

# CURRICULUM VITAE

**David N. Richardson, PhD, PE, FACI**

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Chancellor's Associate Professor-

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Room 126 Butler-Carlton Hall  
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Rolla, Missouri 65409

And

Director- QC/QA Certification Training

Reese Asphalt Laboratory  
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Missouri University of Science and Technology  
Rolla, Missouri 65409

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**This document is divided into six areas:**

- **Professional Background and Activities**
  - **Construction Materials Program Development at Missouri S&T**
  - **Scholarly Contributions**
  - **Teaching**
  - **University Service**
  - **Professional Course Development (Continuing Education)**
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## CAREER SUMMARY

ACTIVITY	CAREER
Years full-time service	31
Years at associate professor rank	24
<b>Professional Status</b>	
Professional registration	PE in 2 states
Fellow status	Fellow of ACI
<b>University Teaching</b>	
Awards (CET, campus, national)	18
CET average	3.5+
No. courses developed	9
No. sections taught	156+
Learning pedagogy committees	5
<b>Scholarly Contributions</b>	
No. external research grants / as PI	20 / 18
Funding (PI share of grants)	\$3.1 M
Refereed publications	21
Published technical reports / books	40
Presentations (technical)	533+
<b>Continuing Education</b>	
Short courses directed	181+
Approximate no. participants	~3000
Conferences directed	61
Approximate no. participants	>10,000
Campus income	\$3.7+ M
<b>Campus Service</b>	
Professorships / Fellowships developed	\$560,000
Lab equipment procured	\$1.2 M
Laboratories designed	4
Committee chairs / total committees	19 / 60
<b>Professional Service</b>	
ACI national technical committees	7
ACI regional chapter offices	President, VP, Director
<b>Awards</b>	
Teaching	18
Advising	2
Faculty	3
Research / Scholarly	1
Technical Society	3

## **PROFESSIONAL BACKGROUND AND ACTIVITIES**

## PROFESSIONAL BACKGROUND AND ACTIVITIES

### EDUCATION

- B.S. in Civil Engineering, University of Missouri-Rolla, 1971
- M.S. in Civil Engineering (Environmental), University of Missouri-Rolla, 1973
- Ph.D. in Civil Engineering (Geotechnical), University of Missouri-Rolla, 1984  
*Dissertation: "Relative Durability of Shale"; advisor: R.W. Stephenson*

### PROFESSIONAL EXPERIENCE

- 2015-present Chancellor's Professor, Missouri S&T
- 1991-2015 Associate Professor, Department of Civil Engineering, UMR/Missouri S&T
- 1984-1991 Assistant Professor, Department of Civil Engineering, UMR
- 1980-1984 Graduate Teaching Assistant, Department of Civil Engineering, UMR
- 1980-1996 Consultant, Rolla Geotechnical Engineers, part-time
- 1975-1980 Owner/Operator, Richardson Testing Laboratories, Searcy, Arkansas (retained ownership through 1996)
- 1977-1980 Partner, Long and Richardson Consultants, Searcy, Arkansas (time concurrent with Richardson Testing Laboratories)
- 1975-1976 Staff Engineer, Blaylock, Threet, and Associates, Searcy, Arkansas, part-time (time concurrent with Richardson Testing Laboratories)
- 1973-1975 Project Engineer/Manager, Johnson Engineers, Inc., Palestine, Texas
- 1969-1971 Technician, St. Louis County Highway Dept, Materials Laboratory (part-time)

### REGISTRATION/CERTIFICATION

#### Registered Professional Engineer

- State of Missouri (No. E-21513)
- State of Arkansas (No. 4440)

#### Certification

- Certified Nuclear Density Gauge Operator
- MoDOT Bituminous QC/QA Certification
- ACI Grade 1 Field Certification Examiner

### HONORS

#### National/Professional Awards

- 2015 Member- Academy of Civil Engineers
- 2014 Fellow of ACI
- 2003 ACI Missouri Chapter Concrete Person of the Year
- 1993 ASCE Best Practice-Oriented Paper, ***ASCE Journal of Materials in Civil Engineering***
- 1988 ASEE National New Engineering Educator Award

## University Awards

### *Teaching: Student-voted*

- Missouri S&T CET Outstanding Teaching Awards- 2015, 2014, 2012, 2010, 2008, 2007, 2006, 2005, 2004, 2001, 2000, 1997, 1987
- Dean of Engineering Teaching Excellence Award- 2006, 2005, 2004

### *Teaching: Peer-selected*

- 2011 Campus Faculty Teaching Award
- 1988 ASEE National New Engineering Educator Award

### *Advising: Student-voted*

- 2005 UMR Outstanding Freshmen Student Advisor Award

### *Advising: Peer-selected*

- 2006 Campus Freshmen Engineering Outstanding Advising Award

### *Faculty: Student-selected*

- 2011 Chi Omega Outstanding Professor Award
- 2004 Bernard R. Sarchet Outstanding Faculty Award

### *Faculty: Peer-selected*

- 2015 Chancellor's Professor
- 1995 UMR Academy of Civil Engineers Faculty Achievement Award
- 1984 Chi Epsilon honor society

## PROFESSIONAL SERVICE

### **Current Technical Society Membership**

- American Society of Civil Engineers
- American Concrete Institute
- Association of Asphalt Pavement Technologists
- American Concrete Pavement Association

### **Current Technical Committee Activities**

- ACI Committee 325 -Concrete Pavements (2004-present)
- ACI 325 A Subcommittee –Design (2006-present)
- ACI 325 D Subcommittee -Proportioning for Pavements (**Chair**)(2010-present)
- ACI Committee 214 -Evaluation of Results of Tests Used to Determine of the Strength of Concrete (2004-present)
- ACI Committee 330 -Concrete Parking Lots and Site Paving (2005-present)
- ACI 330 TG Subcommittee -Heavy Duty Concrete Parking Lots (2006-present)
- ACI Committee 211 –Proportioning of Concrete Mixtures (2009-present)

**Past Professional Society Offices/Committees**

*ACI:*

- ACI Examiner for Grade I Field Technician Certification Program (1998-2007; 2010, 2011)
- Past-President, Missouri Chapter, ACI (2006)
- President, Missouri Chapter, ACI (2005)
- Vice-President, Missouri Chapter, ACI (2004)
- Director, Missouri Chapter, ACI (1985-1987; 2001-2003)
- ACI - Missouri Chapter, Student Activities Committee
- ACI - Missouri Chapter, Certification Committee

*MoDOT:*

- MoDOT Technical Advisory Group-Pavements
- MoTREC UMR representative
- MoDOT High Performance Concrete Task Force

*Other:*

- Mid-West Concrete Consortium: academic representative

**Professional Journal Reviewer/ Software Beta Tester**

- ACI Materials Journal
- ASCE Journal of Transportation Engineering
- ASCE Journal of Materials in Civil Engineering
- FHWA “DRIP”-Drainage in Pavements software

**CAREER TOTAL INCOME at MISSOURI S&T (last updated: fall 2014)**

Source	Funds
<b>Research Grants: (2014 dollars)</b>	
External	3,103,593
Internal	4570
<i>Subtotal</i>	<b>3,108,164</b>
<b>Continuing Education: (2014 dollars)</b>	
QC/QA Certification Short Courses	2,498,421+
Conferences	1,305,634+
ACI Certifications	28,540
<i>Subtotal</i>	<b>3,735,955+</b>
<b>Total</b>	<b>6,940,758+</b>

Additionally, developed several endowments totaling \$560,000 (see **Service** tab).

