Mary E. Vancura

1499 Laurel Avenue
Saint Paul, MN 55104

Phone: 612-356-0190
E-mail: mvancura@aydmill.com

Professional Experience

Ayd Mill Concrete Engineering LLC, Saint Paul, MN 11/2025-current

Principal Engineer and Owner

Thermal control plans for mass concrete, concrete slab-on-grade design and evaluation, concrete mix designs (fibers, dosing, alternative to Portland cement, blended cements), concrete specification review, concrete submittal and product review, third-party response and review for contractors, diagnose concrete infrastructure failures, concrete service-life prediction.

Buildings Consulting Group, Minneapolis, MN 12/2024-11/2025

Principal Engineer

Building exterior analysis and repair, mix design, concrete failure assessment, concrete specifications, infrastructure water ingress troubleshooting and repair, thermal control, industrial slab-on-grade assessment and repair.

American Engineering Testing, Saint Paul, MN 9/2021-11/2024

Principal Engineer and Building Performance, Forensics, and Testing Manager

Managed a group of 12 employees who were engineers and technicians.

Concrete repair, mix design, failure assessment, service life assessment, specifications, and thermal control. Building materials non-destructive testing, assessment, measurement, and repair.

Beton Consulting Engineers, Mendota Heights, MN 2018-9/2021

Principal Engineer/Vice President

Responsible for growing Beton's business through establishing industry contacts, managing employees, mentoring employees, and finding and hiring employees.

Beton Consulting Engineers, Mendota Heights, MN 2013-2018

Senior Engineer

Investigate concrete failures with concrete petrography and non-destructive testing. Design concrete repair protocols. Design specialty concrete mixtures and testing protocols. Thermal modeling and monitoring of mass concrete structures. Service life design planning and modeling. Concrete specification writing.

MAST Lab, University of Minnesota Minneapolis Campus 2012-2013

Project Manager

Assist visiting researchers build, install, and test structural specimens for earthquake engineering research. Managed undergraduate workers.

Cemstone Products Company, Mendota Heights, MN 2010-2012

Part-Time Research Engineer

Researched durability, rheology, and admixture dosage of pervious concrete, viability of large-scale limestone cement concrete block production, and incorporating fine and coarse recycled concrete aggregate into 3000-4000 psi concrete mixtures. Prepared concrete samples for petrographic examination.

BKBM, Inc., Brooklyn Center, MN
Structural Engineer 2006-2007
Performed structural design of new steel and masonry buildings including office buildings, schools, churches, and municipal buildings; of building additions; and of structural modification to historical structures. Duties also included field verification of structural members, connection design, and shop drawing review.

Landform, Minneapolis, MN
Design Engineer 2005
Assisted with the design and drafting of residential building developments, analyzed storm water runoff for pre- and post-construction conditions, and estimated quantities for bid assembly.

Wenck Associates, Inc. (Now Stantec), Maple Plain, MN
Project Engineer 2004-2005
Assisted the city Engineer for the city of Delano with land development and street repair projects, oversaw construction of an 80-home, lake side sand filter sewage treatment system, and became familiar with NPDES, SWPPP, MPCA Phase I & II, WMO, DNR, EPA, MN/DOT permits and regulations.

Sheep Mountain Lodge, Glacier View, AK
Breakfast and Lunch Cook 5/2004-10/2004
Seasonal lodge staff. Responsible for preparing and cooking all breakfast and lunch orders. Prepared soups and vegetables for the evening meal.

Campus for Human Development/Room in the Inn, Nashville, TN
GED Instructor and Case Manager 2002-2004
Jesuit Volunteer Corps Staff for 1 year and paid staff for another year. GED instructor for homeless adults and case manager for homeless veterans to secure healthcare and housing.

Education

University of Minnesota, Minneapolis, Minnesota
Ph.D. Civil Engineering December 2013
Dissertation: *Evaluation of In-Situ Variability of Concrete Pavement Properties and Their Effect on Performance*
Committee members: Steve Wojtkiewicz (chair), Alex Fok, Randal Barnes, and Lev Khazanovich

University of Minnesota, Minneapolis, Minnesota
M.S. Civil Engineering July 2010
Thesis: Performance Evaluation, Impermeability Remediation, and Structural Analysis of Pervious Concrete Pavements

Augsburg College, Minneapolis, Minnesota
Master of Business Administration 2007
Capstone Project Title: Augsburg Fortress Business Continuity Management Plan and Recommendations

Gonzaga University, Spokane, Washington
B.S. Civil Engineering 2002

Professional Memberships

American Concrete Institute 2007-Present
- *Member ACI 207 Mass Concrete (2018-present)*
- *Member ACI 117-0N Tolerance Data (2018-present)*
- *Member ACI 380 Structural Plain Concrete*
- *Member ACI 548 Polymers & Adhesives in Concrete (2019-2025)*
- *Associate Member ACI 242 Alternative Cements*
- *Associate Member ACI 548 Polymers & Adhesives in Concrete*

