Basetime
PRECISION MONITORING

Locator One | Bridge monitoring | The Netherlands

Bridge monitoring Haringvliet bridge, Numansdorp, The Netherlands

The Haringvliet Bridge on the A29 was constructed in the 1960s. Over time, the bridge deck, mechanical components, and technical systems required replacement. Therefore, a major renovation project was initiated on behalf of Rijkswaterstaat (Dutch national road and water authority). Through this renovation, the bridge will remain safe and accessible for the region in the future.

coenradie
world-class surveying solutions

The accuracy of the chosen method has exceeded expectations and it can be concluded that the Basetime system can be used with much higher accuracies than the originally stated specifications, provided that post-processing is done on the highly redundant measurements.

- Sander Schröder (Manager Innovations – Coenradie BV)

Monitoring of the bridges abutments

During the summer of 2023, the Haringvliet Bridge was closed for several weeks to conduct maintenance. One of the necessary tasks was to remove and replace the movable part of the bridge, with the old structure weighing 1,500 tons and the new one 2,000 tons. This was a significant challenge, necessitating precise monitoring of the rest of the bridge, including the piers, for deformation and settling.

Throughout the project, numerous sensors were deployed to monitor activities closely. Coenradie BV engineering firm, an early adopter of the Basetime system, utilized the Locator One for deformation measurements during the work. Four Locator One devices were placed at the corners of the bridge abutment, with a fifth Locator One serving as a reference station on a settlement-free object nearby. Configuring the Locator One devices remotely to measure 24 times per day provided detailed insight into the bridge's movements due to factors like tides and temperature. The wealth of data offered valuable insights to surveyors and engineers. Post-processing analyses allowed for the calculation of daily averages, filtering out influences from temperature and tides, achieving deformation precision to less than 1 millimeter accuracy!

Several findings emerged during the execution:

- Locator One excelled in detecting trend analyses and breakpoints from changes as small as 1 millimeter.
- Trends over longer periods closely correlated with changes in object temperature.
- Moments of bridge deck removal and replacement were easily discernible.

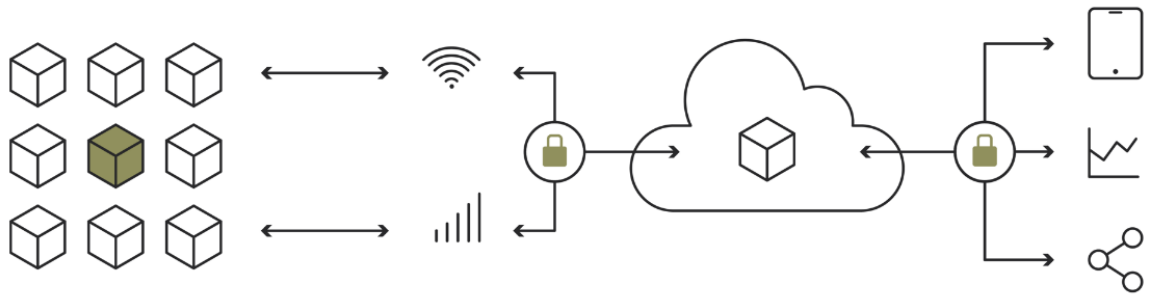
The accuracy of this approach surpassed expectations. It can be concluded that the Basetime system can achieve much higher precision than originally specified, provided there is post-processing of the highly redundant measurements processing 24 daily measurements into one daily value.

Data and Automation: The Basis for Predictions

Data and automation form crucial pillars for making reliable predictions about asset behavior. Information on deformation of critical assets, especially over extended periods, offers insights into their natural behavior. Deviations from this behavior serve as indicators of trend breaks, suggesting further investigation may be necessary. The Locator One guarantees high precision, resulting in at least 95 percent of planned measurements resulting in reliable and precise data.

Basetime is working to increase the accuracy and, specifically, the reliability of the outcomes by soon providing a network adjustment within the computation environment for object monitoring.

