Karl Peterson

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EDUCATION

MICHIGAN TECHNOLOGICAL UNIVERSITY, Houghton, Michigan.
Master of Science, Civil Engineering, 2001

UNIVERSITY OF MINNESOTA, Institute of Technology, Minneapolis, Minnesota.
Bachelor of Science, Geology, 1995

EXPERIENCE

1999 - present: **Research Sci./Eng. I**, Department of Civil and Env. Engineering,
MICHIGAN TECHNOLOGICAL UNIVERSITY,
Houghton, Michigan

Responsible for the operation and maintenance of the Non-Conductive/Volatile Phase Materials Characterization Facility, a suite of labs equipped with an environmental scanning electron microscope, an x-ray microscope, zoom stereo and petrographic microscopes, and a wide array of sample preparation equipment. Worked on a variety of research projects involved with the petrographic examination of building materials. Prepared and examined hundreds of thin sections from a diverse array of materials, including concrete pavements, concrete structures, rapid-set patching materials, asphalt concrete, concrete block, aggregate sources, historic slags, historic pottery, and biofilter media. Pioneered development of a desktop scanner based automated air void characterization method. Instructor for School of Technology Civil Engineering Technician course CET1141 Fundamentals of Cemented Aggregate Mixtures.

1995 - 1998: **Geologist I**, Office of Materials and Road Research,
MINNESOTA DEPARTMENT OF TRANSPORTATION,
Maplewood, Minnesota

Started a petrographic laboratory for the preparation and analysis of thin sections produced from portland cement concrete, asphalt concrete pavements, and aggregate sources. Created an interactive geographic format to display aggregate source records, highway construction records, and pavement condition records using available DOT computer databases and ArcView software. Investigated concrete pavements from throughout the state, primarily focussed on durability issues involved with alkali-aggregate reactivity. Performed analyses of cores in lab and field for subsurface investigations.

1994 - 1995: **Research Assistant**, Department of Civil Engineering,
UNIVERSITY OF MINNESOTA,
Minneapolis, Minnesota

Worked on the development of an aggregate durability test using a hydraulic fracture apparatus to simulate freeze-thaw cycles. Conducted petrographic investigations of aggregate sources, and portland cement concrete specimens, including highway cores and freeze-thaw test beams.

SELECTED PUBLICATIONS

Peterson, K., Gress, D., Van Dam, T., Sutter, L., "Crystallized Alkali-Silica Gel in Concrete from the Late 1890s," *Cement and Concrete Research*, Vol 36, pp. 1523-1532, 2006.

Sutter, L., Peterson, K., Touton, S., Van Dam, T., Johnston, D., "Petrographic Evidence of Calcium Oxychloride Formation in Mortars Exposed to Magnesium Chloride Solution," *Cement and Concrete Research*, Vol 36, pp. 1533-1541, 2006.

Hwang, J. Y., Shi, S., Xu, Z., Peterson, K. W., "Synthesis of Monodispersed Iron Oxide Particles by a Large-Scale Microwave Reactor," *Chemical Engineering Communications*, Vol. 193, pp. 1586-1591, 2006.

King, J.A., Miller, M.G., Barton, R.L., Keith, J.M., Hauser, R.A. Peterson, K.R., Sutter, L.L., "Thermal and Electrical Conductivity of Carbon-Filled Liquid Crystal Polymer Composites," *Journal of Applied Polymer Science*, Vol. 99, No. 4, pp. 1552-1558, 2006.

Li, H., Leuking, D., Mihelcic, J.R., Peterson, K., "Biogeochemical Analysis of Hydrogen Sulfide Removal by a Lava-Rock Packed Biofilter," *Water Environment Research*, Vol. 77, No. 2, pp. 179-186, 2005.

Peterson, K.W., Swartz, R.A., Sutter, L.L., Van Dam, T.J., "Hardened Concrete Air Void Analysis with a Flatbed Scanner," *Transportation Research Record*, TRR1775, pp. 36 - 43, 2001.

Tikoff B., Peterson K., “Physical Experiments of Transpression Folding”, *Journal of Structural Geology*, vol. 20, no. 6, 1998.

Bruinsma J., Peterson K., Snyder M., "Chemical Approach to Formation of Calcite Precipitate from Recycled Concrete Aggregate Base Layers," *Transportation Research Record*, TRR1577, pp. 10-17, 1996.

CERTIFICATIONS

ACI Concrete Field Testing Technician - Grade I, expires April 29, 2009.