



Australian Government

Department of Education, Employment and Workplace Relations

MEM05037C Perform geometric development

Release: 1

MEM05037C Perform geometric development

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	This unit of competency covers the skills required by an Engineering Tradesperson - Fabrication for marking out general fabrications using geometric development techniques. The marking out is done to specifications interpreted from technical drawings and job specifications.
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Application of the Unit

Application of the unit	This unit of competency applies in jobbing workshops and involves the development of templates and general fabricating using geometrical layout techniques. The marking out is undertaken to specified measurements, tolerances and shapes. Skills covered by this unit are generally applied in occupational and work situations associated with steel fabrication, boilermaking or sheet metal work. This unit has been developed for Engineering Tradesperson - Fabrication apprenticeship training and the recognition of trade level skills in geometric development and marking out. For skills required for marking out activities associated with general engineering and maintenance functions, see the following units: • MEM07005C Perform general machining • MEM12006C Mark off/out (general engineering) • MEM18006C Repair and fit engineering components. Band: A Unit Weight: 6
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Licensing/Regulatory Information

Not Applicable

Pre-Requisites

Prerequisite units		
Path 1	MEM09002B	Interpret technical drawing
	MEM12023A	Perform engineering measurements
	MEM12024A	Perform computations

Employability Skills Information

Employability skills	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.
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Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Transfer dimensions from a detail drawing to work	1.1. Specifications and work requirements are determined and understood using correct and appropriate calculations 1.2. Development is carried out to specifications or standard operating procedures using appropriate tools and equipment 1.3. Datum points are correctly established and marked appropriate to task requirements
2. Make templates as required	2.1. Appropriate template material is chosen 2.2. Templates are produced to specification 2.3. Correct storage procedures are followed including labelling and identification to standard operating procedures
3. Develop patterns as required	3.1. Parallel line, radial line and triangulation development methods are chosen and applied 3.2. Allowances for fabrication and assembly are correctly determined and transferred
4. Interpret relevant codes, standards and symbols	4.1. Relevant standards/codes and symbols are interpreted 4.2. Requirements of standards/codes are interpreted and applied to materials and processes
5. Estimate quantities of materials from detail drawings	5.1. Materials are correctly identified 5.2. Quantities are estimated from drawings 5.3. Material wastage is minimised

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

Required skills include:

- performing geometric calculations
- carrying out geometric development
- establishing datum points

REQUIRED SKILLS AND KNOWLEDGE

- producing templates to specification
- labelling and storing templates
- developing patterns
- making fabrication and assembly allowances
- determining material and component quantities
- minimising material wastage

Required knowledge

Required knowledge includes:

- specifications of work
- tools and equipment
- development preparation
- datum points
- materials used for the preparation of templates
- manufacturing allowance considerations
- template development, labelling, identification and storage requirements
- development methods and applications
- fabrication and assembly allowances
- sources of data on fabrication
- relevant standards and codes

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

A person who demonstrates competency in this unit must be able to mark out general fabrications using geometric development. Competency in this unit cannot be claimed until all prerequisites have been satisfied.

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

Assessors must be satisfied that the candidate can competently and consistently apply the skills covered in this unit of competency in new and different workplace situations and contexts. Critical aspects of assessment and evidence include:

- examining detailed drawings for fabrication requirements and specifications including materials, measurements and tolerances, joining methods, standards and code requirements
- correctly calculating allowances for fabrication and assembly including shrinkage, thickness and inside/outside measurements
- correctly establishing and marking datum points
- selecting and using parallel line, radial line and triangulation development methods with minimum material wastage with accurate dimensions and allowances
- accurately producing templates.

Context of and specific resources for assessment

This unit has been developed to support training in and recognition of trade level competency in marking out using geometric development as applied to a sheet metal or metal fabrication environment. Assessment should emphasise a workplace context and procedures found in the candidate's workplace.

The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

Method of assessment

Typically, persons engaged in Engineering Tradesperson - Fabrication work are required to apply their geometric development skills and techniques across a range of jobs and specifications.

EVIDENCE GUIDE	
	A single assessment event is not appropriate. On the job assessment should be included as part of the assessment process wherever possible. Where assessment occurs off the job, judgement must consider evidence of the candidate's performance in a productive work environment that includes a sufficient range of appropriate tasks and materials to cover the scope of application for this unit. 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.
Guidance information for assessment	This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with applying geometric development or other units requiring the exercise of the skills and knowledge covered by this unit. 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.

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

RANGE STATEMENT	
regional contexts) may also be included.	
Template material	Template material may include: • steel plate • perspex • timber • cardboard • paper
Storage procedures	Storage procedures may include: • labelling • identification (e.g. template lofts)
Development methods	Development methods may include: • parallel line • radial line • triangulation
Allowances	Allowances may include: • thickness • bend • pitch • angle • circumference • perimeter
Standards/codes and symbols	All work carried out in accordance with legislative and regulatory requirements

Unit Sector(s)

Unit sector	
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Co-requisite units

Co-requisite units	
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Co-requisite units		

Competency field

Competency field	Fabrication
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