Masters in innovative, cutting-edge drilling solutions
Leading global experts in drilling solutions that support our clients’ unique needs with our specialised in-house equipment design, manufacturing, training and maintenance capabilities.
WHO WE ARE

Master Drilling, established in 1986, is a global technology solutions driven company, focused on delivering a fully mechanised range of services to the mining, civil and energy sectors. As the trusted partner of choice, our business model is characterised by cutting-edge technology, innovative solutions and tailor-made designs, coupled with a flexible support and logistics chain. We partner with our clients during every project touchpoint – from exploration phase to the production and capital stages.

Our leading experts and advisors strive to provide a solution for every operational challenge – be it access, transportation, ventilation or analysis – focusing on the continuous research and development of new techniques and methods.

Master Drilling is listed on the Johannesburg Stock Exchange (JSE).
WE CHALLENGE
THE STATUS QUO
TO PROVIDE OUR
CLIENTS WITH
SPECIALISED,
ADAPTIVE AND
INTEGRATED
DRILLING
SOLUTIONS
WHY ARE WE DIFFERENT

SPEED
Our automated drilling operations, compared to conventional methods of drilling and blasting, allow us to complete jobs and complete operations in record time.

EFFICIENCY
We enhance our clients productivity through remote operation and monitoring, reducing manpower costs, ensuring safety and real-time sample grading.

ACCURACY
We have good aim. Efficiently locating productive ore bodies and meeting your analysis requirements is what we are about.

FLEXIBILITY
The flexibility, simplicity and mobility of our equipment, as well as the customised designs that match the individual needs of our clients.

INNOVATION
Arising from our continual search for cost-saving, state-of-the-art designs and capacities that have allowed us to meet unique challenges.

SCALE
Economies of scale resulting from owning and operating the largest fleet of drill rigs in the world.
Master Drilling is a global business with geographic diversification being part of our strategy as it broadens our growth potential and reduces our overall risk.

We tailor solutions to meet the specific conditions and challenges faced by our clients.
CLIENT BASE
Our track record speaks for itself

We provide specialised drilling services to blue-chip, major and mid-tier companies in the mining, civil and energy sectors, across a number of commodities.

SEE OUR CLIENTS HERE
OUR APPROACH

We challenge the status quo to provide our clients with specialised, adaptive and integrated drilling solutions.
OUR ZERO HARM PHILOSOPHY

Our aim is not only to comply with stipulated health and safety codes, but also to continually exceed the targets we have set for ourselves as a global business and a responsible corporate citizen.

This means a focus on:

- Identifying and reviewing safety, health, environmental and quality risks and hazards through performance measurement, ensuring effective corrective action and training
- Ongoing health and safety initiatives for employees and surrounding communities
- The efficient use of resources and a focus on reducing our carbon footprint

Master Drilling Group Ltd is ISO 9001, ISO 14001, BS OHSAS 18001 certified
OUR SERVICES

We have a comprehensive portfolio of niched services, adapting to and meeting our clients’ requirements.

ROCK BORING
Our raise boring fleet of 128 rigs is the largest in the world. With our larger diameter rigs we are able to drill depths up to 1.5 km.

SLIM DRILLING
Master Drilling has a fleet of equipment that is highly specialised and the first of its kind to be brought into Africa.

SUPPORT SERVICES
Our service division additionally undertakes design, engineering, manufacturing, customisation and maintenance support for our drilling activities.
**RAISE BORING**

We have over 30 years’ experience in this field, and our raise boring fleet is the largest in the world. With over 100 rigs that operate quickly and efficiently in hard rock, we are able to drill up to a depth of 1.5km.

**APPLICATION**
- Drill shafts for ventilation, transferring ore, rock storing silos & hoisting to the surface.
- Tunnels route waste water underground for disposal and access rail system shafts.
- Hydro Electric or Pump Storage plants for pressure shafts & access nuclear storage facilities.