**CONSTRUCTION MATERIALS PROGRAM DEVELOPMENT  
at MISSOURI S&T**

## FOUNDING and DEVELOPMENT CONSTRUCTION MATERIALS PROGRAM at MISSOURI S&T

In 1984, the Construction Materials Program at the then-University of Missouri-Rolla essentially did not exist. There was no active faculty, no history of funded research, three graduate courses were taught at irregular intervals- many times by graduate students, lab equipment was minimal, no cadre of graduate students, and no short courses being taught. The following are the highlights of the development of the program accomplished by David Richardson:

<b>CURRICULUM:</b> <i>all sections in all courses taught solely by DR 1984-2012</i>
<b>CE 216 Construction Materials:</b> <ul style="list-style-type: none"> <li>• Course content completely re-configured</li> <li>• In 1984, was essentially a concrete course; lecture portion was expanded to include asphalt, masonry, steel, and different types of aggregate</li> <li>• Number of lab exercises were expanded from 4 to 9 periods</li> <li>• Number of ASTM procedures taught was expanded from 7 to over 60</li> <li>• Replication of equipment expanded from 3 squads to 8</li> </ul>
<b>CE 312 Bituminous Materials:</b> <ul style="list-style-type: none"> <li>• Course content completely re-configured</li> <li>• Course expanded from 2 credit hours to 3 to allow the addition of a lab component to include full asphalt-aggregate, binder, and mix testing capabilities</li> <li>• Taught on a rotating regular basis</li> </ul>
<b>CE 313: Properties of Concrete</b> <ul style="list-style-type: none"> <li>• Course content completely re-configured</li> <li>• Course included a minor lab component</li> <li>• Taught on a rotating regular basis</li> </ul>
<b>CE 317 (Asphalt) Pavement Design</b> <ul style="list-style-type: none"> <li>• Course content completely re-configured</li> <li>• Taught on a rotating regular basis</li> <li>• Course eventually split into 2 courses</li> </ul>
<b>CE 356 Concrete Pavement Design</b> <ul style="list-style-type: none"> <li>• Newly developed course in 2008</li> <li>• Taught on a rotating regular basis</li> </ul>
<b>CE 401 Advanced Properties of Concrete</b> <ul style="list-style-type: none"> <li>• Developed and taught 1986</li> </ul>
<b>CE 401 Advanced Construction Materials</b> <ul style="list-style-type: none"> <li>• Developed and taught 1992</li> </ul>
<b>CE 401 Advanced Construction Materials Laboratory</b> <ul style="list-style-type: none"> <li>• Developed 1986, taught 1986 and 2002</li> </ul>



## **LABORATORY EQUIPMENT: (only equipment secured by DR is shown)**

### **Asphalt Lab**

- Over 140 items of new lab equipment added, sources of funds primarily from research grants and short course income
- Equipment added/refurbished:

*Binder Lab:* 2 Brookfield rotational viscometers, Prentex pressure-aging vessel, degassing oven, Bohlin Gemini 150 dynamic shear rheometer, Applied Test Systems bending beam rheometer, absolute and kinematic viscosity equipment, ductility device, thin-film and rolling-thin-film ovens, penetrometer, ring and ball softening point equipment, clay-gel column chromatography equipment, asphalt cement pycnometers, asphalt extraction/recovery equipment (reflux, Abson, continuous-flow centrifuge, and rotary evaporator methods plus non-standard equipment/methods for large-scale extraction/recovery, 1 small and 2 large batch centrifuges)

*Mixture Lab:* Asphalt Mixture Performance Tester (AMPT) with fatigue testing jig and overlay testing jig and 4 dedicated environmental chambers, plus a 4" core drill for preparing specimens, APA Loaded Wheel Tester fitted to also run the Hamburg Wheel Test, MTS 651 environmental chamber for creep compliance and tensile strength, 3 Rice method specific gravity workstations, 3 Pine gyratory shear compactors, three asphalt ignition ovens, CoreLok device, CoreDry device, Geotest multi-loading machine (TSR, Marshall or CBR), mechanical and manual Marshall compaction equipment, water baths, ovens, 2 sample extruders, 2 five-gal can mixers, 10-gal can mixer, 2 five-quart Hobart mixers, 20-quart Hobart mixer w/heater, specific gravity electronic balance workstation, resilient modulus indirect tension equipment, including a PC workstation for data acquisition and test control and Tensile Strength Ratio (Lottman) equipment.

**Cost: \$747,000**

### **Aggregate Lab**

- Over 100 items of new lab equipment added, sources of funds for the larger (greater than \$1000) items were primarily from research grants and short course income.
- Major equipment added/refurbished: Los Angeles Abrasion machine, 3 Gilson testing screen shakers, 4 Rotosift-type sieve shakers, CBR equipment (includes 1 motorized and 2 manually operated load frames and field CBR kits), resilient modulus equipment, a range of sampling and splitting devices, 7 large exterior-access aggregate bins, 18 small bins, 8 specific gravity workstations, permeability workstation for 10 in. diameter specimens, 8 SUPERPAVE consensus and source testing equipment workstations (sand equivalent, flat/elongated aggregate templates, sand particle shape analyzers, and plasticity index), 3-tier Micro-Deval station, wet-ball mill device, aggregate crushing value test equipment, methylene blue testing equipment, sand organic impurities kit, water-alcohol freeze/thaw station, sulfate soundness station, slake durability device, bench-scale and portable point-load test devices, large six-person minus #200 washing station, ultrasonic sieve cleaner, type M laboratory crusher from American Pulverizer Company, Iowa Pore Index testing station, carbonate analyzer, pH meter, unconfined compression frame, and falling head permeameter.
- **Cost: \$258,000**

### **Concrete Lab**

- Over 75 items of new lab equipment added, sources of funds for the larger (greater than \$1000) items were primarily from research grants and short course income
- Major equipment added/refurbished: controlled-environment room for moist-curing and conditioning specimens, freeze/thaw cabinet, Blaine cement fineness apparatus, mini-slump devices, James maturity meter, Intellirock maturity equipment, Schmidt hammer and calibration

<p>anvil, air content meters (3 pressuremeter "B"-type, 4 roll-a-meters, and Chace air indicator), cylinder capping station that includes compound heater and cylinder capping molds for 2 in. through 6 in. diameter specimens, concrete saw, microwave workstation for concrete moisture content determination, Kestrel weather station, spud vibrator, various electronic balances, various ovens, ring shrinkage device, curing tanks, dust collection system, storage racks, and miscellaneous supporting items.</p> <ul style="list-style-type: none"> <li>• <b>Steel connections lab:</b> Skidmore-Wilhelm calibration device, Torquon shear wrench, non-impact electric torque wrench, large manual torque wrench, and weld inspection equipment: magnetic particle, dye penetrant, and weld measuring gages.</li> <li>• <b>Cost : \$57,000</b></li> </ul>
<p><b>Masonry Lab</b></p> <ul style="list-style-type: none"> <li>• Several items of new lab equipment added, sources of funds primarily from departmental/campus sources</li> <li>• Major equipment added: water retentivity device, brick/block capping molds, brick/block unit weight station, a concrete block-forming machine, and a bond-wrench load frame.</li> <li>• <b>Cost: \$8,000</b></li> </ul>
<p><b>Load Frame Lab</b></p> <ul style="list-style-type: none"> <li>• Over 25 items of new lab equipment added, sources of funds for the larger (greater than \$1000) items were primarily from research grants and short course income</li> <li>• Major equipment added/refurbished: load testing equipment including a concrete cylinder (4" and 6") compressometer/extensometers, a 200,000 lb Tinius-Olsen universal compression/tension machine updated to be servo-controlled with data acquisition PC workstation, a Rainhart portable beam tester, an MTS 651 environmental chamber, accessories for split-tensile and TestMark, ASTM, and Forney flexural (beam) strength testing, and rebar tension and bending testing equipment.</li> <li>• <b>Cost: \$136,000</b></li> </ul>
<p><b>Total Laboratory Equipment Cost: \$1.2 M</b></p>

<p><b>LABORATORY SPACE DESIGN:</b></p> <ul style="list-style-type: none"> <li>• <b>1990:</b> Developed separate Asphalt Lab Room in old Butler-Carlton Hall</li> <li>• <b>2000:</b> Designed layout and details of the Materials Lab complex for the new Butler-Carlton Hall: Reese Asphalt Lab (Room 112), Aggregate Lab (Room 111), Concrete &amp; Masonry Lab (Room 109), Jones Structural Materials (Load Frame) Lab (Room 106), and the Ross Materials classroom (Room 110)</li> </ul>
<p><b>RESEARCH GRANTS:</b></p> <ul style="list-style-type: none"> <li>• Research sponsors: NAS, NSF, MATC, ASEE, MoDOT, MAPA, NUTC/UTC, MRTC, numerous industrial</li> <li>• 20 externally-sponsored projects</li> <li>• Several internal projects involving undergraduates</li> </ul> <p><b>Income: \$3.1 M</b></p>
<p><b>GRADUATE STUDENTS:</b></p> <ul style="list-style-type: none"> <li>• 21 graduate students recruited</li> </ul>
<p><b>FULL-TIME RESEARCH ASSOCIATE:</b></p> <ul style="list-style-type: none"> <li>• 2005: full-time senior research associate supported 100% by the PI</li> </ul>

