David Eugene Schaad, Ph.D., P.E., BCEE, D.WRE

Business Address:
Box 90287
Department of Civil and Environmental Engineering
Duke University
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Home Address:
201 Baynes Court
Chapel Hill, North Carolina 27517
(919) 240-4393

EDUCATION

Ph.D. in Civil Engineering, 1998, Duke University, Durham, North Carolina (Faculty Advisor: Zbigniew Kabala)
M.S. in Civil Engineering, 1991, University of Colorado, Boulder, Colorado (Faculty Advisor: Ken Strzepek)
B.A. in Physics and Mathematical Sciences (Double Major), 1990, Denison University, Granville, Ohio

PROFESSIONAL EXPERIENCE

Associate Professor of the Practice and Associate Chair (July 2008 – Present);
Adjunct Assistant Professor and Assistant Chair (December 2003 – June 2008)
Department of Civil and Environmental Engineering, Duke University, Durham, North Carolina

Senior Design Engineer (March 2008 – January 2010)
AMEC Earth and Environmental, Inc., Raleigh, North Carolina

Construction Operations Manager (June 2006-February 2010)
Royall Contractors, LLC, Durham, North Carolina

Senior Design Engineer (Dec. 2003-Dec. 2006); Vice President – Civil Engineering (Oct. 2000 – Nov. 2003)
Marshall Miller & Associates, Inc., Raleigh, North Carolina

Project Design Engineer (November 1999 – September 2000)
Appian Consulting Engineers, P.A, Wake Forest, North Carolina

Branch Manager (April – October 1999); Senior Project Engineer (April 1997 – March 1999)
Marshall Miller & Associates, Inc., Raleigh, North Carolina

Research Assistant (May 1996 – April 1997)
Department of Civil and Environmental Engineering, Duke University, Durham, North Carolina

Project Engineer (June 1991 – August 1995)
Parsons Engineering Science, Inc., Cleveland, Ohio

HONORS and AWARDS

Blue Ribbon "Teamwork" Award (DukeEngage Team) - 2007
Top 10 "Dukies of the Year" – Towerview Magazine - 2006
Earl I. Brown II Outstanding Civil Engineering Faculty Award – Chi Epsilon – 2006
Capers and Marion McDonald Award for Excellence in Mentoring and Advising - Pratt School of Eng. – 2006
Outstanding Volunteer Advisor - Leading at Duke Awards, Office of Student Activities and Facilities - 2006
HOPE Professor - Residence Life and Housing Services – 2006
Pi Mu Epsilon, National Mathematics Honorary - 1990
Sigma Pi Sigma, National Physics Honorary - 1990
Sigma Xi, National Scientific Research Society - 1990

PEER-REVIEWED PUBLICATIONS

7. "Design and Routing of Storm Flows in a Watershed without Surface Streams," D.E. Schaad, J. Farley, and C. Haynes, *Journal of Hydrology*, 375(3-4):334–344, 2009.

6. "A Perfect Storm: Examining Natural Disasters by Combining Traditional Teaching Methods with Service Learning and Innovative Technology," D.E. Schaad, L.P. Franzoni, C. Paul, A. Bauer, and K. Morgan, *International Journal of Engineering Education*, 24(3): 450-465, 2008.

5. "Design and Performance of a Multi-Purpose Constructed Wetland and Flow Equalization Basin," D.E. Schaad, W. 'Brent' Chambers, J.M. Halley and S. Denson, *Journal of Environmental Engineering*, 134:118-125, February 2008.

4. "Protecting Off-Site Populations and Site Workers from Vapor Discharges During Shallow Soil Mixing at the NCSU NPL Site," D.E. Schaad, J.M. Halley, and V. Alaimo, *Journal of the Air & Waste Management Association*, 57:1038-1049, September 2007.

3. "Using UCS as a Surrogate Performance Standard at the NCSU NPL Site," D.E. Schaad, J.M. Halley, and S.A. Wilson, *Journal of Environmental Engineering*, 132:1355-1365, October 2006.

2. "Dipole Flow Test with a Tracer: A New Single-Borehole Tracer Test for Aquifer Characterization," D.J. Sutton, Z.J. Kabala, D.E. Schaad, and N.C. Ruud, *Journal of Contaminant Hydrology*, 44:71-101, January 2000.

1. "Air sparging decision tool," L.A. Beabes, E.J. Karkalik, D.E. Schaad, and R.W. Volpi, *In Situ and On-Site Bioremediation*, 4(1): 227-232, 1997.

PEER-REVIEWED PUBLICATIONS SUBMITTED

1. "Chemical Cocktail and Density Driven Distribution: An examination of the groundwater impacts and remedial effectiveness at the NCSU NPL Site, " M.A. Hoff and D.E. Schaad, submitted to *Journal of Contaminant Hydrology*, April 2010.

CONFERENCE PROCEEDINGS, PRESENTATIONS and OTHER PUBLICATIONS

25. "Service Learning Summit," sponsored by ASCE/ASME/EWB, September 25-26, 2009, University of Colorado, Boulder.

24. "Engineering Change: Sustainable Development and Experiential Learning with the Duke Chapter of Engineers Without Borders," 2008 UCOWR/NIWR Annual Conference, Durham, North Carolina, July 22, 2008.

23. "Focus the Nation," Panel Discussion on Environmental Justice, Duke University, January 31, 2008.

22. "High School Counselors Visitation Day," Panel Discussion on DukeEngage, Duke University, January 29, 2008.

21. "Conversation on Environmental Justice" – Martin Luther King, Jr. Holiday, Home Depot Smart Home, January 21, 2008.

