



NORMAL & INVERTED PLUMB LINE

OVERVIEW

MODEL EDS-50/51

Encardio-rite offers model EDS-50 normal and model EDS-51 inverted plumb line for monitoring tilt of tall structures & high rise buildings and for measurement & monitoring of relative displacement in concrete and masonry dams between:

- ◆ dam top and the base
- ◆ base and the foundation rock

Encardio-rite system employs two travelling telescopes (one each for the X and Y axes) for the measurement of displacement. The travelling telescopes are mounted at right angles to each other. This obviates the necessity of moving and realigning the telescope, plumb line and reference plumb every time a reading has to be taken in the X and Y axes. Two travelling telescopes not only cut short the observation time but also minimize any chance of error. To facilitate observation from the same direction, one of the telescopes is provided with a right angle prism before the objective lens. This helps the observer in taking both the X and Y readings, sitting at the same place. This also saves floor space.

NORMAL PLUMB LINE

Encardio-rite model EDS-50 normal plumb line is used for the measurement & monitoring of displacement between the top and base of a dam. The upper end of the plumb line wire is fixed through a collet arrangement centered on a rectangular collet bar, fixed at the top of the dam. A heavy weight of around 10 kg is clamped at the lower end of the wire. To prevent any to & fro oscillatory movement of the plumb due to any vibration or shock, the weight is damped in a tank filled with oil. A tilt in the dam brings about a shift in the weight which is measured by a set of travelling telescopes mounted perpendicular to each other on an observation table. Zero reading of the travelling telescope is taken with a reference plumb mounted on the observation table, opposite to each telescope.

INVERTED PLUMB LINE

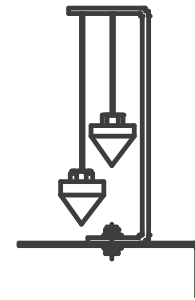
Encardio-rite model EDS-51 inverted plumb line is used for the measurement & monitoring of displacement between the base of the dam & the rock foundation. A hole of 150 mm or more in diameter is drilled from the gallery to the desired depth upto the foundation rock. One end of the plumb wire is attached to a steel anchor with the help of a collet. The steel anchor is centered & grouted at the bottom of the drilled hole. The upper end of the steel wire is fastened by a collet to a float submerged in a water tank in the observation area. A tension of around 8 kgf is maintained in the plumb wire. The water in the tank acts as a damping medium & prevents any to & fro oscillatory movement of the pendulum due to any vibration or shock. A tilt or displacement in the foundation brings about a shift in the float which is measured by a set of travelling telescopes mounted perpendicular to each other on the observation table. Reference plumbs are provided for taking zero reading of the travelling telescopes.

FEATURES

- ◆ Robust and easy to install.
- ◆ Reliable, accurate and simple to read.
- ◆ Proven technology and excellent design.
- ◆ Regular frequent monitoring with ease.
- ◆ Accuracy better than with geodesic or theodolite survey.

REFERENCE PLUMB

It provides a permanent reference point for the transverse & longitudinal measurement of displacement of the structure. The deflection of the plumb line is measured with respect to these permanent reference plumbs. Each reference plumb is provided with two plumb line bobs hanging from strings. The reference plumb is fixed once and for all and is not to be moved, removed or dismantled under any circumstances at any later stage.

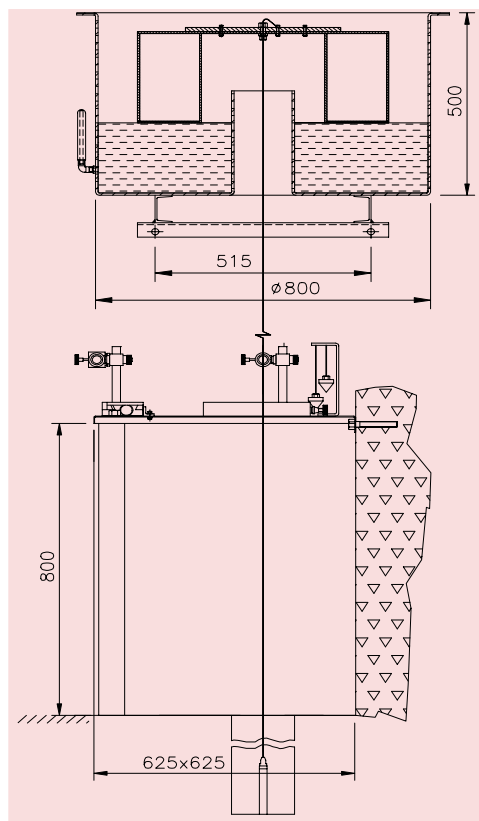
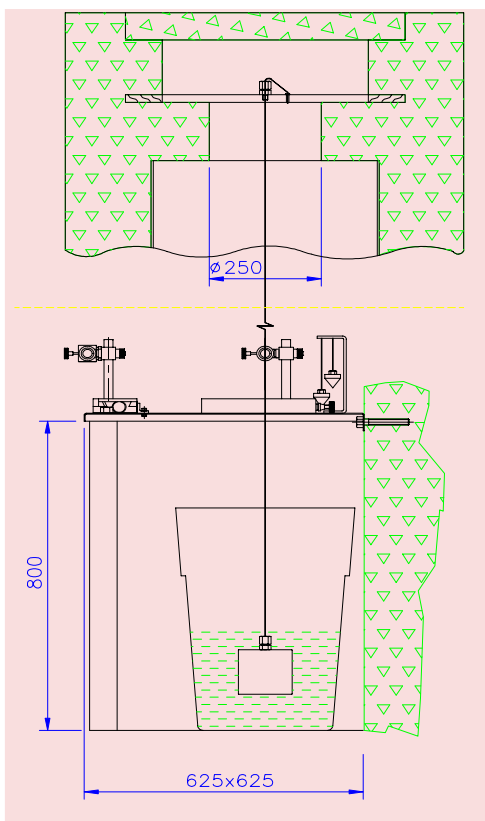


Reference plumb

TRAVELLING TELESCOPE

It consists of a heavy aluminium base provided with a sliding mechanism which permits the telescope (mounted on a vertical pillar) to be moved across the base along a horizontal vernier scale. Coarse as well as fine setting is provided. A focusing knob & provision for rotating the cross in the eye piece and aligning it vertically with the plumb line is available in the eye piece. The travelling telescope can focus between 250 mm and 500 mm from the end of the objective lens.

To facilitate observation from the same direction, the 'Y' telescope is provided with a right angle prism before the objective lens.



SPECIFICATIONS NORMAL PLUMB LINE

Telescope focus range	250 mm to 500 mm
Measuring range	± 75 mm
Resolution	0.01 mm
Accuracy	0.1 mm
Table size	625 mm x 625 mm
Stainless steel wire	1 mm dia x 60 m long (other lengths available)
Wire suspension	Collet on a rectangular bar grouted at the top
Suspension wt.	10 kg
Tank (PVC)	40 litre capacity
Damping oil	S.A.E. 40

SPECIFICATIONS INVERTED PLUMB LINE

Telescope focus range	250 mm to 500 mm
Measuring range	± 50 mm
Resolution	0.01 mm
Accuracy	0.1 mm
Table size	625 mm x 625 mm
Stainless steel wire	1 mm dia x 60 m long (other lengths available)
Wire suspension	Collet on hollow float in tank filled with water
Wire tension	8 kgf
Tank (Fiber glass)	800 mmf x500 mm long
Float material	PVC

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