**BENEFITS**
- No explosives required - a lower cost alternative in certain applications and scale compared to conventional methods
- A fast and efficient way of excavating rock
- Stronger - stable circular excavation is completed with no damage to the sides of the hole or shaft

**HORIZONTAL RAISE BORING**

We have pioneered HRB technology and applications worldwide. HRB is similar to traditional raise boring where a contact tunnel is bored horizontally.

**APPLICATION**
- Used where a horizontal excavation is required and a chamber is available at both ends.
- Excavating tunnels through mountains to connect parallel metro and rail tunnels.
- For nuclear storage tunnels or short tail races in hydro-electric plants.

**BENEFITS**
- Has lower support requirements due to stable circular excavation
- Improved production advance rates as a result of continuous excavating cycle
- Compact equipment design contributes to greater mobility. More cost effective and reliable when compared to a TBM system

**BOX HOLE BORING**

This mode of drilling is conducted underground from the bottom upward to create access. Master Drilling currently has the largest fleet of box hole drilling machines in the world.

**APPLICATION**
- Holes are drilled from the bottom up to the intersection of the ore body. This is then used as a transfer pass for dropping material from the reef/ore horizon downwards where it can be collected and transported; or as a ventilation shaft to the mining location.

**BENEFITS**
- Drilled upwards, no typical holing point is required
- Personnel are not required to enter the excavation; enhancing safety
- Safer, faster and a lower cost alternative to Alimak excavation
- Drill rods feature a unique non-rotating stabiliser design

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**ROCK BORING**

- Raise Boring
- Horizontal Raise Boring
- Box Hole Boring
- Slot Boring
- Reef Boring
- Mobile Tunnel Boring
- Blind Shaft Boring System
Slot boring holes tend to be smaller in diameter than box hole and raise boring, as the rigs can start drilling without any civil preparation at the base of the machine. If a slot is drilled and completed, the machine will move to the next slot position without delay. Slots are typically between 0.6m and 2.4m in diameter and 35m in length.

Reef boring is related to narrow vein ore bodies, where equipment is moved underground and positioned in such a way that holes can be drilled on the reef horizon. Small single pass holes are drilled and, if required, enlarged by reaming which can then be backfilled if required.

The Mobile Tunnel Boring technology is specifically designed for horizontal and inclined hard rock applications; eliminating the need to drill and blast. The high-level automation allows us to excavate tunnels with a smooth circular cross-section, safely and cost effectively.
CORE DRILLING

This method provides clients with high quality geological samples, allowing for accurate modelling and resource estimation. Core samples also provide invaluable information regarding the geotechnical properties of underlying geology, critical for mine design in terms of safety and optimisation.

PERCUSSION DRILLING

The system is deployed using fleet- truck and crawler-based units and operates through air driven hammers that drive percussive bits with conventional and reverse airflows.

BLIND SHAFT BORING SYSTEM

BSBS is a mechanised alternative for conventional drill and blast shaft sinking. The system can facilitate access, and establish ventilation shafts of up to 9.5m in diameter and up to 1 500m deep in hard-rock applications where no bottom hole access exists.

APPLICATION

Mainly used in both surface and underground drilling for defining and delineating ore bodies. Used to drill cover holes for determining groundwater in underground mining.

APPLICATION BENEFITS

- Non-invasive
- Effective in difficult or remote areas

MINE APPLICATION

- No explosives required
- Ensures for a continuous production process
- Fewer personnel required to work in shaft during construction
- A safer, faster, more flexible method of accessing underground ore bodies
- Advances up to 6m per day, whilst simultaneously supporting the shaft; improving mine production and logistics
- Allows for simultaneous mine level break-away development

MORE SLIM DRILLING SERVICES
### SLIM DRILLING

**Core Drilling**

**Percussion Drilling**

**Reverse Circulation Drilling**

**Mud Rotary Drilling**

**Air Rotary Drilling**

### SLIM DRILLING APPLICATION

**REVERSE CIRCULATION DRILLING**

RC drilling is used to obtain information about underlying geology and is also used to drill down to geological ore body before intersecting it with a core hole. In addition, it is applied as a method of grade control drilling.

