Office
Charleston, SC

Education
MS Civil and Environmental/ Structural Engineering,
Penn State University - 2001
BS Civil/Structural Engineering,
Penn State University – 1999

Registration & Certifications
North Carolina, Georgia, Florida, South Carolina, Virginia, New York

NACE Corrosion Specialist (Certification No. 40356)
NACE Protective Coating Specialist (Certification No. 40356)
NACE CP II - Certified Cathodic Protection Technician (Certification No. 40356)

Professional Memberships
Member, American Concrete Institute
- Committee 329 – Performance Criteria for Ready Mixed Concrete (Chair)
- Committee 222 – Corrosion of Metals in Concrete (Secretary)
- Committee 201 – Durability of Concrete (Member)
- Committee 301 - Specifications for Structural Concrete (Member)

Member, International Concrete Repair Institute

DAVID G. TEPKE, PE
CONCRETE AND CORROSION CONSULTANT

David Tepke, PE, serves as the Building Solutions Group Manager at SKA's Charleston, SC Office. He has more than 15 years of experience in designing durable solutions for new structures, troubleshooting construction, and evaluating, repairing and preserving existing structures across a wide range of sectors, construction eras and exposures.

Employed with SKA since 2007, Dave specializes in concrete mixture and testing technology; concrete specification and non-conformance issues; non-destructive testing and structural monitoring; investigation, assessment and structural repair of damaged or deteriorated concrete structures; corrosion control and service-life extension of reinforced concrete structures; and protective coatings and waterproofing of concrete and metals. He is a NACE-certified Corrosion Specialist and Protective Coating Specialist, a member and leader on American Concrete Institute committees on concrete durability, corrosion, specifications and testing, and is a published author and frequent speaker at technical conferences on these topics.

Prior to joining SKA, David held a position as a university instructor and participated in state and federally funded research on evaluation, durability design and monitoring of concrete transportation structures in severe environments.

REPRESENTATIVE PROJECTS

Lowenstein and 1939 Buildings Textile Facility Condition Assessment, Rock Hill, SC: Condition assessment of interior and exterior columns at a former textile plant with previous exposure to chlorine gas, sodium hydroxide and hydrogen peroxide. Provided recommendations for repair of reinforced concrete columns with extensive distress and preservation strategies for extending service life of other columns and portions of columns.

Summer Winds Walkway Corrosion Assessment and Repair Documents, Indian Beach, NC: Part of team that evaluated walkway concrete slabs at coastal condominium via corrosion-related testing for chloride contamination. Lead engineer for design of structural replacement of highly deteriorated slabs

SKA CONSULTING ENGINEERS

Professional Memberships, cont.

Member, SSPC: The Society for Protective Coatings

Member, NACE International

Member, American Welding Society Subcommittee C2C Thermal Sprayed Coating for Reinforced Concrete

Selected Publications

Tepke, D. G., Trejo, D, Isgor, O.B., eds., "Chloride Thresholds and Limits for New Construction", Farmington Hills, MI, *American Concrete Institute,* July 2016.

Ghosh, Pratanu; Hanson, Shannon; Tepke, David, Thomas, David, Tikalsky, P.J.; "Influence of HPC Mixtures on Diffusion Coefficients, Resistivity, and Chloride Concentrations," *Proceedings of the 2012 International Congress of Durability of Concrete,* Trondhiem, Norway, June 18-22, 2012, 13 pp.

Jana, D. and Tepke, D.G., "Corrosion of Aluminum Metal in Concrete – A Case Study," *Proceedings of the 32nd Conference on Cement Microscopy,* ICMA, New Orleans, Louisiana, March, 2010, 33 pp.

Konecny, P., Tikalsky, P.J., and Tepke, D.G; "Performance Evaluation of Concrete Bridge Deck Affected by Chloride Ingress: Simulation-Based Reliability Assessment and Finite Element Modeling, *Journal of the Transportation Research Board No. 2028, Transportation Research Record,* Washington, D.C., 2007, pp. 3-8.

Konecny, Petr; Tikalsky, Paul; Tepke, David; "Performance Assessment of Concrete Bridges Applying SBRA Approach," *IABSE Symposium on Responding to Tomorrow's Challenges in Structural Engineering*, Budapest, Hungary, September, 2006.

