Unit ID: 903

Domain **FOUNDATION BUILDING SCIENCE AND DRAWING SKILLS**

Title: **Apply knowledge of basic building drawing in different contexts**

Level: 2 **Credits: 6**

Purpose

This unit standard specifies the competencies required to knowledge of basic building drawing in different contexts. It includes demonstrate knowledge of building drawing fundamentals, apply basic drawing techniques, produce drawings for brickwork, produce basic drawings for foundations, walls and floors, produce basic drawings of arches, lintels and openings, draw basic views of windows, doors and jambs and draw views of basic roof structures and drainage. This unit standard is intended for people requiring basic building drawing skills as applied in different contexts.

Special Notes

1. This unit standard gives users exposure to a holistic approach of study and world of work to gain an understanding of the world as a set of related systems, by recognizing that problem solving contexts do not exist in isolation but that they may differ from context to context according to the area of application.

2. This unit standard may be assessed in any context of operation and may be assessed in conjunction with other relevant technical unit standards selected from a particular domain that has a thematic link to this unit standard.

3. Glossary of terms:
   - *'SABS'* refers to South Africa Bureau of Standards.

4. Assessment evidence may be collected at any realistic place where logical collection of such evidence can be achieved.

5. The correct use of the suitable technical terminology must be stressed, especially in formulating definitions and principles.

6. All diagrams and graphs should be drawn in pencil and must be supplied with the necessary subtitles (labels in ink).

7. All printing must be done free-hand in pencil according to the SABS 0111-1 Code of Practice for Engineering Drawing.

8. All drawings must be done with drawing instruments, the only exceptions being printing, free-hand drawing and the C-type line and break line.

9. Drawing scale: 1:1, 1:2, 1:5, 1:10, 1:20, 1:50, 1:100, 1:200

10. All work must comply with legislation and all subsequent amendments.

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 0143: 1994, Code of practice for Building drawing
    - SABS 0111-1: 1993, Code of practice for Engineering drawing, Part 1: General principles

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: Demonstrate knowledge of building drawing fundamentals.

Range

The terms used in building drawing may include but not are limited to drawing, centre, and centre-line, internal diameter, outside diameter, diameter, maximum, minimum and circumference.

Drawing instruments and equipment may include but are not limited to A2 or A3 drawing paper, A2 -drawing board and table, t-square, protractor $180^{0,}$ clutch pencils 0, 3 and 0,5mm with H or 2H leads, eraser, set squares (30^0,60^0 and 45^0), masking tape and/or drawing clamps or clips, spring-bow pencil compass and divider and French curve and/or flexi curve.

Performance Criteria

1.1 Fundamental building drawing concepts and terminologies are described in terms of drawing documents, types of drawings, components of drawings and use of abbreviations of terms.

1.2 Drawing instruments and materials are identified and their uses are stated.

1.3 Building drawing symbols and abbreviations for building components, materials hatching of cut pieces are identified, sketched and correctly applied.

1.4 Terminologies, the principles, and projection methods for first angle and third angle projection are explained.

1.5 Principles of projection are applied in drawing first and third angle orthographic projection, axonometric drawings and plan views of site plans and projection symbols are correctly drawn.

1.6 The concept of sectional drawings is described in terms of terminologies definitions, interpretation of techniques, methods and good practice in sectioning.

1.7 Axonometric drawing is explained in terms of terminologies, methods and lines used in oblique and isometric drawing.

1.8 From given information and/or instructions, oblique and isometric views are drawn and all required information is included.

Element 2: Apply basic drawing techniques.

Range

Geometric constructions may include but are not limited to functions to bisect a straight line segment, bisect an angle, draw a perpendicular line from a given point on a line, draw a perpendicular line from a given point outside a given line, draw a perpendicular line at the end of a given line segment, draw a line parallel to another line at a given distance, draw a circle through three given points, draw parallel lines using set squares, draw an arc to lines that form a right angle, obtuse angle and an acute angle, draw an arc joining a straight line to an arc or curve, draw an arc joining two other arcs or circular curves, draw an ellipse by means of the four centre method, transfer a given angle, divide a given line segment into an amount of equal segments, and draw a hexagon, an octagon, an equilateral triangle and/or a square.

