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Concrete Durability Center
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Professional Experience

2008-Present Research Associate, The University of Texas at Austin

2008 The University of Texas at Austin
Jan.-Aug. Post-Doctoral Fellow

2004-2007 Ph.D. The University of Texas at Austin
Laboratory and Field Evaluations of External Sulfate Attack

2003-2004 M.S.E. The University of Texas at Austin
Laboratory Testing and Investigations of Delayed Ettringite Formation

Education

2004-2007 The University of Texas at Austin
Ph.D. Civil, Architectural, and Environmental Engineering
Advisors: Kevin J. Folliard and Michael D.A. Thomas (University of New Brunswick)

2003-2004 The University of Texas at Austin
M.S. Civil and Architectural Engineering
Advisor: Kevin J. Folliard

1998-2003 The University of Texas at Austin
B.S. Civil and Architectural Engineering

Teaching Experience

2006-2007 Teaching Assistant/Grader, CE 393 - Advanced Concrete Materials (Graduate Course), The University of Texas at Austin

2007 Teaching Assistant, CE 351 - Concrete Materials (Undergraduate Course), The University of Texas at Austin

2006 Undergraduate Mentor, Kevin Graf, The University of Texas at Austin, *Test Methods for Sulfate Profiling*

Professional Memberships

Member, ASTM International

Voting Member, Committee C01 – Cement, *since* 2008

Voting Member, Committee C09– Concrete and Concrete Aggregates, *since* 2008

Member, American Concrete Institute, 2004-present

Voting Member, ACI 201 (Durability), 2005-present

Associate Member, ACI 350 (Environmental Structures), 2008-present

Voting Member, ACI 350 (Durability). 2009-Present

Funded Projects

2014-Present Hycrete, Inc. “Testing Program to Evaluate the Effects of Hycrete on Resistance of Concrete to Alkali-Silica Reaction – Phase 3,” Thanos Drimalas (Co-PI, University of Texas at Austin) and Kevin Folliard (Co-PI, University of Texas at Austin)

2013-Present Texas Department of Transportation, “Inter-Agency Contract – Long-term Durability” Thanos Drimalas Co-PI, The University of Texas at Austin) and Kevin J. Folliard (Co-PI, The University of Texas at Austin)

2013- Present Hycrete, Inc. “Testing Program to Evaluate the Effects of Hycrete on Resistance of Concrete to Alkali-Silica Reaction – Phase 2,” Thanos Drimalas (Co-PI, University of Texas at Austin) and Kevin Folliard (Co-PI, University of Texas at Austin)

2012-2014 Hycrete, Inc. “Testing Program to Evaluate the Effects of Hycrete on Resistance of Concrete to Alkali-Silica Reaction,” Thanos Drimalas (Co-PI, University of Texas at Austin) and Kevin Folliard (Co-PI, University of Texas at Austin)

2012-2013 Texas Department of Transportation, “Inter-Agency Contract” Thanos Drimalas Co-PI, The University of Texas at Austin) and Kevin J. Folliard (Co-PI, The University of Texas at Austin)

2011-Present Texas Department of Transportation, “Development of Rapid, Cement-based Repair Materials for Transportation Structures,” Kevin J. Folliard (PI, The University of Texas at Austin)

2011-2012 W.R. Grace Construction Products, “Salt Scaling Resistance of Polymer Modified Concretes” Thanos Drimalas (PI, The University of Texas at Austin)

2010-2013 Texas Department of Transportation, “Characterizing Class C Fly Ashes for Alkali Silica Reaction Mitigation Effectiveness” Kevin Folliard (PI, The University of Texas at Austin)

2010-2012 Hycrete, “Influence of Integral Water Repellent on the Durability of Concrete Exposed to External Sulfates” Kevin Folliard (Co-PI, University of Texas at Austin) and Thanos Drimalas (Co-PI, University of Texas at Austin)

