Shaft Sinking

DRIVING PROGRESS
Innovation and creative construction in Shaft Sinking.
From major desalination plant facilities, pipelines, hydropower plants and cable tunnels, to metro and mine access and ventilation shafts, McConnell Dowell delivers outstanding shaft and access solutions for our customers and the community.

**Capability, Capacity and Creativity**

We have been delivering creative underground shaft and access solutions to the international market for water and wastewater management and hydropower development for over 40 years, the mining industry for more than 30 years and power / utility providers for more than 20 years.

Our capability is truly multi-disciplinary. From access declines / shafts for resources, minerals and metalliferous mines; ventilation and emergency shafts for road and rail infrastructure; temporary access / logistics shafts for tunnelling operations; sewerage / stormwater tunnels and drop shafts; water, fuel, gas and oil pipelines construction shafts and rising mains etc. to renewables including hydropower energy and water desalination facility tunnels, shafts and underground caverns, the depth and breadth of our offer drives innovative, cost efficient construction and effective risk management.

In addition, our sister company, Moolmans, is a world leader in shaft sinking and access development, with expertise to sink and equip both vertical and decline shafts of various diameters to depths of more than 2000 metres, through all types of rock formations. Moolmans provides technical support and guidance, through to full partnering with McConnell Dowell, dependent on Project complexity.

**Safe, Assured and Committed**

At McConnell Dowell, we are committed to safety and ensuring everyone goes ‘Home Without Harm’. Everything we do is focused on minimising impact on our customers, the environment and the community.

Our collaborative and professional approach, combined with our ISO accredited project management systems, ensures high quality infrastructure is delivered on time and within budget.

As active members of the Australian, New Zealand and Singapore Tunnelling & Underground Construction Societies, the International Pipeline and Offshore Contractors Association (IPLOCA), Australian Pipelines and Gas Association (APGA) and Australian Petroleum Production & Exploration Association (APPEA), we are at the forefront of industry innovation and best practice.
Our progressive thinking and creative approach is what makes us different.
So we’ve built a culture of progressive thinking. It’s an approach that looks for opportunities, embraces change and finds different, creative solutions to difficult problems.

**Building better communities and providing a better life**

McConnell Dowell is founded on a proud heritage of innovation and pioneering spirit. In collaboration with our customers and partners, we have a proven track record in building better communities through safe, smart and efficient infrastructure. Since the early 1960’s our reputation has been forged by finding innovative solutions and delivering creative construction outcomes that contribute positively to those communities.

Our progressive thinking, on-going culture of expertise, innovation and creative approach is what sets us apart. It’s why our projects consistently win industry awards and why so many of our customers keep coming back to us.

**Innovation that improves lives**

We care deeply about the people we work with: our customers, our employees, our partners, investors and the communities we serve around the world.

We foster a safe, high quality, systematic and structured approach that allows people to challenge ideas, find hidden insights, look for innovative solutions and deliver infrastructure that improves the quality of life and benefits all stakeholders.

From ambitious resource projects in remote locations to large-scale, city-changing infrastructure, for almost 60 years customers have been coming to McConnell Dowell with complex projects that require innovative
BUSINESS MODEL

A value offering encompassing part or full optimal integration of the complete life cycle of project execution; Project Management, Engineering, Procurement, Construction, Commissioning and Operations.

Value Offering

Market Sectors

Specialist Capabilities
We operate throughout Australia, Asia, New Zealand and the Pacific Islands bringing local knowledge and international expertise.

Global Regions

Group expertise

In addition to the experience from within the McConnell Dowell Group, we can call on our sister company Moolmans, a world leader in shaft sinking.

Like McConnell Dowell, Moolmans is also wholly owned by Aveng and is a South African-based leader in contract mining operating across Africa.

For more than 60 years Moolmans has provided specialised services to the mining industry that include open cut mining, shaft sinking and access development, and underground mining projects. Moolmans currently works on a number of projects throughout Africa and has mined a range of commodities for a variety of reputable clients.

Moolmans has developed strong brand equity through our strong customer relationships, extensive experience in remote and difficult locations, and a track record of sound operational performance.
South Africa

Platreef

Moolmans has showcased its shaft sinking capacity at the Platreef project, which included the construction of a terrace, sinking and lining of the bulk sample 7.25 m diameter shaft to a -750 level, as well as cover drilling and the development of two underground stations at -450 and -750 level.

