3310 Green Park Circle
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CHRIS C. KERCSMAR, P.E., LEED A.P.
SENIOR CONSULTANT

cckercsmar@engsys.com

Mr. Kercsmar is a Senior Consultant for ESI and a registered Professional Engineer (P.E.) in Virginia, North Carolina, South Carolina, Maryland, Pennsylvania, and the District of Columbia. He has over 22 years of experience in the investigation and design of facilities with expertise in structural and building envelope (i.e. roof, wall, and floor) systems. Mr. Kercsmar has extensive experience with the assessment of facility distress and the development of project documents (i.e. plans, details, and specifications) and cost estimates for repair/restoration projects, as well as new building design. He also specializes in precast/prestressed concrete specialty engineering, fall protection consulting for buildings, and parking structure consulting.

In addition to his work as a consulting Professional Engineer, Mr. Kercsmar served as a Structures Specialist with Virginia Task Force 1 (VATF1) between 2012 and 2015. VATF1 is a FEMA Urban Search and Rescue (US&R) team that responds to domestic disasters, and it is one of only two US&R teams in the United States that deploys internationally to disaster zones.

Areas of Specialization

Structural and materials testing and investigations
Building envelope investigations
Repair, restoration, and renovation design
Damage assessments, including the identification of pre-existing conditions
Parking structure investigations
Precast/prestressed concrete structure investigations
Fall protection consulting and assessments for building anchorages.
Seismic assessments in conformance with ASCE 31-03, “Seismic Evaluation of Existing Buildings.” [Note this reference has been superseded with ASCE 41-13, “Seismic Evaluation and Retrofit of Existing Buildings.”]

Education

B.S., Civil Engineering, Lehigh University, Bethlehem, PA

Licensed Professional Engineer (P.E.)

State of Virginia …….. License No. 032914
State of North Carolina.....License No. 029023
State of South Carolina..... License No. 33492
State of Georgia……..License No. PE031121
State of Maryland……..License No. 34325
State of Pennsylvania ……. License No. PE062269
District of Columbia…….. License No. PE905853
National Council of Examiners for Engineering and Surveying (NCEES) (No. 18672)
LEED Accredited Professional (A.P.)
Structures Specialist, FEMA Urban Search & Rescue

June 2017

Professional Affiliations/Honors

International Concrete Repair Institute (ICRI), National

ICRI Carolinas Chapter

Raleigh Claims Association (2017)

USAID: USA 1
Urban Search and Rescue (US&R) Team, Structures Specialist (2012 to 2015)

FEMA
Virginia Task Force 1, US&R Team, Structures Specialist (2012 to 2015)

American Institute of Steel Construction (AISC)

ASTM International

Precast/Prestressed Concrete Institute (PCI)

Building Enclosure Council of Washington, D.C

Technical Committees

ASTM E06,
Performance of Buildings

ASTM E06.11
Horizontal and Vertical Structures/Structural Performance of Completed Structures.

ASTM E06.22
Durability Performance of Building Constructions.

ASTM E06.24
Building Preservation and Rehabilitation

Technology. ASTM E06.81, Building Economics.

PCI Blast Resistance and Structural Integrity

Committee. PCI Sustainability Committee
(previous Vice Chair).

PCI Parking Structures Committee
(previous member). PCI Student

Education Committee
PCI Technical Activities Council (previous member)

Positions Held

Engineering Systems Inc., Charlotte, North Carolina
Senior Consultant, 2015 – Present

WDP & Associates Consulting Engineers, Inc., Manassas, Virginia
Senior Engineer, 2013 - 2015

ECS Mid-Atlantic, LLC, Chantilly, Virginia
Principal, 2012 - 2013
Senior Project Manager, 2010 - 2012

cK Structural, PLLC, New Braunfels, Texas
President, 2009 - 2010

Schwab Structural Engineering, Inc., New Braunfels, Texas
Vice President, Co-owner, 2004 - 2009

The Consulting Engineers Group, Inc., San Antonio, Texas
Associate, 2001 - 2004
Project Engineer, 1998 - 2001

Tindall Corporation, Virginia Division, Petersburg, Virginia
Project Engineer, 1994 - 1998

Publications/Presentations

PCI Blast Resistance and Structural Integrity Committee: "PCI Design Handbook: Appendix A: Blast-resistant design of precast, prestressed concrete components," PCI Journal, Winter 2014.

PCI Parking Structures Committee: "PCI Maintenance Manual for Precast Parking Structures," MNL 136-04,
2004.

