Building and Plumbing Newsflash 548

Energy assessments for residential dwellings and use of software (updated)

Purpose

To provide updated advice for building certifiers, other building practitioners and homeowners about energy assessments in Queensland for residential dwellings when software is used to demonstrate compliance with the energy equivalence standard.

Background

Energy equivalence standards for residential dwellings

Under the Queensland Development Code Mandatory Part 4.1—Sustainable buildings (QDC 4.1), houses and townhouses must achieve a minimum energy equivalence (thermal performance) rating of 6-stars. Units in a multi-unit residential building must have an average of 5-stars, which is determined by calculating the energy equivalence of all units, with no individual unit to be rated less than 4-stars.

The energy equivalence standards for residential dwellings promote a range of design features, such as good orientation and room layout, suitable ventilation, shading, insulation and glazing. The inclusion of such features can contribute to occupant comfort and reduced need for air conditioning.

Approved software

Software tools must be approved for use under the Nationwide House Energy Rating Scheme (NatHERS) and there are four currently available :

- AccuRate Sustainability
- BERS Professional
- FirstRate5, and
- Home Energy Rating Optimisation (‘HERO’).

Each tool has a different user interface and house energy assessors are trained in their preferred tool.

Software is the most common method used for assessing the energy efficiency of a dwelling’s building shell—its roof, walls, windows and floors. House energy assessors use an approved software tool to model the dwelling’s plans to predict its total annual energy load. A house energy star rating (out of 10 stars) is then generated for the design given the particular location of the dwelling.

An energy rating using software allows for flexible design options compared to the more prescriptive provisions of the National Construction Code (NCC), as different building features can be emphasised. For example, a higher level of insulation can be used to off-set a darker coloured roof (that attracts heat) in hotter areas while still achieving compliance.

The software assessment for the dwelling’s plans must be submitted with the building development application to demonstrate its compliance with the energy equivalence standard under QDC 4.1.

Optional credits

Under QDC 4.1 compliance with the relevant energy equivalence standard can be achieved by using approved software only or by combining the software's star rating with optional credits. Optional credits are available for (based on minimum design specifications):

- covered outdoor living area—with ceiling fan, 1-star with houses and for each unit in a multi-unit residential building; if without ceiling fan, then ½-star, and/or
- photovoltaic (solar) energy system—1 star for a minimum 1 kilowatt capacity with houses only.

If optional credits are used for a house or townhouse, the building shell must meet a minimum baseline star rating for the particular climate zone. The minimum building shell rating is 4.5-stars in NCC climate zones 1 (tropical), 2 (subtropical) and 5 (warm temperate), and is 5-stars in climate zone 3 (hot arid).

If outdoor living areas are included with units in a multi-unit residential building, then optional credits can only be used in climate zones 1 and 2 when calculating the average star rating of all units for the whole building.

Design inclusions

The type of energy efficient features proposed to be included with the dwelling should be identified early between parties, particularly the building designer/architect, house energy assessor, builder, building certifier and client, so all are clear about which ones will be incorporated into its final design and construction. These design inclusions should be clearly noted on the dwelling's plans.

House energy assessor competence

The building certifier has discretion under the *Building Regulation 2006* to decide whether a house energy assessor is a 'competent person' to perform the software assessment.

A house energy assessor may be accredited with an Assessor Accrediting Organisation (AAO) and there are three currently operating in Australia:

- Australian Building Sustainability Association (ABSA)
- Building Designers Association of Victoria (BDAV) via 'Design Matters', or
- House Energy Raters Association (HERA).

If an accredited assessor has performed the assessment, the building certifier can accept that it has been completed by a competent person (subject to any contrary evidence). Accredited assessors operate under a Code of Practice and are subject to quality assurance reviews by their respective AAO, are required to undertake continuing professional development and have professional indemnity insurance.

Updated software tools that produce the NatHERS Certificate identifies if the house energy assessor is 'accredited' or 'non-accredited' (see Figure 1 below).

If a non-accredited assessor has performed the assessment, before the building certifier can accept that they are competent, they will need to confirm that the assessor:

1. has suitable training and skills
2. used appropriate assessment practices, and
3. used an approved NatHERS software tool.

