



**Australian Government**

# **CPPSIS5050A Create engineering drawings**

**Release 1**

## **CPPSIS5050A Create engineering drawings**

### **Modification History**

Unit revised and not equivalent to CPPSIS5020A Create engineering drawings  
Element structure, performance criteria, and critical aspects reviewed to reflect workplace requirements  
Skills and knowledge requirements and the range statement updated

### **Unit Descriptor**

This unit of competency specifies the outcomes required to create and output two-dimensional (2-D) engineering drawings using suitable surveying software. It requires high-level technical application and the ability to apply theoretical concepts to a range of surveying data specifications. Functions would be carried out within organisational guidelines.

### **Application of the Unit**

This unit of competency supports the application of planning, organisational, communication and problem-solving skills; and high-level understanding of technology. The skills and knowledge acquired upon completion of this unit would support the needs of employees in surveying.

### **Licensing/Regulatory Information**

Licensing, legislative, regulatory and certification requirements may impact on this unit. Incorporate these requirements according to state, territory and federal legislation.

### **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

- |   |  |  |
|---|--|--|
| 1 | Prepare computer-aided design (CAD) environment.                   | <p>1.1 <b><i>Objectives</i></b>, deliverables, constraints and principal work activities are defined and documented according to the written spatial data specifications and <b><i>legislative requirements</i></b>.</p> <p>1.2 System variables are customised to suit standard operating procedures.</p> <p>1.3 Relevant manuals, instructions and operating procedures for software and hardware being used are obtained according to workplace procedures.</p> <p>1.4 Menus are customised to suit standard operating procedures.</p> <p>1.5 <b><i>Drawing</i></b> defaults are customised to suit the applicable drafting standards and procedures.</p> |
| 2 | Create 2-D engineering drawings or three-dimensional (3-D) models. | <p>2.1 Engineering drawings are created using available software systems.</p> <p>2.2 Drawing <b><i>entities</i></b> are linked to database <b><i>attributes</i></b> to suit job requirements.</p> <p>2.3 Detailed views are created using various scales to meet job requirements.</p> <p>2.4 Plots are produced at required scales to meet job requirements.</p> <p>2.5 If a 3-D model is created, <b><i>products</i></b> are determined and entities are created in <b><i>3-D space</i></b> to job requirements.</p>   |

- 3 Produce output.
  - 3.1 Files are saved in various *formats* according to standard operating procedures.
  - 3.2 Entities are produced from the drawing files or database and are listed in required format to meet job requirements.
  - 3.3 *Supplementary data* is extracted from engineering drawing to meet job requirements.
  
- 4 Finalise the task.
  - 4.1 *Required documentation* is completed promptly, accurately and according to *organisational guidelines*.
  - 4.2 *Relevant personnel* are informed of the results.
  - 4.3 Spatial data is archived according to *project specifications*.

## Required Skills and Knowledge

This section describes the essential skills and knowledge and their level, required for this unit.

### Required skills

- ability to create, extract and output information from engineering plans
- communication skills to:
  - consult effectively with clients and colleagues
  - impart knowledge and ideas through oral, written and visual means
- computer skills to apply surveying software
- literacy skills to:
  - assess and use workplace information
  - locate and interpret written documentation
  - prepare and manage documentation
  - read and write technical reports
  - research and evaluate
- numeracy skills to:
  - analyse errors
  - perform mental calculations
  - record with accuracy and precision
  - organisational skills to prioritise activities to meet contractual requirements
- spatial skills to:
  - exercise precision and accuracy in relation to spatial and aspatial data design
  - archive and retrieve spatial data
  - manage and manipulate spatial data
  - manage files

### Required knowledge

- data formats
- data management
- industry requirements and standards
- organisational policies and guidelines
- planning and control processes
- road design software
- spatial reference systems
- standard plan design and presentation conventions

