

THE ROBBINS COMPANY

FOCUSED FORWARD





THE ROBBINS COMPANY FOCUSED FORWARD



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ROBBINS INTRODUCTION

THE MOST TRUSTED NAME IN TUNNELING

With more than 60 years of innovation and experience, The Robbins Company is the world's foremost developer and manufacturer of advanced, underground construction machinery. Over the years, our name has become synonymous with the finest crafted machines in tunneling. Each piece of equipment, from our TBMs to our cutters to our SBUs and everything in between, is engineered for maximum durability and premium performance, ensuring the successful completion of even the most difficult underground construction projects.

As populations expand and new markets emerge, The Robbins Company continues to evolve to meet the changing demands of our customers. In fact, our customers' challenges drive our innovation. Our global network of sales and service representatives provides unmatched levels of customer support, while Onsite First Time Assembly helps our customers shed months off their project timelines and millions of USD off their budgets. It's no surprise that Robbins machines are at the center of many of the biggest tunneling infrastructure projects around the world. At Robbins, we not only help our partners accomplish their goals, we also push the tunneling industry forward.

+ LEADING THE INDUSTRY WITH OVER 60 YEARS OF FIRSTS

First main beam TBM

First successful employment of disc cutters
to bore hard rock

First double shield TBM

First floating gripper design allowing
continuous steering of a TBM

First 19 - inch cutters

First wedge - lock cutter mounting system

First successful rock boring head for
auger boring machines



ROBBINS TEAM

ROCK SOLID

PARTNERS



“We are most proud that LNS has been able to bring TBMs back to Norway after 22 years since the last TBM project! And the reason we managed to do that on the Rossaga Hydroelectric Project was because of very close cooperation with Robbins.”

FRODE NILSEN
MANAGING DIRECTOR, LNS

BY YOUR SIDE

When you work with The Robbins Company, you get the most advanced machinery in the tunneling industry and the most dedicated people. While there are no guarantees underground, you can be sure Robbins will be with you at every turn, from machine design through breakthrough and beyond.

CORE VALUES

At the core of Robbins is a group of highly experienced and respected individuals—sales people, project managers, engineers, field service technicians—who believe that relationships with customers should be as enduring as the machines. That’s why we’re committed to working with you to shatter old concepts, create new methods, and set new records in underground excavation.

SUCCESS WITHIN REACH

Our global network of employees makes it easy to get the answers you need to keep your project moving forward. With four primary manufacturing facilities, 12 international sales and service locations, and representatives worldwide, we’re there to support you—in any country, in any culture, at any time.



TOTAL COST OF OWNERSHIP

MAKING THE SMART INVESTMENT

Tunneling is a challenging undertaking. No matter how much you plan, there will always be surprises. The best way to reduce risk and ensure success on your project is to select the best machine for the job and consider the total cost of ownership of that machine.

WHAT IS YOUR TOTAL COST OF OWNERSHIP?

If you're basing your choice of machines solely on initial cost, and not taking into account the entire cost of operation and maintenance, you're not seeing the whole picture. To calculate total cost of ownership, decision makers must consider:

- What's the manufacturer's track record? Are they being honest about advance rates and past problems?
- How much uptime will the machine and components will have?
- When difficult ground or fault zones are encountered, can the machine proceed through them?
- Will the manufacturer help troubleshoot issues when they arise, or will you have to figure it out alone?
- What is the wear rate on cutters and other consumables that need to be maintained and replaced throughout the tunnel drive?
- Is the machine built to last over multiple tunnel projects? Is the machine built with 10,000 hours of usable life?



"The age of the machine wasn't a concern for us, it was a positive. We knew it could perform in harder, abrasive rock."

STUART LIPOFSKY

MANAGER, DIGINDY TUNNELS, S-K JV

THE RIGHT MACHINE MAKES ALL THE DIFFERENCE

In the business of tunneling, miscalculations are extremely costly. They mean missed project deadlines, costly repairs—and paying workers while your machine is being fixed. Having a expertly engineered machine and a strong tunneling partner means maximized uptime and your project being finished faster.



MAIN BEAM LONGEVITY

The long-running Main Beam TBM now boring the DigIndy Tunnels in Indianapolis, Indiana, USA will have bored more than 50 km by the time it completes the network of tunnels below the city. The machine, originally built in 1980, has been used on at least six different tunnel projects in the U.S. and Canada.



BUILT TO LAST

+ Over 50% of Robbins Main Beam TBMs have been used on three or more projects

MACHINE	# OF TUNNELS
MB112-124 Built in 1968, this still operational machine has excavated nearly 30 km (18 mi).	● ● ● ● ● ● ● ● ● ● ● ● ●
MB94-218 Last used in Costa Rica this TBM has bored over 40 km (25 mi) of tunnel since 1981.	● ● ● ● ● ● ● ● ● ●
MB148-212 Last used in Switzerland this workhorse has excavated over 50 km (31 mi).	● ● ● ● ● ● ● ● ●
MB91-155 This machine has set world records during excavations totaling nearly 50 km (31 mi).	● ● ● ● ● ● ● ● ●
MB82-125 Operational since 1968, this time-tested TBM bored its last tunnel in Canada.	● ● ● ● ● ● ● ●
MB1110-230 This TBM has bored over 34 km (21 mi) of tunnel during the past three decades.	● ● ● ● ● ● ● ●
MB203-205 Built in 1980, this TBM set a world record in 2013 by boring 124.7 miles (409 ft) in 24 hours.	● ● ● ● ● ● ● ●

ROBBINS MAIN BEAM TBMs

WORKHORSE OF THE TUNNELING INDUSTRY

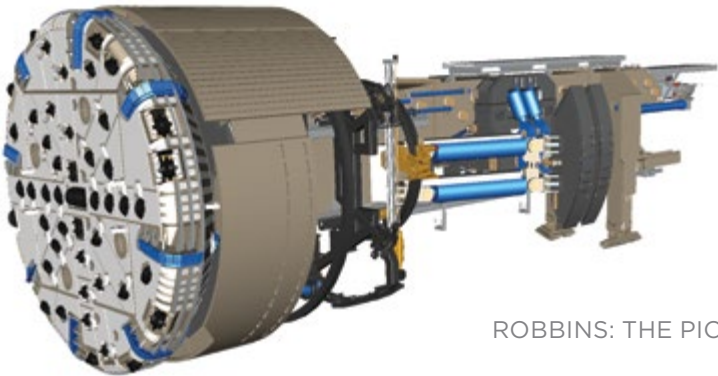
At Robbins, we don't shy away from hard rock, we cut right through it. Each one of our custom-built Main Beam TBMs is designed and manufactured to deliver superior thrust and torque to take on the world's toughest rock conditions. In fact, Robbins machines hold nearly 90% of TBM advance records around the world.

With over 60 years of experience, our abundance of field data allows us to continually improve our Main Beam TBM design to achieve maximum performance and efficiency. We outfit all our machines with powerful features such as ultra-durable cutterheads, laser targeted steering, floating gripper systems and more, so you spend less time digging out of problems and more time digging tunnels.



