

## South Africa

### Mining Group Expands To Tunnelling Market

Rucbor, a division of the Murray & Roberts RUC group, has developed appropriate equipment to excavate tunnels and shafts more efficiently and with greatly reduced safety risks. One of the company's new contracts is the Sedrun II shaft in Switzerland where a 1.8 m-diameter raise borehole will be bored to a depth of 723 m, after which shaft boring, using a V-mole, will be used to bore this shaft to 7 m in diameter. This vertical shaft forms part of the AlpTransit Gotthard tunnel and will be undertaken in jv with Thyssen-Schachtbau and Ostu-Stettin. It is a dual-purpose shaft, which will provide ventilation and be equipped with hoisting equipment. In addition to raise and shaft boring of the shaft, the contract calls for steel-fibre reinforced-shotcrete support and the equipping of the shaft with winders and conveyances. The newest of the company's four Wirth HG 330 raiseboring machines, manufactured in Germany, is in operation at this project, and has been sent from Germany to site in Switzerland in May. Boring began in June and is expected to be complete by June 2003. Visit [www.ruc.co.za/rucbor.htm](http://www.ruc.co.za/rucbor.htm)

The company is reportedly the only drilling contractor in the world that can offer these directional drilling techniques. To date, it has successfully drilled more than 1,000 m within contract tolerances using this technology. A rotary vertical drilling system, pioneered by RUC, will be used to steer the pilot hole drilling within the required tolerance of 0.5 m deviation over 723 m.

In addition, RUC's expert subsidiary Rucmin has developed a robust and compact two boom drillrig. This rig can drill 1 to 3 metre drilling rounds and is also equipped to support holes. It can be used to stope wide ore bodies and to drill rounds for tunnels of up to 5 x 4.5 m in size. The unit is easy to maintain and is operated by two people, facilitating safe operation through the performance of its own mechanical barring, with the boom extending 5 m in front of the operator. This drillrig is self-propelled utilising either diesel or electric power units driving rubber-tyred or track bound wheels, as well as crawler tracks. The units can be applied in trackless, inclined or tracked mining environments. Visit [www.ruc.co.za/rucmin.htm](http://www.ruc.co.za/rucmin.htm)

Rucbor is with Rucmin one of the two divisions of international contract mining company RUC, which was a wholly-owned subsidiary of Murray & Roberts group until RUC has been renamed Murray & Roberts RUC with effect 1<sup>st</sup> July, 2002. Visit [www.murrob.com](http://www.murrob.com)

## World Digest Of Tunnels Under Planning

**Australia.** Brisbane Mayor Jim Soorley has proposed a A\$1 billion road and rail tunnel, linking the South East Freeway at Woolloongabba to the Inner City Bypass with a toll between \$2 and \$3. The 5 km tunnel would be funded by the council and carry 70,000 vehicles a day (read E-News Weekly # 16). A plan to build four traffic tunnels at a cost of A\$3.2 billion has been unveiled by Liberal Opposition candidate to Brisbane mayoralty Campbell Newman. The proposed tunnels would include a 3.6 km tunnel under Milton Road linking the Western Freeway at Mount Coot-tha with Hale Street at Paddington; a 5.8 km east-west bypass linking Old Cleveland Road with the Western Freeway at Toowong; a 5.7 km north-south bypass following a similar route to Mayor Jim Soorley's proposed tunnel, connecting Ipswich Road at Woolloongabba to the Inner City Bypass at Bowen Hills; and a 600 m tunnel between Hale Street and Merivale and Cordelia streets in South Brisbane. These tunnels would be funded by a toll and \$800 million from state and federal

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governments. They would form a triangular network around inner Brisbane. Brisbane is Australia's third largest city. The Brisbane City Council election is not until 2004.