"Parking Structure Restoration, Maintenance and Repair," HalfMoon Continuing Education, Richmond, Virginia, September 29, 2016 and Jessup, Maryland, February 18, 2016.

"Structure Repair and Maintenance," Parking Association of the Virginias, Fall Workshop, Williamsburg, Virginia, December 12, 2013.

"Quality Management for Basic Structural Steel," Wnuk Spurlock Architecture, Washington, D.C., Lunch and Learn Seminar, June 12, 2013.

"Parking Maintenance 301: Improving Parking Performance thru Cost-Effective Maintenance Practices," National Parking Association, Webinar (co-presenter), March 20, 2013.

"Parking Maintenance 101: Top Maintenance Tips for the Profitable Life of Your Garage," National Parking Association, Webinar (co-presenter), January 16, 2013.

"Parking Structure Maintenance and Restoration," National Parking Association Webinar (co-presenter), January 16, 2013.

"Parking Maintenance: Secrets of Success," National Parking Association 2012 Convention, Hollywood, Florida, October 18, 2012.

"Fall Protection Testing and Certification," Parsons Brinckerhoff, Herndon, Virginia, Lunch and Learn Seminar, May 1, 2012.

"Sustainability Through Durability, Adaptability, and Deconstructibility," BuildBoston 2010 (co-presenter), Boston, Massachusetts, November 19, 2010.

"Engineering Sustainability: The Green Engineer," Lorman Education Services Seminar, McAllen, Texas, November 13, 2008.

"The Effect of Ion Beam Surface Modifications on Fatigue Crack Initiation in Polycrystalline Nickel," Morrison, D. J., J.W. Jones, **D.E. Alexander**, C. Kovach and G.S. Was, Materials Science and Engineering **A115**, 315-321 (1989).

Selected Project Experience

Structural and Building Envelope Investigations and Repair

Building envelope investigation of an elevated concrete and wood-framed patio experiencing damage due to water infiltration. Water testing was performed with a spray rack to systematically recreate infiltration conditions so as to document pathways of leakage.

Structural investigation and repair recommendations for structural steel-framed grandstand bleachers and light poles at a Minor League baseball stadium located in Woodbridge, Virginia.

Building envelope investigation of damaged flooring material for a residential structure located in Clayton, North Carolina. The flooring and subfloor are located over a crawlspace, and the damage occurred following a winter storm and power outage.

Building envelope investigation of damaged gymnasium flooring for a fitness center located in Greensboro, North Carolina. Distortion of the hardwood flooring occurred within one year of the opening of the facility.

Structural and building envelope investigations of five fabrication support buildings for a manufacturer of wood trusses and other components located in Winchester, Virginia. Coordinated cost estimates and developed a table for maintenance and repair costs over a 30-year period, accounting for multiple options and the effects of inflation.

Roofing investigation of a single family residential structure in Charlotte, North Carolina. The steep- slope roof consisted of composition shingles. An assessment was made to determine the cause of alleged sheathing and shingle buckling.

Structural investigation of concrete floor framing for a university building located in Williamsburg, Virginia. Concrete joists were reinforced with a proprietary trussed-bar system circa 1920s.

Building envelope investigation of a multi-story health care facility during the renovation design phase to convert it to offices and laboratory space for a higher education institution located in the central Virginia region. The investigation was performed to evaluate the condition and performance characteristics of wall, glazing, and roofing systems. Directed and oversaw selective demolition performed by specialized subcontractors that were retained to support the investigation effort. Oversaw water testing at several of the curtainwall and masonry façade. Used pachometers and infrared thermography. Performed visual observations overall and tactile inspections at test cut areas.

Building envelope investigation of a brick and stone masonry building during the renovation design phase for conversion to a dormitory at a private school in northern Virginia. Performed water testing at exterior basement walls to identify areas of water infiltration. Measured atmospheric conditions, including ambient temperature, humidity, and wind speed. Installed moisture probes (sleeves) at exterior walls and obtained in situ temperature and relative humidity conditions within the sleeves. Tested slab moisture with calcium chloride kits.

Structural investigation and repair recommendations for aluminum-framed retractable seating at an NFL stadium. Developed repair documents, including plans, details, and specifications.

Building envelope investigation of a natatorium located in Washington, D.C. where elevated interior humidity and temperatures as well as excessive amounts of moisture exfiltration are routinely experienced. Previous attempts were made by Mechanical Engineers and Contractors to improve the quality of the interior environment, however without success. Test cuts and excavations were performed by a retained contractor, and as-built conditions were inspected and documented. Ground penetrating radar, infrared thermography, moisture meters, and pachometers were also used for the investigative efforts.