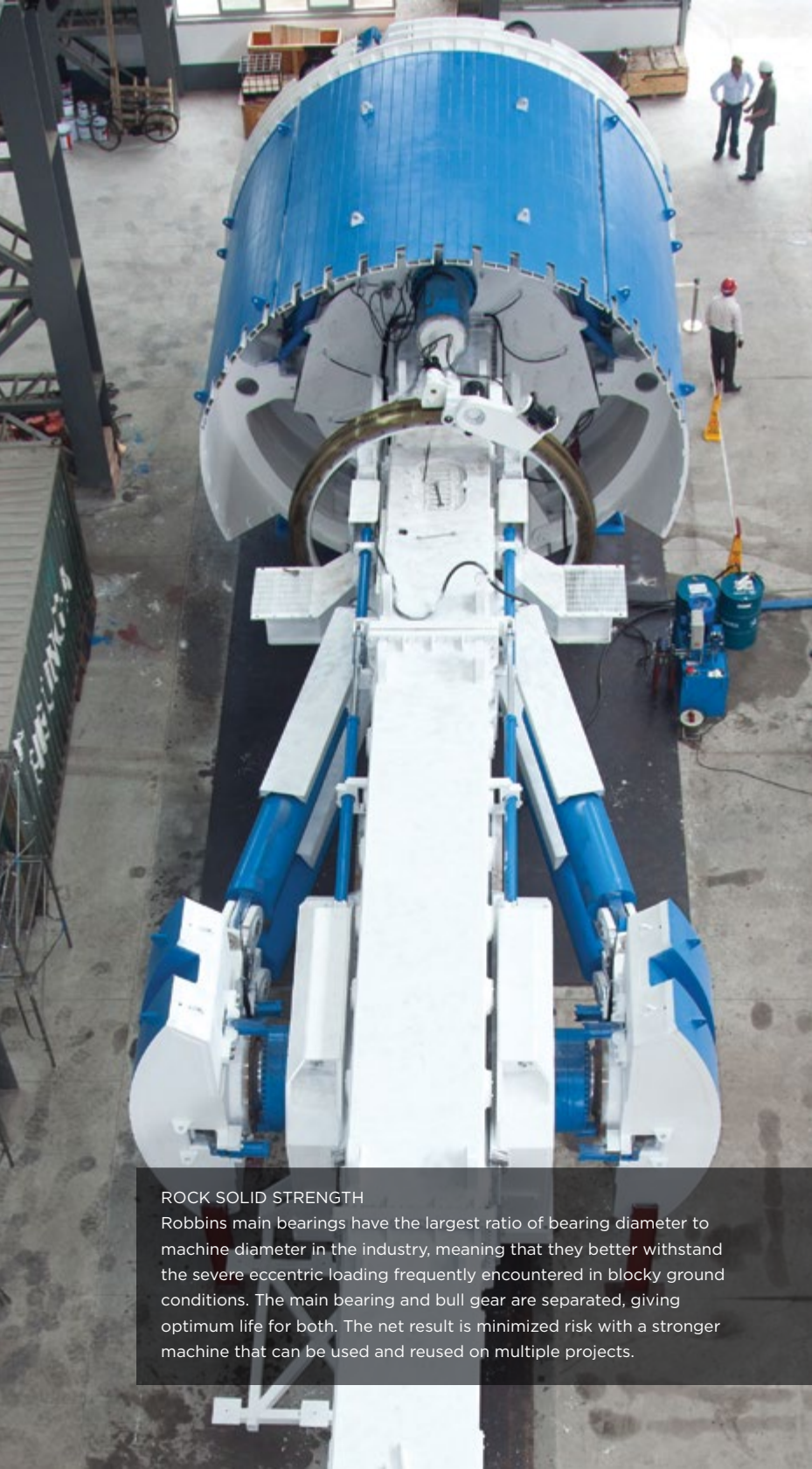
"The 3.25 m (10.7 ft) main beam machine performed well and the availability was excellent. The layout makes it feel like a much bigger machine."

JOHN ARCISZEWSKI
PROJECT MANAGER, SOUTHLAND CONTRACTING



ROBBINS: THE PIONEER OF HARD ROCK TUNNELING

Our TBM designs feature crack and wear-resistant cutterhead structures, and the most robust machine structure in the industry—up to 33% heavier than any other design on the market.



ROCK SOLID STRENGTH

Robbins main bearings have the largest ratio of bearing diameter to machine diameter in the industry, meaning that they better withstand the severe eccentric loading frequently encountered in blocky ground conditions. The main bearing and bull gear are separated, giving optimum life for both. The net result is minimized risk with a stronger machine that can be used and reused on multiple projects.





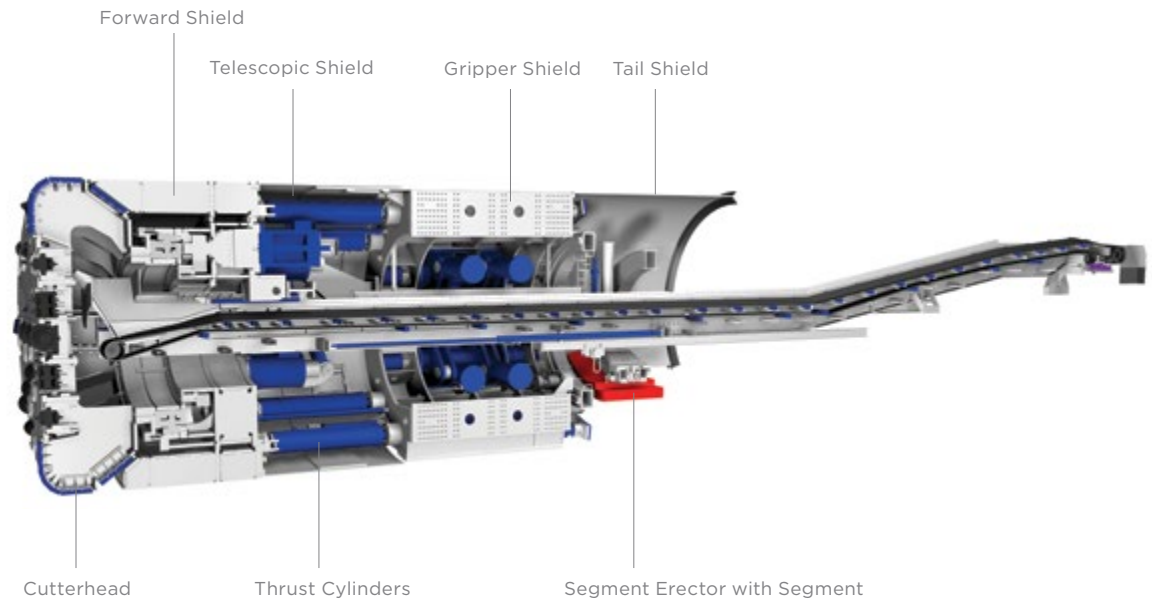
ROBBINS DOUBLE SHIELD AND SINGLE SHIELD TBMs

FEAR NO ROCK

Fractured rock. Fault Zones. Conglomerates. Dykes. Unstable geology can be an insurmountable obstacle if you're using the wrong machine. With Robbins Single and Double Shield TBMs, you get enhanced ground support without sacrificing performance.

Robbins invented the Double Shield TBM more than 40 years ago. We've been leading the industry ever since. Our Double Shield TBMs offer unmatched versatility—back-loading cutters, digital monitoring and guidance, dual-thrust reaction systems—for safe, efficient boring in fractured rock and other difficult ground conditions. Double Shield TBMs bore and line simultaneously, offering more efficiency than Single Shield TBMs that only bore and line sequentially. Single Shield machines are simpler and require less of an initial investment.

Today, with their record setting advance rates, high performance cutters, and outstanding reliability, Robbins shielded TBMs set the standard for safety, utility, and strength.





KARGI KIZILIRMAK HEPP | TURKEY

A 10.0 m (32.8 ft) diameter Double Shield TBM overcame squeezing ground, fault zones, and fractured rock to bore up to 723 m (2,372 ft) in one month—and significantly outperform a drill and blast heading proceeding from the opposite direction.



