

SINGLE SKIN MASONRY

Weatherproofing and Thermal Compliance Pathways

Merricks House by Aktis Architects
Photography by Timothy Kaye

WEATHERPROOFING

According to the National Construction Code (NCC), structures require external walls that prevent the penetration of water that could cause unhealthy or dangerous conditions and undue dampness or deterioration of building elements. For single skin masonry walls, weatherproofing can be met through one of three **deemed-to-satisfy (DTS)** pathways:

Commercial Buildings
NCC Volume One



(1)

AS 3700

(2)

AS 4773 Series

(3)

ABC Housing Provisions

Residential Houses
NCC Volume Two



Only AS 3700 Can Be Used as DTS Pathway

These three DTS pathways specify the surface treatments to be used to provide weatherproofing to an external single skin masonry wall:

(a) **Acrylic Paint**
3 coats of acrylic-based exterior paint



(b) **Cement Paint**
1 coat of cement paint, followed by 2 coats of acrylic paint.



(c) **Render**
Render coating (only in AS 3700 and AS 4773 series).



(d) **Clear Coating**
Clear water repellent coatings, provided there is an overhang of ≥ 1.5 m.



IF ONE OF THE FOUR OPTIONS CANNOT BE MET, A PERFORMANCE SOLUTION WILL BE REQUIRED FOR WEATHERPROOFING.

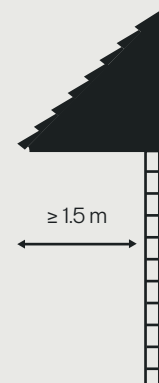
Note: The weatherproofing requirement does not need to be met for:

- A Class 7 or 8 building
- A garage, tool shed, sanitary compartment, etc.
- An open spectator stand or open deck carpark



Photography by Jack Lovel

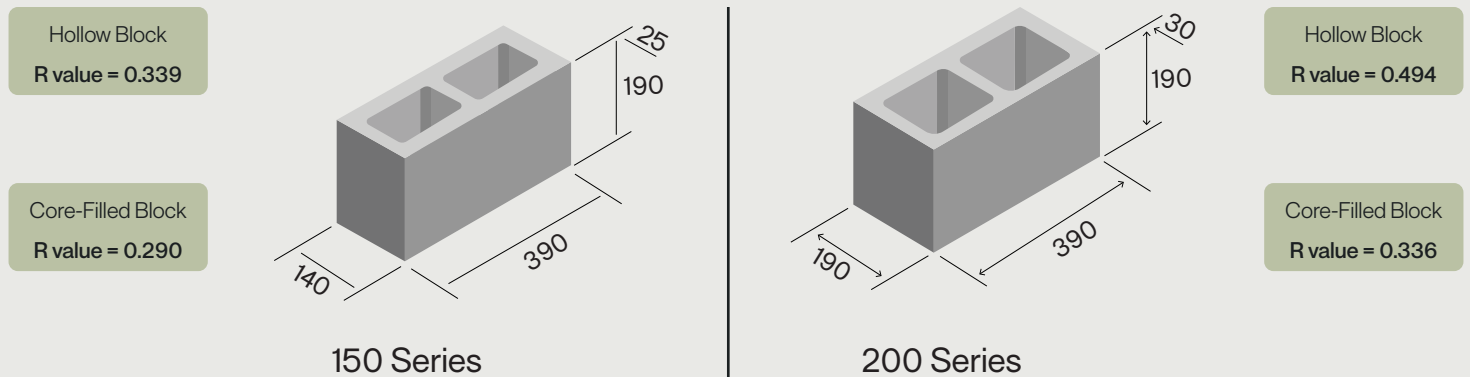
Note: If there is not sufficient overhang and a clear coat finish is desired, a performance solution will be required in consultation with a weatherproofing professional.



THERMAL COMPLIANCE

In addition to complying with weatherproofing requirements, walls forming part of the building envelope must also meet minimum thermal requirements for energy efficiency. As single skin masonry walls do not have a high R-value, it is important to determine where they are suitable from an energy efficiency standpoint.

As a reference, generic R-values for single skin walls are provided below:



RESIDENTIAL ENERGY EFFICIENCY

Under the NCC Volume Two, there are two main DTS pathways for residential energy efficiency:

- 1) Using a NatHERS house rating software (**recommended for single skin masonry walls**)
- 2) Using the ABCB Housing Provisions Standard Elemental Design Provisions

If using a software, single skin masonry walls may be permissible, as designers can offset the lower R value of these walls with optimised orientation and glazing, ceiling insulation, etc. In cooler climates, achieving the required thermal performance for a 7-star rating will pose challenges with the widespread use of single skin masonry walls.

If using the Elemental Provisions, designers must use Tables 13.2.5a through to 13.2.5o as appropriate to determine the minimum insulation for external walls. **However, for single skin concrete masonry walls, DTS tables are only available for Climate Zones 1 and 3.** Additionally, if internal linings are fixed to a metal frame on a single skin masonry wall, thermal bridging must be accounted for. It is therefore difficult to specify single skin concrete masonry walls using the Elemental Provisions.

COMMERCIAL ENERGY EFFICIENCY

Under the NCC Volume One, there are four main verification pathways for commercial energy efficiency:

- 1) Obtain a minimum NABERS Energy Rating based on building class
- 2) Verification Using a Reference Building (VURB)
- 3) Obtain a Green Star Building rating
- 4) Using the DTS pathways in Part J4

For the last two, Part J4 of NCC Volume One must be met. Within Part J4, walls must achieve a minimum R value of 1.0, meaning that single skin masonry walls will not comply unless an internal lining is fitted. **It is therefore recommended that designers use either the NABERS or the VURB verification pathway** for commercial energy efficiency to achieve compliance.

IF ONE OF THE FOUR OPTIONS CANNOT BE MET, A PERFORMANCE SOLUTION WILL BE REQUIRED ENERGY EFFICIENCY.

