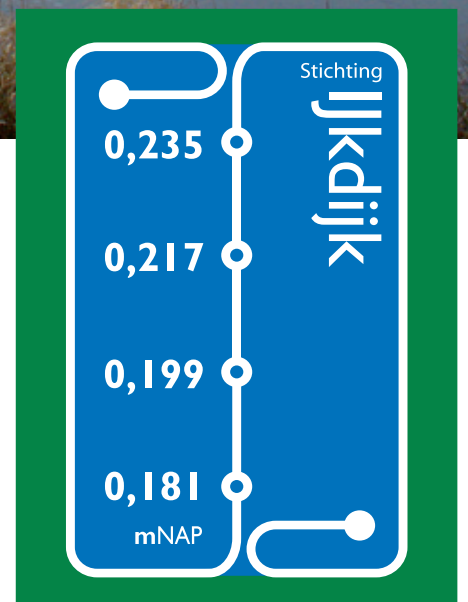


IJkdijk

smart levee solutions,
from finger in the dike
to finger on the pulse



The IJkdijk is a unique international test facility where the aim is to develop smart levees and to integrate, and validate dike- and sensor technology.

IJkdijk optimises the inspection, management, and maintenance of water systems. It helps support efficient decision-making in the event of imminent flooding.

Motive

Throughout the world, the most densely populated areas are found in deltas and along coastlines, lakes, and rivers. As these areas are extremely valuable in economic terms and are continuing to develop, the risk of flooding here needs to be low. In many of these areas, the ground surface is subsiding due to water extraction, sediment settlement, or other geological processes. At the same time, climate change is leading to more extreme weather conditions and rising sea levels. These changing conditions mean that high water levels will occur more frequently and will become more extreme. This will lead to major economic damage and a greater risk of loss of life. As a consequence, delta areas in The Netherlands are vulnerable.

In recent years, enormous technological developments have taken place in the collection and distribution of knowledge. Monitoring systems, sensor networks, earth observations, and simulation techniques have all made prediction systems more powerful. The potential exists to substantially improve water safety by compiling more up-to-date information and by deploying this more effectively to provide advance warnings. The focus is therefore on observation, measurement, inspection and prediction. Unsafe situations related to flooding risks or levee failure can therefore be detected in a timely way.

Improved operational systems are needed to cope with climate problems, together with investment in waterways and levees. The development of operational high-water risk management is comparatively cost effective and quick to apply. For water-management authorities to use more advanced monitoring systems during inspection; for crisis coordination using decision-making support systems when dealing with disasters.

Aim

There are numerous examples of the more obvious uses of sensors. From the car industry to household applications. Developments in this field have made significant strides. The IJkdijk Foundation was established so that knowledge exchange could lead to even greater progress in the world of robust sensor networks and safe and reliable water systems. The aim is that the unique test facility will drive innovation and lead to smart levees. The value of a variety of technologies can be demonstrated by carrying out experiments in a controlled environment and under pre-determined conditions, and knowledge about the failure of levees can be increased. More frequent flooding, speed up innovation!

Knowledge of failure mechanisms

Fortunately, levee failures do not happen often in the Netherlands. But when they do, the consequences are severe. A centuries-long battle against water has provided the Netherlands with a great deal of knowledge about levees. In particular how they should be built, and to a certain extent how they weaken. A weak spot is not always visible to a levee patroller and can occur in many ways. It is therefore essential to gather knowledge about the mechanisms that lead to failure. IJkdijk gives the opportunity to fill in these gaps using 1:1 tests and robust sensor networks, and measures that are needed to keep the hinterland safe can also actually be implemented. The Netherlands has approximately 3,700 km of primary levees and 14,000 km of other or secondary levees. This knowledge is used in two programmes that are being carried out over a number of years known as SBW (Strength Loading of Levees) and VIW (Improving Levee Inspections).

Robust sensor networks

A vital pre-condition for large-scale water management products is good real-time insight into the status of the water system and its levees. Current initiatives for using sensor technology need to be radically scaled-up, and a flexible sensor-ICT-infrastructure must be designed and developed. Measurement and monitoring are performed for two reasons. The first is so that measurements can