ROBBINS EPBs

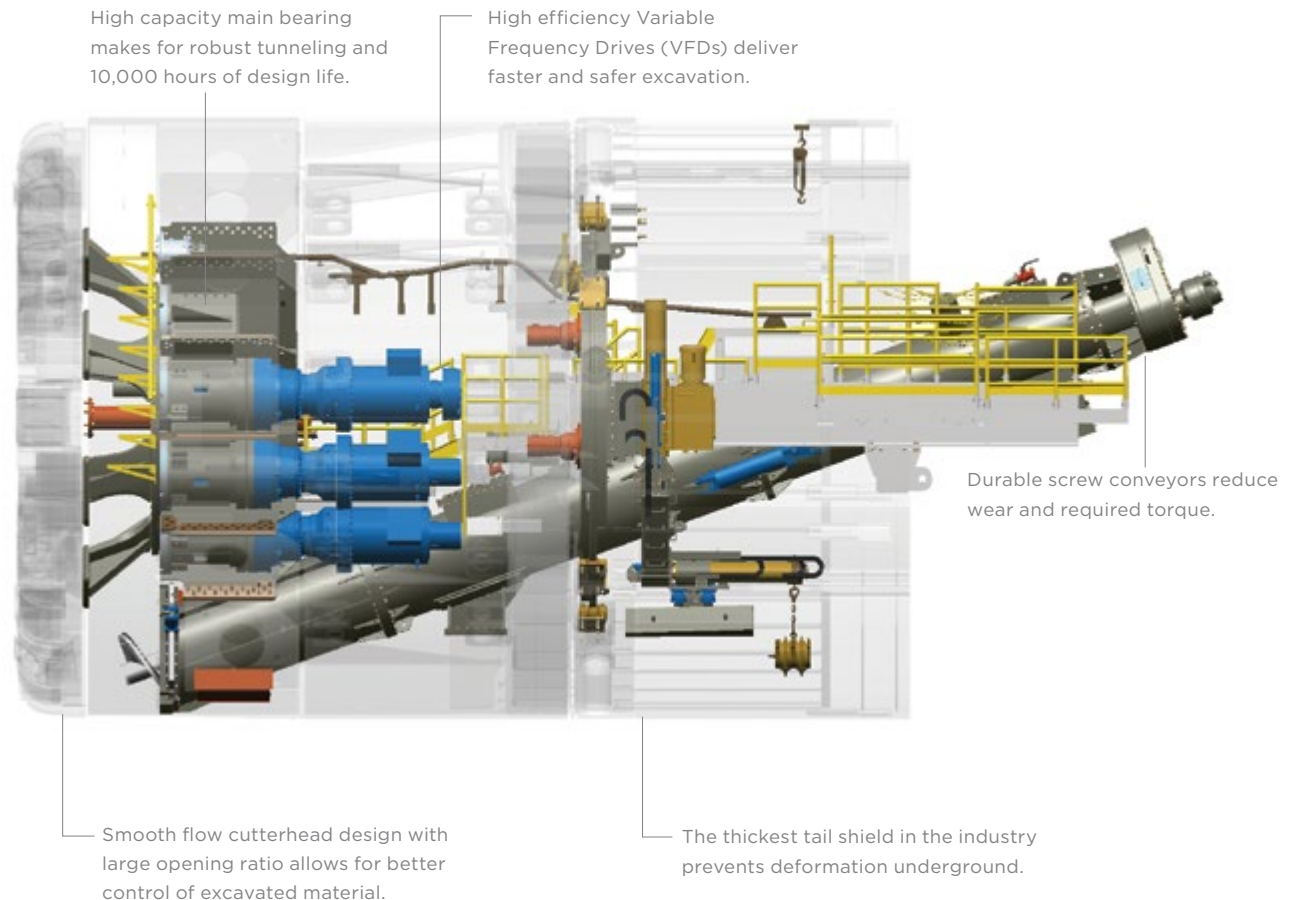
PERFORMANCE UNDER PRESSURE

A BALANCED APPROACH

When a project's geology gives you its worst, Robbins Earth Pressure Balance machines (EPBs) give you their best. From electric Variable Frequency Drives (VFDs) to unique smooth flow cutterheads that drive through soft soils, our EPBs are customized to handle the specific challenges of your project. Whether your project is under 7 bar of pressure in sand or just a few meters below the surface in boulder fields, Robbins EPBs are up to the challenge.

CONDITIONED TO ADVANCE

Robbins EPBs are the workhorses of soft ground tunneling, outpacing and outlasting the competition on some of the world's most punishing underground jobsites and setting record advance rates along the way. Using abrasion-resistant wear plating, customized cutting tools, heavy duty screw conveyors, and adaptable ground conditioning systems, Robbins takes EPB design to the next level.





CHENNAI METRO | INDIA

A Robbins 6.65 m (21.8 ft) diameter EPB triumphed over mixed ground, hard granite rock, and more at India's Chennai Metro in 2016.





EMISOR ORIENTE WASTEWATER TUNNEL | MEXICO CITY, MEXICO
Robbins' space-saving continuous conveyors haul muck up deep shafts at three mixed ground EPB jobsites in Mexico City.



ROBBINS CONVEYORS

QUALITY IN MOTION



“The soil condition, crew experience, rigorous schedule, continuous conveyor, and the reliability of the Robbins TBM are all factors that helped achieve a national record.”

VADIM BOCHAROV
MANAGING DIRECTOR, SK MOST

BUILT TO MOVE

At Robbins, we know that what lies behind your TBM is as important as what lies in front of it. That’s why our conveyor systems can move more than a thousand tons of muck per hour through kilometers of twisting tunnel, up a 200 m (656 ft) shaft to a stacker conveyor with capacity to store several days’ worth of production.

MORE ADVANTAGES, LESS COMPLEXITY

With a reliable conveyor system removing the rock from your tunnel 24/7, ventilation requirements are reduced and operations are streamlined, even in very long tunnels, to keep your machine moving. Simplifying tunneling logistics—it’s just another way Robbins helps jobs get done faster.

POWERFUL TECHNOLOGY

Our systems are designed with swift and intuitive setup in mind. Once muck starts moving, patented self-adjusting curve idlers keep spillage in check, while ground additives neutralize variable conditions and eliminate many of the problems associated with conveying fluidized muck. Our simple single-drive, steel cable-belt systems are perfect for straight tunnels while our multi-drive, fabric belt systems carry muck through multi-curve tunnels with ease.

VERTICAL SOLUTIONS

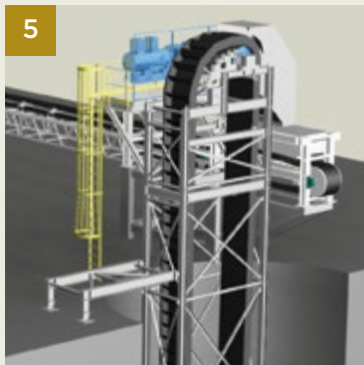
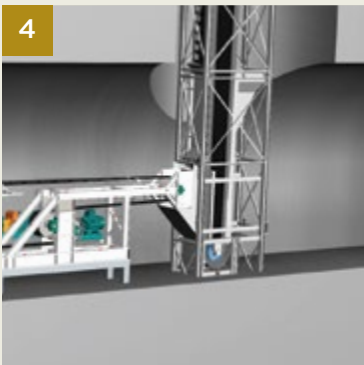
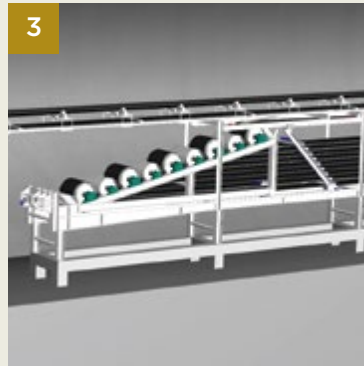
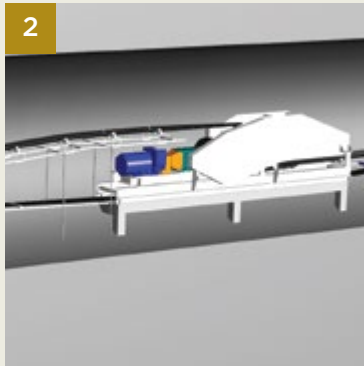
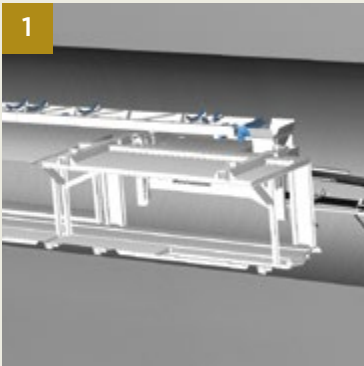
Our two vertical conveyor systems are designed to meet your site’s exact specifications. For a deep shaft application, nothing beats our steel cord belt S-Type conveyors. However, if you have a small diameter shaft, our J-Type conveyor may be the economical solution you’ve been looking for.



ROBBINS CONVEYORS

DESIGNED TO

TAKE IT ALL OUT



1. ADVANCING TAIL PIECE

The advancing tail piece contains the system's tail pulley, which includes a protected working window to safely install idler assemblies, all while the belt is still in motion.

2. BOOSTER DRIVE

Add supplemental power to your system at specific locations with Robbins booster drives, which properly control the amount of tension in the belt, even through curves.

3. BELT STORAGE CASSETTE

Robbins belt storage cassettes can be designed in horizontal or space-saving vertical configurations, and are designed for your capacity needs—whether you need 300 m (984 ft) or more than 500 m (1640 ft) of belt storage.

4. MAIN DRIVE

The main drive supplies the force needed to move the belt and its load. Variable Frequency Drives (VFDs) offer smooth control and efficient operation.

