

REGISTERED NATIONAL STANDARD

UNIT OF COMPETENCY



Title:	Construct brick and block structural systems ¹				
TQF Level:	4	Credits:	5	Version:	1
National standard code:	NS161-04				
Associated qualification (and code):	National Certificate in Bricklaying and Blocklaying Level 4 QR-04-NQ-028-02-1005-26-01				
Approval date:	10 September 2026		Review date:	10 September 2031	
Purpose:	This unit describes the skills and knowledge required to construct brick and block structural systems, including the construction of load-bearing brick and block walls and engaged piers. It involves preparing for work, setting out structural brick and block systems, constructing load-bearing walls with appropriate reinforcement, finishing mortar joints, and conducting clean-up activities. The unit applies to bricklayers and blocklayers working on both new and existing structures and working independently. At this level, workers are expected to take responsibility for organising and completing tasks, following workplace procedures, meeting safety requirements, and ensuring compliance with Tonga National Building Code. The unit emphasises structural performance, accuracy in construction, and compliance with constructural engineering and regulatory requirements to ensure safe and durable brick or block systems. This unit supports bricklayers who are expected to take responsibility for assigned structural brick or block wall construction tasks and complete work independently while meeting Tonga National Building Code requirements. In successfully completing this unit standard, learners are able to: • Prepare the worksite, materials, tools, and equipment while following OHS and environmental procedures. • Interpret and apply construction plans, specifications, standards and codes relating to brick and block structures. • Plan and organise work tasks, materials, and sequencing to achieve efficient bricklaying operations. • Identify and control hazards associated with brick or block work (e.g., manual handling, silica exposure, working at heights).				

¹ Due to safety issues inherent in working with electricity and combustible substances, all training and assessment activities must be in accordance with Tonga National Building Code.

	• Calculate material quantities using measurements and construction formulas. • Select and prepare tools, equipment, and materials for structural brick or block work. • Safely and accurately set out load-bearing walls, blockwork bond, gauges and reinforcement placements. • Mix mortar to specified consistency and quality for different brick or block applications. • Lay bricks and blocks to line, level, plumb, and specified bond patterns. • Install horizontal and vertical reinforcing in accordance with specifications. • Construct structures maintaining correct gauge, alignment, and structural integrity. • Apply finishing techniques such as raking or ruling joints and cleaning surfaces to achieve required finish. • Ensure work meets required tolerances and quality standards. • Clean up work area and dispose of, reuse, or recycle materials according to environmental procedures. • Maintain and store tools and equipment in safe and serviceable condition. • Apply finishing techniques and ensure compliance with Tonga National Building Code. • Carry out clean-up and maintenance of tools, equipment, and work areas.
Learning Outcome 1 (LO1)	Prepare and organise work to construct brick and block load bearing walls.
Performance standards	1.1 Read, identify and apply brick and block structural systems requirements from plans, specifications and Tonga National Building Code; 1.2 Follow requirements in workplace safety and environmental documentation and workplace procedures; 1.3 Use measurements and apply formulas to calculate material quantities; 1.4 Determine job priorities and sequence job tasks in consultation with others on site; 1.5 Identify potential hazards and determine and implement control measures; 1.6 Select and use personal protective equipment (PPE) appropriate for job; 1.7 Select equipment and tools and report damage or faults; 1.8 Check conformity of materials against the specifications and place materials in preparation for the work.

Learning Outcome 2 (LO2)	Set out load bearing brick and block wall and engaged piers.
Performance Standards	2.1 Set out and mark engaged piers, brick and block wall; 2.2 Set out blockwork bond and gauge; 2.3 Set out location of horizontal reinforcing; 2.4 Mark position of articulated joints.
Learning Outcome 3 (LO3)	Construct load bearing brick and block walls
Performance standards	3.1 Mix mortar to meet job requirements; 3.2 Lay blocks to set out height between control joints, maintaining bond, engaged piers and centring starter bars; 3.3 Install and tie horizontal and vertical reinforcing to specified bed joints; 3.4 Install and secure roof tie down, bracing and vertical support; 3.5 Clean and prepare blockwork for formwork and core filling.
Learning Outcome 4 (LO4)	Finish mortar joints and clean up work area.
Performance standards	4.1 Finish joints to specified profile and depth to meet current industry standards; 4.2 Brush down face of blockwork to remove mortar residue; 4.3 Clear the work area and dispose of waste following environmental requirements; 4.4 Clean tools and equipment, check for serviceability and report damage or faults; 4.5 Store and secure tools and equipment following workplace procedures.
Pre-requisites	NS133-03 Apply <i>Occupational Health and Safety</i> (OHS) requirements, policies and procedures
Co-requisites	N/A
Underpinning skill and knowledge	The following skills and knowledge underpin this unit standard: <u>Skills:</u> Work Preparation Select, correctly fit and use personal protective equipment (PPE).

