

Tanavit Pattarakittam 2012: Factors Influencing Half-Cell Potential Measurement in Reinforced Concrete. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Wanchai Yodsudjai, D.Eng. 90 pages.

The purposes of this research are to find the influences of covering, chloride content, moisture content, compressive strength and type of corrosion on the half-cell potential measurement in reinforced concrete structure and find the relationship between level of corrosion and the potential value. Two sizes of concrete slabs; 30x30x10 and 30x30x12.5 cm. were prepared. The potential was measured every week for the corrosion that accelerated by switching the concrete specimens between wet and dry conditions and was measured every day for the corrosion that accelerated by electricity. As a result, the potential decreases (more negative) with the increase of chloride content and moisture content. In the other hand, the potential increases (more positive) with the increase of compressive strength. However, the influences of covering are still unconvinced. The potential increase as the electrical resistance of the repaired material is higher than that of the old concrete. However, the repaired concrete using more than one material is still unconvinced. Although the potential measurement of the pitting corrosion are similar to that of the uniform corrosion the weight loss of the pitting corrosion is higher than that of the uniform corrosion. The variations of potential measurement (difference of potential measurements of each point in 1 specimen) decrease with the higher covering, chloride content and moisture content. In the other hand, the variations of potential measurement increase with the higher compressive strength. The variation of potential measurement of the pitting corrosion is higher than that of the uniform corrosion. In addition, there is relationship between the level of corrosion and the potential; that is, the level of corrosion increases with the decrease of the potential and there is a chance for the reinforcement to lose their weight if the average of potential is lower than -450 mV in dry condition.

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Student's signature

Thesis Advisor's signature