5. VERTICAL CONVEYOR

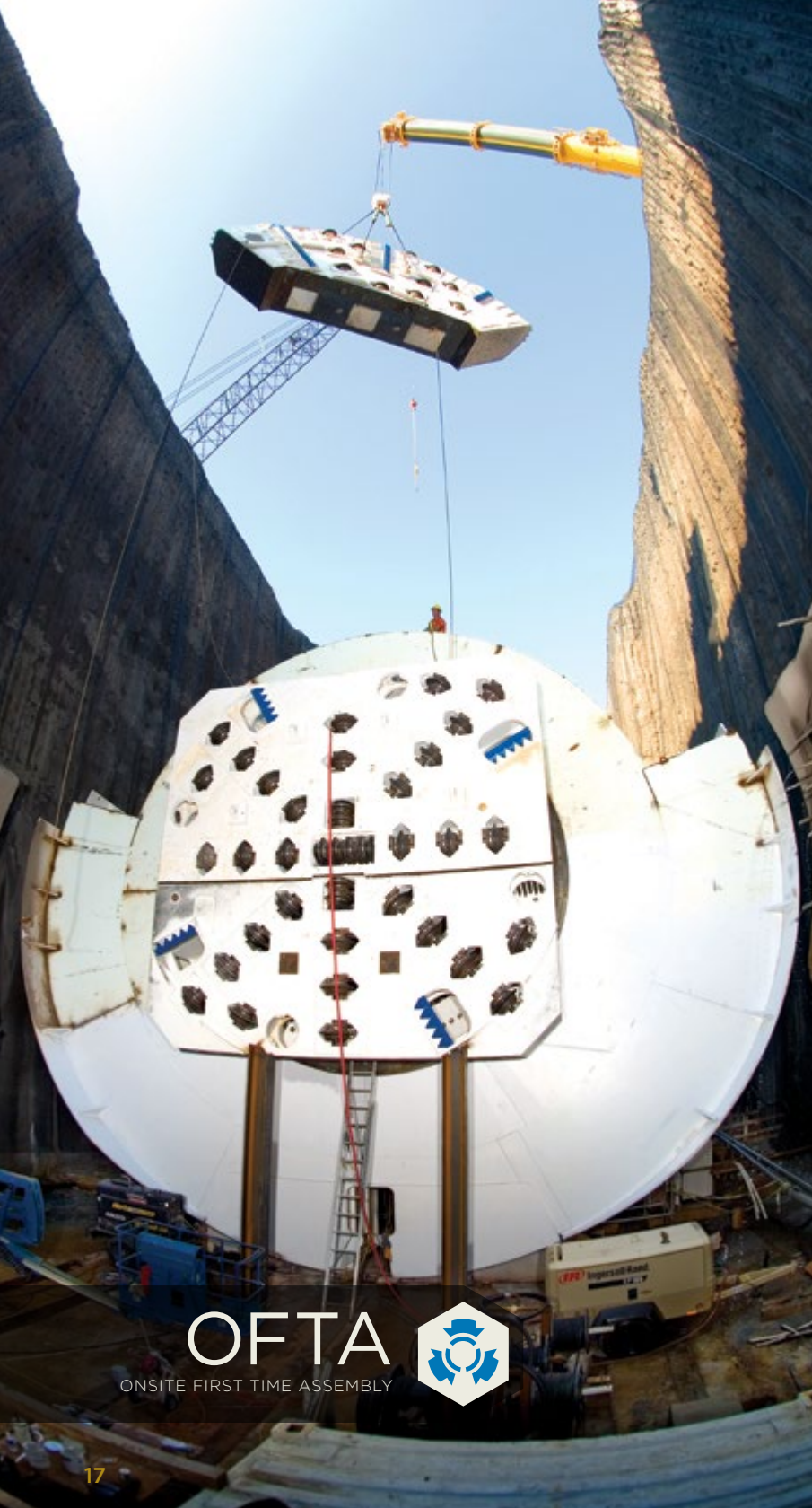
Available in two configurations, S-Type and J-Type, Robbins vertical conveyors are ideal for deep shafts and limited space configurations. Robbins vertical conveyors can be designed for shafts up to and over 650 m (2133 ft) deep.

6. STACKER CONVEYOR

From a simple fixed incline conveyor to a cable-stayed, radial stacker with 15 m (49 ft) of vertical motion, we offer a full range of muck storage solutions.



Robbins conveyors are relentless muck movers: they are capable of hauling 1800 metric tons (2000 U.S. tons) per hour or more.



OFTA

ONSITE FIRST TIME ASSEMBLY

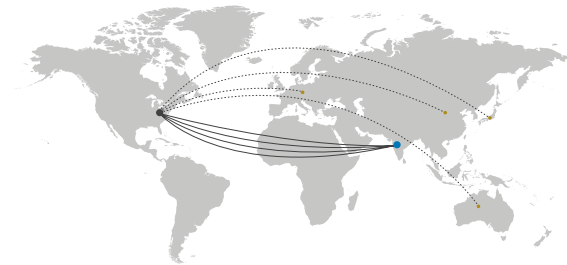


ROBBINS ONSITE FIRST TIME ASSEMBLY

BUILD IT RIGHT

BUILD IT ONCE

WITHOUT OFTA



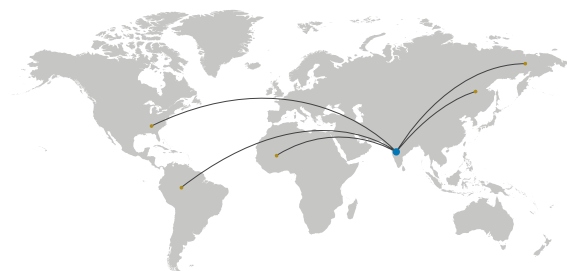
● Origin of Parts

● First Assembly

● Final Assembly

Factory tested sub-systems and quality components are shipped directly to the jobsite for assembly by skilled personnel—a method with proven time and cost savings of up to four to five months and USD \$4 million.

WITH OFTA



● Origin of Parts

● Final Assembly

The same sub-systems and quality components are assembled in a factory, then disassembled and shipped to the jobsite, where they are assembled again for launch. Multiple shipments of components are required.

A NEW WAY OF THINKING

The days of designing TBMs with pen and paper are long gone, so isn't it time TBM manufacturers stopped assembling them the old-fashioned way? Robbins thinks so. That's why we created Onsite First Time Assembly (OFTA), a revolutionary process that's changing the face of the tunneling industry.

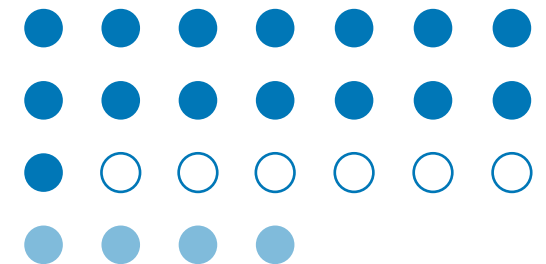
With Robbins' OFTA method, machines are assembled at the jobsite, allowing you to forego pre-shop assembly, disassembly, extra labor, and shipping costs. The machine is assembled and tested onsite, saving time and money.

GO FURTHER, FASTER

There are other advantages to OFTA as well. Site personnel involved with the OFTA process typically receive greater training due to the additional hours spent during machine assembly and testing. Contractors who opt for OFTA deliveries are often able to take over full operation and maintenance of their new TBM much faster than contractors who opt for a traditional delivery.

By combining over six decades of tunneling expertise with advanced project management systems, powerful 3D design software, and additional onsite training, our OFTA method ensures that your machines aren't just built fast, but built to last.

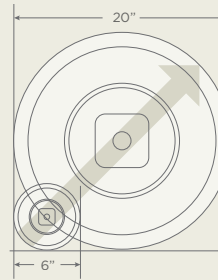
OVER
25+
OFTA
PROJECTS
WORLDWIDE



● HARD ROCK

○ EPB

● CROSSOVER



FULL RANGE

Whether you are boring a long, large diameter tunnel or a series of short, small diameter tunnels, Robbins has the cutters you need. We manufacture cutters in a full range of sizes, from as small as 165 mm (6.5 in) in diameter for our SBUs to as large as 508 mm (20 in) in diameter for our TBMs.

CUT COSTS WITH THE CORRECT CUTTER CHOICE

Robbins invented disc cutters, and our designs are time-tested by contractors around the world. Through the years, Robbins disc cutters have rolled through more than 400 tunnel projects and in excess of 130 million cubic meters (170 million cubic yards) of rock.

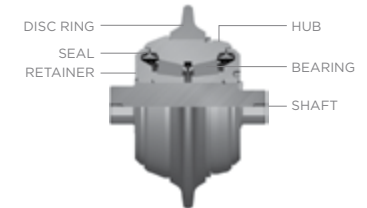
ROBBINS DISC CUTTERS

CUTTING EDGE

SOLUTIONS

There's a reason Robbins is the tunneling industry's preferred cutter and cutting tool supplier: our cutters make breakthroughs. We were the first company to use rolling disc cutters, the first with the wedge-lock mounting design, and the first to use 483 mm (19 in) cutters. Made from proprietary materials and forged for strength, our durable cutters are built to last. Their unique design, paired with time-tested components and top-notch maintenance, results in fewer cutter changes—just another way that Robbins reduces downtime.

We're continually improving our cutter technology, allowing owners and contractors to take on projects of increased size and complexity. Features like our innovative Wedge-Lock™ mounting design and customized changing tools make replacing cutters safe and simple. Meanwhile, our remote cutter monitoring system minimizes downtime during cutter changes by wirelessly transferring detailed temperature, rotation, and vibration data. This data helps operators make more efficient decisions and avoid costly complications before they happen.



NO CUTTING CORNERS

Every year we continue to develop new materials, processes and cutter designs. Robbins offers the newest technology available because we do more research and development than any other cutter manufacturer. We have conducted extensive tests on hundreds of projects for over half a century—on real projects under the worst conditions. With this information, we have developed the best product on the market.

