Assessing energy equivalence using the peer review process

Peer review guideline

June 2015
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1. Background

This guideline outlines the peer review process which can be used as a compliance option for the assessment of the energy equivalence (thermal performance) of new houses, and major renovations (where practical) in Queensland.

It is intended to assist clients, designers, council officers, building certifiers and other interested parties to understand the peer review process. The peer review process has been developed by Building Codes Queensland (BCQ) of the Department of Housing and Public Works as an option to assess the energy equivalence of housing designs in Queensland.

This process provides independent peer review of alternative solutions for the energy equivalence of house designs that may not readily comply with either the elemental (formerly known as ‘deemed-to-satisfy’ (DTS)) provisions or verification method using computer simulation under the Building Code of Australia (BCA).

The process is intended for use under the ‘expert judgement’ assessment provisions of the BCA (see Figure 1 below). The ‘expert judgement’ will be made by a suitably qualified and recognised specialist, referred to in this guideline as the ‘expert’.

Figure 1: Compliance Levels of the Building Code of Australia
Application

The peer review process applies to assessing the energy equivalence for class 1 and 10a buildings under the BCA i.e. a detached or semi-detached house and its attached garage.

New class 1 buildings and major renovations (where practical) in Queensland must achieve a minimum house energy equivalence of 6-stars\(^1\) (out of 10), in accordance with the BCA (Part 3.12, Volume Two) or Queensland Development Code (QDC) Mandatory Part 4.1—Sustainable buildings (QDC 4.1).

Assumptions

This guideline has been developed to assist building certifiers with the assessment of the minimum standard for thermal performance of the building’s design in relation to energy efficiency standards under QDC 4.1 or the BCA, including its climate zone (as mapped in Appendix 1), and the site’s local climate. This assessment will not cover other matters prescribed by the BCA, such as structural adequacy.

Prior to submission through the peer review process, it is preferable that the building’s design is assessed through other assessment methods, such as the verification method using approved house energy rating software (BERS Pro, AccuRate and FirstRate5 under the Nationwide House Energy Rating Scheme (NatHERS)) relative to its climate file (as mapped in Appendix 2).

Expert assessments will be made subject to the relevant building and planning requirements, such as siting and boundary clearances.

Experts should only provide advice on aspects of design relevant to their competencies and they should seek guidance from other suitably qualified persons as required.

The peer review assessment report (Form 2—see Appendix 4) can be used as evidence of suitability under the BCA (Part 1.2.2, Volume Two).

Legislation

This guideline is made under section 258 of the Building Act 1975. It is intended to assist in compliance with the Act by specifying a process for peer review in Queensland\(^2\) through the expert judgement method under the BCA.

2. What is peer review?

Peer review is an alternative assessment process for minimum energy efficiency performance requirements under the BCA (Volume Two) or QDC 4.1. The assessment is conducted by a specialist (the expert) in building design and energy efficiency. Experts who are recognised under this guideline are suitably qualified persons who have been found competent in a particular design

\(^{1}\) In the Northern Territory, this guideline should be read in conjunction with the relevant Northern Territory energy equivalence requirements.

\(^{2}\) In the Northern Territory, experts from Queensland’s peer review panel are recognised. See Building Note 68 issued by Building Advisory Services on 5 May 2010, as available at www.lands.nt.gov.au.
field and with experience from a relevant discipline, such as architectural science, building design, building physics or engineering. Experts are selected by agreement between BCQ and its former energy efficiency housing committee.

Applicants may, on behalf of clients, formally apply to have building designs assessed for energy equivalence by an expert through the peer review process (Form 1—see Appendix 3). The expert will provide the applicant with a completed peer review assessment report (Form 2), which can be used to support a building development application as evidence of compliance with the energy efficiency performance requirements under QDC 4.1 or BCA.

### 3. Application for peer review assessment

#### Application process

The following steps outline the peer review process:

1. To formalise an application, select a person from the list of peer review experts from the Department of Housing and Public Works’ website, as available at [www.hpw.qld.gov.au](http://www.hpw.qld.gov.au) and arrange a quote.

2. Once you have agreed on the terms, complete the peer review application for energy equivalence requirements (Form 1) and give it to your chosen expert with a copy of the building plans and any other relevant supporting documentation. Applicants may wish to submit other material, such as a software assessment report (using BERS Pro, AccuRate or FirstRate5), to assist the expert in understanding how the design varies from typical compliance methods.

3. The expert reviews the application including all relevant material and assesses compliance with the minimum energy efficiency performance requirements under QDC 4.1 or BCA. The expert may request further information if required. The expert prepares a peer review assessment report (Form 2) stating if the design is ‘supported’ or ‘not supported’, and outlines the reasons justifying their decision or recommended modifications required to achieve the equivalent minimum energy efficiency performance requirements under the QDC 4.1 or BCA.