## SHORT COURSES:

### 1998:

- Developed the QC/QA certification training program for MoDOT
- 51 five-day Superpave certification training courses held (1998-present)

### 1999:

- Developed QC/QA aggregate certification training course
- 2 courses held (1998-present)

### 2000:

- Developed the Superpave re-certification course
- 53 two-day courses held (1998-present)

### 2006:

- Developed the aggregate consensus tests certification training course
- 23 one-day courses held (1998-present)

### 2006:

- Developed the TSR certification training course
- 16 one-day courses held (1998-present)

### 2010:

- Developed the ignition oven binder content certification training course
- 4 one-day courses held (1998-present)

### 1996-2011:

- 14 ACI one-day Grade 1 field certification courses held

**Total Courses: 156**

**Income: \$2.4 M**

## CONFERENCES:

### 1985-present:

- Directorship of the annual Asphalt Conference; expanded to day-and-a-half
- 31 Asphalt Conferences directed

### 1986-present:

- Directorship of the annual Concrete Conference; expanded to day-and-a-half
- 30 Concrete Conferences directed

**Income: \$1.3 M**

## ENDOWMENTS:

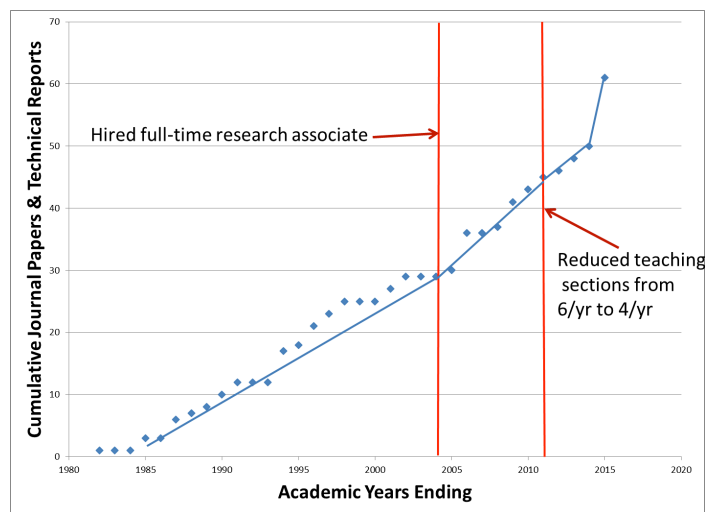
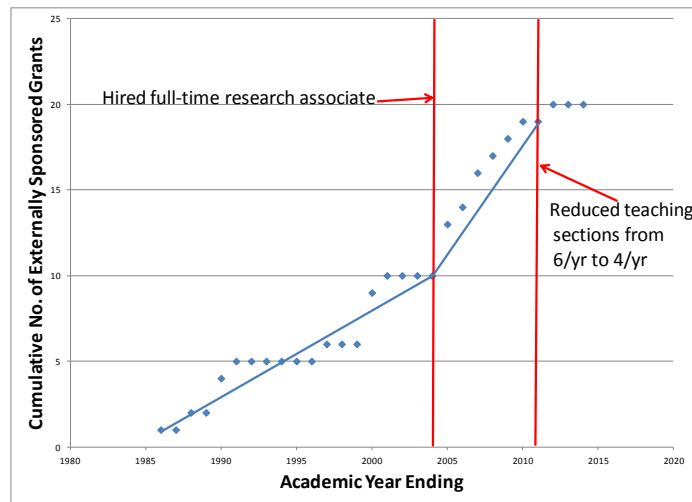
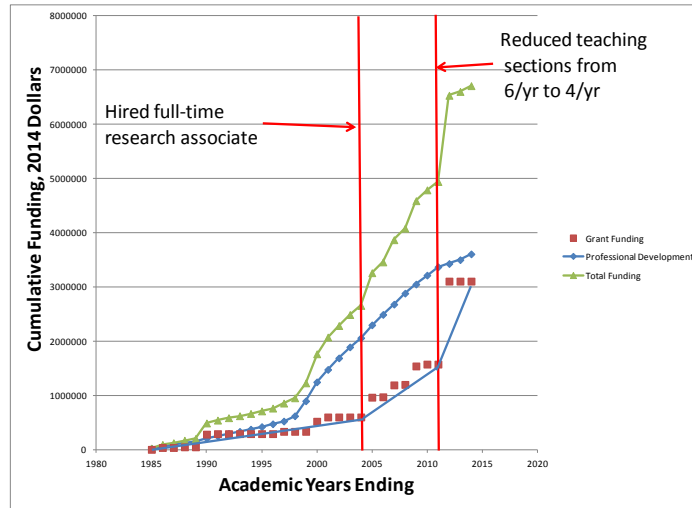
- 2000: Initiation and development of the **MAPA Endowed Asphalt Graduate Student Fellowship**
- 2011: Initiation and development of the **MAPA Endowed Asphalt Materials Professorship**

**Total: \$560 K**

## NATIONAL RECOGNITION:

- Authored over 50 technical publications
- Given over 533 presentations
- Currently active in 7 national technical society (ACI) committees, including authorship of several national consensus Guidelines
- Directed 61 conferences and paper sessions

## Milestones



## **SCHOLARLY CONTRIBUTIONS**

## SCHOLARLY CONTRIBUTIONS

### REFEREED JOURNAL PUBLICATIONS

\*= Major advisor for student

\*\*= Corresponding/Leading author

**Richardson, D.N.\*\***, Beckemeier, K.W.\*, and Volz, J.S., (2015), "Effects of Powder Additives on High Volume Fly Ash Mixtures," *ACI Materials Journal*, Vol. 112, No. 4, pp.535-546.

**Richardson, D.N.\*\*** and Davis, C.P.\*, (2015), "Particle Size and Specimen Preparation Effects on the Iowa Pore Index," *ACI Materials Journal*, Vol. 112, No. 3, 477-485 pp.

**Richardson, D.N.\*\*** and Lusher, S.M.\*, (2015), "Prediction of Freeze-Thaw Durability of Concrete," *ACI Materials Journal*, Vol. 112, No. 3, 439-450 pp.

Lusher, S.M.\* and **Richardson, D.N.**, (2015), "Guayule Plant Extracts as Recycling Agents in Asphalt Mixtures with High Reclaimed Binder Content," *ASCE Journal of Materials in Civil Engineering*, Vol. 27, No. 10, pp. 04014269, 1-10.

**Richardson, D.N.\*\*** and Whitwell, B.A.\*, (2014), "Concrete Production Plant Variables Affecting Flexural Strength Relative to Compressive Strength", *ASCE Journal of Materials in Civil Engineering*, Vol. 26, No. 8, pp. 04014032, 1-10.

Belarbi, B.\*\*, **Richardson, D.N.\*\***, Swenty, M.K., and Taber, L.H.\*, (2010), "Effect of Contamination on Steel-Reinforcing Bar-Concrete Bond", *ASCE Journal for Performance of Constructed Facilities*, Vol. 24, No.3, pp. 206-214.

Han, Y-P.\*, Petry, T.M. and **Richardson, D.N.** (2006), "Resilient Modulus Estimation System for Fine Grained Soils", *Transportation Research Record*, No. 1967, Transportation Research Board, pp.69-77.

Taber, L.H.\*, Belarbi, D.J., and **Richardson, D.N.** (2002), "Effects of Reinforcing Bar Contamination on the Steel-Concrete Bond During Concrete Construction", *ACI 5<sup>th</sup> International Conference, Special Publication SP-209*, Cancun, Mexico, pp. 839-861.

**Richardson, D.N.\*\*** (2001), "AASHTO Drainage Coefficients for Flexible Pavements", *Transportation Research Record*, No. 1778, Transportation Research Board, pp.73-80.

