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APPLICATION OF ADVANCED JET GROUTING SOLUTIONS FOR THE CONSTRUCTION OF HYDROELECTRIC POWER PLANTS

Summary:

The construction of hydroelectric power plants typically requires the execution of deep construction pits close to or even inside of rivers. The paper describes geotechnical challenges and solutions of such projects on the basis of the expansion of the water power plant in Kirchbichl, Austria. This power plant is in operation since the late 1940s and was upgraded with an additional power house as well as a new floodwater relief channel. Therefore two approx. 100m long construction pits were built bordering the existing power plant. Differences in water levels of up to 20m in combination with high permeable soil layers required the execution of water tight and stiff retaining walls and high as well as deep seated sealing slabs. Especially the areas next to the existing structure were critical for the success, as the more than 70 years old building is very sensible to deformations. Moreover, the execution of piles and jet grouting columns had to pass through the former excavation, which was backfilled using very heterogenic material. Thus, various geotechnical products were applied, including jet grouting, bored piles, micro piles and strand anchors.

The paper points out the key challenges of such projects, ranging from design stage, execution on site till quality control and documentation. It also addresses the risks faced during the various project phases and describes proper approaches how to mitigate them.

Key words:

Jet grouting, bored pile, sealing slab, water power plant, risk assessment, quality control.

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