

TURKISH D

Construction boom as the country invests in

Evening in Istanbul: The Blue Mosque and its minarets silhouetted by the setting sun.

ELIGHT

the future

From the Mediterranean coastline to the Black Sea, Turkey is today a bustling scene of industrial and civil development. Throughout the country, large investments are being made in many different areas ranging from quarrying and mining to road construction and hydropower. And the companies carrying out the work are delighted with the advanced technology of the equipment they are using.

Miracle maker in Istanbul

A company producing aggregate and ready-mix concrete, about 40 kilometres from the heart of the historic city of Istanbul, considers it has invested in a “miracle maker”.

That’s how pleased the company, KIBSAS, is with the Atlas Copco ROC D7 drill rig it purchased recently to meet the rising demands from the aggregate and concrete industries.

The company has been working for many years in two quarries – one near Istanbul, the other at Bursa, further to the

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Atlas Copco on the map: Turkey is developing fast and Atlas Copco equipment and know-how is the common denominator for contractors at several worksites.

► south. Thanks to the new equipment, large savings are now being realised.

Says chief executive Osman Üçüncü: “We used to work with two surface crawler rigs, one hydraulic and one pneumatic, to meet our production targets at both sites. But that all changed when we bought the Atlas Copco ROC D7.”

The rig is equipped with the COP 1838 rock drill and the Secoroc FI 51 drillstring with a 102 mm drop centre ballistic bit. The average bench height is 12 metres.

“Now we have switched both the older rigs to our operations in Bursa and the new rig is working at the Istanbul site, where large savings in production costs are being achieved at the same time as we are experiencing dramatic increases in production,” Mr Üçüncü points out.

“The cost of drilling has been halved

and the rig’s high performance has also resulted in a sharp decrease in the consumption of accessories, such as bits, shanks and rods.”

Production from the two quarries is around 4.5 mt per year and the company plans to increase production of cement and aggregates by about 12 per cent over the next year. Currently, 600,000 m³ of aggregate goes to the concrete plant and the remainder is sold to road contractors.

Super highway beside the sea

The 500 km Black Sea Highway is the first part of a scheme which could eventually link up with the Trans-European road system, making it possible for trucks to drive from Georgia to northern Europe in just four days.

The road starts at Hopa on the Georgian border and will run 500 km along the coast to Samsun, where it will join up with another road scheme which will go inland to Ankara to link up with existing roads going westward.

The first 18 km of this super highway, complete with 3 km tunnels, was opened last October. The remaining stretches under construction are being built mainly on land reclaimed from the sea. For the past 10 years, boulders from inland quarries have been excavated and transported to the coast to form the road’s embankments.

The first tunnels

Turkish contractor Cengiz is building 120 km of the highway and was responsible for the first tunnels constructed at Hopa. Excavation was carried out with hand-held Atlas Copco BBC 16 pneumatic rock drills from 1995 to 1999 with a crew of eight drillers, working at two faces using portable compressors.

Some 90 km along the coast from Georgia, Cengiz has also started work on the twin-tube Cayeli tunnels, which are 1.06 km long on the sea side and

Happy with the ROC D7: From left, service technician Murat Ykican, Atlas Copco Manager Turgay Ozan and Osman Üçüncü, CEO of KIBSAS.



Newcomer to the site: The ROC D7-11 surface crawler rig has halved the cost of drilling and cut the consumption of bits, shanks and rods.



Where the road will run: One of the picturesque views that travellers will enjoy when the new highway is in use.



1.36 km on the land side. The contractor will also construct two 500m tunnels at a site 10 kilometres to the east.

Two Atlas Copco Rocket Boomer L2 D drill rigs have been purchased by the company to handle these two tasks. The first is developing the four faces off the central access on the tunnels and the second will open the east portals and work towards the central access.

The Rocket Boomer, which is equipped with COP 1838 rock drills, has

an operating height of 3 m – but this can be reduced to 2.35 m by lowering the protective roof. It can drill cross-sections up to 90 m², has an anti-jamming function, separate pumps for percussion, damping and positioning, and rotation gives independent control and maximum output in each cycle.

Praise for rigs

Access to the central section of the tunnels was achieved by ramping up from

the adjacent highway and excavating along a short valley watercourse, which was then culverted from waterfall to sea prior to establishing the portals. Waste rock from the tunnels is trucked to the nearest rockfill site along the reclamation project.

The access is 600 m from the east portals along the straight tunnel alignment. Top headings of 60 m² will be followed by 38 m² benches. The face round is 120 holes of between 2.5 and 3 m deep, which are charged with dynamite primed with millisecond-delay detonators. All drilling is handled by the Rocket Boomer rigs – including rock bolting.

Sabahattin Erten, Cengiz's site manager, describes the Rocket Boomer rig as "the best machine available."

Asim Cengiz, Vice Chairman of the Cengiz Group and project manager for the Black Sea Highway tunnels, adds: "Atlas Copco served us well on the first tunnels and we expect no less on the ones currently under construction." ▶



Simply the best: That's the site manager's verdict on the Rocket Boomer L2 D rigs working in the twin-tube Cayeli tunnels.

Flashback: During a seminar on Modern Trends in Tunnelling, held last year at Atlas Copco in Turkey, delegates from various Turkish construction and mining companies admire one of the two Rocket Boomer L2 D rigs prior to delivery to the Cengiz Group for the Black Sea Highway project.



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Where success is copper-bottomed

A massive sulphide deposit with a total pre-mining resource of 19.7 million tonnes is being mined at Cayeli on the Black Sea. And with a content of 4.2% copper, 6.5% zinc, 0.8 gm/t gold and 44 gm/t silver, the venture is considered to have a bright future.

