How to Perform a Detailed Concrete Corrosion Assessment in Four Steps

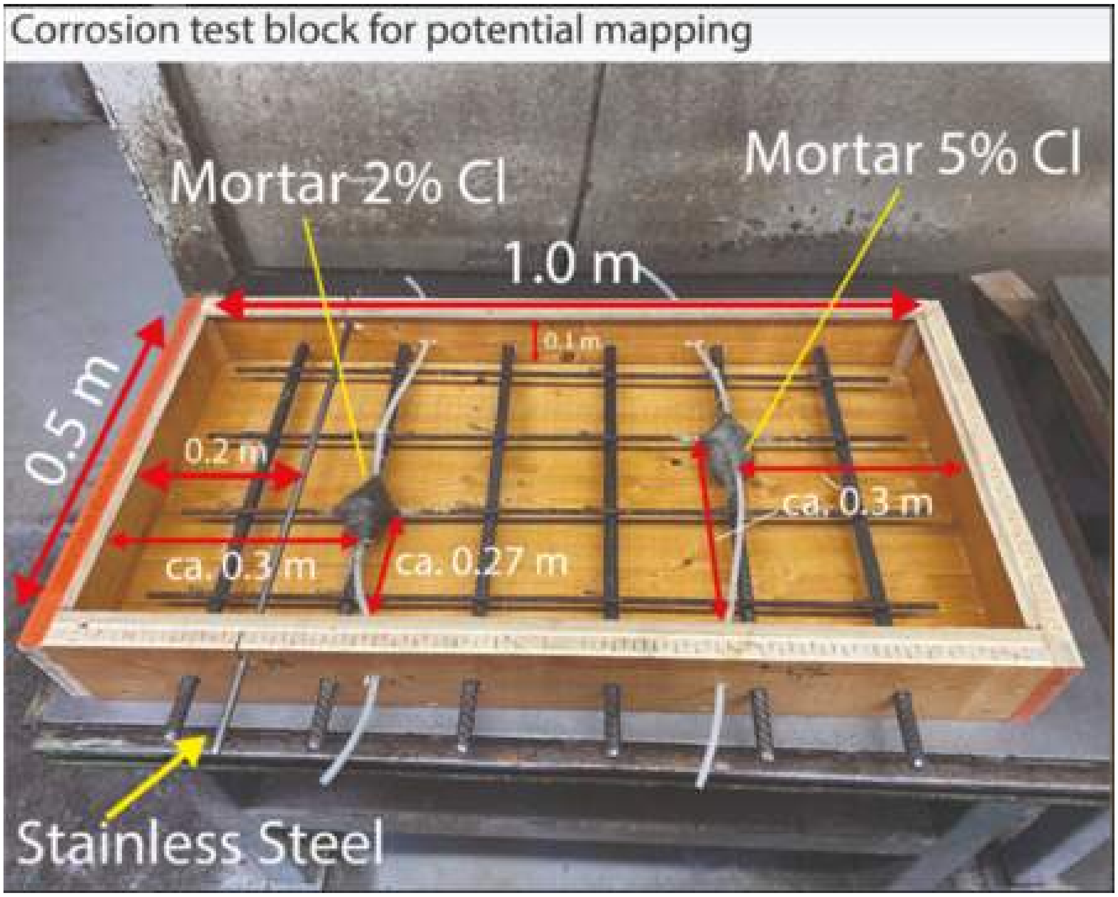
Concrete bridges and buildings are facing a long-term issue: Corrosion of steel reinforcement reducing the structural performance and ending to collapse.

This is a main durability problem, and it causes an economically global loss of $2.5 billions / year.

Concrete Corrosion Assessment is a very important task that most inspectors should perform in any relevant inspection of concrete structures.

The process is quite complex, and it involves the use of many sensors as it is a probabilistic test that is influenced by external factors such as humidity, temperature, light exposure, chloride and carbonation content, etc.

However, it is possible to get a detailed corrosion assessment by following the next steps (this is a real example using a Demo Block explaining how our users normally perform a concrete corrosion test):



Note: only the lowest left anode (2% Cl) was activated in this test.

1. **Corrosion likelihood:** Estimate the Corrosion Potential with Half Cell Potential Method (using [Profometer Corrosion]) - the areas in purple and red have a bigger probability of being corroded.

