

Unit ID: 826

Domain

**ROAD CONSTRUCTION AND
MAINTENANCE - MATERIAL TESTING**

Title:

**Perform laboratory testing pertaining to
soils and gravel as part of material
testing operations**

Level: 2

Credits: 30

Purpose

This unit standard is intended for those who work in road construction and maintenance performing material testing operations. People holding credit for this unit standard are able to: Plan and prepare for testing under supervision; perform laboratory testing under supervision; record test readings under supervision; complete work related documents; and clean up work area.

Special Notes

1. Entry information:

Prerequisite:

- Unit 712 - *Comply with health, safety and environmental rules and regulation in road construction and maintenance work operations.*

2. Expected workplace production target are to be met.

3. Assessment evidence may be collected from a real workplace, a simulated workplace or an appropriately simulated environment in which road construction and maintenance operations are carried out.

4. Equipment and tools include but are not limited to scale, compaction hammers, crusher, moulds, surcharge weights, nuclear density gauge, sieves, liquid limit device, water, grooving tool, sample container, ovens and stationery.

5. Documentation include but are not limited to the following standard methods TMH1(Technical Methods for Highways):

- Method A1(a) - The wet preparation and sieve analysis of gravel, sand and soil samples.
- Method A1(b) - The dry preparation and sieve analysis of gravel, sand and soil samples
- Method A2. - The determination of the liquid limit of soils by means of the flow curve method.
- Method A3 - The determination of the plastic limit and plasticity index of soils.
- Method A5 - The determination of the percentage of material passing a 0.075 mm sieve in a soil sample.
- Method A7 - The determination of the maximum dry density and optimum moisture content of gravel, soil and sand.
- Method A8 - The determination of the California Bearing Ratio of untreated soils and gravels.

- Method A9 - The determination of the California Bearing Ratio of lime-stabilized soils and gravels.
 - Method A10(a) -The determination of the in-place dry density of soil or gravel by the sand replacement method.
 - Method A10(b) - The determination of the in-place dry density and moisture content of soils and gravels by nuclear methods.
 - Method A11T - Tentative method for the determination of the maximum dry density and moisture content of graded crushed stone and cohesionless sand by means of vibration compaction.
 - Method A12T - Tentative method for the determination of the relative density of soils.
 - Method A14 - The determination of the unconfined compressive strength of stabilized soils, gravels and sands.
 - Appendix to Method A14 - Procedure for the making of specimens for the determination of the unconfined compressive strength of stabilized soils, gravels and sands.
 - Method A16T Tentative method for the determination of the indirect tensile strength of stabilized materials.
 - Method B15 - The determination of the dry bulk density, apparent relative density and water absorption of material passing the 4,75 mm sieve.
6. Safe working practices include but are not limited to day-to-day observation of safety policies and procedures and compliance with emergency procedures.
 7. Performance of all elements in this unit standard must comply with all relevant workplace requirements, contractual agreements and manufacturers' specifications.
 8. Regulations and legislation relevant to this unit standard include but are not limited to the following:
 - Labour Act, No. 11 of 2007 as amended
 - Occupational Health and Safety Regulations No. 18, 1997 and 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. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website www.nta.com.na.

Elements and Performance Criteria

Element 1: Plan and prepare for testing under supervision

Performance Criteria

- 1.1 Work instructions, including plans, specifications, quality requirements and operational details are obtained, explained, clarified and applied to the allocated task.

- 1.2 Safety requirements, including personal protective clothing and equipment are obtained from the site safety plan, workplace policies and procedures, and applied to the allocated task.
- 1.3 Traffic control requirements are obtained and implemented according to workplace requirements.
- 1.4 Laboratory apparatus and equipment selected to carry out tasks are checked for consistency with the requirements of the job, their usability and calibrated faults are rectified or reported prior to commencement.
- 1.5 Instructions requesting laboratory test are matched with labels attached to bags and containers holding material samples.
- 1.6 Material samples are prepared according to standard methods of testing and workplace procedures.
- 1.7 Environmental protection requirements are obtained and applied according to workplace procedures and environmental management plan.

Element 2: Perform laboratory testing under supervision

Performance Criteria

- 2.1 Selected apparatus are prepared according to the standard methods of testing and manufacturers' specification.
- 2.2 The laboratory tests are performed according to standard methods of testing and manufacturers' specification.

Element 3: Record test readings under supervision

Performance Criteria

- 3.1 Laboratory test readings are recorded on suitable prescribed forms in line with details contained in standard methods of testing manuals.
- 3.2 Recorded results are handed to supervisor.

Element 4: Complete work related documents

Performance Criteria

- 4.1 Work related documents are completed in accordance with contract and workplace requirements.
- 4.2 Maintenance and service related documents are completed in accordance with manufacturer and workplace requirements.
- 4.3 Documents related to accidents or other incidents are completed in accordance with workplace requirements.

Element 5: Clean up work area

Performance Criteria

- 5.1 Work tables are cleared and materials disposed of or recycled in accordance with environment management plan.
- 5.2 Apparatus and laboratory instruments are cleaned, checked, maintained and stored in accordance with manufacturers' and laboratory's recommendations and standard work practices.
- 5.3 Unused and untested materials are safely stored and stacked for future use.

Registration Data

Subfield:	Road Construction and Maintenance
Date first registered:	
Date this version registered:	
Anticipated review:	
Body responsible for review:	Namibia Training Authority