

Unit of Competency CPPHES5001

Conduct thermal performance assessment of complex residential buildings

Application

This unit specifies the skills and knowledge required to analyse information to assess the thermal potential of the building envelope of planned residential buildings and the thermal performance of existing residential buildings, including alterations and additions, involving complex construction methods and materials. Assessments are conducted using the regulatory mode of software accredited under the Nationwide House Energy Rating Scheme (NatHERS) and require client consultation to devise solutions to achieve required energy ratings.

This unit is suitable for those using a broad range of cognitive, technical and communication skills to select and apply methods and technologies to analyse information and provide solutions to sometimes complex problems.

This unit forms part of the licensing requirements for thermal performance assessments. For further information, check with the relevant regulatory authority.

Prerequisite Unit

CPPHES4004 Conduct thermal performance assessment of residential buildings.

Competency Field

Home Sustainability.

Elements and Performance Criteria

1. Prepare for thermal performance assessment.	1.1	Consult with client to confirm scope and purpose of assessment and respond to questions to clarify issues and concerns.
	1.2	Check and apply relevant jurisdictional requirements to planned thermal performance assessment.
	1.3	Obtain documentation and drawings required for the assessment and check to verify consistency and sufficiency to meet software and regulatory requirements.
	1.4	Refer inconsistencies in documentation back to client for clarification and amendment.
	1.5	Analyse complex features of building envelope and construction methods and materials, and source technical advice to clarify requirements for thermal performance assessment.
	1.6	Source additional information required to conduct assessment to meet client and regulatory requirements.
	1.7	Check computer equipment to ensure correct operation and confirm software version and libraries are current and meet regulatory requirements.

2. Collate and input information into NatHERS software tool.	<p>2.1 Extract information required for input into software tool from building documentation and NatHERS technical notes.</p> <p>2.2 Enter extracted information into software tool according to regulatory requirements for all relevant building zones.</p> <p>2.3 Source and enter information about non-standard building materials and designs, alterations and additions correctly according to software and regulatory requirements.</p> <p>2.4 Check inputted data and make necessary adjustments to ensure accuracy and compliance with regulatory requirements.</p>
3. Model thermal performance of building.	<p>3.1 Apply software tool functions and modelling methods suitable for building type and construction methods and materials.</p> <p>3.2 Run simulation to determine if the potential thermal performance of the building complies with regulatory requirements.</p> <p>3.3 Check simulation against latest documentation and amend identified discrepancies.</p> <p>3.4 Analyse software tool outputs to clarify assumptions, identify limitations and correct errors in data entry.</p> <p>3.5 Interpret software tool outputs and profile thermal performance strengths and weaknesses of building.</p>
4. Identify options to improve thermal performance of building.	<p>4.1 Analyse profiled strengths and weaknesses in thermal performance of building.</p> <p>4.2 Access technical advice and identify cost effective options for improving thermal performance considering outputs of thermal performance assessment, client needs, practicality and building type.</p> <p>4.3 Identify interactions of suggested improvements on other aspects of building performance.</p> <p>4.4 Use software tool to reassess building and impact of identified options on thermal performance.</p>
5. Evaluate options to achieve required energy rating.	<p>5.1 Conduct further analysis to identify changes to building design features to achieve required energy rating.</p> <p>5.2 Consult with client to present options, discuss viability of changes and seek direction for building reassessment.</p> <p>5.3 Apply software tool functions and modelling methods to generate thermal performance simulations based on recommended changes to design features.</p> <p>5.4 Negotiate with client to agree on the use of alternative materials or features to achieve required energy rating.</p>
6. Report and certify thermal performance assessment outcomes.	<p>6.1 Finalise thermal performance assessment and collate design and assessment documentation in line with relevant jurisdictional regulatory requirements and for auditing and quality assurance.</p> <p>6.2 Document options and recommendations for achieving required energy efficiency rating according to regulatory requirements.</p> <p>6.3 Discuss assessment outcomes with relevant persons and obtain approval to proceed with certification according to organisational requirements.</p> <p>6.4 Submit NatHERS report through required portal to generate universal certificate.</p> <p>6.5 Confirm stamping is complete and secure documentation according to regulatory requirements.</p>

	6.6	Store assessment documentation according to regulatory requirements and to enable recovery for audit and quality assurance purposes.
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Foundation Skills

Candidates require:

- oral communication skills to interact with clients from diverse social, economic and cultural backgrounds
- numeracy skills to interpret thermal performance outputs including U-values and R-values.

