



Dr Michael Challenor BSc(Hons) PhD
Consultant Scientist – Scientific Services
AIREY TAYLOR CONSULTING

Qualifications

- Doctor of Philosophy (Nanotechnology, Neuroscience, UWA, 2015)
- Bachelor of Science, Honours – Nanotechnology (UWA, 2010)
- Bachelor of Science – Nanotechnology (Curtin University of Technology, 2009)

Professional Memberships

- Concrete Institute of Australia, Member

Career Posts

- Consultant Scientist – Airey Taylor Consulting (September 2016 – Present)
- Laboratory Technician– Microanalysis Australia Pty Ltd. (November 2015 – September 2016)
- Casual Labourer and Trade Assistant – Challenor Construction – (Jan 2006 – 2016)
- Research Analyst Intern - CingleVue International Pty Ltd (February 2015 – April 2015)
- Private Tutoring – High School and University level Maths & Science (2007-2018)

Project Experience

ATC Project Experience (Corrosion/Damp Investigation and Remediation)

- ❑ **Trinity College – Junior School, Science Block Gibney, Chapel**
Investigate roof and building seal leaks, spalling, boney concrete. Reporting, design of remedial measures. Investigation of the Chapel structure, causes of recurrent roof leaks, remedial recommendations and budget.
- ❑ **48 Havelock St West Perth Apartments - Building Damp and Mould investigation and Steel roof investigation**
Performed building wide dampness and mould investigation. Liaised with Strata Company initiating resident survey, identifying issues both beneath and remote from a problematic roof garden. Conducted a steel roof inspections/stormwater adequacy evaluation, identifying maintenance items and under-sized roof sumps. Identified horizontal ingress of damp *via* external cornices and limitations of weep hole placement in façade walls contributing to mould colonization. Provision of remedial recommendations.
- ❑ **Aquatic Centre Condition and Service Life Projections by Core Survey:** Churchlands SHS (2017) Aquatic Centres. Coordination of site crews coring samples and GPR investigations of reinforcement placement. Coordinating chloride, carbonation profiling of sampled concrete in splash, sub-splash and submerged areas; diffusion modelling to predict the time to first maintenance (the onset of reinforcement corrosion).

ATC Project Experience (Brickwork)

- ❑ **Midland Brick Investigation**
Client: Midland Brick
Literature review to determine thermal parameters for chemical modelling of off-gassing of chemical additives to kilning process for production of brick material.
- ❑ **15 Spinaway Parade - Falcon**
Client: Private Home-owner
Compilation of report investigating loss of mortar from external leaf of external wall of existing circa 16 year old house. Diagnosis of causes of fretting brickwork and weathering mechanisms of brickwork and mortar in a property located in close proximity to the ocean. Provision of recommendation (aesthetic for remediation of heavily fretted areas).



☐ **Fremantle Hospital Engineering Block**

Client: Fremantle Hospital

Assessment of brickwork mortar loss and calcium leachate mechanisms in a severe marine environment of circa 58-years old building. Performed invasive investigation of condition of wire-ties between the internal and external leaves using an illuminating videoscope. Detailed diagnosis of cause for calcite leaching. Provision of concept level remedial advice for bulging brickwork.

☐ **Old Harmony Post Office, 177 Hay Street Subiaco**

Client: Property owner (renovation)

Assessment of soil compaction around external brick wall of circa 100 year old building. Assessment of cracked brickwork, bulging brickwork rising damp and brick surface coating damage induced by salt and moisture. Provision of report outlining cracked brickwork stitching and wire-tie remediation and concept level remedial solution for cathodic protection of mortar from further degradation by insertion of electro-osmotic electrodes into brickwork.

ATC Project Experience (Façade Investigation and Remediation)

☐ **Kings Square 1 Cracking of Concrete Façade Fins**

Client: John Holland Group

Led team of rope access operators in abseil dilapidation surveys of 21 storey structure (14 storeys affected) to characterize cracks and concrete cover on decorative structural façade fins, QA of survey method, document findings, statistical work up of data and report. With Engineers, proposed causal mechanism of cracking (primarily restraint vs shrinkage). Provision of advice on extent of crack opening/closing due to thermal effects and estimated time to corrosion staining from premature rusting of reinforcement exposed to elements through cracking. Evaluated state-of-the-art crack isolation membrane and elastomeric coating systems to provide remedial options. Supplier liaison regarding site-specific material warranties.

