

The backfilling test in the groundwater recovery experiment

(1) Observation of saturation and swelling process

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The Groundwater REcovery Experiment in Tunnel (GREET) is conducted by making the Closure Test Drift (CTD) recovered with water at the depth of 500m. Backfilling test is conducted as a part of GREET to acquire physical property change of the backfill material.

Bentonite mixture was constructed into two pits excavated 1m in depth on the floor of the CTD. Hydraulic pressure, soil pressure and moisture content were measured to grasp the groundwater saturation process and the swelling process of backfill material.

The moisture content in the pits got almost fully saturated till one month after. During water filling event, both hydraulic pressure and soil pressure reached 3.1 MPa at maximum. The swelling pressure of the backfill was calculated as 0.03-0.09 MPa.

Observation inside the pit will be continued, and characteristics of backfill material will be investigated again. Changes of hydraulic pressure and soil pressure will be simulated and the construction method will be validated.

Keywords: Groundwater recovery experiment in tunnel, Backfilling test, Backfill material, Bentonite