## Evidence Guide

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

<b>Overview of assessment</b>	This unit of competency could be assessed on its own or in combination with other units relevant to the job function, for example CPPSIS5049A Conduct an engineering surveying project.
<b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>	<p>A person who demonstrates competency in this unit must be able to provide evidence of:</p> <ul style="list-style-type: none"><li>• assessing and recording information from varied engineering sources</li><li>• performing a range of tasks where choice between a substantial range of options is required</li><li>• operational knowledge in a broad range of CAD environments.</li></ul>
<b>Specific resources for assessment</b>	<p>Resource implications for assessment include access to:</p> <ul style="list-style-type: none"><li>• assessment instruments, including personal planner and assessment record book</li><li>• assignment instructions, work plans and schedules, policy documents and duty statements</li><li>• registered training provider of assessment services</li><li>• relevant guidelines, regulations and codes of practice</li><li>• suitable venue and equipment.</li></ul> <p>Access must be provided to appropriate learning and assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p>
<b>Context of assessment</b>	Holistic: based on the performance criteria, evidence guide, range statement, and required skills and knowledge.
<b>Method of assessment</b>	<p>Demonstrated over a period of time and observed by the assessor (or assessment team working together to conduct the assessment).</p> <p>Demonstrated competency in a range of situations, that may include customer/workplace interruptions and involvement in related activities normally experienced in the workplace.</p> <p>Obtained by observing activities in the field and reviewing induction information. If this is not practicable, observation in realistic simulated environments may be substituted.</p>

## Guidance information for assessment

Assessment requires that the clients' objectives and industry expectations are met. If the clients' objectives are narrowly defined or not representative of industry needs, it may be necessary to refer to portfolio case studies of a variety of surveying and spatial information services requirements to assess competency.

Oral questioning or written assessment and hypothetical situations (scenarios) may be used to assess underpinning knowledge (in assessment situations where the candidate is offered a preference between oral questioning or written assessment, questions are to be identical).

Supplementary evidence may be obtained from relevant authenticated correspondence from existing supervisors, team leaders or specialist training staff.

All practical demonstration must adhere to the safety and environmental regulations relevant to each State or Territory.

Where assessment is for the purpose of recognition (recognition of current competencies [RCC] or recognition of prior learning [RPL]), the evidence provided will need to be authenticated and show that it represents competency demonstrated over a period of time.

In all cases where practical assessment is used it will be combined with targeted questioning to assess the underpinning knowledge.

Assessment processes will be appropriate to the language and literacy levels of the candidate and any cultural issues that may affect responses to the questions, and will reflect the requirements of the competency and the work being performed.

## 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 in the performance criteria is detailed below. Add any 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.

***Objectives*** may include:

- client requirements
- written survey data specifications.

***Legislative requirements*** may include:

- relevant state, territory and federal legislation affecting organisational operations, including:
  - anti-discrimination and diversity

- industrial relations.



- Drawings** may include:
- charts
  - diagrams
  - plans.
- Entity** refers to a single item created on the screen such as:
- arc
  - circle
  - hatch
  - line
  - text.
- Attributes** are properties associated with an entity and may include:
- colour
  - layer
  - level
  - line type
  - line width
  - text.
- Products** may include:
- aspect maps
  - line of sight maps
  - slope maps
  - visualisation estimation
  - volume estimation.
- 3-D space** may include:
- line of sight (intervisibility) map
  - fly through products.
- Formats** may include:
- DXF (data exchange format)
  - PTS (a format used in the triangulation process to define the position of points and triangles)
  - XLS (Excel spreadsheet format).
- Supplementary data** may include:
- area
  - volumes
  - lengths
  - angles
  - perimeters.
- Required documentation** may include:
- field records
  - final product reports
  - survey plots.
- Organisational guidelines** may include:
- appropriate timelines
  - final product formats
  - format design parameters
  - particular requirements for data processing.
- Relevant personnel** may include:
- supervisors and managers
  - site personnel
  - surveyors.
- Project specifications** refer
- detailed technical descriptions of the survey data and

to: its requirements.

## **Unit Sector(s)**

Surveying and spatial information services

## **Custom Content Section**

Not applicable.