**Richardson, D.N.\*\*** (1997), "Drainability Characteristics of Granular Pavement Base Material", *ASCE Journal of Transportation*, Vol.123, No. 5, pp. 385-392.

Gawedzinski, M.J.\* and **Richardson, D.N.\*\*** (1997), "Waste Thermoplastic in Concrete Masonry", *The Masonry Society Journal*, Vol.15, No.1, pp.27-30.

**Richardson, D.N.\*\*** (1996), "AASHTO Layer Coefficients for Cement-Stabilized Soil Bases", *ASCE Journal of Materials in Civil Engineering*, Vol. 8, No. 2, pp.83-87.

**Richardson, D.N.\*\*** (1991), "Review of Variables That Influence Measured Concrete Compressive Strength", *ASCE Journal of Materials in Civil Engineering*, Vol. 3, No. 2, pp. 95-112.

**Richardson, D.N.\*\*** (1990), "Effects of Testing Variables on the Comparison of Neoprene Pad and Sulfur-Mortar Capped Concrete Test Cylinders", *ACI Materials Journal*, Vol. 87, No. 5, pp. 489-495.

**Richardson, D.N.\*\*** and Wiles, T.T.\* (1990), "Shale Durability Rating System Based on Loss of Shear Strength", *ASCE Journal of Geotechnical Engineering*, Vol. 116, No. 12, pp. 1864-1880.

**Richardson, D.N.\*\*** (1989), "Relationship of Point-Load Index to Compressive Strength of Concrete", *ACI Materials Journal*, Vol. 86, No. 4, pp. 409-416.

**Richardson, D.N.\*\***, Stephenson, R.W., and Molloy, D. (1987), "Soil Shrinkage-Induced Failure of a Foundation", *ASCE Journal of the Performance of Constructed Facilities*, Vol. 1, No. 4, pp. 210-228.

**Richardson, D.N.\*\*** and Long, J.\* (1987), "The Sieved Slake Durability Test", *Journal of the Association of Engineering Geologists*, Vol. XXIV, No. 2, pp. 247-258.

## **BOOKS/SPECIAL PUBLICATIONS/SPECIFICATIONS**

Mullarky, J.I., Parkes, N.K., **Richardson, D.N.**, Roberts, J.W., Smith, K.D., and Smith, T.J., (2015), **ACI 325.9R-15**, "Guide for Construction of Concrete Pavements", (Richardson: Chapters 5.10 - Opening to Traffic, Chapter 5.11- Quality Control and Quality Assurance, and Chapter 5.12 – Inspection), *American Concrete Institute*, 62 pp., ISBN 978-1-942727-31-6.

Luke, A., Bognacki, C., Castles, B., Cook, J.E., Jenkins, R.S., Leming, M.L., Lobo, C.L., Luciano, J.J., Parnes, J., **Richardson, D.N.**, Sullivan, P.J.E., Takhtovich, E., Vogt, W.L. and Werner, O.R., (2011), **ACI 214R-11**, "Guide to Evaluation of Strength Test Results of Concrete", *American Concrete Institute*, 52 pp., ISBN 978-0-87031-423-0.

Bartlett, F.M., Kaufman, A.L., **Richardson, D.N.**, and Vogt, W.L., (2010), **ACI 214.4R-10** "Guide for Obtaining Cores and Interpreting Compressive Strength Results", *American Concrete Institute*, 17 pp., ISBN 978-0-87031-254-0.

**Richardson, D.N.** (1991), "Review of Variables That Influence Measured Concrete Compressive Strength", *National Ready Mix Concrete Publication No. 170* and *National Aggregate Association Circular No. 132*, Silver Spring, Maryland, 17 pp.

## **BOOKS/SPECIAL PUBLICATIONS/SPECIFICATIONS PENDING**

**Richardson, D.N.\*\***, Cost, V.T., Holland, J., and Taylor, P., **ACI 325D**, "Guide for Design and Proportioning of Mixtures for Concrete Pavements", *American Concrete Institute*, in TAC-review.

Kazanis, K, Birdwell, B., Buzelli, D., Cook, M., Gaspey, B., Holland, J., Parkes, N, **Richardson, D.N.**, Rodden, R., Scurto, G., Tu, D., Tull, C., Varner, R., **ACI 330.X**, "Guide for Design and Construction of Concrete Site Paving for Industrial and Trucking Facilities", *American Concrete Institute*, in TAC-review.

## **PUBLISHED TECHNICAL REPORTS**

**Richardson, D.N.**, (2015), "Volume I: Summary Report", *MoDOT Pavement Preservation Research Program*, MoDOT TRyy1141, 51 pp.

**Richardson, D.**, Lusher, S.M., Boeckmann, A., and Luna, R., (2015), "Volume II: Data Collection for Pavement Management: Historical Data Mining and Production of Data", *MoDOT Pavement Preservation Research Program*, MoDOT TRyy1141, 159 pp.

**Richardson, D.** and Lusher, S.M., (2015), "Volume III: Development of Pavement Family and Treatment Performance Models", *MoDOT Pavement Preservation Research Program*, MoDOT TRyy1141, 57 pp.

**Richardson, D.N.** and Lusher, S.M., (2015), "Volume VI: Pavement Treatment Trigger Tables/Decision Trees and Treatment Candidate Selection Process", *MoDOT Pavement Preservation Research Program*, MoDOT TRyy1141, 122 pp.

**Richardson, D. N.**, Anderson, N., Boeckmann, A.Z., Luna, R., Lusher, S.M., Rosenblad, B., Sneed, L., (2014), "NUTC/MoDOT Pavement Preservation Research Program," **NUTC Project 00039112**, National University Transportation Center, Rolla, Missouri, <http://transportation.mst.edu/research/r300/>, 228 pp.

**Richardson, D.N.**, and Lusher, S.M.\* (2013), "The Guayule Plant: A Renewable, Domestic Source of Binder Materials for Flexible Pavement Mixtures", **New Ideas for Highway Systems, NCHRP-IDEA Project 143**, Trans. Res. Board, Washington, D.C., pp. 149-154.

Maerz, N.H., and **Richardson, D.N.** (2013), "Aggregate Shape Characterization Using Digital Image Processing", **New Ideas for Highway Systems, NCHRP-IDEA Project 78**, Trans. Res. Board, Washington, D.C., p. 75.

**Richardson, D.N.\*\***, Beckemeier, K.W.\* , and Davis, D.D.\* (2012), "Evaluation of HVFA Cementitious Paste and Concrete Mixtures," **Final Report A, TRyy1110**, Missouri Department of Transportation, 252 p.

**Richardson, D.N.\*\*** (2009), "Quick Test for Percent Deleterious Material", **Contract No. RI07-052**, Missouri Department of Transportation, 166 p.

**Richardson, D.N.\*\*** (2009), "Quick Test for Durability Factor Estimation", **Contract No. RI07-042**, Missouri Department of Transportation, 113 p.

**Richardson, D.N.\*\*** and Lusher, S.M.\* , (2009), "Resilient Moduli of Granular Base Materials Using a Modified Type 5 Gradation", **Contract No. RI08-021**, Missouri Department of Transportation, 40 p.

**Richardson, D.N.\*\***, Petry, T.M., Ge, L., Han, Y.P., and Lusher, S.M.\* , (2009), "Resilient Moduli of Typical Missouri Soils and Unbound Granular Base Materials", **Contract No. RI06-001, MoDOT**, Missouri Department of Transportation, 235 p.

**Richardson, D.N.\*\*** and Lusher, S.M.\* , (2008), "Determination of Creep Compliance and Tensile Strength of Hot-Mix Asphalt for Wearing Courses in Missouri", **Contract No. RI05-052**, Missouri Department of Transportation, 68 p.

**Richardson, D.N.\*\*** and Lusher, S.M.\* , (2006), "Calibration of the CoreLok Method for Determination of Missouri Aggregate Specific Gravities", **Contract No. RI06-017**, Missouri Department of Transportation, 37 p.

**Richardson, D.N.\*\*** (2006), "Strength and Durability Characteristics of a 70% Ground Granulated Blast Furnace Slag Concrete Mix", **Project No. R199-035**, Missouri Department of Transportation, 134 p.