1. Training and skills

Since 1 July 2013, the 'Certificate IV in NatHERS Assessment' has been available as an appropriate qualification for new and existing house energy assessors. It would be expected that the building certifier would consider the Certificate IV in NatHERS Assessment as providing strong evidence that the assessor has the necessary training to undertake software assessments.

Further details about the Certificate IV in NatHERS Assessment and nationally registered training providers are available from the Australian Government's MySkills website.

If the house energy assessor does not hold a Certificate IV in NatHERS Assessment, the building certifier will need to consider their successful completion of a software training course and relevant assessment skills and experience.

2. Assessment practices

The NatHERS National Administrator has issued a NatHERS Technical Note (current version is June 2019) that sets out acceptable industry practice for undertaking software assessments for regulatory purposes.

In determining whether a non-accredited assessor is a competent person to perform the house energy assessment, the building certifier should ensure that their assessment has complied with the relevant NatHERS Technical Note.

3. Approved NatHERS software tools

For a non-accredited assessor, the building certifier must be satisfied that the software assessment has been undertaken using an approved NatHERS software tool. The four software tools and their currently approved versions are listed on the NatHERS website.

NatHERS Certificate

The NatHERS Certificate presents a comprehensive summary of the software assessment in a uniform format between the different software tools. It aims to improve understanding about house energy star ratings, particularly for building practitioners and homeowners. It also allows the energy efficient design aspects of a dwelling to be more easily checked.

All software tools produce the NatHERS Certificate and it is generated in a fixed file format for record keeping as a .pdf document.

The NatHERS Certificate includes relevant information, such as:

- if the software assessment was prepared by an:
  - accredited assessor—colour print-out, their accreditation number and AAO, and NatHERS logo displayed, or
  - non-accredited assessor—black/white print-out and no NatHERS logo displayed
- building design features and the specifications for windows, walls, floors, ceiling and roof, and
- a unique certificate number to enable confirmation that it is a valid assessment and a QR code.

The NatHERS Certificate must be generated with all approved software tools.

Examples of the two types of NatHERS Certificate are shown in Figure 1. More information about the NatHERS Certificate, including sample certificates, is available on the NatHERS website.

Other considerations

If using software for compliance with QDC 4.1, the following matters also need to be considered:

Building Form 15

If the building certifier determines the assessor is a competent person they can accept and rely on a Form 15—Compliance certificate for building design or specification from the assessor. It is common practice for a building certifier to request a 'Form 15' from the house energy assessor to confirm that the dwelling's design complies with the energy equivalence standard.

Optional credits

If QDC 4.1 optional credits are used and combined with the software's house energy star rating to achieve compliance with the energy equivalence standard, then the optional credits need to be separately noted with the dwelling's plans.

Thermal breaks for metal frames and trusses

As heat can bypass insulation by travelling along metal framing systems used with external walls and/or roof structure, the effectiveness of the insulation can be reduced where thermal breaks are not included in the design and construction of the dwelling.

If the design includes metal frames and trusses, then thermal breaks must be separately noted with the dwelling's plans. Thermal breaks are not assessed by the software, but are separate requirements (deemed-to-satisfy (DTS) provisions) for houses under NCC Volume Two (section 3.12.0(a)(i)(C)).

Stamped plans

The building certifier needs to confirm that dwelling plans used for the software assessment (to generate its star rating) are consistent with the building development approval. Dwelling plans that were assessed by the house energy assessor should be stamped, signed and dated on all pages. This avoids substitution of later versions of the dwelling's plans which may have been amended to include a design variation. Any variation to the originally approved plans could compromise the dwelling's compliance with the energy equivalence standard, as well as its ongoing performance. All relevant design specifications should be noted on the approved plans.

If there is a design variation to the building shell, the dwelling's design will need to be re-assessed for compliance with the energy equivalence standard.

Dwelling-specific software assessment

Each dwelling must have its own individual software assessment and house energy star rating even if using a standard house plan, such as a project home. This accounts for the property's particular location and the dwelling's orientation and other specific design aspects (e.g. choice of roof colour), which influence energy efficiency and occupant comfort.