Unit Mapping Information

Supersedes and equivalent to CPPHSA5001A Assess thermal performance of complex residential buildings.

Links

Companion Volume Implementation Guide:

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>

Assessment Requirements for CPPHES5001

Conduct thermal performance assessment of complex residential buildings

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria of this unit by using an accredited Nationwide House Energy Rating Scheme (NatHERS) software tool to conduct thermal performance assessments of three complex residential buildings. The buildings assessed must include different designs:

- appropriate to a tropical, a temperate and a cold climate zone
- to fit sites with different exposures, topography and a wide diurnal temperate range
- that use climate-appropriate construction methods and materials
- involve complex levels, built shading devices and void arrangements

and incorporate the following:

- one single storey dwelling with:
 - a minimum of three bedrooms
 - one ground floor split level
 - two different ground floor construction
 - three different roof constructions including raked ceilings, sloping walls and at least three clerestory windows, dormer construction, split style walls
- one triple storey dwelling (a minimum of four bedrooms) with:
 - an underground basement/garage with a different footprint
 - a ground floor and a first floor
 - a habitable attic space with at least two dormer windows
 - a lift from the basement to both the ground floor and first floor
- one open-plan studio apartment.

The assessments must be conducted according to the requirements of the software, technical notes and jurisdictional regulations.

Knowledge Evidence

To be competent in this unit, a candidate must demonstrate knowledge of:

- Australian climate zones, characteristics and data used in thermal performance assessments
- design features that influence the thermal comfort of buildings
- energy units of measurement and terminology associated with thermal performance assessments:
 - energy efficiency
 - heating and cooling loads
 - solar heat gain coefficient (SHGC) and U-value
 - R-values
- options to improve thermal performance of buildings:

- construction materials
- sealing the building envelope
- floor coverings
- insulation levels
- orientation
- overshadowing
- passive heating and cooling
- shade
- structural changes
- thermal mass
- ventilation
- window size, location, type and coverings
- principles of passive design:
 - glazing
 - insulation
 - orientation
 - passive cooling
 - passive solar heating
 - shading
 - thermal bridging and breaks
- regulatory requirements for thermal performance assessments of residential buildings categorised as Class 1, 2, 4 and 10a of the National Construction Code (NCC)
- thermal performance properties of a variety of building materials:
 - solar absorptance
 - heat transfer coefficients and U-values
 - material thickness
 - reflectivity
 - resistance heat flow up and down
 - solar heat gain coefficient and emissivity
 - thermal bridging and breaks
 - thermal resistance and R-values
- thermal performance ratings:
 - current rating requirements
 - documentation of ratings
 - legal requirements
 - uses
- types and operation of NatHERS accredited software tools:
 - assumptions and limitations as to what can be assessed inherent in NatHERS software protocols and accredited software
 - building and external elements included in NatHERS thermal performance assessments
 - requirements for modelling complex buildings and non-standard materials.

Assessment Conditions

Assessors must meet the requirements for assessors contained in the Standards for Registered Training Organisations.

This unit must be assessed in the workplace or a close simulation using realistic workplace conditions, materials, activities, responsibilities, procedures, safety requirements and environmental considerations.

Candidates must have access to:

- current accredited NatHERS software tool and associated equipment and manuals
- the NCC and jurisdictional guidelines associated with conducting NatHERS assessments
- residential building design documentation and technical information to allow achievement of the performance evidence
- NatHERS technical notes and software accreditation protocol.

Links

Companion Volume Implementation Guide:

<https://vetnet.education.gov.au/Pages/TrainingDocs.aspx?q=6f3f9672-30e8-4835-b348-205dfcf13d9b>