The contract was awarded by Ivanhoe Mines in August 2013 and work began in January 2014. Moolmans’ contract is to conduct all sinking activities to a final depth of 982 m, which included 450 m station, 750 m station, 850 m station, 950 m station and shaft bottom spillage arrangement on 980 m station.

Having successfully completed stations at 450 m and 750 m below surface, the shaft intersected the upper contact of the Platreef deposit approximately 783 m in September 2018. Moolmans began with the 850 m station in November 2018.
The works included the sinking, lining and equipping of an 8.5 m diameter Main Shaft to a depth of 1,000 m and a 7.5 m diameter Ventilation Shaft to a depth of 930 m. It included the development, construction and equipping of stations, levels and permanent infrastructure. Conventional South African sinking techniques that include five-deck stages, mechanised-drilling jumbos and cactus-grab mucking with kibbles were used.

Four mechanically independent Hepburn winches were used for stage winding at the Ventilation Shaft. Mechanised trackless machinery was used for the development of all horizontal works.

The Aveng Electrical Shaft Safety System was developed, which uses PLCs to control shaft sinking and winder interlocks. The mine was designed for mining both the Merensky and UG2 reef with a shaft hoisting capacity of 270,000 t per month.
South Africa
Kalagadi

The scope of work included the sinking, lining and equipping of the 10.8 m diameter production shaft to a depth of 385 m, and the 6.8 m diameter Ventilation Shaft to a depth of 322 m. Both the shafts were sunk through the Kalahari Sands and supported by means of 1.0 m reinforced lining with second toe in at + 36 m below surface.

Further works included the construction of shaft stations, ore passes, pump stations, conveyor loading systems and shaft-bottom infrastructure.

The team was able to boast the sinking of both shafts without a lost-time accident being recorded in either of the shaft barrels. The shaft system was designed to produce 3 million tonnes of run-of-mine manganese ore with the use of mechanised trackless mining machinery.
The scope of work included the sinking, lining and equipping of the Main Shaft (11.7 m in diameter) to a depth of 180 m and the Ventilation Shaft (9.2 m in diameter) to 168 m. This included the development and equipping of a Decline Materials Shaft (7 m in width and 3.3 m in height at -17 degrees) for a distance of 700 m; and the development and equipping of the underground coal–storage bunker and all the associated station works and connecting works.

Moolmans tackled the project with a number of new innovations; the design and use of a cantilever headgear for blind sinking, the development of the -17 degree decline using unassisted load-haul dumpers (LHDS), and the development of a low-profile conveyor-loading chute.

A notable achievement was the completion of the heaviest deep-slinging operation in Southern Africa, in which mining machinery weighing up to 65 tonnes was lowered down to the shaft bottom at 165 m, using a mobile hydraulic crane.
New Zealand

Glen Eden Storage Tank and Branch Sewer Upgrade

Design and construction to upgrade the existing wastewater infrastructure in the Glen Eden area and reduce the number of overflows that occur following periods of prolonged heavy rain.

Scope of works consisted of:

- Construction of a 2,000 m$^3$ storage tank under an existing carpark and playing fields in Harold Moody Reserve
- Construction of a new tank overflow to the adjacent Waikumete Stream
- Construction of a new network sewer in Harold Moody Reserve
- Construction of 800 m of a new transmission sewer, 10 m deep, along Glendale Road from Ceramco Park to Harold Moody Reserve
- Construction of a new transmission sewer through Sherrybrooke Esplanade and Parrs Park including a new box culvert, associated connections, and chambers
- Construction of a new network sewer from Rangeview Road to Sherrybrooke Esplanade, including drilling underneath the NIMT railway and construction of a pipe bridge over Waikumete Stream.
New Zealand

**Huntly North Mine Shaft**

The construction of a ventilation shaft to provide ventilation to Huntly East Mine. The shaft has a finished internal diameter of 4.3 m and when complete will be approximately 270 m deep.

The upper 40 m of the shaft was constructed by blind-sinking a precast concrete caisson through Tauranga Group alluviums. Below 40 m BC the shaft was constructed by drill and blast methods through a series of rock strata.