Minnesota Concrete Conference Planning Committee 2023 2023-Current
International Concrete Repair Institute 2024-Current
National Society of Professional Engineers 2025-Current
Transportation Research Board 2010-2021
- *AFD50: Rigid Pavement Design Committee 2010-2013*
- *AFN20: Properties of Concrete 2013-2021*

Minnesota Concrete Council 2012-2023
- *Board Member 2015-2016*
- *Research Committee 2015-2020*
- *Chairwoman of Research Committee 2018-2020*
- *Education Committee 2015-2022*
- *Scholarship Committee 2021*

Certifications

Professional Engineer (PE), States of Minnesota, Iowa, Texas, Florida, Washington, Michigan, South Carolina, Wisconsin, Ohio, Oklahoma, Virginia, California, Colorado, Pennsylvania, Massachusetts, North Dakota, South Dakota, Missouri, Arizona, Nevada, and Louisiana

Leadership in Energy and Environmental Design (LEED) AP

Teaching Experience

Aggregate Ready-Mix Association of Minnesota **2011-2017**
American Concrete Institute Concrete Field 1 Instructor
American Concrete Institute Adhesive Anchor Installer Instructor
American Concrete Institute Proctor, Concrete Field 1 field test

University of Minnesota, Duluth Minnesota **Spring 2016**
Swenson College of Science and Engineering Civil Engineering Department
CE 4126 Design of Concrete Structures
Instructed on the design of concrete structures based on ACI 318-14, ASCE-7, and IBC. Class topics included choosing design loads, analysis of load paths, design of beams and slabs to resist moment and shear, design of columns, reinforcement detailing, and deflection control.

Publications

Vancura, M. E., Tompkins, D. M., and Khazanovich, L. Reappraisal of Recycled Concrete Aggregates as Coarse Aggregate in Concretes for Rigid Pavements, *Transportation Research Record: Journal of the Transportation Research Board*, No. 2113, Concrete Materials 2009, pp. 149-155.

Vancura, M., MacDonald, K., & Khazanovich, L. Structural Analysis of Pervious Concrete Pavement, *Transportation Research Record: Journal of the Transportation Research Board*, No. 2226, Pavement Management 2011 Vol. 2, pp. 13-20.

Vancura, M., MacDonald, K., & Khazanovich, L. Microscopic analysis of paste and aggregate distresses in pervious concrete in a wet, hard freeze climate, *Cement and Concrete Composites*, 33 (2011) pp. 1080-1085.

Vancura, M., MacDonald, K., & Khazanovich, L. Location and Depth of Pervious Concrete Clogging Material Before and After Void Maintenance with Common Municipal Utility Vehicles, *Journal of Transportation Engineering*. March 30, 2012, American Society of Civil Engineers, v 138, n 3, p 332-338.

Vancura, M., Tompkins, D. M., and Khazanovich, L. Freeze-Thaw Durability and Salt Scaling Resistance Assessment of Portland Cement Concrete Composite Pavement, *Concrete Materials 2012,* Transportation Research Record: Journal of the Transportation Research Board, 2012, p. 76-83.

Vancura, M., Barnes, R, Khazanovich, L. Concrete Pavement Thickness Variation Assessment with Cores and Nondestructive Testing Measurements*. Transportation Research Record: Journal of the Transportation Research Board, No. 2347*, Transportation Research Board of the National Academies, Washington, D.C., 2013, pp. 61-68.

Buffenbarger, J. K., **Vancura, M. E.,** MacDonald, K. M. Performance-Based Concrete Mixtures for Durable, Long-life Bridges. *SP326-115*, August 10, 2018.

Professional Presentations

Minnesota Transportation Conference, Saint Paul, MN, May 31, 2024. *Have Concrete Properties Changed with the Introduction of Type 1L Cement?*

University of Minnesota Twin Cities CEGE 8400 Grad Seminar, Minneapolis, MN, April 12, 2024. *Material Properties, Market Effects, and Concrete Production Consequences of Type 1L Cement and Liquid Fly Ash.*

American Concrete Institute Conference, Boston, MA, October 29, 2023. *History of DEF Testing and Specifications.*

Minnesota Transportation Conference, Saint Paul, MN, May 16, 2023. *Concrete Service Life Served-Up Three Ways: Policy, Specification, and Promise.*

ACI Technology Forum, Saint Paul, MN, September 1, 2022. *Debate: Alternatives to Cylinder Breaks for Acceptance Testing.*

Scholer-Peterson Concrete Conference Manhattan, KS February 13, 2020, *Concrete Floor Flatness Specifications and Measurement Technique*

University of Minnesota Annual Concrete Conference Minneapolis, MN, December 6, 2018, *Do We Need Cylinders? Alternate Methods of Concrete Acceptance*

Aggregate & Ready-Mix Association of Minnesota 2018 Annual Convention Minneapolis, MN, November 27, 2018, *Get Excited About Aggregates in Ready-Mix Concrete*

Minnesota Concrete Council, St. Paul, MN, September 20, 2018, *Taking the Mystery out of Mass Concrete*

