

## **DRAFT TANZANIA STANDARDS**

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### **TBS/MMDC 2 (5179) P3 Glossary of mining terms - part 2: Boring and Exploration**

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**TANZANIA BUREAU OF STANDARDS**

# Glossary of Mining terms.

## Part 2: Boring and Exploration

### 1 Foreword

This draft Tanzania Standard is being prepared by the Mining Technical Committee (MMDC 2), under the supervision of the Mining and Minerals Standards Divisional Committee (MMDC).

This draft Tanzania Standard consists of the following parts, under the general title Glossary of Mining terms:

Part 1: Surveying.

Part 2: Boring and exploration.

Part 3: Drilling and blasting.

Part 4: Ventilation

Part 5: Shafts and associated equipment.

Part 6: Transport.

Part 7: Drainage.

Part 8: Strata control.

Part 9: Geology.

Part 10: Winning and working.

Part 11: Electrical engineering and lighting.

In preparation of this draft Tanzania standard assistance was derived from Indian national standard IS 15838:2008 Mining – Glossary of terms and British standard BS 3618-3:1971 Glossary of mining terms, Part 3: Boring and Exploration.

### 2 Scope

This standard covers the definitions of terms used in mining industry in connection with boring and exploration.

### 3 Terms and Definitions

The following definitions apply to the terms related to boring and exploration in mining industry.

**3.1 Air Flushing** — The circulation of air through the drilling apparatus during drilling to cool the bit and to remove the cuttings from the hole.

**3.2 Auger** — A tool, developed from the Archimedean screw, used for soil sampling or the drilling of shallow holes.

**3.3 Auger Stem** — A long rod used in rope drilling to increase the weight acting on the bit.

**3.4 Bailer** — A tube, fitted with a valve at its base, which is lowered into a borehole to remove cuttings and water.

- 3.5 Banka Method** — A manual method of boring used for sampling alluvial deposits.
- 3.6 Beche** — See 'Fishing tools'.
- 3.7 Bentonite** — A special form of thixotropic clay used in the composition of drilling mud.
- Note: Thixotropic clays are those clays that are weakening when they are remolded and increasing in strength when allowed to stand undisturbed.
- 3.8 Bevel-Wall Bit** — A diamond coring bit with its inner walls tapered to house a split ring core lifter.
- 3.9 Bit** — The cutting tool of a drilling or boring appliance.
- 3.10 Boart** — A diamond of industrial grade used as the cutting element in drill bits; known variously as diamond, bort, bortz, carbon, congo, etc.
- 3.11 Bort** — See 'Boart'.
- 3.12 Bortz** — See 'Boart'.
- 3.13 Borehole Logging** — The determination of the physical, electrical and radioactive properties of the rocks traversed by a borehole.
- 3.14 Boring Head** — The assembly which applies the drilling pressure and rotation to the drill rods.
- 3.15 Bottom Discharge Bit** — A diamond coring bit having a series of longitudinal holes along the length of the crown to provide a straight flow of flushing media through the face of the bit to facilitate minimum contact of flushing media with the incoming core to minimize core loss.
- 3.16 Bracehead** — A long handle used to turn the drill string in percussive drilling.
- 3.17 Bull-Nose Bit** — A non-coring diamond-set bit which can be in the form of a bull nose bit, pilot bit or concave bit.
- 3.18 Bull Wheel** — A reel used in rope drilling to accommodate the boring rope by which the bit is suspended in the hole.
- 3.19 Cable Drilling** — A system of percussive drilling in which the drill string is suspended at the end of a long rope.
- 3.20 Calf Wheel** — A reel used in rope drilling to accommodate the boring rope by which the casing is raised or lowered.
- 3.21 Caliper** — An instrument used in conjunction with a microlog which, when lowered down a borehole, measures and records the internal diameter throughout its depth.
- 3.22 Calyx** — A cylindrical container fitted above the core barrel to catch the coarse cuttings which tend to fall back to the bottom of the hole.
- 3.23 Calyx Drilling** — A method of rotary drilling using a toothed cutting bit or chilled shot.
- 3.24 Casing** — Piping used to support the sides of a borehole. Flush coupled casing has female connection at both ends and while joining with other casing a coupling with two male connections is used. Flush joint casing has a male thread at one end and female thread at the other; no coupling is used.
- 3.25 Casing Bit** — A diamond-set rotary bit designed to bore out an annulus slightly larger than the casing. It is withdrawn before the casing is inserted.
- 3.26 Casing Drive Hammer** — A weight used to drive casing down a borehole.

