

8th BALKAN MINING CONGRESS
PROCEEDINGS

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MINING INSTITUTE BELGRADE

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APPLICATION OF PIPE UMBRELLA SUPPORT TUNNELING SYSTEM IN UNDERGROUND MINES IN NORTH MACEDONIA

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Abstract: *Stability of the excavation face in shallow tunnels and in poor ground is at present a relevant problem in tunnelling. One of the methods used in such cases is Pipe Umbrella Support Tunneling System. The calculation procedure is based on analysis of the ground characteristics, the dimensions of the structure and on its depth with respect to the ground surface, excavation face reinforcements elements, pre-support works, free length and groundwater. The supporting is an extremely important work operation in the construction of underground mining facilities. In this paper is given a modification of the Pipe Umbrella Support Tunneling System, used in the supporting of the decline, in an underground mine in our country.*

Key words: FACE, DECLINE, PRE-SUPPORT, SUPPORTING, NEW AUSTRIAN TUNNELING METHOD

INTRODUCTION

The stability of an excavation face of a shallow underground structures depends not only on the characteristics of the ground, on the dimensions of the structure and on its depth with respect to the ground surface, but also on the following factors:

- The possible presence of excavation face reinforcements elements;
- Possible pre-support works;
- The free length (distance of the tunnel supports from the excavation face) [1];
- The possible presence of groundwater.

Face reinforcement elements are usually made up of fibreglass dowels that are inserted into previously bored holes, which have been sealed with the surround-