Minnesota Concrete Council, St. Paul, MN, March 8, 2018, *Floor Flatness and What it Means to the Contractor and Specifier*

University of Minnesota Center for Transportation Studies 2017 Research Conference, Minneapolis, MN November 2, 2017, *Concrete Proportioning: The Corrosion Environment for Steel in Concrete*

ASCE Quad Cities Section/USACE—Rock Island/ASCE Structural Engineering Institute Engineering Training Conference, Davenport IA, October 13, 2017, *Mass Concrete Thermal Control Modeling*

24th Annual Transportation Research Conference, Saint Paul, Minnesota May 22-23, 2013
Evaluation of In-Situ Variability of Concrete Pavement Thickness and Revised Measurement Frequency Protocol

Transportation Research Board 92nd Annual Meeting, Washington, D.C., January 13-17, 2013
Concrete Pavement Thickness Variation Assessment with Cores and Non-Destructive Testing Measurements

NEES & CMMI QuakeSummit 2012, Boston, MA, July 9-12 2012 *Real-time Data Viewing with RDV*

Transportation Research Board 91th Annual Meeting, Washington, D.C., January 22-26 2012
Freeze-Thaw Durability Assessment of PCC-PCC Composite Pavement Concretes Using CIF Methodology of International Union of Laboratories and Experts in Construction Materials, Systems, and Structures, France: Capillary Suction, Deicing Salt Scaling Resistance, and Internal Damage

Aggregate and Ready-Mix Association of Minnesota Annual Convention, Minneapolis, MN, December 7, 2011
What Happens if Plastic Pervious Concrete is Too Dry?

2011 International Concrete Sustainability Conference, Boson, MA, August 9-11, 2011
From Surface to Microstructure: Investigating the Causes of In-Service Pervious Concrete Raveling Distresses

22nd Annual Transportation Research Conference, Saint Paul, Minnesota, May 24-45, 2011
Pervious Concrete Pavement

South Dakota School of Mines & Technology 47th Annual Concrete Conference, Rapid City, South Dakota, March 4, 2011

- *Pervious Concrete Mixture Design*
- *Pervious Concrete: What if it Goes Wrong?*

Transportation Research Board 90th Annual Meeting, Washington, D.C., January 23-27 2011

- *Structural Analysis Of Pervious Concrete Pavement*
- *Effectiveness of Maintenance of Pervious Concrete Pavements' Permeability With Conventional Municipal Utility Equipment*
- *Construction of Sustainable Pavements: Two-layer Concrete Pavements at the MnRoad Facility*

Cemstone Knowledge is Power 2011: Concrete Paving Technologies Seminar, Egan Minnesota, January 18, 2011
Pervious Concrete—Woodbridge Neighborhood Update

Barr Engineering, Bloomington, Minnesota, July 19, 2010
Investigation of In-Service Pervious Concrete in Cold Climates

21st Annual Transportation Research Conference, Saint Paul, Minnesota, April 27-28, 2010
PCC Mix Designs Using Recycled Concrete Pavements

Transportation Research Board 89th Annual Meeting, Washington, D.C., January 10-14, 2010
Relationship of Pervious Concrete Pavement Distress and Success to Design, Construction, Maintenance, and Environment

59th Annual Concrete Conference, Saint Paul, Minnesota, December 3, 2009
Performance of Pervious Concrete Pavement in Cold-Weather Climates

Aggregate & Ready-Mix Association of Minnesota Annual Convention, Minneapolis, Minnesota, December 2009
Investigation of In-Service Pervious Concrete in Cold Climates
Minnesota Department of Transportation Road Research Facility open house, Albertville, Minnesota, June 11, 2009.
Twin Cities Area Porous Concrete

Reports

Vancura, M., Khazanovich, L., MacDonald, K. Performance Evaluation of In-Service Pervious Concrete Pavements in Cold Weather. Ready Mixed Concrete Research & Education Foundation, December 2010.

Santero, N. J., Harvey, J., **Vancura, M**., and Khazanovich, L. Design and Construction Guidelines for Thermally Insulated Concrete Pavements, Task 2: TIC Life Cycle Cost Analysis for Two Caltrans and One Minnesota Case, TPF-5(149) MnDOT Contract No. 89261, June 2011.

Rao, S., Darter, M. I., Tompkins, D., **Vancura, M.**, Khazanovich, L., Signore, J., Coleri, E., Wu, R., Harvey, J., Vandenbossche, J. Composite Pavement Systems Volume 1: HMA/PCC Pavements, SHRP 2 Renewal Project R21, Transportation Research Board, 2012.

Rao, S., Darter, M. I., Tompkins, D., **Vancura, M.**, Khazanovich, L., Signore, J., Coleri, E., Wu, R., Harvey, J., Vandenbossche, J. Composite Pavement Systems Volume 2: PCC/PCC Pavements, SHRP 2 Renewal Project R21, Transportation Research Board, 2012.

Vancura, M., MacDonald, K, Pilarski, P. A Rational Method of Surface Treatment Selections for Concrete Decks. MnDOT report number MN/RC 2018-24. Contract number 1001091. July 2018.