The Murray & Roberts Underground Mining platform provides specialist engineering, construction and mining contracting services in the underground environment to a diverse group of clients including blue chip majors, mid-tier and junior operators in the global mining and metals resources sector.

The Underground Mining platform achieved a turnover of ZAR 8 billion in FY18 with a confirmed order book of more than ZAR 22 billion. Its geographic footprint is one of the largest in its industry, covering Africa, the Americas, Australia and Asia. Our service offering spans the project value chain including specialist engineering, shaft construction, mine development, raise drilling and contract mining.

As an international operation, businesses within the platform leverage each other’s capabilities, positioning them to serve both regional and global mining companies with world class services. The Underground Mining platform is part of the Murray & Roberts Group and oversees the activities of the following regional entities:

<table>
<thead>
<tr>
<th>PLATFORM</th>
<th>CAPABILITIES</th>
<th>GEOGRAPHY</th>
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</thead>
<tbody>
<tr>
<td>OIL &amp; GAS</td>
<td>+ Detailed engineering</td>
<td>AFRICA AMERICAS</td>
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<td></td>
<td>+ Procurement</td>
<td>ASIA</td>
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<td>+ Construction</td>
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<td></td>
<td>+ Commissioning &amp; maintenance</td>
<td>EUROPE</td>
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<td></td>
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People remain our most valuable asset, and the safety of employees and stakeholders is non-negotiable.

Many projects are delivering best-in-class safety performances. Cementation USA is currently 33 months without a lost-time injury (LTI). The GCR joint venture in Mongolia has recorded more than 2 million man hours without an LTI, while RUC Cementation Mining is 14 months LTI free. The platform continues to make progress in implementing fatal risk management programmes to prevent serious incidents and fatalities on projects.

Stop.Think.Act.24/7 is a widely recognised Murray & Roberts health and safety brand developed to educate and motivate employees to be responsible for their own and their colleagues’ safety in the work environment and also at home. “Act” emphasises the importance of taking action to correct unsafe conditions and behaviours, as well as recognising positive behaviour, while “24/7” highlights the need for safety awareness at all times.

The Zero Harm through Effective Leadership Programme aims to increase leadership visibility and to continuously develop a culture of safety.

Our ultimate safety goal is Zero Harm. Safety and performance work in unison and every employee’s commitment to accountability and responsibility to ensure safety is a tenet of our safety philosophy.

We have specific healthcare education and awareness initiatives, including Wellness Days at project sites to encourage healthy lifestyle choices. The Occupational Medicine Programme uses pre-employment, periodic and exit medical examinations to prevent and manage potential workplace-related diseases and other conditions early.

The Underground Mining platform adopts a proactive environmental management policy and implements industry best practice to minimise the impact of our business activities on the environment.

Engineered Excellence is a strategic imperative that cuts across everything we do. This means that we find the best solution to any challenge, implement it in the best way possible and strive to get it right the first time.

Using offsite brick and mortar training academies, coupled with formal project site skills delivery programmes, Murray & Roberts offers industry best practice in technical and supervisory training covering a wide field of disciplines. The training methodology includes e-learning, simulation, visual-based training and integrated assessment-based training in a customised solution. The academies also offer a training service to our clients and are an integral part of our commitment to train and upskill local employees.

These training programmes are critical to the platform’s project delivery success and have provided much needed skills training and livelihood to the local and indigenous communities on our projects across remote locations including recent programmes in Mongolia, Papua, Africa, remote locations in Latin America, and multiple projects in the northern Arctic region.
**ORDER BOOK**

**ORDER BOOK TIME DISTRIBUTION**

(R billion)

<table>
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<tr>
<th>Year</th>
<th>2019</th>
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<th>&gt;2020</th>
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<tbody>
<tr>
<td>Value</td>
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<td>7.3</td>
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**NEAR ORDERS AND PIPELINE**

(R billion)

<table>
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<th>Category</th>
<th>Value</th>
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<td>Near order</td>
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<tr>
<td>Category 1</td>
<td>19.4</td>
</tr>
<tr>
<td>Category 2</td>
<td>19.8</td>
</tr>
<tr>
<td>Category 3</td>
<td>17.4</td>
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</table>

**Near orders:** Tenders where the Group is the preferred bidder and final award is subject to financial/commercial close – there is more than a 90% chance that these orders will be secured.

**Category 1:** Tenders submitted or tenders the Group is currently working on (including near order) – projects developed by clients to the stage where preliminary studies are being obtained – chance of being secured as firm as a function of client approval as well as bid win probability.

**Category 2:** Budgets, feasibility and prequalification, the Group is currently working on – project planning underway, not at a stage yet where projects are ready for tender.