Due to a change in the Client’s situation, unfortunately the Shaft contract was suspended at a depth of 141 m.
Singapore

Downtown Line Stage 2
Mass Rapid Transit - Beauty
World Station & Tunnels

Design and construction of a new Mass Rapid Transit (MRT) underground station and associated tunnels. The station forms part of Downtown Line Stage 2 (DTL2) scheme, to link commuters from the Bukit Timah corridor to the North East Line, North South Line, and Circle Line, connecting the north western part of Singapore to the Marina Bay area.

It represents 40% of Singapore’s broader rail network, passing through the heart of the island. When the fully completed, Singapore will have an underground rail network larger than London’s rail network. A critical aspect of the project was phasing the works to maintain vehicle and pedestrian access across the site in a very congested part of Singapore.

Scope of works consisted of:

• Two MRT 1,100 m bored tunnels with an internal diameter of 5.8 m
• Two cross passages
• 135 m of cut and cover tunnels
• A new underground station including entrances, subway links, architectural finishes and external landscaping. The station also doubles as a civil defence shelter.

The project was a great success and was completed six months ahead of schedule and under budget. The project team was also recognised by the industry for their impressive safety culture and management record receiving several Health and Safety awards.
The Adelaide Desalination project involved the design, build, operate and maintain contract for a 100 GL per annum reverse osmosis desalination plant. The project, nominated for the ITA 2011 Tunnelling Project of the Year, encompassed extensive work in all construction disciplines including bulk earthworks, civil structures, marine, tunnelling, mechanical, electrical and building work.

The shaft works included the drill and blast excavation of three onshore shafts:

- the Outfall and Energy Recovery Shaft — 13 m x 16 m ovoid shaft x 41 m deep
- the Working Shaft — 10 m dia x 45 m deep
- the Intake Shaft — 17 m dia x 50 m deep
- two riser shafts above the IPS via bored pile rotary rig — 26 m deep

Other tunnelling / underground scope of works included:

- the Intake Pump Station (IPS) underground cavern — with a floor level 38 m below ground, and size of 50 m long x 16 m wide x 24 m high, it was constructed by a combination of road header sequential excavation and controlled drill and blast technique
- a 2.8 m ID 1.5 km segmentally lined TBM driven sub-sea intake tunnel
- a 2.8 m ID 1.2 km segmentally lined TBM driven sub-sea outfall tunnel;
- an 8 m high, 2 m dia sea-bed precast RC and GRP seawater intake riser structure;
- six vertical 0.9 m dia outfall riser shafts.
Philippines

Ambuklao and Binga Hydro Projects

The project involved the rehabilitation — bringing back to life — of the 175 MW hydropower facility in the north region of Luzon, Philippines.

The project scope entailed the rehabilitation and construction of civil tunnels, shafts and tunnels at Ambuklao, as well as an upgrading from 100 to 120 MW of output from the Binga hydropower facility downstream.

The works at Ambuklao included the excavation and construction of an intake structure 17 m high, 13.5 m wide 24 m deep, a 6 m excavated, 5 m lined diameter drop shaft 124 m deep and several drill and blast tunnels of 3.4 m dia of 50 m length up to 6.8 m dia x 191 m length. Works at Binga included an intake structure 6.5 m high, 14.5 m wide 29 m deep, a 5 m dia x 241 m and 7.8 m dia x 159 m long access and headrace tunnel.
New Zealand

Rosedale Ocean Outfall

The project involved the design and construction of a 3 km long (2.4 km onshore and 0.6 km offshore) EPB TBM driven tunnel.

The works included the design and construction of an innovative 45 m deep 6 m internal diameter cascade drop shaft and inlet works, which was a New Zealand first; and a GRP lined drilled shaft 2.4 m dia. 30 m deep. Given the deepening of the tunnel a more complex UV shaft cascade structure was installed to allow the shaft to be sunk in the back-shunt.

