

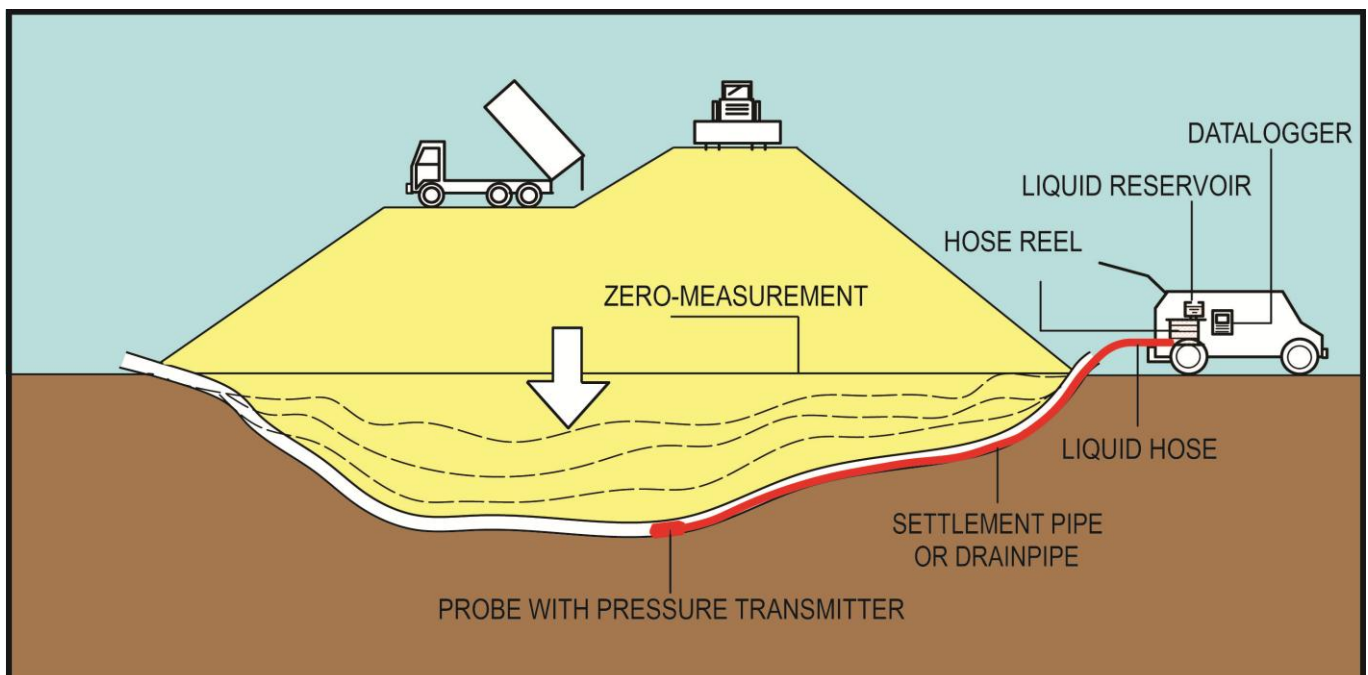


MEASURING SOIL SETTLEMENT

- Embankments
- Road foundations
- Waste disposal sites
- Underground pipes
- Directional drillings
- Sewage pipes

THE LPMH-SYSTEM

The system basically consists of a measurement probe containing a pressure transmitter that, via a hose on a reel, is connected to a liquid reservoir. The probe is pulled through the settlement pipe or drain line with intervals, (e.g. 1,00m, 2,00m, 5,00m etc). Recording the hydrostatic pressure at each interval results in the relative profile of the pipe's level. By subsequently putting the probe on a fixed point outside the pipe it is possible to relate the pipe's profile to the national grid level. By repeating the measurement with time intervals the progression of the settlement of the subsoil is determined in a very accurate manner. To ensure maximum accuracy each measurement is automatically compensated for variations in temperature and atmospheric pressure. The measurement vehicle is fitted with an automatic processor/datalogger so that the readings can be made available right on the spot, if so required.