- 2010-2012 Texas Department of Transportation, “Inter-Agency Contract” Kevin Folliard (Co-PI, The University of Texas at Austin) and Thano Drimalas (Co-PI, The University of Texas at Austin)
- 2009-2013 Electrical Power Research Institute (EPRI), “Effects of Potassium Acetate De-Icing Chemicals on the Performance of Concrete Containing Fly Ash” Michael D.A. Thomas (PI, University of New Brunswick), Thano Drimalas (Co-PI, The University of Texas at Austin) and Kevin J. Folliard (The University of Texas at Austin)
- 2008-2010 W.R. Grace Construction Products, “Investigating Alkali Silica Reaction, Salt Scaling and Freeze-Thaw Resistance in Alkali Activated Fly Ash Mixtures,” Thano Drimalas (Co-PI, The University of Texas at Austin) and Kevin J. Folliard (Co-PI, The University of Texas at Austin)
- 2008-2010 W.R. Grace Construction Products, “Alkali Activated Fly ash in ASTM C 1293 Testing,” Thano Drimalas (Co-PI, The University of Texas at Austin) and Kevin J. Folliard (Co-PI, The University of Texas at Austin)
- 2007-2010 Texas Department of Transportation, “Coatings Systems for Sealing Bridge Structures Affected by ASR/DEF,” Kevin Folliard (Co-PI, The University of Texas at Austin) Maria Juenger (Co-PI, The University of Texas at Austin) Michael D.A. Thomas (Co-PI, The University of Texas at Austin)
- 2006-2008 Texas Department of Transportation, “Evaluation of Long-Term Durability of Concrete,” Kevin J. Folliard (PI, University of Texas at Austin)
- 2008-2009 W.R. Grace Construction Products, “Evaluation of Freeze-Thaw and Scaling Resistance of Concrete Containing EXP 3000, EXP 3003, and Eclipse Plus,” Thano Drimalas (Co-PI, The University of Texas at Austin) and Kevin J. Folliard (Co-PI, The University of Texas at Austin)
- 2006-2009 FHWA, “Alkali Silica Reactivity (ASR) Development and Deployment Program,” Kevin J. Folliard (Co-PI, The University of Texas at Austin) Michael D.A. Thomas (Co-PI, The University of New Brunswick) Benoit Fournier (Co-PI, University of Laval)
- 2004-2009 Texas Department of Transportation, “Sulfate Resistance of Concrete Exposed to External Sulfate Attack,” TxDOT 0-4889, Kevin Folliard (Co-PI, University of Texas at Austin) Michael D.A. Thomas (Co-PI, University of Texas at Austin)
- 2008 W.R. Grace Construction Products, “Evaluation of Freeze-Thaw and Scaling Resistance of Concrete Containing EXP 3000,” Thano Drimalas (Co-PI, The University of Texas at Austin) and Kevin J. Folliard (Co-PI, The University of Texas at Austin)
- 2004-2008 FHWA, “Lithium Implementation Project for ASR Affected Concrete,” Michael D.A. Thomas (PI, University of New Brunswick)
- 2002-2005 Texas Department of Transportation, “Preventing Premature Concrete Deterioration due to ASR/DEF in New Concrete,” TxDOT 0-4085, Kevin Folliard (PI, University of Texas at Austin)

Publications

Thomas, M.D.A., Folliard, K.J., Fournier, Drimalas, T., Garber, S., “Methods for Preventing ASR in New Construction: Results of Field Exposure Sites,” FHWA Report, Report No. FHWA-HIF-14-004, December 2013.

Thomas, M.D.A., Folliard, K.J., Fournier, P., Rivard, P., Drimalas, T., “Methods for Evaluating and Treating ASR-Affected Structures: Results of Field Application and Demonstration Projects – Volume I: Summary of Findings and Recommendations,” FHWA Report., Report No. FHWA-HIF-14-0002, November 2013.

Thomas, M.D.A., Folliard, K.J., Fournier, P., Rivard, P., Drimalas, T., Garber, S., “Methods for Evaluating and Treating ASR-Affected Structures: Results of Field Application and Demonstration Projects – Volume II: Details of Field Applications and Analysis,” FHWA Report., Report No. FHWA-HIF-14-0003, November 2013.