The cascade drop shaft structure prevented the aeration of water in the outfall, eliminating the need for both a vortex and air relief shafts and was a New Zealand first.
19 No. On-shore TBM recovery shafts
6 m diameter shafts, various depths up to 30 m
Methods: sheet piles, secant piles, NATM, segment caisson sink
NSW Government Partnership Excellence Award

Australia

Sydney Desalination Plant
Water Distribution Network

Delivered by Alliance, the EPC project scope comprised of 17 km of pipeline and the 250ML/day pump station infrastructure to convey desalinated water from the plant at Kurnell to the City Tunnel at Erskineville. Main challenges included the laying of 7 km of twin steel pipelines across Botany Bay by a laybarge designed and fabricated on fast-track basis for the project as well as the underwater marine recovery of the 110 t 2.5 m dia TBM 800 m offshore.

Nineteen shafts in total were constructed in weak ground comprising:

- 10 sheet piled shafts; 7 secant bored pile shafts and 2 segmentally lined caisson shafts;
- a deepest shaft of 18 m, shallowest 10 m;
- an average diameter of 13 m

Other tunnelling / underground scope of works included:

- 2.7 km of 2.5 m OD tunnels with 1.8 m MSCL carrier pipe by EPB pipe jacking micro TBM;
- 3.6 km of 2.5 m OD tunnels with 1.8 m MSCL carrier pipe by AVN (slurry) pipe jacking micro TBM’s 1 & 2;
- 3.5 km of open cut DN1800 MSCL pipeline.
Australia

**Bogong Hydro Project**

The tunnelling works included 6.6 km of 5 m dia. tunnel excavated with a hard rock Tunnel Boring Machine (TBM), 1.1 km of drill and blast tunnel at 4.5 m dia and two deep shafts of 96 m and 140 m depth at 5.0 m dia.

The headpond drop shaft was constructed utilising a 25 m initial pre-sink through weathered rocks with the remainder, plus the entire downstream drop shaft excavated by raise-boring technique. They were lined with permanent rock bolts and shotcrete, with DS drop shaft being fully concrete lined.
Australia

Heroes Avenue Sewage Tunnels

The works included construction of a 645 m, 1,200 mm diameter sewer line to cross under the Brisbane River. To provide access to the micro-tunnels, four 35 m-deep shafts needed to be constructed using a combination of contiguous bored piles, drill and blast, caisson and diaphragm wall construction techniques.

The ground conditions varied from hard fractured water-bearing rock to clays and reclaimed land. Access was very constricted with no closure of Coronation Drive (adjacent to Brisbane River, on the western side) or the adjacent walkway being permitted.

Conventional micro-tunnelling (pipe jacking) involving boring the tunnel for the proposed sewer/drain, using a tunnelling shield (a fully automatic mechanised tunnelling machine) propelled from a launch shaft towards a reception shaft.
Three shafts were constructed as part of the tunnelling operation and these also presented many challenges. A high groundwater table; shaft base heave; limestone rock fissures connections to the sea; and the close proximity to an adjoining industrial premise all added complexity to the shaft design and construction.

The shafts were constructed using jet grouting, sheet piling and sequential excavation method (SEM) utilising bolts, mesh and shotcrete lining techniques.
Shaft Sinking Experience and Capability

McConnell Dowell has a very wide range of experience in shaft construction, dating back to pipeline crossings and hydro-projects in the 1970s to 1980s, requiring shafts for access at depth for tunnelling works. Shafts are also utilised extensively for the mining and resource sectors. We have referenced a list of our more notable projects that include sizeable shaft construction performed by McConnell Dowell.

