Settlement Plates

Applications

Settlement plates provide direct measurements of settlement beneath placed fills. Applications include:

- Monitoring consolidation of ground treated with wick drains and surcharges.
- Monitoring settlement of foundation soil during construction of embankments.

Components

Base Plate: 24 x 24 x 0.25 inch steel plate with connection for riser.

Riser: 1-inch threaded steel pipe, typically supplied in 5-foot lengths. Threads allow extensions to be added.

Sleeve: 1.5-inch PVC, typically supplied in 5 foot length, optional or required, depending on specifications.

Extensions: Riser & sleeve extensions, with couplings, required as height of fill increases.

Automation Components: L-Bar mini prism or GNSS-based sensor.

Installation & Maintenance

Settlement plates are installed at specified locations and the initial elevations of the plate and the top of the riser are noted carefully.

Fill is hand-compacted around the riser to the specified level of the first lift. Paint, flags, cones, or fences are used to make the riser visible to equipment operators.

A riser extension is added when fill approaches the top of the existing riser. The prism or GNSS sensor is moved to the top of the extension and new offset is noted. Fill is again hand-compacted around the riser to the specified level of the next lift. These steps are repeated until all the fill has been placed.

Monitoring Methods

Traditional: Settlement plates are traditionally monitored by a surveyor, who measures the elevation of the top of each riser. Each set of observations requires a visit by the surveyor, who then prepares and delivers a report.

AMTS: Risers are fitted with prisms. An AMTS system is installed on site to automatically perform observations and transmit measurements to the internet. Site visits are required only for maintenance.

GNSS: Risers are fitted with GNSS sensors. For best precision, a reference GNSS sensor also installed at a stable location near the work site. Sensors automatically transmit measurements to the internet. Site visits are required only for maintenance.

GeoCloud Project Website

A GeoCloud server on the internet receives the measurements, performs any necessary processing, and then makes data, graphs, and reports available on a secure project website.