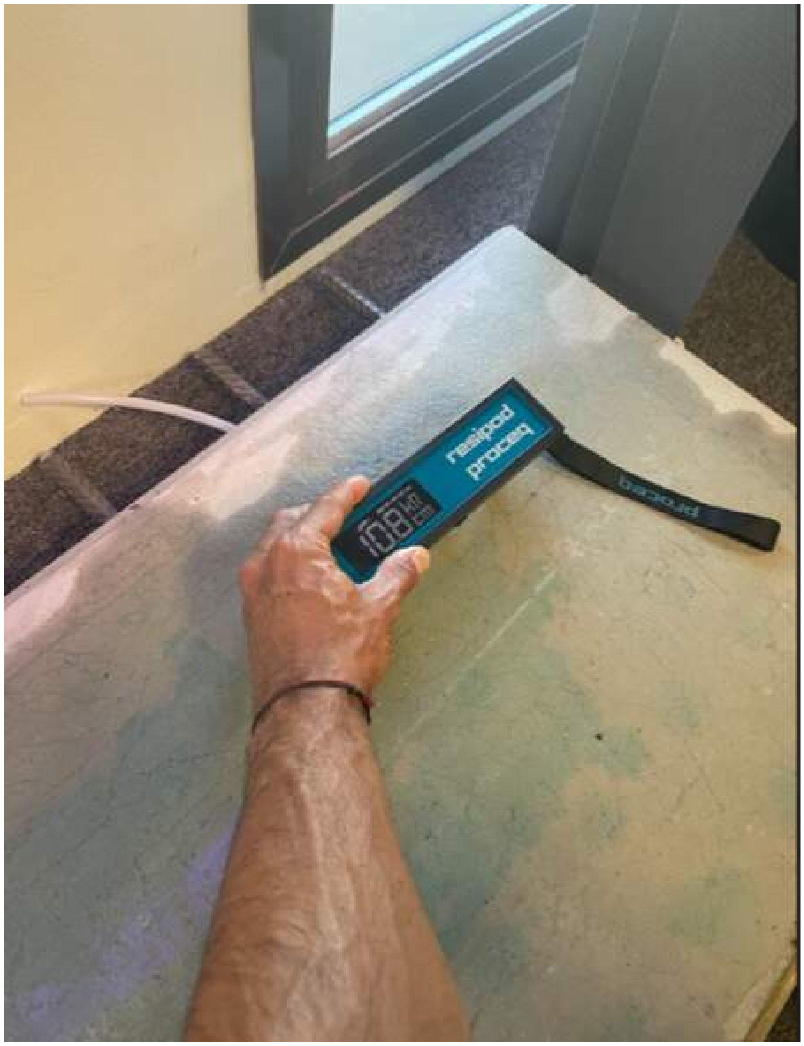
Corrosion likelihood using Profometer Corrosion

2. **Cover evaluation:** Detect and map concrete cover (using [Profometer PM8000 Pro]). Lack of concrete cover can lead to a bigger probability of corrosion as rebars are less protected against environmental attacks.

Concrete cover data using Profometer PM8000 Pro

3. **Resistivity estimation:** Estimate concrete resistivity (using [Proceq Resipod](#)). Low resistivity areas are more likely to develop corrosion issues as the permeability is higher, and the chlorides and the carbonatation can reach deeper.

