



Sang-yun Lee, Ph.D., P.E.

PRINCIPAL PETROGRAPHER

Dr. Lee has extensive experience in materials evaluation in microscopical, petrographic, chemical, physical and field investigations of various construction and geological materials. Dr. Lee leads projects that document quality and composition of cementitious and geological construction materials in regard to performance problems, causes of distress and failure, quality assurance and assistance in renovation. His expertise includes: petrographic and microscopical examination; SEM-EDS analysis; masonry and stucco examination; concrete and aggregate petrography; flooring and coating system evaluation; and litigation support.

Academic Credentials

Ph.D. in Geology (Petrology)
Texas Tech University, 1999

M.S. in Civil Engineering
(Materials)

Texas Tech University, 2001

B.S. in Geology

Kyungpook National University,
Taegu, South Korea, 1995

Licensure/Certification

Professional Engineer
Texas

Licensed Professional Geologist
Indiana

Professional Affiliations

American Concrete Institute

ASTM International

State Microscopical Society of IL

The Society of Concrete
Petrographers

Contact Information

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Representative Project Experience

Concrete Quality and Condition Evaluation Support

- Performed petrographic examination of concrete samples from an embassy building to evaluate concrete placement and consolidation problems, and assess overall concrete quality and condition.

Aggregate Petrography

- Performed petrographic examination of aggregates (ASTM C295) as a part of preconstruction evaluation of materials for pier construction project in Hawaii.

Air-Void System Analysis

- Part of a team that developed a computerized linear-traverse/point-count device meeting the requirements of ASTM C457.

Materials Characterization and SEM/EDS

- Performed laboratory tests of Chrome Ore Processing Residue (COPR) samples. Tests included optical microscopy, SEM/EDS, and X-Ray Diffraction to characterize the COPR materials.

Fire Damage of Concrete

- Investigated fire damaged concrete bridge located near Brownstone, Illinois. Performed laboratory analysis, determined the extent of the damage, and provided condition assessment support for the repair of the damaged concrete.

Flooring System

- Investigated terrazzo floor distress in an elementary school in Minnesota. Performed field investigation and laboratory analysis (petrographic examination) for the collected samples to determine the cause of the terrazzo distress.

Deterioration Investigation

- Investigated distressed (scaled) concrete sidewalk and driveway apron in a commercial area in Quakertown, Pennsylvania. Performed petrographic examination, air-void system analysis, and chemical analysis to determine cause of reported concrete surface distress.

Publications

- Lee, S.Y., Broton, D., 2017, "Microscopical Examination of Class G Oil Well Cement Clinker," World Cement, September 2017
- Lee, S.Y., Daugherty, A., Broton, D. 2013. "Assessing Aggregates for Radiation-Shielding Concrete: Methods for Petrographic Examination of High-Density and Boron-Bearing Aggregates." Concrete International, Vol. 35, No. 5, 31-38. May.
- Lee, S.Y., Daugherty, A., Broton, D. 2013. "Petrographic Examination of Iron-Ore and Colemanite Aggregates Used in Radiation Shielding Concrete." Proceedings of the Thirty-Fifth Conference on Cement Microscopy, 367-382.
- Lee, S.Y. Jennings, V., Daugherty, A. 2013. "Petrographic Evaluation of Deleterious Materials in Aggregates Used for Airfield Pavements in Accordance with UFGS Specification." Proceedings of the Thirty-Fifth Conference on Cement Microscopy, 250-266.
- Taylor, P., Pyc, A., Lee, S.Y., and Zemajtis, J. 2008. "Effect of Carbonation on Deicer Resistance of Concrete Containing Fly Ash or Slag." PCA R&D SN2827, Portland Cement Association.
- Lee, S.Y., C.G. Barnes, A.W. Snoke, and Howard, K. 2003. "Petrogenesis of Mesozoic Peraluminous Two-Mica Granites in Lamoille Canyon, Ruby Mountains, Nevada." Journal of Petrology, Vol. 44, 713-32.
- Lee, S.Y. and C.G. Barnes. 2001. "Petrogenesis of Tertiary Intrusions in Lamoille Canyon and Implications for Formation of Ruby Mountains Core Complex, Nevada." Geological Society of America Abstract with Programs, Vol. 33, No. 5.
- Lee, S.Y. and C.G. Barnes. 2000. "Petrogenesis of Tertiary and Cretaceous Intrusions in Lamoille Canyon and Implications for Tectonic Evolution of Ruby Mountains Metamorphic Core Complex, Nevada." Geological Society of America Abstract with Programs, Vol. 32, No. 7.
- Jeon, M, Barnes, C., and Lee, S.Y.. 2000. "Oxygen and Carbon Isotope Profiles in Metasedimentary and Granitic Rocks in Lamoille Canyon, Ruby Mountains Metamorphic Core Complex, Nevada." Geological Society of America Abstract with Programs, Vol. 31, No. 7.
- Lee, S.Y. and Barnes, C. 1999. "Petrogenesis of Tertiary Intrusions in Lamoille Canyon, Ruby Mountains Metamorphic Core Complex, Nevada." Geological Society of America Abstract with Programs, Vol. 31, No. 12.
- Lee, S.Y. 1999. "Geology and Petrology of Cretaceous and Tertiary Granitic Rocks, Lamoille Canyon, Ruby Mountains, Nevada." Ph.D. Dissertation, Texas Tech University.
- Snoke, A., Barnes, C., Lee, S.Y., Strike, A., and Howard, K. 1999. "Emplacement, Deformation, and Exhumation of a Tertiary (~29MA), Sheet-Like Monzogranitic Intrusion in the Ruby Mountains Core Complex, Northeastern Nevada." Geological Society of America Abstract with Programs, Vol. 31, No. 35.
- Lee, S.Y. and Barnes, C. 1997. "Geology and Petrology of Cretaceous and Tertiary Granitic Rocks, Lamoille Canyon, Ruby Mountains, Nevada." The Grand Tour of the Ruby East Humbolt Metamorphic Core Complex, Northeastern Nevada, Field Trip Guide, BYU Press.
- Lee, S.Y., Barnes, C, Snoke, A., and Howard, K. 1997. "The Geology and Petrology of Cretaceous and Tertiary Granitic Rocks in the Lamoille Canyon, Ruby Mountains, Nevada." Geological Society of America Abstract with Programs, Vol. 29, No. 2.



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Presentations

Lee, S.Y., Daugherty, A., Willems, T. 2013. "Application of Petrographic Analysis for Corrosion Assessment." Presented at 2013 Fall ACI Convention: Sponsoring Committee 222 - Corrosion of Metals in Concrete-Laboratory Test Methods for Corrosion Assessment: Technical Review and Practical Implications, Part 1.

Lee, S.Y., Willems, T. 2013. "Case Study on Concrete Pavers Exhibiting Physical Salt Attack." Presented at 2013 Fall ACI Convention: Sponsoring Committee 123 - Research and Current Developments. Open Paper Session, Part 1 of 2.

Howard, K., Lee, S.Y., Barnes, C., Snoke, A., and Wright, J. 2004. "Style of Intrusion of Crustal Melts into Middle Crust in the Cretaceous Back-Arc: Ruby Mountains Core Complex, Nevada." Presented at The Rocky Mountain (56th Annual) and Cordilleran (100th Annual) Joint Meeting, Geological Society of America Abstract With Programs.