



# **Building Commission**

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## **Meeting the new energy efficiency requirements for residential buildings in the BCA 2012**

### **Alternative Solutions**

#### **Meeting the energy efficiency requirements of the BCA 2012**

There are various routes to compliance with the energy efficiency requirements in the BCA 2012 that come under two broad headings – Deemed-to-satisfy provisions and alternative solutions.

#### **Deemed-to-satisfy (for Class 1 buildings)**

Deemed-to-satisfy provisions (officially known as acceptable construction practice in the BCA), cover two compliance pathways:

1. Elemental provisions (known previously as deemed-to-satisfy or DTS); or
2. HERS and elemental provisions (a mixture of a rating, using NatHERS accredited software, and compliance with other relevant elemental provisions in the BCA)

#### **Deemed-to-satisfy (for Class 2 and Class 4 parts of buildings)**

There is only one compliance pathway for Class 2 and Class 4 parts of buildings that is a combination of HERS and elemental provisions.

#### **Alternative solutions**

Sometimes the deemed-to-satisfy provisions may be considered too rigid or do not work for certain building designs. In these cases the BCA allows compliance with an alternative solution. These compliance pathways give flexibility in compliance, enabling the use of innovative building solutions and materials. An alternative solution must be shown to meet the performance standards in the BCA by:

1. Verification method using a reference building (Part V2.6.2.2 in the BCA); and/or
2. Comparison with the deemed-to-satisfy provisions; and/or
3. Evidence of suitability; and/or
4. Expert Judgement.

This Advisory Note deals with the alternative solution compliance pathways. For information on the deemed-to-satisfy provisions, see advisory note AN022.

#### **When can a building be labelled ‘6 Stars’?**

Only buildings that achieve a 6 Star rating using NatHERS accredited software can claim to be ‘6 Star’. If a building has achieved compliance using any other method (e.g. elemental provisions, verification methods or other alternative solutions), then it cannot claim that it is a ‘6 Star’ building. It can, however, state that it meets the energy efficiency requirements of the BCA.

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## **Alternative solutions and assessment methods**

When an alternative solution is used, it must be proven that it meets the applicable performance requirements. In order to do this, the alternative solution must be assessed by using one of the specified assessment methods that are outlined in this advisory note (and listed in the BCA, Clause 1.0.9), or a combination of them.

## **Certifying alternative solutions**

The registered building surveying practitioner, engaged for the project, is responsible for assessing whether a proposed building solution meets the relevant performance requirement in the BCA. It is up to the registered building surveyor to decide the extent of documentation that is required to ensure they are satisfied and so can confidently sign a certificate of design compliance. The building surveyor must ensure that this documentation is attached to their certificate of design compliance.

## **Assessment methods**

### **Verification Methods**

A verification method means a test, inspection, calculation or other method that determines whether a building solution complies with the relevant performance requirement(s).

### **Verification method using a reference building**

The BCA 2012 provides a verification method for meeting the performance requirements based on a calculation methodology adopted in the BCA verification method V2.6.2.2 (verification using a reference building) for energy efficiency. The use of this verification method applies to Class 1 buildings and an enclosed Class 10a building, attached to a Class 1 building.

The reference building verification method requires the user to calculate an annual energy load benchmark by modelling a reference building which complies with the elemental provisions using the criteria in Clause V2.6.2.2. This sets the theoretical annual energy loads that would have been generated by that building had it been built to comply with the deemed-to-satisfy (elemental) provisions. This sets a quantifiable benchmark when modelling the alternative solution. The proposed building must achieve annual heating and/or cooling loads not more than the annual loads of the reference building (i.e. of equal or better performance). The benchmark may be an annual energy load for cooling only in climate zones 1 and 2 or separate targets for heating and cooling in all other Western Australian BCA climate zones.

This method requires two modelling runs; the first to set the benchmark target and the second to demonstrate that the alternative solution achieves, or better, the benchmark target. When using the verification method, please note that clause V2.6.2.2(e) requires the reference building to be modelled using the deemed-to-satisfy (elemental) provisions as set out in 3.12.0(a)(ii). This means that the reference building must comply with **all** requirements listed in Part 3.12.1 - Building Fabric, Part 3.12.2 - External Glazing and Shading, Part 3.12.3 - Building Sealing, Part 3.12.4 - Air Movement.

In using this verification method, sufficient documentation must be provided to the building surveyor to ensure that they are satisfied the building meets the performance requirements. It is up to the building surveyor to decide what they require to be satisfied that the calculation method used is capable of complying with the requirements of V2.6.2.2(c) However the documentation could include the following:

1. Documentation to show how the reference building meets the deemed-to-satisfy (elemental) provisions of the BCA;
2. Sufficient information to determine that the same calculation method has been used for both calculation runs. For example, the same version of the same NatHERS software tool (Accurate, BersPro, FirstRate5) has been used for each run;
3. Sufficient information to determine that the heating and cooling loads for the proposed building and reference building use the same parameters, as set out in V2.6.2.2(b), e.g. orientation, floor plan etc.;
4. Sufficient evidence to demonstrate that the heating and cooling loads of the proposed building will be equal to or less than the reference building.

### **Comparison with the deemed-to-satisfy provisions**

This method can be used for particular elements within a building, or a range of elements, as opposed to the whole building, as is the case for the reference building method.

It involves a comparative analysis, which would demonstrate that an alternative solution is better than, or at least equivalent to, the deemed-to-satisfy provisions. A defined benchmark needs to be provided to the building surveyor to show the alternative solution meets the same level, or performance, of the deemed-to-satisfy provisions. This is done by subjecting both the deemed-to-satisfy solution and the alternative solution to the same level of analysis using the same methodology. This will clearly determine whether the alternative solution meets the deemed-to-satisfy provision(s).

