

Unit ID: 905

**Domain FOUNDATION BUILDING SCIENCE AND
DRAWING SKILLS**

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

Level: 4

Credits: 6

Purpose

This unit standard specifies the competencies required to apply knowledge of advanced building drawing in different contexts. It includes apply basic knowledge of Computer-Aided Draughting (CAD), produce views of brickwork and masonry for walls up to 2 brick thickness, produce advanced drawings of foundations, walls and floors, produce advanced drawings of arches, lintels and openings, draw advanced views of windows, doors and jambs, construct drawings of panelling, stairs and reinforcement and draw advanced views of roof structures and drainage. This unit standard is intended for people requiring advanced 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 drawings must be done with drawing instruments, the only exceptions being printing, free-hand drawing and the C-type line and break line.
8. All drawings must be numbered, showing the title and scale, and where applicable drawings must show centre lines and the projection system symbol.
9. All work must comply with legislation and all subsequent amendments.

10. All printing must be done free-hand in pencil according to the SABS 0111-1 Code of Practice for Engineering Drawing.
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 Practice
 - 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: Apply basic knowledge of Computer-Aided Draughting (CAD).

Performance Criteria

- 1.1 Various types of plotters and printers used in the industry are listed and briefly described in terms their advantages and disadvantages.
- 1.2 Types of storage devices are listed and described.
- 1.3 The use of back system is explained.

Element 2: Produce views of brickwork and masonry for walls up to 2 brick thickness.

Performance Criteria

- 2.1 The arrangement of standard bricks in several of bonds are identified and drawn.
- 2.2 Views of brickwork for walls up to 2 brick thickness and combinations in isometric, plan view and elevations (English bond, Flemish bond and double Flemish bond) are drawn.
- 2.3 Pictorial views and sections of quoin and T-junctions are drawn in various bonding patterns. .
- 2.4 Elevations and sections of masonry walls in random rubble, snecked rubble, ashlars, squared rubble and Kentish rag are drawn.

Element 3: Produce advanced drawings of foundations, walls and floors.

Performance Criteria

- 3.1 Sections are drawn through strip foundations, foundations with footings and water logged foundations.
- 3.2 Sectional elevations of piers and honeycomb walls are drawn.
- 3.3 Foundation brickworks of various thicknesses are drawn.
- 3.4 Sectional views of walls which include cavity wall, sectional elevations with and without windows, airbricks and ventilation, air ducts, plaster, damp proofing and lintels are drawn.
- 3.5 Sectional views and details of suspended timber floors including waterproofing, ventilation and basement floor are drawn.
- 3.6 Sectional views and details of non suspended concrete or cement floors (including internal walls, backfill and undisturbed earth and waterproofing) are drawn.
- 3.7 Fireplaces in a long wall of a room, a short wall of a room, a fireplace supported by a trimmer arch and a fireplace supported by a slab are drawn.

Element 4: Produce advanced drawings of arches, lintels and openings.

Performance Criteria

- 4.1 From given information, the parts around an opening (for windows and doors) in a wall are drawn.
- 4.2 Structural principle to consider when choosing relative widths of openings are interpreted.
- 4.3 Supports for brickwork over the head of an opening are identified.
- 4.4 Elevations, plan views and sections of precast lintels, cast in situ lintels and ring beams (cast in situ and U-blocks) are drawn.
- 4.5 Elevations and sections of stone arches (masonry), segmental and semi-circular arches in rough bricks and gauged bricks are drawn.

Element 5: Draw advanced views of windows, doors and jambs.

Range

Steel windows to show sections at head and sill, the placement of frames in relation to adjacent construction and placement of frames in cavity walls.

Performance Criteria

- 5.1 Various views and sections of wooden casement windows with fanlight and steel windows are drawn.
- 5.2 Various views and sections of doors, steel and wooden door jambs in walls up to 1 ½ brick thickness, frames in relation to adjacent construction and method of fixing frames are drawn.

Element 6: Construct drawings of panelling, stairs and reinforcement.

Performance Criteria

- 6.1 Different components used for dado wall paneling are identified and incorporated in plan and vertical sectional views.
- 6.2 Shelving views of metal elbows and wooden frames are drawn.
- 6.3 A straight flight of wooden stairs inclusive of landings, balusters and handrails is constructed.
- 6.4 A straight flight and or return flight of concrete stairs inclusive of landings, method of fixing balusters and handrails and reinforcing is constructed.
- 6.5 A reinforced concrete floor without beams showing details of reinforcing is drawn.
- 6.6 Sectional views of end beams and T- beams showing all constructional details are drawn.

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

Range

Roof truss construction may include but are not limited to Howe truss, SA (South Africa) roof truss, fink truss, Belgium truss, strutted truss, King post truss, collar truss and couple truss.

Details required for roof truss drawings may include but are not limited to ceiling details (also suspended), eaves (open, closed and flush), roof coverings (tiles), valleys, ridges and hips, chimney stack and sectioning, parapet walls and flashing.

Fittings may include but are not limited to gutters, down pipes, earthenware pipes, poly vinyl chloride (PVC) pipes and cast iron pipes.

Sanitary fixtures may include but are not limited to water closet pan (WC pan), hand wash basin, gully, trough and sink.

Performance Criteria

- 7.1 Various roof truss constructions are drawn.
- 7.2 Sectional views and elevations of roof trusses and their details are drawn.

- 7.3 Various abbreviations for fittings are interpreted and neat drawings of various sections and fittings used in drainage are produced.
- 7.4 Methods of fixing gutters in position at the eaves of a roof are drawn.
- 7.5 Sectional views of fittings and methods of joining gutters and down pipes at the eaves of a roof are drawn.
- 7.6 Simple line diagrams to showing hot water and cold water layouts are drawn.
- 7.7 Sectional views of sanitary fixtures 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