

Exponent®
Engineering & Scientific Consulting

Mat Radlinski, Ph.D., P.E.

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Professional Profile

Dr. Radlinski specializes in concrete and cement-based materials. He has extensive experience investigating problems associated with all aspects of concrete construction including installation deficiencies, concrete material failures and performance concerns in a wide range of applications, including structural building components, foundations, parking structures, bridges, floor slabs, pavements, prestressed and post-tensioned concrete, water containment and environmental structures, concrete pipe and industrial chimneys.

Dr. Radlinski's areas of expertise include analysis and optimization of concrete mix design, characterization of chemical composition and physical properties of concrete, and evaluation of durability-related concrete failures including cracking, chemical attack, corrosion, and freeze-thaw damage. He has also evaluated failures of various cement-based materials such as stucco, flooring underlayments, fiber-cement siding, asbestos-cement pipe, tile thinset, swimming pool plaster, and oilwell cement. Dr. Radlinski has conducted numerous flooring failure investigations related to moisture problems, installation, and material performance and compatibility. He has also specific expertise in condition assessment and service life analysis of asbestos-cement pipe.

Prior to joining Exponent, Dr. Radlinski was a research assistant at Purdue University, where he contributed to several research projects funded by the Indiana Department of Transportation. That research focused on optimization of ternary cementitious systems (containing fly ash and silica fume) for bridge deck concrete, investigation into the causes for premature deterioration of joints in rigid pavement, instrumentation and monitoring of structural behavior of prestressed high-strength concrete girders and high-performance concrete bridge deck, and field installation and performance assessment of commercial rapid-setting repair materials.

Dr. Radlinski's academic background also includes design of steel, reinforced concrete and wood structures, including a Master's thesis on reliability-based optimization of space trusses.

Academic Credentials & Professional Honors

Ph.D., Civil Engineering, Purdue University, 2008

M.S., Civil Engineering, Szczecin University of Technology, Poland, 2004

Hugh W. and Edna M. Donnan Scholarship, 2008

Purdue University Graduate Student Award for Outstanding Teaching, 2008

Magoon Outstanding Teaching Assistant Award, 2008

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William L. Dolch Graduate Scholarship for Outstanding Research in Materials Science, 2006

Polish Ministry of Infrastructure Distinguished Thesis Award for Master's Thesis, 2005

Licenses and Certifications

Professional Engineer Civil, California, #77089

Professional Affiliations

American Society of Civil Engineers

American Concrete Institute, Committee 224 – Cracking

Publications

Mayercsik N., Radlinski M. Sensitivity analysis of ground penetrating radar data to the relative dielectric constant used in forensic evaluations of concrete slab-on-ground thickness. Proceedings, 10th Forensic Engineering Congress, American Society of Civil Engineers, pp. 1007-1017, Seattle, WA, November 1-4, 2024.

Radlinski M, Sachs R, and Jayapalan A. Investigation of widespread cracking and bowing of bathroom wall ceramic tile installations. Proceedings, 10th Forensic Engineering Congress, American Society of Civil Engineers, pp. 1007-1017, Seattle, WA, November 1-4, 2024.

Radlinski M, Wolf J. Condition assessment and service life analysis of an asbestos-cement sewer pipe. Proceedings, Pipelines 2016, pp. 321-333, Kansas City, MO, July 17-20, 2016.

Radlinski M, Olek J. Effects of curing conditions on the properties of ternary (ordinary portland cement/fly ash/silica fume) concrete. ACI Materials Journal 2015; 112(1):49-58.

Harris N, Radlinski M. Asbestos-cement pipe condition assessment and development of optimum replacement methodology. Proceedings, 6th Congress on Forensic Engineering, pp. 268-279, San Francisco, CA, October 31-November 3, 2012.

Radlinski M, Olek J. Investigation into the synergistic effects in ternary cementitious systems containing portland cement, fly ash and silica fume. Cement and Concrete Composites 2012; 34(4):451-459.

Del Mar Arribas-Colón M., Radlinski M., Olek J., and Whiting N.M. Investigation of premature distress around joints in PCC pavements: Parts I & II. FHWA/IN/JTRP-2012/25 & FHWA/IN/JTRP-2012/26. Joint Transportation Research Program, Indiana Department of Transportation and Purdue University, West Lafayette, Indiana, 2012.

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

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.

Radlinski M, Olek J, Nantung T. Shrinkage and cracking of ternary concrete under various curing conditions. Concrete International 2011; 33(1):49-55.