Tepke, David G.; Tikalsky, Paul J.; and Scheetz, Barry E.; "Concrete Maturity Field Studies for Highway Applications," *Journal of the Transportation Research Board, Transportation Research Record,* Washington, D.C., No. 1893, 2004, pp. 26-36

Kurgan, Geoff; Tepke, David; Schokker, Andrea; Tikalsky, Paul; and Scheetz, Barry; "The Effects of Blended Cements on Concrete Porosity, Chloride Permeability, and Resistivity," *Proceedings of the 8th CANMET/ ACI International Conference on Fly Ash, Silica Fume, Slag and Natural Pozzolans in Concrete,* M. Malhotra – Editor, American Concrete Institute Special Publication 221, Paper No. 6, 2004, 21 pp.

Tikalsky, Paul J.; Tepke, David G. Kurgan, Geoffrey; and Schokker, Andrea; "High-Performance Concrete Bridge Deck Initiative – Performance Based Specifications in Pennsylvania," *Proceedings of the 2004 Concrete Bridge Conference,* Charlotte, NC; Portland Cement Association, Session 13, Paper No. 51, May 17-18, 2004, 10 pp.

with high-performance concrete, concrete repairs, performance-based impressed current cathodic protection system that included alternative approaches of using conductive coating anode and embedded MMO activated titanium mesh anode, and associated deck and soffit coatings.

Summer Winds Wastewater Treatment Plant Review, Indian Beach, NC: Consultation regarding coating distress at steel waste-water treatment components including recommendations for testing, coatings and installation of galvanic cathodic protection system.

Campbell Soup Spice Room Concrete Slab Condition Assessment, Maxton, NC: Assessment of highly distressed structural concrete slab in the previous brining area of the facility. Evaluation included corrosion and materials testing. Recommendations were provided for addressing distress including use of cathodic protection system and slab replacement techniques.

Campbell Soup Silo Condition Assessment, Maxton, NC: Assessment of steel silos for product containment that included third-party anchor testing of baseplate bolts, concrete cover testing, excavation review and material sampling for chemical testing, third-party ultrasonic testing of silo thickness and recommendations for addressing issues based on findings.

TE Connectivity Plating Pit Concrete Corrosion Investigation, Winston-Salem, NC: Investigation of an industrial plating pit exposed to a number of aggressive chemicals throughout plant history. Assessment included corrosion and materials testing. Information was evaluated and recommendations were offered regarding use of the facility, correction of distress and modification of use.

RJ Reynolds Building Reinforced Concrete Tunnel/ Plaza Assessment, Winston-Salem, NC: Corrosion condition assessment of plaza deck reinforced concrete and tunnel. Assessment included sampling for chemical and petrographic evaluation, resistivity, cover and delamination testing, evaluation of conditions and report with recommendations for service life extension.

Nissan Stadium Upper Deck and Upper Concourse Waterproofing Repairs, Nashville, TN: Multi-phase project to address deterioration and leaks in NFL stadium. Work included expansion joint and sealant replacement, structural concrete repairs, structural alternations, high-performance decorative waterproofing floor coatings, and concrete overlays.

Publications, cont.

Camisa, Stephen J.; Tepke, David G.; Schokker, Andrea J.; Tikalsky; Paul J.; "Reduction in the Early-Age Cracking of a Concrete Bridge Deck," "High-Performance Concrete Bridge Deck Initiative – Performance Based Specifications in Pennsylvania," *Proceedings of the 2004 Concrete Bridge Conference,* May 17-18, 2004, Charlotte, NC; Portland Cement Association, Session 9 Paper No. 50, 13 pp.

Tikalsky, P.J. Tepke, D.G., and Schokker, A.; "Designing Highway Bridges for 75-100 Years," *2nd International RILEM Workshop on Life Prediction and Aging Management of Concrete Structures,* Paris, France, May 5-6, 2003.