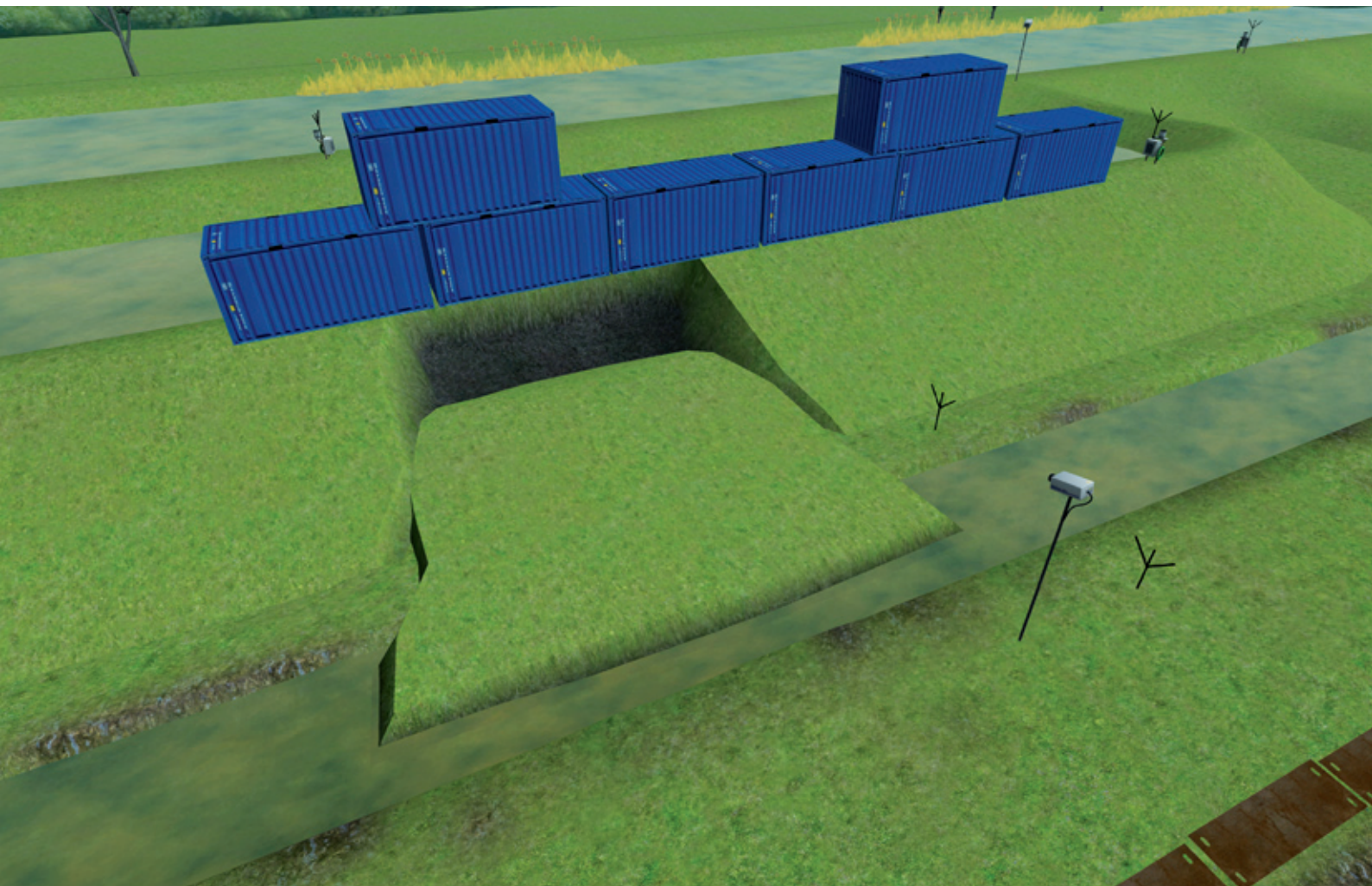
act as an 'alarm bell'. If a threshold value is exceeded, this must be the basis to take action. The second reason is to collect data that are then used in the calculation of scenarios. Improved data collection and its interpretation are not only intended for crisis management, but can also be used in the preliminary phase to give a more specific indication of where preventative measures need to be taken in the levee system. The information standards to be developed will be linked to existing standards and initiatives as far as possible.

Economic impulses

The IJkdijk creates opportunities for economic development in The Netherlands. It promotes export by developing examples of know-how and experience in the creation of water safety products aimed at a Dutch consumer market, and which also act as a demonstration for the international market. To win export orders, it is essential to build up and maintain a good reputation for know-how. Investing in innovations at IJkdijk maintains the level of knowledge in the Dutch consultancy world, increases the chance of standardisation, and enables other elements of trade and industry in The Netherlands to profit from the reputation that has already been built up in the world of water consultancy.

The IJkdijk Foundation is supported by more than 30 parties, including government, consultancy bureaus, building contractors, and ICT- and sensor companies.

You can visit www.ijkdijk.nl for up-to-date-information about experiments and companies.



The IJkdijk Foundation was established by:



Deltares
P.O. Box 177
2600 MH DELFT
The Netherlands
www.deltares.nl



**Foundation for
Applied Water Research**
Arthur van Schendelstraat 816
3511 ML UTRECHT
The Netherlands
www.stowa.nl



**Stichting Integrated
Development Lab**
Anne de Vriesstraat 70
9402 NT ASSEN
The Netherlands



TNO Knowledge for business
Eemgolaan 3
9727 DW GRONINGEN
The Netherlands



N.V. NOM
Paterswolderseweg 810
9728 BM GRONINGEN
The Netherlands
www.nom.nl

If you would like more information about
the IJkdijk, then contact

Wouter Zomer
Foundation IJkdijk
P.O. Box 424
9700 AK Groningen
The Netherlands
Tel. (+31) 06 224 042 60
info@ijkdijk.nl
www.ijkdijk.nl