20. "Water: Availability, Quality and Global Health" – PPS 154/PPS 254/Law 364/Interdis 110B/Nursing 455 – November 1, 2007.

19. "Intersession of Disaster Preparedness," Panel Discussion Participant, School of Medicine, June 13, 2007.

18. "Examining Natural Disasters Using Service-Learning and Innovative Instructional Technology," D. E. Schaad, Presented at the *EPICS (Engineering Projects in Community Service) Conference*, May 22-24, 2007, University of California, San Diego.

17. "DukeEngage: A New Cooperative Paradigm for Civic Engagement and Engineering," D. E. Schaad, Poster Presented at the *EPICS (Engineering Projects in Community Service) Conference*, May 22-24, 2007, University of California, San Diego.

16. "Intersession of Disaster Preparedness," Panel Discussion Participant, School of Medicine, June 12-15, 2006.

15. "Instructional Technology and Service Learning," J. Ahern-Dodson, D.E. Schaad, and M. Simmermeyer, Panel Discussion at the CIT Showcase, April 27, 2006.

14. "Engineering the Future," D.E. Schaad, Honors Day Keynote Speaker, Denison University, April 11, 2006.

13. "Engineering a Response to the Tsunami," D.E. Schaad, Department of Civil and Environmental Engineering, Bucknell University, February 2, 2006.

12. "Modification and Re-Use of a Turntable: Achieving Waste Treatment Goals While Conserving Real Estate" D.E. Schaad and L.D. Thompson, Presented at the *4th Annual Railroad Environmental Conference*, Urbana, Illinois, October 10, 2002.

11. "A Synopsis of the Remedial Action for Soils at the North Carolina State University Lot 86 NPL Site," J.M. Halley and D.E. Schaad, Presented at the *Ground Water Professionals of North Carolina Fall Seminar*, Raleigh, North Carolina, November 30, 2001.

10. "A Multi-Purpose Constructed Wetland and Flow Equalization Basin," D.E. Schaad and W.R. McCloe, Presented at the *3rd Annual Railroad Environmental Conference*, Urbana, Illinois, September 27, 2001.

9. "Stabilizing Multi-Contaminant Laboratory Waste," J.M. Halley and D.E. Schaad, *Soil Sediment and Groundwater*, Oct/Nov 2000.

8. "Mode Deconvolution for the Dipole-Flow Test with a Tracer," Z.J. Kabala, D.J. Sutton, and D.E. Schaad, *Poster Papers, TraM'2000, International Conference on Tracers and Modeling in Hydrogeology* University of Liege, Liege, Belgium, May 26-29, 2000, pp. 66-70.

7. "Dipole Flow Test with a Tracer: A New Methodology for Characterizing Subsurface Parameters," D.E. Schaad, *Ph.D. Dissertation*, Department of Civil and Environmental Engineering, Duke University, 1998 (Faculty Advisor: Z. Kabala)

6. "Interpretation of the Dipole Flow Tests with a Tracer Conducted at the Lizzie Field Site," D.J. Sutton, D.E. Schaad, and Z.J. Kabala, Poster Presentation at the *American Geophysical Union Spring Conference*, Boston, Massachusetts, May, 1998. Abstract published in the supplement to *EOS, 79*, pg. F325, April 28, 1998.

5. "Dipole Flow Test with a Tracer for Aquifer Characterization," D.J. Sutton, D.E. Schaad, and Z.J. Kabala, Poster Presentation at the *Annual North Carolina Water Resources Research Conference*, North Carolina State University, Raleigh, April, 1998. Abstract published in the *Conference Proceedings*.

4. "Dipole Flow Test with a Tracer: Field Tests and Results," D.E. Schaad, Z.J. Kabala, and D.J. Sutton, Poster Presentation at the *American Geophysical Union Fall Conference*, San Francisco, California, December 8-12, 1997. Abstract published in the supplement to *EOS, 78(46)*, pg. F323, November 18, 1997.

3. "Confidence Regions for Aquifer Parameters Estimated from a Slug Test," L. Chen, D.E. Schaad, D.J. Sutton, and Z.J. Kabala, Poster *Presentation at the American Geophysical Union Fall Conference*, San Francisco, California, December 8-12, 1997. Abstract published in the supplement to *EOS, 78(46)*, pg. F225, November 18, 1997.

2. "Air Sparging Decision Tool," L.A. Beabes, E.J. Karkalik, D.E. Schaad, and R.W. Volpi, *Proceedings of the Fourth International Symposium on In Situ and On-Site Bioremediation*, New Orleans, Louisiana, April 1997.

1. "Investigation and Remediation of DNAPLs in Groundwater Near a Municipal Well Field, Allegheny County, Pennsylvania," B.H. Hackett and D.E. Schaad, Presented at the *National Water Well Association Outdoor Action Conference*, Las Vegas, Nevada, May 2 – 4, 1995. Paper published in the *Conference Proceedings*.

