Opportunities for PhD Scholarships (2 positions)

Two scholarships are currently available within the Department of Civil Engineering, Monash University for suitable candidates to study towards a PhD.

**Project Title:**
Cementitious Gel: The Missing Link in Understanding the Ageing of Built Infrastructure

**Project Description**
Corrosive coastal exposure prematurely ages built reinforced concrete infrastructure, causing unplanned remediation and safety concerns. Traditional durability forecasting models, based on convective and ionic transport of chloride, overlook the influence of the cement gel. The mechanisms of chloride and water adsorption/binding/release to/from the gel will be scrutinized by a number of advanced techniques, including Helium Ion Microscopy, which will provide the first visual characterization of the pore structure of cement gel to 0.25 nm. Analytical modelling of chloride/water/gel interaction will be integrated with macro-transport predictive models and calibrated with diffusion experiments: culminating in superior durability forecasts. The project is funded by the Australian Research Council as part of the ARC Discovery Project DP120102203.

The project is planned for 3 years' duration, including two full-time postgraduate research student positions:

- **PhD 1.** Chloride movement through concrete (durability): Cement Gel Characterization and definition of the C-S-H gel and pore characteristics. The student will need a strong background in engineering with an interest in mineralogy and/or characterisation of materials (preferably cement-based), and become familiar in aspects of nanocomposite characterisation;

- **PhD 2.** Chloride movement through concrete (durability): Development of analytical models for chloride transport and verification testing. The student will need a strong background in civil engineering, preferably durability of construction materials, and a strong interest and/or experience in reinforcement corrosion and modelling the transport of corrosive chlorides in concrete

**Scholarships (2 No.) to Study for a PhD**
An Australian Research Council Scholarship is available in the Department of Civil Engineering, Monash University, Clayton Campus. The positions are 3 years full-time research towards a PhD. A tax-free stipend is provided ($28,000/year). Australian Citizens, Australian permanent residents, or New Zealand Citizens, are exempted from the full tuition fee costs for the duration of candidature. International Students are eligible to apply that is conditional upon the awardee’s ability to meet the full tuition fee costs for the duration of candidature.

**Qualifications**
Civil or Materials Engineering graduates with Honours 1 or Honours 2A degree and a demonstrated interest in durability of cement-based materials.

**Contact:**
For further details, please contact:
Associate Professor Frank Collins
Head of Structures
Opportunities for PhD Scholarships (2 positions)

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or

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Dept of Civil Engineering, Building 60, Monash University, Clayton Campus Vic 3800
Phone (03) 9905 1956, Fax (03) 9905 4944; e-mail: Jenny.Manson@monash.edu

Applications:

Applications should include a cover letter specifying interests, qualifications and experience that relate to the research project, curriculum vitae which should include employment history, publications, copies of academic transcripts, names and contact details of three referees. The applications should be sent to Associate Professor Frank Collins at the above address.