**Richardson, D.N.\*\*** (2005), "Aggregate Gradation Optimization", **Task Order No. R198-035**, Missouri Department of Transportation, 111 p.

Maerz, N.H. and **Richardson, D.N.** (2002), "Aggregate Shape Characterization Using Digital Image Processing", **IDEA Final Report, NCHRP-78**, Trans. Res. Board, Washington, D.C., 51 p.

**Richardson, D.N.\*\***, Morrison, W.J.\* , Kremer, P.A.\* , and Hubbard, K.M. (1996) "Determination of AASHTO Drainage Coefficients", **MCHRP Final Report, Study 90-4**, Missouri Department of Transportation, 194 p.

**Richardson, D.N.\*\***, and Hubbard, K.M. (1996) "Determination of AASHTO Drainage Coefficients: Missouri Climatological Data", **MCHRP Final Report, Study 90-4**, Missouri Department of Transportation, 204 p.

**Richardson, D.N.\*\***, and Kremer, P.A.\* (1994), "Determination of AASHTO Layer Coefficients, Vol. II: Unbound Granular Bases and Cement Treated Bases", **MCHRP Final Report, Study 90-5**, Missouri Department of Transportation, 166 p.



**Richardson, D.N.\*\***, Lambert, J.K.\* and Kremer, P.A.\* (1994), "Determination of AASHTO Layer Coefficients, Vol. I: Bituminous Materials", **MCHRP Final Report, Study 90-5**, Missouri Department of Transportation, 237 p.

Cole, N.A., Stevens, G.T., Heagler, J.B. and **Richardson, D.N.** (1982), "Research Alternative Uses of Wastes Created by Industry's Use of High-Sulfur Coal", Office of Environmental Affairs, **Louisiana Department of Natural Resources**.

## **PEER-REVIEWED CONFERENCE PROCEEDINGS (Full-length)**

Han, Y-P.\*, Petry, T.M., and **Richardson, D.N.** (Jan. 2006), "A Systems Approach for Estimating Field Moisture Contents", Compendium of papers, **85<sup>th</sup> Annual Meeting of the Transportation Research Board**, CD-ROM, National Research Council, Washington, D.C..

**Richardson, D.N.\*\***, (July, 1998), "Making Concrete Less Abstract", Proceedings: **Fifth Annual Undergraduate Faculty Enhancement Workshop/Symposium**, Univ. Of Calif.- Berkeley, Berkeley, California.

**Richardson, D.N.\*\***, (May, 1985), "Relative Durability of Shale-A Suggested Rating System", **Proceedings of the 36th Annual Highway Geology Symposium**, Clarksville, Indiana.

## **NON-REFEREED CONFERENCE PROCEEDINGS (Full-length)**

Richardson, D.N. (April, 1995), "D-Cracking of Concrete Pavements", **Missouri Concrete Conference**, Rolla, Missouri.

Richardson, D.N. (Nov. 9-10, 1994), "Estimation of Resilient Modulus of Coarse-Grained Granular Base Materials", **37<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri.

Richardson, D.N. (Nov. 9-10, 1994), "Estimation of Resilient Modulus of Fine-Grained Subgrade Soils", **37<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri.

Richardson, D.N. (Nov. 9-10, 1994), "Estimation of Drainage Coefficients", **37<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri.

Richardson, D.N. (Nov. 1987), "Parking Lot Flexible Pavement Design: State of the Practice in Missouri", **30<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri.

Richardson, D.N. (Nov. 1985), "Evaluation and Preparation of Roadway Subgrades", **28<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri.

## **WORKSHOP PROCEEDINGS**

**Richardson, D. N.** (2011), "Short Course Notebook", **Ignition Oven Binder Content Testing QC/QA Short Course**, Rolla, Missouri.

**Richardson, D. N.** (2006), "Short Course Notebook", **Aggregate Consensus Testing QC/QA Short Course**, Rolla, Missouri.

Richardson, D. N. (2006), "Short Course Notebook", **Tensile Strength Ratio QC/QA Short Course**, Rolla, Missouri.

Richardson, D. N. (2001), "Short Course Notebook", **Level 2 Bituminous QC/QA Short Course**, Rolla, Missouri.

Richardson, D. N. (1998), "Short Course Notebook", **Superpave QC/QA Short Course**, Rolla, Missouri.

Richardson, D.N. (1988), "Workshop Notebook", **Pavement Design and Analysis Computer Workshop**, Rolla, Missouri.

## OTHER REPORTS/NON-REFEREED PUBLICATIONS

Lusher, S.M.\* and Richardson, D.N. (2006), "Enhancement of the California Bearing Ratio Test", Department of Civil Engineering, University of Missouri-Rolla, Rolla, Missouri, 28 p.

Wilson, P.\* and Richardson, D.N. (2001), "Aggregate Optimization of Concrete Mixtures", Special Report, Department of Civil Engineering, University of Missouri-Rolla, Rolla, Missouri, 18 p.

Richardson, D.N. and Kotteman, J.\* (1989), "Relationship of Durability of Shale to Soaked Compression and Static Compaction Characteristics", Special Investigation, Department of Civil Engineering, University of Missouri-Rolla, Rolla, Missouri.

Richardson, D.N. (1989), "Testing Variables Affecting the Compressive Strength of Concrete Cylinders", Special Report, Department of Civil Engineering, University of Missouri-Rolla, Rolla, Missouri.

Richardson, D.N. and Layman, R.S.\* (1988), "Effect of Flyash in Bituminous Pavement Mixtures on Retained Strength", Special Investigation, Department of Civil Engineering, University of Missouri-Rolla, Rolla, Missouri.

Richardson, D.N. and Wiles, T.\* (1987), "Relationship of California Bearing Ratio and Durability of Shale", Special Investigation, Department of Civil Engineering, University of Missouri-Rolla, Rolla, Missouri.

Richardson, D.N. (Dec. 1984), "Highlights of UMR's 27<sup>th</sup> Annual Asphalt Conference and Workshop", **Mid-West Contractor**, Kansas City, Missouri.

## INVITED CONFERENCE PRESENTATIONS

"MoDOT Pavement Preservation Study", **58<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri (Nov. 2015).

"ACI 325 Guide for Design and Proportioning of Concrete Mixtures for Pavements", **ACI Spring National Convention**, Reno, Nevada (March 24, 2014).

"MoDOT Pavement Preservation Research Program", **2<sup>nd</sup> Annual CIES Transportation Research Conference**, Jefferson City, Missouri (September 13, 2013).

Lusher, S.M. and **Richardson, D.N.**, "High RAP/Shingle Mix Binder Modifiers Derived from the Guayule Plant," **55<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri (December 4, 2012)

"High Volume Flyash Concrete in Missouri", **Missouri Concrete Conference**, Rolla, Missouri (April 26, 2012)

"Strength Testing: Effect of Specimen Size", **Missouri Concrete Conference**, Rolla, Missouri (April 27, 2012)

"Poor Testing Techniques and Consequences for the Entire Project Team", **Concrete Council of St. Louis**, St. Louis, Missouri (September 22, 2011)

“Poor Testing Techniques and Consequences” **Missouri Concrete Conference**, Rolla, Missouri (April 26, 2011)

“Basis for Acceptance: Lab Cured vs. Field Cured Specimens”, **Missouri Concrete Conference**, Rolla, Missouri (May 4, 2010)

**Richardson, D.N.**, and Snell, L., “Living With Variations in Slump”, **ACI National Convention**, St. Louis, Missouri (Nov. 2008)

“Asphalt Program at UMR”, **50<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri (Nov. 2007).

“The Asphalt Conference: The First 50 Years”, **50<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri (Nov. 2007).

“Concrete Research at UMR”, **Missouri Concrete Conference**, Rolla, Missouri (April 3, 2007).

“UMR’s Asphalt Program”, **49<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri (Nov. 2006).

“ACI Activities”, **Missouri Concrete Conference**, Rolla, Missouri (April 5, 2006),

“Concrete Testing in the Field”, **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (March, 2005).

“Concrete Testing in the Lab”, **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (March, 2005).

“Elements of Successful Chapter Seminars”, **ACI National Convention**, Washington, D.C. (March, 2004).

