



DRAFT TANZANIA STANDARD

Test methods – Determination of strength of cored specimens of field compacted, matured, cementitiously stabilized material.

TANZANIA BUREAU OF STANDARDS

0 National foreword

The Tanzania Bureau of Standards is the statutory national standards body for Tanzania, established under the Act.No.3 of 1975, amended by Act.No.2 of 2009.

This draft Tanzania Standard is being prepared by **BCDC 5 Roads Technical Committee under the supervision of the Building and Construction Standards Divisional Committee (BCDC).**

In the preparation of this Tanzania Standard, reference was made to ***SANS 3001-GR52:2010 Sampling and preparation of cored specimens of field compacted, matured, cementitiously stabilized material, published by SOUTH AFRICAN NATIONAL STANDARDS***

1 Scope

This Tanzania Standard applies to cementitiously stabilized material (fine grained and coarse-grained soils) and describes a method for sampling and preparing core specimens taken from matured stabilized pavement layers for strength testing.

2 Definitions

For the purposes of this Tanzania Standard, the following definitions shall apply:

2.1 Acceptable

acceptable to the authority administering this standard, or to the parties concluding the purchase contract, as relevant.

2.2 Cementitious stabilizing agent.

chemical materials, such as cement, hydrated lime, blends of cement or lime and cementitious extenders that are used to develop compressive and tensile strength when mixed with road construction materials.

2.3 Indirect tensile strength

ITS

stress at failure generated by the load required to split a cylindrical specimen of height 127 mm and of diameter 152 mm at a load application rate of 40 kN/min

2.4 Matured

mixture that has developed into a solid conglomeration and gained strength over a period of months or years.

2.5 Fine grained Soil

fine natural particles of silt and clay size.

2.6 Coarse grained soil

Coarse particles of crushed stone, gravel and sand.

2.7 Unconfined compressive strength

UCS

stress at failure generated by the load required to crush a cylindrical specimen of height 127 mm and of diameter 152 mm to total failure at a load application rate of 150 kN/min.

3 Apparatus

- 3.1.** Coring machine, equipped with a core barrel of diameter 152 mm and diamond cutting crown capable of coring a length of at least 300 mm.
- 3.2.** Diamond or carborundum saw.
- 3.3.** Vernier calipers, measuring to at least 150 mm \pm 0,5 mm.
- 3.4.** Silicone oil or grease.
- 3.5.** Putty, epoxy resin quick-setting type.

4 Indirect tensile Strength (ITS) testing apparatus, as described in **The United Republic of Tanzania Ministry of works, Laboratory Testing Manual (2000)**.

4.1 Sampling of core specimens

Use the coring machine to core through the stabilized layer and extract core specimens.

NOTE: The core barrel and crown are normally cooled with water. In cases where the cores are particularly fragile the use of a compressor to provide air as a coolant may be considered.

4.2 Preparation of the test core.

NOTE: The test cores should have a diameter of not less than 152 mm, larger core barrels with a diameter of up to 300 mm may be used.

4.2.1. *Inspect the test core for cracks that will invalidate the results. When these are noted, record this in the test report and record the result as questionable.*

4.2.2. *Use the diamond or carborundum saw to trim the uneven ends of the core, cut to a length of between 100 mm and 130 mm at 90° to its sides (axis).*

4.2.3. *Use the callipers to determine the length of the core, taking at least four equally spaced measurements, and record the average length to the nearest 1 mm.*

4.2.4. *Determine the diameter of the core, taking at least three measurements at right angles to each other, equally spaced along the length of the core, and record the average diameter to the nearest 1 mm.*

5 Procedure

5.1. Unconfined compressive strength (UCS) testing

For UCS testing, follow the procedure as described in Laboratory Testing Manual (MoW –2000).

5.2. ITS testing

Coat the bearing surfaces of the two ITS loading platens with a thin coat of silicone oil or grease.

5.2.1. *Mix approximately 20 ml of the epoxy resin putty.*

5.2.2. *Spread half of the putty on each loading strip over the full length that bears against the core.*

5.2.3. *Place the curved side of the specimen on the lower concave loading platen and position the upper loading platen on top of the specimen, diametrically opposite the lower loading platen.*

5.2.4. *Centre the load transfer plate on top of the upper loading platen and place the assembly centrally under the loading ram of the compression testing machine.*

5.2.5. *Apply a load of 0.1 KN to the specimen to seat the loading platens. Inspect the assembly for symmetry and adjust if necessary.*

5.2.6. *Remove all the putty squeezed out from under the bearing strips.*

5.2.7. *Allow the putty to harden before proceeding with the test as described in **The United Republic of Tanzania Ministry of works, Laboratory Testing Manual (2000)**.*

6 Test report

On an acceptable form, report the depth to which the stabilized layer is sampled, to the nearest 5 mm, and the average length and diameter of the core to the nearest 1 mm. Note any cracks, crumbling or aggregate loss that may affect the strength of the core and result in a questionable result (see 4.2.1)

Bibliography

- **The United Republic of Tanzania Ministry of works**, Laboratory Testing Manual (2000).
- **TMH1**, Standard methods of testing road construction materials.
- **SANS 3001-GR53**, Civil engineering test methods – Part GR53: Determination of the unconfined compressive strength of compacted and cured specimens of cementitiously stabilized materials.
- **SANS 3001 – GR54**, Civil engineering test methods – Part GR54: Determination of the indirect tensile strength of compacted and cured specimens of cementitiously stabilized materials.