VW LIQUID SETTLEMENT PLATES

GROUND MOVEMENT MONITORING

Applications

Vibrating Wire (VW) Liquid Settlement Plates are designed for low maintenance sub-surface monitoring of both settlement and heave.

Typical applications include:

- Monitoring vertical movement in Earth Fills and Landfills
- Confirmation of settlement for Surcharges and Consolidation projects.
- Embankment and Dam monitoring.

Specifications

Pressure Sensor - Vibrating Wire output

Range:	Up to 7m
Resolution:	0.025% full scale
Temp Rating:	-20 to +80 °C
Dimensions:	450x450mm or 500x500mm

Installation

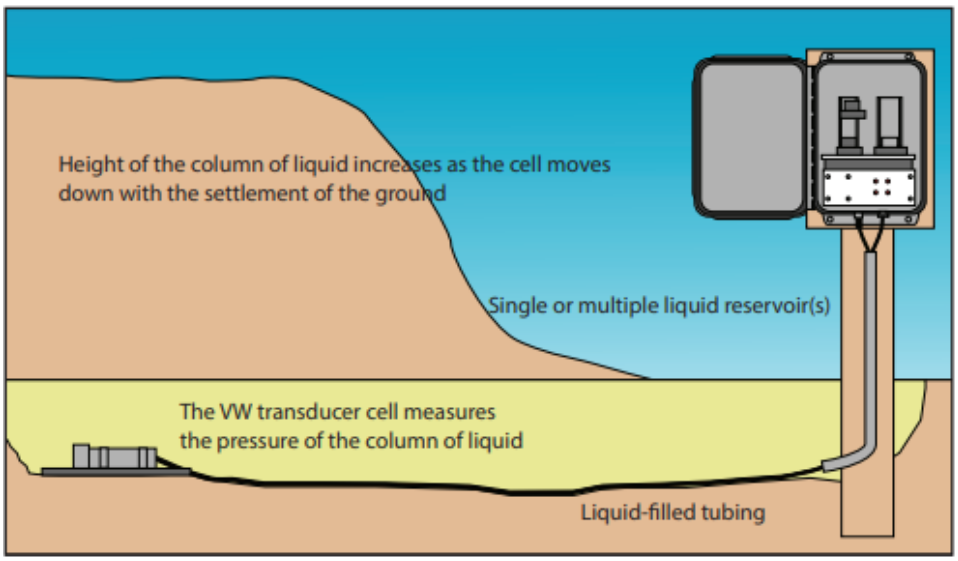
System components include a reservoir, vibrating wire liquid settlement plates, tubing, cabling, deaired liquid, and a datalogger.

The reservoir is installed at a location outside of the zone of influence. Each settlement plate is linked to the liquid reservoir by tubing runs, connecting them to a shared fluid system.

The tubing and reservoir are filled with a de-aired liquid. Any air bubbles are carefully removed to ensure reading accuracy.

Readings from the plates are transferred via cables to dedicated nodes located near the reservoir, then sent wirelessly to a local gateway. Both tubing and data cables are run through pre-dug trenches and then buried after installation.

Upon the completion of the installation, a commissioning reading of each plate is taken and set as the base value.



Operation

When settlement or heave occurs in the sub-surface material the sensor will record a change in observed pressure on the affected settlement plates. An increase in the pressure this would correspond to settlement and a decrease would indicate heave.

All readings are differential and are compared to a site zero reading taken post installation as well as the liquid level at the reservoir.
This is why the reservoir must be installed away from the area of works to ensure the pressure changes recorded by the sensors are correct.

The tubing is installed within a trench to lessen the impact of potential damage through site works and to ensure a consistent temperature across the system. The reservoir is fitted with a barometric pressure transducer to adjust for the effects of atmospheric pressure changes.

Key Advantages

High Resolution and Frequency:
The system can detect displacements as small as 7mm and provide readings up to every 15 minutes.

Long Distance Data Acquisition:
The sensors can be installed up to 1km from the reservoir location, connected via buried tubing and cables.

Automated and Low Maintenance:
Systems collect data for multiple years, providing high frequency, 24hr data with minimal need for maintenance.