PROFESSIONAL CERTIFICATIONS

Registered Professional Engineer in:

State	Registration Number	Issue Date	State	Registration Number	Issue Date
Colorado	36954	10/11/2002	Mississippi	15740	11/27/2002
Florida	58925	8/2/2002	Missouri	EN 029738	9/1/1998
Georgia	026118	6/14/2000	Nebraska	E-10618	10/29/2002
Illinois	062-053474	Fall 1999	North Carolina	22836	5/1/1997
Indiana	PE 19800440	9/10/1998	Ohio	E-60584	7/29/1996
Iowa	16366	8/13/2002	Oklahoma	21146	7/11/2003
Kentucky	22078	7/30/2001	Pennsylvania	PE057271	4/25/2002
Louisiana	30402	11/12/2002	Virginia	0402 031515	4/20/1998
Maryland	23332	8/26/1998	West Virginia	13552	11/12/1997
Michigan	6201044515	8/20/1998	Wisconsin	35860-006	11/14/2002
Minnesota	42201	10/29/2002			

Board Certified Environmental Engineer, (Hazardous Waste [written and oral examination], 2005 and Water and Wastewater [oral examination], 2009), American Academy of Environmental Engineers

Diplomate, Water Resources Engineer, American Academy of Water Resources Engineers, 2008

North Carolina Contractor's Exam Qualifier: Highway (2002), Public Utilities (2002) and Building (2004)

40 Hour Hazardous Waste Operations Training in Accordance with 29 CFR 1910.120(e), 1991

OSHA 8 Hour Confined Space Entry Training in Accordance with 29 CFR 1910.146, 1993

COURSES TAUGHT

Course	Number of Students	Percentage of Course Taught	Student Ratings (5 = High, 1 = Low) Course	Instructor
CE24 – Intro. to Environmental Engineering and Science (Fall 2010)	55	100%		
CE100 – Practical Methods in Civil Engineering - Section 1 (Fall 2010)	15	100%		
CE100 – Practical Methods in Civil Engineering - Section 2 (Fall 2010)	14	100%		
CE100 – Practical Methods in Civil Engineering - Section 3 (Fall 2010)	13	100%		
EGR60/PPS107/ENV161 – Sci. and Pol. of Nat. Disast. (Spring 2010)	80	100%	3.42	3.29
EGR61/PPS109/ENV162 – Natural Catastrophes: Rebuilding from Ruins (Spring 2010)	52	100%	4.00	4.09
CE185/EGRMGMT299.09 – Engineering Sustainable Design and Construction (Spring 2010)	25	100%	3.78	3.89
CE193 - Integrated Environmental Design (Spring 2010)	4	100%	4.25	4.00
CE24 – Intro. to Environmental Engineering and Science (Fall 2009)	50	100%	4.00	4.60
CE100 – Practical Methods in Civil Engineering - Section 1 (Fall 2009)	15	100%	4.13	4.50
CE100 – Practical Methods in Civil Engineering - Section 2 (Fall 2009)	14	100%	4.08	4.50
CE100 – Practical Methods in Civil Engineering - Section 3 (Fall 2009)	14	100%	4.10	4.60
CE185 – Engineering Sustainable Design and Construction (Fall 2009)	10	100%	4.00	4.00
CE142 – Engineering Sustainable Design and Const. (Spring 2009)	20	100%	4.44	4.29
CE193 – Integrated Environmental Design (Spring 2009)	9	100%	4.78	4.30
CE198.02 – Env. Eng. Design and Fabrication: Photovoltaic System Performance Indicator (Spring 2009)	5	100%	4.33	4.67
CE198.05 – Env. Eng. Design and Fab.: Wind-to-Water (Spring 2009)	5	100%	4.00	4.00
CE293 - Environ. Engineering Project Management (Spring 2009)	1	100%	N/A	N/A
CE100 – Practical Methods in Civil Engineering - Section 1 (Fall 2008)	11	100%	4.33	4.44
CE100 – Practical Methods in Civil Engineering - Section 2 (Fall 2008)	15	100%	4.85	4.92
CE100 – Practical Methods in Civil Engineering - Section 3 (Fall 2008)	11	100%	4.45	5.00
EGR60/PPS107/ENV161 – Sci. and Pol. of Nat. Disast. (Spring 2008)	44	100%	4.38	4.31
EGR61/PPS109/ENV162 – Natural Catastrophes: Rebuilding from Ruins (Spring 2008)	43	100%	4.05	4.26
CE193 - Integrated Environmental Design (Spring 2008)	6	100%	4.00	4.33
CE198.04 – Env. Eng. Design and Fabrication: Inland Desalination Operation and Disposal in Rural, Isolated Communities (Spring 2008)	5	100%	4.00	4.00
CE198.05 – Env. Eng. Design and Fabrication: Photovoltaic System Performance Indicator (Spring 2008)	4	100%	4.00	4.75
CE100 – Practical Methods in Civil Engineering - Section 1 (Fall 2007)	8	100%	4.83	5.00
CE100 – Practical Methods in Civil Engineering - Section 2 (Fall 2007)	13	100%	4.40	4.70
CE100 – Practical Methods in Civil Engineering - Section 3 (Fall 2007)	10	100%	4.80	5.00
EGR183 – Engineering Sustainable Design and Const. (Spring 2007)	13	100%	4.55	4.64
CE193 - Integrated Environmental Design (Spring 2007)	4	100%	4.00	4.00
CE198.04 – Env. Eng. Design and Fabrication: Energy Recovery from a Dairy Farm (Spring 2007)	5	100%	4.50	5.00
CE198.05 – Env. Eng. Design and Fabrication: Treatment of Pond Water for Bacteria and Viruses (Spring 2007)	5	100%	4.20	4.00
CE100 – Practical Methods in Civil Engineering - Section 1 (Fall 2006)	15	100%	4.50	4.70
CE100 – Practical Methods in Civil Engineering - Section 2 (Fall 2006)	15	100%	4.67	4.93
CE100 – Practical Methods in Civil Engineering - Section 3 (Fall 2006)	12	100%	4.73	4.87
EGR165.02/PPS196.11/ENV181.01/ ENV298.71/EGRMGMT298.04 - Natural Catastrophes: Rebuilding from Ruins (Co-Coordinators: Franzoni, Klein, Hinton, Haff, and Haff - Spring 2006)	171	80%	3.96	4.38
CE193 - Integrated Environmental Design (Spring 2006)	1	100%	5.00	4.00
CE265.02 - Advanced Living Technology Design (DELTA Smart House Course - Co-Instructors: Rose [handled most of the daily administrative effort], Nadeau, Kielb, and Brooke - Spring 2006)	10	20%	4.22	4.33

