

Unit of Competency CPPHES4001

Research and assess impact of building elements on thermal performance of residential buildings

Application

This unit specifies the skills and knowledge required to research and assess the impact of construction materials and methods, design elements and building condition on thermal performance of residential buildings.

This unit is for individuals who work independently as home sustainability or Nationwide House Energy Rating Scheme (NatHERS) assessors using specialised knowledge to complete thermal performance assessments of residential buildings. It involves completing routine and non-routine tasks and dealing with predictable and sometimes unpredictable problems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Prerequisite Unit

None.

Competency Field

Home Sustainability.

Elements and Performance Criteria

1. Assess impact of building design features on thermal performance of building.	1.1 Research building design features that influence thermal performance. 1.2 Determine potential impact of building design features on thermal performance. 1.3 Examine ways in which building design features can be altered to improve thermal performance.
2. Assess influence of common construction materials on thermal performance.	2.1 Research properties of construction materials that influence thermal performance. 2.2 Research properties of glazing units that influence thermal performance. 2.3 Determine impact of climate on choice of construction materials to improve thermal performance. 2.4 Examine ways in which cost, practicality, size or space constraints can influence choice of building materials when improving thermal performance. 2.5 Research construction materials that meet requirements for improving thermal performance. 2.6 Research ways that correct use and installation of materials can improve thermal performance. 2.7 Examine condition of materials and the effect that condition can have on degrading thermal performance.

3. Assess impact of construction methods on thermal performance.	3.1	Identify construction methods used in residential building.
	3.2	Identify key components of the building envelope.
	3.3	Identify methods of testing building envelope for efficiency.
	3.4	Examine construction methods used on building envelope components and effect on thermal performance.
4. Identify impact of common building faults on thermal performance of building.	4.1	Evaluate influence of poor construction techniques and condition of building elements on thermal performance.
	4.2	Research sources of professional advice on ways to respond to common building faults that may influence thermal performance.
	4.3	Examine potential impact of poorly designed or installed measures for improving thermal performance on other aspects of residential building.
5. Document information and research findings.	5.1	Collate information and research results and check to confirm accuracy.
	5.2	Identify impact of building elements on thermal performance of residential buildings.
	5.3	Identify benefits of efficient building techniques and an efficient building envelope on thermal performance of residential buildings.
	5.4	Document findings according to workplace requirements.

Foundation Skills

Candidates require:

- reading skills to interpret and consolidate a wide range of information on thermal performance of buildings
- numeracy skills to interpret and calculate statistical data on the thermal performance of different construction materials and methods.

Unit Mapping Information

Supersedes and equivalent to CPPHSA4015A Assess impact of building elements on thermal performance of residential buildings.

Links

Companion Volume Implementation Guide:

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

Assessment Requirements for CPPHES4001

Research and assess impact of building elements on thermal performance of residential buildings

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria of this unit by researching and documenting an assessment of the impact of building elements on thermal performance for three different residential buildings involving at least three of the following residential construction methods:

- structurally insulated panels
- pre-fabricated buildings
- brick veneer
- cavity brick
- concrete block masonry
- lightweight construction
- reverse brick veneer.

Knowledge Evidence

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

- building design features that may influence the thermal performance of a building:
 - wall type
 - convection
 - eaves
 - floor types
 - glazing and windows
 - insulation
 - landscaping
 - materials
 - orientation
 - shading
 - siting
 - thermal mass
 - ventilation
 - zoning and layout
- causes of and remedies for condensation
- energy efficiency provisions of building regulations and the National Construction Code (NCC)
- key components of the building envelope
- solar passive building design principles
- passive house building design principles

- properties of building materials that can influence thermal performance:
 - emissivity
 - R-value
 - reflectivity
 - solar absorptance
 - U-value
- properties of glazing units that can influence thermal performance:
 - solar heat gain coefficient
 - U-value
 - visible light transmission
- types of building construction materials used in residential buildings:
 - correct industry terminologies
 - sources of information on their thermal performance
- types of building defects, poor construction techniques and condition of building elements that can impact on the thermal performance of residential buildings:
 - condensation
- methods for testing building envelop efficiency:
 - blower door testing
 - thermal imaging
- types of residential building construction methods:
 - materials used
 - benefits and limitations
 - implications for thermal performance.

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:

- documentation associated with residential buildings and building products and materials to allow achievement of the performance evidence
- building codes, standards and regulations including the NCC
- computer equipment and software suitable for accessing online catalogues and references to source information on the thermal performance of building products and materials
- reference materials and/or computer equipment to access current information on the thermal performance of building products and materials including:
 - solar passive building design
 - passive house building design
 - thermal performance of building materials and construction methods
 - building envelope thermal performance
 - common building defects including condensation
 - house energy rating schemes
 - blower door testing and thermal imaging

- manufacturers' product information on building products and materials.

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