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Contract</th>
<th>Shaft Construction</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>Jurong Island ExxonMobil Pipeline Tunnel</td>
<td>Design &amp; Construct</td>
<td>Bored Pile shafts of dia. 12 m &amp; 8.7 m to 25 m depth</td>
<td>2018–2019</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Glen Eden Wastewater Storage Tank</td>
<td>Design &amp; Construct</td>
<td>Storage tank of 2000 m³ capacity, 18.5 m dia x 12 m deep constructed by caisson sinking method</td>
<td>2016–2018</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Huntley North Coal Mine Vent Shaft</td>
<td>Design &amp; Construct</td>
<td>Blind-sink shaft 6 m x 260 m (141 m completed)</td>
<td>2011–2012</td>
</tr>
<tr>
<td>Singapore</td>
<td>Contract C916 – Beauty World Station 2 km of 7 m dia segment lined tunnels.</td>
<td>Design &amp; Construct</td>
<td>TBM Launch shaft by DWall and drill &amp; blast (28 m x 28 m)</td>
<td>2009–2012</td>
</tr>
<tr>
<td>South Australia, Australia</td>
<td>Adelaide Desalination Plant. Design and construction of desalination plant with three major shafts, IPS cavern.</td>
<td>Design &amp; Construct</td>
<td>Shaft sinking by drill &amp; blast 3 no. 41–50 m deep shafts from 8 to 17 m dia. Cavern 40 m x 15 m x 23 m</td>
<td>2009–2010</td>
</tr>
<tr>
<td>Philippines</td>
<td>Rehabilitation of existing Ambukiao &amp; Binga Hydro Plants with 2 km of underground excavations</td>
<td>Construct</td>
<td>Shaft sinking by drill &amp; blast 124 m deep 6 m dia. concrete lined drop shaft &amp; 2 major intake excavations</td>
<td>2008–2010</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Rosedale AWTP Ocean Outfall. 3 km 2.8 m dia segment lined tunnel &amp; 2 km 1.6 m dia submarine pipeline</td>
<td>Design &amp; Construct</td>
<td>45 m deep 6 m ID cascade drop shaft; GRP lined drilled shaft 2.4 m dia 30 m deep</td>
<td>2007–2010</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Hobson Bay Tunnel Project. 3 km long, 3.8 m ID segment lined tunnel and shafts</td>
<td>Design &amp; Construct</td>
<td>4 no. shafts approx. 35 m to 40 m deep (22 m, 8 m &amp; 10 m ID)</td>
<td>2007–2010</td>
</tr>
<tr>
<td>New South Wales, Australia</td>
<td>Sydney Desalination Project. 7 km of tunnelling in Sydney</td>
<td>Design &amp; Construct</td>
<td>TBM Launch and Recover shafts, 16 shafts to 6 m dia, various depths to 30 m</td>
<td>2007–2009</td>
</tr>
<tr>
<td>Queensland, Australia</td>
<td>Southern Regional Water Pipeline (SRWP)</td>
<td>Alliance</td>
<td>20 shafts of various size, shape &amp; depths for MTBM</td>
<td>2006–2009</td>
</tr>
<tr>
<td>Victoria, Australia</td>
<td>Bogong Hydropower Project. 140MW Plant and 8 km of tunnels and structures</td>
<td>Design &amp; Construct</td>
<td>5 m dia x 140 m deep head-pond &amp; 5 m dia x 96 m deep downstream drop shafts by raise-bore</td>
<td>2006–2009</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Pike River Coal Mine. 2.5 km of D&amp;B access tunnel, pit bottom development and ventilation shaft</td>
<td>Construct</td>
<td>110 m deep shaft sinking by drill &amp; blast, raise-boring and Alimak raise method</td>
<td>2006–2009</td>
</tr>
<tr>
<td>Queensland, Australia</td>
<td>Heroes Avenue Sewer Tunnels</td>
<td>Construct</td>
<td>4 No. 35 m deep shafts by drill &amp; blast, contig bored piles, caisson &amp; D-Wall</td>
<td>2004–2009</td>
</tr>
<tr>
<td>New South Wales, Australia</td>
<td>Blue Mountains Sewage Transfer Scheme. Tunnel Project 20 km of TBM.</td>
<td>Design &amp; Construct</td>
<td>Shaft construction by drill &amp; blast, 8 shafts to 120 m in depth</td>
<td>1993–1996</td>
</tr>
<tr>
<td>Queensland, Australia</td>
<td>Thalanga Underground Mine, decline, side development, vent shaft</td>
<td>Construct</td>
<td>Central exhaust shaft construction by 2.4 m dia</td>
<td>1989–1991</td>
</tr>
</tbody>
</table>
In addition to McConnell Dowell’s experience, our parent company Aveng has an established Mining business, Moolmans, in Africa that specialises in mine shaft access and development, the most recent being the Platreef Project in Mokopane. The table below summarises some of the more notable projects undertaken by Moolmans/ Aveng Mining.