**Category 3:** Opportunities which are being tracked and are expected to come to the market in the next 36 months – identified opportunities that are likely to be implemented, but still in pre-feasibility stage.

**Revenue**

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<tr>
<td>June</td>
<td>3 524</td>
<td>3 566</td>
<td>1 779</td>
<td>1 727</td>
<td>2 701</td>
<td>2 754</td>
<td>8 004</td>
<td>8 046</td>
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<td>Operating profit</td>
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<td>124</td>
<td>109</td>
<td>217</td>
<td>147</td>
<td>123</td>
<td>471</td>
<td>464</td>
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<tr>
<td>Margin (%)</td>
<td>6%</td>
<td>3%</td>
<td>6%</td>
<td>13%</td>
<td>5%</td>
<td>4%</td>
<td>6%</td>
<td>6%</td>
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<tr>
<td>Order book</td>
<td>10 738</td>
<td>11 021</td>
<td>4 799</td>
<td>3 117</td>
<td>6 533</td>
<td>3 368</td>
<td>22 070</td>
<td>17 506</td>
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</table>
Engineered Excellence

Established in 1990 as a shaft sinking and raise drilling specialist, RUC Cemenation Mining has grown into a business operating across Australia, New Zealand, Mongolia, Indonesia and the Philippines. Attributable turnover for FY18 was ZAR 1.78 billion. We contract with many of the major mining houses in the underground mining sector including Newmont, Rio Tinto, BHP, PT Freeport and Anglo Gold Ashanti as well as major mining houses in Australia such as Newcrest and Northern Star Resources. We also provide services to a large number of mid-tier gold and nickel miners.

With our extensive fleet of modern equipment and a highly experienced and qualified team of mining professionals, the company has gained a reputation for the successful execution of the most complex and challenging assignments.

Shaft Sinking

RUC Cemenation Mining, through our Mongolian joint venture, is contracted at the Oyu Tolgoi mine in Mongolia to sink two of the largest shafts in Asia, at 11m and 10m diameter to a depth of 1,150m. All design and engineering for the shaft sinking is being completed in Australia.

RUC Cemenation Mining is also the only shaft sinking contractor in Australia that has been continuously sinking shafts over the past 15 years.

Mine Development

RUC Cemenation Mining is contracted to complete full service mining contracts throughout Australia, including at Dacian’s Mount Morgan project, where monthly advance is in the region of 1,400m. With a fleet of nine electric hydraulic, two boom jumbos, four production drills, 10 LHDs and 10 trucks, we have strong capabilities across the sector.

Raise Drilling

RUC Cemenation Mining has the most extensive range of raise drills in Australia with 25 rigs in the fleet. We manufacture our own range of raise drills, the Strata range. We hold the record for the largest raise drilled shaft in Australia, 930m at a diameter of 6m.

Construction

RUC Cemenation Mining undertakes significant construction works, in particular at Freeport where we are constructing all of the rail chutes for the Grasberg block cave mine. Through our Mongolian joint venture we are constructing the primary ore flow system for Oyu Tolgoi as well as the construction associated with the shaft sinking contract.

Engineering

Our engineering capability is focused principally on in-house needs to support our shaft sinking and mine development projects.

Contract Mining

Contract mining in Australia is part and parcel of our mining contracts and includes the full range of production drilling, stope blasting, remote loading and haulage.

Innovation

RUC Cemenation Mining has taken the lead in transitioning to the future digital mine with the use of semi-autonomous trackless mechanised machinery in the lateral development and mining of the orebody. Our global technology partnership with Remote Control Technologies will provide us with first access to new developments in remote control and automation systems, specifically for use in the underground mining environment.

We are also establishing full digital capability at Dacian Gold’s Mount Morgan’s project in Laverton, Western Australia, through a fibre backbone network and plug and play wi-fi technology which will extend to all working faces. RUC Cemenation Mining operates the latest semi-autonomous drilling and ore handling equipment at this site.
Cementation Americas is a ZAR 2.7 billion turnover (FY18) underground mining contracting and engineering company with operating hubs in North Bay and Salt Lake City, providing services for clients throughout North and South America and internationally. Recent key clients include Rio Tinto, Vale, Lundin Mining and Glencore PLC. With the additional capabilities of Cementation Above Ground (AG) and Merit Consultants International, Cementation Americas encompasses a larger scope of the project life cycle with the goal of improving project delivery in all phases.

Cementation AG is a specialist design-build engineer, procure and construct (EPC) contractor providing surface material handling and process systems on a mine to market scope for the resource sector. Cementation AG’s focus is on total cost of ownership and delivering systems with outstanding reliability.

