

# MAN AND MACHINE

MOBILE TUNNEL BORING



# THE MOBILE TUNNEL BORING SYSTEM

The Mobile Tunnel Boring system is specifically designed for the Mining Sector. It is common to use the Tunnel Boring method for Civil and Energy related projects, where it is well established and well proven. The novelty of the Mobile Tunnel borer relates to its ability to be efficiently used in mines, which requires flexibility, mobility and modular construction.

The machine and our service are suited for the excavation of various types of tunnels. Access tunnels to underground orebodies, such as declines, portals, haulages, inclines, ramps, ring roads, connecting tunnels etc. Most of these are used during the development and pre-production stages of mine construction or mining. These tunnels are normally larger with permanent services installed and longer in distance. That is why we use the 5.5m diameter configuration together with the bunker unit to allow for seamless production while trucks are switched to load and provide material handling through inclines, turns and breakaways to the point of discharge, eliminating secondary material handling.

The smaller and shorter 4.5m diameter configuration is used for reef drives and contact tunnels. Which is frequently used on sub level caving, block caving and steep/shallow dipping narrow vein mining. The logistical and material handling services allows for the fast relocation of the Mobile Tunnel Borer to excavate tunnels in the production phase of mining.

## THE BENEFITS:

The system has the potential of exponential production rates giving mining owners the ability to access underground ore bodies faster and with higher returns. It allows for continuous operation, full face cutting, with simultaneous rock support and material handling.

Safety is paramount with a predominantly non-explosive continuous operation where the crew will not be exposed to an unsupported face or hanging wall/roof.

The increased productivity, continuous operation, less manpower, proven consumable usage, flexibility utilization offsets mechanized complexity for a cost competitive alternative to existing mining tunnelling practices and alternative access.

Quality excavations are produced without explosives induced fractures and damage to the surrounding rock, thereby reducing support requirements. The round profile tunnel provides a structural superior

geometry to that of a conventional drill & blast tunnel. The standard size excavation provides for standard pre-fabricated and prepared services.

The tunnel offering is in the form of a contracted service with the mine owner not required to invest in capital equipment.

The service is in the form of the Mobile Tunnel Borer and associated equipment required for logistics and material handling. The specialized experience and manpower to perform new technology implementation and mechanization are provided inclusive of the service to the employer.

The cutting principle is based on conventional tunnel boring. Thus, reducing the conceptual risk of a hard rock cutting method for rock in excess of 300 MPa strength with proven consumable performance in varying conditions and rock types.

The system is flexible for different types of infrastructure and will be used in operations with different mining methods such as the ability to change the diameter of the tunnel, curve radius' and inclinations as well as geological conditions.

The equipment is modular in configuration which increases the mobility and reduces complexity of design and maintenance.

A round profile tunnel is not ideally suited for vehicles that require a flat driving surface, such as most trackless mining equipment. For this reason, we excavate the round profile and replace cut material to the invert of the tunnel.

Less than 5% of the excavated material is used to fill the invert, providing for a flat driving surface.

To initiate cutting, the Mobile Tunnel Borer requires a rounded profile side wall to grip and thrust the machine forward. For this reason a starting frame is assembled in advance of the next heading to be tunnelled. The machine is then assembled in this frame to start cutting. Once the backup of the Mobile Tunnel Borer has advanced through the starting frame, it can easily be disassembled and moved to the next location where a new heading will be started. The process repeats itself.

For breakaways the Mobile Tunnel Borer relies on a starting chamber that the starting frame will be assembled in. This starting chamber will be excavated and made safe by cyclical conventional mechanised drilling, blasting, scaling, loading, supporting and hauling equipment. This however forms a small part of the excavation required for instance on a undercut level for block caving. Considering a 200m diameter orebody, with a ring road and 16m spaced contact tunnels. Of all the tunnels excavated the drill & blast starting chambers will only comprise; 5% of the excavated rock; the rest being excavated by continues rock boring. In mine development tunnels, drill & blast will even represent a smaller percentage.



## THE SPECIFICATIONS:



### 4.5M DIA. CONFIGURATION:

Total Length : 23 meters  
Weight : 240 Metric tons



### 5.5M DIA. CONFIGURATION:

Total Length : 31 meters  
Weight : 300 Metric tons

## GENERAL:

- 17" Disc cutters
- Backloading cutters
- 1m advance stroke
- Finger shield
- Probe drill
- Support drill capable of cable anchors : 8 bolts at 30° spacing
- Mesh installation capable
- Onboard dry dust scrubber
- Ventilation extension cartridge
- 1300kW installed power
- 1600 kVA onboard transformer
- 250m capacity water and electrical reels
- 14 m³ bunker capacity
- Cutter head and shield assembled in starting frame, positioned by 23t capacity telehandler with manipulator attachments for placing
- Removable motivators for the remote control repositioning of backup units
- 20-30t capacity dumper truck capability

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



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