**Norway.** Early design is underway for the 30-35 km highway E 18 between Grimstad and Kristiansand in Aust-Agder county. The local authorities are lobbying to build a 3.5 km-long tunnel in Lillesand to save natural landscape much used for recreation. For cost reasons, Statens Vegvesen, the national roads administration, is also planning an alternative solution without tunnel. The tunnels would consist of double tubes, each with two lanes. It is uncertain whether the plans can be realised, due to cost. An alternative can be a single tube tunnel with three lanes. If the local authorities and Statens Vegvesen do not agree where the road should pass, where and how long the bridges and tunnels should be, the government will make the final decision. Apart from the possible above-mentioned tunnel in Lillesand, approximately ten tunnels, totalling 6-7 km, are planned between Grimstad and Kristiansand. Their length varies from 100-150 m to 3,500 m. The tunnels have no name yet. The cross section will be between 50-60 sq m for each tube (two tubes with two lanes each). If the single-tube three-lane alternative is chosen, the cross section will be 70-75 sq m. The dominating geology is gneiss and granite, with sulphide gneiss in some areas. The excavation method is expected to be drill/blast. The project will be one of three projects in Norway developed under Public Private Partnership. A private consortium will design, build, finance, and maintain the road for approximately 25 years. The other two PPP projects are two sections of the E 39 highway, one between Lyngdal and Flekkefjord in Vest-Agder county and the other between Klett and Bårdshaug in Sør-Trøndelag county, visit [www.tunnelbuilder.com](http://www.tunnelbuilder.com), item no/41. Visit [www.vegvesen.no/prosjekter/ops](http://www.vegvesen.no/prosjekter/ops). Engineering firms involved so far are Asplan Viak and Via Nova for some of the technical planning. Zoning plans should be ready in February 2003. Then the project will enter a political stage. Tenders should be invited in 2004-2005. Statens Vegvesen will hopefully start prequalification of the consortiums in 2003-2004. This will depend on the planning process and governmental decisions.

**Portugal.** Madeira, a Portuguese island off Morocco, has 61 road tunnels in service. Nineteen of these tunnels are double tubes, all on the Airport-Ribeira Brava expressway. There are also 16 tunnels under construction (17 km) and 30 in planning (17 km). In the short term, 11% of the road network will run through 107 tunnels, which is 69 out of 608 km of roads. To date, 5.8% (35 km) of Madeira's roads cross tunnels. The longest existing tunnel exceeds 3 km (see table).

Madeira has currently under construction fifteen new tunnels, one of which only is a double tube, the Caniçal tunnel. They are:

- 2 tunnels (940 and 320 m) on the Calheta bypass
- dos Moinhos (275 m) and Jardim Pelado (1,020 m) on the Calheta-Prazeres section
- Caniçal (2 x 2,125 m)
- 4 tunnels (455, 377, 874 and 712 metres) on the Caniço-Camacha road link
- Curral das Freiras (2,450 m)
- Achada (424 m) and Cruz (654 m) on the Machico-Faial expressway
- 1 tunnel (2,700 m) on the Ponta do Sol bypass
- Ribeira Brava-Tabua (1,397 m)
- Saramago (165 m) on the Rosário-São Vicente section.

Thirty other tunnels are under planning. Among these are the tunnels on the Machico-Caniçal expressway, four of which being double tubes. They are:

- Fazenda branch A
- Fazenda north (175 m) and Fazenda south (185 m)
- Palmeira north (855 m) and Palmeira south (836 m)
- Piquinho west (463 m) and Piquinho east (448 m)
- Portais north (675 m) and Portais south (655 m)
- Queimada II (715 m)
- Queimada II branch A (300 m).

Longest existing tunnels in Madeira	
<u>Tunnel names</u>	<u>Lengths</u>
Encumeada	3,086 m
Jardim do Mar-Paul do Mar	2,511 m
Norte	2,097 m
Ribeira Brava	1,789 m

There are also five tunnels to be built on the Faial-Santana-Ribeira de São Jorge road connection:

- Cortado (2,360 m)
- Faial (435 m)
- Pinheiro (480 m)
- Ribeira de São Jorge (220 m)
- Rocha do Navio (190 m).