Kruse, K., Jasso, A., Folliard, K.J., Ferron, R., Juenger, M., Drimalas, T., “Characterizing Fly Ash,” The University of Texas at Austin, Center for Transportation Research (CTR), CTR 0-6648-1, 2013.

Pesek, P., Riding, K., Schindler, A., Drimalas, T., Folliard, K.J., “0-6332 Final Report: Development of Predictive Model for Bridge Deck Cracking and Strength Development,” The University of Texas at Austin, Center for Transportation Research (CTR), CTR 0-6332, 2013.

Dhole, R.D., Thomas, M.D.A., Folliard, K.J., Drimalas, T. “Characterization of Fly Ashes for Sulfate Resistance,” *ACI Materials Journal*, V 110, n 2, p 159-168, March-April 2013.

Drimalas, T., Folliard, K.J., Thomas, M.D.A., Fournier, B., and Bentivegna, A. “Study of The Effectiveness of Lithium and Silane Treatments on Field Structures Affected by ASR,” In *Proceedings of the 12th International Conference on Alkali-Aggregate Reactivity in Concrete*, Drimalas, T., Ideker J.H. and Fournier, B. Eds., Austin, Texas, USA, 2012, 10 pp.

Hayman, S., Thomas, M.D.A., Drimalas, T., Folliard, K.J., “Deterioration of Concretes Exposed to Potassium Acetate Due to Alkali-Silica Reaction,” In *Proceedings of the 12th International Conference on Alkali-Aggregate Reactivity in Concrete*, Drimalas, T., Ideker J.H. and Fournier, B. Eds., Austin, Texas, USA, 2012, 10 pp.

Ideker, J.H., Drimalas, T., Bentivegna, A.F., Folliard, K.J., Fournier, B., Thomas, M.D.A., Hooton, R.D, and Rogers, C.A, “The Importance of Outdoor Exposure Sites,” In *Proceedings of the 12th International Conference on Alkali-Aggregate Reactivity in Concrete*, Drimalas, T., Ideker J.H. and Fournier, B. Eds., Austin, Texas, USA, 2012, 10 pp.

Tremblay, S., Fournier, B., Thomas, M.D.A., Drimalas, T., and Folliard, K.J. “The Lomas Boulevard Road Test Site, Albuquerque (New Mexico) – A Case Study on the Use of Preventive Measures Against ASR in New Concrete,” In *Proceedings of the 12th International Conference on Alkali-Aggregate Reactivity in Concrete*, Drimalas, T., Ideker J.H. and Fournier, B. Eds., Austin, Texas, USA, 2012, 10 pp.

Drimalas, T., Ideker, J.H., Arrietta, G., Folliard, K.J., Fournier, B., Thomas, M.D.A., “Evaluating Combination of Aggregates in the Accelerated Mortar Bar Test,” In *Proceedings of the 12th International Conference on Alkali-Aggregate Reactivity in Concrete*, Drimalas, T., Ideker J.H. and Fournier, B. Eds., Austin, Texas, USA, 2012, 10 pp.

Folliard, K.J., Thomas, M.D.A., Fournier, B., Resendez, Y, Drimalas, T., and Bentivegna, A., “Evaluation of Mitigation Measures Applied to ASR-Affected Concrete Elements: Preliminary Findings from Austin, TX Exposure Site,” In *Proceedings of the 12th International Conference on Alkali-Aggregate Reactivity in Concrete*, Drimalas, T., Ideker J.H. and Fournier, B. Eds., Austin, Texas, USA, 2012, 10 pp.

Thomas, M.D.A., Folliard, K.J., Fournier, B., Drimalas, T., Rivard, P., “Study of Remedial Actions on Highway Structures Affected by ASR,” In *Proceedings of the 12th International Conference on Alkali-Aggregate Reactivity in Concrete*, Drimalas, T., Ideker J.H. and Fournier, B. Eds., Austin, Texas, USA, 2012, 10 pp.

Drimalas, T., Ideker, J.H., Bentivegna, A.F, Folliard, K.J., Fournier, B., Thomas, M.D.A., “The long-term monitoring of large-scale concrete specimens containing lithium salts to mitigate alkali-silica reaction,” ACI Special Publication, N 289, p 245-261, 12th International Conference on Recent Advances in Concrete Technology and Sustainability Issues, 2012.