“Concrete Testing: The What, Where, How, and Why”, **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (March, 2004).

“Case Study: Use of Ground Granulated Blast Furnace Slag”, **Missouri Concrete Conference**, Rolla, Missouri (April 8, 2003).

“Concrete Basics”, **Missouri Concrete Conference**, Rolla, Missouri (April 8, 2003).

“From Placing to Sawing”, **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (March, 2003).

“Nurturing Concrete Slabs During Gestation”, **Dept. of Civil Engineering Materials Area Seminar Series**, Rolla, Missouri (Feb. 21, 2003).

“UMR’s New Concrete Laboratories”, **Missouri Concrete Conference**, Rolla, Missouri (April 9, 2002).

“Inspection Basics”, **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (March, 2002).

“Paving Basics”, **MoDOT District 6 Presentation**, Chesterfield, Missouri (February, 2002).

“UMR’s New Asphalt Laboratory”, **44<sup>th</sup> Annual Asphalt Conference**, Rolla, Missouri (Nov. 2001)

“Intent of the Specifications”, **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (March, 2001).

“Basics of Concrete Testing”, **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (March 7, 2000).

"Glasphalt Update", **42<sup>nd</sup> Annual Asphalt Conference**, Rolla, Missouri (Nov.17, 1999).

"Certification: Superpave QC/QA", **42<sup>nd</sup> Annual Asphalt Conference**, Rolla Missouri (Nov.17, 1999).

"Recent Developments in Highway Materials Engineering", **Dept. of Civil Engineering Graduate Seminar Series**, Rolla, Missouri (Oct.14, 1999).

"Effects of Variables on Slump Test Results", **Missouri Concrete Conference**, Missouri (April 26-27,1999).

"Testing Do's and Don'ts", **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Kansas (1999).

"Concrete Properties Affecting Performance", **ACPA Missouri-Kansas Paving Conference**, ACPA , Kansas City, Kansas March,1999)

"Testing: What It Can Do for You", **Missouri Concrete Conference**, Rolla, Missouri (1998).

"Testing Do's and Don'ts", **ACPA Missouri-Kansas Paving Conference**, ACPA, Kansas City, Missouri (1998).

"Superpave Laboratory/Field Testing Equipment", **39th Annual Asphalt Conference**, Rolla, Missouri (1996),

"Materials' Property Estimation for the Practicing Engineer", **Department of Civil Engineering Graduate Seminar Series**, Rolla, Missouri (1996).

"Impact of Improper Testing", **Missouri Concrete Conference**, Rolla, Missouri (1996).

"Variables That Influence Measured Concrete Strength", **ACPA 2nd Annual Meeting, Illinois Chapter**, Springfield, Illinois (1996).

"Use of Portland Cement in Concrete", **American Ceramic Society, UMR Student Chapter**, UMR, Rolla, Missouri (1995)

"Poor Specifications/Design Details", **ACI Missouri Chapter Meeting**, St. Louis, Missouri (1995).

"Flexural vs Compressive Strength—A Comparison", **Missouri Concrete Conference**, Rolla, Missouri (1995).

"Base Drainage", **ACPA Missouri-Kansas Paving Conference**, Kansas City, Kansas (1995).

"AASHTO Pavement Design Method—New Developments", **37th Annual Asphalt Conference**, Rolla, Missouri (1994).

"Soil—Cement Base Study", **Missouri Concrete Conference**, Rolla, Missouri (1994).

"Determination of AASHTO Layer and Drainage Coefficients for Pavement Design", **Department of Civil Engineering Graduate Seminar Series**, Rolla, Missouri (1993).

"Effects of Poor Test Cylinder Procedures", **Missouri Concrete Conference**, Rolla, Missouri (1989).

"Proper Cylinder Testing - Cradle to Grave", **29th Annual Meeting, Missouri Concrete Association**, Lake Ozark, Missouri (1989).

"Parking Lot Design: Current Practice", **30th Annual Asphalt Conference**, Rolla, Missouri (1987).

"Evaluation and Preparation of Subgrades", *28th Annual Asphalt Conference*, Rolla, Missouri (1985).

## RESEARCH GRANTS AND CONTRACTS

### Sponsors:

#### National:

- National Academy of Science (NAS)
- National Science Foundation (NSF)
- American Society of Engineering Educators (ASEE)

#### Regional:

- Midwest Transportation Center (MATC)
- National University Transportation Center (NUTC)
- University Transportation Center (UTC)

#### State:

- Missouri Dept. of Transportation (MoDOT)
- Missouri Asphalt Pavement Association (MAPA)
- Industrial

### Externally Sponsored Research Summary

Role	Grants (2014 dollars)	Number Projects
PI	<b>3,103,556</b>	<b>18</b>
Co-PI	<b>94,164</b>	<b>2</b>
<b>Total</b>	<b>3,108,164</b>	<b>20</b>

#### External (not 2014 dollars)

Title: ***MoDOT Pavement Preservation Research Program***  
 Total Amount: **\$1,429,187**  
 Match Amounts: \$813,158 (MoDOT); \$500,000 (NUTC); \$116,029 (UMC)  
 Sponsor: MoDOT  
 Dates: June 2012- August 2014  
 PI: David Richardson  
 Co-PIs: Neil Anderson, Andrew Boeckmann, Ronaldo Luna, Michael Lusher, Brent Rosenblad, Lesley Sneed

Title: ***Design & Evaluation of HVFA Concrete Mixes***  
 Total Amount: **\$150,000**  
 Match Amounts: \$100,000 (MoDOT); \$50,000 (NUTC)  
 Sponsor: MoDOT  
 Dates: Dec. 6, 2010- May 31, 2012  
 PI: Jeffery Volz  
 Co-PIs: David Richardson (20%) and John Myers

Title: ***The Guayule Plant: A Renewable Source of Binder of Materials for Flexible Pavement Mixtures***  
 Total Amount: **\$286,359**  
 Match Amounts: \$ 99,996 (NAS); \$45,000 (MAPA); \$95,449 (NUTC); \$45,914 (P.I.'s Missouri S&T fixed price accounts)  
 Sponsors: NAS; MAPA  
 Dates: Feb 1, 2009-July, 2012  
 PI: David Richardson

Title: ***Resilient Moduli of Type 5 Granular Base Materials***  
 Amount: **\$ 7434** from the sponsor  
 Sponsor: MoDOT  
 Dates: June 15- August 15, 2008  
 PI: David Richardson

Title: ***Concrete Durability Factor Estimation (Quick Test for Durability Factor Estimation)***  
 Total Amount: **\$102,486**  
 Match Amounts: \$59,997 (MoDOT); \$34,162 (UTC); \$8327 (P.I.'s UMR fixed price accounts)  
 Sponsor: MoDOT  
 Dates: Dec. 2007-March 2009  
 PI: David Richardson

Title: ***Innovative Deleterious Material Test (Quick Test for Percent of Deleterious Material)***  
 Total Amount: **\$ 70,184**  
 Match Amounts: \$44,812 (MoDOT); \$ 23,372 (UTC); \$2000 (UMR)  
 Sponsor: MoDOT  
 Dates: Dec. 2007-July 2009  
 PI: David Richardson

Title: ***Calibration of CoreLok Method for Determination of Missouri Aggregate Specific Gravities***  
 Total Amount: **\$5327**  
 Match Amounts: \$4946 (MoDOT); \$291 (P.I.'s UMR fixed price accounts)  
 Sponsor: MoDOT  
 Dates: May 2006-June 2006  
 PI: David Richardson

Title: ***Resilient Moduli of Typical Missouri Soils and Unbound Granular Base Materials***  
 Total Amount: **\$150,004**  
 Match Amounts: \$100,004 MoDOT); \$50,000 (UTC)  
 Sponsor: MoDOT  
 Dates: March 2005-Jan 2009  
 PI: David Richardson (50%)  
 Co-PIs: Thomas Petry, Louis Ge

Title: ***Determination of Creep Compliance and Tensile Strength of Hot-Mix Asphalt for Wearing Courses in Missouri***  
 Total Amount: **\$180,414**  
 Match Amounts: \$57,769 (MoDOT); \$60,247 (UTC); \$62,398 (P.I.'s UMR fixed price accounts)  
 Sponsor: MoDOT  
 Dates: Dec. 2005-Jan. 2008  
 PI: David Richardson

