

UQ Fire Project #2020.10

PERFORMANCE OF CONCRETE AFTER FIRE

Advisory Team

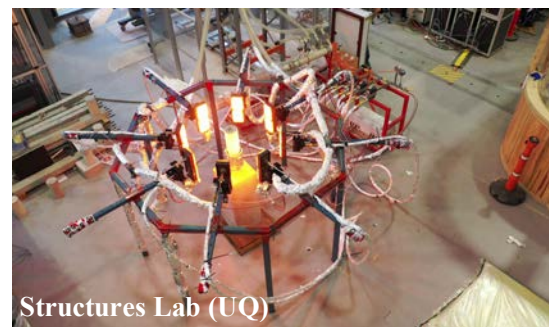
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Keywords

Concrete structures, fire safety, mechanical behaviour

Background and motivation

Experimental study to investigate the residual compressive strength constitutive models of concrete at elevated temperatures. The study will require fire testing of concrete samples (1) at varied heating conditions and (2) for two aggregate types. This information will be used to gauge the residual mechanical behaviour of concrete at elevated temperatures and the validity of current constitutive models in existent design guidelines.



Research objectives

- 1) Correlation between heating condition and residual compressive strength after heated at varied heating rates.
- 2) Conclude the influence of aggregate type in the above.
- 3) Develop a FE model that incorporate the new constitutive models and compares this with constitutive models available in design guidelines.

Methodology

This project will be based on the following experimental stages: (all samples are already casted)

- Perform fire tests with concrete cylinders (1) containing different aggregate types, (2) for different heating conditions.
- Measure residual compressive strength of tested samples
- Propose a new constitutive in a range of heating conditions

Recommended literature

Cement Concrete & Aggregates Australia. 2010. Fire Safety of Concrete Buildings
https://www.ccaa.com.au/imis_prod/documents/Library%20Documents/CCAA%20Technical%20Publications/CCAA%20Guides/CCAAGUIDE2010-T61-FireSafety.pdf