COURSES TAUGHT (continued)

Course	Number of Students	Percentage of Course Taught	Student Ratings (5 = High, 1 = Low) Course	Instructor
CE100 - Practical Methods in Civil Engineering (Fall 2005)	4	100%	4.67	4.67
CE193 - Integrated Environmental Design (Spring 2005)	7	100%	4.71	5.00
CE198.23 – Env. Eng. Design and Fabrication: Arsenic Removal from Drinking Water (Spring 2005)	6	100%	4.17	4.33
CE265.02 - Advanced Living Technology Design (DELTA Smart House Course - Co-Instructors: Younger [handled most of the daily administrative effort], Nadeau, Kielb, and Brooke - Spring 2005)	9	20%	4.29	3.86
CE292 and CE293 - Structural and Environmental Engineering Project Management (Co-Instructor: Joe Nadeau - Spring 2005)	3	50%	4.50	4.50

PATENTS

1. "Photovoltaic-Thermal Hybrid System," X.G. Xin, O.C. Osbert, T. Rose, B. Alvarez, F. Coleman, K. Dickens, S. Felkins, H. Halten, D. Huie, C. Harrison, C. Neufeld, C. Pikaart, S. Steinberg, M. Younger, J. Board, D.E. Schaad, J.C. Nadeau, R. Kielb, M. Brooke, Provisional Patent, June 2007

INDEPENDENT STUDIES, PRATT FELLOWS, and GRAND CHALLENGE SCHOLARS SUPERVISED

14. John Reynolds – "Resource Consumption Monitoring and Incentives for Conservation and Efficiency on Central Campus" (Fall 2010)
13. Trisha Lowe – "Carbon footprints of current and innovative renewable energy generating systems (Fall 2010), Grand Challenge Scholar
12. Jason Wong – "Optimizing Rainwater Harvesting Installation in Kashongi, Uganda" (Summer 2010), Service Opportunities in Leadership
11. Lyndsey Morgan – "reNEWable: a new look at the old excuse that renewable energy is unattainable" (Spring 2010 – Spring 2011), Graduation with Departmental Distinction and Grand Challenge Scholar
10. EngSeng Ng – "Energy Harvesting and Beneficial Re-Use of Waste Streams from Large Scale Swine Operations" (Spring 2010 – Spring 2011), Pratt Fellow and Grand Challenge Scholar
9. Maggie Hoff – "Groundwater Impact, Migration and Modeling at the NCSU Lot 86 NPL Site" (Fall 2009 – Spring 2010), Parsons Fellows Project, Graduation with Departmental Distinction, Eric Pas Award Winner and Grand Challenge Scholar
8. Jai Singh - "Urban Watershed Restoration: evaluating current stream restoration and urban stormwater management practices and incentives, and developing and testing new strategies to effectively restore hydrological and ecological function of urban stream systems" (Fall 2009-Spring 2010), Graduation with Distinction, Brewster Snow Award Winner, and Grand Challenge Scholar
7. David Nammour – "The effects of "Green" energy systems on a household's energy consumption" (Spring 2010)
6. Will Patrick – "Water PLUS: Low Power UV for Water Disinfection" (Fall 2008 – Spring 2009), Grand Challenge Scholar
5. Sam Beardsely – "Water Treatment System for a Rural Clinic in Honduras" (Fall 2008 – Spring 2009), Parsons Fellows Project, Brewster Snow Award Winner, and Graduation with Departmental Distinction
4. Devin McDaniel – "Bridge over a Seasonally Flooded River in Bolivia" (Fall 2008 – Spring 2009), Parsons Fellows Project
3. Shefaali Singh – "Development of Site Plans for Permit Approval for Educational Modular Building Addition, St. Mark AME Zion Church" (Fall 2007)
2. Emily Wren – "Resource-Efficient Building: Innovations in Home Design and Construction and Potential Applications in Low Income Housing Projects" (Spring 2006)
1. Becky Dann - "The Influence of Land Use on Travel Behavior: Literature Review and Application to the Trapelo Road Corridor of Belmont, Lexington, and Waltham, Massachusetts" (Summer 2005)

FACULTY ADVISOR

- Engineers Without Borders (2005-Present)
- WERC Student Design Team - competes annually at the WERC Design Contest in Las Cruces, New Mexico (2005 – 2009)
  - "Photovoltaic System Indicator" Team – First Place and Oak Ridge Associated Universities Award, 2009
  - "Wind-to-Water" Team – Most Innovative Concept, 2009

PROFESSIONAL AFFILIATIONS

- American Society of Civil Engineers
- American Academy of Environmental Engineers
- American Academy of Water Resources Engineers
- American Water Works Association
- Water and Environment Federation
- American Society for Engineering Education
- Association of Environmental Engineering and Science Professors
- Sigma Xi
- Pi Mu Epsilon
- Sigma Pi Sigma