Tikalsky, Paul J., Tepke, David and Marek, Pavel; "Use of Simulation Based Reliability Assessment Method to Evaluate the Resistance of Composite Bridge Decks to Cracking; *20th Czech and Slovak International Conference, Steel Constructed Bridges* – September, 2003, Prague, CZ.

Tikalsky, P.J., Tepke, David G.; "Concrete Maturity Progress: A Survey of Departments of Transportation," *Journal of the Transportation Research Board: Transportation Research Record,* Volume 1775, p. 125-131, November, 2001.

Selected Research Reports

Tepke, D.G., and Tikalsky, P.J., "Best Construction Practices for Concrete Bridge Decks," PTI 2007-61, *Pennsylvania Transportation Institute,* State College, PA, July 1, 2007.

Tepke, D.G., and Tikalsky, P.J., "Best Engineering Practices Guide for Bridge Deck Durability." PTI 2007-63, *Pennsylvania Transportation Institute,* State College, PA, July 1, 2007.

Tikalsky, P.J., Scheetz, B.E., and Tepke, D.G., "Construction of SR 6220 Section A10 (Interstate 99) Bridges in Centre County: Structures 100-110 (s-23857, s-23859, s-23839, s-23840, s-23848, s-23849, s-23850, s-23851, s-23852, s-23853)," PTI 2007-65, *Pennsylvania Transportation Institute,* State College, PA, March, 2007.

Ferraris, C. F.; Brower, L. E.; Beaupre, D.; Chapdelaine, F.; Domone, P.; Koehler, E. P.; Shen, L.; Sonebi, M.; Struble, L.; Tepke, D.; Wallevik, O.; Wallevik, J. E., "Comparison of concrete rheometers: International tests at MB (Cleveland, Ohio) in May 2003." (NISTIR 7154), Gaithersburg, MD. National Institute of Standards and Technology, September 2004.

Tepke, D.G., Camisa, S.J., and Tikalsky, P.J., "Oregon Concrete Maturity Method Pilot Study"," PTI 2003-35, *Pennsylvania Transportation Institute,* March 2003.

Smith, K.M., Schokker, A.J., Tikalsky, P.J., and Tepke, D.G., "Evaluation of Bridge Deck Design Factors Using Concrete Resistivity," PTI 2003-26, *Pennsylvania Transportation Institute,* March 2003.

Tikalsky, P.J., Schokker, A.J., Tepke, D.G., Camisa, S.J., Goel, S., Smith, K.M., and Kurgan, G.J., "Best Practices Guide to Quality Concrete Construction," PTI 2003-21, *Pennsylvania Transportation Institute,* March 2003.

Tikalsky, P.J., Scheetz, B.E., and Tepke, D.G., "Using the Concrete Maturity Meter for QA/QC," *Pennsylvania Department of Transportation,* Report no. PA-2000-026+97 42(22), January 2001.

Tabor City Correctional Facility Concrete Wall Evaluation, Tabor City, NC: Evaluation of surface defects of newly constructed concrete walls, including development of testing plan and evaluation of testing results to provide opinions on conditions and durability.

ITG Slab Moisture Investigation, Greensboro, NC: Assessment and concrete moisture testing to evaluate delaminated epoxy coating. Provided recommendations for addressing elevated concrete internal relative humidity.

Ragan-Brown Fieldhouse Basketball Floor Buckling/Moisture Investigation, Greensboro, NC: Assessment of concrete and wood moisture testing to evaluate a buckling basketball floor. Provided recommendations for addressing slab moisture.

Mitchell Water Treatment Plant, Greensboro, NC: Condition assessment and evaluation of reinforced concrete treatment plant constructed in the 1950's. Work included corrosion-related testing of embedded steel, evaluation of concrete quality and evaluation of concrete contamination to provide recommendations for service-life extension for the primary operations building and basins. Engineer of Record for repair documents to replace slab, repair masonry and install protective coatings.

500 West Friendly Avenue Parking Deck, Greensboro, NC: Condition assessment of a steel framed parking facility with a split slab system. Engineer of Record for repairs of the parking deck including removal of original split-slab system, installation of a new bonded concrete overlay and protective coatings on the steel decking and structural framing.

