

<b>Title</b>	<b>Develop fabrication patterns manually for complex three-dimensional objects</b>		
<b>Level</b>	<b>4</b>	<b>Credits</b>	<b>10</b>

<b>Purpose</b>	<p>This unit standard is one in a series of pattern development and marking out unit standards for people training in engineering fabrication trades.</p> <p>People credited with this unit standard are able to develop fabrication patterns manually for complex three-dimensional objects.</p>
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<b>Classification</b>	Mechanical Engineering > Engineering - Fabrication
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<b>Available grade</b>	Achieved
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<b>Prerequisite</b>	Unit 25704, <i>Develop fabrication patterns manually for simple three-dimensional objects</i> , or demonstrate equivalent knowledge and skills.
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## Guidance Information

- 1 Reference
 

Health and Safety at Work Act 2015.  
Boundy, A; *Engineering Drawing, 8th edition*. McGraw-Hill Australia, 2011; ISBN 0071016767.
- 2 Definitions
 

*Complex three-dimensional objects* – oblique ducts, bends; branches of unequal diameter cylinders, oblique cones and pyramids; truncated oblique cones and pyramids; and square to rectangular, square to round, and rectangular to round transitions between inclined planes and more than one offset.  
*Manually* – produced using non-electronic drawing instruments.  
*Specifications* – detail that defines an object being made; commonly communicated by annotated and dimensioned drawings; by written description, or by other communication media. External references may also be used to specify objects such as tables or industry standards.
- 3 Related unit standards
 

This unit standard is one of a set for fabrication shape development and marking out:

  - Unit 25704, *Develop fabrication patterns manually for simple three-dimensional objects* (Level 3); typically assessed off job.
  - Unit 30440, *Layout and mark off fabrication components* (Level 3); typically assessed on job.

- Unit 25705, *Develop fabrication patterns manually for complex three-dimensional objects* (Level 4); typically assessed off job.

#### 4 Materials

Examples of materials are – sheet, plate, structural sections, angles, channels, ducts, pipes, tubes.

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## Outcomes and performance criteria

### Outcome 1

Develop fabrication patterns manually for complex three-dimensional objects.

**Range** six three-dimensional pattern developments involving parallel lines, radial lines, true lengths; may include auxiliary views.  
 Three pattern developments must involve transitions.  
 The overall evidence must include developments covering three different material thicknesses.  
 Examples of developments are – transition with top and bottom surfaces not parallel, square to round transition, square to round transition with top and bottom surfaces not parallel, pipe interpenetration at an angle (pipes not at 90 degrees), square to round interpenetration, cones with diagonal cut, complex polygon with diagonal cut, diagonal cut through oblique cone.  
 Pattern material – paper or cardboard.

### Performance criteria

1.1 Development method is selected to suit objects.

**Range** examples are – parallel lines, radial lines, auxiliary views, true lengths, layout of views on floor or pattern material, identification and notation of reference points between views.

1.2 Sufficient orthographic views of objects are drawn to enable pattern development.

1.3 Patterns are manually developed from orthographic views.

1.4 Pattern developments include material thickness allowances.

1.5 Patterns are checked for dimensional accuracy in accordance with specifications, and any inaccuracies corrected.

**Range** examples are – measurement, modelling of patterns into three dimensional shapes.

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<b>Planned review date</b>	31 December 2022
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**Status information and last date for assessment for superseded versions**

Process	Version	Date	Last Date for Assessment
Registration	1	17 July 2009	31 December 2022
Review	2	20 July 2017	N/A

**Consent and Moderation Requirements (CMR) reference**

0013

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

**Comments on this unit standard**

Please contact Competenz [qualifications@competenz.org.nz](mailto:qualifications@competenz.org.nz) if you wish to suggest changes to the content of this unit standard.