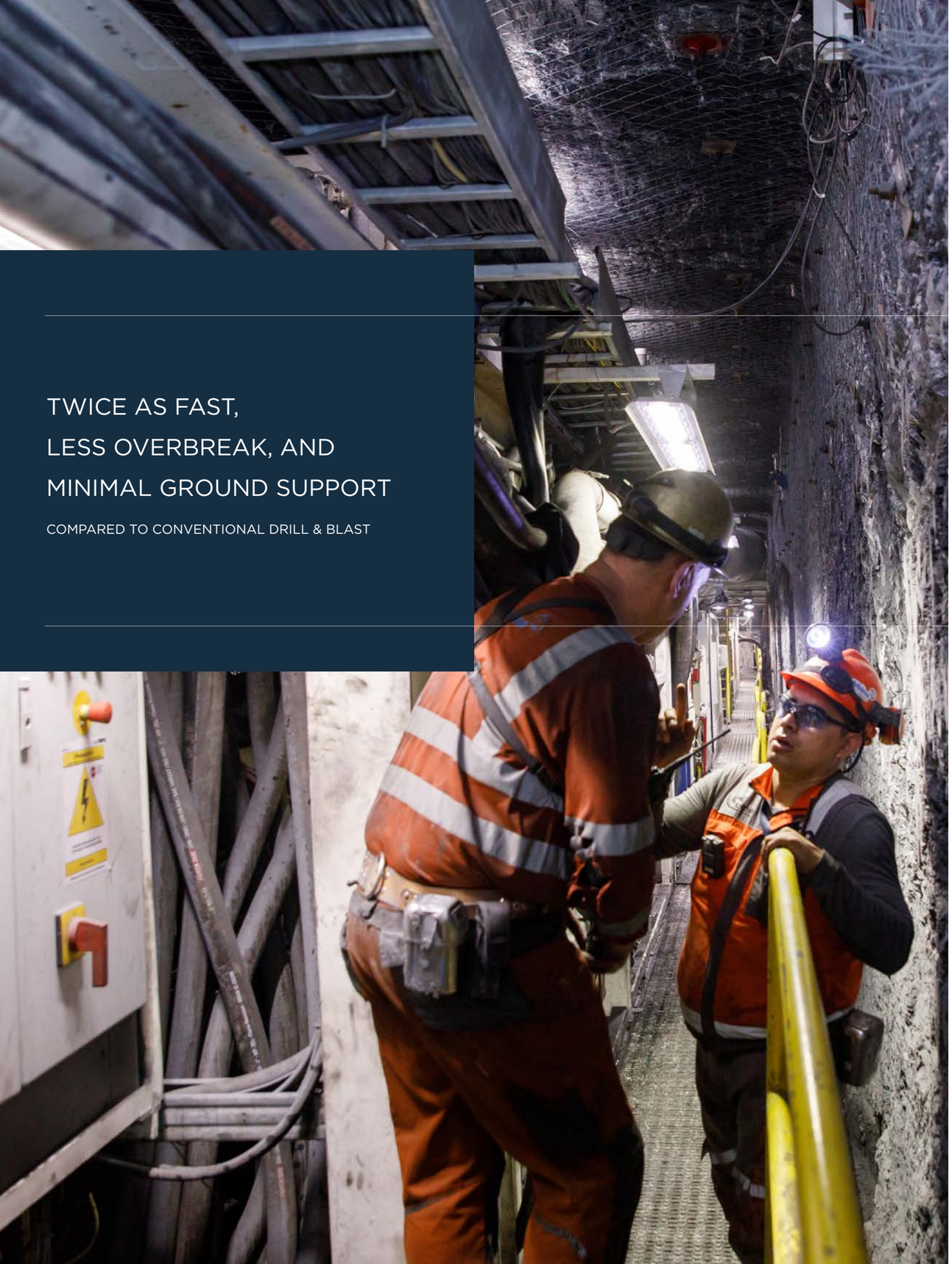
MDM5000

BUILT FOR MINES BY THE EXPERTS IN TUNNELING

FIDEL MORIN
Projects Superintendent
Fresnillo Mine, Mexico

FIDEL MORIN + PROJECTS SUPERINTENDENT,
FRESNILLO MINE

Robbins had the experience and the skills to provide a rectangular profile tunnel boring machine. No one else has been able to do that.