4. Where a proposed design is considered not to comply, experts may advise the applicant of any recommended modifications to the design necessary to achieve equivalent minimum energy efficiency performance requirements under the QDC or BCA.

5. Where an applicant wishes to rely on the peer review assessment report (Form 2) the form should be submitted to the relevant building certifier.

#### Applicant’s requirements

The applicant must ensure that the following are included in the submission for peer review assessment:

- a completed peer review application (Form 1)
- relevant designs and specifications, such as plans, sections, elevations, details of building materials; and
- site analysis that includes local climatic data (average monthly temperatures, humidity, rainfall, wind speed/direction), topography, solar access (including sun paths), boundary clearances, adjacent property information, etc.

This information can be used by the expert in the assessment of the design’s energy equivalence compliance.

**Verification of performance**

Applications for peer review assessment are recommended to also include any associated data and/or reports relevant to the thermal performance assessment of the proposed building application, such as consultants’ reports, building authority advice, building material thermal performance data or assembly test results etc.

### 4. Peer Review fees

**Liability for payment**

The peer review assessment fees must be met by the applicant or as nominated for billing on the peer review application (Form 1) to the expert.

**Assessment fees**

The time and cost associated with the assessment of a peer review application will be charged according to the expert’s standard hourly consulting rate, or as otherwise agreed between the parties. It is recommended that fee agreements include provisions relating to re-assessment of any amended designs.

**Repeat assessment (amended design)**

If, after assessing a building design, the expert considers that its does not meet the equivalent energy efficiency performance requirements, the applicant may re-submit the building design, with amendments, for re-assessment.

### 5. Peer Review reporting

**Reporting**

The expert considering the application must complete a peer review assessment report (Form 2) which is to be provided to the applicant within 20 business days where no variations are required to support the building development application.

A copy of a completed assessment report (Form 2) and relevant application material must be forwarded by the expert to the administering authority within five (5) business days of the decision.

The assessment report (Form 2) must state whether the application being assessed is ‘supported’ or ‘not supported’, and must include:
• a description of the building and its energy efficient design features e.g. for thermal comfort design performance

• the method of assessment used, including all qualifying and relevant factors e.g. comparative references

• justification of how the building’s design features will perform in compliance with the minimum energy efficiency performance requirements under QDC 4.1 or BCA.

The assessment report (Form 2) must be submitted as part of the building development application if it is relied upon by the relevant building certifier.

Quality assurance

To ensure the consistency and accuracy of the assessments made by the expert, the administering authority may audit peer review assessments.

6. Communication

The expert will communicate with the nominated contact person as indicated on the peer review application (Form 1), but they will not communicate with the applicant’s client, council officers or certifying organisations unless otherwise agreed between the expert and the applicant.

It is the responsibility of the applicant to consult with and inform their client, council officers and other relevant organisations on matters relevant to the application. The applicant must ensure that any changes to the building design required to achieve the performance requirements are agreed to by their client, and that the client understands the impact of those changes on the cost and appearance of the building.

The expert will provide a peer review assessment report (Form 2) to the applicant within 20 business days of the application submission where no variations are required.

The expert may assist the applicant to improve the building’s energy equivalence. If significant changes are required, the expert will issue a peer review assessment report (Form 2) stating that the building does not achieve the performance requirement (‘not supported’) and the reasons why.

Definitions

**Administering authority**: the administering authority for the peer review process is BCQ.

**Applicant**: is the person submitting the application for peer review (i.e. an architect, building designer, engineer etc), usually acting on behalf of their client (i.e. homeowner).

**Assessment report (Form 2)**: a written document issued by the expert advising the applicant that their building design is assessed as ‘supported’ or ‘not supported’, and the justification of their decision or recommended modifications required to achieve compliance.

**Building certifier**: is a person who, under the Building Act 1975, is licensed as a building certifier.

**Expert judgement**: means the ‘judgement of an expert who has the qualifications and experience to determine whether a building solution complies with the performance requirement’ (BCA, Part 1.1, Volume Two).
**Expert**: is a person who conducts the assessment of the building’s design in relation to it meeting the energy efficiency performance requirements under QDC 4.1 or BCA through the peer review process. The expert is a person with suitable qualifications, such as a specialist in building energy efficiency from a particular design field, and has extensive experience from a relevant discipline, like architectural science, building design, building physics, engineering etc.

Experts are selected by agreement between BCQ and its former energy efficiency housing committee.

The list of peer review experts can be found on the department’s website at [www.hpw.qld.gov.au](http://www.hpw.qld.gov.au).