- 3.27 Casing Drive Head** — A collar screwed to the top of the column of casing to prevent the casing from being damaged by the impact of the drive hammer.
- 3.28 Casing Drive Shoe** — A hardened steel shoe screwed to the lower end of the casing to protect the casing when it is driven down a hole by percussive means.
- 3.29 Casing Jar Hammer** — A drive hammer used to extract casing.
- 3.30 Casing Shoe** — A diamond or tungsten carbide (T. C.) set rotary bit screwed to the end of a casing string. It clears the way for casing by reaming the already drilled hole and allows the drilling string to pass through for further drilling.
- 3.31 Cathead** — A winch used primarily to raise or lower casing.
- 3.32 Cavings** — Rock fragments which fall from the sides of a borehole.
- 3.33 Chilled Shot Bit** — A flat-surfaced bit used with hardened steel shot to drill rock by a milling action.
- 3.34 Chilled Shot Drilling** — A method of rotary drilling in which chilled steel shot is used as the cutting medium.
- 3.35 Chopping Bit** — A chisel-bit used in rotary drilling to break up dropped core or broken rock.
- 3.36 Circulating Fluid** — The fluid, which may be water, mud or air, circulated through the drilling apparatus during drilling. Its chief functions are to remove the cuttings, to cool the bit, and in the case of mud to support the sides of the hole.
- 3.37 Circulating Pump** — The pump used to circulate mud or water through the drilling column.
- 3.38 Clamps** — A tool used at the mouth of a borehole to grip the drill rods or the casing, as these are being inserted or withdrawn.
- 3.39 Clinometer** — An instrument used to determine the amount and direction of dip of rock strata.
- 3.40 Collar** — The mouth of a borehole.
- 3.41 Collaring** — The operation of starting to bore a hole.
- 3.42 Concave Bit** — See 'Bull-Nose Bit'.
- 3.43 Conductor Casing** — The first length of casing inserted in a borehole.
- 3.44 Congo** — See 'Boart'.
- 3.45 Core** — The cylindrical sample of rock bored out during core drilling.
- 3.46 Core Barrel** — The cylindrical container which receives the core as it is drilled (see also 'Double-Tube', 'Single-Tube', 'Split Core Barrel' and 'Wire Line Core Barrel').
- 3.47 Core catcher** — A spring clip at the base of the core barrel which enables the core to be broken off from the rock formation at the end of each run and prevents the slippage of core while being lifted/brought out of the hole.
- 3.48 Core clip** — See 'Core catcher'.
- 3.49 Core Drilling** — A method of rotary drilling in which a core is recovered.
- 3.50 Core Lifter** — See 'Core catcher'.
- 3.51 Core Picker** — A cylinder with flat internal springs used to recover dropped core.

