Ain Shams University
Faculty of Engineering
Structural Engineering Department

"Repair of Concrete Columns Containing High Percentage of Chlorides"

A Thesis
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STATEMENT

This thesis is submitted to Ain Shams University, Cairo, Egypt, on april 2014 for degree of Master of Science in Civil Engineering (Structural).

The work included in this thesis was carried out by the author at Reinforced Concrete Lab , Faculty Of Engineering , Department of Civil Engineering (Structural Division), Zagazig University.

No part of this thesis has been submitted for a degree or qualification at any other University or Institute.

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Omar Sayed Kamal Abdeen

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ABSTRACT

This research contains testing of 29 RC columns with comparable dimensions (200 x 200 x 1500 mm) and (200 x 300 x 1500 m). They are cast using a common concrete mix and supplied with different (sodium chloride to cement) ratios (i.e. by weight). Nine control columns did not contain to chloride, and 12 untreated together with 8 treated columns were subjected to chloride by adding different salt cement ratio (i.e. weight) (s/c) equals to (3%, 6% and 10%) to the mixing water of concrete.

The 29 concrete columns were divided into 10 groups; each encompasses control, untreated and treated columns (supplied with (CFRP) or increase the thickness of the concrete). For modeling, the finite element method was used by applying (ANSYS 14) program and a good agreement was obtained between the experimental results and theoretical results.

Keywords: corrosion, sodium chloride, experimental program, untreated columns, treated columns, CFRP, modeling.

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