EXPERIENTIAL LEARNING

- DukeEngage in New Orleans
  - June 1 – August 2, 2008 – 18 students participating
  - June 10 – August 5, 2007 – 19 students participating
- DukeEngage International Projects and/or Engineers Without Borders Projects
  - La Mercedes, Honduras, June 25 – August 22, 2010 – 11 students participating (clinic construction) – DukeEngage Group Project - on site for five weeks of the project
  - La Mercedes, Honduras, June 5 – August 2, 2009 – 9 students participating (clinic construction) – DukeEngage Group Project - on site for four weeks of the project
  - Obrajes, Bolivia, May 18 – July 14, 2009 – 12 students participating (bridge construction) – DukeEngage Individual Projects - on site for one week
  - La Mercedes, Honduras, August 18-24, 2008 – 6 students participating (site assessment for health clinic) – on site for the entire week
  - Nokukonjeru, Uganda, June 23 – August 18, 2008 – 13 students participating (livelihood enhancement) – DukeEngage Group Project
  - Ciudad de Dios, Peru, May 19 – July 14, 2008 – 12 students participating (extend waterline 3km) – DukeEngage Group Project
  - Kasaka and Kanoni, Uganda, July-August 2007 – 6 students participating (rainwater harvesting) – on site for ten days
  - Banda Aceh and Lamnga, Indonesia Trip, August 2005 – 5 students participating (mechanical aerator) – on site for ten days
- P3 Student Design Contest, Sponsored by EPA
  - "TA Brown Mechanical Aerator," 2006 – Honorable Mention
  - "Constructing Sustainable Homes Following Natural Disasters," 2006
  - "The DELTA Smart House: Cross Disciplinary Projects Within the Design Framework of Sustainable Construction," 2005
- Cities of the Future Competition, Sponsored by the History Channel and ASCE – 2008 Washington, DC regional winner, 2 teams and eight students competing
- Initiated Departmental "First Friday" Field Trips – 2005

RESEARCH and TEACHING GRANTS FUNDED

- DukeEngage Durham and Beaurfort – Watershed Mangement at the Basin Scale ($50,000 – 2011)
- "Duke Engineers Without Borders – 2010-2011 International Projects: Bolivia, Uganda, and El Salvador," Lord Foundation, ($12,500 – 2010)
- "WERC Design Contest," (Gunsch – PI, Schaad – Co-PI), Lord Foundation ($10,000 - 2010)
- DukeEngage Honduras ($50,000 – 2010)
- "Stream Restoration Project on Central Campus," (Deshusses – PI, Schaad – Co-PI), Lord Foundation ($5,000 – 2009)

- DukeEngage Honduras ($60,000 – 2009)
- "Duke Engineers Without Borders - 2008-2009 International Projects: Bolivia and Honduras," Lord Foundation, ($15,000 – 2008)
- "WERC Design Contest," (Gunsch – PI, Schaad – Co-PI), Lord Foundation ($10,000 - 2008)
- DukeEngage New Orleans ($146,100 – 2008)
- DukeEngage Peru-EWB ($88,175 – 2008)
- DukeEngage Uganda-EWB ($103,810 – 2008)
- DukeEngage Site Assessment – Honduras ($5,000 – 2008)
- "Natural Catastrophes: Rebuilding from Ruins," Sophomore Service Learning Initiative ($20,000 – 2008)
- "Duke Engineers Without Borders - 2007-2008 International Project: Uganda," Lord Foundation, ($15,000 – 2007)
- "WERC Design Contest," (Gunsch – PI, Schaad – Co-PI), Lord Foundation ($10,000 - 2007)
- "Computers for Experiential Learning," (Virgin – PI, Schaad and Medina – Co-PIs), Lord Foundation ($15,000 – 2007)
- DukeEngage New Orleans ($82,000 – 2007)
- "TA Brown Mechanical Aerator," EPA – 2006 P3 Design Contest ($10,000 - 2006)
- "Constructing Sustainable Homes Following Natural Disasters," EPA – 2006 P3 Design Contest ($10,000 - 2006)
- "Practical Learning Instruction and Support of Student Project Capabilities" (PI: Joe Nadeau - Co-PIs: Larry Bohs, Chris Brasier, Henri Gavin, Marcus Henderson, Miguel Medina, and David Schaad), Lord Foundation ($15,000 – 2006)
- "Duke Engineers Without Borders - 2006-2007 International Project: Uganda," Lord Foundation, ($25,000 – 2006)
- "International Research Service Learning" (with students: L. Pearson, B. Abrams, Y. Yamanaka, Y. Wenn, and K. Costello), Office of Research Service Learning ($11,500 – 2006)
- "The DELTA Smart House: Cross Disciplinary Projects Within the Design Framework of Sustainable Construction," EPA – 2005 P3 Design Contest ($10,000 - 2005)
- "Performance of Extended Aeration of Sewage Treatment Process," Purolator Facet, Inc. ($59,281 - 2005-2007)
- "WERC Design Contest," Lord Foundation ($6,000 - 2005)
- "Engineers Without Borders - Tsunami Recovery Projects: Interdisciplinary Design and Implementation for Sustainable Development" (Schuler – PI, Schaad and Vallero – Co-PIs), Lord Foundation ($25,000 - 2005)

DEPARTMENTAL SERVICE
- Faculty Secretary (2003-Present)
- Undergraduate Advisory Board Coordinator (2003-Present)
- Support of Tenure and Promotion Cases (2003-Present)
- Oversight of Departmental Technical Staff (2003-Present)
- Departmental Space Management (2003-2010)
- Oversight of Departmental Administrative and Financial Staff (2003 – 2009)
- Home Depot Smart Home Residential Selection Committee (2007)
- Support of Faculty Search Committees (2003-2007)

