



The liquid level method for measuring settlements is based on the principle of communicating tubes. As early as 1933, v. TERZAGHI achieved a measuring accuracy of  $\pm 0.01$  mm with the help of a centric suspension and a micrometer indicator. Measurements are relative and are related to a random zero point. The measuring principle is illustrated in Fig. 1.

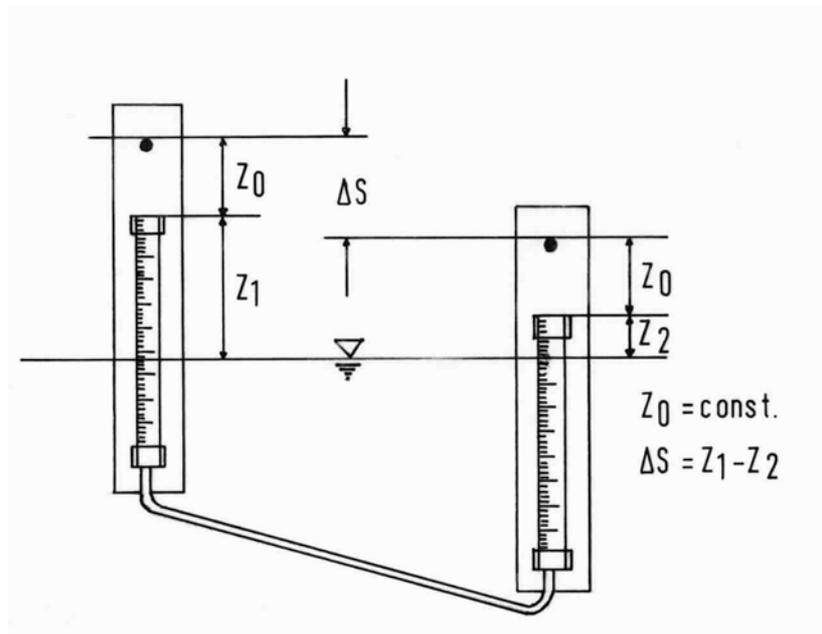


Fig. 1 Measuring principle of the liquid level method

Measurements are taken on the review minus preview principle and are confirmed with several readings in a forward and reverse pass. Reading accuracies of  $\pm 0.001$  mm are usually quoted nowadays by all manufacturers. Allowing for various sources of error we consider an actual measuring accuracy of  $\pm 0.01$  mm to be realistic. Possible sources of error are: Change of density of the gauge fluid due to fluctuations of temperature, changes of gravity at the measuring points, oscillations of the liquid column and formation of air bubbles in the tube system, fluctuations of air pressure, liquid losses from the reservoirs, thermal expansion of the measuring vessels, capillary forces in the measuring vessels, and mistakes when reading and levelling the liquid vessels.