

# Evaluation of Petrographical Characteristics of Deteriorated Cement Concrete Containing Potential ASR

## Abstract

Understanding the alkali–silica reaction (ASR) is a very important step in order to measure the structural integrity of a certain building and establishment. ASR can affect the life expectancy of a structure, making it deteriorate much faster than how it is supposed to be. The purpose of this research is to focus on the characteristics of deteriorated cement concrete that is suspected to be containing ASR and its effect of its chemical composition and relative strength. By using the petrographic analysis method, ASR can be found in the suspected samples and it can be further researched by running the X-ray fluorescent spectrometry (XRF) test to examine the mineral content of the respective samples. Furthermore, the relative strength of the samples can be determined by using the Schmidt Rebound Hammer test. Overall, several minerals in the samples such as  $SO_3$  and CaO were found to be affecting the Estimated Concrete Strength ( $f_{cu}$ ) of the samples the most. This study definitively answers the question regarding the correlation between the chemical composition of concrete and its Estimated Concrete Strength.

## Keywords

ASR; Estimated concrete strength; Schmidt rebound hammer; XRF