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Geological Aspects of Swissmetro, a Long-Distance High-Speed Transport System in the Shallow Subsurface

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Abstract:

The high-capacity passenger subway Swissmetro shall connect all major cities in the northern Alpine foreland of Switzerland. In addition, the neighbouring traffic systems shall be included in the Swissmetro concept. In this project, geological, hydrogeological and geotechnical studies have been conducted under particular consideration of technical and civil engineering related conditions and parameters. Beside standard engineering geological work, the most critical geological issues addressed in the study and presented in this paper include: deep glacial erosion and Quaternary valley fills, karst hydrogeology in the Jura Mountains, deep saline aquifers and neotectonics in the area of the Tabular Jura and Rhinegraben.

The main study shows that the Swissmetro project is feasible from geological and geotechnical perspectives. As part of this main study a research project focusing on the Swissmetro Pilot Section Lausanne-Geneva has been started.

Resume:

Le nouveau metro it haute vitesse et capacite, nomme Swissmetro, reliera toutes les villes principales dans le bassin molassique de la Suisse. En outre, les systemes de transport public existants seront inclus dans le concept de Swissmetro. Des etudes geologiques, hydrogeologiques et geotechniques ant ete entreprises qui prennent en compte les contraintes liees it la construction de l'ouvrage. Les questions geologiques les plus critiques abordees dans l'etude sont: l'hydrogeologie du karst du Jura, la problematique du gas, la neotectonique dans la region du Jura tabulaire et du Rheingraben, l'erosion glaciaire profonde et les terrains meubles Quaternaires it grande epaisseur.

L'etude principale prouve que le projet de Swissmetro est faisable du point de vue geologique et geotechnique. Dans le cadre de l'etude principale, un projet de recherche sur le troncon pilote de Swissmetro Lausanne-Geneve a ete lance.

Keywords: Segment Basle-Zurich; Hydrogeology; Gas; Neotectonics in the area of the Tabular Jura and Rhinegrabim; Swissmetro route Berne-Zurich; Example of a geological aspect: Deep glacial erosion and Quaternary valley fills; Tertiary and Quaternary sediments; Folded Jura with Mesozoic sediments; Molasse rocks (mainly of shallow marine origin), and the Tabular Jura with Mesozoic sediments and Molasse rocks.

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