### **Evidence of suitability**

This can be used to support a material, form of construction or design that satisfies either a performance requirement or a deemed-to-satisfy provision. Clause 1.2.2 of the BCA provides further information on this.

## **Expert judgement**

This assessment method can be used when the proposed alternative solution cannot be quantifiably benchmarked. Expert judgement allows for a subjective viewpoint of a qualified professional. The opinion should be based on certain literature, precedents or even general knowledge of the particular issue or building solution. The person making this judgement must be considered an expert.

### **Who is considered an expert?**

An expert is defined within the BCA as *'[a person] who has the qualifications and experience to determine whether a building solution complies with the performance requirements'*. A registered building surveying practitioner, or permit authority, may ask the following questions to help decide if the person can be considered an expert.

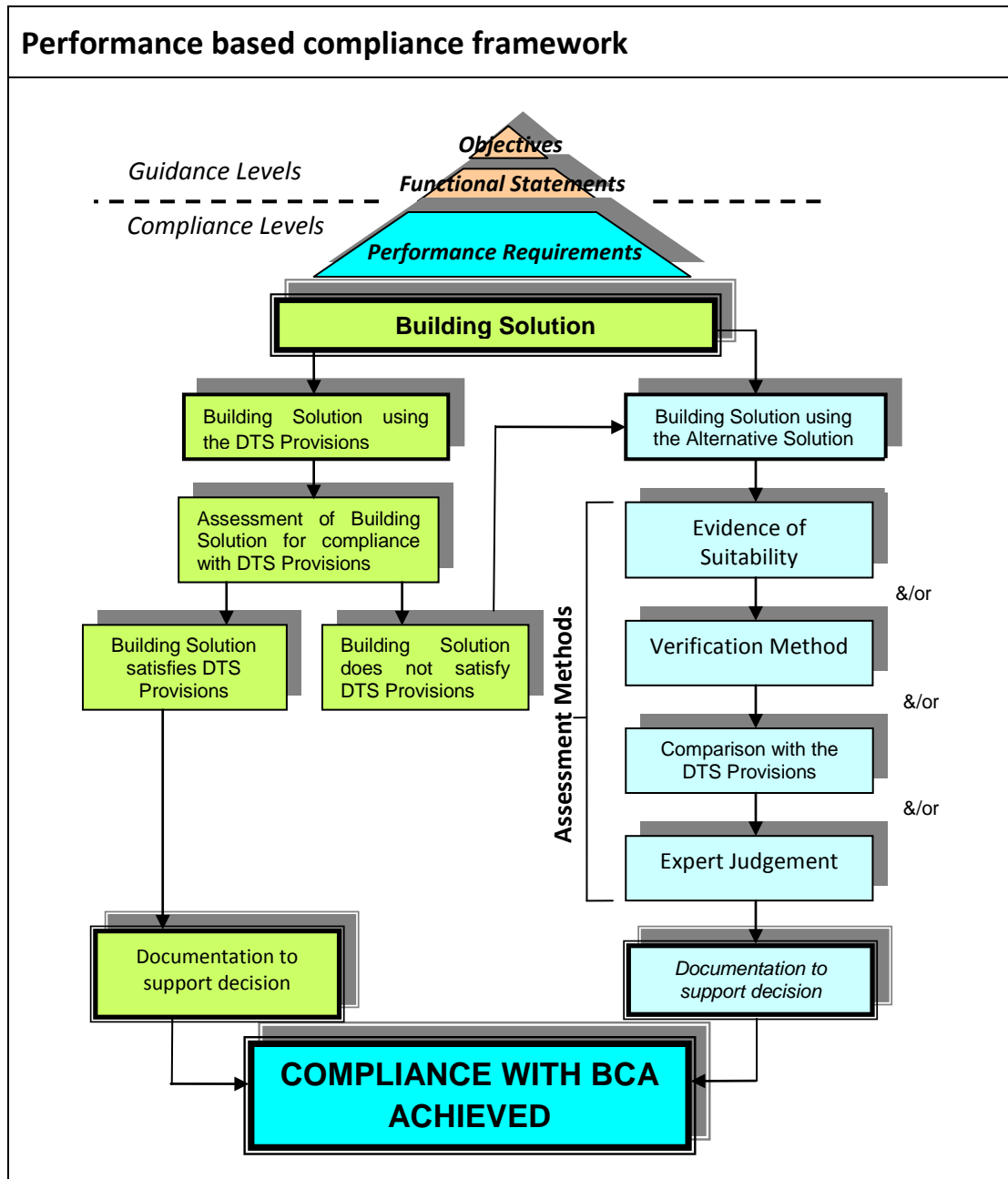
- Is the person providing the expert judgement eligible to be a member of the relevant organisation or association?
- Are the qualifications and experience of the person still current and relevant?
- Does the person have the appropriate experience?
- Does the person have the appropriate level and type of professional indemnity insurance?

## **Further information**

For further information on the various compliance pathways for energy efficiency in the BCA, please see the ABCB Information Handbook, Energy Efficiency Provisions for BCA 2010, Volume Two.

<http://www.abcb.gov.au/en/education-events-resources/publications/abcb-handbooks>

## Diagram of the compliance pathways for energy efficiency in the BCA



Reproduced from the Information Handbook, Energy Efficiency Provisions for BCA 2010, Volume Two with permission from the Australian Building Codes Board [www.abcb.gov.au](http://www.abcb.gov.au)

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*NOTE: Reference to the BCA in this Advisory Note means Volume One and Two of the National Construction Code series.*