of the polystyrene installation and any surface contamination including oxidation that has occurred must be removed before applying the plaster. As with other plastering systems, the plaster coat must be finished with a waterproof coating such as acrylic paint.

An EIFS system provides thermal insulation to the concrete block construction, which also provides thermal mass for heat storage to the building interior.

Surface preparation

Before plastering, installing an EIFS system or simply painting concrete block walls, the masonry must have a moisture content of no more than 70% relative humidity and be clean and free of loose material, dirt and efflorescence.

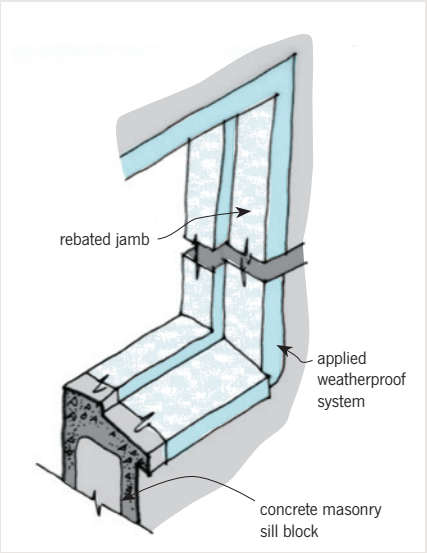

Figure 1: Weatherproofing membrane to opening.

Weatherproofing around openings

Preparation of all openings is needed in addition to applying the weatherproofing coating to the external face of concrete blockwork. Before windows and doors are installed, a weatherproofing system must be applied around all openings and critical junctions in the blockwork (see Figure 1).

Coatings may include:

- alkali-resistant, water-based dispersion coatings
- bitumen emulsions
- proprietary cementitious waterproof coatings.

Their compatibility with other coatings and finishes must be confirmed, as it is essential that subsequent coatings will adhere to the prepared opening – this applies in particular with the bitumen-based waterproofing systems. Cementitious weatherproof coatings must have their performance verified before use.

Application is typically by brush, roller or spraying in three coats to provide a thickness between 180–250 microns. Before applying the waterproof membrane, the concrete must again be free of dirt and other contaminants, and the moisture content should be below 70% relative humidity.