

Unit of Competency CPPHES4004

Conduct thermal performance assessment of 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. Assessments involve a variety of building designs and materials across all jurisdictions using the regulatory mode of software accredited under the Nationwide House Energy Rating Scheme (NatHERS).

This unit is for individuals who work independently using specialised knowledge and skills to complete thermal performance assessments. It involves completing routine and non-routine tasks and dealing with predictable and sometimes unpredictable problems.

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

Prerequisite Units

CPPCMN4008 Read plans, drawings and specifications for residential buildings

CPPHES4003 Operate and maintain computer system to support thermal performance assessments

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	Research and apply jurisdictional regulatory and NatHERS requirements to planned thermal performance assessment.
	1.3	Obtain documentation and drawings for the assessment and review to verify consistency and sufficiency to meet software, NatHERS technical notes and regulatory requirements.
	1.4	Refer inconsistencies in documentation or drawings back to client for clarification and amendment.
	1.5	Request additional information required to conduct assessment to meet client and regulatory requirements.
	1.6	Check computer equipment to ensure correct operation and confirm that software version and libraries are up to date according to regulatory requirements.
2. Collate and input information	2.1	Extract information required for input into software tool from building documentation and NatHERS technical notes.
	2.2	Enter extracted information into software tool according to regulatory requirements for the building.

into NatHERS software tool.	2.3	Enter information on non-standard building materials and designs, alterations and additions correctly according to software and regulatory requirements.
	2.4	Check inputted data and make necessary adjustments to ensure accuracy and compliance with regulatory requirements.
3. Model thermal performance of building.	3.1	Apply software tool functions to model thermal performance of building.
	3.2	Run simulation to determine if the building's potential thermal performance complies with regulatory requirements.
	3.3	Check simulation against latest documentation set and amend identified discrepancies.
	3.4	Analyse software tool outputs to clarify assumptions, identify limitations and correct errors in data entry.
	3.5	Interpret software tool outputs and profile building's thermal performance.
4. Identify options to improve thermal performance of building.	4.1	Analyse strengths and weaknesses in thermal performance of building.
	4.2	Access technical advice and identify cost effective options for improving thermal performance considering outputs of thermal performance assessment, practicality and type of building.
	4.3	Identify interactions of identified improvements on other aspects of building performance.
	4.4	Use software tool to reassess building and impact of identified options on thermal performance.
5. Report and certify thermal performance assessment outcomes.	5.1	Finalise thermal performance assessment and collate design and assessment documentation in line with regulatory requirements in relevant jurisdictions and for auditing and quality assurance.
	5.2	Write up options and recommendations for achieving required energy efficiency rating according to regulatory requirements.
	5.3	Discuss assessment outcomes with relevant persons and obtain approval to proceed with certification according to organisational requirements.
	5.4	Submit NatHERS report through required portal to generate universal certificate.
	5.5	Confirm stamping is complete and secure documentation according to regulatory requirements.
	5.6	Store assessment documentation in accordance with regulatory requirements to enable recovery for audit and quality assurance purposes.

Foundation Skills

Candidates require:

- numeracy skills to interpret thermal performance outputs including U-values and R-values
- reading skills to interpret a variety of texts including regulations, codes, technical notes and building plans and specifications
- writing skills to complete standard forms and generate business correspondence and reports
- problem-solving skills to:
 - make recommendations based on the outputs of NatHERS software tools
 - determine optional improvements to thermal performance.

Unit Mapping Information

Supersedes and equivalent to CPPHSA4012A Conduct NatHERS assessment of planned residential buildings.

Links

Companion Volume Implementation Guide:

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

Assessment Requirements for CPPHES4004

Conduct thermal performance assessment of 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 six residential buildings.

The assessments must be conducted in accordance with the requirements of the software, technical notes and jurisdictional regulatory requirements.

The buildings assessed must include:

- different designs appropriate to a tropical, a temperate and a cold climate zone
- a variety of building materials and designs appropriate to the climate zone.

These buildings must incorporate the following:

- one single story dwelling (a minimum of three bedrooms)
- one double storey dwelling (a minimum of three bedrooms)
- an apartment unit (two bedrooms) in a Class 2 building modelled as:
 - a ground floor unit over a basement/carpark
 - a middle level unit with neighbouring units above and below
 - and a top floor unit with a roof over
- one alteration works that includes an addition to one of the above dwellings.

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 the thermal performance of buildings:
 - construction materials
 - draughtproofing
 - floor coverings
 - insulation levels
 - landscaping and plantings
 - orientation
 - overshadowing

- passive heating and cooling
- shade
- structural changes
- thermal mass
- ventilation
- window size, location, type and coverings
- passive design and thermal performance principles:
 - glazing
 - insulation
 - orientation
 - passive cooling
 - passive solar heating
 - shading
 - skylights
 - thermal mass
 - building sealing
 - thermal bridging and breaks
- regulatory and jurisdictional 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 common 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
- types and operation of NatHERS accredited software tools:
 - assumptions and limitations as to what can be assessed which are inherent in NatHERS software protocols and accredited software
 - building and external elements included in NatHERS thermal performance assessments.

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>