Structural investigation and development of repair documents for a damaged and deteriorated post- tensioned concrete parking structure located in Williamsburg, Virginia.

Structural investigation of a concrete slab-on-grade for a light industrial building located in Springfield, Virginia. The investigation assisted the owner in resolving a dispute with one of the tenants.

Structural investigation and materials testing of a deteriorated and damaged public swimming pool located in Stafford County, Virginia. Developed repair documents, including plans, details, and a project book of specifications. Also developed a contractor bid package.

Structural investigation and evaluation of a chemical manufacturing facility located in West Deptford, New Jersey. The facility sustained fire damage, including the collapse of roof framing components. Developed repair documents, including plans, details, and specifications.

Structural and building envelope investigations of a 74-unit townhouse community located in Haymarket, Virginia. The units experienced damage and distress to brick veneer and wood-framed balcony systems. Developed plans, details, and specifications for repair.

Structural and building envelope investigations of a Department of Defense facility located in Alexandria, Virginia. The facility consists of a 17-story and 15-story office building, two support buildings, and two parking structures.

Structural investigation of a wood-framed building located in Blacksburg, Virginia. The building experienced foundation settlement during construction. Performed structural analysis of floor trusses and walls at areas of concern. Developed conceptual repair recommendations.

Structural investigation and evaluation of a damaged and deteriorated steel-framed pedestrian bridge located in McLean, Virginia. Developed repair documents.

Structural investigation and evaluation of a wastewater treatment building located in Germantown, Maryland. The exterior walls, which had been constructed with acoustic masonry block, were improperly constructed, and effects to the structural and acoustic performance of the walls were evaluated.

Structural investigation, sampling, and testing of a thin-set, cementitious floor overlay material for an existing building that was undergoing a renovation. The building is located in Washington, D.C.

Litigation Support

Structural investigation of three below-building parking structures located in Charleston, South Carolina to assess the structures' as-built conditions and their conformance with the project specifications and applicable building code and industry standards. The structures were comprised of post-tensioned and conventionally reinforced concrete slabs as well as concrete masonry unit (CMU) walls. Visually observed and documented deficiencies, oversaw floor elevation measurements throughout each structure, used surface penetrating radar to identify the locations of reinforcing steel and void cells within CMU walls, directed contractors for opening test cuts in concrete and sampling and testing and soil conditions.

Building envelope investigation of multi-family residential buildings located in Olathe, Missouri to determine the extent and consequences of construction defects. The buildings were wood-framed with cement board siding and stucco used at the exterior. Assisted in the review of file material and the communication of opinions to the client.

Roofing investigation of a large manufacturing facility in Greenville, South Carolina. Existing low-slope systems consisted of built-up roofing and single-ply membrane systems. An assessment was made to determine if the expected useful service life of each system had been exceeded.

Structural and geotechnical investigation of a residential development for which several homes were subjected to foundation movement. Previous repairs had been implemented and required evaluation as to their effectiveness.

Structural investigation of a precast/prestressed concrete parking structure located in Columbia, South Carolina to identify and evaluate deficiencies in its fabrication and construction.

Building envelope investigation of a built-up roofing system installed on a health care facility in Anderson, South Carolina. A roofing contractor was hired by the Owner to demolish and re-apply the existing roofing system. To assist our client, existing conditions were documented prior to demolition, the demolition process was observed, and material samples were maintained for testing and further analysis.

Structural investigation of failed pipe hangers that had been attached to the bottom of precast/prestressed double tees within a parking structure located in Isfahan, Iran.

Structural investigation of two precast/prestressed concrete parking structures located in Plano, Texas, that contained damaged (including failed) and distressed components.

Structural investigation of a basketball arena located in Lubbock, Texas. The arena consisted of precast/prestressed concrete components with questionable support conditions. Developed and oversaw full-scale on-site load testing of one of the components. Developed repair details and specifications.

Structural investigation and evaluation of a distressed lightweight concrete topping slab for a grocery store in Washington, D.C. The slab had experienced cracking and delamination during construction.

Materials and Structures Testing and Investigation

Materials sampling and testing in support of a project team's repair and restoration efforts at a Department of Defense facility located in Arlington, Virginia.

On-site testing and materials sampling and laboratory testing for an Architect of the Capitol facility located in Washington, D.C.