In Funchal, Madeira's capital, the Cabouqueira tunnel (580 m) is being considered between Rua Dr. Pita and Avenida Calouste Gulbenkian and the Alferes Veiga Pestana tunnel (140 m). The Santana tunnel (2,360 m) is also under design. Outside Funchal, the Ponte Vermelha tunnel (75 m) is planned on the Ribeira Brava bypass, and three tunnels (605, 500, 235 m) will also be built between Rosário and vila de São Vicente. Finally, seven tunnels are under study for the Seixal-Porto Moniz connection (read E-News Weekly # 25).

**Spain.** The regional government of Andalusia has signed an agreement with the cities of Sevilla, San Juan de Aznalfarache, Mairena del Aljarafe and Dos Hermanas about the construction of Line 1 of the Sevilla metro. Bids are to be invited on 25<sup>th</sup> July. Construction will commence in 2003. Line 1 will cost €360 million. Spanish construction firms have started to team up to build the line under a 35-year concession. The bidders should be: ACS, Sando, Azvi, Alstom and Ploder; Ferrovial, Alsa Keolit, Detea and Vimac; FCC, Martín Casillas and Abengoa; Sacyr, Paris mass transit operator RATP and Datia; Necso, Dragados and Salvador Rus. OHL is also expected to bid.

## World Digest Of Bids

**Bulgaria-Greece.** Three consortia and three companies placed offers to build a motorway tunnel under the Bulgarian-Greek border to link the towns of Gotse Delchev and Drama. Greece and the European Union's programme Phare will jointly extend €1 million to Bulgaria to fund the construction of the 447 m-long tunnel. The candidates include Germany's Hallesche Mittel-deutsche Bau, Greek firms Themeliodoni and Prodeftiki, a Bulgarian consortium comprising Transstroy Varna and engineering companies, a Bulgarian-Greek consortium that includes Siconco and Heitkamp and a Bulgarian consortium grouping three companies Patishta-Pazardzhik, Hidrostroy-Sestrimo and Glavbolgarstroy. Read E-News Weekly # 17.

**Germany.** Two periodic notices have been issued for electric and mechanical equipment of Line U3 of the Nuremberg metro. First is for the 1.5 km Sünderbühl to Gustav-Adolf-Straße extension. Second is for the 950 m Maxfeld extension. Visit <http://ted.eur-op.eu.int/udl?request=Seek-Deliver&language=en&docid=106713-2002>, OJ S 136, and <http://ted.eur-op.eu.int/udl?request=Seek-Deliver&language=en&docid=107633-2002>, OJ S 137, or contact City of Nuremberg, fax +49 9112314978.

**Spain.** Open bidding, deadline 3<sup>rd</sup> September, 2002 for a design and construction contract to transfer underground the C-31 road and build a new underground station for the Baix Llobregat metro in Amadeu Tomer. The C-31 will be built in cut-and-cover on a distance of 700 m, variable cross sections of 25, 50 and 36 m, minimum height 5 m. Geological studies have not been made yet. The metro station will also be built in cut-and-cover. There will be a 120 m-long central platform. Award is expected for September 2002. Design will take five months. Construction will last two years from April 2003. Tender value €86.2 million. Visit <http://ted.eur-op.eu.int/udl?request=Seek-Deliver&language=en&docid=99058-2002>, OJ S 127, or contact Consorci per a la reforma de la Gran Via, L'Hospitalet, fax +34 932640854. E-mail [correu@consorcigvhospitalet.com](mailto:correu@consorcigvhospitalet.com)

**Spain.** Open call for bids, deadline 31<sup>st</sup> July, 2002 for construction of the 10.6 km Albuñol-Adra section of Autovía del Mediterráneo in Granada and Almería provinces, Andalusia region. There will be two twin cut-and-cover tunnels, 150 m and 200 m in length. Tender value €93 million. Visit <http://ted.eur-op.eu.int/udl?request=Seek-Deliver&language=en&docid=105210-2002>, OJ S 135, or

contact Ministry of development, Madrid, fax +34 915978537 or +34 915978470. E-mail [cpublic@mfom.es](mailto:cpublic@mfom.es). Read E-News Weekly # 24.