- 3.52 Core Shell** — A cutting cylinder, fitted between the bit and the core barrel or casing, used to maintain the diameter of the borehole. (The outside wall may be set with diamonds or hard metal.)
- 3.53 Core spring** — See 'Core catcher'.
- 3.54 Counter Flush Boring** — A method of core drilling in which the circulating fluid passes down the borehole and returns up the inside of the rods, providing continuous recovery of the core.
- 3.55 Cross Bit** — A percussive bit which has four chisel edges arranged in a cross.
- 3.56 Crown** — Synonymous with bit; also, used to denote that part of a bit containing the diamonds.
- 3.57 Crown Block** — A pulley block mounted at the top of a derrick from which the traveling block is suspended
- 3.58 Cruciform bit** — See cross bit.
- 3.59 Dart** — See 'Fishing Tools'.
- 3.60 Deflection** — The intentional alteration of the course of a borehole in directional drilling.
- 3.61 Deflection Wedge** — A wedge-shaped tool inserted in a borehole to direct the bit along a prescribed course.
- 3.62 Derrick** — The framework over a borehole, used primarily to allow lengths of drill rod to be added to the drilling column.
- 3.63 Deviation** — The wandering of a borehole from its intended course.
- 3.64 Diamond** — See 'boart'.
- 3.65 Diamond Bit** — A rotary bit using diamonds as the cutting media.
- 3.66 Dip Meter** — An instrument used to record the amount and direction of the dip of strata exposed in the sides of a borehole.
- 3.67 Directional Drilling** — Drilling in which the course of a borehole is controlled by deflection wedges or other means. The technique of directional drilling is used:
- a) To deflect a deviated borehole back on to course, and
  - b) To deflect a borehole off course, either to bypass an obstruction in the hole or to take a second core. The drilling of a bore in a predetermined direction.
- 3.68 Double Tube Core Barrel** — A core barrel fitted with an inner tube to protect the core from erosion by the circulating fluid.
- 3.69 Drag Bit** — A rotary bit which has two or more cutting blades or wings with hard-faced cutting edges (various types are the two-wing, three-wing, fish-tail and pilot bits).
- 3.70 Draw Works** — The winch used in rotary drilling to raise and lower the drilling column and casing.
- 3.71 Drill Collar** — A heavy drill rod used immediately above the core barrel to minimize deviation of the hole.
- 3.72 Drill Head** — See 'Boring Head'.
- 3.73 Drilling Rate** — The overall rate of advancement of the borehole.

- 3.74 Drill Rods** — Lengths of rod coupled together forming the drilling column, to the end of which the bit is attached.
- 3.75 Drill Stem** — See 'Auger stem'.
- 3.76 Drill String** — The string of tools commonly used in rope drilling, namely, rope socket, sinker bar, sliding jars, drill stem and drill bit.
- 3.77 Drilling Column** — The column of drill rods the end of which the core barrel and/or bit is attached.
- 3.78 Drilling rate** — The overall rate of advancement of the borehole.
- 3.79 Drive hammer** — See 'Casing drive hammer'.
- 3.80 Drive head** — See 'Casing drive head'.
- 3.81 Drive Rod** — A splined rod which is the drill head of a diamond drilling apparatus by means of which pressure and rotation are applied to the column of drill rods.
- 3.82 Drive shoe** — See 'Casing drive shoe'.
- 3.83 Earth auger** — See 'Auger'.
- 3.84 Face discharge bit** — A type of diamond bit of similar design to that of the bottom discharge bit. The flushing water passes down the annular space between the inner and outer tubes of the core barrel and is discharged through holes in the face of the bit without washing against the core.
- 3.85 Fir-Tree Bit** — A rotary bit in which a number of cutting edges are arranged behind a pilot bit to enlarge the hole.
- 3.86 Fishing Tools** — Tools used to recover objects lost or stuck down a borehole. such as a length of rods, remaining in the hole after the drill column has broken (see 'Beche', 'Dart', 'Overshot assembly', 'Rotary Tap', 'Spear' and 'Spring Dart').
- 3.87 Fish-Tail Bit** — See 'Drag Bit'.
- 3.88 Flush-Coupled Casing** — See 'Casing'.
- 3.89 Flush Joint Casing** — See 'Casing'.
- 3.90 Four Cutter Bit** — See Roller Rock Bit.
- 3.91 Gamma-Ray Log** — The record obtained in borehole logging of the radioactive emission of the rocks traversed by a borehole.
- 3.92 Geochemical Prospecting** — A method of mineral exploration based on the systematic measurement of the chemical properties of rocks, soils, river sediments, waters, etc.
- 3.93 Geophone** — An electromechanical device/sensor to record the seismic waves.
- 3.94 Geophysical Prospecting** — The making and interpretation of certain physical measurements to obtain information of the sub-surface geological structures.
- 3.95 Gravimeter** — An instrument used to measure relative values of gravitational force, indirectly depicting density of underlying rock formation.
- 3.96 Grief stem** — The rod usually square in section attached to the top of the drill column in rotary drilling. It passes through the rotary table and is turned by it, but is free to slide down through it as the borehole deepens.

