

Sediment characteristics after treatment with dewatering tubes

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Introduction: The worldwide use of geosynthetic tubes for dewatering dredged sediments is increasing due to the high processing capacity as well as the excellent achievable results in comparison to other treatment methods. As the method is quite new the efficiency and mode of operation of this dewatering technique is not well known.

Methods: In order to increase the knowledge and understanding of this system the two first harbour maintenance projects executed in Germany, Verden [1] and Husum, where the dewatering tubes have been applied, were scientifically supervised by the University of Rostock.



Fig. 1: Installed tubes in a pyramidal pattern.

One main focus of the scientific analysis consisted in the achievable dry solid content over time after pumping the conditioned sediments into the tubes. This topic has been analyzed in detail. Moreover some other basic analysis (e.g. sieve curve analysis, loss of combustion, densities, calcium content, etc.) have been performed.



Fig. 2: Trial pit in the lower (first) tube layer.

As the tubes can be installed in a stacked pyramidal pattern with several tube layers another question raised was the undrained shear strength of the dewatered material. By using a hand-held vane tester the undrained shear strength at several locations in different tube layers was determined.

Results: As outcome some principal phenomena of this specific dewatering technique could be observed and some indicative values for the time related dewatering behaviour could be derived. Furthermore some first insights in the dry solid content/undrained shear strength relation could be detected.

References: [1] Wilke et al. (2011) *Mobile Baggergutentwässerung mit geotextilen Schläuchen - Verdener Grossversuch* **12. Informations- und Vortragstagung über "Kunststoffe in der Geotechnik"**:115-119