



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **CPCCCM1005A Carry out measurements and calculations**

**Release: 1**

## CPCCCM1005A Carry out measurements and calculations

### Modification History

Not applicable.

### 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

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

CPCCOHS2001A

Apply OHS requirements, policies and procedures in the construction industry

### Employability Skills Information

This unit contains employability skills.

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## 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 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

### Elements and Performance Criteria

Element	Performance Criteria
1 Plan and prepare.	<p>1.1 Work instructions are confirmed and applied using relevant <b>information</b> .</p> <p>1.2 <b>Safety (OHS)</b> requirements are obtained from site safety plan, other regulatory specifications or legal obligations, and are applied.</p> <p>1.3 Measuring and calculating <b>equipment</b> 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 <b>Measurements</b> are obtained using a rule or tape accurate to 1mm.</p> <p>2.3 Measurements, including <b>areas and volumes</b> , are confirmed and recorded.</p>
3 Perform calculations.	<p>3.1 Appropriate <b>calculation factors</b> are determined and correct method is selected for achieving required result.</p> <p>3.2 <b>Material quantities</b> for the project are correctly calculated using appropriate factors.</p> <p>3.3 Results are confirmed and recorded.</p>

- 4 Estimate approximate quantities.
  - 4.1 Calculations for determining material requirements are taken.
  - 4.2 Appropriate formulas for calculating quantities are selected.
  - 4.3 Quantities are estimated from the calculations taken.
  - 4.4 Material quantities for the project are calculated, confirmed and recorded within enterprise tolerances.

## Required Skills and Knowledge

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

### Required skills

Required skills for this unit are:

communication skills to:

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:

determine requirements

enable clear and direct communication, using questioning to identify and confirm requirements, share information, listen and understand

follow instructions

read and interpret:

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

documentation from a variety of sources

drawings and specifications

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

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.
Context of and specific resources for assessment	<p>This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.</p> <p>Assessment of essential underpinning knowledge will usually be conducted in an off-site context.</p> <p>Assessment is to comply with relevant regulatory or Australian standards' requirements.</p> <p>Resource implications for assessment include:</p> <ul style="list-style-type: none"><li>an induction procedure and requirement</li><li>realistic tasks or simulated tasks covering the mandatory task requirements</li><li>relevant specifications and work instructions</li><li>tools and equipment appropriate to applying safe work practices</li><li>support materials appropriate to activity</li><li>workplace instructions relating to safe work practices and addressing hazards and emergencies</li><li>material safety data sheets</li><li>research resources, including industry related systems information.</li></ul> <p>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.</p>
Method of assessment	<p>Assessment methods must:</p> <ul style="list-style-type: none"><li>satisfy the endorsed Assessment Guidelines</li></ul>



of the Construction, Plumbing and Services Integrated Framework 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

### 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  
 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.

**Safety (OHS)** is to be in accordance with state or territory legislation and regulations, organisational safety policies and procedures, and project safety plan and may include:

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.

#### **Equipment** includes:

calculators and laser equipment

rulers  
tape measures  
trundle wheels.

**Measurements** are to:

be in metric scale  
cover all necessary calculations.

**Areas and volumes** include:

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.

**Calculation factors** :

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.

**Material quantities** are to be:

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

## Unit Sector(s)

Construction  
Construction

## Functional Area

empty  
empt