<table>
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<tr>
<th>BENEFITS</th>
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<tbody>
<tr>
<td>Operator fully protected in cabin</td>
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<tr>
<td>Allows for automated rod handling and the automated line-up and positioning of the rig</td>
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<tr>
<td>Operational data can be transferred to server for reporting purposes</td>
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<tr>
<td>A range of safety feature, including high wall detection and the optimisation of cone splitters</td>
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<tr>
<td>Cost effective method</td>
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### MUD ROTARY DRILLING

We currently have three rotary drive rigs equipped for mud rotary drilling. These operate a variety of water or mud type systems, ranging from centrifugal to triplex pumps. We apply mud rotary drilling principles on all raise boring pilot drilling applications.

<table>
<thead>
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<tbody>
<tr>
<td>Holes can be drilled in geology with water ingress, and can be used as the most accurate form of directional drilling at depth</td>
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<tr>
<td>Effective for difficult ground conditions</td>
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### AIR ROTARY DRILLING

Ideal for use in poorly consolidated geologies to establish pilot holes for raise bore machines, drilling large diameter blast holes and drilling for samples from poorly consolidated mine dumps and tailings.

<table>
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<tr>
<td>Low cost solution with increased rate of penetration, extended bit life and high production</td>
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<td>Low personnel complement</td>
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<tr>
<td>Establishes a large diameter and relatively short blast holes from a large flat bench</td>
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<tr>
<td>Provides cost effective way of drilling tails and other unconsolidated formations</td>
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### APPLICATION

**Used for the drilling of utility, paste, de-watering and other infrastructure holes.**

**Used for borehole development in the oil and gas industry.**

**Used to apply large diameter blast holes in the surface or open cast mining industry and is similar to the blast hole application of percussion drilling.**

**Used for aircore drilling in poorly consolidated geologies, such as old tailings.**
Master Drilling has a wide spectrum of skills and experience globally in directional drilling. Our complete systems can be utilised to create vertical and angular holes.

Similar to Master Drilling’s remote operated support system, this system promotes access and allows for the installation of anchors, mesh, cable bolts, shuttering and equipping.

Master Drilling has several remotely operated support shaft systems. These systems are tasked with applying a variety of shaft support materials, to ensure the geological stability of the shaft. The geological conditions of the shaft and the method of the drilling would determine which system and which material is applied to the challenge.

In the energy industry it is commonly used in hydro-electrical projects to ensure straight excavations.

- Ensure that a straight hole is drilled
- Results in less pipe wear during installations

- Can be utilised in existing shafts
- Allows for personnel accessibility

- Remote operated, no people in the shaft during operations
- Where required, can be applied before the shaft walls are exposed to the outside atmosphere, limiting oxidation
- High flow rates are possible that ensures thick application, fast (Machine dependant)
- Increased geological stability when application is completed

Where a accurate shafts are required; hoisting shafts in mining and the drilling of batch plant holes in order to deliver material to underground operations.

Where oxidisation of the strata is to be kept to a minimum.

Where shaft/hole longevity is to be guaranteed.
Master Drilling is able to provide circular or secant pile walls cost effectively, efficiently and with fewer labour requirements. This offering has shaft, pre-sink and piling applications.

We provide geo intelligence services by means of strategic partnerships and alliances.

In general civil construction the use of piling equipment for the purpose of foundations is very common.

- Fast
- Low-cost
- Requires less labour
- Provides high-quality structure

- Geological exploration planning and management
- Geological, geotechnical and geohydrological logging
- Geological sampling and lab analysis
- Geological resource modelling report compilations and database management
- Environmental monitoring and management

- Mine added, belt analyser and grade control services
- Geohydrological services
- Grouting and ground stabilisation services
- Turnkey grade control solutions
- Environmental monitoring and management
THANK YOU

For more information please go to:

www.masterdrilling.com