An individual assessment is also required with each unit in a multi-unit residential building to account for their particular elevation and aspect.

Figure 1: Examples of the NatHERS Certificate

Note: Examples shown are the front page only.

Accredited assessor–
Certificate in colour with NatHERS logo

Nationwide House Energy Rating Scheme
NatHERS Certificate No. 0004466397
Generated on 22 Feb 2020 using CSIRO AccuRate Sustainability V2.4.3.13

6.0
The more stars the more energy efficient
NATIONWIDE HOUSE ENERGY RATING SCHEME
119.0 MJ/m²
Predicted annual energy load for heating and cooling based on standard occupancy assumptions.
For more information on your dwelling's rating see: www.nathers.gov.au

Property
Address Unit 1, 37 Graham Road , Highett , VIC , 3190
Lot/DP Lot gf DP 442528, loy Y
NCC Class* 1a
Type New Home

Plans
Main Plan rtr
Prepared by d

Construction and environment
Assessed floor area (m²)*
Conditioned* 250.0
Unconditioned* 0.0
Total 250.0
Garage
Exposure Type Suburban
NatHERS climate zone 62

Thermal performance
Heating 106.7 MJ/m²
Cooling 12.3 MJ/m²

Accredited assessor
Name John Smith
Business name NA
Email john.smith@na.com.au
Phone 03 955 5555
Accreditation No. 3333
Assessor Accrediting Organisation HERA
Declaration of interest Yes - managed

About the rating
NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

Verification
To verify this certificate, scan the QR code or visit hstar.com.au/QR/Generate?p=BrHnboVGP.
When using either link, ensure you are visiting hstar.com.au

National Construction Code (NCC) requirements
The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.
In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at www.abcb.gov.au.
State and territory variations and additions to the NCC may also apply.

* Refer to glossary.
Generated on 22 Feb 2020 using CSIRO AccuRate Sustainability V2.4.3.13 for Unit 1, 37 Graham Road , Highett , VIC , 3190
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Non-accredited assessor–
Certificate in black/white with no NatHERS logo

Residential Energy Rating — Non-Accredited 0004466397

This rating report has been completed by a **rater (non-accredited assessor)***. For more details see the NatHERS House Energy Rating Scheme (NatHERS) website www.nathers.gov.au.

About the rating NatHERS software models expected thermal energy loads using information on design and construction, climate and common patterns of household use. The software does not take into account appliances apart from the airflow impacts from ceiling fans.

Star rating 6.0

Annual thermal performance
Total 119.0 MJ/m², **Heating** 106.7 MJ/m², **Cooling** 12.3 MJ/m²

Property
Address
Unit 1, 37 Graham Road , Highett , VIC , 3190
Lot/DP Lot gf DP 442528, loy Y
NCC Class* 1a
Type New Home

Verification
To verify this rating report, scan the QR code or visit hstar.com.au/QR/Generate?p=BrHnboVGP.
When using either link, ensure you are visiting hstar.com.au

Plans
Main Plan rtr
Prepared by d

Construction and environment
Assessed floor area (m²)*
Conditioned* 250.0
Unconditioned* 0.0
Total 250.0
Garage
Exposure Type Suburban
NatHERS climate zone 62

Rater*
Name John Smith
Business name NA
Email john.smith@na.com.au
Phone 03 955 5555
Declaration of interest Yes - managed

National Construction Code (NCC) requirements
The NCC's requirements for NatHERS-rated buildings are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.
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State and territory variations and additions to the NCC may also apply.

*Raters (non-accredited assessors) are not required to have any formal qualifications,insurance, ongoing professional development or quality assurance checks on their ratings. This is distinct from NatHERS accredited assessors who are required to have qualifications, ongoing professional development and have quality assurance checks on their ratings.

* Refer to glossary.
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More information

To find out more about:

- energy equivalence standards, see 'energy equivalence rating' <here>
- NatHERS, see www.nathers.gov.au
- Handbook to assist with Energy Efficiency Provisions for NCC Volume Two (2019), and
- energy efficiency design features of dwellings, see 'Your Home' at www.yourhome.gov.au.

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