

11. Regulations and legislation relevant to this unit standard include the following:
- Labour Act, No. 11, 2007.
 - Occupational Health and Safety Regulations No. 18, 1997 and all subsequent amendments
 - SABS 0111-1: 1993, Code of practice for engineering drawing, part 1. - General principles.
 - ISO-origin standards
 - SANS 10044-1: 2004, Code of Practice for Welding: Part 1 – Glossary of Terms
 - SANS 10044-2: 2004, Code of Practice for Welding: Part 2 – Symbols

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority on www.nta.com.na.

Elements and Performance Criteria

Element 1: Apply knowledge of engineering drawing fundamentals.

Range

The terms used in engineering drawing may include but not are limited to drawing, centre, centre-line, cylinder and cylindrical, degree (of angle), internal diameter, outside diameter, pitch circle diameter, material, square, hexagon, millimetre, metre, radius, diameter, maximum, minimum and circumference.

Terms related to dimensions and tolerances may include but are not limited to basic dimensions, tolerance, angularity, concentricity, cylindricity, flatness, parallelism, roundness, straightness, symmetry, tolerance zone, auxiliary dimension, position, functional dimension, non-functional dimension, redundant dimension, true lengths and true position or true profile.

Performance Criteria

- 1.1 General abbreviations and symbols for terms used in engineering drawings are identified and correctly used.
- 1.2 Abbreviations for terms relating to dimensions and tolerances used in engineering drawings are identified and correctly used.
- 1.3 Dimensioning rules for dimension and projection lines are correctly applied.

Element 2: Produce drawings of fastening devices, welding joints and screw threads.

Range

Fastening devices may include but are not limited to hexagonal head bolts, nuts, studs, drilled holes, tapped holes, studs and threaded assemblies.

Threaded fasteners may include but are not limited to a variety of bolt heads, machine screw heads, locking devices, keys and keyways, electrical fittings and fasteners and metal conduit fittings and fasteners.

Welded joints may include but are not limited to butt, lap, tee, corner and edge.

Joint and weld types may include but are not limited to square butt weld, single V-butt weld, fillet weld and double V-butt weld.

Supplementary welding symbols include weld all round, weld on site, weld all around on site, finish on weld face and elements and location of elements.

Performance Criteria

- 2.1 The uses of various fastening devices are identified.
- 2.2 Views of various fastening devices are constructed using the conventional method.
- 2.3 Drawings of various threaded fasteners are produced.
- 2.4 Welding joints and symbols are identified.
- 2.5 Drawings of various welding joints are produced.
- 2.6 Welding symbols are interpreted and applied to specify various joint and weld types.
- 2.7 Supplementary welding symbols are interpreted to indicate the finish, description of weld face and elements of a welding symbol.
- 2.8 Terminologies applicable to screw threads are defined.
- 2.9 Detailed representation of metric V- and square screw threads are drawn.

Element 3: Apply knowledge of machining and surface texture symbols.

Performance Criteria

- 3.1 Basic machining symbols are identified and drawn and their uses are stated.

- 3.2 Surface texture symbols are read and applied from a table giving roughness values and grade numbers.
- 3.3 Surface textures are specified using the appropriate machining symbols with the required roughness numbers.
- 3.4 A production method, treatment and/or coating for producing a surface texture are specified.
- 3.5 The correct method for indicating the symbols as well as a suitable size and proportion of the symbols are used.

Element 4: Produce advanced drawings in first angle orthographic projection.

Performance Criteria

- 4.1 Primary views of full, half and/or partial sections and sectional views of castings and/or multi-part objects are drawn to required scales.
- 4.2 The recognized symbol of projection for first angle orthographic projection is drawn.

Element 5: Produce isometric drawings.

Range

The following must be considered for drawings under this element.

- The four centre method should be used for the construction (drawing) of isometric circles and arcs.
- Hidden detail may be required.
- Centre lines should be inserted where appropriate.
- Dimensions are not required.
- The isometric scale is not required in isometric drawings.

Performance Criteria

- 5.1 An isometric drawing of a single item of which at least two views are given in the first angle orthographic projections is drawn.
- 5.2 Isometric drawings of different objects are drawn and the hidden detail of the holes and circular parts is inserted.

Element 6: Produce drawings in third-angle orthographic projection.

Performance Criteria

- 6.1 Given appropriate starting information, the primary and secondary orthographic views of full, half and/or partial section and sectional views of castings and/or multi-part objects are drawn to required scales.

- 6.2 The recognized symbol of projection for third-angle orthographic projection is drawn.

Element 7: Use curves of interpenetrations in drawings.

Range

Shapes of pipes and/or prisms may be triangular, square, rectangular, hexagonal, octagonal and/or circular.

Performance Criteria

- 7.1 A view of a given pipe or prism is drawn and the curve of interpenetration is inserted.
- 7.2 Views of T-end, Forked-end and a Rod-end are drawn and the curve of interpenetration is inserted.

Registration Data

Subfield:	Engineering Science and Drawing
Date first registered:	18 November 2010
Date this version registered:	18 November 2010
Anticipated review:	2015
Body responsible for review:	Namibia Training Authority