UNIVERSITY COMMITTEES/SERVICE
- Provost's Lecture Series Committee (Spring 2010-Present)
- Academic Integrity Committee (Spring 2010 – Present)
- DukeEngage Faculty Advisory Committee (Spring 2007 – Present)
- Academic Standards Advisory Committee (Fall 2008 – Present)
- Campus Sustainability Committee (Fall 2007 – Present)
- Klein-Wells (Civic Engagement) Committee (Spring 2009-Fall 2009)
- DukeEngage Group Application Evaluation Committee (Fall 2008, 2009)
- DukeEngage Individual Application Evaluation Committee (Spring 2008, 2009)
- Office of Service Learning Proposal Evaluation Committee (Spring 2007)
- Joint Committee on Student Affairs and Athletics (Fall 2006)
- Big Idea Working Group - The Duke Commitment: Support for Students Learning to Make a Difference (Fall 2006-Spring 2007)

PROFESSIONAL SERVICE
- Engineers Without Borders USA, Faculty Leadership Council, Spring 2010 – Present (FLC Secretary – Spring 2010-Present)
- Technical Review Committee, Water Resources Research Institute of the University of North Carolina, 2009

- Reviewer: Journal of Environmental Management, Journal of Professional Issues in Engineering Education and Practice, Journal of Hydrology, Water Resources
- Examiner, American Academy of Environmental Engineers, North Carolina, 2008
- Panel Judge for the "Edge Awards" sponsored by the Triangle Business Journal, 2004, 2006

PRACTICAL EXPERIENCE SUMMARY

Associate Professor of the Practice and Associate Chair (July 2008 – Present);
Assistant Chair and Adjunct Assistant Professor (November 2003 – June 2008)

Department of Civil and Environmental Engineering, Duke University, Durham, North Carolina

Associate Chair serving as the primary administrative and operational entity in the department. Responsibilities include supporting the Chair and administering the daily tasks of the department, working with the Chair on establishing an annual departmental budget and monitoring departmental expenditures. Teaching responsibilities include teaching practice oriented courses in both the undergraduate and graduate curriculum.

Key Projects:

Infant and Maternal Health Clinic, Las Mercedes, Honduras – Led groups of students conducting assessment and then implementation trips for a clinic in the highlands of Honduras. In cooperation with the Exploring Medicine program, students designed and fabricating a 4,800 sf health clinic equipped with running water, solar power, and a septic leach field. The initial assessment trip consisted of collecting surveying data, preliminary soil testing, and pricing building materials in La Esperanza, the nearest (relatively) large population center. Assessment team consisted of six students and the implementation trip consisted of nine students. The team work with members of the community, the local cooperative (COMPRINIL), and Heifer International to complete the project. The initial implementation team of nine students leveled the building pad, dug the foundations, installed the reinforcing steel, poured spread and strip footers, installed concrete masonry unit walls, and placed three (of a total of nine) steel trusses. The final implementation team of eleven students installed the plumbing, tiled the floors, installed the toilets and sinks, and painted the clinic.

Bridge Over a Seasonally Flooded River, Obrajes, Bolivia – Faculty advisor for the design and construction of a pier supported, cast-in place concrete bridge over a seasonally flooded river in the altiplano of Bolivia. The bridge consisted of two piers and two abutments supporting a total of twelve beams to support a bridge deck more than seven feet above the normal water surface. The width of the river was approximately 100 feet. The team worked in cooperation with Engineers in Action and the community of Obrajes to construct the structure.

Uganda Rainwater Harvesting – Worked with Central Buganda University to design and fabricate 10,000 liter rainwater harvesting tanks to supplement drinking water supplies for the school and surrounding villages (Kanoni and Kasaka). Tanks were constructed of concrete with reinforcing steel and poultry fencing. Rainwater capture strategy required adding tin gutters to buildings and constructing a "first flush" system to prevent particulates from being washed into the tanks. Led a team of six students who also participated in these activities.

DukeEngage in NOLA – Faculty Coordinator for one of the annual DukeEngage experiences where approximately 20 students invest nine weeks engaged in service internships in the New Orleans, Louisiana area. Weekly large group meetings with an invited speaker and additional reflection sessions were used to further enhance the experience. Students worked with the following community partners: City of New Orleans Public Works Dept., Public Health Dept., Public Schools, Water and Sewerage Board, Providence Community Housing, Concordia, St. Bernard Parish Engineering Department, and Habitat for Humanity and lived at Xavier University the first year of the project and at Loyola University in subsequent years.

Hurricane Katrina Response, St. Bernard Parish, Louisiana – Led a team of students (140 in 2006, 100 in 2008, and 80 in 2010) to participate in reconstruction activities over Spring Break. Work included removal of mud and flood debris, destroyed white goods, chemicals, and home materials; rebuilding and community service. Coordinated meetings with the Army Corps of Engineers to visit levee construction sites in the Lower Ninth Ward and adjacent to the Mississippi River-Gulf Outlet (MRGO) as well as other speakers that could share their experiences with the students. (March 2006, 2008, 2010)

Southeast Asia Tsunami Response – Participated in engineering rebuilding teams in the area near Banda Aceh, Indonesia. Specifically worked with local Non-governmental organizations (NGOs) and relief teams with respect to water supply and waste disposal placements, home reconstruction, and livelihood restoration. Led a team of six

students who also participated in these activities, specifically the development of a mechanical aerator to assist shrimp farmers.

Consulting Engineer (November 2006-Present)
David E. Schaad, Ph.D., P.E. and Associates
Conducted expert witness evaluation and other independent engineering/design projects.

