



Australian Government

Department of Education, Employment and Workplace Relations

CPCCCM1015A Carry out measurements and calculations

Release: 1

CPCCCM1015A Carry out measurements and calculations

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency specifies the outcomes required to carry out measurements and perform simple calculations to determine task and material requirements for a job in a construction work environment.
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Application of the Unit

Application of the unit	This unit of competency supports achievement of skills to take measurements and use these to calculate material quantities and calculations for related tasks commonly used and applied in construction work.
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units	Nil
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Employability Skills Information

Employability skills 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

ELEMENT	PERFORMANCE CRITERIA
1. Plan and prepare.	<p>1.1. Work instructions are confirmed and applied using relevant <i>information</i>.</p> <p>1.2. <i>Safety (OHS)</i> requirements are obtained from site safety plan, other regulatory specifications or legal obligations, and are applied.</p> <p>1.3. Measuring and calculating <i>equipment</i> selected to carry out tasks is consistent with job requirements, is checked for serviceability, and any faults are rectified or reported.</p>
2. Obtain measurements.	<p>2.1. Method of obtaining the measurement is selected and applied.</p> <p>2.2. <i>Measurements</i> are obtained using a rule or tape accurate to 1mm.</p> <p>2.3. Measurements, including <i>areas and volumes</i>, are confirmed and recorded.</p>
3. Perform calculations.	<p>3.1. Appropriate <i>calculation factors</i> are determined and correct method is selected for achieving required result.</p> <p>3.2. <i>Material quantities</i> for the project are correctly calculated using appropriate factors.</p> <p>3.3. Results are confirmed and recorded.</p>
4. Estimate approximate quantities.	<p>4.1. Calculations for determining material requirements are taken.</p> <p>4.2. Appropriate formulas for calculating quantities are selected.</p> <p>4.3. Quantities are estimated from the calculations taken.</p> <p>4.4. Material quantities for the project are calculated, confirmed and recorded within enterprise tolerances.</p>

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills for this unit are:

REQUIRED SKILLS AND KNOWLEDGE

- communication skills to:
 - determine requirements
 - enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand
 - follow instructions
 - read and interpret:
 - documentation from a variety of sources
 - drawings and specifications
 - report faults
 - use language and concepts appropriate to cultural differences
 - use and interpret non-verbal communication, such as hand signals
 - written skills to record measurements, calculations and quantities
- identifying and accurately reporting to appropriate personnel any faults in tools, equipment or materials
- numeracy skills to apply measurements, calculations and geometry
- organisational skills, including the ability to 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
- technological skills to:
 - use a range of mobile technology, such as two-way radio and mobile phones
 - voice and hand signals to access and understand site-specific instructions.

Required knowledge

Required knowledge for this unit is:

- basic calculators
- communication devices
- company procedures
- construction terminology
- job safety analysis (JSA) and safe work method statements
- measuring, calculating, geometry and determination of quantities
- processes for care of measuring equipment
- project quality requirements
- site and equipment safety (OHS) requirements
- tolerances.

Evidence Guide

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, 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 who demonstrates competency in this unit must be able to provide evidence of the ability to:

- locate, interpret and apply relevant information
- comply with site safety plan, OHS regulations and state and territory legislation applicable to workplace operations
- comply with organisational policies and procedures, including quality requirements
- safely and effectively use tools and equipment
- communicate and work effectively and safely with others
- complete measurements, calculations and determination of quantities for different projects of varying complexity in a range of contexts or occasions over time
- calculate each of the following using a realistic construction task or example:
 - length
 - perimeter
 - circumference
 - area
 - volume
 - number
 - ratio
 - percentage
 - conversion of metres to millimetres and millimetres to metres
 - measure using a rule or tape measure five separate tasks within 1mm accuracy.

EVIDENCE GUIDE

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 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
- 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.

EVIDENCE GUIDE

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

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.

Information includes:

- diagrams or sketches
- instructions issued by authorised organisational or external personnel

RANGE STATEMENT

	<ul style="list-style-type: none"> • manufacturer specifications and instructions • maps • material safety data sheets (MSDS) • memos • organisation's work specifications and requirements • plans and specifications • regulatory and legislative requirements • relevant Australian standards • safe work procedures or equivalent • signage • verbal or written and graphical instructions • work bulletins • work schedules.
<i>Safety (OHS)</i> is to be in accordance with state or territory legislation and regulations, organisational safety policies and procedures, and project safety plan and may include:	<ul style="list-style-type: none"> • clothing and equipment • handling of materials • hazard control • hazardous materials and substances • organisational first aid • use of firefighting equipment • use of tools and equipment • workplace environment and safety.
<i>Equipment</i> includes:	<ul style="list-style-type: none"> • calculators and laser equipment • rulers • tape measures • trundle wheels.
<i>Measurements</i> are to:	<ul style="list-style-type: none"> • be in metric scale • cover all necessary calculations.
<i>Areas and volumes</i> include:	<ul style="list-style-type: none"> • calculating regular and irregular shapes, such as rectangles, squares, circles, triangles, trapeziums, cubes, cones, pyramids and cylinders that represent calculations taken in a construction environment.
<i>Calculation factors:</i>	<ul style="list-style-type: none"> • include length, area, weight, height, width, depth, volume, mass, scales, ratios, perimeters, quantities, numbers, grade, percentages, addition, subtraction, multiplication and division • are to be performed manually and with the aid of a calculator.

RANGE STATEMENT

Material quantities are to be:

- calculated in either packed, bulk, loose or compacted states
- converted to volumes in the other states.

Unit Sector(s)

Unit sector Construction

Co-requisite units

Co-requisite units Nil

Functional area

Functional area