

Nathan Harris, Ph.D., P.E.
Senior Engineer

Professional Profile

Dr. Nathan Harris is a Senior Engineer in Exponent's Buildings and Structures practice, where he specializes in concrete and other cementitious materials. He has experience investigating durability and performance issues related to concrete ingredients, concrete building components, concrete pavements, portland cement-based plaster (stucco), fire-damaged concrete, cementitious toppings, tile, asbestos-cement pipe, and concrete surface coatings. He has experience analyzing the physical and chemical properties of concrete's cementitious constituents particularly those properties that influence concrete durability. He also has experience investigating water intrusion and moisture accumulation in building components such as decks and roof assemblies.

Dr. Harris' educational background includes coursework in engineering materials, mechanics of materials, design of steel, concrete and timber structures, and finite element analysis. His coursework also included minors in geotechnical engineering and engineering management. He has experience in the analysis of concrete and cementitious materials through the use of optical and scanning electron microscopes. He also has experience in the development and operation of finite element analysis pre-processing software.

Prior to joining Exponent, Dr. Harris was a researcher at Cornell University where he studied the use of supplementary cementitious materials in Portland cement concrete. His research focused on the interactions between chemical admixtures and fresh concrete paste and their influences on concrete air void systems and freezing and thawing durability. Another primary focus of Dr. Harris' research was on methods for testing and control of supplementary cementitious materials for use in concrete.

Academic Credentials and Professional Honors

Ph.D., Civil and Environmental Engineering, Cornell University, 2007
M.S., Civil and Environmental Engineering, Brigham Young University, 2004
B.S., Civil and Environmental Engineering, Brigham Young University, 2004

Licenses and Certifications

Registered Professional Engineer, California, #C75356

Publications

Radlinski M, Moncarz P, Harris N. Concrete spalling in slip-form constructed industrial chimney. Proceedings, Awarie Budowlane, 25th Engineering Conference on Construction Failures, pp. 1037–1044, Szczecin-Miedzyzdroje, Poland, May 24–27, 2011.

Radlinski M, Harris N, Moncarz P. Sustainable concrete: impacts of existing and emerging materials and technologies on the construction industry. Proceedings, 2011 Architectural Engineering National Conference, pp. 252–262, Oakland, CA, March 30–April 2, 2011.

Ley MT, Harris NJ, Folliard KJ, Hover KC. Investigation of air-entraining admixture dosage in fly ash concrete. *ACI Materials Journal* 2008 Sept/Oct; 105(5):494–498.

Harris NJ, Hover KC, Folliard KJ, Ley MT. The use of the foam index test to predict AEA dosage in concrete containing fly Ash: Part I—Evaluation of the state of practice. *Journal of ASTM International* 2008 Jul; 5(7).

Harris NJ, Hover KC, Folliard KJ, Ley MT. The use of the foam index test to predict AEA dosage in concrete containing fly ash: Part II—Development of a standard test method: apparatus and procedure. *Journal of ASTM International* 2008 Jul; 5(7).

Harris NJ, Hover KC, Folliard KJ, Ley MT. The use of the foam index test to predict AEA dosage in concrete containing fly ash: Part III—Development of a standard test method: proportions of Materials. *Journal of ASTM International* 2008 Jul; 5(7).

Harris NJ. Evaluating the influence of fly ash on air entrained concrete. Doctoral Dissertation, Civil Infrastructure, School of Civil and Environmental Engineering, Cornell University, Summer 2007.

Harris NJ, Hover KC, Folliard KJ, Ley T. Variables affecting the ASTM Standard C 311 loss on ignition test for fly ash. *Journal of ASTM International* 2006 Sept; 3(8).

Benzley SE, Harris NJ, Scott M, Borden M, Owen SJ. Conformal refinement and coarsening of unstructured hexahedral meshes. *Journal of Computing and Information Science in Engineering* 2005 Dec; 5(4):330–337.

Harris NJ, Benzley SE, Owen SJ. Conformal refinement of all-hexahedral finite element meshes based on multiple twist plane insertion. Proceedings, 13th International Meshing Roundtable, pp. 157–167, Williamsburg, VA, September 2004.

Presentations

Harris NJ, Radlinski M, Lyons AV. Asbestos-cement pipe condition assessment and development of methodology for optimum replacement in water distribution systems. American Water Works Association Distribution Systems Symposium, National Harbor, MD, September 2010.

Harris NJ. Conformal refinement of all-hexahedral finite element meshes based on multiple twist plane insertion. 3th International Meshing Roundtable, Williamsburg, VA, September 2004.

Reviewer

Peer Reviewer, *American Concrete Institute Materials Journal*

Peer Reviewer, *American Society for Testing and Materials, Journal of Testing and Evaluation*

Professional Affiliations

- American Concrete Institute (member)
- American Society of Civil Engineers (associate member)