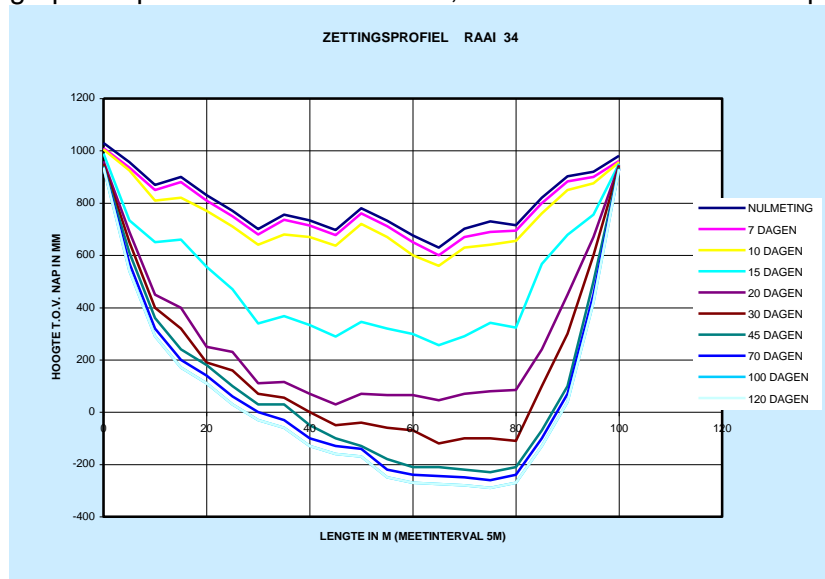
Contrary to other systems available on the market, the LPMH-system does not require that the pipe itself is filled with water: the LPMH-unit has its own liquid system. Whether the pipe is empty or wholly or partly filled with liquid (e.g. groundwater or drain water) does not make any difference for the operation of the LPMH-system.

ADVANTAGES COMPARED TO LEVELLING RODS.

- More reliable and more accurate.
- No disruption or damage by earth moving equipment or other external influences.
- No point measurement but integral monitoring of the settlement over the entire profile.
- Easy to obtain a time settlement diagram for any point along the profile.
- Measurements can be continued after completion of the work. These measurements are still fully reproducible with the first (zero-)measurement.

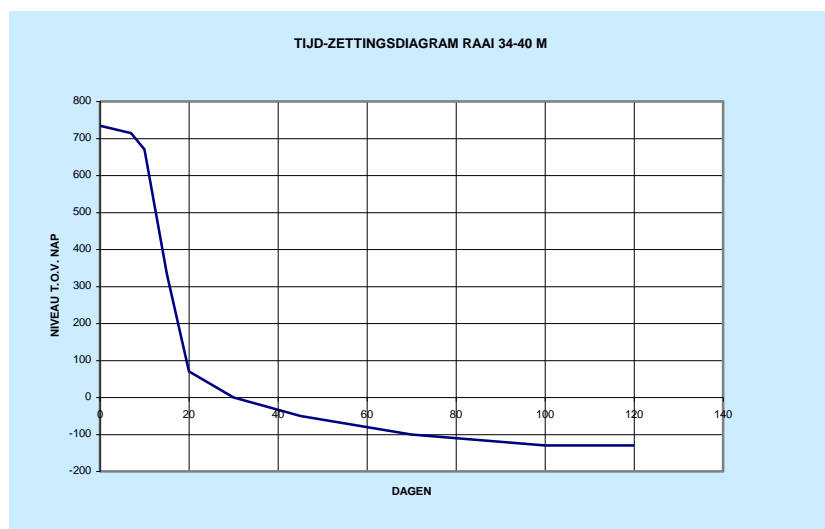
MEASUREMENT REPORT

The report presents the measurement for each profile or cross-section in both alphanumeric and graphical presentation. In addition, all measurement data are provided in a digital version.



LEVEL PROFILE

All successive measurements are presented in one graph per profile. This offers an immediately clear picture of the development of the settlement over the full length of each profile. In the imaginary example shown here the measurement interval was 5 meter. This interval can be adjusted in accordance with a client's requirements varying from 0,50m to 10m.



SETTLEMENT VERSUS TIME

It is easily possible to establish a settlement-versus-time diagram for each interval point along the length of a profile. In the imaginary example shown here is that the point at 40m distance from the end in cross-section 34. Usually the time coordinates are presented on a logarithmic scale. The graph serves as a tool to monitor the settlement in a specific point and to predict further settlement to be expected.

RELIABLE AND ACCURATE

- Due to the fact that it operates on its own internal liquid system, the LPMH-unit is fully autonomous. Whether the measurement pipe is wholly or partly filled with water or is totally empty makes no difference.
- The sensor probe stops at every interval. There are no dynamic factors that could influence the measurements.
- This results in a measurement accuracy of only a couple of millimeters.

A PROVEN CONCEPT

The LPMH-system is a well proven concept on the basis of countless measurements we have carried-out for our clients on infrastructural projects, at waste disposal sites and in the piping and sewage industry.



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