

**Project Proposal:**

**Durability of concrete structures: corrosion problems and evaluation of the remaining resistance of deteriorated structures.**

Corrosion is one of the most important factors that affect the durability of concrete especially in locations prone to extreme weather, corrosive agents or other harsh environments. A thorough understanding of corrosion phenomena is important for a safe concrete design. Many of the design criteria are strongly influenced by corrosion issues, yet many designers have only a basic understanding of these processes. One of the most difficult issues related to corrosion is the assessment of the remaining resistance of structure that has already undergone significant deterioration.

For this project, I will summarize methods used to assess the resistance of aged concrete structures. A major focus will be the impact of corrosion on these methods.

Several steps will be needed to achieve this:

First: introduce the corrosion problem by understanding the physical and chemical processes involved.

Second: understand the effect that corrosion could have on stresses distribution in a concrete structure. This step will include a list of some of the more recent way to assess the area reduction of a concrete element due to corrosion.

Depending on timing, I would like also to add a case study of an existing bridge and to expand the research not only to concrete but also to some other design particulars such as expansion joints or abutments.