TWICE AS FAST,
LESS OVERBREAK, AND
MINIMAL GROUND SUPPORT

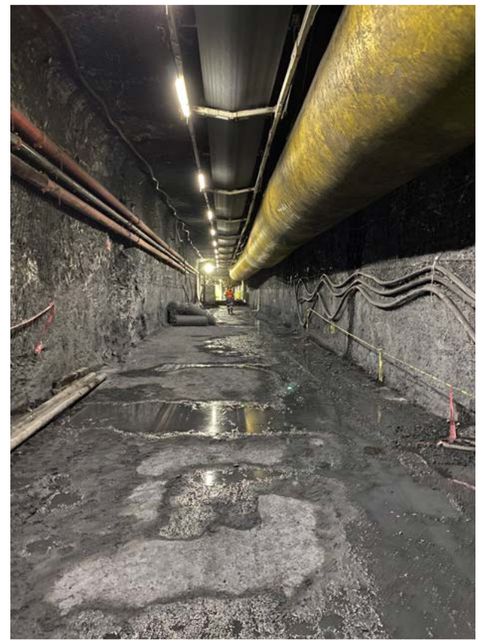
COMPARED TO CONVENTIONAL DRILL & BLAST

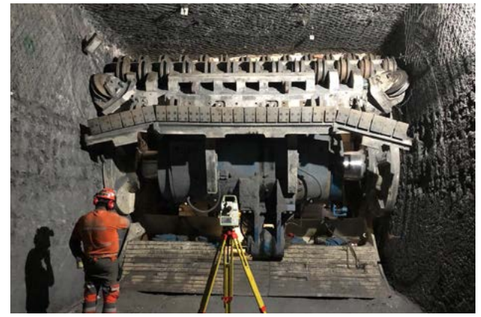
PRODUCING THE PERFECT PROFILE

The world's first successful rectangular tunnel boring machine, designed specifically with mines in mind.

Until now, the excavation of mining drifts and access tunnels has been accomplished through often slow and arduous drill and blast methodology. Historically, mechanized tunneling methods have lacked the customization needed to aid in expediting mining activities.

The Robbins MDM5000 has changed all of that. Designed specifically for the excavation of long drifts and access tunnels, the MDM5000 offers excavation at twice the rate of drill and blast. The rectangular profile eliminates the need to pour a road bed or cut the invert, allowing for immediate use by the mine's fleet of vehicles.

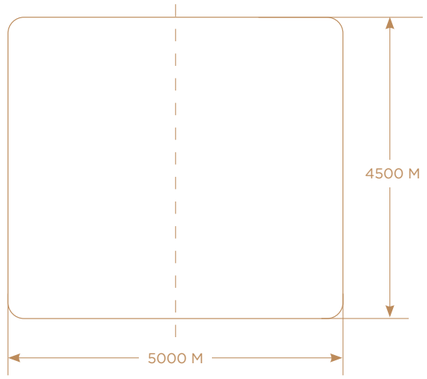


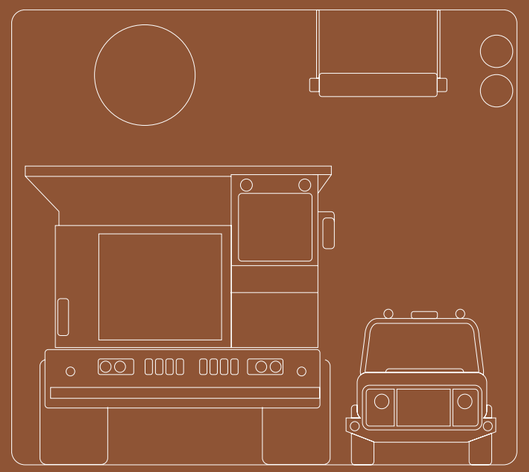


A precision profile, ready for use

CROSS SECTION

Rectangular 22.5 m²
5.0 m wide x 4.5 m high





SIMPLIFIED ACCESS

FOR A LARGE FLEET OF VEHICLES

The MDM5000 allows for accelerated access to the ore body, leading to increased production rates, and more efficient mining operations.

