WIRTGEN GROUP

Wirtgen

Job Report Surface Mining

2200 SM: Track connection in hard limestone in Warstein / Germany

Wirtgen Surface Mining:

2200 SM: Construction of a track connection in hard limestone in Warstein/Germany

Harald Lissberg, Windhagen, 1 Sept. 2004

Situation:

Working together with the company Johann Bunte GmbH & Co. KG, a Wirtgen Surface Miner 2200 SM was subjected to a long-time test in which a planed subgrade was created in the cutting area (Devonian compact limestone) as part of the track connection project for the Warsteiner brewery.

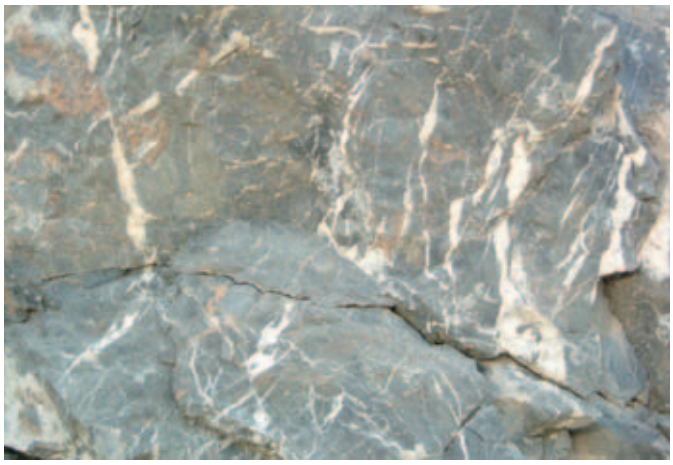
This long-time test was conducted from 6 January 2004 to 27 February 2004.
The following criteria was to be taken into account:

- The removal of the limestone without drilling or blasting
- The formation of an embankment structure which was true to cross-section, line and level and free from fissures and cracks
- The formation of the bottom seal of the planed sub-grade, true to cross-section, line and level and with a measuring accuracy of ± 3 cm

The entire milled material was to be directly used as material for the embankment or for areas where the soil was to be replaced.

Material data:

- Material: limestone (Devonian compact limestone)
- Density: 2,65 g/cm^3
- Uniaxial compressive strength: approx. 100 MPa up to a maximum of 125 MPa
- Volume: approx. 35.000 m^3
- Daily performance: 800 bcum



Structure:

The material is mainly compacted with cracks spaced over 50 cm apart. The cracks run along all three planes.
A route for the subsequent rail track was cut as part of the construction project.

The milled material was loaded onto trucks via the loading conveyor or sidecast onto the embankment.

The following performances were achieved:

- Cutting performance of 294 t/h
- Effective performance of 173 t/h

Several factors influenced the milling output:

The ascent and descent of the milling area from 3% to 4% and the long truck changing times due to the confined space on site.

The long-time test yielded the following grain size distributions:

- In the compacted sections, the entire material was comminuted to < 70 mm
- In the layered sections:
  - approx. 75% of the material had a grain size of under 50 mm
  - approx. 25% of the material had a grain size of over 50 mm, but no larger than 120 mm
    Only a few individual grains reached sizes of over 150 mm.

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