

Single storey house energy efficiency

P2.6.1

The Performance Requirements of the National Construction Code (NCC) can be met using either a Performance Solution, a Deemed-to-Satisfy (DTS) Solution, or a combination of both. The following demonstrates the performance-based design process, aligning with the ABCB's Performance Solution Process guidance document.



Scenario

A single storey house is to be built in Perth, Western Australia. Whilst the initial house design meets the minimum glazing requirements for energy efficiency using the DTS Provisions, the client wishes to take advantage of more affordable, less energy efficient glazing that does not comply with the DTS Provisions. The client is also willing to improve other low cost energy efficiency elements to compensate for the glazing changes.



Prepare a performance-based design brief

What are the design objectives?

To reduce glazing costs for the client whilst maintaining the minimum level of energy efficiency thermal performance required by the NCC.

Who should be consulted?

Building designer, client, builder, energy assessor and the regulatory approval authority.

What is the basis of the Performance Solution?

- Using the Verification Method V2.6.2.2 in NCC Volume Two to provide flexibility in meeting the energy efficiency thermal Performance Requirements.
- The acceptance criterion for the revised design is using less heating and cooling energy than a 'reference building', which satisfies the minimum requirements in V2.6.2.2(b).

What evidence is proposed?

- Output from energy rating software simulations, which estimate the heating and cooling energy use for a 'reference building'. Noting that the energy rating software tool used cannot be a current or previously accredited version of a Nationwide House Energy Rating Scheme (NatHERS) tool, and/or functions provided in non-regulatory mode.
- A revised design which includes the less energy efficient glazing and any other modifications needed to meet the minimum performance level through predicting less energy.
- A written report explaining the approach used, the modifications made to the design and the heating and cooling energy use determined by the energy rating software simulations for both the 'reference building' and the revised design.

Which DTS Provisions are applicable?

Parts 3.12.1, 3.12.2, 3.12.3 and 3.12.4 contain the DTS Provisions for the thermal performance of a dwelling relevant to energy efficiency.

Which Performance Requirement is applicable?

The primary Performance Requirement is P2.6.1 — Building in Part 2.6 Energy Efficiency.

Note: for brevity, the applicable Performance Requirements and DTS Provisions have been limited. When determining which Performance Requirements and DTS Provisions are applicable, consideration should be made to the latest edition of the NCC. This solution may also impact other Performance Requirements and DTS Provisions and must be considered in accordance with Part A2 of NCC 2019.



Carry out analysis

Which Assessment Methods are the most suitable and where can they be found?

Assessment Methods listed in A2.2 of Part 2 state that any Assessment Method, or a combination of them, may be used to determine if a Performance Solution complies with the Performance Requirements. In this scenario, the Verification Method V2.6.2.2 is used as the Assessment Method.

The energy assessor is using the criteria detailed in V2.6.2.2 to establish the thermal performance of the 'reference building'. The energy rating software used meets the calculation method requirements identified in V2.6.2.2 and provides separate heating and cooling energy-use outputs. In modelling this scenario, the energy assessor also identifies and recommends other low-cost energy efficiency elements to compensate for the proposed glazing changes.



Evaluate results

The energy assessor develops a report detailing the modelling inputs and the energy rating done in accordance with the approach in V2.6.2.2. The report identifies that the requirements of V2.6.2.2 are addressed and include:

- Separate heating and cooling loads for the 'reference building' and the revised design.
- Details demonstrating that the 'reference building' meet the requirements in V2.6.2.2(b).
- Which elements were varied between the 'reference building' and the revised design, noting the requirements of V2.6.2.2(c).
- Which energy rating software is used and how it meets the calculation method requirements in V2.6.2.2(d).
- Which climate data is used in accordance with V2.6.2.2(e).

The building designer, client and builder review the report and agree that the revised design satisfies the acceptance criteria and meets the requirements of V2.6.2.2. The report is retained for submission to the regulatory approval authority as evidence of suitability that the Performance Requirement P2.6.1 is satisfied.



Prepare a final report

What should be in the final submission?

The final report provided by the energy assessor contains sufficient details to demonstrate that the requirements of V2.6.2.2 and, subsequently, the Performance Requirement P2.6.1 are satisfied.

A covering letter is provided by the building designer to supplement this report and summarises the key points relevant to this Performance Solution, which include:

- Scope of the solution, stakeholders involved, which Performance Requirement was assessed and the approach used.
- Overview and outline of the modelling carried out by the energy assessor.
- Comparison of the heating and cooling energy use of the 'reference building' and the revised design with the acceptance criteria in V2.6.2.2.
- Acceptance that the solution demonstrates compliance.