Performance Criteria

2.1 The purpose of different types of scales used in industry is stated.

2.2 Appropriate scales for the different categories as contained in the code of practice for building drawing are applied.

2.3 Line requirements for quality, types of lines and their uses are described and line drawing in pencil for specific purposes in building drawing is correctly used.

2.4 Letters, figures and symbols are identified, applied and printed according to building standards and requirements in terms of annotations, lettering, spacing and character height.

2.5 Terminology and applications associated with dimensions and tolerances are explained. This includes dimension lines, dimension figures, sequence for dimensions and tolerances.

2.6 Rules, methods for dimensions, dimension lines and extension are correctly applied.

2.7 Terminologies used in geometrical constructions are defined and interpreted.

2.8 Instruments, methods and techniques used in geometrical constructions are identified correctly applied.

2.9 Requirements for plans and elevations of simple solids are listed.

2.10 Different types of building plans and the setting out of simple building structures are interpreted using the Pythagoras method of 3-4-5.

Element 3: Produce drawings for brickwork.

Performance Criteria

3.1 Standard bricks and variations are drawn.

3.2 Views of brickwork for walls up to 1 brick thickness and combinations in isometric, plan views and elevations (stretcher bond, English bond and Flemish bond) are drawn.

3.3 Pictorial views of right-angled corners (quoin), T-junctions and Straight walls are drawn.

Element 4: Produce basic drawings of foundations, walls and floors.

Performance Criteria

4.1 Strip foundations and foundation brickwork up to 1 ½ bricks are defined and drawn.

4.2 Sectional elevations of foundations for ½ brick walls, 1 brick walls, 1 ½ brick wall, and 1 brick piers are drawn.

4.3 The placing of damp-proof courses, damp proof membrane, ant guards and materials available is indicated.

4.4 Sectional views of ½ brick and 1 brick walls which include airbricks, plaster, wall plates, internal walls and floors are drawn.

4.5 Sectional views and details of a suspended timber floor are drawn.

4.6 Cement floors which include earth undisturbed, earth filled, screed and hardcore are drawn.

Element 5: Produce basic drawings of arches, lintels and openings.

Performance Criteria

5.1 Various types of arches are described.

5.2 Soldier arches, flat gauge arches, and semi-circular arches with rough bricks or gauged bricks are drawn with sections.

5.3 Most commonly used lintels (pre-cast and cast in situ) are drawn.

Element 6: Draw basic views of windows, doors and jambs.

Performance Criteria

6.1 Vertical and horizontal sections of wooden casement windows and steel windows are drawn.

6.2 Cross sections at heads, jambs and sills of a window are drawn to show placing of frames in relation to adjacent construction.

6.3 Elementary views and sections with various mouldings of doors up to four panels are drawn.

6.4 Views of wooden door frames and steel door frames are drawn.

Element 7: Draw views of basic roof structures and drainage.

Performance Criteria

7.1 Various types of roof trusses used in building industry are identified and their drawings are drawn.

7.2 Various views of roof truss constructions showing ceiling and joist details are drawn.

7.3 Single-line diagrams of simple modern roof trusses are drawn.

7.4 Views of basic roof coverings (corrugated zinc and fiber cement sheets) are drawn.

7.5 The principles of drainage for simple dwellings are stated and various abbreviations for fittings are interpreted using neat drawings of various sections and fittings used in drainage.

7.6 Methods of fixing rainwater goods, (eaves and gutters) used in building construction are drawn.

7.7 Details (closed, open and flush eave details) of rainwater goods used in building construction are drawn.

7.8 Various views of fittings (down pipes) used in storm water drainage are drawn.

Registration Data

Subfield:	Building 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