Bentivegna, A.F., Drimalas, Ideker, J.H., Hayman, S., “Mitigation of ASR affected concrete in Boston, MA, USA: A case study,” Concrete Repair, Rehabilitation and Retrofitting III – Proceedings of the 3rd International Conference on Concrete Repair, Rehabilitation, and Retrofitting ICCRRR 2012, p 944-949, 2012.

Du, L. Folliard, K.J., Drimalas, T., “Effects of additives on properties of rapid-setting controlled low-strength material mixtures,” ACI Materials Journal, V 109, n 1, p 21-29, January-February 2012

Dhole, R.D., Thomas, M.D.A., Folliard, K.J., Drimalas, T., “Sulfate Resistance of Mortar Mixtures of High-Calcium Fly Ashes and Other Pozzolans,” ACI Materials Journal, V 108, n 6, p 645-654, November-December 2011

Drimalas, T., Kruse, K., Bentivegna, A.F., Folliard, K.J., Brown, D., and Sandberg, P., “Effect of In-Boiler Additions to Coal Combustion on Composition, Compressive Strength Development and Durability of Resulting Combustion Products,” 2011 International Concrete Sustainability Conference, Boston, August 2011

Thomas, M.D.A., Hayman, S., Drimalas, T., and Folliard, K.J., “Deterioration of Cement Paste Exposed to Potassium Acetate Solution,” International Congress on the Chemistry of Cement, Madrid, Spain, July 2011.

Dhole, R.D., Thomas, M.D.A., Folliard, K.J., Drimalas, T. “Effect of Fly Ash Composition on the Sulfate Resistance of Concrete,” Proceedings, Annual Conference – Canadian Society for

Civil Engineering, V 3, P 1549-1558, 2009, Canadian Society for Civil Engineering Annual Conference 2009.

Thomas, M.D.A., Folliard, K.J., Drimalas, T., and Ramlochan, T., "Diagnosing Delayed Ettringite Formation in Concrete Structures," *Cement and Concrete Research*, Volume 38, Issue 6, pp. 841-847, June 2008

Folliard, K.J., Drimalas, T., "Evaluation of Class C Fly Ash in Sulfate Environments," The University of Texas at Austin, Center for Transportation Research (CTR), CTR Technical Report 0-4889-2, 2008

Thomas, M.D.A., Folliard, K., Drimalas, T., "Diagnosing Delayed Ettringite Formation in Concrete Structures," 11th Euroseminar on Microscopy Applied Building Materials, Universidade do Portugal, Portugal, June 2007

Thomas, M.D.A., Folliard, K.J., Drimalas, T. and Ramlochan, T., "Diagnosing delayed ettringite formation in concrete structures." 11th EuroSeminar on Microscopy Applied to Building Materials, Porto, Portugal, CD-ROM, 2007.

Folliard, K.J., Barborak, R., Drimalas, T., Du, L., Garber, S., Ideker, J., Ley, T., Williams, S., Juenger, M., Thomas, M.D.A., and Fournier, B., "Preventing ASR/DEF in New Concrete: Final Report," The University of Texas at Austin, Center for Transportation Research (CTR), CTR 4085-5, 2006.

Folliard, K.J., Barborak, R., Drimalas, T., Du, L., Garber, S., Ideker, J., Ley, T., Williams, S., Juenger, M., Thomas, M.D.A., and Fournier, B., "Preventing ASR/DEF in New Concrete: A Summary," The University of Texas at Austin, Center for Transportation Research (CTR), CTR PSR 4085-S, 2006.

Drimalas, T., Folliard, K.J., and Thomas, M.D.A., "Suitable Test Methods for Delayed Ettringite Formation," in preparation, to be submitted to *Cement and Concrete Research*.

