7 Star Homes Program Technical Criteria (Stream A)

This 7 Star Homes Program (Program) Technical Criteria (Criteria) sets out the technical requirements for homes designed and constructed under Stream A of the Program.

Please note: Changes to the National Construction Code (NCC) are yet to be determined. The Criteria contained in this document should not be interpreted as confirmation or an indication of any of the changes under consideration. For more details on the proposed changes and the public comment process, visit the Australian Building Codes Board website.

# Scope

This Criteria provides participants in the Program with the technical requirements to be eligible to claim the $4,000 rebate per home.

It sets out the minimum criteria that a home needs to meet. Additionally, it also outlines a flexible approach to building design, construction techniques, selection of building products, mechanical equipment, lighting, appliances and on-site energy generation.

To be eligible to claim the rebate, participants must register to participate and comply with the Program Guidelines and the Terms and Conditions of Participation.

In summary, each home must:

* achieve a minimum 7-star NatHERS rating using FirstRate5
* comply with a whole-of-home assessment (requirements outlined below)
* pass the ABV assessment.

The requirements outlined in this Criteria are not a substitute for regulatory requirements and provide an additional set of measures that are intentionally more stringent. Where an overlap exists, the more stringent requirement applies. Where a requirement of this Criteria contravenes a regulatory requirement, the regulatory requirement should take precedence.

The Criteria’s technical requirements are in addition to, and not intended to detract from, existing building regulations, standards, and laws including:

* the NCC
* Australian Standards
* federal laws
* state laws
* local laws and planning scheme requirements.

## Geographic scope

This Criteria is applicable to all climate zones in Victoria.

## Building scope

### In scope

This Criteria covers design to as-built phases of new class 1a dwellings only including:

* detached houses
* one of a group of two or more attached dwellings, each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit.

### Out of scope

The following are out of scope of this Criteria:

* other residential building classes such as 1b, 2, 3, 4 or 10a[[1]](#footnote-2)
* energy use related to electric vehicles charging at the home
* embodied energy and emissions of building materials that are not included in the WoH assessment.

This Criteria covers building fabric efficiency (NatHERS, airtightness and insulation integrity) and WoH assessment. Other environmental themes such as water efficiency, use of sustainable materials and sustainable transport initiatives do not form part of the Criteria.

Please note: Participation in this Program and compliance with the Criteria does not result in any form of certification or endorsement by SV and SV does not endorse any business or product under this Program.

# Design requirements

7-star homes will have improved thermal performance levels, air-tightness and insulation integrity to ensure they are naturally more comfortable in winter and summer. Additionally, these homes will have energy-efficient fixed appliances and may include a renewable energy generation system to reduce emissions and operational costs.

## Thermal envelope requirements

### Design

* 7-star NatHERS energy rating - this rating must be conducted by a NatHERS accredited assessor in accordance with the current NatHERS Technical Note[[2]](#footnote-3) and the current Victorian Building Authority practice note (PN55-2018).[[3]](#footnote-4)
* The NatHERS energy rating must be generated using FirstRate5 to work with the WoH tool.
* Meet or surpass NCC heating and cooling load caps.
* Include R2 or equivalent in internal walls for wet areas.
* Rangehood and exhaust fans from wet areas ventilated directly to outside and must have dampers.
* Carbon monoxide sensors to the kitchen if they have gas cooktops.

### Construction

* Air leakage is not more than 10 ACH at 50 Pa reference pressure when tested in accordance with AS/NZS ISO 9972, Method 1 (SV provides one free ABV assessment per home).
* Insulation consistency achieving a 95% coverage (walls, floors and ceilings).
* All external wall junctions insulated.

To meet the Criteria, the ABV assessment will include inspection of:

* ceilings (excluding ceilings between different stories within the same dwelling)
* walls (door and window areas are excluded from the total wall area calculation and internal walls are not assessed). Note that all major external wall junctions must have no thermal bridges. It is recommended that insulation is installed in all junctions when wraps are installed.

Exclusions: Floors and all areas that are required to be un-insulated under regulations (e.g. ductwork penetrations) or have a specific regulatory requirement that differs from the requirements of this Criteria can be excluded from the assessment.

## Whole-of-home assessment requirements

The WoH assessment must be completed by a person who has completed the WoH training.

The assessment must meet the specified performance criteria for appliances as set out below or an equivalent annual energy use budget for the home.

### Lighting

* 100% LED must be IC4 rated
* lighting power density limits must meet or surpass NCC, namely:
	+ general internal lighting – 4 Watts/m2;
	+ outside lighting – 4 Watts/m2
	+ garage lighting – 3 Watts/m2.

### Hot water system

Hot water systems for the homes must meet criteria that has a minimum energy-efficiency performance similar to the following hot water systems:

* gas-boosted solar hot water system (minimum 60% energy savings in zone 4)[[4]](#footnote-5)
* electric-boosted solar hot water system (minimum 60% energy savings in zone 4)[[5]](#footnote-6) or
* heat pump hot water system (minimum 60% energy savings in zone 4).[[6]](#footnote-7)

Electrical storage hot water systems, instantaneous gas and gas storage systems are excluded from this Program.

### Heating and cooling

The overall energy performance of the home will be dependent on a combination of the thermal envelope of the home and its heating and cooling systems. For the purpose of this Program, the heating and cooling will need to meet a similar annual energy use budget to a 7-star NatHERS rating paired with the requirements set out in the table below.

