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Universität Stuttgart · WAREM · Pfaffenwaldring 7a · 70569 Stuttgart

WAREM Seminar June 20, 2017

Master Thesis Presentation

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Numerical Modelling of Multiple Arch / Buttress Dams

The complex geometry of the buttress / multiple arch dams makes the evaluation of their safety a challenge. However, this type of dam leverages over the gravity type in terms of material (concrete) savings. Since the stability of the dam is a function of its structural form rather than its weight, the geometry of the arch plays an important role in the efficient distribution of applied forces.

Various arch geometries were explored, and their responses to stress and deformation investigated. The preferred geometry was analyzed for safety against sliding and overturning, however, ways of improving the overall safety resistance of the structure were proposed. a

The smaller base area of the multiple arch dam makes the uplift pressure exerted on the dam base at the base-foundation interface lower when compared to other dams with larger base area. The influence of the exerted uplift forces was however investigated.

Reinforcements were introduced into the numerical model as smeared and discrete elements to reduce tensile stresses in the concrete forming the arch.

Keywords: Finite Element, hydrostatic pressure, uplift pressure, stresses, deformation

Date: Tuesday, June 20, 2017

Time: 17:30

Location: Pfaffenwaldring 7.11

WAREM Students and other interested parties are cordially invited.