Drimalas, T., Folliard, K.J., Thomas, M.D.A., "Effects of Alkali Silica Reaction on the potential for Delayed Ettringite Formation," in preparation, to be submitted to *Cement and Concrete Research*

Drimalas, T., Folliard, K.J., Thomas, M.D.A., Clement, C., "Long term monitoring and evaluation of concrete samples placed in outdoor sulphate exposure site: Part I investigating cement types and w/cm." In preparation, to be submitted to *ACI Materials Journal*

Drimalas, T., Folliard, K.J., Thomas, M.D.A., Clement, C., "Long term monitoring and evaluation of concrete samples placed in outdoor sulphate exposure site: Part II investigating supplementary cementing materials," In preparation, to be submitted to *ACI Materials Journal*

Presentations

“Assessing Alkali-Silica Reactivity in the Field Based on Outdoor Exposure Sites,” Expansive Reactions Conference, Corvallis, Oregon., July 2014.

“Mitigation Measures for Portland-Limestone Cements to Control Thaumasite Sulfate,” American Concrete Institute Spring Convention, Reno, Nevada, USA, April 2014

“Laboratory and Field Investigations of Delayed Ettringite Formation,” American Concrete Institute Spring Convention, Reno, Nevada, USA, April 2014

“Interaction between Potassium Acetate and Concrete,” American Concrete Institute Spring Convention, Minneapolis, Minnesota, USA, April 2013

“Evaluating Combination of Aggregates in the Accelerated Mortar Bar Test.” International Conference on Alkali-Aggregate Reaction (ICAAR),” Austin, Texas, USA, May 2012

“Study of The Effectiveness of Lithium and Silane Treatments on Field Structures Affected by ASR.” International Conference on Alkali-Aggregate Reaction (ICAAR),” Austin, Texas, USA, May 2012

“Laboratory and Field Deterioration of Concretes due to Physical Salt Attack,” American Concrete Institute Fall Convention, Dallas, Texas, USA, March 2012

“Sulfate Attack: Do we design for Chemical or Physical Attack,” Anna Maria Conference, Holmes Beach, Florida, USA, November 2011

“External Sulfate Attack: How do we mitigate,” Expansive Reactions Conference, Corvallis, Oregon, USA, July 2011

“Potassium Acetate Deterioration on Cement Pastes,” International Congress on the Chemistry of Cement, Madrid, Spain, July 2011

“Research Needs for Improving Alkali Silica Reaction Specifications,” Workshop on Specifications on Alkali-Aggregate Reaction, St. Louis, Mo., June 2010.

“Mitigation Measures and Test Methods for Salt Crystallization in Concrete,” Cryspom II Conference, Giessbach, Switzerland, June 2010

“Sulfate Resistance of Concretes Exposed to External Sulfates,” *2010 Concrete Durability Workshop*, Austin, TX., April 2010.

“ASR Mitigation – FHWA/AASHTO Guidelines for Mitigating ASR,” *National Bridge Conference*, Phoenix, AZ., February 2010

“Sulfate Resistance of Concretes Exposed to External Sulfates,” *2010 Concrete Durability Workshop*, Austin, TX April 2010.

“Evaluation of Concrete Prisms in Outdoor Sulfate Environments,” *ACI Fall 2009 Convention*, New Orleans, November 2009.

“Anomalies of External Sulfate Attack Research”, LMC Seminar, Crans-Montana, Switzerland, January, 2008.

“Sulfate Resistance of High-Calcium Fly Ash Concrete”, *ACI Fall 2007 Convention*, Puerto Rico, October 2007.

“Sulfate Resistance of Concrete Exposed to External Sulfate Attack”, *4th Annual TxDOT/CCT Concrete Paving Conference*, Austin, Texas October, 2006.

“Delayed Ettringite Formation Research at UT Austin”, *ACI Central Texas Chapter Monthly Meeting*, Austin , Texas, August, 2004.

Professional Service

Reviewer, Cement and Concrete Research, 2011-Present

Reviewer, ACI Materials Journal, 2006-Present

Reviewer, Journal of Materials in Civil Engineering, 2006 - Present

Reviewer, Construction and Building Materials, 2009 – Present

Organization and Scientific Committee, International Conference on Alkali-Aggregate Reaction, 2012

Co-Editor, International Conference on Alkali-Aggregate Reaction, 2012