- 3.97 Guide rod** — See 'Drill collar'.
- 3.98 Hand auger** — See 'Auger'.
- 3.99 Hand-Set-Bit** — A rotary bit in which diamonds are set in activities drilled in the surface of the bit.
- 3.100 Hoist** — See 'Draw Works'.
- 3.101 Impregnated Bit** — A bit having very small diamond grits located at random throughout the sintered matrix. In the course of drilling the sintered matrix wears out gradually allowing new diamond grits to expose for cutting action.
- 3.102 Inclinometer** — An instrument used to determine the amount and direction of deviation of a borehole from vertical.
- 3.103 Jar Hammer** — See 'Casing Jar Hammer'.
- 3.104 Kelly** — See 'Grief stem'.
- 3.105 Laterolog** — A type of electrical log giving optimum value of electrical resistivity of rocks traversed by a borehole.
- 3.106 Lifting Bail** — The link by which the water swivel is suspended.
- 3.107 Marsh Funnel** — A funnel used to measure the viscosity of drilling mud.
- 3.108 Microlog** — The record obtained in borehole logging of the porosity of the rocks traversed by a borehole.
- 3.109 Monkey** — See 'Casing Drive Hammer'.
- 3.110 Mud Balance** — An instrument used to measure the density of drilling mud.
- 3.111 Mud-Flush Drilling** — A method of drilling in which a mud of controlled physical properties is used as the circulating fluid.
- 3.112 Mud pump** — See 'Circulating pump'.
- 3.113 Neutron Log** — The record obtained in a borehole logging by measurement of captured neutrons giving an index of hydrogen content/porosity of the rock traversed in a borehole.
- 3.114 Off-take** — A length of boring rods unscrewed and detached at the top of a borehole.
- 3.115 Overshot Assembly** — See 'Fishing Tools'.
- 3.116 Penetration Rate** — The actual rate of penetration of drilling tools.
- 3.117 Penetrometer** — An instrument which automatically records the depth of drilling and the penetration rate.
- 3.118 Percussive Drilling** — A method of drilling in which repeated blows are applied by the bit which is rotated intermittently.
- 3.119 Pilot** — A smooth bar used to guide a reaming bit or casing bit in the hole.
- 3.120 Pilot Bit** — See 'Plug Bit' and 'Drag Bit'.
- 3.121 Plug Bit** — See 'Bull-Nose Bit'.
- 3.122 Prove** — To ascertain the character of the strata by boring or tunneling.