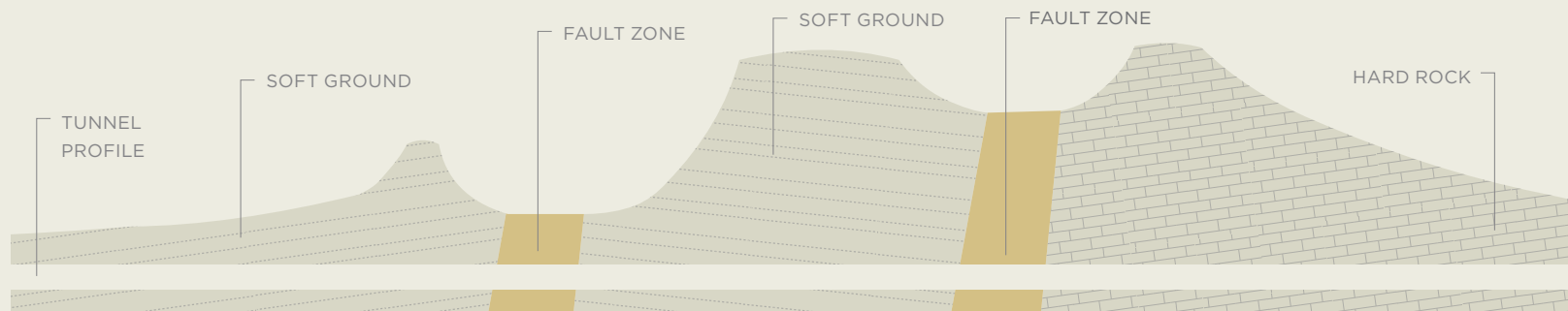


AMR PROJECT | ANDHRA PRADESH, INDIA
Robbins disc cutters, like those boring the world's longest adit-free tunnel, are capable of excavating rock up to 400 MPa UCS and incredibly abrasive material of near pure silica or quartz.



GROSVENOR DECLINE TUNNEL | MORANBAH, AUSTRALIA
Australia's Anglo American Coal Mine is the first in Australia to use a TBM for drift construction. The unique Crossover XRE safely excavated in methane gas conditions, ultimately completing the tunnels 14 times faster than a roadheader.





"Crossover machines are the way to go. Segmentally lined rock tunnels eliminate a lot of issues in loose rock. And for projects with both ground types, it makes perfect sense. I think advance rates are comparable to standard EPBs."

STEVE SKELHORN
PROJECT SPONSOR,
MCNALLY CONSTRUCTION INC.

ROBBINS CROSSOVER TBMs

ONE MACHINE MANY GEOLOGIES

Face it. Ground conditions don't always fit into tidy categories. Tunnels often pass through hard rock, soft ground, boulders, watery clays, fracture zones, and a mixture of everything in between. Today's TBMs must adapt to shifting conditions, and Robbins Crossover TBMs do just that by combining the most powerful features from different machines. Adaptable, dependable, and efficient, Robbins Crossover TBMs are built to endure multiple tunnel projects over many years.

A CROSSOVER FOR ANY CONDITION

Our Crossover machines come in three main types, and can switch between modes while inside the tunnel. The XRE, a cross (X) between Rock (R) and EPB (E) TBMs, is ideal for taking on projects with sections of hard rock and soft ground. The XSE, a cross (X) between Slurry (S) and EPB (E), can utilize a mixed ground or spoke-type cutterhead to excavate variable conditions and a screw conveyor to maintain face pressure. For projects in complex ground conditions under water pressure, the XSE excels. The XRS, a cross (X) between rock (R) and slurry (S) TBMs, is the best choice in tunnels with both hard rock and soft, water-bearing ground.

MORE EFFICIENT EXCAVATION

Depending on the type of Crossover TBM, muck removal from the machine face can be easily switched to support different ground conditions. EPB screw conveyors can be strengthened with abrasion resistant, replaceable sections for rock, and belt conveyors can be used if hard rock conditions are encountered. For an XSE TBM, both slurry piping and an EPB-style screw conveyor can be installed on the machine.



XRE Crossover Between Rock/EPB

For excavation in mixed soils with rock

XSE Crossover Between Slurry/EPB

For excavation in mixed soils to soft ground under water pressure

XRS Crossover Between Rock/Slurry

For excavation in hard rock and soft water-bearing ground

ROBBINS EPIC PROJECTS

SOFT GROUND SUCCESS

1964

PARIS RER METRO | FRANCE

The Robbins Company designed and provided the precursor to all modern EPB and Slurry machines, using compressed air to tunnel through mixed ground below the Arc de Triomphe.

2008

SACRAMENTO UNWI SEWER | USA

A 4.25 m (13.9 ft) EPB bored below Sacramento, USA using a continuous conveyor for smooth muck removal. The speedy TBM achieved a world record in its size class, excavating 210 m (690 ft) per week.

2010

METRO LINE 12 | MEXICO

Using OFTA, Robbins launched the largest TBM in Mexico, a 10.2 m (33.5 ft) EPB. The machine reached advance rates of up to 135 m (442.9 ft) per week.

2013

MOSCOW METRO | RUSSIA

With precision TBM operation and ground conditioning, crews drove a 6.2 m (20.3 ft) Robbins EPB to a nationwide record of 37.8 m (124 ft) advance in one day, and an early breakthrough.

2014

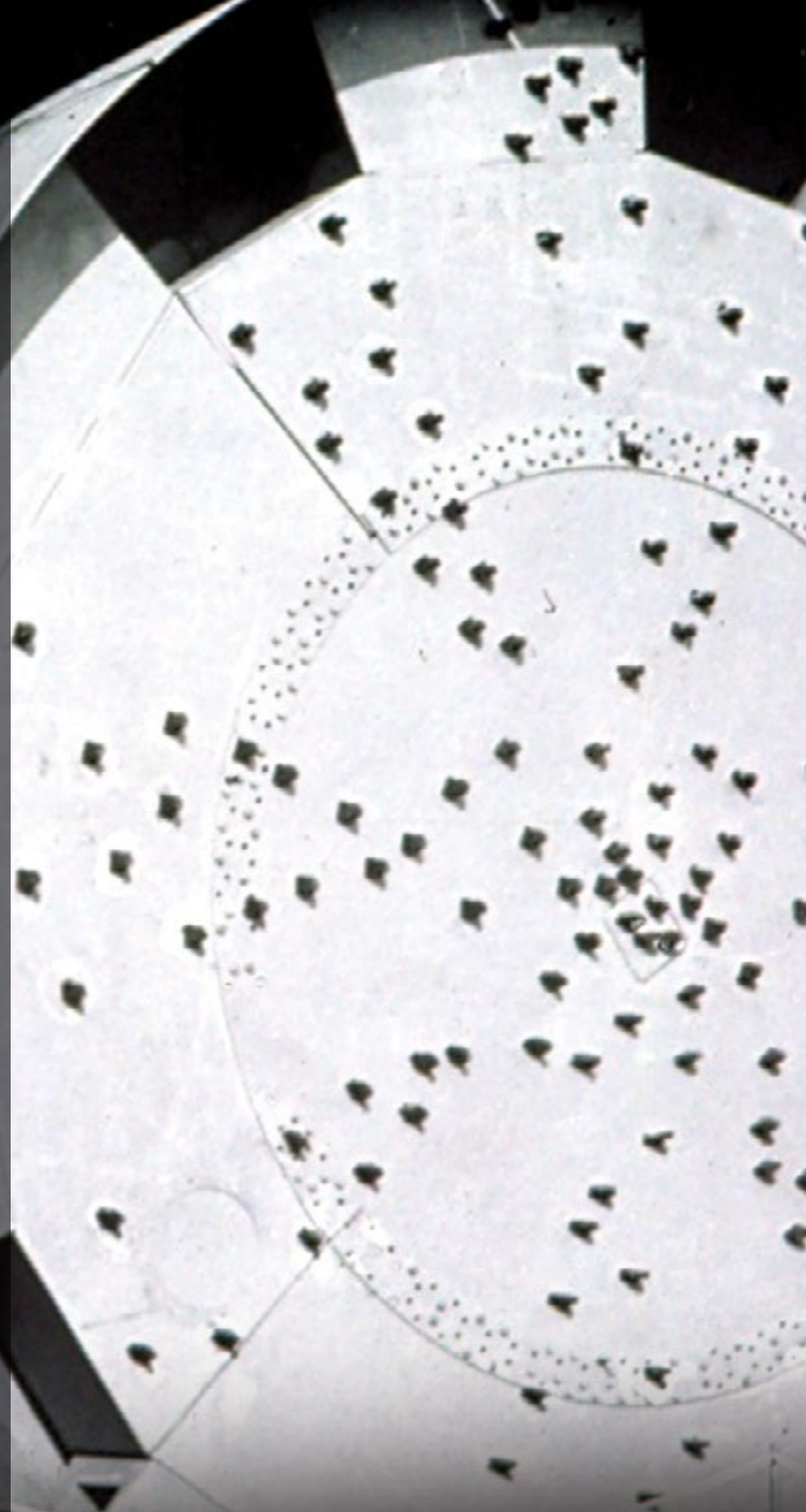
SAN FRANCISCO CENTRAL SUBWAY | USA

Two Robbins mixed ground EPBs bored through curves of 137 m (450 ft) in radius at rates up to 513 m (1,683 ft) per month, all while minimizing settlement below active subway lines and buildings.