TOM BAKER
Principal / Topo

TOM BAKER + PRINCIPAL / TOPO

Rectangular tunnels are desirable in the mining industry because it gives you a flat roadbed. With a circular tunnel you need to pour a road bed or cut out the invert. As soon as the drive is completed, the drift is ready for traffic.

NO MATTER THE DISTANCE, CONTINUOUS CONVEYORS KEEP THE MATERIAL MOVING

The excavated material is removed from the face via a chain conveyor, then onto a continuous belt conveyor which loads into underground silos. The silos feed muck cars that are hauled by locomotives to the shaft bottom where the material is hoisted to the surface.

MAXIMUM UCS UP TO:

200 MPa

RECOMMENDED UCS:

50-150 MPa

Average boring speed at UCS (Unconfined Compressive Strength) of up to 100 MPa:

10-12 m per day

Average boring speed at UCS (Unconfined Compressive Strength) of 100 - 150 MPa:

7-10 m per day

Minimum Turning Radius:
400 meters

Roadway Cross Section:
22.5 sq. meters

Estimated Weight:
1,000 Tons

SPECIFICATIONS

Robbins Mine Development Machine
MDM5000

FOR LONG MINE DEVELOPMENT DRIFTS

Operating Element

Nominal Excavated Dimensions:
5.0 m wide x 4.5 m high

Overcut Method:
Vertical steer at rear grip

Number of Disc Cutters:
30 Double disc cutters (60 discs total)
Sizes 58 x Ø432 mm and 4 x Ø457 mm

Nominal Individual Load Per Cutter:
267 kN per cutter (133.5 kN per disc)

Average Cutter Spacing: 92 mm

TBM Shields

Overall Dimensions:
5.0 m wide x 4.5 m high

Overall Length:
2.8 m (without fingers)

Drive Control

Swing Cylinders:
Degree of operation: 113˚either direction from horizontal

Torque:
3,500 kNm maximum at 310 bar swing cylinder pressure

Installed Power: 782 kW

Main Bearing

Type of Bearings Used:
One two-row taper roller bearing and one single-row cylindrical roller bearing

