Conducting Structural Assessments on Aging Bridges

Overview

- Nebest inspects two bridges that were built in mid-1970's and needed a structural assessment.
- SFCW technology was used to provided more resolution and detailed mapping, despite the condition of the concrete subsurface
- They were able to map with a **single** instrument and a **single** pass, both near-surface targets and deeper ones.

In this case study, a Proceq GP8000 concrete mapping system was used to assess the condition of two bridges in the area of Nijverdal, in the Netherlands.

Situation

Because of the age of both bridges, a structural assessment was required by the customer. For this, it is needed to have information regarding the current state, as well as the actual material parameters (concrete strength, geometry and rebar configuration). The two bridges were built in a similar way, with prefab inverted T-girders as main span, and in situ abutments. The main span is usually the most critical element in this type of assessments.

This type of girders has prestressed strands with a specific tendon profile (either parabolic or with hard bends), in such a way that it follows the line of the bending moment diagram, which gives some structural benefits. Practically this means that the strands are somewhere in the top of the body close to the abutments and it's in the bottom of the body somewhere mid span.

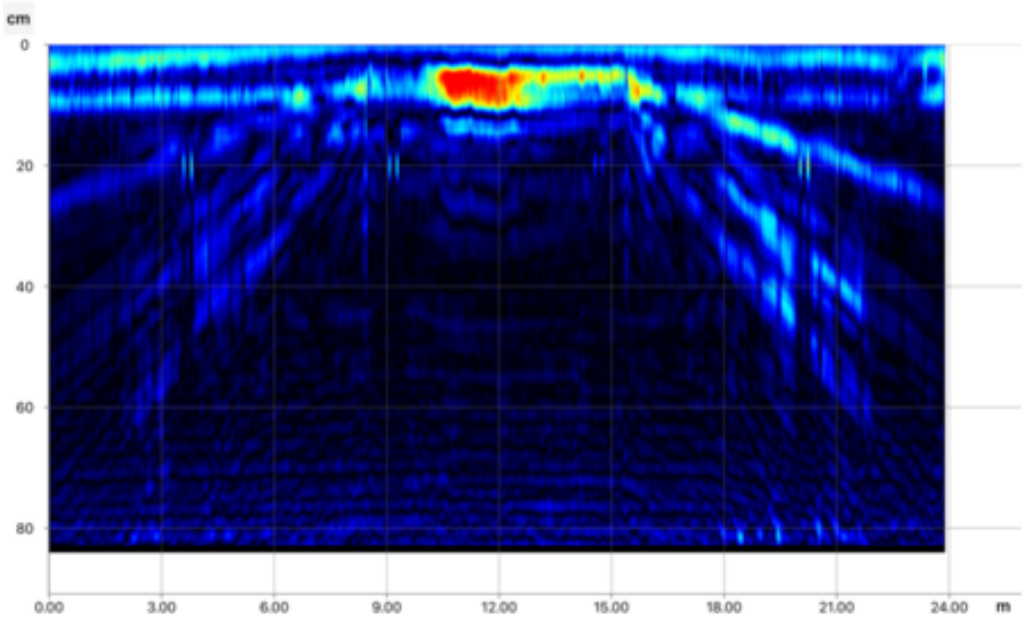
The customer had information for neither of the bridges, regarding the concrete quality or rebar configurations.

Solution

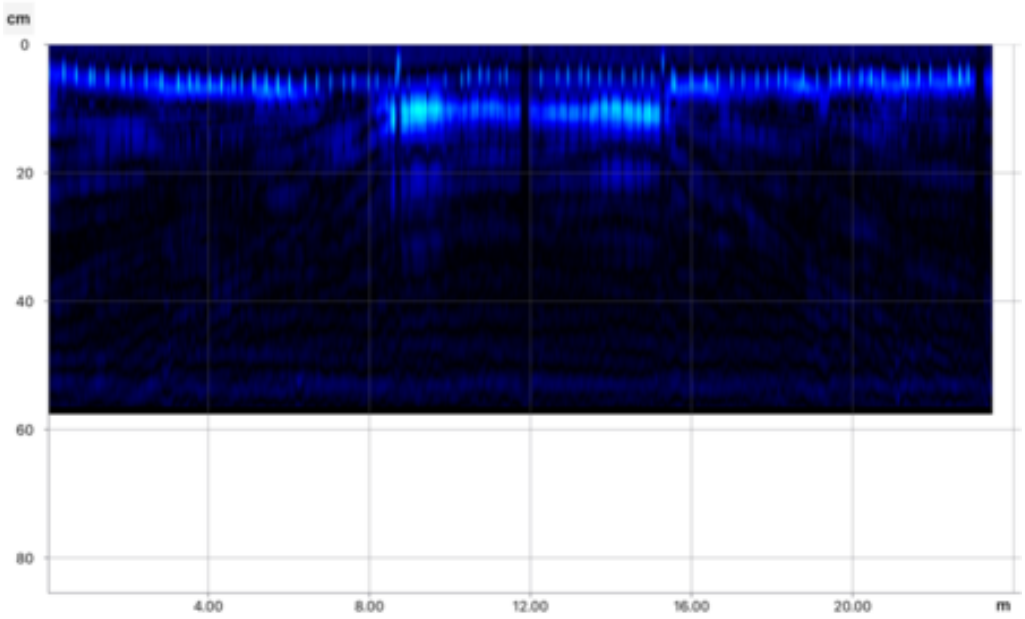
The service provider, Nebest, made several line scans in the length of the girders, just in line with the body of the girder. They collected great results of the tendon profile using a GP8000 concrete GPR.

Along with information from the hydro demolition process Nebest got good results on how the tendon profile was designed.

All this information together gave us the information we needed to complete the project.



Scan profile strands Reggebrug



Scan Profile inverted T Girder Ibbenburenbrug