2016

JAIPUR METRO | INDIA

Two 6.5 m (21.3 ft) Robbins EPBs bored below a historic gate to the walled city built in 1727. Passing just 4.5 m (15 ft) below the gate foundation, the TBMs recorded less than 2.0 mm (0.08 in) of settlement—well within safe limits.



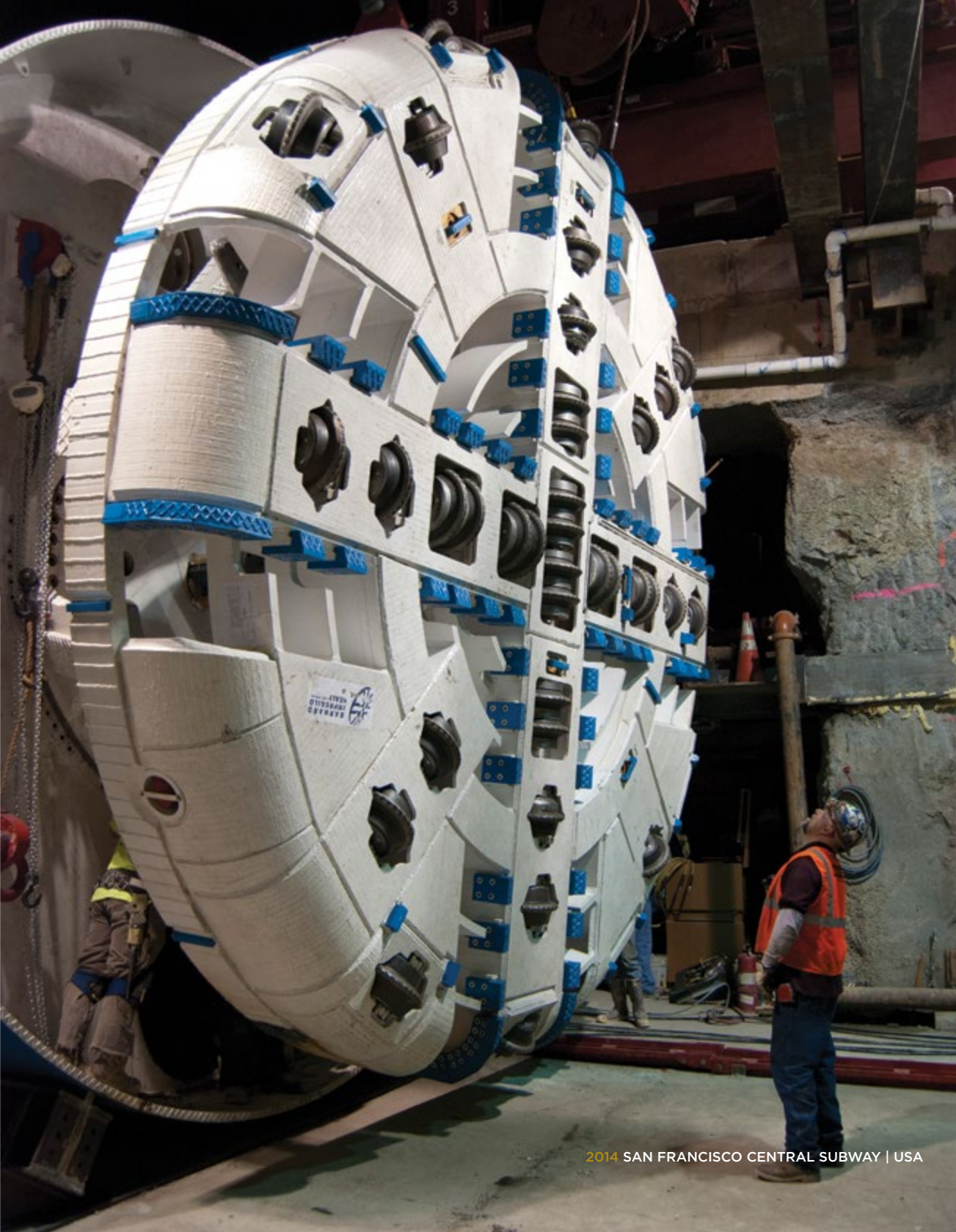
1964 PARIS RER METRO | FRANCE



2008 SACRAMENTO UNWI SEWER | USA



2010 METRO LINE 12 | MEXICO



2014 SAN FRANCISCO CENTRAL SUBWAY | USA



2016 JAIPUR METRO | INDIA



2013 MOSCOW METRO | RUSSIA

ROBBINS EPIC PROJECTS

OVERCOME THE ELEMENTS

1956

HUMBER RIVER SEWER TUNNEL | CANADA

James S. Robbins developed the first rolling disc cutters, dressing the cutterhead of a machine with 11.5 inch (292 mm) discs to excavate crystalline limestone. The successful project marked the first instance of TBM usage in hard rock.

2015

GROSVENOR DECLINE TUNNELS | AUSTRALIA

Australia's Anglo American Coal Mine utilized a Crossover (XRE) TBM to successfully bore two decline tunnels that allowed access to new coal seams. In the process, the unique, explosion proof XRE TBM was able to bore in methane gas conditions at rates 14 times faster than that of a roadheader. The machine made its final breakthrough in February 2015.

2016

LIAONING NOW | CHINA

In Northeastern China, five Robbins Main Beam TBMs excavated sections of a massive water scheme totaling over 70 km (43 mi) in length. The machines, mounted with 20-inch disc cutters, bored more than twice as fast as competing TBMs on the project and achieved long cutter life of 1,355 cubic meters (48,000 cubic feet) bored per cutter ring.

2016

TÚNEL EMISOR PONIENTE II | MEXICO

Launched in 2015, Mexico's first Crossover TBM proved itself a success. The 8.7 m (28.5 ft) diameter machine for Túnel Emisor Poniente (TEP) II traversed andesite, dacite, and fault zones, all while achieving a national record of 57 m (187 ft) in one day. featured two-speed gearboxes, enhanced probe drilling, and other designs that enabled it to bore through anything from soft ground to hard rock.



1956 HUMBER RIVER SEWER TUNNEL | CANADA



2015 GROSVENOR DECLINE TUNNELS | AUSTRALIA



2016 LIAONING NOW | CHINA



2016 TÚNEL EMISOR PONIENTE II | MEXICO



2005 PARRAMATTA RAIL LINK | AUSTRALIA



2011 OLMOS TRANS-ANDEAN TUNNEL | PERU



2016 AMR PROJECT | INDIA



2011 NIAGARA TUNNEL PROJECT | CANADA



2010 EAST SIDE ACCESS | NEW YORK

ROBBINS EPIC PROJECTS

UNDERGROUND ROCK STARS

2005

PARRAMATTA RAIL LINK | SYDNEY, AUSTRALIA

With over 80% of the tunnel length in curves, this winding tunnel through Sydney Sandstone marked the occasion of not one but two then-world records by Robbins Main Beam TBMs. The speedy machines excavated 92 m (302 ft) in one day and 417 m (1368 ft) in one week.

2010

EAST SIDE ACCESS | NEW YORK

Over the course of four headings, The Robbins TBM excavated faster than another manufacturer's machine boring the project's parallel tunnels. Tunneling was completed at East Side Access in 2010.

2011

NIAGARA TUNNEL PROJECT | CANADA

A Robbins Main Beam TBM completed a 10.4 km-long (6.5 mi) drive below Niagara Falls. The machine set a world record for TBMs over 12 meters in diameter by excavating 467 m (1525 ft) per month.

2011

OLMOS TRANS-ANDEAN TUNNEL | PERU

A Robbins TBM powered a path through the Andes under 2000 m (6500 ft) cover, making it the second deepest tunnel in the world.

2016

AMR PROJECT | INDIA

At 43.5 km (27 mi), the Alimineti Madhava Reddy (AMR) Project will be the longest tunnel without intermediate access in the world when complete.



NEXT GENERATION STATIONS

Wireless operator stations and touch screen monitors make TBM operation and long-term data collection easy, so you can identify trends and make adjustments.

