Title	**Demonstrate knowledge of and interpret mechanical engineering drawings and geometric tolerancing**		
Level	**2**	**Credits**	**3**

Purpose	This is an entry level unit standard for people working in the mechanical engineering trades involved in the interpretation of drawings. This unit standard is for use in the training and assessment for mechanical engineering trades. This unit standard is one of a series of three unit standards with unit standards 29653 and 29655**.** People credited with this unit standard are able to demonstrate knowledge of: engineering drawing office procedures and drawing concepts; select and interpret mechanical engineering drawings; and interpret geometric tolerancing in mechanical engineering drawings.

Classification	Mechanical Engineering > Engineering Drawing and Design

Available grade	Achieved

Explanatory notes

1 References
SAA/SNZ HB1:1994, Technical drawing for students. Available from Standards New Zealand.
Boundy, A. W. 2011, *Engineering Drawing,* 8th ed., McGraw-Hill Inc, Australia.

2 Definition
Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider mechanical engineering industry sectors as examples of best practice.
Feature refers to the general term used to identify part or portion of a component such as a hole, shaft or lug.
Interpretation – the explanation in practical terms of features shown graphically in the drawing.
Workplace procedures refers to procedures used by the organisation carrying out the work and applicable to the tasks being carried out. They may include but are not limited to – standard operating procedures, safety procedures, equipment operating procedures, codes of practice, quality management practices and standards, procedures to comply with legislative and local body requirements.

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of engineering drawing office procedures.

Evidence requirements

1.1 Drawing procedures are explained in accordance with workplace procedures and/or accepted industry practice.

Range drawing procedures - control, approval, variation, distribution, storage.

Outcome 2

Demonstrate knowledge of drawing concepts in accordance with recognised reference materials.

Evidence requirements

2.1 Drawing concepts are explained.

Range concepts – scale, third angle projection, first angle projection, isometric drawing, oblique drawing.

Outcome 3

Select mechanical engineering drawings in accordance with workplace procedures and/or accepted industry practice.

Evidence requirements

3.1 Drawings are selected from physical or computerised storage and validated.

3.2 Drawing version numbers are identified and currency confirmed.

Outcome 4

Interpret mechanical engineering drawings in accordance with recognised reference materials.

Range interpretation must include a minimum of one detail drawing and one assembly drawing.

4.1 Drawing views and sections are interpreted.

Range drawing views and sections include but are not limited to – projection angle; cutting planes and direction of viewing.

4.2 Drawing lines are identified and their application stated.

Range lines include but are not limited to – continuous thick, continuous thin, continuous ruled with zig-zag, dashed, chain.

4.3 General engineering symbols are identified.

Range symbols include – diameter, radius, square, centre line, angularity, machining, plus a minimum of six other general engineering symbols.

4.4 Basic welding symbols are identified.

Range basic welding symbols include but are not limited to – weld all around, site weld, complete penetration from one side, flush, convex and concave contours.

4.5 Dimensions and size tolerances are interpreted from given drawings.

Range dimensions and size tolerances include but are not limited to – length, diameter, radius, positioning of holes, countersink, chamfer, bolt, nut, screw, screw thread, keyway.

4.6 Materials are identified from drawings.

Outcome 5

Interpret geometric tolerancing in mechanical engineering drawings in accordance with recognised reference materials.

Range geometric tolerancing – flatness, straightness, perpendicularity, concentricity, parallelism, circularity.

Evidence requirements

5.1 Geometric tolerancing of features is explained.

Range explanation must include a minimum of five different features.

5.2 Geometric tolerances are interpreted from given drawings.

Replacement information	This unit standard replaced unit standard 21910

Planned review date	31 December 2021

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	15 September 2016	N/A

Consent and Moderation Requirements (CMR) reference	0013

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

Please note
Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.