

In-situ measurement of permeability of fault zones by hydraulic tests and continuous groundwater-level observation

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GSI, AIST constructed an integrated groundwater observatory at Matsusaka-Iitaka as a part of the groundwater and crustal deformation observation network for the prediction research of the Nankai and Tonankai earthquakes (Shigematsu et al., 2012; Koizumi, 2013). Hole 1 (total depth 600m) was penetrated the Median Tectonic Line (MTL) at a depth of 473.9m. Total depth of Hole 2 is 208m. We obtained core samples and well logging data and conducted hydraulic tests in these wells. Screened depth of Hole 1 is 547.6 - 558.5 m and is located in the lower fracture zone of the MTL fault zone developed in the Sanbagawa metamorphic rocks. Screened depth of Hole 2 is 145.5-156.4 m and is located at a branch fault in the Ryoke Granitoids (Shigematsu et al., 2012).

The results of the hydraulic tests and continuous groundwater observation show $1.8 - 8.5 \times 10^{-16}$ and $1.8 \times 10^{-15} \text{ m}^2$ in Hole 1 and Hole 2, respectively. These permeabilities are consistent with laboratory permeability measurement of MTL fault rocks (Wibberley and Shimamoto, 2003).

Keywords: permeability, fault zone, hydraulic test, groundwater level