Key Projects:
Brunswick County Land Development Evaluation - Expert Witness evaluation regarding a land development case in Brunswick County, North Carolina. Evaluated potential development concept and impact of wetlands on the proposed subdivision.

Wake County Subdivision Evaluation - Expert Witness evaluation regarding errors and omissions in grading and storm water management plan for two subdivisions in Wake County, North Carolina.

Educational Modular Building Addition, St. Mark AME Zion Church, Durham, North Carolina – Project manager in the development of plans for the permitting of a proposed modular building installation for after school educational activities at St. Mark AME Zion Church. Included the development of landscaping, storm water and grading plans and all associated permitting and negotiations with planning department and other city entities.

Parking Lot Development, Durham, North Carolina – Project manager in the development of plans for a parking lot at the corner of Channing and Roxboro. Included the development of landscaping, storm water and grading plans and all associated permitting and negotiations with planning department and other city entities.

Senior Design Engineer (March 2008 – January 2010)
AMEC Earth and Environmental, Inc., Raleigh, North Carolina
Project manager and lead designer on a variety of industrial wastewater and stormwater management projects.

Key Projects:
Hamlet Wastewater Treatment Facility, Hamlet, North Carolina - Served as Project Manager responsible for addressing the storm water quality and quantity flowing from the yard. The existing process flow conveys the water first through an equalization lagoon, then to a grit chamber and oil water separator, and finally to a dissolved air floatation (DAF) unit. Project responsibilities included evaluating the current system and determining alternative conveyance options from the lagoon to the oil-water separator as well as surface grading to re-direct non-contact stormwater and grit management for the system.

Goldsboro Siding Drainage Project, Goldsboro, North Carolina – Served as Project Manager for addressing the storm flows ponding behind highway and railroad rights of way and conceptualizing approaches for conveying the retained stormwater off-site. Additional site complications were present because of the location within the coastal plain and unvarying topography.

Construction Operations Manager (June 2006-February 2010)
Royall Contractors, LLC, Durham, North Carolina
Supervise construction managers and coordinate subcontractors in commercial and residential development and construction projects.

Key Projects:
Northern Way Subdivision, Durham, North Carolina – Fourteen lot (12.2 acres) residential subdivision. Worked with the team which installed road, water, sewer, and stormwater infrastructure as well as coordinated with other utilities to provide electrical and phone service. The final product results in a recorded plat and lots were sold to three different builders.

Southpoint Prompt Care, Durham, North Carolina – Constructed an 8,500sf urgent care facility in Southwest Durham. Major earthwork was required to make the site workable with the surrounding properties. The building is steel construction with a brick facade.

Senior Design Engineer (December 2003-December 2006); Vice President – Civil Engineering (October 2000 – November 2003); Branch Manager (April – October 1999); Senior Project Engineer (April 1997 – March 1999)
Marshall Miller & Associates, Inc., Raleigh, North Carolina

Worked in different capacities in the Civil Engineering Department in the Environmental Sciences and Engineering Division of an ENR Top 500 Engineering Firm servicing the Mid-Atlantic Region. **Primary responsibilities included:**

- Managing and supervising work performed by engineers, designers, and support staff,
- Controlling the financial performance of a department with an annual revenue of over $1,000,000,
- Direct oversight of multiple projects, some of which had design budgets in excess of $225,000,
- Designing waste water treatment systems to address industrial and domestic waste streams,
- Developing designs of storm water control structures and strategies to address downstream water quality and quantity,
- Preparing, reviewing and sealing technical reports, plans, specifications and engineering studies,
- Designing remedial systems to address groundwater and soil contamination,
- Fostering client relationships, and
- Interfacing with regulatory agencies.

Key Projects:

Compliance Review Program, National Railroad System – Served as engineer in responsible charge for the preparation and review of Spill Prevention, Control, and Countermeasure (SPCC) Plans at over fifty sites across the Eastern United States. Some of the site also required the production of Stormwater Pollution Prevention Plans (SWPPP).

Petersburg Flooding Project – Expert Witness, Petersburg, Virginia - Conducted an in-depth hydrologic analysis of flooding in Old Town Petersburg alleged to be the result of a removal of a portion of the levee by a VDOT contractor. Conducted a forensic analysis to determine the likely causes of the flooding. Served as an expert witness through the discovery phase of the project - case settled before trial.

Decatur Fueling Platform, Decatur, Illinois - Project Manager for the design of a three hundred foot long, parallel track, locomotive servicing facility. The facility also included two parallel, one hundred foot long raised rail sections for longer term service work. Design work included all of the sanding, fueling, and lubrication delivery processes, electrical, ventilation, and heating, as well as stormwater control and fire suppression system design. The design of the metal building which housed the facility was also part of the design effort.

North Carolina State University Lot 86 National Priorities List Site – Groundwater Treatment System Design, Raleigh, North Carolina - Project Manager and Senior Engineer in the development of the Remedial Design at the North Carolina State University Lot 86 National Priorities List Site. The NCSU Lot 86 Site served as a burial site for hazardous chemical and low-level radioactive waste generated in the University's educational and research laboratories from 1969 until its closure in November 1980. NCSU estimates that it disposed of approximately 300,000 cubic feet of chemical wastes at the site. To remediate the impacted groundwater, the system uses a series of fourteen saprolite extraction wells and four bedrock extraction wells to capture and contain the plume. After recovery, the process units that make up the treatment system include air stripping, filtration, activated carbon polishing and mercury specific ion exchange treatment to meet the surface water discharge limitations.

