



Australian Government

CPCSUS4003A Maximise energy efficiency through applied trade skills

Release: 1

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Modification History

New unit.

This version first released with CPC08 Construction, Plumbing and Services Training Package Version 9.

Unit Descriptor

This unit of competency specifies the outcomes required to undertake a trade using techniques and practices aimed at achieving high levels of energy efficiency in the finished work. Energy efficiency requirements may be specified by legislation or building codes, or commissioned by a client or a site manager. The unit may include working with others and as a member of a team.

Application of the Unit

This unit of competency applies to builders and tradespeople who identify opportunities for energy efficiency gains in a building and apply energy efficiency techniques in residential and commercial construction work.

Licensing/Regulatory Information

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

Pre-Requisites

Nil

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Where ***bold italicised*** text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

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|---|---|--|
| 1 | Identify energy efficiency aims of the project. | <p>1.1 <i>Building science principles</i> are used to identify the <i>energy efficiency expectations</i> of the work based on plans, drawings and specifications.</p> <p>1.2 <i>Relevant personnel and stakeholders</i> are consulted to confirm the <i>building envelope</i> and energy efficiency requirements of the work, and identify specific instructions on priority areas.</p> <p>1.3 Limitations to achieving the energy efficiency requirements are identified and communicated to relevant personnel in order to identify appropriate solutions.</p> |
| 2 | Prepare for task. | <p>2.1 Products and <i>materials</i> are identified based on building science knowledge and according to project energy efficiency specifications, substitutions are checked for comparable energy efficiency characteristics, and are approved with relevant personnel before use.</p> <p>2.2 Plant, tools and equipment selected to carry out tasks are consistent with building science principles and the requirements of the job to deliver energy efficient outcomes.</p> <p>2.3 Materials appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use.</p> <p>2.4 Material quantity requirements are calculated according to plans, specifications and energy efficiency.</p> |

- 2.5 Differences in standard practice to achieving energy efficient outcome are identified and factored into work plan to gain approval, and task timeframe is adjusted where appropriate.
- 3 Perform tasks using *energy efficient techniques*.
- 3.1 Unnecessary waste of products and materials is avoided through the use of *energy efficient techniques*, and greenhouse gas emissions are specifically minimised or eliminated.
- 3.2 Products and materials are handled and used according to manufacturer specifications to ensure energy efficiency ratings are maintained when installed.
- 3.3 Planned cavities and openings created in the building envelope during the project are minimised or sealed to avoid unnecessary air leakages.
- 3.4 Opportunities for achieving energy efficiency outcomes by minimising energy leakages are maximised by communicating with others on site when required.
- 4 Finalise and evaluate work.
- 4.1 Assessment by qualified energy assessor of work undertaken is arranged to confirm extent of energy efficiency outcomes achieved.
- 4.2 Improvements required in own work practices to ensure energy efficiency outcomes are identified and noted for future development.

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- learning skills to:
 - evaluate own actions and make judgments about performance and necessary improvements
 - respond to change such as differences in current work site environmental and sustainability requirements
- numeracy skills to calculate and confirm correct quantities of materials for work tasks
- oral communication skills to:
 - enable clear and direct communication, using questioning to identify and confirm requirements, and share information
 - report hazards on the work site, including faults in tools, equipment or materials
 - use language and concepts appropriate to cultural differences
- reading skills to:
 - interpret documentation, including drawings and specifications
 - understand written instructions, procedures and signage
 - interpret manufacturer instructions for safe handling of tools and equipment
- writing skills to complete pre-operational checklists and simple equipment fault forms

Required knowledge

- general construction terminology
- introductory awareness of building science and energy efficiency principles
- procedures for the safe handling and storage of materials, and environmentally friendly disposal of materials
- processes for calculating material requirements
- quality requirements relevant to the task
- types, characteristics, uses and limitations of tools and equipment
- types, location and use of relevant safety information, such as:
 - job safety analyses (JSA) and safe work method statements
 - safety data sheets
 - safety manuals and instructions for tools, plant and equipment
 - signage
 - environmental and work site safety plans
- workplace and equipment safety requirements

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment This unit of competency could be assessed by performing a range of tasks in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

A person should demonstrate the ability to:

- undertake three different tasks within the relevant trade specification, using principles or techniques that are designed to maximise the energy efficiency characteristics of the building or project
- locate, interpret and apply relevant information, standards and specifications
- comply with site safety plan and work health and safety (WHS) legislation, regulations and codes of practice applicable to workplace operations
- comply with organisational policies and procedures, including quality, environmental and sustainability requirements
- safely and effectively operate and use tools, plant and equipment and handle materials and components
- communicate and work effectively and safely with others.