**Note:** The energy rating scheme for air conditioners changed in April 2020. Prior to this air conditioners were rated under the 2013 GEMS Determination. Ducted systems were not required to carry Energy Rating Labels, but most room air conditioners (e.g. split systems) were required to carry the familiar Energy Rating Label with a star rating band at the top. From April 2020, all newly registered air conditioners must have a zoned energy rating (ZER), which provides a separate rating in cold, average and hot climate zones. Most of Victoria is in the cold climate zone, but the north-west corner is in the average climate zone. Room air conditioners are required to have the new format (rectangular) zoned energy rating label (ZERL).

| **Heating/cooling type** | **Performance** | **2019 GEMS performance rating** |
| --- | --- | --- |
| Ducted AC (20kW or less) | Minimum ACOP 3.4, minimum AEER 3.4 | 2 Stars in cold zone for heating (HSPF = 3.5)3 Stars in cold zone for cooling (TCSPF = 4.5) |
| Ducted AC (greater than 20kW)  | Minimum ACOP 3.4, minimum AEER 3.3 | 2 Stars in cold zone for heating (HSPF = 3.5)2 Stars in cold zone for cooling (TCSPF = 3.5) |
| Room AC (3kW or less)  | 4.5 Stars heating (ACOP = 4.5)4.5 Stars cooling (AEER = 4.5) | 3 Stars in cold zone for heating (HSPF = 4.5)4.5 Stars in cold zone for cooling (TCSPF = 6.0) |
| Room AC (3-6kW)  | 4.0 Stars heating (ACOP = 4.25)3.5 Stars cooling (AEER = 4.00) | 2.5 Stars in cold zone for heating (HSPF = 4.0)4.0 Stars in cold zone for cooling (TCSPF = 5.5) |
| Room AC (7-10kW)  | 3.0 Stars heating (ACOP = 3.75)2.5 Stars cooling (AEER = 3.5 | 2.0 Stars in cold zone for heating (HSPF = 3.5)3.5 Stars in cold zone for cooling (TCSPF = 5.0) |
| Room AC (10kW or more) | 2.5 Stars heating (ACOP = 3.5)2.0 Stars cooling (AEER = 3.25) | 2.0 Stars in cold zone for heating (HSPF = 3.5)3.5 Stars in cold zone for cooling (TCSPF = 5.0) |
| Gas-ducted heating systems  | Meet or surpass a minimum 5-star energy rating | TBA |
| Gas room heater – balanced flue gas heater | Minimum 4-star energy rating  | TBA |

*Note: Open flue gas heaters are not permitted.*

### Ventilation

The combined benefits of an airtight and well-insulated home need to be coupled with a good ventilation strategy. The following design recommendations will enable homes to operate efficiently while moving water vapour (moisture), smoke and odours to the external environment. The ventilation requirements are as follows:

Bathroom and toilet ventilation should:

* incorporate a self-closing damper which prevents air leakage through the ventilation fan when it is not operating
* be vented directly to outside (not the roof cavity), and
* have a sufficient air path (door grill, vented door frame) connected to the rest of the house to enable air to be drawn into the room and the fan to work optimally.

Kitchen ventilation should:

* incorporate a self-closing damper which prevents air leakage through the ventilation fan when it is not operating
* be vented directly to outside (not the roof cavity), and
* where a gas cooktop or oven is installed, a carbon monoxide sensor must be installed in the kitchen.

# ABV assessment

Participants will receive one free on-site ABV assessment. This assessment is preceded by on-site ABV training (as outlined in the Program Guidelines).

The purpose of the ABV assessment is to ensure each home is built to achieve the same efficiency rating it has been designed to meet.

SV will provide one free ABV assessment per home (up to four homes). If a home fails the ABV assessment, the participant will (at SV’s discretion) be responsible for the cost of any subsequent assessments. Please note, the ABV assessment training is only required to be completed once, and not per home built.

The ABV will be conducted by an independent evaluator once the home is completed. The evaluator visits the home to check the home’s air tightness, appliances, and insulation. The ABV assessment consists of three types of tests:

* a blower door test, to simulate wind blowing against the building’s exterior to identify air leakages in the building’s envelope
* thermal imaging - this is completed in conjunction with blower door testing to locate missing or poorly installed insulation that may result in the movement of heat/cool into and out of the building
* a visual inspection of windows, ceiling insulation and appliances to ensure these align with the design.

Once the home has passed the ABV assessment, you will receive an ABV report. The report must be provided to SV.

# Further information

For further information about the Program:

* See the Program Guidelines
* Book a 1:1 meeting with a member of the 7 Star Homes team.
* Contact us at homes@sustainability.vic.gov.au or call 1300 363 744 and ask to speak to the 7 Star Homes team.
1. Class 1b refers to buildings for short-term accommodation (eg boarding houses, guest house or hostel); class 2 buildings are apartment buildings; class 3 are residential buildings other than class 1 or 2 (typically long-term accommodation); class 4 refers to a dwelling within a non-residential building; class 10a are non-inhabitable buildings such as sheds, garages or carports. See https://www.abcb.gov.au/Resources/Publications/Education-Training/Building-classifications [↑](#footnote-ref-2)
2. **S**ee http://www.nathers.gov.au/publications/nathers-technical-note [↑](#footnote-ref-3)
3. See (http://www.vba.vic.gov.au/\_\_data/assets/pdf\_file/0003/20397/PN-55-2018-Residential-Sustainability-Measures.pdf [↑](#footnote-ref-4)
4. See https://www.energy.vic.gov.au/\_\_data/assets/word\_doc/0026/421964/Victorian-Energy-Upgrades-Specifications-Version-2.0.docx [↑](#footnote-ref-5)
5. See https://www.energy.vic.gov.au/\_\_data/assets/word\_doc/0026/421964/Victorian-Energy-Upgrades-Specifications-Version-2.0.docx [↑](#footnote-ref-6)
6. See https://www.energy.vic.gov.au/\_\_data/assets/word\_doc/0026/421964/Victorian-Energy-Upgrades-Specifications-Version-2.0.docx [↑](#footnote-ref-7)