## World Digest Of Contract Awards

**France.** Cegelec has been awarded a contract worth €866,000 to replace the engine of a supply station at the 7 km Maurice Lemaire tunnel in Sainte-Marie-aux-Mines. The tunnel will be closed for six weeks in September and October to enable heavy refurbishment works (ventilation, maintenance of lighting, signalling, video system, etc.) and a full inspection prior to the construction of a parallel rescue tunnel, the construction of which may begin in 2003. Tenders have been invited to renovate this tunnel. Read E-News Weekly # 1 and visit [www.tunnelbuilder.com](http://www.tunnelbuilder.com), item fr/42. Also visit [www.saprr.fr](http://www.saprr.fr)

## World Digest Of Ongoing Tunnelling

**Italy.** Condotte d'Acqua reports breakthrough on 9<sup>th</sup> July, 2002 of the 1,158 m-long tunnel on the 4 km Monguelfo bypass in Bolzano province. Work started in March 2001 and Condotte used a hydraulic hammer to bore 1,028 metres, the difference is the cut-and-cover portions at the east and west portals. Waterproofing works, concreting works, road surfacing and installation of equipment will follow. The tunnel will be commissioned in December 2002, five months ahead of schedule. The whole project will cost €27.7 million. Visit [www.condottespa.it](http://www.condottespa.it)



Picture 1: Holing through of the Monguelfo bypass tunnel.

**Vietnam.** The construction of a tunnel through Hai Van Pass in central Vietnam is progressing smoothly. By the end of June, 2,095 m of the main tunnel and 2,246 m of the rescue tunnel had been completed, accounting for one-third of the total length of the tunnel. Construction is being undertaken by Japan's Hazama and Vietnam's Civil Engineering Corporation No. 6 (Cienco 6) at the northern drive, and Korea's Dong Ah and Vietnam's Song Da Construction Corporation at the southern drive. The project includes a main tunnel and a rescue tunnel with a total length of 6.4 km from Lang Co in Phu Loc district of the central province of Thua Thien-Hue to the Lien Chieu Industrial Zone in Da Nang city. The main tunnel is 11.5 m-wide and has two lanes allowing vehicles to go at a speed of 80 kmph. The rescue tunnel runs alongside the main tunnel and is connected to it by cross passages, spaced at 400 m intervals. The US\$73.7 million project is financed by the state budget and loans from the Japanese Bank for International Cooperation (JBIC). The tunnel is scheduled for completion in 2003. Read E-News Weekly # 4. Visit [www.tunnelbuilder.com](http://www.tunnelbuilder.com), item vn/11.

## World Digest Of Tunnel Renovation & Maintenance

**Spain.** Open call for bids, deadline 8<sup>th</sup> August, 2002 for design as part of the reopening of the Canfranc international rail tunnel between Spain and France on the Saragossa-Pau line. Tender value €1 million. A total of €16 million will be spent to put the 7.8 km tunnel back to service. The Spanish government will invest €10 million for the 4.7 km stretching out on its territory. Time frame of 20 months for design. Reopening is planned for 2006. The line is closed since 1970 further to a rail crash. Visit <http://ted.eur-op.eu.int/udl?request=Seek-Deliver&language=en&docid=103526-2002>, OJ S 132, or contact ministry of development, Madrid, fax +34 915979942 and +34 915978470. E-mail [vrpascual@mfom.es](mailto:vrpascual@mfom.es) and [cpublic@mfom.es](mailto:cpublic@mfom.es)

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