**Energy efficiency housing committee** (former): a committee that was established by BCQ to facilitate industry input into the progression of energy efficiency standards for buildings in Queensland. It comprised of representatives from the then following organisations:

- Association of Building Sustainability Assessors (ABSA)
- Australian Institute of Architects (AIA)
- Australian Institute of Building Surveyors (AIBS)
- Building Designers Association of Queensland (BDAQ)
- Building Services Authority (BSA)
- Centre for Subtropical Design (CSD)
- Department of Public Works (DPW)
- Housing Industry Association (HIA)
- Local Government Association of Queensland (LGAQ)
- Master Builders Association (MBA)
- Property Council of Australia (PCA)
- Solar Logic (BERS Pro)
- Think Brick Australia (TBA)
- Timber Queensland (TQ)
- Urban Development Institute of Australia (UDIA).
Appendix 1

Queensland's climate zones under the Building Code of Australia

<table>
<thead>
<tr>
<th>BCA climate zone</th>
<th>Prevailing conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Tropical</td>
<td>Hot humid summer, warm winter</td>
</tr>
<tr>
<td>2 – Subtropical</td>
<td>Warm humid summer, mild winter</td>
</tr>
<tr>
<td>3 – Hot arid</td>
<td>Hot dry summer, warm winter</td>
</tr>
<tr>
<td>5 – Warm temperate</td>
<td>Warm summer, cool winter</td>
</tr>
</tbody>
</table>

NB. Queensland does not have an area covered by BCA climate zone 4.
Appendix 2

Software (NatHERS) climate files for Queensland

<table>
<thead>
<tr>
<th>NatHERS Reference Number</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Longreach</td>
</tr>
<tr>
<td>5</td>
<td>Townsville</td>
</tr>
<tr>
<td>7</td>
<td>Rockhampton</td>
</tr>
<tr>
<td>9</td>
<td>Amberley</td>
</tr>
<tr>
<td>10</td>
<td>Brisbane</td>
</tr>
<tr>
<td>19</td>
<td>Charleville</td>
</tr>
<tr>
<td>29</td>
<td>Weipa</td>
</tr>
<tr>
<td>32</td>
<td>Cairns</td>
</tr>
<tr>
<td>35</td>
<td>Mackay</td>
</tr>
<tr>
<td>36</td>
<td>Gladstone</td>
</tr>
<tr>
<td>39</td>
<td>Mount Isa</td>
</tr>
<tr>
<td>50</td>
<td>Oakey</td>
</tr>
<tr>
<td>–</td>
<td>Atherton (proposed)</td>
</tr>
<tr>
<td>–</td>
<td>Maleny (proposed)</td>
</tr>
<tr>
<td>–</td>
<td>Toowoomba (proposed)</td>
</tr>
</tbody>
</table>
## Appendix 3

### Form 1—Peer review application for energy equivalence

![Form 1—Peer review application for energy equivalence](image)

**Applicant details**
- **Name:**
- **Company name (if applicable):**
- **Contact phone:**
- **Fax:**
- **Email:**

**Billing address**
- **Name:**
- **Address:**

**Project details**
- **Property address:**
- **Local government area:**
- **Building description:**

**Areas (metres²)**

<table>
<thead>
<tr>
<th>Floor</th>
<th>Ext. wall</th>
<th>Roof</th>
<th>Glazing</th>
<th>Garage</th>
</tr>
</thead>
</table>

**Software assessment details**
- **Software type (e.g. BERS Pro, AccuRate, FirstRate5):**
- **Climate zone (as defined by Building Code of Australia):**
- **Climate file (software reference location):**

**Rationale for applying for peer review**
- **(e.g. design did not readily comply with software assessment)**

**Conditions eligible for expert assessment**
- **(e.g. high level of window areas, use of certain construction material)**

**applicant’s signature:**

<table>
<thead>
<tr>
<th>Date:</th>
<th>/</th>
<th>/</th>
</tr>
</thead>
</table>

**OFFICE USE ONLY**

- **Expert’s name and number:**
- **Expert’s peer review job reference number:**

A copy of the current plans and accompanying specifications, and any software simulation report or other relevant material, must be submitted with this application.

**For more information**
- Building Codes Queensland
- Building Industry and Policy
- Department of Housing and Public Works
  - buildingcodes@hpw.did.qld.gov.au

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*Queensland Government*
### Form 2—Peer review assessment report for energy equivalence

**Applicant details**
- Name:
- Company name (if applicable):
- Contact phone:
- Fax:
- Email:

**Project details**
- Property address:
- Local government area:
- Expert’s signature:
- Date:
- Expert’s peer review job reference number:

The Assessment Report must be submitted as part of the Building Development Application if it is relied upon by the relevant building certifier as evidence of suitability that the building’s design can comply with the energy efficiency performance requirements under QBCA 4.1 or the Building Code of Australia.

**Assessment result:** SUPPORTED / NOT SUPPORTED (circle result)

1. Description of the building and its energy efficient design features.

2. Method of assessment used, including all qualifying and relevant factors e.g. comparative references.

3. Justification of how building design and energy efficiency features will demonstrate compliance with the minimum energy efficiency performance requirements.

For more information
- Building Codes Queensland
- Building Industry and Policy
- Department of Housing and Public Works
- BuildingIndustryPolicy@dpi.qld.gov.au

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