

REGISTERED NATIONAL STANDARD



UNIT OF COMPETENCY

Title:	Carry out measurements and calculations for tiling ¹				
TQF Level:	2	Credits:	4	Version:	1
National standard code:	NS167-02				
Associated qualification (and code):	National Certificate in Wall and Floor Tiling Level 3 QR-03-NQ-028-03-1005-26-01				
Approval date:	10 September 2026		Review date:	10 September 2031	
Purpose:	This unit describes the skills and knowledge required to carry out measurements and perform basic calculations to determine task and material requirements for tiling work. It involves selecting appropriate measuring tools, obtaining accurate measurements, and performing calculations such as perimeter, area, volume, ratios and percentages. It supports accuracy and efficiency in planning, estimating and completing tiling tasks by ensuring workers can correctly determine material quantities. This unit provides foundational numeracy competence essential for tiling tasks such as estimating materials, preparing work layouts, reading plans and confirming dimensions. In successfully completing this unit standard, learners are able to: • Familiarise with unit measurements • Accurately obtain measurements using appropriate methods and tools. • Use correct formulas and calculation methods to determine material quantities, areas, volumes and other numerical requirements for tiling tasks. • Select, check and apply measuring and calculating equipment suited to tiling activities. • Record measurements and calculation results accurately to support effective task planning, estimating and work execution.				

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.

Learning Outcome 1 (LO1)	Familiarise with unit measurements
Performance standards	1.1 Identify common metric and imperial units used in tiling; 1.2 Use scale ruler; 1.3 Use measuring tape; 1.4 Use electronic measuring devices; 1.5 Perform metric and imperial conversion.
Learning Outcome 2 (LO2)	Obtain measurements for tiling
Performance Standards	2.1 Select measuring and calculating equipment; 2.2 Obtain and record linear measurements accurately using a ruler, scale, tape or other measuring equipment. 2.3 Apply method of obtaining measurements required to meet tiling task requirements; 2.4 Re-check measurement method and calculation processes for accuracy.
Learning Outcome 3 (LO3)	Perform perimeter and circumference calculations relevant to tiling.
Performance Standards	3.1 Determine appropriate calculation factors; 3.2 Select correct formula for achieving required result; 3.3 Calculate, confirm and record material quantities; 3.4 Calculate, confirm and record perimeter and circumference.
Learning Outcome 4 (LO4)	Perform area and volume calculations relevant to tiling
Performance standards	4.1 Determine appropriate calculation factors; 4.2 Select correct formula for achieving required result; 4.3 Calculate, confirm and record material quantities; 4.4 Calculate, confirm and record areas and volumes.
Learning Outcome 5 (LO5)	Perform ratio and percentage calculations relevant to tiling
Performance standards	5.1 Determine appropriate calculation factors; 5.2 Select correct formula for achieving required result; 5.4 Calculate, confirm and record material quantities; 5.4 Calculate, confirm and record ratio and percentage.
Pre-requisites	N/A
Co-requisites	N/A

Underpinning skill and knowledge

The following skills and knowledge underpin this unit standard:

Skills:

Measurements

- Familiarise with unit measurements.
- Select appropriate measurement methods to meet tiling task requirements.
- Choose correct measuring tools (rulers, tape measures, trundle wheels, laser devices) and check them for serviceability.
- Take and record linear measurements accurately.

Calculations

- Select appropriate calculation factors
- Select correct formulas for required calculations (perimeter, circumference, area, volume).
- Calculate, confirm and record:
 - material quantities
 - areas and volumes
 - ratios and percentages
- Convert units between metres and millimetres accurately.

Practical Problem-Solving

- Apply calculation outcomes to determine material needs for tiling projects.
- Interpret task requirements and use numerical information effectively.

Documentation

- Record measurements and calculated results clearly and accurately for workplace use.

Knowledge:

Tiling Requirements

- Industry expectations and workplace standards for carrying out accurate measurements and calculations.

Measuring and Calculating Equipment

	• Uses and applications of equipment including: ○ tape measures ○ rulers ○ trundle wheels ○ laser measuring devices ○ electronic calculators Mathematical Concepts and Formulae • Formulae and processes for calculating: ○ Perimeter ○ Circumference ○ Area ○ Volume ○ Ratio ○ percentage • Methods for converting metres to millimetres and millimetres to metres. Workplace Application of Numerical Information • Procedures for interpreting specifications requiring calculations. • Importance of accuracy in determining project material quantities and dimensions.
Assessment requirements	<u>Assessment methods</u> 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	- Training providers must have their own moderation system approved by TNQAB before accreditation is granted: - Relevant internal moderation processes are documented; - Assessment is planned for each unit, and moderation processes are integrated into such plan. - Unless specified elsewhere, external moderation is conducted by the National Qualifications unit of TNQAB for all unit components of a national qualification: - Samples of assessed activities are submitted for moderation; - Moderation (external) forms are available on request.
Resource requirements	- Power point presentations on measurements and calculations - Trainer's Guide - Learner's Guide - Electronic calculators - Laser measuring equipment - Rulers - Scale rule - Tape measures - Trundle wheels - Structured assessment and evidence-collection tools

	11. Calculator (standard: fx82, fx100) 12. Construction drawing map
Requirements to complete this unit	There are four (5) Learning outcomes and twenty-one (21) 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> <i>Accuracy</i> refers to how close a measurement is to the true value; in this unit, measurements are accurate to 1 millimetre (mm). <i>Area</i> is the amount of surface space inside a shape, measured in square units (e.g. m²). <i>Calculation Factors</i> refer to numbers or values used in formulas to achieve correct measurement results. <i>Circumference</i> refers to the distance around a circular shape. <i>Computer-Based or Online Calculator</i> refers to digital tools used for tiling measurement and calculations. <i>Confirming Calculations</i> refer to checking calculations to ensure results are correct before use. <i>Construction Task Requirements</i> refer to measurement and calculation needs specific to completing a tiling work task.

8. **Electronic Calculator** refers to a handheld device used to perform mathematical calculations.
9. **Formula** is a mathematical rule used to calculate measurements such as area or volume.
10. **Laser Measuring Equipment** refers to electronic equipment used to measure distances quickly and accurately using a laser.
11. **Linear Measurement** refers to measuring straight lengths such as height, width or distance.
12. **Material Quantities** refer to the amount/number of materials required for a tiling task, calculated from measurements.
13. **Measurement** refers to the process of finding the size, length, area or volume of an object or space using standard units.
14. **Method of Calculation** refers to the chosen way of applying a formula to solve a measurement problem correctly.
15. **Percentage** is a number expressed as a fraction of 100, often used to calculate allowances or wastage.
16. **Perimeter** is the total distance around the outside of a shape.
17. **Ratio** is a comparison between two quantities showing their relative sizes.
18. **Recording Measurements** refer to writing down measurement results clearly and accurately.
19. **Ruler** is a straight measuring tool used for short linear measurements.
20. **Serviceability** refers to the condition of measuring equipment being safe and suitable for use.
21. **Specifications** refer to documents or instructions that outline how measurements and calculations must be carried out.
22. **Supervision** refers to working under guidance while carrying out measurements and calculations.
23. **Tape Measure** is a flexible measuring tool used to measure lengths and distances on site.
24. **Trundle Wheel** is a wheeled measuring device used to measure long distances on the ground.
25. **Unit Conversion** refers to changing a measurement from one unit to another.

	26. <i>Units of Measurement</i> refers to standard values used in tiling measurements, such as millimetres (mm) and metres (m). 27. <i>Volume</i> is the amount of space inside a three-dimensional object, measured in cubic units (e.g. m³).
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.