Title: ***Strength & Durability Characteristics of a 70% GGBFS Concrete Mix***  
 Total Amount: **\$12,443**  
 Match Amounts: \$10,764 (MoDOT); \$1669 (P.I.'s UMR fixed price account)  
 Sponsor: MoDOT  
 Dates: July-October, 2005  
 PI: David Richardson

Title: ***Aggregate Gradation Optimization***  
 Total Amount: **\$12,167**  
 Match Amounts: \$10,194 (MoDOT); \$1973 (P.I.'s UMR fixed price accounts)  
 Sponsor: MoDOT  
 Dates: 2001  
 PI: David Richardson

Title: ***Aggregate Shape Characterization Using Digital Image Processing***  
Total Amount: **\$72,756**  
Match Amounts: \$69,118 (NAS); \$3638 (P.I.'s UMR fixed price accounts)  
Sponsor: NAS  
Dates: 2000  
PI: Norbert Maerz  
Co-PI: David Richardson (53%)

Title: ***Acquisition of Automatic Pavement Analyzer***  
Total Amount: **\$80,376**  
Match Amounts: \$40,188 (MAPA); \$40,188 (P.I.'s UMR fixed price accounts)  
Sponsor: Missouri Asphalt Pavement Assoc. (MAPA)  
Dates: 2000  
PI: David Richardson

Title: ***Effects of Contaminants of Bond on Reinforcing Bars***  
Total Amount: **\$62,200**  
Match Amounts: \$20,000 from the sponsors; \$20,000 (UTC), \$15,000 (MRTC), \$7200 Co-P.I.'s UMR fixed price accounts)  
Sponsors: McCarthy (\$4500), Site Advancement Foundation (\$2500), AGC (\$1000), St. Louis CTAF (\$5000), Ind. Advancement Fund (\$5000), So. Ill. Const. Advance. Pgm. (\$1000), Erectors & Riggers (\$1000)  
Dates: June 2000-May 2001  
PIs: D.J. Belarbi and David Richardson (56%)

Title: ***Start-up of Superpave QC/QA Short Course***  
Total Amount: **\$23,527**  
Match Amounts: \$15,898 (MATC); \$7629 (P.I.'s UMR fixed price accounts)  
Sponsor: MATC  
Dates: Sept. 1997  
PI: David Richardson

Title: ***Determination of AASHTO Layer Coefficients***  
Total Amount: **\$63,686** (MHTD)  
Sponsor: Missouri Highway and Transportation Dept. (MHTD)  
Dates: 1990-1994  
PI: David Richardson

Title: ***Determination of AASHTO Drainage Coefficients***  
Total Amount: **\$38,924** (MHTD)  
Sponsor: Missouri Highway and Transportation Dept.  
Dates: 1990-1994  
PI: David Richardson

Title: ***Undergraduate Construction Materials Laboratory Computer-Based Instrumentation***  
Total Amount: **\$4175**  
Sponsor: NSF  
Dates: 4-1-91 to 9-30-92  
PI: David Richardson

Title: ***New Engineering Educator Award***  
Amount: **\$5000** (ASEE)  
Sponsor: American Society of Engineering Educators (ASEE)  
Dates: 1988  
PI: David Richardson

Title: ***Strength Characteristics of Latex Modified Concrete***  
Amount: **\$12,965** from the sponsor  
Sponsor: Weldon Springs Fund, Univ. of Missouri  
Dates: 1986  
PI: David Richardson

## Internal

Title: ***Effect of Beam Testing Variables on Flexural Strength***  
Amount: **\$750** from the sponsor  
Sponsor: UMR Alumni Development  
Dates: 2000  
PI: David Richardson

Title: ***Aggregate Contribution to VMA Collapse***  
Amount: **\$1000** (OURE)  
Sponsor: Office of Undergraduate Research Education, UMR  
Dates: 1995  
PI: David Richardson

Title: ***Aggregate Durability***  
Amount: **\$650** (OURE)  
Sponsor: Office of Undergraduate Research Education, UMR  
Dates: 1991  
PI: David Richardson

## GRADUATE STUDENT DEVELOPMENT

### Doctor of Philosophy:

Michael Lusher, expected graduation: May, 2016  
Dissertation: *High RAP/Shingle Mix Binder Modifiers Derived from the Guayule Plant*

Y. P. Han, graduated December, 2005  
Dissertation: *Resilient Modulus Estimation System*

David Blanpied, graduated: 1995  
Dissertation: *D-Crackability: A Finite-Element Measure*

### Masters of Science:

Joe Clendenen, expected graduation: 2016  
Thesis: *Effect of Testing Variables on Beam Strength Results*

Clayton Reichle, graduated: August, 2013  
Thesis: *"Effect of Mix Parameters on Longevity of Bituminous Mixtures"*

Karl Beckemeier, graduated: December, 2012  
Thesis: *Effect of High Volumes of Fly Ash on Cement Paste*

Drew Davis, graduated: December, 2012  
Thesis: *Effects of High Volume Flyash and Powder Activators on Plastic and Hardened Concrete Properties*

Christopher Davis, graduated: December 2011  
Thesis: *Influence of Particle Size and Specimen Preparation on the Iowa Pore Index*

Gary Davis, graduated: December 2008  
Thesis: *Estimation of Deleterious Materials*

Justin Carr, graduated: August 2008  
Thesis: *Estimation of Concrete Durability Factor*

Brent Whitwell, graduated: December 2006  
Thesis: *Effect of Mix Variation on Flexural Strength*



Michael Lusher, graduated: May 2004  
Thesis: *Prediction of the Resilient Modulus of Unbound Granular Base and Subbase Materials Based on the California Bearing Ratio and Other Test Data*

Joseph Molinaro, graduated: 2003  
Thesis: *Particle Shape Video Imaging: Flat and Elongated Aggregate Analysis*

Larry Taber, graduated: 2001  
Thesis: *Effect of Contamination on the Steel-Concrete Bond During Concrete Construction*  
Co-advisor

Y.P Han, graduated: 1996  
Non-Thesis Topic: *Soil Stabilization Expert System*

Mark Gawedzinski, graduated: 1993  
Thesis: *An Evaluation of the Use of Thermoplastics in Concrete Masonry*

Thomas Abkemeier, graduated: 1992  
Thesis: *Indirect Tensile Test Correlative Study*

Rodney Joel, graduated: 1990  
Thesis: *A Method for Controlling Concrete Workability Using Aggregate Gradation Control*

John Kotteaman, graduated: 1989  
Non-Thesis Topic: *Relationship of Durability of Shale to Soaked Compression and Static Compaction Characteristics*

Timothy Wiles, graduated: 1988  
Thesis: *A Shale Durability Rating System Based on Shear Strength*

John Long, graduated: December 1987  
Thesis: *Optimization of Richardson's Shale Durability Rating System*

## **GRADUATE COMMITTEE MEMBERSHIP**

### **Doctor of Philosophy**

Joseph Wilson  
Mahdi Arezoumandi  
L.K. Crouch  
Engin Koncagal  
Yumin Yang  
Mamuht Ekenal  
Sutton Stephens  
Adam Sevi  
Carlos Ortega  
Many more

### **Masters of Science**

Trevor Looney  
Kyle Holman  
Brian Tucker  
Kyle Marley  
Michael Wolfe  
Brian Swift  
Edwin Reeves  
Drew Sielbach  
Thomas Smith  
Hsun-Ming Chang  
Donald Simpson

Nouri Ourfali  
Dathan Jones  
Chris Brammeier  
Brian Carlson  
Noppadol Jaisue  
Chao-Wang Yeh  
Greg Rice  
Tint Lwin  
Hta Hta Nyunt  
Htay Kyaw  
Janet Fraley  
Kent MacPeak  
Patrick Harrington  
Houshmond Hossaingholi  
Eric Lidholm  
Dave Schledorn  
Kathy Wertis  
R. Prezbindowski  
Many more