Baptist Medical Center Boiler Room, Winston-Salem, NC: Engineer of Record for design of a steel-frame boiler support system and concrete repairs to address corrosion-related distress of the concrete boiler room slab. Involvement included preparation of design documents and site review.

War Memorial Stadium, Greensboro, NC: Condition assessment and evaluation for an 80-year old historical baseball stadium. Project included assessment of materials-related concrete distress and corrosion-related distress of concrete and steel components, limited structural load study of deteriorated components, and recommendations for extending the service life.

Dockside Condominiums, Charleston, SC: SKA performed an investigation of distress condition in the

Select Presentations and Invited Lectures

Tepke, David G., "A Look Back at Code Durability Requirements for 20th Century and Current Structural (Reinforced) Concrete (Historical ACI 318 Code Durability Requirements)," *NACE Concrete Service-Life Extension Conference, NACE International*, Columbia University, New York, NY, June 28, 2017.

Tepke, David G., "Why Bad Things Can Happen to Good Concrete: Mechanisms and Identification of Materials-Related Distress in Concrete Structures," A*SCE NC Section Spring 2017 Technical Conference*, Duke University Fitzpatrick Center, Durham, NC, April 28, 2017.

Tepke, David G., "Case Study of Performance-Based Specifications for SCC Coastal Condominium Repair (Alt: Using Performance-Based Criteria for SCC Coastal Condominium Column Repair)," American Concrete Institute Spring 2017 Convention, Detroit, MI, March 28, 2017.

Tepke, David G., "Performance-Based Specifications for Ready-Mix Concrete," *NC State University of Professional Development Design Your Own Continuing Education Experience*, Raleigh, NC, December 2, 2016.

Tepke, David G., "Challenges and Solutions for Coastal Zone Concrete Repair," ASCE Coastal Branch North Carolina Section Luncheon, Wilmington, NC, August 9, 2016.

Tepke, David G., "Cracking Common Concrete Cracking Conundrums," *NC State University of Professional Development Design Your Own Continuing Education Experience,* Raleigh, NC, December 11, 2015.

Tepke, David G., "Cracking Common Concrete Cracking Conundrums," *Frank L. Blum Construction Company: FL Blum University Lecture Series,* Winston-Salem, NC. October 12, 2015.

Tepke, David G., "High-Performance Ready Mixed Concrete for Repairs in Coastal Environments: Case Studies," *NACE Concrete Service-Life Conference,* Philadelphia, PA. June 29-July 1, 2015.

Tepke, David G. and Yarborough, Kent, S., "Staying Ahead of the Corrosion Curve: Corrosion of Reinforcing Steel in Coastal Condominium Structures," *SKA Tech Talk Series,* Wilmington, NC, May 22, 2015.

Tepke, David G., "The Process of Engineering Solutions for Concrete Problems," *University of North Carolina Invited Lecture,* Charlotte, NC, March 13, 2015.

Tepke, David G., "Alkali-Silica Reactivity – Mechanisms Specifications for Effective Mitigation and Local Considerations," *NC State University of Professional Development Design Your Own Continuing Education Experience,* Raleigh, NC, December 5, 2014.

Tepke, David G., "Review of Corrosion of Concrete Reinforcement: Mechanisms, Assessment, Mitigation and Repair," *NC State University of Professional Development Design Your Own Continuing Education Experience,* Raleigh, NC, December 5, 2014.

Tepke, David G., "Corrosion of Steel in Concrete," *ICRI Carolinas Spring 2013 Conference,* Durham, NC, March 15, 2013.

Tepke, David G., "Reducing the Cost of Corrosion Damage of Reinforced Concrete Structures," *SKA Consulting Engineers Seminar,* Greensboro, NC, June 28, 2012.

Tepke, David G., "Corrosion of Steel in Concrete: Mechanisms, Testing and Preservation," *ASCE North Carolina Northern Branch August Meeting,* Greensboro, NC, August 16, 2011.

Tepke, David G., Tikalsky, P.J., and Konecny, P., "Sustainable Highway Bridges: Update on the I-99 Long-Term Bridge Deck Durability Study," *American Concrete Institute Fall 2010 Convention,* Pittsburgh, PA, October 24, 2010.

exterior facade, balcony and parking garage. SKA also performed repair design, prepared contract documents and assisted during bidding and construction. Assisted with design, field observations and soundings, contract administration, and in a technical specialist role.