Production at the site, located 100 km from the Turkey-Georgia border, started in 1994 and 491,000 tonnes were produced in the following year. Cayeli Bakir Isletmeleri A.S., a consortium of Inmet Mining, Eti Holding and Gamma Construction, is responsible for managing the mine.

The known mineralisation at Cayeli has a total strike length of 920 m, a vertical extent of 600 m, and is open in both directions. In terms of total tonnage and grade, the orebody has one of the world's highest copper contents for its size, which varies between a few metres to more than 100 m.

Good performance

The mine is planned for transverse open stoping, with 20m between sublevel drifts, and stopes can be from 10m to 80m long, containing ore of 30–40 MPa. This is an easy match for the Atlas Copco Boomer 282 rigs that form the backbone of the rig fleet used for development, in combination with the Atlas Copco loaders.

Two rigs are constantly at work driving the 7m wide, 5m high production drifts. The standard round can be up to 80 x 4m holes, using 48mm button bits, and up to five 2.4m Swellex rock bolts are set for each metre advance.

Rig operator Aziz Alay takes it all in his stride and fully agrees with Deputy General Manager Dr Sabri Altinoluk, who says: "We are more than happy with the performance of the rigs."

Atlas Copco Wagner ST-6C and ST-8B Scooptrams, three of each, load the rock and are equipped with ejector buckets which discharge horizontally into the 33-tonne capacity Minetrucks – three Wagner MT-433 and two MT-436B units.



Atlas Copco Wagner line-up: Scooptrams and Mine Trucks at the Cayeli mine.

The Scooptrams are radio remote controlled, ensuring that drivers never have to enter the stopes. This undoubtedly contributes to Cayeli's enviable safety record, with its 387 employees, it has

scored 442 days without any lost time due to personal injury accidents.

Everyone at the mine is proud of this record, which begins with the careful screening of employees and followed by training in Germany or Canada.

General Manager John Timmons, whose long career includes some of the most well known mining locations, says: "Not only is Cayeli a world-class deposit, it's also a world-class producer!"



General Manager John Timmons: "The Cayeli mine is a world-class producer."

Key performers at three new dams

Drilling and grouting equipment from Atlas Copco is playing a key role on three important dam projects which form part of hydropower developments along the Mediterranean coast of southern Turkey.

The dams are Berke on the River Ceyhan, at the eastern end of the coastline, Akköprü on the Dalaman river, towards the western end, and Çine on the river of the same name.

The equipment has been supplied to all three sites by the Istanbul-based company DBC Makina, which covers the whole country.

A key unit at the projects is the Diamec 262 all-hydraulic core drill for surface and underground drilling, which can also be equipped for top-hammer and Down-The-Hole drilling.

Just perfect

At the Berke site, where the dam will be 201m high and the sides of the river gorge rise to around 500m, total drilling will



Happy with the Atlas Copco Boomer 282: Planning engineer Hasan Giray with rig operator Aziz Alay.

*In action at the Çine dam:
The single Unigrout ma-
chine at the site is equipped
with the new Pumpac high
capacity grout pump.*



amount to almost one million metres. The work is being carried out by 14 Diamec 262 rigs and 40 locally made units, with a design based on the Atlas Copco concept. Drilling is scheduled for completion in June this year.

Other equipment at the site includes two CEMIX units, an electric-powered Mustang A32 rig with COP 64 hammer, two ROC crawler rigs and a Boomer 282 drilling rig.

Chief drilling engineer Mr I. Tanner Sökeli says: “The Diamec 262 is a perfect machine which has performed beyond expectations. There was no trouble even when relatively untrained personnel were operating it.”

Quality job

At the Akköprü dam there are five Diamec 262 rigs in action – three crawler-mounted and two skid-mounted – and four Unigrout grouting units, two of them equipped with Pumpac units to pump grout with a high sand content over long distances.

The first equipment at the site was a

skid-mounted, electric-powered Diamec 262 and one Unigrout unit, which were employed in drilling and grouting the diversion tunnels.

This first Unigrout has reportedly been running 24 hours a day for four months. Project Manager Ilker Akar, of the main contractor NTF, says: “A very good quality job was carried out on the diversion tunnels and the rig and grouting equipment performed better than expected. DSI, the owner-controller of the project, was also very impressed.”

Around 20 million m³ of limestone for rockfill is being quarried some 5km from the dam site, using an Atlas Copco ROC F7 rig equipped with the Coprod system and two ROC 742HC units.

A national first

The construction method for the Çine dam, which will provide drinking water and irrigation as well as power generation, is RCC (Roller Compacted Concrete), and it is the first time this has been used in Turkey.

The method involves a mix of cement, ash and aggregate, with no water. First, a series of layers are compacted using a rotating cylinder. Then the dam is built up in 30cm layers of RCC, each followed by a 4cm layer of normal concrete.

Five Diamec 262 drills have been supplied to the site – two crawler-mounted and diesel powered, and three skid-mounted electric units – which are used for both coring and in-the-hole drilling. One of the Unigrout units at the site is equipped with the new Pumpac high capacity grout pump.

Mahmut Ulusoy, project manager for the drilling and grouting work, says: “The Diamec machines are excellent and extremely fast, achieving 90 metres per day drilling 20–25 metre holes for the grout curtain of the coffer dam.

“All in all we think this equipment is playing an invaluable role in the success of the project.”

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*Drilling grout
holes in the main
dam body: There
are five Diamec
262 units at the
Akköprü site.*