Concrete resistivity results using Resipod



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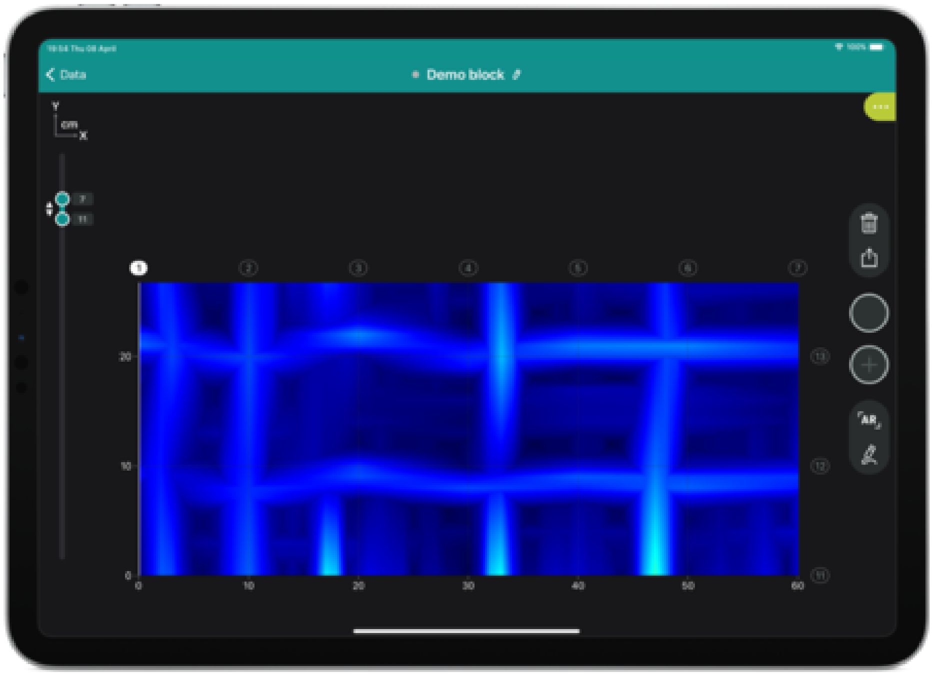
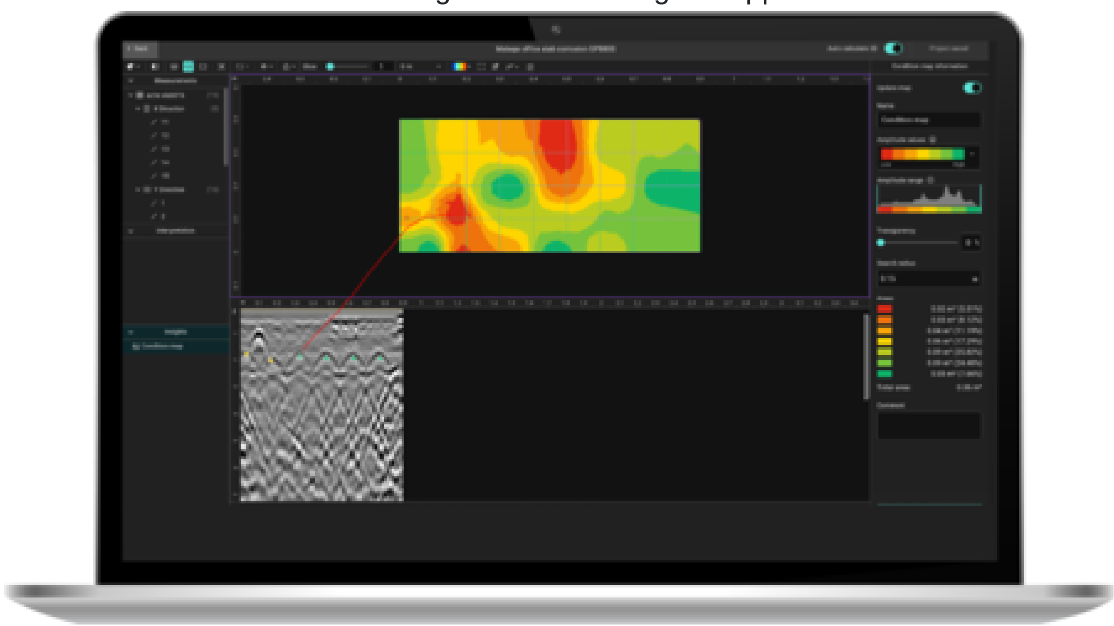
4. **Deterioration Maps:** It is possible to develop a Deterioration Map for a closer look at the signal reflection strength (using [Proceq GP8x00]() and [GPR Insights]()). This map helps to identify areas with a high probability of being deteriorated; for example, areas with corrosion, weaker materials, lower density, more permeability, etc.



GPR signal C scan using GP app



Deterioration map using GPR Insights

The combination of this intelligent data coming from these four powerful sensors is of key importance as it enhances the quality of the Half Cell Potential inspection, a qualitative method that may be affected by external factors like temperature and humidity. This comprehensive data provides a 360-degree view to corrosion experts and aids in making maintenance and repair decisions. You can now take corrosion assessment to a new level!

Explore more applications, case studies and tips for investigating concrete on our [Tech Hub](#).