ROBBINS R&D AND INNOVATION

MOVING THE INDUSTRY

FORWARD



Today's tunnel projects are more complex than ever, and they're only getting more difficult. To meet the evolving demands of our partners, our engineers work tirelessly to develop technology that makes tunnel boring safer, faster, and more versatile. Below are some of our most recent innovations.

DISC CUTTERS

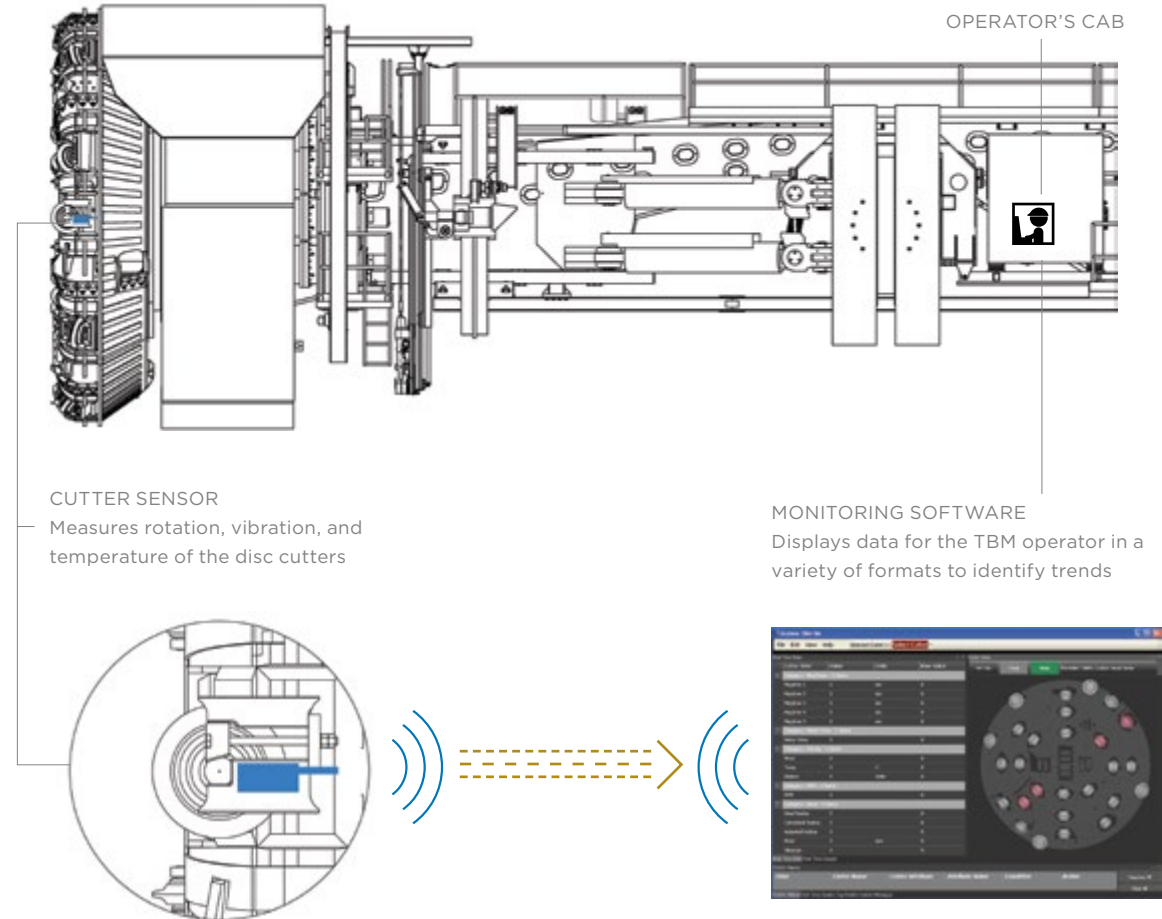
Whether we're investigating new tool steels or designing EPB disc cutters that can effectively excavate in high-pressure conditions, Robbins engineers are continually rolling out advanced cutter technologies. Our latest innovation, the patented Remote Cutter Monitoring System, allows contractors to minimize downtime while maximizing efficiency, all from a touch screen in the operator's cab. Sensors in each cutter housing pick up vibration, temperature, and rotation signals to give the operator a clear picture of cutter wear.

CROSSOVER

Tunneling has evolved. So have Robbins TBMs. Our groundbreaking Crossover TBMs overcome complex ground conditions by combining features from different types of TBMs (Mixed Ground EPB/Rock, and EPB/Slurry). Best of all, Crossover TBMs can be converted inside the tunnel depending on geology. (See pg. 20 for more information)

M McNALLY SUPPORT SYSTEM

The McNally Support System is the most efficient way to increase advance rates and maintain worker safety on Main Beam machines in difficult rock conditions. Designed and patented by C&M McNally for exclusive use on Robbins TBMs, the McNally system has been proven on projects worldwide.





DIFFICULT GROUND SOLUTIONS

KEEP YOUR TBM

ON THE MOVE

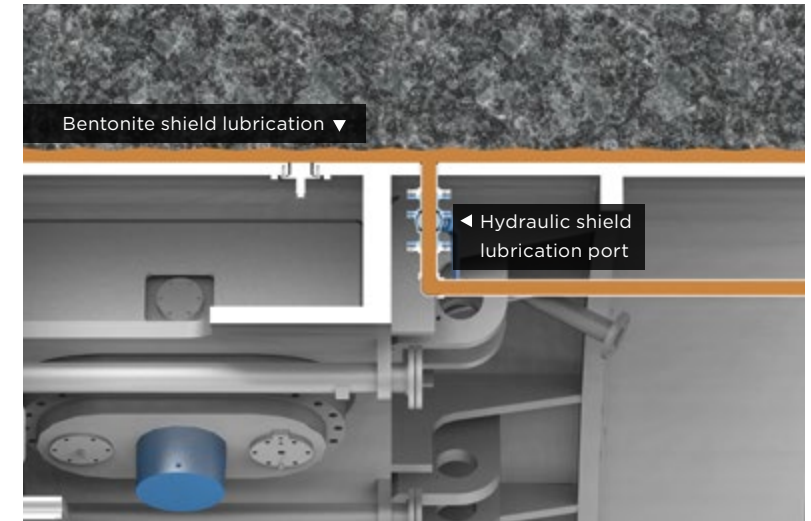
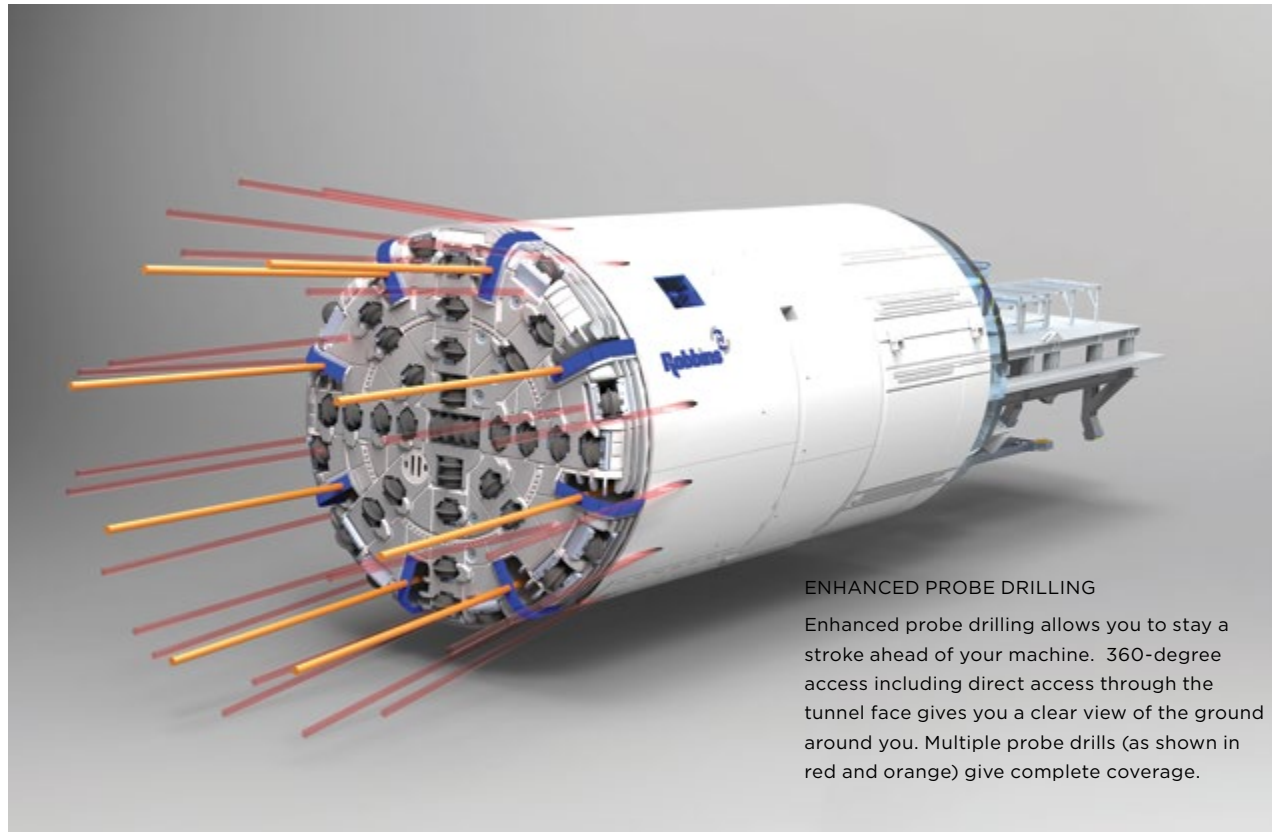
Every technological breakthrough Robbins has ever made has been an answer to one of our client's challenges, and our latest offering is no different. Difficult Ground Solutions (DGS) is a suite of options available for shielded hard rock and Crossover TBMs that can keep your machine moving in long tunnels, high cover, and challenging geological features. From Continuous Advance Shield Design to Water Inrush Control, Robbins is committed to keeping your project moving forward.