Radlinski M, Olek J. High-performance concrete bridge decks: a fast-track implementation study. Volume

2: Materials, FHWA/IN/JTRP-2008/29-2, Publication FHWA/IN/JTRP-2008/29-2, Joint Transportation Research Program, Indiana Department of Transportation and Purdue University, West Lafayette, IN, 2010.

Radlinski M, Olek J, Nantung T. Development and application of maturity method for prediction of concrete's resistance to chloride ion penetration. Transportation Research Record, Vol. 2164, Transportation Research Board of the National Academies, pp. 105-112, Washington D.C., 2010.

Radlinski M, Olek J, Zhang Q, Peterson K. Evaluation of the critical air-void system parameters for freeze-thaw resistant ternary concrete using the manual point-count and the flatbed scanner methods. Journal of ASTM International 2010; 7(4).

Peterson K, Sutter L, Radlinski M. The practical application of a flatbed scanner for air-void characterization of hardened concrete. Journal of ASTM International 2009; 6(9).

Radlinski M, Olek J. Assessing the critical air-void system parameters for freeze-thaw resistant ternary concrete using the manual point-count and a flatbed scanner. 88th Annual Transportation Research Board Meeting (CD-ROM), TRB, Washington, D.C., 2009.

Radlinski M, Olek J, Nantung T. Influence of curing conditions on strength development and strength predictive capability of maturity method. Laboratory and field-made ternary concretes. Transportation Research Record, Vol. 2080, Transportation Research Board of the National Academies, pp. 49-58, Washington D.C., 2008.

Radlinski M. Evaluation of applicability of ternary OPC/FA/SF binder systems for bridge deck concrete. Ph.D. Dissertation, Purdue University, West Lafayette, IN, December 2008.

Radlinski M, Olek J, Nantung T. Effect of mixture composition and initial curing condition on scaling resistance of ternary (OPC/FA/SF) concrete. Journal of Materials in Civil Engineering 2008; 20(10):668-677.

Radlinski M, Olek J, del Mar Arribas M, Rudy A, Nantung T, Byers M. Influence of air-void system parameters on freeze-thaw resistance of pavement concrete—Lessons learned from field and laboratory observations. Proceedings, 9th International Conference on Concrete Pavements, pp. 824-83, San Francisco, CA, August 17-21, 2008.

Radlinski M, Olek J, Nantung T. Evaluation of transport-related properties of ternary (OPC/FA/SF) concrete mixtures using migration- and absorption-type tests. Proceedings, 9th CANMET/ACI Conference on Fly Ash, Silica Fume, Slag, and Natural Pozzolans in Concrete, SP-242, ACI, pp. 281-497, 2007.

Radlinski M, Olek J, Zander A, Nantung T. Influence of production method and curing conditions on chloride transport, strength and drying shrinkage of ternary mix concrete, transport properties and concrete quality. Materials Science of Concrete Special Volume, American Ceramics Society, Wiley & Sons, pp. 215-229, 2007.

Olek J, Radlinski M, del Mar Arribas M. Premature deterioration of joints in selected Indiana portland cement concrete pavements. Proceedings, 23rd Conference on Structural Failures, Szczecin-Miedzyzdroje, Poland, pp. 859-868, 2007.

Radlinski M, Olek J, Kim H, Nantung T, Zander A. Preliminary optimization analysis of ternary mixtures for bridge decks. Proceedings, International Symposium Brittle Matrix Composites, pp. 161-174, Warsaw, Poland, October 23-25, 2006.

Paczkowski WM, Radlinska A, Radlinski M, Radlinski L. Quasi-evolutional polyoptimization of a barrel vault spatial truss. Proceedings, XXII National Conference on Polyoptimization and Computer Aided Design, pp. 144-151, Mielno, Poland, June 2004.

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Badower A, Radlinska A, Radlinski M, Radlinski L. Stochastic character of cross sections of bars catalogue. Proceedings, National Conference on Polyoptimization and Computer Aided Design, pp. 11-12, Mielno, Poland, June 2004.

Paczkowski WM, Radlinska A, Radlinski M, Radlinski L. Polyoptimization analysis of a barrel vault spatial truss. Proceedings, 3rd International Conference of Students Scientific Groups, pp. 33-39, Siedlce, Poland, September 2004.

