



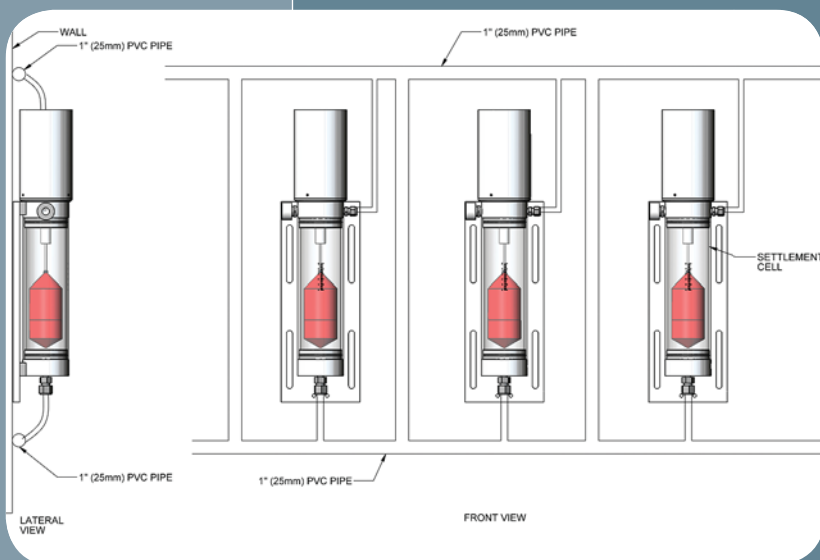
Multi Cell Liquid Settlement System



Settlement Cell

The RST Liquid Settlement System is an automated, multi-cell, settlement monitoring system used to monitor heave and/or settlement. The system configuration is very versatile, limited only by local conditions and site specifications. It is a closed system consisting of a volume of de-aired fluid that is distributed throughout an arrangement of settlement cells, one of the cells being the reference cell. The reference cell should be installed in a stable location unaffected by the area of concern. Settlement cells are installed at their predetermined strategic locations. The settlement cells are connected to two small diameter horizontal PVC (or copper for long term installations) running parallel to each other, one at an elevation above and the other at an elevation below that of the settlement cells. The two parallel tubes are also connected by vertical tubes on either side of the settlement cells. An antifreeze fluid (typically 50% water-50% glycol) is used to fill the lower horizontal tubing, the vertical tubings and the settlement cell up to an elevation that corresponds to the zero reading of the settlement cell. Vertical tubings on either side of the settlement cell provide a fluid level equilibrium in the settlement cell. The voids of air, in all of the cells, are connected together via the upper horizontal tubing, effectively exposing the entire system to a common atmosphere.

As a cell experiences settlement or heave, the cell body moves up or down with respect to the level of fluid, which remains constant throughout the system. The amount of movement is measured by the LVDT linear transducer housed within the settlement cell. The sensor consists of two parts, the core and the body. The core of the LVDT is mounted on a float, floating on the fluid within each cell, and the body is mounted to the cell. As settlement or heave is experienced, the LVDT body will move up or down, relative to the LVDT Core, giving a relative change in readings. The datalogger records the readings from each settlement cell.



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applications

Monitoring structures that may be exposed to settlement as a result of nearby construction, tunneling, or natural phenomena.

Monitor compensation grouting.

features

Reference cell insures a common liquid level, removes cell interdependency, and allows cell isolation.

De-aired fluid keeps the continuity of the fluid consistent.

Surfactant reduces the adverse affects of surface tension.

Temperature compensation stabilizes temperature effects on fluid density.

A closed system exposes the system to a common atmosphere as opposed to external atmospheres that may vary from cell to cell.

High quality tube fittings prevent leaks.

specifications

ITEM	DESCRIPTION
SETTLEMENT CELLS	
Width	150 mm (6 in.)
Height	550 mm (22 in.)
System Accuracy	± 0.3 mm (± 0.012 in.)
Transducer	LVDT
Measuring Ranges	50 mm (2.0 in.) 100 mm (4.0 in.)
Water Height	<100 mm (<4.0 in.)