Litchfield Retreat Condominiums, Pawleys Island, SC: Conducted multiple phase condition assessment (90 unit condos) to prioritize repairs and service-life extension methods. Assessment included review of reinforcing steel conditions at excavations, site testing and sample extraction for third-party chloride testing. Phase I repairs included structural slab edge replacement, re-surfacing surfaces and acrylic anti-carbonation soffit coatings, slab edge polyurethane coatings, replacement of deficient aluminum handrail new handrails with fluoropolymer coatings, concrete repairs, galvanic zinc anodes for protection of embedded reinforcing adjacent to repairs, coating of steel angles with organic zinc, epoxy and polyurethane coatings, andd other related repairs. Phase II included protective coatings, concrete repairs, sacrificial anodes, and structural reinforcement of stair towers with construction deficiencies.

York Hospital Employee Parking Deck, York, PA: Condition assessment and evaluation of precast and cast-in-place concrete components, connections and joints of a multi-level parking facility. Involvement included service life prediction, recommendations for preservation, development of repair and preservation documents and field review for implementation of galvanic corrosion protection of cast-in-place concrete piers with corrosion-related deterioration.

Sound of the Seas II Condominiums, Emerald Isle, NC: Conducted review of the design and installation of an impressed current cathodic protection system on condominium balconies. Work included review of submittals and on-site procedures to verify compliance with specifications. Work also included site quality assurance review of concrete repairs, deck coating installation and locating galvanic anodes.

Shipyard Village Condominiums, Pawleys Island, SC: Part of the SKA team that reviewed existing documentation and developed documents for concrete repairs, replacing prestressed concrete panels with severe corrosion distress with cast-in-place concrete. Scope of work included extension of service life of other panels with thermal spray cathodic protection. Involvement included development of specialized concrete and thermal spray specifications, and field evaluation.

Select Presentations and Invited Lectures, cont.

Tepke, David G., "Alkali-Silica Reactivity: Specifications for Effective Mitigation and Local Considerations," *Structural Engineering Association North Carolina Northern Branch Seminar,* Greensboro, NC, May 4, 2010.

Tepke, D.G., Tikalsky, P.J., Spangler, B., "The Influence of Casting Sequence on Early Age Cracking of Multi-Span Steel Girder Bridges", *85th Annual Transportation Research Board Meeting,* Washington D.C., January 2006.

Tepke, David G. and Tikalsky, Paul J; "Implementation of High-Performance Concrete Technology for Pennsylvania Bridge Decks", *American Concrete Institute Fall 2005 Convention,* Kansas City, Kansas, November, 2005.

Tikalsky, P.J., Tepke, D.G., Trianafilou, L., and Wathne, L., Speakers, "Best Practices for High-Performance Concrete Bridge Decks," *Penn State-PennDOT-FHWA Workshop,* State College, PA, September 16, 2004.

Tepke, David; Kurgan, Geoff; Schokker, Andrea; Tikalsky, Paul; and Scheetz, Barry; "The Effects of Blended Cements on Concrete Porosity, Chloride Permeability, and Resistivity," *8th CANMET/ ACI International Conference on Fly Ash, Silica Fume, Slag and Natural Pozzolans in Concrete,* American Concrete Institute, Las Vegas Nevada, May 2004.

Tepke, David G.; Tikalsky, Paul J.; and Scheetz, Barry E.; "Concrete Maturity Field Studies for Highway Applications," *83rd Annual Transportation Research Board Meeting,* Washington D.C., January 2004.

Tikalsky, P.J., Tepke, D.G.; Camisa, S.; and Wathne, L., Speakers, "Oregon DOT Concrete Maturity Workshop," *Penn State-Oregon DOT-FHWA Workshop,* Salem, OR, August 27, 2002.

Tepke, D.G. and Tikalsky, P.J., "Tips For Using the Maturity Meter for QC/QA," *Concrete Curing: Basic Principles, Practical Experiences, and Innovations Workshop at the 81st Annual Transportation Research Board Meeting,* Washington D.C., January 2002.

