Extend the life of Concrete Structures

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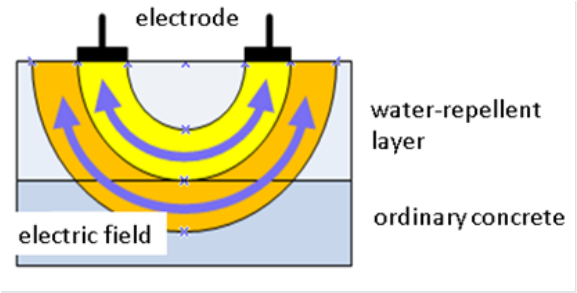
Research Outline

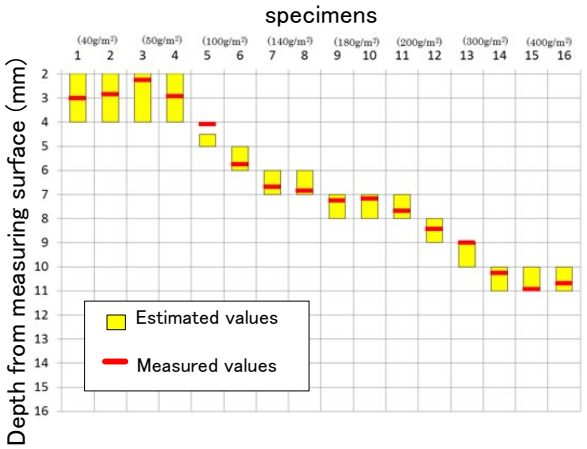
Estimation method of the Depth of Water Repellent Layer formed by Silane

In order to improve the durability of concrete, it is necessary to prevent the intrusion of water. The water repellent layer is formed by silane-based surface impregnation type water repellent. We developed an non-destructive method for estimating the depth of water repellent layer. The depth of water repellent layer is estimated with a hi-frequency capacitive water analyzer whose electrodes were modified.



Estimation principle

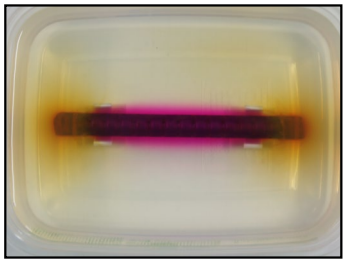
As the result, the estimated values and indicated values are directly related each other. With this method we could estimate the depth of water-repellent layer. And by improving the electrode, the estimation range become finer, and we could estimate shallower depth of water repellent layer.



Estimated values of water repellent layer

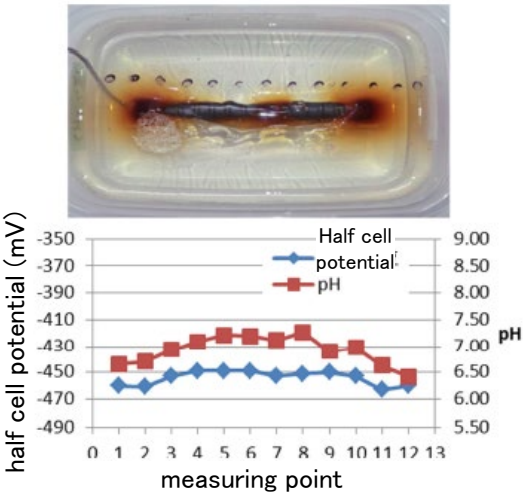
Development of a Visual Educational Tool of Reinforcing Bar's Corrosion

The objective of this study is to develop an educational tool that can simulate corrosion of reinforcing bar in concrete. The visual educational tools that were made with aqueous gel and had various factors were prepared.



Visual Educational Tool of Reinforcing Bar's Corrosion

The distributions of half-cell potential were measured and then compared with the results by the visual inspection. It was found that the base half-cell potential indicates the corrosion of reinforcing bar in the tool, in a similar way as the bar in concrete. Therefore, it can be considered that the tool can simulate the corrosion of reinforcing bar in concrete and that the tool is very effective to deepen students' knowledge on the corrosion of reinforcing steel.



Half cell potential and pH along re-bar