Cutterhead

Maximum Thrust: 10,876 kN

Recommended Thrust: 8,007 kN

Number of Cylinders: 2

Front Gripper

Maximum Force: 14,594 kN

Recommended Max Force:
14,594 kN

Rear Gripper

Maximum Force: 10,519 kN

Recommended Max Force:
10,519 kN

Number of Cylinders: 2X

Torque

Maximum: 1,310 kN

Recommended:
1,310 kN

Number of Cylinders: 4

The control booth

Propel System

Maximum Force:
4,332 kN

Recommended Force:
4,003 kN

Number of Cylinders: 2

Support Type

Advance Support

Anchors

Mesh

TBM Conveyor

Type: Chain Type

Width: 860 mm

Length: 11,350 mm

Drive System: Hydraulic

Capacity:
300 tons per hour

Muck Apron

Gathering Wheels

Hydraulic System

System Operation Pressure:
317 bar

Oil Tank Capacity:
8,100 liters

Installed Power in HPU: 950 kW

Electrical System

Cutting Unit Drive Primary Voltage:
6 - 10 kV

Secondary Voltage:
380 - 660 VAC

Transformer:
2,400 kVA

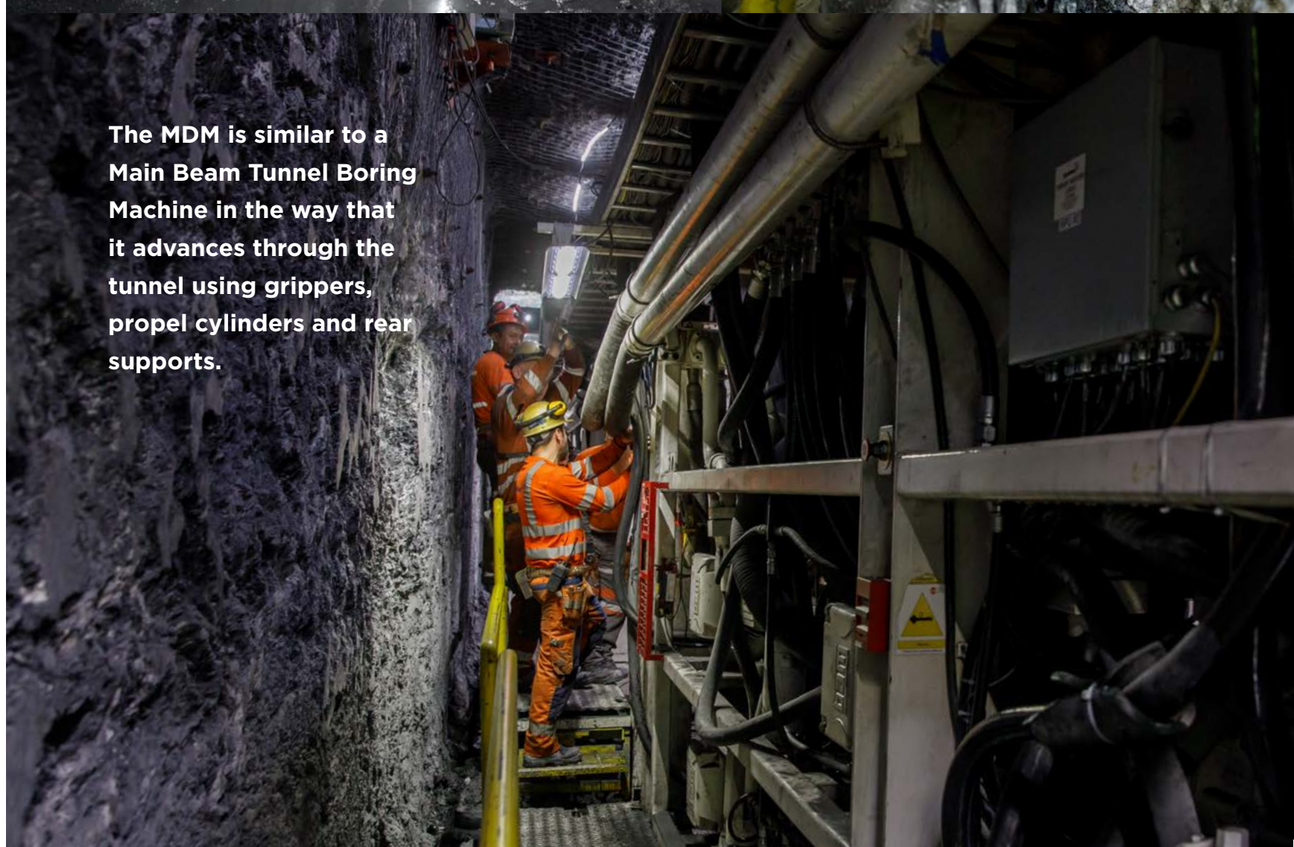
Additional Equipment

Communication System, Video Control System

Automatic Guidance System: Yes

Data Acquisition System: Yes

The MDM is similar to a Main Beam Tunnel Boring Machine in the way that it advances through the tunnel using grippers, propel cylinders and rear supports.



PROJECT SPOTLIGHT

Fresnillo Mine

FRESNILLO, MEXICO

ROBBINS MDM5000

BORING 12 KM OF TUNNELS FOR HAULAGE DRIFTS IN MEXICO'S LARGEST SILVER MINE.

Robbins

RELIABLE | RESPONSIVE