<table>
<thead>
<tr>
<th>Location</th>
<th>Project</th>
<th>Description</th>
<th>Shaft Depth</th>
<th>Year</th>
</tr>
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<tbody>
<tr>
<td>Mokopane, North West, RSA</td>
<td>Platreef Project</td>
<td>Shaft sinking 7.25 m dia</td>
<td>982 m (ongoing from 750 m)</td>
<td>2014–Current</td>
</tr>
<tr>
<td>Rustenburg, North West, RSA</td>
<td>Wesizwe Platinum</td>
<td>Main Shaft: 8.5 m dia</td>
<td>1000 m</td>
<td>2012-2017</td>
</tr>
<tr>
<td>Secunda, Mpumalanga, RSA</td>
<td>Shondoni Mine</td>
<td>Main shaft blind-sink 11.7 m dia</td>
<td>165 m</td>
<td>2012-2017</td>
</tr>
<tr>
<td>Codelco-VP, Chile</td>
<td>Chuquicamata, Copper Mine</td>
<td>Vent Shaft: 11.0 m dia</td>
<td>918 m</td>
<td>2012-2016</td>
</tr>
<tr>
<td>Hotazel, Northern Cape, RSA</td>
<td>Kalagadi Manganese</td>
<td>Production Shaft: 10.8 m dia; Ventilation Shaft: 6.8 m dia</td>
<td>385 m 322 m</td>
<td>2010-2015</td>
</tr>
<tr>
<td>Trichardt, RSA</td>
<td>Thubelisha Mine</td>
<td>Main Shaft: 11.7 m dia</td>
<td>180 m</td>
<td>2009-2014</td>
</tr>
<tr>
<td>Balfour, Mpumalanga, RSA</td>
<td>Burnstone</td>
<td>Vent. Shaft: 9.2 m dia</td>
<td>168 m</td>
<td>2008-2012</td>
</tr>
<tr>
<td>Konkola, Zambia</td>
<td>Konkola Mine</td>
<td>Main Shaft: 9.0 m x 7.0 m Oval</td>
<td>800 m</td>
<td>2006-2012</td>
</tr>
<tr>
<td>Steelpoort, Limpopo, RSA</td>
<td>Two Rivers Project</td>
<td>Four declines (8°)</td>
<td>1,125 m 1,615 m</td>
<td>2003-2012</td>
</tr>
<tr>
<td>Johannesburg, RSA</td>
<td>Central Rand Gold</td>
<td>One decline</td>
<td>165 m</td>
<td>2009-2010</td>
</tr>
<tr>
<td>Steelpoort, RSA</td>
<td>Dilokong Mine</td>
<td>Two declines (8°)</td>
<td>600 m</td>
<td>2008-2010</td>
</tr>
<tr>
<td>Ogies, RSA</td>
<td>Zondagsfontein Mine</td>
<td>Main Shaft: 11.0 m dia</td>
<td>120 m</td>
<td>2007-2010</td>
</tr>
<tr>
<td>Springs, RSA</td>
<td>Modder East Mine</td>
<td>6.5 m dia shaft</td>
<td>344 m</td>
<td>2007-2009</td>
</tr>
<tr>
<td>Ogies, RSA</td>
<td>Irenedale Mine</td>
<td>11.4 m dia shaft</td>
<td>160 m</td>
<td>2006-2007</td>
</tr>
<tr>
<td>Ogies, RSA</td>
<td>Frischgewaagd Mine</td>
<td>8.6 m dia shaft</td>
<td>200 m</td>
<td>2006-2007</td>
</tr>
<tr>
<td>Ulundi, RSA</td>
<td>Zululand Anthracite Colliery</td>
<td>6.0 m dia shaft</td>
<td>300 m</td>
<td>2005-2006</td>
</tr>
<tr>
<td>Black Rock, RSA</td>
<td>Nchwaning 1 Mine</td>
<td>5.2 dia shaft</td>
<td>450 m</td>
<td>2002-2005</td>
</tr>
<tr>
<td>Secunda, RSA</td>
<td>iTemba Lethu Mine</td>
<td>15.0 x 9.0 m dia Elliptical shaft</td>
<td>146 m</td>
<td>2005-2006</td>
</tr>
<tr>
<td>Swartklip, RSA</td>
<td>Union Section</td>
<td>3Q Vent. Shafts, 5.1 m dia</td>
<td>72 m</td>
<td>2003-2004</td>
</tr>
</tbody>
</table>