Condition Assessment of the Tallest and Most Famous Cathedral in Croatia

Overview

- To conserve the largest and most famous cathedral in Croatia, the University of Zagreb was asked to assess the interior and exterior condition of the structure.
- A Proceq GP8000 concrete mapping system was used to assess the subsurface condition of the columns, walls and the floor of the old cathedral.
- The Stepped Frequency Continuous Wave (SFCW) Technology enabled the team to map both near-surface and deeper targets with a **single** instrument and a **single** pass.





Challenge

The Zagreb Cathedral, built in the 12th century, is the tallest building in Croatia and considered the most monumental sacral cathedral in the country. The professional research team from the University of Zagreb, Faculty of Civil Engineering, provided technical details of the structures for reconstruction.

With no history of the cathedral's build, the team were challenged with finding out information about the subsurface condition of the columns, walls and floors. The team also wanted to 'see' inside the structure of the pillars, know the layering of different materials, the thickness, and to locate any hidden openings below the floor.

The Solution

Several technologies were used including used to assess the subsurface condition of the columns, walls and the floor including the Proceq GP8000 concrete mapping system.

The Proceq GP8000, provided detailed information on the layers of the subsurface structure in a non-destructive, effective, and reliable way. It also delivered the best quality images of the conditions beneath the column and walls and floor of this famous cathedral.

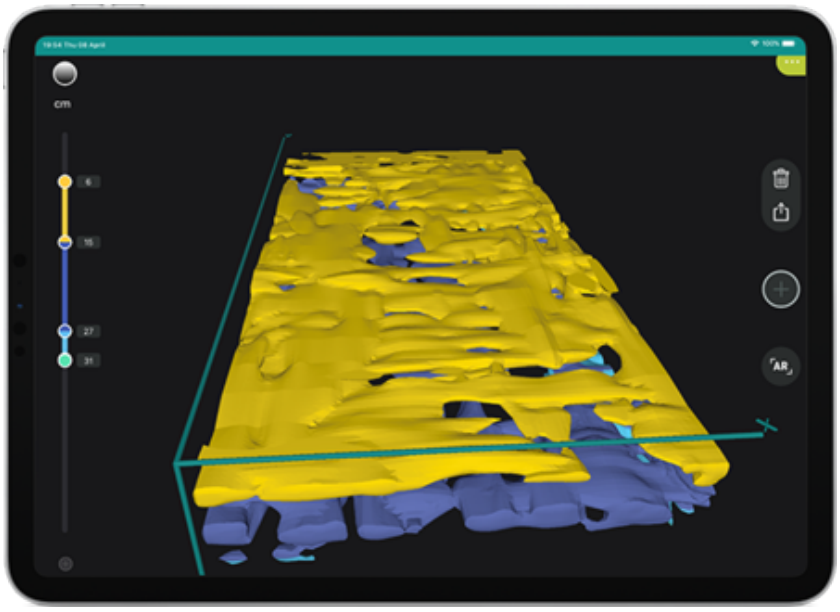
Results

Using the Proceq GP8000 concrete GPR scanner, the team were able to get the information they needed fast and accurately, with the results stored securely in the cloud for future reference.

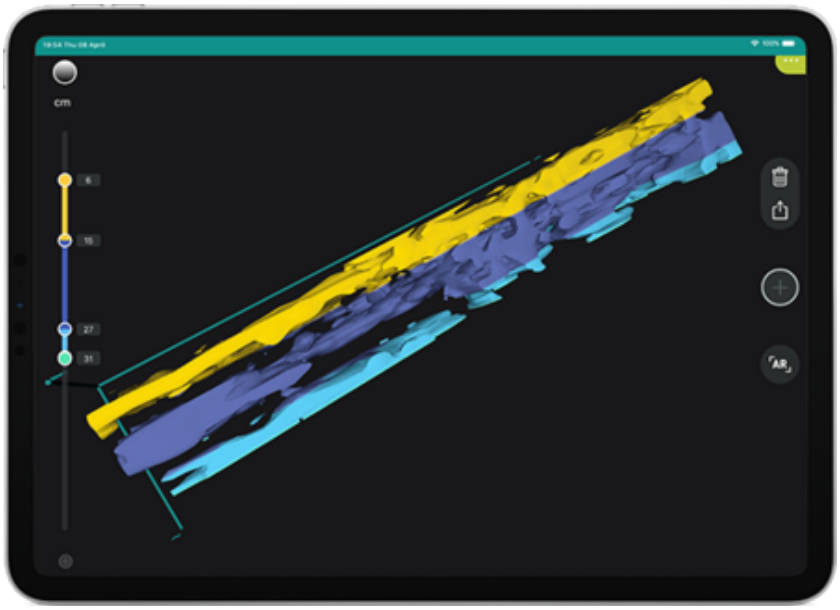
A number of hidden openings were detected and a map of different subsurface layers was provided. Because of its age, the cathedral was built entirely from stone. No concrete has been used and no rebars were located.

Where most equipment would stop, the SFCW technology provided enough depth penetration for the customer to reach targets even at 70cm. The GP8000 provided accurate information on the edge dimensions of the hidden openings, their depth and the subsurface layering.

The Proceq GP app allowed the team to visualize beneath the surface with the 3D images and augmented reality giving never seen before insights into the old cathedral - a fascinating look into Croatian history which was appreciated by the team at the University of Zagreb.



3D view of the top shift (yellow line) and mortal joint between second stone shift (dark blue line)



Depth layering of the second floor stones line and rock base (light blue)

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