

## INVENTEC IS AWARDED THE WILLEMSPOLDER DIKE MONITORING PROJECT

The Stichting FloodControl IJkdijk \*) and the water authority Waterschap Rivierenland have awarded Inventec with the order for the engineering, installation and management of a monitoring system for the dike of the Willemspolder near the municipality of IJzendoorn, The Netherlands. Main objective of the project is to monitor the functioning of a vertical sand retaining geotextile as a preventive means against the failure mechanism piping. The length of the dike section to be monitored is 200m.

Major components of the monitoring system are:

- Distributed Temperature Sensing (DTS) via optical fiber cables running alongside the geotextile. These cables are put in place by means of horizontal directional drilling.
- Distributed Temperature Sensing through optical fibers that are integrated in the geotextile.
- Fiber optic Distributed Strain Sensing (DSS).
- Piezo meters at different levels at both sides of the geotextile.
- Water level meters.

In the subject case DTS is applied according to the heat-pulse technology which means that the optical fiber is heated-up periodically over its full length. A subsequent increased drop in temperature at a particular location along the fiber means that at that spot the velocity of the groundwater flow is higher than elsewhere. This can indicate the formation of a pipe. It is even possible to calculate the actual flow velocity. The DTS technology offers a spatial resolution of 1m and a temperature resolution of below 0,1°C.

The DSS fiber that also runs parallel to the geotextile measures the distributed strain as a function of the subsidence of the above lying clay body as a result of the formation of a pipe.

Monitoring will take place on a continuous basis during periods of high water levels in the River Waal. The measurement data will be sent in real-time to the DDSC (Dijk Data Service Center) via Inventec's own Livesense web platform. The monitoring will continue for a period of two years under the second IJkdijk development programme with a possible extension of two years under the authority of Waterschap Rivierenland.

\*) Stichting FloodControl IJkdijk is a joint development body of TNO, STOWA, Deltares, N.V. NOM and the industry.

