



## **BUILDING NOTE**

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### **ALTERNATIVE SOLUTIONS FOR THE PROPOSED ENERGY EFFICIENCY MEASURES**

The Energy Efficiency Measures (EEM) of the Building Code of Australia (BCA) became mandatory in Western Australia on 1 July 2003.

The Performance Requirement P2.6.1 of the BCA states the following:

*A building must have, to the degree necessary, a level of thermal performance to facilitate the efficient use of energy for artificial heating and cooling appropriate to-*

- (a) the function and use of the building; and*
- (b) the internal environment; and*
- (c) the geographic location of the building; and*
- (d) the effects of nearby permanent features such as topography, structures and buildings; and*
- (e) solar radiation being-*
  - (i) utilised for heating; and*
  - (ii) controlled to minimise energy for cooling; and*

In line with most other Performance Requirements in the BCA, a building can be assessed against the above requirements on the basis of complying with the Deemed-to-Satisfy solutions of the BCA or on the basis of an Alternative Solution or a combination of the two. Contrary to the Deemed-to-Satisfy solutions, that are set and inflexible, Alternative Solutions can provide flexibility and will need to be adopted where compliance with the Deemed-to-Satisfy provisions is either not possible or undesirable.

An Alternative Solution must to be based on one or any combination of the following Assessment Methods:

- (a) Evidence to support that the use of a material, form of construction or design meets a Performance Requirement or a Deemed-to-Satisfy Provision...*
- (b) Verification Methods such as-*
  - (i) the Verification Methods in the BCA; or*
  - (ii) such other Verification Methods as the appropriate authority [being the local government] accepts for determining compliance with the Performance Requirements.*
- (c) Comparison with the Deemed-to-Satisfy Provisions.*

(d) *Expert Judgement.*

The BCA has adopted Verification Methods that can be used to confirm the compliance of a building with the Performance Requirements of the BCA. These methods are based on determining the energy rating of buildings. The Australian Building Codes Board is preparing a detailed description of this procedure for the energy rating of houses. In the meantime, the procedure may be taken as that upon which the following three computer software programs are based:

?? version 3.5 of FirstRate

?? version 2.32 of NatHERS

?? version 3.2 of BERS

The Verification Methods adopted by the BCA are:

*V2.6.2.1 Verification using stated value*

*V2.6.2.2 Verification using a reference building*

The verification using stated value is likely to be the most common form of verification and includes the star house energy rating. In BCA Climate Zones 1 and 3, a 3.5 star rating equivalent will represent compliance with the Performance Requirements, whilst in Climate Zones 4 to 6, compliance can only be confirmed by a minimum 4 star rating. Local governments must be satisfied that the Verification Method has been accurately carried out before accepting the Alternative Solution.

In order to maintain a level of confidence in the star energy rating certificates, the Sustainable Energy Development Office (SEDO) has introduced an accreditation system, whereby the accredited users of the FirstRate software are randomly audited. Local governments can check the accreditation of the person that has prepared a star energy rating system by referring to the latest list of WA accredited FirstRate house energy rating assessors located at { HYPERLINK <http://www1.sedo.energy.wa.gov.au/pdf/assessors.pdf> }.

Currently Central TAFE, and the Housing Industry Association, are conducting training in the use of FirstRate software. A growing number of builders, designers and consultants are undertaking the training and becoming accredited. The Department recommends that local government officers attend the training, in order that they may become familiar with the workings of the software and its abilities and limitations.

Unfortunately the current energy rating programs are limited in their capabilities when it comes to the hot and humid regions in the north of the State. In summary, the limitations are:

*Version 3.5 of FirstRate* – This software will not accept inputs for hot and humid regions. For further information on FirstRate you can refer to { HYPERLINK <http://www.seav.vic.gov.au/buildings/firstrate/index.html> }.

*Version 2.32 of NatHERS* – This software will accept inputs for all regions of Australia, however the software is unable to take into account the effects of air movement on the skin and the ventilation rates associated with a typical tropical design house.

*Version 3.2 of BERS* – This software appears to be the most suitable, of the three, for hot and humid regions because it, apparently, takes into account some effects associated with air movement. For further information on BERS you can refer to { HYPERLINK <http://www.solarlogic.com.au> }.

The good news is that CSIRO, which developed the NatHERS program, are in the process of developing a new version that can take into account ventilation and air movement effects on occupants of a building. Both BERS and FirstRate use NatHERS as their main engine, thus those software will also be improved by the development.

The second Verification Method, namely verification using a reference building, can be used in any location. This verification method relies on comparing the cooling or heating energy load of the proposed building with a reference building. An equivalent, or lower, energy load, associated with the proposed building, will represent compliance with the Performance Requirements.

Other Assessment Methods remain available to the proponents and local governments. These have to be considered carefully, to ensure the technical requirements of the BCA are consistently applied.

For further information in relation to the accreditation and audit of assessors contact may be made with Mr Andrew Fairs, Manager Sustainable Energy Development Office (SEDO), on 9420 5648.



Peter Gow  
EXECUTIVE DIRECTOR OFFICE OF POLICY AND PLANNING

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