Tepke, D., G, and Tikalsky, P.J., "Arrhenius Maturity for QC/QA on Highway Structures in Pennsylvania," *American Concrete Institute Fall 2001 Convention,* Dallas, TX, October 2001

Tepke, D., G, and Tikalsky, P.J., "Concrete Maturity Progress: Survey of Departments of Transportation," *80th Annual Transportation Research Board Meeting,* Washington D.C., January 2001.

Nuclear Station Concrete Evaluation: Developed testing program to optimize concrete mixture proportions for reducing the cracking tendency for a two foot thick restrained cask. Work included material optimization and direction associated with testing for cracking potential and adiabatic heat gain. Part of a team that designed, installed and monitored a load test on a large scale cask.

Duke Cliffside Station: Review of concrete distress in slip-formed tower. Provide concrete construction troubleshooting services for contractor. Made suggestions for changing concrete mixture design. Part of a team that conducted non-destructive evaluation of concrete using stress-wave methods and made recommendations for correcting construction deficiencies.

Grimsley Natatorium, Greensboro, NC: Developed a long-term monitoring program, installed data acquisition system, and monitored and evaluated strain, crack width, wall tilt and environmental gages for quantifying wall movement in a natatorium.

University of North Carolina, Greensboro Quad Dormitories; Greensboro, NC: Developed a testing program to evaluate the material properties of 80 year old reinforce concrete structures in a multi-building complex. Work included review of exploratory openings, selection of sample locations and statistical analysis of results to characterize in-place materials for a load study.

Cone Health Five (5) Parking Deck Condition Assessments, Greensboro, NC: Condition assessments and evaluation reports of five multi-level parking decks at the medical campus. Structural types included structural steel framing, precast, prestressed concrete and cast-in-place post-tensioned concrete. Provided options for service-life extension and recommendations for additional work and repair. Repair recommendations were prioritized and cost estimates provided.

Baptist Hospital Parking Deck B, Winston-Salem, NC: Corrosion durability assessment of post-tensioned concrete slab areas and potential preservation system at the multi-level parking facility. Provided recommendations for preservation of the structure.

VA Medical Center Building 26 Parking Deck, Durham, NC: Project Engineer for contract administration phase for repairs to a post-tensioned parking deck. Repairs in the project included post-tensioned strand repairs, facade repairs, reinforced concrete repairs, and thermal spray protection.

Sandpiper Run Condominiums, Pawleys Island, SC: Part of the SKA team that reviewed existing documentation and developed documents for concrete repairs and extension of service life of prestressed hollow-core concrete panels with thermal spray cathodic protection. Involvement included development of performance-based thermal spray specification and field evaluation.

Guilford Technical Community College, Jamestown, NC: Retained as consultant to address concerns associated with inclusion of aggregates historically known to be susceptible to alkali-silica reaction in a new parking deck structure. Involvement included identification of the potential concern, review of test reports, testing consultation, and providing recommendations.

Hyperion Towers, Myrtle Beach, SC: Developed performance-based specifications for high-performance self-consolidating concrete for encasement of steel columns at a coastal condominium. Involvement included work with concrete producer to optimize the mixture.

University of North Carolina, Greensboro Walker Parking Deck, Greensboro, NC: Investigation to diagnose observed distress in prestressed concrete components in a parking deck that identified alkali-silica reaction (ASR) in concrete samples. Recommendations to extend the service-life were provided and implemented**.**

Harmony Bridge, Georgetown, SC: Condition assessment and evaluation of timber bridge with recommendations for repair.

FTCC Vocational Educational Building, Winston-Salem, NC: Evaluation of distressed precast concrete architectural panels with delayed ettringite formation (DEF).

Montgomery Building, Spartanburg, SC: Corrosion and durability assessment and structural evaluation of cast stone (precast concrete) façade panels on historic building with extensive deterioration.

North Carolina A&T Price Hall Annex, Greensboro, NC: Condition assessment and evaluation of concrete frame building. Concrete durability study and non-destructive stress wave testing to identify alkali-silica reactivity and associated distress in columns, and identify extent. Repair recommendations were made.