Merit Consultants International is a consulting company with over 30 years’ experience in surface mine infrastructure and construction management. Merit is committed to keeping the scope of a project in the owner’s control and acts as an extension of the owner’s team.

SHAFT SINKING
Cementation Americas is a premier shaft sinking contractor and is the most active contractor in North America. The company has sunk the deepest shaft in the world outside of South Africa at the Kidd Mine in Canada.

MINE DEVELOPMENT
Cementation Americas is actively involved in development work throughout North America, including lateral development, ramp development, and underground caverns and bins. The company carries out both track and trackless ramp and lateral development work by employing either our own extensive fleet of equipment or by operating the client’s equipment. These development projects range from substantial new mine development programmes to mine expansion and refurbishing projects.

RAISE DRILLING
Cementation Americas specialises in large diameter raise drilling and operates some of the largest raise boring machines in the world. Raise drilling, an alternative method for shaft and raise development between levels, is the most cost-effective form of vertical raising and provides the fastest, and safest form of shaft development.

Cementation Americas introduced large diameter hard rock raise boring into Canada in 2004 and currently holds the record for the largest diameter (5.52m) single pass bored shaft at 694m in the Canadian Shield.

CONSTRUCTION
Our underground construction work includes a full range of speciality mine construction services. We have the capabilities for underground construction and installation projects for mining and civil applications.

ENGINEERING
Cementation Americas employs an in-house team of engineers and designers with expertise in mining, mechanical, electrical, civil, structural and geotechnical disciplines. We are a leading provider for design-build mine access projects, delivering engineering services from concept through to detailed engineering for mine access and material handling infrastructures.

CONTRACT MINING
From complete operation of underground mines to speciality stopes and pillar mining, Cementation Americas experienced contract mining team has successfully completed a range of projects for clients.

INNOVATION
We are continuing the development and use of Virtual Reality (VR) technology, with a focus on taking VR into all phases of a mine’s life-cycle. Planned advancements include simulation, real-time monitoring and inspection, and ready access to vital digitised information using Augmented Reality.
Murray & Roberts Cementation is a ZAR 3.52 billion turnover (FY18), mining contracting company headquartered in Johannesburg, South Africa. The company has served the mining industry for more than a century, providing services to many of the mining companies operating across Africa, including De Beers, Impala Platinum, South 32, Kalagadi Manganese, Petra Diamonds, Mopani, Palabora and Ivanplats.

Murray & Roberts Cementation offers global expertise in shaft sinking, tunnelling, raise drilling, engineering, design and contract mining. The company provides a comprehensive range of services across all phases of mine project delivery from concept to commissioning and operations. Our capabilities also include mine development and mine engineering.

Murray & Roberts Cementation offers a complete range of mine development services including vertical and decline shaft sinking and equipping, mine haulage development and tunnelling, underground chamber excavation and support as well as equipment installation and shaft refurbishment.

Murray & Roberts Cementation introduced the concept of contract mining and is a recognised leader in this field. We offer a variety of services including mine design and planning, specialist pre-feasibility and feasibility studies, mining equipment and fleet maintenance studies, underground infrastructure design and installation, mechanised and semi-mechanised development and stoping.

Murray & Roberts Cementation offers a comprehensive range of mining services to support its mine development and contract mining operations.

Our services used extensively throughout the industry include:
- Underground exploration drilling, medium and large diameter raiseboring and drainhole drilling as well as directional drilling
- Drop raising
- High pressure underground water management including cementation, water doors, cover drilling and grouting as well as shaft dewatering
- Underground dam and high pressure bulkhead construction
- Grout plant design, construction and operation and grout pack installation
- Silo and settler construction as well as large tip and boxfront construction
- Orepass and shaft rehabilitation.

Murray & Roberts Cementation has identified a need within the mining industry for independent design-build services for shaft sinking and related mining. This specialist service was a natural extension of our in-house design services provided to support operational divisions. The service integrates the practical knowledge of the operations with the design ability of the mine engineering department and the data banks of the estimating and scheduling department. Mine engineering delivers mine access designs, shaft sinking and equipment designs and mining layout ore depletion designs. The result is a service that provides clients with a practical design function complementing our operational services.

Rock cutting and mechanised shaft sinking (vertical and decline shafts) is a key focus for Murray & Roberts Cementation and we have relationships with several original equipment manufacturers in this field. We are also pursuing innovation in shaft borer enlargements and remote shotcreting of raisebore holes.

Murray & Roberts Cementation includes the following businesses:
- Murray & Roberts Cementation Zambia
- Murray & Roberts Cementation DRC
- Murray & Roberts Cementation Tanzania
- Many other areas of Africa through Group operating companies.
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