Locator One



Basetime
PRECISION MONITORING

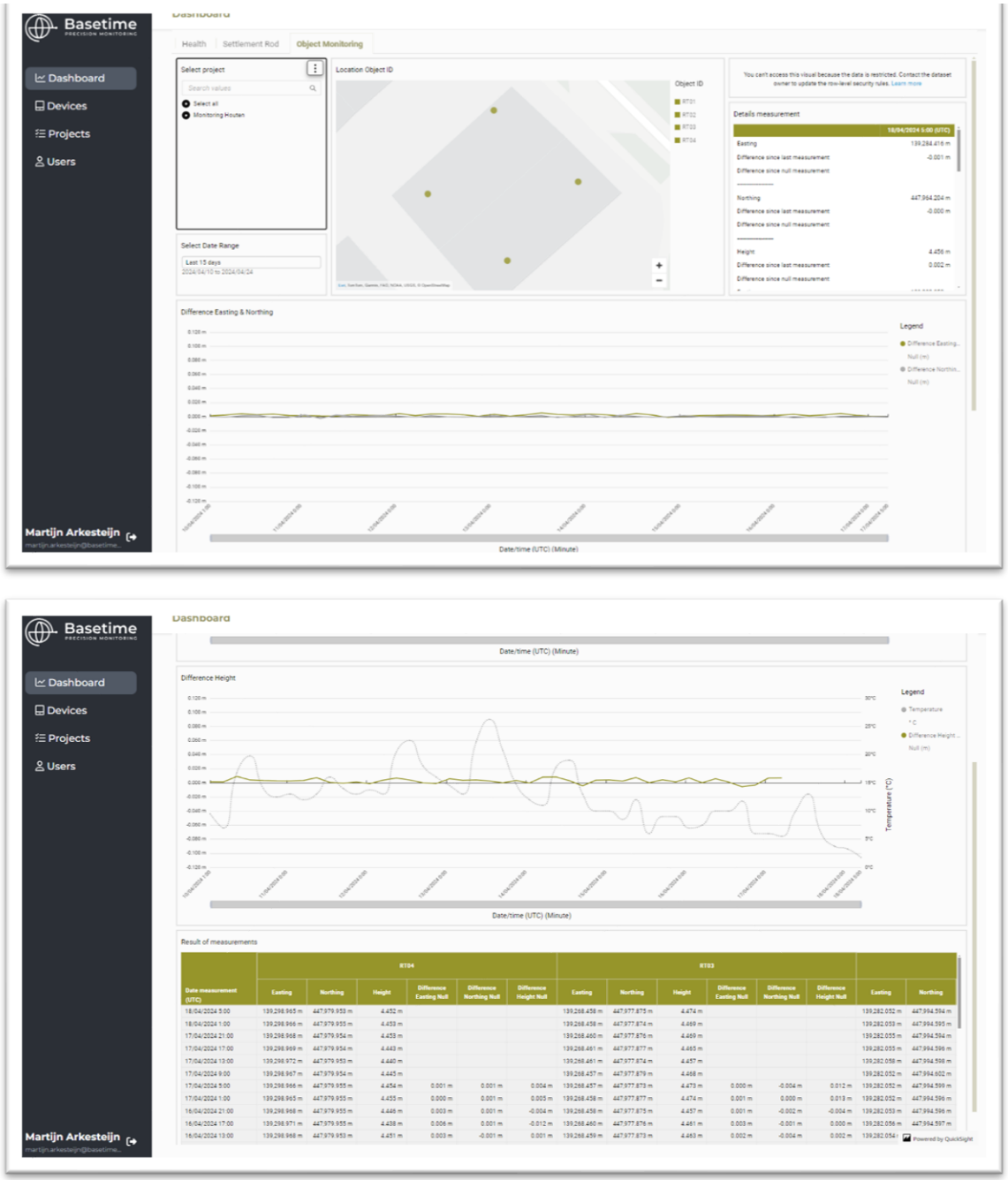
Locator One

Bridge monitoring

The Netherlands

Other applications

Beyond bridge monitoring, there are opportunities to monitor other critical public transport assets such as dams, tunnel entrances, and other infrastructure elements. As a sector, we must embrace this digitization and automation to tackle our monumental infrastructure challenges affordably, ecologically responsibly, and within available resources.



Parvamoti bridge monitoring dashboard