#### **UNDERGRADUATE RESEARCH ADVISOR**

Michael Ax  
Tiffany Benda  
Hans Buckwalter  
Mariola Bush  
Ronald Hamm  
Steven Jackson  
Preston Kramer  
Scott Kutter  
Rodney Layman  
Katherine Ragan  
Carla Ross  
Timothy Wiles  
Philip Wilson  
James Wright  
R. Zankawisc  
Keith Fiebig  
R. Hiller  
S. Davies  
Several more

## **TEACHING**

## TEACHING

### SUMMARY OF UNIVERSITY COURSES TAUGHT

#### Undergraduate:

- 1984-2015 CE 216 Construction Materials
- 1983-1984 CE 229 Foundation Engineering I
- 1980-1982 CE 215 Soil Mechanics Laboratory
- 1986-present CE 298 Civil Engineering Design Project (team advisor-72 teams)

#### Undergraduate/ Graduate:

- 2008-present CE 356 Concrete Pavement Design
- 2007-present CE 317 Asphalt Pavement Design
- 1985-present CE 312 Bituminous Materials
- 1984-present CE 313 Properties of Concrete
- 1986-2005 CE 317 Pavement Design
- 1983 CE 329 Foundation Engineering II

#### Graduate:

- 1998, 2002 CE 401 Advanced Construction Materials Laboratory
- 1992 CE 401 Advanced Construction Materials
- 1986 CE 401 Advanced Properties of Concrete

### CURRICULUM DEVELOPMENT

- 2008 CE356 Concrete Pavement Design
- 2007 CE317 Asphalt Pavement Design
- 1998 CE401 Advanced Construction Materials Laboratory
- 1992 CE401 Advanced Construction Materials
- 1986 CE317 Pavement Design
- 1986 CE401 Advanced Properties of Concrete
- 1985 CE312 Bituminous Materials
- 1984 CE313 Properties of Concrete
- 1984 CE216 Construction Materials

### EVALUATION OF INSTRUCTIONAL QUALITY

#### Summary Results of CET Evaluations:

Course	Years Offered	Number Sections	Mean Enrollment	Mean Score	Std. Dev.
CE 229 Foundation Engineering	1982-1984	5	25	3.6	0.2
CE 216 Construction Materials	1984-2015	89	33	3.4	0.2
CE 312 Bituminous Materials	1985-2012	17	11	3.6	0.3
CE 313 Properties of Concrete	1985-2015	21	19	3.6	0.2
CE 317 Asphalt Pavement Design	1986-2015	19	19	3.5	0.2
CE 356 Concrete Pavement Design	2008-2014	4	28	3.7	0.1
CE 401 Advanced Construction Materials	1992	1	2	4.0	--
<b>Overall</b>		<b>156</b>	<b>23</b>	<b>3.5*</b>	<b>0.2</b>

\* Campus mean score = 2.9/4.0

**Number of sections taught per year = 5, not including advising 74 CE 298 teams**

## **Teaching Pedagogical Activity**

### **Departmental**

**Chair**, Quality in the Classroom Task Force

### **Campus**

Communicating-Across-the-Curriculum Task Force  
Communication Committee  
Communication Implementation Committee  
WAC Director Search Committee

## **UNIVERSITY SERVICE**

## UNIVERSITY SERVICE

### ENDOWMENTS DEVELOPED

Title:	MAPA Graduate Student Fellowship
Amount:	<b>\$10,000</b> (MAPA)
Sponsor:	Missouri Asphalt Pavement Association
Dates:	2000
Title:	MAPA Flexible Pavements Professorship
Amount:	<b>\$550,000</b> (MAPA)
Sponsor:	Missouri Asphalt Pavement Association
Dates:	2011

### ADMINISTRATIVE RESPONSIBILITY

1996-2011	Area Coordinator, Construction Materials
1992-1996	Area Coordinator, Construction Materials, Construction, & Transportation
1984-1992	Area Coordinator, Construction Materials
1984-1992	Area Coordinator, Construction

### DEPARTMENTAL COMMITTEES

#### Chair

2014	Freshman Visit Coordinator
2012-2015	MAPA Professor Search Committee
2012	Phone-a-thon Director
2011-2012	Structures Faculty Search Committee
2009-2010	Strategic Planning Committee
2006-2007	Civil Engineering Undergraduate Program Committee
2005	Phone-a-thon Director
1990-2003	Extension Committee
2000-2001	G. Chen Mentoring Committee
1997-1999	Long Range Planning Curriculum Subcommittee
1994-1998	Quality in the Classroom Task Force
1995-1998	CE Finance Committee
1997-1998	Transportation Faculty Search Committee
1991-1997	Infrastructure Research Committee
1996	Senior Trip Task Force
1991-1992	Student Recruitment Committee

#### Member

2013-2014	Graduate Student Support Policy Task Force
2013-2014	Equipment Use Task Force
2008-present	MAPA Professor Search Committee
2003-2014	Graduate Affairs Committee
2002-2013	Civil Engineering Program Committee
2008-2009	Architectural Engineering Program Committee
2006-2011	Jones Chair Search Committee
2006-2007	Transportation Faculty Search Committee
2002-2005	G. Morrison Mentoring Committee
1998-2004	New Building Equipment Committee
2002-2004	CE Faculty Search Committee

2003	ArchE Program Committee
1998-2003	New Building Committee
1998-2003	Scholarship Committee
2002	GTA Task Force
1998-2002	Curriculum Committee
1988-2001	Freshmen Engineering Presenter
1984-2001	University-Day Open House Committee
1998-1999	Undergraduate Affairs Committee
1996-1999	Long Range Planning Committee
1998-1999	CE Chairman Search Committee
1998-1999	Scholastic Action Committee
1995-1996	Construction Faculty Search Committee
1995-1996	Jones Chair Search Committee
1994-1995	CE Chairman Search Committee
1989-1991	Capstone Course Development Committee
1985-1989	Curriculum Committee
1986-1988	Scholastic Action Committee
1986-1987	CE Chairman Search Committee
1985-1987	Faculty Recording Secretary
1985-1987	Student Recruitment Committee

## **UNIVERSITY/SCHOOL COMMITTEES**

1992-2007	Freshmen Engineering Advisor
2006	Freshmen Engineering Program Director Search Committee
1989-present	UMR Doctoral Faculty
1986-present	UMR Graduate Faculty
1995-1996	WAC Director Search Committee
1996-1998	Communication Implementation Committee
1995	Communication Committee
1994-1995	Communication-Across-the-Curriculum Task Force
1990	Extension Director Search Committee
1987-1988	Grievance Hearing Panel



**PROFESSIONAL COURSE DEVELOPMENT  
(Continuing Education)**

## PROFESSIONAL COURSE DEVELOPMENT AND INSTRUCTION

### CONFERENCES/SESSIONS ORGANIZED and DIRECTED

Years	Number of Annual Conferences	Conference
1985-2015	31	Annual Asphalt Conference
1986-2016	31	Missouri Concrete Conference
2014	1	ACI National Meeting Paper Session
<b>Total</b>	<b>63</b>	

### CERTIFICATION SHORT COURSES ORGANIZED, DIRECTED, and INSTRUCTED Last Update: 2014

Academic Year	Number of Courses	Course Length (days)	Course
1998-2015	53	5	Superpave QC/QA Certification Course
2000-2014	55	2	Superpave QC/QA Re-Certification Course
2006-2015	19	1	TSR Certification Course
2006-2015	26	1	Aggregate Consensus Testing Certification Course
2010-2015	5	1	Binder Ignition Certification Course
1999-2000	8	2	Aggregate/QA Certification Course
1998	1	1	Pavement Design Workshop
<b>Total</b>	<b>167+</b>		

### Summary Results of Short Course Evaluations:

Short Course	Years Offered	Number of Courses	Mean Score
Level 2 Bituminous QC/QA Certification Course	1998-2014	52	3.6
Level 2 Bituminous QC/QA Re-Certification Course	2000-2014	51	3.6
		103	3.6

### ACI CERTIFICATION COURSES ORGANIZED and DIRECTED

Years	Number of Courses	Course
2010-2011	2	ACI Grade 1 Field Technician Certification
1996-2007	12	ACI Grade 1 Field Technician Certification
<b>Total</b>	<b>14</b>	

**LAST REVISION DATE**  
February 2, 2016