- 3.123 Rathole** — A hole drilled alongside a borehole to accommodate the kelly during rod changing.
- 3.124 Reaming Bit** — A rotary bit used to enlarge the diameter of a borehole.
- 3.125 Reaming Pilot** — See 'Pilot'.
- 3.126 Reaming Shell** — See 'Core Shell'.
- 3.127 Recovery Tap** — See 'Fishing Tools'.
- 3.128 Reversed Flush Boring** — See 'Counter Flush Boring'.
- 3.129 Rig** — The complete equipment used for drilling a borehole.
- 3.130 Rocking Beam** — The beam used to impart a reciprocating movement to the drilling column in percussive drilling.
- 3.131 Rod stand** — See 'Off-take'.
- 3.132 Roller Rock Bit** - A rotary bit fitted with two or more hardened steel or tungsten carbide tipped rollers of cylindrical or conical form (variously known as two-cone, three-cone or four-cutter bits, etc.).
- 3.133 Rope Drilling** — See 'Cable Drilling'.
- 3.134 Rose Bit** — A rotary bit used to mill through steel objects lost in a borehole.
- 3.135 Rotary Drilling** — A method of drilling in which rotation and thrust are applied to the bit, producing a continuous cutting action.
- 3.136 Rotary Table** — The mechanism used in some forms of rotary drilling to rotate the drilling column.
- 3.137 Round Trip** — The operation of withdrawing the drill rods and bit, etc., from the hole, of extracting core, replacing rods and bit and resuming drilling.
- 3.138 Sand Reel** — The reel on which the bailer rope is wound.
- 3.139 Sediment Tube** — See 'Calyx'.
- 3.140 Set-Out** — See 'Off-take'.
- 3.141 Shearmeter** — An instrument used to measure the gel strength of drilling mud.
- 3.142 Single-Tube Core Barrel** — The simplest core barrel, having only a single cylindrical tube.
- 3.143 Sinker Bar** — A heavy rod used to increase the snatching effect of the sliding jars in rope drilling.
- 3.144 Sintered Bit** — A rotary bit in which diamonds are located in a predetermined pattern at the surface of a sintered matrix.
- 3.145 Sliding Jars** — A sliding joint used in rope drilling to apply a snatch to the bit at each upward stroke.
- 3.146 Slips** — See 'Clamps'.
- 3.147 Sludge** — Rock cuttings produced by the drill bit.
- 3.148 Sludge Barrel** — See 'Calyx'.
- 3.149 Slush Pump** — See 'Circulating Pump'.
- 3.150 Spear** — See 'Fishing Tools'.
- 3.151 Split Core Barrel** — A type of core barrel which can be opened longitudinally to remove the core.

- 3.152 Spring Dart** — See 'Fishing Tools'.
- 3.153 Spudding** — The operation, in rope drilling, of boring through the sub-soil at the start of a hole.
- 3.154 Spudding Bit** — A heavy chisel-bit used in percussive drilling to drill through sub-soil.
- 3.155 Standpipe** — See 'Conductor Casing'.
- 3.156 Surface casing** — See 'Conductor Casing'.
- 3.157 Swivel head** — See 'Drill head'.
- 3.158 Tackle** — See 'Fishing Tools'.
- 3.159 Tectonometer** — An apparatus used on the surface to obtain knowledge of the structure of the underlying rocks.
- 3.160 Three-Cone Bit** — See 'Roller Rock Bit'.
- 3.161 Tiller** — See 'Bracehead'.
- 3.162 Traveling Block** — The pulley block which hangs below the crown block and is used for lifting the drilling column.
- 3.163 Turbo Drilling** — A system of drilling in which the bit is directly driven by a turbine at the bottom of the hole.
- 3.164 Two-Cone Bit** — See 'Roller Rock Bit'.
- 3.165 Under Reaming Bit** — An expanding bit used to enlarge the diameter of the hole below the casing to allow the casing to be lowered further down the borehole.
- 3.166 Walking Beam** — See 'Rocking Beam'.
- 3.167 Wall Scraper Bit** — A Rotary bit used to enlarge the diameter of a borehole.
- 3.168 Water Swivel** — The swivel coupling through which the circulating fluid enters the drilling column.
- 3.169 Wedge Reaming Bit** — A tapered or bull-nose bit used to restart drilling after a deflection wedge has been fitted into a borehole.
- 3.170 Wedge Rose Bit** — A rotary bit used to mill off part of the top ring of a deflection wedge.
- 3.171 Weight Indicator** — An instrument which records the weight of the column of rods suspended from the boring rope.
- 3.172 Whipstock** — See 'Deflection wedge'.
- 3.173 Wire Line Core Barrel** — A double tube core rotary barrel, the inner tube of which can be removed to extract a core without withdrawing the drill rods.