Concrete modulus of elasticity testing of obtained concrete samples for a foreign Embassy building located in Washington, D.C.

On-site testing of 34,000 anchors used for attachment of stone panels for a national museum located in Washington, D.C. Designed steel frames and performed on-site testing of mock-up panels subjected to loads that simulated seismic, wind, and gravity forces.

On-site testing and materials sampling and testing of components for two fire-damaged structures: one of which was a multi-family housing building located in Washington, D.C, and the other was a public storage building located in Herndon, Virginia.

Damage Assessment

Post-hurricane assessments of three residential structures in Hilton Head, South Carolina to determine the extent and cause of sustained damage.

Seismic assessment of more than 85 buildings in the Metro Washington, D.C. area following the 2011 earthquake that occurred with its epicenter located in Mineral, Virginia.

Analysis of a collapsed aluminum-framed canopy structure at a university in Washington, D.C. to determine if failure occurred due to the application of snow loads that exceeded minimum Building Code requirements. Also, four other still-standing canopies at the facility were evaluated to determine their structural adequacy.

Analysis of collapsed aluminum sunshade structures that were attached to exterior walls of a building located in Arlington, Virginia to determine if failure occurred due to the application of snow loads that exceeded minimum Building Code requirements.

Seismic evaluations, in conformance with ASCE 31-03, “Seismic Evaluation of Existing Buildings,” of three buildings: a high-rise office building in Washington, D.C., a low-rise office building in McLean, Virginia, and a one-level, light-industrial facility located in Hyattsville, Maryland.

Precast/Prestressed Specialty Engineering

Design and detailing of an 18,000-seat precast stadium superstructure located in Eugene, Oregon. The stadium was comprised of pre and post-tensioned raker beams, match-casted Y-shaped columns, seating units, and other components.

Design and detailing of a 1,100 stall precast parking structure in San Antonio, Texas. The project was a 2007-08 SACEC Engineering Excellence Award winner.

Design and detailing, including for blast effects of insulated precast walls for a building at military base located in San Antonio, Texas.

Design and detailing of three total precast buildings used as part of an electronic data processing facility located in New Braunfels, Texas.

Design and detailing of an 800-stall precast parking structure located in Virginia that featured a helipad at the top level.

On-site construction administration for one administration building, two dormitories, and two cell housing buildings for a correctional facility located in North Carolina.

Fall Protection Consulting

Design of a fall protection system to provide safe access to the tops of large storage tanks at a chemical manufacturing facility located in Aberdeen, Maryland. Steel beams were added to the existing building framing and served as tie-off points for personal fall arrest system usage. Procedures were developed to provide information for the correct and safe use of the fall protection system.

Testing, evaluation, and certification of roof fall protection anchorages for a medical office building located in McLean, Virginia. Analyzed the existing system’s compliance and provided recommendations for the addition of anchorages at areas of non-compliance.

Designed and detailed roof stanchions to be used as fall protection anchorages for a Department of Defense facility located in Arlington, Virginia. The stanchion attachment design had to account for thin roof slab conditions.

Testing, evaluation, and certification of roof anchorages to be used for fall protection tie-off points for a building at military facility located in Potomac, Maryland.

Inspection of the roof fall protection anchorages on the main terminal of an international airport located in Dulles, Virginia.

Parking Structure Investigation and Consultation

Surveyed and assessed the condition of four parking structures for a university located in Richmond, Virginia. Two of the structures were comprised of precast/prestressed concrete systems, one was post- tensioned cast-in-place concrete, and one was traditionally-reinforced cast-in-place concrete. Provided an estimate of the expected useful service life, and developed details and specifications for repair for each structure.

Developed a program for performing maintenance and minor repairs for a precast/prestressed concrete parking structure that served a county government building located in Leesburg, Virginia.

Peer reviewed the bracing system used to provide the temporary bracing during the erection of a precast parking structure located in Charleston, South Carolina. Provided recommendations to improve the system.

Surveyed and identified areas of damage and distress for two post-tensioned parking structures located in Reston, Virginia. Developed a repair bid package as well as plans, details, and specifications that were submitted for permit.

New Building Analysis and Design

Structural engineering in support of the relocation of large chemical containers at a power plant facility located in Washington, D.C. The design accounted for mitigation of internal blast forces due to the presence of a fire protection system and one of the containers being reactive to water.

Served as the Structural Engineer-of-Record for a parking structure at an international airport located in Newark, New Jersey. The structure's framing system was comprised of cast-in-place concrete, precast/prestressed concrete, and structural steel.