- Read and interpret plans, specifications, standards and codes relevant to brick or block structural systems.
- Identify and follow workplace safety, environmental documentation and procedures.
- Calculate material quantities using measurements and formulas.
- Sequence work tasks and determine job priorities in consultation with others.

Risk Management

- Identify hazards and implement appropriate control measures.
- Inspect and check tools, equipment and plant for faults and report issues.

Structural Construction

- Set out brick or block walls, engaged piers, blockwork bond, gauge, reinforcement locations and articulated joints.
- Mix mortar to required job specifications.
- Lay blocks to set-out height, maintain bond and centre starter bars.
- Install horizontal reinforcing, roof tie downs, bracing and vertical supports.
- Lay attached piers with reinforcement to specified heights.
- Clean and prepare blockwork for formwork and core filling.

Finishing and Housekeeping

- Finish mortar joints to required profile and depth in accordance with standards.
- Brush down blockwork to remove excess mortar.
- Clear work areas, dispose of, recycle or reuse materials safely and environmentally responsibly.
- Clean, check and store tools and equipment.

Knowledge:

Construction Standards and Documentation

- Tonga National Building Code and specifications for brick or block structural systems.

	• Workplace safety documentation and environmental procedures. Workplace Processes and Safety • Requirements for reading, interpreting and applying brick or block construction plans and specifications. • Job sequencing, task planning and collaboration on construction sites. • Workplace hazard identification and control measures for brick or block construction. • Safe use and maintenance of tools, equipment, plant and PPE. Structural Reinforcement Requirements and Techniques • Methods for setting out brick or block walls, engaged piers, block bonds, gauges and reinforcement placement. • Properties and preparation of mortar for structural brick or block work. • Structural principles for loadbearing brick and block wall. • Brick and block expansion, control joints, articulation joints. • Techniques for laying brick or block units to maintain structural integrity and meet tolerances. • Requirements for horizontal reinforcing, vertical support, articulated joints and roof tie down systems. • Installation and preparation requirements for core filling and formwork. Finishing and Quality Standards • Standards relating to mortar joint finishing profiles and depths. • Techniques for cleaning blockwork surfaces without causing damage. Environmental and Waste Management • Safe disposal, reuse and recycling of construction materials in compliance with workplace and environmental requirements.
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Assessment requirements

Assessment methods may include more than one of the following:

Direct Observation

Assessment of learners while they are performing tasks in real time in a real simulated environment.

- The learner performs practical tasks.
- The assessor watches the learner complete these tasks against a checklist or performance standards.

Assessor Requirements

- Use a structured observation checklist aligned to performance standards
- Observe multiple occasions to ensure consistency of competence.
- Record evidence of safe work practices, correct use of equipment, etc.
- Provide immediate feedback where appropriate.
- Ensure conditions reflect real workplace standards.

Oral Questioning

Verbal questions asked to assess the learner's understanding of knowledge and reasoning.

- Conducted during or after practical tasks.
- Can be structured (planned questions) or informal (follow-up probing).

Assessor Requirements

- Ask questions that test underpinning knowledge
- Use open-ended questions
- Confirm learner understanding where practical performance is not enough.
- Record responses clearly (notes or checklist).
- Adjust language to suit learner literacy levels.

Written Test

A structured assessment requiring learners to provide written responses.

- Short-answer questions, multiple choice, or case scenarios.
- Typically conducted off-site or in a classroom environment.

Assessor Requirements

- Design questions that assess knowledge.
- Ensure the test is clear, aligned to unit requirements and appropriate for language, literacy, numeracy levels

	• Mark responses using a marking guide or model answers. • Provide feedback and identify gaps in knowledge. • Ensure results reflect the learner's independent performance. Work-Based Activity Assessment conducted in a real workplace while the learner performs actual job tasks. • Learners complete normal workplace duties. • Evidence is collected over time. Assessor Requirements • Coordinate with workplace supervisors. • Gather evidence such as - Observation reports, Supervisor feedback, etc. • Verify that tasks meet unit performance standards. • Ensure authenticity (learner's own work). • Confirm competence across different situations and timeframes. Assessment should use a combination of the above methods to ensure sufficient, valid, authentic, and current evidence of competence in both skills and knowledge, in line with unit requirements. <u>Context of Assessment:</u> Competency is to be assessed in the workplace or a simulated workplace environment that accurately reflects a real workplace setting. Assessment is to comply with relevant regulatory or relevant standards' requirements. Assessment of essential knowledge will usually be conducted in an off-site situation.
Moderation arrangements	1. Training providers must have their own moderation system approved by TNQAB before accreditation is granted: a) Relevant internal moderation processes are documented; b) Assessment is planned for each unit, and moderation processes are integrated into such plan. 2. Unless specified elsewhere, external moderation is conducted by the National Qualifications unit of TNQAB for all unit components of a national qualification:

	a) Samples of assessed activities are submitted for moderation; b) Moderation (external) forms are available on request.
Resource requirements	1. Power point presentations 2. Trainer's Guide 3. Learner's Guide 4. Tonga National Building Code 5. Videos on structural brick or block construction 6. Plans and Specifications 7. Clay bricks and concrete blocks 8. Mortar materials (cement, sand, lime, water) 9. Additives for mortar (plasticisers, bonding agents) 10. Steel bars (starter bars, vertical reinforcement) 11. Horizontal reinforcement 12. Steel ties 13. Bond beams and lintels 14. Tie-down components and fixings 15. Core filling materials (e.g., grout or concrete) 16. Cleaning materials (e.g., acid solution for masonry cleaning) 17. Trowels 18. Brick hammer 19. Bolster chisel 20. Jointing tools 21. Tape measures 22. Levels (spirit level) 23. Squares 24. String lines and line pins 25. Bricklayers' profiles 26. Set-out rods or brickies' tape 27. Mixing equipment (manual; shovel, wheelbarrow or mechanical mixer) 28. Hand and power tools (including battery-operated tools, grinder) 29. PPE's 30. Site safety signage and barriers

	31. JSEA (Job Safety and Environmental Analysis) 32. Structured assessment and evidence-collection tools 33. Calculator (standard: fx82, fx100)
Requirements to complete this unit	There are four (4) Learning outcomes and twenty-two (22) Performance Standards to measure competence. To demonstrate competence, the person studying this unit is: - Required to demonstrate all LOs to the expected standards; - Required to attain an Achieved Grade (Competent) to fulfil the requirements of the Unit Standard; - Eligible to three (3) attempts to achieve the required competency within 14 days of the first attempt. Failure to achieve the required competency after three (3) attempts on the specific part of the assessment will require the person studying this Unit to re-enrol for the same Unit.
Important notes and definitions	<u>Notes:</u> - All training and assessment activities must be in accordance with Tonga National Building Code. - Assessors must comply with the Tonga national assessment and moderation requirements. <u>Definitions:</u> Bond Beam refers to a horizontal structural element (reinforced beam) within brick or block used to tie walls together and distribute loads. Brickwork Tolerances refers to acceptable limits of variation in brick or block work Control Joint / Articulation Joint refers to a joint designed to allow movement in brick or block due to temperature changes, shrinkage, or structural movement. Core Filling refers to the process of filling voids in masonry blocks with grout or concrete for structural strength.

5. *Engaged Pier* refers to a vertical structural support integrated into a wall to provide additional strength and load distribution.
6. *Gauge* refers to the vertical spacing of courses to ensure consistent height and alignment.
7. *Hierarchy of Control* refers to a system used to minimise workplace hazards, ranked from elimination to PPE.
8. *Horizontal Reinforcement* refers to steel reinforcement placed in bed joints to improve resistance to cracking and lateral forces.
9. *Jointing* refers to finishing the mortar joints to a specified shape and depth for structural and aesthetic purposes.
10. *JSEA (Job Safety and Environmental Analysis)* refers to risk assessment process.
11. *Level* refers to perfect horizontal alignment
12. *Line* refers to straight alignment along a length
13. *Load-Bearing Wall* refers to a wall designed to carry and transfer loads from the roof, floors, or other structural elements to the foundation.
14. *Loadbearing Wall* refers to a wall that supports structural loads from floors, roofs, or other elements.
15. *Masonry Structural System* refers to a construction system using brick or block units and reinforcement to form load-bearing elements of a building.
16. *Mortar* refers to mixture used to bond brick or block units.
17. *OHS (Occupational Health and Safety)* refers to workplace safety regulations and practices.
18. *Plumb* refers to perfect vertical alignment
19. *PPE (Personal Protective Equipment)* refers to safety equipment such as helmets, boots, gloves, and high-visibility clothing.
20. *Profile* refers to a temporary vertical support used to guide accurate bricklaying and maintain alignment.
21. *Raking joints* refers to removing mortar to create joint profile.

	22. Reinforcement refers to steel bars or mesh incorporated into brick or block to improve strength and structural performance. 23. Set Out refers to the process of marking positions and dimensions of walls and corners before construction begins. 24. Setting-Out Instruments refers to tools used to measure and align structures (e.g., tape measures, spirit levels, automatic and laser levels) 25. Silica dust refers to hazardous dust produced during cutting masonry materials. 26. Starter Bars refers to vertical reinforcing bars that extend from the footing into the wall structure. 27. Tie-Down System refers to a system used to secure roof structures to walls to resist uplift forces such as wind loads. 28. Tonga National Building Code refers to a set of technical provisions for the design and construction of buildings and structures in Tonga. 29. Vertical Reinforcement refers to steel bars placed vertically within wall cores to increase load-bearing capacity. 30. Work area refers to the particular section where tasks are performed at the work site.
Public comments on unit	Please contact TNQAB National Qualifications Unit (email EnquireNQ@tnqab.to or Telephone 28136) if you like to discuss or suggest changes to the details of this unit.