

**Domain**

**BRICKLAYING**

**Unit ID: 21**

**Title:**

**Construct masonry arches**

**Level: 3**

**Credits: 8**

### **Purpose**

This unit standard specifies the competencies required to construct masonry arches within walls and above columns or attached piers. It includes the preparation, setting out and construction of masonry walls and arches. This unit standard is intended for those who work as bricklayers and plasterers.

### **Special Notes**

1. Entry information

Prerequisite:

- Unit 3 - *Apply safety rules and regulations in bricklaying operations* or demonstrated equivalent knowledge and skills.

2. This unit standard requires the laying of bricks and blocks to construct arches. Bricklaying and block laying tasks include all types of concrete bricks/blocks (hollow and solid).
3. To demonstrate competence, at a minimum, requires evidence of constructing three arches with a diameter of 1-1.5 meters, of which two are to be in brick and one in block. In each case ensuring correct identification of requirements and finishing of the tasks, correct selection and use of appropriate processes, tools and equipment and completing all work to specification.
4. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which bricklaying operations are carried out.
5. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' guidelines and instructions.
6. '*Specifications*' refers to any, or all of the following: manufacturers' specifications and recommendations, site and workplace specific requirements.
7. Regulations and legislation relevant to this unit standard include the following:
  - Labour Act No 6, 1992
  - Occupational Health and Safety Regulations No.18, 1997and all subsequent amendments.

### **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](http://www.nta.com.na)

## **Elements and Performance Criteria**

### **Element 1: Plan and prepare for work**

#### **Range**

Tools and equipment are to include but are not limited to wheelbarrows, concrete mixers, buckets, hoses, shovels, measuring tapes/rules, plumb rules, jointing tools, hammers (club, scutch), bolsters, spirit levels, dumpy levels, trowels, mortar boards, straight edges, profiles, string lines, line blocks, line pins, builders lines, masonry saws, mason's squares, builder's squares, pointing or raking tools, timber and centre, timber toms, packers and wedges, jig saws and adjustable metal props.

Tools and equipment may include scaffolds, forklifts, pallet trolleys, brick buggies and small petrol/diesel engines/compressors/mixers.

Materials are to include but are not limited to clay bricks, masonry blocks, reinforcing materials, aggregates, cement and lime, timber and plywood. Materials may include waterproofing materials.

#### **Performance Criteria**

- 1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied.
- 1.2 Safety requirements are followed in accordance with safety plans and policies.
- 1.3 Sign and barricade requirements are identified and implemented.
- 1.4 Plant, tools and equipment selected to carry out tasks that are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement.
- 1.5 Material quantity requirements are calculated in accordance with plans and/or specifications.
- 1.6 Materials appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use.
- 1.7 Environmental protection requirements for the project are identified and applied in line with environmental plans and regulatory obligations.

## **Element 2: Set out first course**

### **Performance Criteria**

- 2.1 Location and line of brickwork/block work wall is set out on concrete footing/slab to job drawings.
- 2.2 Span of arch is determined from prepared allotted arch centre plus 4mm.
- 2.3 Arch spans are set out to location for first course.

## **Element 3: Construct wall to arch level**

### **Performance Criteria**

- 3.1 Mortar mix is prepared and bricks/blocks are laid to form wall to set out.
- 3.2 All work is carried out to specifications and standards.
- 3.3 Gauge of abutting walls is maintained within standard tolerance at each course level.
- 3.4 Plumb and alignment of vertical wall face is maintained.
- 3.5 Bricks are cut.
- 3.6 Bricks/blocks are laid level and to line over length of wall.
- 3.7 Abutment jambs/piers are laid vertical up to springing line.
- 3.8 Bricks/blocks are laid in stretcher bond to springing line of arch with perpendicular joints maintained in vertical line.

## **Element 4: Construct arch centre**

### **Performance Criteria**

- 4.1 Arch centre is set out and curve is drawn up in accordance with specifications and plan.
- 4.2 Plan is transferred to material and cut to shape.

## **Element 5: Set up arch centre**

### **Performance Criteria**

- 5.1 Height to springing line is determined and height to crown of arch is confirmed to be within standard tolerance.
- 5.2 Height of toms and wedges or adjustable metal props is determined to set up and support timber arch centre.

- 5.3 Supports are adjusted to ensure arch centre is level at right angles to wall face and level across springing line.
- 5.4 Props, toms, packers and wedges are located for easy removal.
- 5.5 Position of central key brick/block is established for gauged arch and tape used to mark gauge.

**Element 6: Cut and lay bricks / blocks to form arch**

**Performance Criteria**

- 6.1 Bricks/blocks are cut and laid on centre to form arch to specifications.
- 6.2 All joints are checked to ensure equal size (parallel) on extrados.
- 6.3 Same size wedge shape is maintained on face.
- 6.4 Centreline of key brick/block wedge is maintained through vertical centre line of arch.
- 6.5 Even joint thickness is maintained around extrados for cut brickwork/block work.
- 6.6 All bricks are cut and laid to maintain even joints.
- 6.7 All joints are struck evenly to depth and shape to specifications.

**Element 7: Clean up**

**Performance Criteria**

- 7.1 Work area is cleared and materials disposed of, reused or recycled in accordance with legislation, regulations and job specifications.
- 7.2 Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers' recommendations and standard work practices.

**Registration Data**

<b>Subfield:</b>	General Construction
<b>Date first registered:</b>	28 September 2006
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<b>Body responsible for review:</b>	Namibia Training Authority