Radlinski M, Radlinska A. Optimization of the spatial truss with random decision variables. M.S. Thesis, Szczecin University of Technology, Poland, 2004. (In Polish).

Presentations

Radlinski M, Sachs R, and Jayapalan A. Investigation of widespread cracking and bowing of bathroom wall ceramic tile installations. Proceedings, 10th Forensic Engineering Congress, American Society of Civil Engineers, pp. 1007-1017, Seattle, WA, November 1-4, 2024.

Radlinski M., McDonald B. Jayapalan A. A case study of very early-age concrete cracking in airfield pavement. American Concrete Institute (ACI) Fall Convention 2017, Anaheim, CA, October 15, 2017.

Radlinski M, Olek J, Nantung T. The influence of curing on the early age properties of ternary concrete. American Concrete Institute (ACI) Fall Convention 2017, Anaheim, CA, October 15, 2017.

Radlinski M. Assessment of aging asbestos cement pipe systems. Live Audio Conference, Lorman Education Services, April 20, 2017.

Radlinski M, Wolf J. Condition assessment and service life analysis of an asbestos-cement sewer pipe. Pipelines 2016, Kansas City, MO, July 17-20, 2016.

Harris N, Radlinski M, Wolf J. Laboratory evaluation of asbestos cement distribution mains: Current state of the art of testing AC pipe. American Water Works Association Annual Conference & Exposition (ACE), Denver, CO, June 9-12, 2013.

Radlinski M, Harris N. Asbestos cement pipe condition assessment and optimum replacement methodology. Live Audio Conference, Lorman Education Services, May 17, 2012.

Harris N, Radlinski M, Lyons T. Asbestos-cement pipe condition assessment and development of methodology for optimum replacement in water distribution systems. 2010 American Water Works Association Distribution Systems Symposium and Exposition, National Harbor, MD, September 19-22, 2010.

Radlinski M, Olek J, del Mar Arribas M, Rudy A, Nantung T, Byers M. Investigation into causes of premature deterioration of joints in PCC pavements in Indiana. 2008 PCCP Workshop & Expo, Indianapolis, IN, February 5-6, 2008.

Radlinski M, Olek J, Frosch R, Zander A, Nantung T. INDOT experience with use of HPC for bridge decks. Crack Free Bridge Deck Workshop, Indianapolis, IN, October 4, 2007.

Poster Presentations

Radlinski M, Olek J, Nantung T. Effect of curing method on properties of ternary (OPC/FA/SF) concrete. 9th International Conference on Concrete Pavements, San Francisco, CA, August 17-21, 2008.

Radlinski M, Olek J, del Mar Arribas M, Rudy A, Nantung T, Byers M. Influence of air-void system parameters on freeze-thaw resistance of pavement concrete—Lessons learned from field and laboratory

observations. 87th TRB Annual Meeting, Washington, D.C., January 13-17, 2008.

Radlinski M, Olek J, Nantung T. Effect of mixture composition and initial curing condition on early and late age scaling resistance of ternary (OPC/FA/SF) mixtures. 86th TRB Annual Meeting, Washington, D.C., January 21-25, 2007.

Radlinski M, Olek J, Nantung T. Using maturity method to estimate the resistance of HPC to chloride-ion penetration. Semiannual ACBM Meeting, Evanston, IL, November 2007.

Radlinski M, Kim H, Olek J and Nantung T. Preliminary optimization analysis of ternary HPC mixtures for bridge decks. Semiannual ACBM Meeting, Chicago, IL, September 2006.

Radlinski M. Assessment of aging asbestos cement pipe systems. Live Audio Conference, Lorman Education Services, September 29, 2022. https://www.lorman.com/training/water-law/asbestos-cement-pipes-and-aging-water-distribution-systems

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

Moncarz P., Radlinski, M. Sustainable Concrete: Current Trends and Emerging Innovations, Exploring the Future of Green Cement and Sustainable Concrete Seminar, San Francisco, CA, June 10, 2010.

Moncarz P., Radlinski, M. Sustainable Concrete: Current Trends and Emerging Innovations, Exploring the Future of Green Cement and Sustainable Concrete Seminar, San Francisco, CA, June 10, 2010.

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

Radlinski M. Assessment of aging asbestos cement pipe systems. Live Audio Conference, Lorman Education Services, September 29, 2022.

Peer Reviews

ASCE Journal of Materials in Civil Engineering

Cement and Concrete Composites

RILEM Materials and Structures

Transportation Research Record

Journal of Environmental Management