



Australian Government

Department of Education, Employment and Workplace Relations

MEM09204A Produce basic engineering detail drawings

Release: 1

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Modification History

Release 1 - New unit of competency

Unit Descriptor

This unit of competency covers the skills and knowledge required to identify drawing requirements, preparing engineering drawings and an engineering parts list, and issuing the drawings. Drawings include 2-D drawings to Australian Standard (AS) 1100.101–1992 Technical drawing – General principles.

Application of the Unit

This unit is suitable for those working within a drafting work environment where most specifications required for the drawing are already determined. Specifications may be obtained from design information, customer requirements, sketches and preliminary layouts. Drawings will usually be carried out with the use of computer-aided design (CAD) systems but may also be done manually. Drawings are produced to AS 1100.101–1992 Technical drawing – General principles, from predetermined critical dimensions and specifications. If a CAD system is used, the unit MEM30031A Operate computer-aided design (CAD) system to produce basic drawing elements, should also be selected. This unit applies to all engineering and manufacturing environments.

Licensing/Regulatory Information

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

Pre-Requisites

MEM09002B Interpret technical drawing

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	Determine drawing requirements	1.1	Check purpose, scope and information requirements for drawing
		1.2	Interpret available information relevant to project and work requirements, and identify and address further information needs
		1.3	Identify and prepare equipment required to complete work
		1.4	Examine requirements for presentation of drawings
		1.5	Confirm communication requirements during project
2	Produce detail drawing	2.1	Prepare drawings in plane orthogonal, or equivalent
		2.2	Apply standard drawing conventions, including dimensions, required method of projection, and full notation
		2.3	Use drawing techniques according to work requirements
		2.4	Apply industry symbols and ensure presentation meets industry standard
3	Prepare engineering parts list	3.1	Identify components or parts and organise by component type and/or in accordance with organisation/customer requirements
		3.2	Prepare parts list in accordance with organisation/customer requirements

- 4 Complete drawing task
 - 4.1 Check and confirm dimensions, angles and proportions
 - 4.2 Ensure drawing is presented according to organisational requirements and contains all relevant and accurate information
 - 4.3 Issue and file drawing according to workplace procedure
 - 4.4 Evaluate work and identify areas for improvement
 - 4.5 Plot or print the final drawing to a standard scale

Required Skills and Knowledge

Required skills

Required skills include:

- literacy skills sufficient to read and interpret instructions and specifications for drawing work
- obtaining all relevant job requirements, data/information and specifications necessary to produce the drawing in accordance with workplace procedures
- planning and sequencing operations
- checking and clarifying task-related information
- using computer technologies and navigating software
- numeracy skills sufficient to interpret technical information and conduct mathematical problem solving as required in the scope of this unit
- applying spatial principles to achieve scale and proportion
- using drafting equipment appropriate to the drawing method chosen
- recording completed drawings and/or parts lists in accordance with standard operating procedures
- handling and storing the approved drawings and/or parts lists in accordance with standard operating procedures

Required knowledge

Required knowledge includes:

- general knowledge of different approaches to drawing
- awareness of copyright and intellectual property issues and legislation in relation to drawing
- environmental and occupational health and safety (OHS) issues associated with the tools and materials used for drawing
- quality assurance procedures
- principles of plane geometry:
 - geometric shapes
 - plane geometry
 - geometric construction
 - line types during construction
- drawing construction:
 - four centre method
 - ordinate method
 - sectioning isometric shapes
 - dimensions and notations
- requirements and purpose of the drawing to be produced
- requirements and purpose of the engineering parts list

- sources of relevant data/information
- timeframe for completion of drawings
- persons who can confirm drawing 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.

<p>Overview of assessment</p>	<p>A person who demonstrates competency in this unit must be able to use interpret and apply drawing specifications, and produce a complete drawing to AS 1100.101–1992 Technical drawing – General principles, using manual or CAD tools.</p>
<p>Critical aspects for assessment and evidence required to demonstrate competency in this unit</p>	<p>Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts.</p> <p>Specifically the candidate must be able to:</p> <ul style="list-style-type: none"> • work within typical site/teamwork structures and methods • apply worksite communication procedures • comply with organisational policies and procedures, including quality requirements • participate in work meetings • comply with quality requirements • use industry terminology • apply appropriate safety procedures • interpret work and design specifications and use reference material to obtain required information for drawing work • produce a detailed engineering drawing to AS 1100.101–1992 Technical drawing – General principles, and according to work requirements.
<p>Context of and specific resources for assessment</p>	<p>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.</p> <p>Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics</p>

	<p>and disability.</p> <p>Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.</p> <p>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with drafting or other units requiring the exercise of the skills and knowledge covered by this unit.</p>
Method of assessment	<p>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways, including direct observation, supervisor's reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.</p>

Range Statement

<p>Standard drawing conventions</p>	<p>Standard drawing conventions include:</p> <ul style="list-style-type: none"> • use of correct sectioning technique • identification of cutting plane • accurate line types • appropriate view positions • use of correct symbols • use of correct dimensioning technique • provision of suitable number of views • use of correct scales • neat presentation
<p>Drawing techniques</p>	<p>Drawing techniques may include:</p> <ul style="list-style-type: none"> • orthogonal projection: <ul style="list-style-type: none"> • first angle projection • third angle projection • projection symbol • preferred system of projection in Australia • number of views • relationship of views • sheet format: <ul style="list-style-type: none"> • borders and title blocks • application of projection symbol • drawing sheets and sizes • lettering styles • Australian Standards • dimensioning: <ul style="list-style-type: none"> • unidirectional dimensioning • aligned dimensioning • projection and dimension lines • arrow heads • dimension placement • scale drawing: <ul style="list-style-type: none"> • recommended scales • reduction scales • enlargement scales • multiple scales • dimensioning techniques of scale drawings • sectioning: <ul style="list-style-type: none"> • types of sections

	<ul style="list-style-type: none">• required section views• placement of views• cutting planes• labelling of cutting planes and section views• general notes
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Unit Sector(s)

Drawing, drafting and design

Custom Content Section

Not applicable.