

TECHNICAL:

Building Code of Australia Applying energy efficiency measures to Class 1 building alterations and additions

The purpose of this Advisory Notice is to provide guidance on the application of the Building Code of Australia (BCA) energy efficiency provisions for alterations and additions to Class 1 buildings.

BACKGROUND

The Building Code of Australia (BCA) provisions for 4-star energy efficient houses were implemented from 1 January 2003. On 1 May 2006, these provisions were increased to require a minimum 5-star level of energy efficiency for all new houses and on 1 September 2010 they were further increased to a minimum 6-star level.

The deemed-to-satisfy provisions in the BCA are applicable to new houses as well as alterations and additions to existing houses. To assist designers and private certifiers this Advisory Notice provides guidance on the application of the provisions to existing buildings.

ALTERATIONS TO EXISTING HOUSES

Where it is reasonable to increase the energy efficiency of the house, then the deemed-to-satisfy provisions should be applied to both the alterations and the existing house. For example, alterations to roof cladding or ceilings are an opportunity to introduce the required roof and/or ceiling insulation. However, if the roof cladding or ceiling lining is only being repaired and repainted to match the new work, then it would be unreasonable to require this to be removed, solely to install new insulation.

ADDITIONS/EXTENSIONS TO EXISTING HOUSES THAT INCREASE THE FLOOR AREA

Additions of one or more habitable rooms must comply with the deemed-to-satisfy provisions required for the building fabric (walls, floors, roofs and windows). Although non-habitable rooms do not need to comply, consideration should be given to maintaining continuity of the insulating barriers to habitable rooms (walls, floors, roofs).

Where a habitable room is increased in size the extended portion must comply with the deemed-to-satisfy provisions (walls, floors, roofs and windows) and it is reasonable to expect that the roof insulation will be carried back into the house at least sufficient to completely cover the room being extended.

The energy efficiency of the roof/ceiling, walls, floor and glazing of the addition should be not less than the energy efficiency of the building before the addition.

ASSESSING THE ENERGY EFFICIENCY OF ADDITIONS/EXTENSIONS TO EXISTING HOUSES

There are various methods of making an addition/extension comply with the energy efficiency provisions of the BCA:

1. Rate the extension itself; if this cannot comply then -
2. Rate the extension plus the existing house; if it still does not comply then -
3. Rate the whole house and include whatever is reasonably necessary to make it comply (such as applying the new glazing to the whole house) but then only require the extension to be constructed accordingly.

The last approach essentially designs the whole house for a 6-star rating and then amputates the extension that is to be constructed. This recognizes that the rest of the house already exists (but could be upgraded at sometime in the future).

PRIORITIES FOR ENERGY EFFICIENCY

In deciding how far to carry the application of energy efficiency provisions into existing houses it is important to understand the relative contributions that each element (roof, walls, floors, glazing etc) makes to the achievement of good thermal performance.

Roofs

Providing an effective barrier in the roof to contain heat in winter and minimise heat gain in summer is the single most important means of moderating comfort conditions in a house. Fortunately most roof spaces are readily accessible making the installation of adequate insulation in the roof relatively easy.

Walls

The effectiveness of walls is not as critical as the roof and the nature of their construction makes it impractical to alter their insulation value to any great extent unless external or internal linings are being removed. Alternative measures, such as increased shading through landscaping, can be of assistance but are difficult to insist on as a mandatory requirement.

Glazing

Potentially, the weakest element in the effectiveness of walls is the extent of glazing. It is suggested that alterations and additions should generally seek to maximise the extent of north facing glazing (with appropriate shading) and minimise the extent of glazing on other orientations. Options for improving the performance of east, west and south facing windows can include reglazing with higher performing glass or applying a reflective film.

Floors

In terms of forming a fully insulated container to maintain comfort conditions inside a house, the floor is the least effective element. However, suspended timber floors have some capacity to be insulated and to achieve a 6-star level of energy efficiency this needs to be addressed.

Sealing

Many of the sealing provisions can be easily retro-fitted and will significantly assist in controlling draughts.

Air movement

Where ventilation openings are inadequate, the installation of a ceiling fan may be the best option.

TO THE DEGREE NECESSARY

In determining the level of compliance required for alterations and additions, a council or private certifier will need to assess against each of the above criteria to ascertain the appropriate level of compliance. A table is attached to provide some further guidance on appropriate levels of compliance for different development proposals. In some cases it may be more appropriate to consider compliance 'to the degree necessary' under *Performance Requirements 2.6.1* and *2.6.2*. The Building Rules Assessment Commission (BRAC) can provide an opinion on a proposed solution and whether it meets the performance requirements.

Energy Efficiency – Class 1 alterations and additions

Description of building work to existing building		Roof/ Ceiling	Walls	Floor	Glazing limits	Shading	Roof lights	Sealing	Air movement
Addition of one or more habitable rooms.									
Max width of opening in wall separating new and existing building less than 1.8m	New work	✓	✓	✓	✓	✓	✓	✓	✓
	Existing building	x	x	x	x	x	x	x	x
Max width of opening in wall separating new and existing building greater than 1.8m	New Work	✓	✓	✓	✓	✓	✓	✓	✓
	Existing work exposed by new opening	✓	x	x	x	x	x	x	x
Addition of non-habitable rooms									
Attached to existing building (no new adjoining habitable rooms)	New work	x	x	x	x	x	x	x	x
Incorporated with additional habitable rooms in new work	New work	✓	✓	✓	✓	✓	✓	✓	✓
Addition of attached Class 10 buildings									
Share a common roof space with Class 1 part	New work	✓	x	x	x	x	x	x	x
	Existing building	✓	x	x	x	x	x	x	x
Roof space separated from the Class 1 building by wall or roof separation	New work	x	✓ ¹	x	x	x	x	x	x
	Existing building	x	x	x	x	x	x	x	x
Addition of Class 10 building separate from existing building									
	New work	x	x	x	x	x	x	x	x
Relocation of existing transportable buildings – Refer Note 2									
Pitched roof	Existing building	✓	x	x	x	x	x	x	x
Flat Roof	Existing building	x	x	x	x	x	x	x	x
Alterations to existing Class 1 buildings									
Minor alterations to the external fabric	New work	Refer Note 3							
Major alterations to the external fabric	New work	Refer Note 3							
Internal alterations classed as building work	Alteration to habitable room	x	x	x	x	x	x	x	x
	Alteration to non-habitable room	x	x	x	x	x	x	x	x
Glazed conservatories/sunrooms attached to or within an existing Class 1 building – Refer Note 4									
Existing walls separate the conservatory/sunroom from the Class 1 building	New work	x	x	x	x	x	x	x	x

- Note 1 The energy efficiency requirements for walls are to apply to the roof separating construction.
- 2 Transportable buildings:
If the transportable building has an accessible roof space, such as a pitched roof, then it would be reasonable to require roof insulation to be installed as it will provide the greatest benefit to the thermal performance of the building fabric. It is suggested that external walls also be insulated if they are to be re-clad either internally or externally.
- 3 The energy efficiency of the existing roof and ceiling construction, walls, floors and glazing should be not less than the energy efficiency before the alteration/s.
- 4 Conservatories/sunrooms:
The special nature of conservatories/sunrooms means that compliance with the energy efficiency provisions is not required provided the thermal performance of the existing house is not compromised by the addition of the conservatory/sunroom. To achieve this, the conservatory/sunroom should be capable of being thermally separated from the main living areas of the house. The former external doors and windows are considered to be a sufficient thermal barrier if they are retained and are capable of being closed to separate the conservatory/sunroom from the existing house.



Government
of South Australia

Further information

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