

70,000 concrete pillars support railway line

In Malaysia, the national railway society is working on the extension of their line network. This also includes the construction of a new, double track railway dam on the section Rawang-Ipoh (approximately 180 km long). Two small BSA concrete pumps play an important role in compacting the ground which can partially only be slightly put under load.

The work in Malaysia on the two track railway line, which will soon be complete, is also of considerable importance for the running of trains over the border to Singapore and Thailand. Whereas it is possible with some sections to lay the new, two-track railway line parallel to the track already existing, for others the course of the track bed must be completely changed. To prevent subsiding at a later date, the ground is stabilised at several sections of the line.

After 'AuGeo Piling', the load capacity is greater for the ground

COFRA, a specialised Dutch Underground Engineering Company is using the so-called 'Au Geo Piling System' to compact the ground for a section of the rail line. Also participating in this project here is the inland construction company TECHNIQUES GEOSYSTEMS SDN BHN. With the 'AuGeo Piling' method, a plastic pipe (diameter 150 mm) encased by a steel pipe, is pressed into the ground by a special gun on a crawler chassis. The plastic pipes consist of HDPE material and are sealed at the base by a 230 x 230 mm steel plate. This double-walled encasement is pressed in vertically until the foundation pressure required is attained (300 kN) – already calculated to cater for the loads on top. Whilst the outer steel casing is pulled out of the ground, the HDPE enclosure remains in the ground along with the steel plate. Above the ground surface, the plastic pipes are shortened to the length required, each reinforced by a reinforcement basket, cast with cement mortar and sealed with a covering.



A special gun presses the plastic pipe which is protected by a steel casing, into a depth of 25 m



The Putzmeister trailer concrete pump BSA 1002 D conveys the cement mortar via a reduction pipe and flexible hoses into the plastic pipes which had been previously pressed into the ground

Technical data of BSA 1002 D

Maximum output 20 cu m/h	Power of Diesel engine 20 kW
Maximum concrete pressure 75 bar	Capacity of the hopper 230 litres (ca.)
Diameter of delivery cylinders 120 mm	Filling height of the hopper 1.1 m (ca.) The upper part of the hopper can be swing up for easily cleaning and servicing wear parts
Stroke of delivery cylinders 1,000 mm	Weight 1,500 kg
Stroke per minute 29	
Control system fully hydraulic	



Map: website of the KTMB

The precise distance of the pillars manufactured between each other – here approximately one metre – essentially depends upon the future load. According to the Project Manager of COFRA, Erwin Bijlhouwer, this pressing method is possible for depths of up to 25 m.

120,000 m³ cement mortar backfilled

TECHNIQUES GEOSYSTEMS use two small Putzmeister stationary pumps of type BSA 1002 D to concrete the pipes. Over a section of 4 km, the machines backfill approximately 70,000 pile hoses with cement mortar (max. 11 mm grain) – a total of approximately 120,000 m³ is pumped. With a conveying performance of max. 20 m³/h, the stationary pumps driven by a

20 kW, 2 cylinder Deutz Diesel, are simply predestined for this task.

After the plastic pipes have been connected, the gaps between the individual support pillars are filled with sand. And now mats of synthetic material are placed in two layers on this surface which is now flat for the track substructure (one layer in the direction of the track, the other at 90° to this). This is then covered with further soil material – e.g. sand, gravel or rubble. By laying the mats in opposite directions, the surface pressure is uniformly passed into the ground via the numerous concrete pillars so that a high surface load is possible.

Further information is attainable via:
<http://www.geotechnics.nl>



Putzmeister AG
Max-Eyth-Str. 10 · D-72631 Aichtal
P.O. Box 2152 · D-72629 Aichtal
Tel. +49 (71 27) 599-0
Fax +49 (71 27) 599-520
Internet: <http://www.putzmeister.de>
E-mail: pmw@pmw.de