Australian Government

CPCPCM2050A Mark out materials

Release 1

INDUSTRY SKILLS COUNCILS
Creating Australia's Future

CPCPCM2050A Mark out materials

Modification History

Prerequisite unit updated
Changes to performance criteria, required skills and knowledge, range statement and critical aspects
Not equivalent to CPCPCM2030A

Unit Descriptor

This unit of competency specifies the outcomes required to mark out plumbing materials prior to fabricating piping, steel sections, ducting and sheet materials, roofing and cladding.

Application of the Unit

Site location for work application may be either domestic or commercial and may be a new work site or an existing structure being renovated, extended, restored or maintained.

Licensing/Regulatory Information

In some jurisdictions, this unit of competency may form part of accreditation, licensing, legislative, regulatory or certification requirements.

Pre-Requisites

CPCPCM2043A Carry out WHS requirements

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

Elements and Performance Criteria

1	Prepare for work.	1.1	Plans and specifications are obtained from job supervisor and job requirements are determined.
		1.2	***Work health and safety*** (WHS) and ***environmental requirements*** associated with marking out of materials are adhered to throughout the work.
		1.3	***Quality assurance requirements*** are identified and adhered to according to workplace requirements.
		1.4	Tasks are planned and sequenced in conjunction with others involved in or affected by the work.
		1.5	***Tools and equipment***, including personal protective equipment (PPE), are selected and checked for serviceability.
		1.6	Work area is prepared to support efficient marking out of materials.
2	Determine job requirements.	2.1	Selected materials are checked for compliance with plans and specifications.
		2.2	Quantity and type of material required are calculated from plans and specifications.
		2.3	Job requirements and ***development methods*** are determined from plans and specifications.

3	Mark out job.	3.1	Dimensions for fabrication and assembly are determined and transferred.
		3.2	Relevant standards, codes and symbols are interpreted.
		3.3	Selected development method is applied as appropriate and according to workplace procedures and ***sustainability principles and concepts***.
		3.4	Calculations are performed to specified job requirements.
		3.5	***Material*** is marked out in compliance with specified measurements.
		3.6	Dimensions are checked for accuracy and compliance with plans and specifications.
4	Clean up.	4.1	Work area is cleared and materials disposed of, reused or recycled according to legislation, regulation, codes of practice and job specification.
		4.2	Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures.
		4.3	Information is accessed and documentation completed according to workplace requirements.

Required Skills and Knowledge

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

Required skills

- communication skills to:
  - access information
  - determine requirements
  - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
  - follow instructions
  - use language and concepts appropriate to cultural differences
  - use and interpret non-verbal communication, such as hand signals
- initiative and enterprise skills to:
  - identify and report to appropriate personnel any faults in tools, equipment or materials
  - mark out plumbing materials according to plans and specifications for the fabrication of plumbing components and applications
- literacy skills to:
  - complete workplace documentation
  - read and interpret:
    - plans and specifications
    - documentation from a variety of sources
- numeracy skills to apply measurements and calculations
- planning and organising skills to:
  - plan and sequence tasks with others
  - plan and set out work
- teamwork skills to work with others to action tasks and relate to people from a range of cultural and ethnic backgrounds and with varying physical and mental abilities
- technology skills to:
  - access and understand site-specific instructions in a variety of media
  - use mobile communication technology

Required knowledge

- identification and correct use of measuring and marking out equipment
- impact of accurate marking out on fabrication process, work time and finished work quality
- job safety analysis (JSA) and safe work method statements (SWMS)

- operation requirements of equipment used for measuring and calculating
- processes of marking out plumbing materials
- relevant WHS regulations and PPE requirements
- SI system of measurement
- sources of information on characteristics and applications of materials being marked out
- workplace operating procedures, including required standards for marking out

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 in the workplace or a close simulation of the workplace environment providing that simulated or project-based assessment techniques fully replicate plumbing and services workplace conditions, materials, activities, responsibilities and procedures.

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

A person who demonstrates competency in this unit must be able to provide evidence of:

- giving instructions
- locating, interpreting and applying relevant information, standards and specifications to marking out materials
- applying safety requirements throughout the work sequence, including the use of PPE
- given the plans and specifications and using any of the three development methods, marking out and measuring the following items of plumbing material:
  - roofing sheets
  - copper tubing
  - polymer pipe
  - steel pressure pipe
  - and one of the following:
    - a square and a round penetration in a roofing sheet

- sheet metal square to round ducting transition
- develop a sheet metal cone
- develop a piece of duct work using parallel line method

- all the above carried out, ensuring:
  - application of sustainability principles and concepts
  - correct identification of requirements and details of proposed markings
  - correct selection and use of appropriate processes, tools and equipment
  - completing all work to specification
  - compliance with regulations, standards and organisational quality procedures and processes
  - communicating and working effectively and safely with others.

Context of and specific resources for assessment

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Assessment is to comply with relevant regulatory or Australian standards' requirements.

Resource implications for assessment include:

- an induction procedure and requirement
- realistic tasks or simulated tasks covering the minimum 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
- material safety data sheets
- research resources, including industry-related systems information.

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.

Method of assessment

Assessment methods must:

- satisfy the endorsed Assessment Guidelines of the Construction, Plumbing and Services Training Package
- include direct observation of tasks in real or simulated work conditions, with questioning to confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application
- reinforce the integration of employability skills with workplace tasks and job roles
- confirm that competency is verified and able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

- competency will need to be demonstrated over a period of time reflecting the scope of the role and the practical requirements of the workplace
- where the assessment is part of a structured learning experience the evidence collected must relate to a number of performances assessed at different points in time and separated by further learning and practice, with a decision on competency only taken at the point when the assessor has complete confidence in the person's demonstrated ability and applied knowledge
- all assessment that is part of a structured learning experience must include a combination of direct, indirect and supplementary evidence.

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.

Supplementary evidence of competency may be obtained from relevant authenticated documentation from third parties, such as existing supervisors, team leaders or specialist training staff.

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.

Work health and safety is to be according to commonwealth, state and territory legislation and regulations and may include:

- handling of materials
- hazard control
- hazardous materials and substances
- PPE prescribed under legislation, regulations and workplace policies and practices
- safe operating procedures, including recognising and preventing hazards associated with:
  - electricity
  - dangerous materials
  - surrounding structure and facilities
  - trip hazards
  - work site visitors and the public
  - working in proximity to others
- use of firefighting equipment
- use of first aid equipment
- use of tools and equipment
- workplace environment and safety.

Environmental requirements cover:

- clean-up protection
- waste management.

Quality assurance requirements may include:

- Australian standards
- Environment Protection Authority (EPA)
- internal company quality assurance policy and risk management strategy
- International Standards Organisation
- site safety plan
- workplace operations and procedures.

Tools and equipment may include:

- adjustable bevels
- dividers
- protractors
- rulers

- scribers
- squares
- tape measures.

Development methods may be:

- parallel line development
- radial line development
- triangulation.

Sustainability principles and concepts:

- cover the social, economic and environmental use of resources to meet current and future needs
- may include:
  - selecting appropriate material to ensure minimal environmental impact
  - efficient use and selection of materials.

Materials may include:

- cladding and timber
- insulating materials for roofing, piping and ducting
- piping (metal and non-metallic)
- roof sheeting (metal, fibreglass and plastic)
- sheet metal
- steel sections.

Unit Sector(s)

Functional area

Unit sector Plumbing and services

Custom Content Section

Not applicable.