☐ **899 Hay Street Heritage Façade remediation**

Client: Savills

Investigated heritage façade cracking of a 3-storey structures housing high fashion retail tenants. Foot inspection and technical reports identifying roof, stormwater, parapet, façade reinforcement corrosion, waterproofing, rising damp, HVAC issues.

☐ **Don Aitken Centre – East Perth**

Client: Main Roads Australia

Led team of rope access operators in abseil dilapidation surveys of 9 storey exposed aggregate concrete building, providing documentation of findings and large technical report on render delamination and proposed concept level remedial program.

☐ **67 Walters Drive Osborne Park – Office Building-wide leak investigation and Carpark dilapidation survey**

Client: JCP Construction

Assessment and diagnosis of causes for building-wide water ingress. Provision of professional advice, concept level remediation and drafting of tender documentation for contractors to fix structure.

Expert Witness Consults:

☐ **5 Queens Street South Perth – Balcony Damp Investigation**

Performed a scientific investigation to diagnose the underlying cause of a leaking balcony. Dispute was between 2 tenants over a leaking balcony from Level 1 to the unit below. Provision of report and concept level remedial recommendations to client for SAT hearing. Attended SAT hearing which resulted in a favorable settlement for our client.

Peer Reviewed Conference Papers and Invited Seminars

- ☐ Clemons T. D., Challenor M., Fitzgerald M., Dunlop S., Smith N. M. & Iyer, K. S., “Manipulating Cellular Interactions of Poly(glycidyl methacrylate) Nanoparticles Using Mixed Polymer Brushes”, ACS Macro Letters, 5 (10), 1132-1136 (2016)
- ☐ Challenor M., O’Hare Doig R. L., Fuller P., Giacci M., Bartlett C., Dunlop S. Hool, L, Iyer, K. S., Rodger J. & Fitzgerald M., “Prolonged glutamate excitotoxicity increases GluR1 protein but decreases mRNA of GluR1 and associated regulatory proteins in dissociated rat retinae in vitro”, Biochimie, Mar 17. pii: S0300-9084(15)00067-X (2015)
- ☐ Challenor M., Gong P., Lorensen D., House M. J., Woodward R. C., St. Pierre T., Fitzgerald M., Dunlop S., Sampson D. D. & Iyer, K. S., “The influence of NaYF4:Yb,Er size/phase on the multimodality of co-encapsulated magnetic photon-upconverting polymeric nanoparticles”, Dalton Trans., ,43, 16780-16787 (2014)
- ☐ Challenor M., Gong P., Lorensen D., Fitzgerald M., Dunlop S., Sampson D. D. & Iyer, K. S., “Iron Oxide-Induced



Thermal Effects on Solid-State Upconversion Emissions in NaYF₄:Yb,Er Nanocrystals." ACS Appl. Mater. Interfaces 5 (16), 7875-7880 (2013)

Awards

- ❑ 2015 – Awarded a scholarship to attend the Curtin Growth Ignition program in Curtin Business School, held at the Innovation Centre of Western Australia
- ❑ 2014 – Awarded a scholarship to participate in the Industry and PhD Research Engagement Program (iPREP) WA
- ❑ 2013 – Awarded The Australian Nanotechnology Network (ANN) overseas travel fellowship to participate in a collaboration with the Institut Européen de Chimie et Biologie (IECB)
- ❑ 2013 – Australian Postgraduate Award (APA) scholarship for Ph.D. studies at the University of Western Australia from 2011 to 2014
- ❑ 2012 – Awarded Poster prize for School of Chemistry Research Forum in UWA, Perth, Australia
- ❑ 2011 – Awarded an ANN bursary to attend the ACMM22/APMC 10/ICONN 2012 conference in Perth, Australia