Context of and specific resources for assessment

Assessment of this unit:

- must be in the context of the work environment
- may be conducted in an off-site context, provided it is realistic and sufficiently rigorous to cover all aspects of workplace performance, including task skills, task management skills, contingency management skills and job role environment skills
- must meet relevant compliance requirements.

Resource implications for assessment include:

- an induction procedure
- realistic tasks or simulated tasks covering the mandatory task requirements
- relevant specifications and work instructions
- tools and equipment appropriate to applying safe work practices
- support materials appropriate to activity
- workplace instructions relating to safe work practices and

- addressing hazards and emergencies
- research resources, including industry-related systems information
- safety data sheets.

Method of assessment Assessment for this unit must verify the practical application of the required skills and knowledge, using one or more of the following methods:

- direct observation of tasks in real or simulated work conditions
- questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- review of relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

Guidance information for assessment This unit could be assessed on its own or in combination with other units relevant to the job function, such as

- CPCCCM1012A Work effectively and sustainably in the construction industry
- CPCSUS4001A Implement and monitor environmentally sustainable work practices

Reasonable adjustments for people with disabilities must be made to assessment processes where required. This could include access to modified equipment and other physical resources, and the provision of appropriate assessment support.

Assessment processes and techniques should, as far as is practical, take into account the language, literacy and numeracy capacity of the candidate in relation to the competency being assessed.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. ***Bold italicised*** wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

- Building science principles*** must include:
- building envelope
 - effective ventilation
 - heat, air and moisture flows:
 - conduction

Energy efficiency expectations may include:

- convection
- radiation
- interaction between occupants, building components and systems, and the environment both indoors and out
- moisture management.
- acoustic insulation between zones and rooms
- achieving relevant energy efficient requirements in the National Construction Code, and other relevant codes and regulations
- achieving or maintaining a home energy rating, commercial building rating, or equivalent energy rating or industry standards and regulations
- effectively selecting and using thermal mass
- energy conservation
- minimising infiltration
- minimising the heat loss and maximising the heat gain based on the requirements of the building reflective of the climatic zones
- minimising thermal bridging
- passive solar design approach
- reducing or minimising energy costs and consumption to heat and cool the building
- thermal resistance
- ventilation, heat and energy recovery
- zero energy homes.

Relevant personnel and stakeholders may include:

- architect
- builder
- developer
- draftsperson
- energy assessor
- energy modeller
- facility manager
- heating, ventilation and air conditioning (HVAC) designer
- HVAC engineer
- manufacturer
- other trades working at the site
- owner
- project manager
- site manager
- supplier.

Building envelope must include:

- building enclosure or shell
- the area separating the internal conditioned air from the outside unconditioned air

Materials may include:

- the roof, walls, windows and doors.
- building and construction materials, including:
 - aerated autoclaved concrete products
 - bricks
 - cement
 - concrete
 - mortar
 - plaster
 - plasterboard
 - plumbing
 - roofing materials
 - steel
 - timber
- building envelope - ceiling, floor, windows and wall insulating materials:
 - air barriers
 - batts
 - expanded polystyrene
 - joining tape
 - reflective foils
 - sealant
 - vapour barriers.

Energy efficient techniques may include:

- advanced framing or optimal value engineering for energy efficient framing
- appropriate selection and installation of insulation without compressing it
- conserving energy by effectively sealing the building envelope to minimise air leakage (exfiltration and infiltration) in the building envelope, shell or enclosure
- effectively installing windows and flashing without breaking the building envelope
- effectively selecting and installing thermal insulation
- minimising embodied energy
- sealing, insulating and minimising duct leakage
- sealing leaky joints
- selecting recycled materials to minimise production energy
- sourcing materials or products locally to minimise transport energy.

Unit Sector(s)

Construction

Custom Content Section

Not applicable.