

Geological and Contractual Analysis

Tunnel Homolé, CZE

Graduate



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Introduction: The Tunnel Homolé, part of the D-35 motorway expansion between Ostrov and Vysoké Mýto in the Czech Republic, aims to alleviate traffic congestion caused by the I-17 route and reduce freight traffic in urban areas. However, major deviations from the predicted geological conditions complicated the excavation process. The early appearance of strong, healthy rock formations made mechanical excavation inefficient in several sections, leading to the utilisation of drill and blast.

Objective: The objective of this thesis is to analyse the consequences of geological deviations in terms of construction delays, changes in excavation methods and contractual handling. The project employs the New Austrian Tunnelling Method, which enables flexible adaption to varying ground conditions through sequential excavation and immediate installation of support elements such as shotcrete and rock bolts. Based on the encountered geological conditions, either mechanical excavation or drill and blast gets utilised. The purpose of this thesis is to evaluate the excavation methods used, the resulting effects on time and cost, and how the applied FIDIC contract framework handles the geological uncertainty.

Result: The encountered geological conditions deviated significantly from the predictions. The frequent and early appearance of healthy siltstones and sandy marlstones made mechanical excavation inefficient in these sections, necessitating the use of the drill and blast method. Consequently, a new support class had to be created and delays in the construction process occurred. From a contractual perspective, the project applied the FIDIC Yellow Book with additional sub-clauses from the Emerald Book. While the Emerald Book provides a clear mechanism for handling geological deviations, the

claim process proved to be time-consuming and therefore negatively affected the contractor's cash flow. The milestone-based payment method is identified as critical for the contractor. It is evident that the excavation process and the contractual management were both significantly influenced by the discrepancy between the expected and the actual geology encountered.

Mechanical Excavation with the Ripper Bucket Own presentation



Charging the Holes with Emulsion-Based Explosives Own presentation



Construction Site Overview Own presentation



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Subject Area Bauausführung, Untertagbau

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