KNOW WHAT'S AHEAD OF YOU

DGS is about visualization: A machine shield doesn't have to obstruct your view of the ground around you. With a host of features like 360-degree, long distance probe drilling, convergence measuring sensors that alert operators to squeezing ground, and canopy drills for ground consolidation, you can stay a stroke ahead of your TBM operation.

TOOLS TO CONQUER WHAT YOU FACE

A host of DGS features can keep your TBM boring in even the most challenging geology. Multispeed gearboxes help prevent your machine from getting stuck by giving you the flexibility to excavate at high RPM/low torque in hard rock or low RPM/high torque when moving through difficult ground. Continuous Advance Shield Design further ensures that your machine will get through the most difficult ground. Features like stepped shields and lubrication ports are customized to move through squeezing ground and blocky rock. If your machine does encounter a sticky situation, breakout torque and emergency thrust options have been proven to get machines moving again.

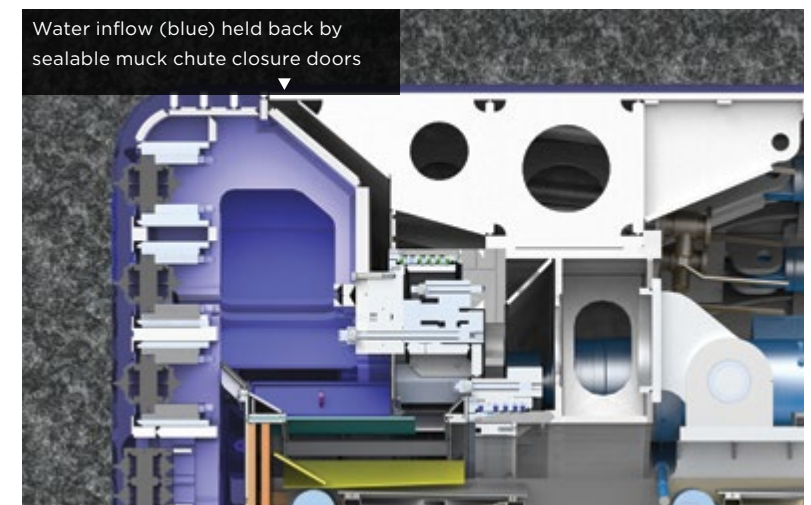


With Rapid Advance Shield Design your machine keeps moving through the tough stuff. Here, a hydraulic shield lubrication port pumps Bentonite into the annular gap between the machine shield and excavated material. The feature can keep your TBM from becoming stuck in squeezing ground or fault zones.

MAXIMIZE SAFETY IN HIGH WATER

In the event of a massive water inflow, Water Inrush Control lets you seal off your TBM and create a safe working environment while dewatering and consolidating ground. Sealable muck chutes and multiple rows of main bearing seals can effectively hold back water pressures up to 30 bar. For Double Shield TBMs, inflatable seals can close the gap between machine shields and keep your crew safe.

Water Inrush Control is capable of sealing your TBM against water pressures up to 30 bar. A sealable muck chute keeps the water (shown in blue) at the front of your TBM for safe and effective dewatering and consolidation.





ROBBINS SBUs

SMALL MACHINE

BIG RESULTS

Compact, powerful, and efficient, no other company makes a product line like the Robbins Small Boring Unit (SBU). Our SBUs are the ideal solution for hard rock and mixed ground utility tunnels with line-and-grade sensitive bores. Own or rent a Robbins Small Boring Unit and see for yourself why our SBUs are the machines of choice on hundreds of jobsites across the globe.

SBU-A AND ABM

Don't let its small size fool you. The SBU-A is built to bore. The SBU-A is a small diameter cutterhead equipped with disc cutters and a high-capacity thrust bearing assembly that can be used with any Auger Boring Machine (ABM) from 900 mm to 1.8 m (36 in to 72 in). Whether you're working in hard rock or mixed ground, the SBU-A is the most effective solution for excavating rock in small diameter drives.

SBU-M

Build longer tunnels, through harder rock, on line and grade with the Robbins Motorized Small Boring Unit (SBU-M). The SBU-M is designed for use with any Auger Boring Machine from 1.2 m to 2.0 m (48 in to 78 in) or any standard pipe jacking unit. Packed with features like an articulating front shield, laser-guided continuous steering, and cutters that can be changed at any point during the drive, the SBU-M stays on task and on target so you can get the job done.

ROCKHEAD

If you need the most efficient tool for excavating longer hard rock bores, then you need the Robbins Rockhead. The machines are modeled after our legendary TBMs and are designed to tackle jobs between 1.35 m - 2 m (54 in - 72 in) in diameter and bores between 90 m - 450 m (300 ft - 1500 ft). Each Rockhead is customized to fit your project's specifications, and is available in both Single Shield (SBU-RHSS) and Double Shield (SBU-RHDS) models.

THE SBU-RC

The Remote Controlled SBU (SBU-RC) is the ultimate solution for high-precision tunneling at small diameter. Our latest innovation for mixed ground and hard rock features precision guidance and articulated steering from the surface, all in a compact 900 mm (36 inch) diameter model. Even smaller diameters, down to 750 mm (30 inches), are in development. The proven SBU-RC utilizes a vacuum system for muck removal and can tackle crossings up to 150 m (500 ft) long at rates of 15 m (50 ft) per day or more, depending on conditions.



"This was an awesome piece of equipment. I was very impressed with the construction quality of this machine, and if I came across another job that required this technology I would use it again." (on the successful use of an SBU-M to bore two utility tunnels below a state highway in Wyoming, USA.)

JON NIX, VICE PRESIDENT & COO, CLAUDE H. NIX CONSTRUCTION



MUMBAI WATER TUNNEL | INDIA

Contractor Unity-IVRCL and Robbins celebrate the record-setting breakthrough of a Robbins main beam TBM. The speedy machine reached national record rates of 870 m (2,855 ft) in one month and 58 m (188 ft) in one day through basalt rock.



ROBBINS FIELD SERVICE

BY YOUR SIDE

EVERY STEP OF THE WAY



"We are a very close knit team. Robbins is very good and professional, and whenever we have needed help, they came and assisted us with advice."

BRIGADIER BOPERAI
JAL JOINT PRESIDENT, AMR

SUPPORTING YOUR VISION

Carving tunnels through the earth's most difficult obstacles is a monumental task. Having a skilled field service team to streamline the tunneling process puts you a step ahead. At Robbins, we offer a wide range of services and support for our customers, from equipment commissioning to training, and beyond. We are committed to becoming an extension of your workforce, and making your project as streamlined and productive as possible.

THE RIGHT FIT

Just as Robbins TBMs are fully customizable, so are our field service teams. Whether you need a senior project manager to oversee day-to-day operations or additional personnel during a labor shortage, we work with you to create a field service program that suits your specific needs.

OUTSTANDING IN OUR FIELD

Robbins field personnel are famous for their technical knowledge and experience. When it comes to underground excavation, they've seen it all, from the most challenging geologic conditions to the most complex tunnel designs. When you have a Robbins technician on your jobsite, you get the support of our entire engineering team. We add a depth and breadth of experience to your staff that is beyond value.





BLACK RIVER TUNNEL | LORAIN, OHIO, USA
A 7.0 m Robbins Double Shield TBM holes through after
swift advance rates through shale rock.



“There is always a demand that drives innovation, and we are constantly innovating. What often drives us is a request from a customer for something that no one in the industry can do yet.”

STEVE SMADING

ROBBINS PRODUCT MANAGER, CUTTERS





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