

Sistarin Ratchamusikpat 2014: Repair Guideline and Life Cycle Cost Analysis of Reinforced Concrete Bridge Deteriorated by Chloride Attack. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Wanchai Yodsudjai, D.Eng. 237 pages.

The purposes of this study were to visual inspect reinforced concrete bridges, to predict lifetime of reinforced concrete structure in chloride environment and to calculated life-cycle costs of various maintenance plans for deteriorated RC bridges

The five existing reinforced concrete bridges were visual inspected and The chloride profiles were investigated. The lifetime of the bridge was calculated, the Fick's second law and Pulvis's equation (for initiation period). The JCI's equation and Markeset's equation (for propagation period). In addition, the life-cycle costs of 41 maintenance methods for the deteriorated RC bridges were calculated.

As a result, it was found that the deteriorated of RC bridges was mostly found in column comparing to the beam and slab. The most deterioration found in column was classified on level 1 (partially cracks or spotted rust on surface concrete structure). The chloride content in column and beam were likely higher than that of slab when the level of deterioration assessed by visual inspection was similar. The Chloride contents and level of deterioration were decreased when the distance from coastline were increased. The prediction of deteriorated level by using the Pulvis's equation (for initiation period) and Markeset's equation (for propagation period) was mostly consistence with the result from the visual inspection. In addition, the lowest life-cycle cost among 41 Maintenance methods was the PU coating in low deteriorated RC bridges (level 1 or 2)

---

Student's signature

---

Thesis Advisor's signature