Lewisburg Stormwater Runoff – Expert Witness, Lewisburg, West Virginia - Conducted an in-depth analysis of a one hundred acre drainage basin with a subsurface discharge into a sinkhole/solution cavity. Analysis included evaluating pre-development and post-development conditions, conducting routing calculations of design storms through the as-built stormwater structures, and recommending engineering controls to minimize off-site discharge. Served as an expert witness through the discovery phase and provided testimony during the trial.

Lake Washington Stormwater/Sediment Runoff – Expert Witness, Parkersburg, West Virginia - Conducted a preliminary review of documented upstream construction practices and recommended additional investigations to examine the cause of sedimentation in Lake Washington - case settled before trial.

Luther Wastewater Treatment Plant, St. Louis Missouri - Served as Project Manager responsible for addressing the storm water quality and quantity flowing from the yard. Project responsibilities included evaluating the current system, determining alternative treatment options, and developing the design for the optimum selected treatment. The process flow conveys the water first through a grit-chamber located at the fueling platform, then through a dual-purpose

equalization basin (combination retention area, grit chamber and oil water separator), which can be operated in series or parallel flow configuration. The process water is then dosed with a chemical coagulant and pumped into a dissolved air floatation (DAF) unit, where it is further conditioned with flocculants. After being processed through the DAF, the water continues through a tertiary treatment of mixed media carbon-clay filters.

Culvert Failure Investigation, Chapel Hill, North Carolina – Served as Lead Investigator on the failure of a culvert at the Eastgate Shopping Center in Chapel Hill, NC. The first project was investigating the over-excavation of the floor of the tunnel, which caused the walls to slide laterally, buckling the post-tensioned concrete decking which formed the roof of the tunnel. The second investigation dealt with the overloading of a portion of the decking with a soil pile and the subsequent collapse.

Shire Oaks Railyard, Shire Oaks, Pennsylvania - Served as Project Manager responsible for developing the design of a truck unloading and fuel transfer system for a railyard located near Pittsburgh, PA. The system was designed to have an above ground fuel storage volume of 200,000 gallons, and have the capacity of processing approximately 30,000 gallons of fuel per day.

Ludlow Engine Terminal, Ludlow, Kentucky - Served as Project Manager responsible for addressing the storm water quality and quantity flowing from the yard. Previously, the storm water flowed through a turntable that was converted into a wastewater treatment plant. Project responsibilities included evaluating the current system, determining alternative treatment options, and developing the design for the optimum selected treatment.

Asheville Railyard, Asheville, North Carolina - Served as Project Manager responsible for developing the design of a truck unloading and fuel transfer system for a railyard located in the western portion of the state. The system was designed to have above ground containment of spills in excess of 7,000 gallons while having the capacity of processing approximately 30,000 gallons of fuel per day.

Elkhart Railyard, Elkhart, Indiana **-** Served as Project Manager tasked with addressing the storm water quality and quantity flowing from a 159-acre railyard to a tributary of the St. Joseph River. To address this, a water retention/storm water quality constructed wetland with a 1.65 million-gallon storage capacity was designed and built. Outflow from the constructed wetland is controlled by a riser barrel structure, which expanded the basin's storage capacity to control a 50-year storm event Water quality is addressed through the 5,000 riparian plants and other wetland species planted as part of the construction activities.

North Carolina State University Lot 86 National Priorities List Site – Soil Treatment, Raleigh, North Carolina -Project Manager and Senior Engineer in the development of the Remedial Design and implementation of the Remedial Action at the North Carolina State University Lot 86 National Priorities List Site. The NCSU Lot 86 Site served as a burial site for hazardous chemical and low-level radioactive waste generated in the University's educational and research laboratories from 1969 until its closure in November 1980. NCSU estimates that it disposed of approximately 300,000 cubic feet of chemical wastes at the site. To remediate the impacted soil at the site, the Record of Decision selected remedy of shallow soil mixing was implemented to encapsulate the area. During the implementation of the remedial action, which was completed by personnel wearing either Level A or Level B protective equipment, approximately 2,240 tons of cement and approximately 743,000 gallons of water were used to stabilize almost 11,000 cubic yards of waste material and impacted soil. The result was a ten-foot thick cement monolith half the size of a football field.

Conway Aerial Fuel Line, Conway, Pennsylvania - Project Manager for the development of a two mile long fuel transmission line designed to carry diesel fuel from the bulk storage facility located adjacent to the Ohio River to a fueling platform located on the far side of approximately eighty active rail lines in a double hump classification yard.

Elevated Railroad Bridge, Northwestern West Virginia - Project Manager responsible for the development and implementation of a Site Restoration Plan to address lead contaminated soils beneath a six tenths of a mile long elevated railway bridge. Site soils were impacted during previous sandblasting and maintenance activities at the structure. Regulatory negotiations, interfacing with legal counsel and representing the client during public presentations were all responsibilities associated with this project.

Two Asphalt Manufacturing Plants with Associated Asphalt Testing Laboratories, Central North Carolina - Project Manager responsible for the development and implementation of Corrective Action Plans at asphalt manufacturing

facilities where the primary contaminants of concern are chlorinated solvents. The contaminant plume impacted bedrock drinking water supply wells installed as deep as 500 feet below the ground surface. Developed alternatives for providing drinking water supplies to impacted neighboring property owners.

Rubber Manufacturer, Roanoke Rapids, North Carolina - Project Manager responsible for conducting a three-phased assessment of the extent of chlorinated hydrocarbon contamination in an area between a closed solvent disposal lagoon and the Roanoke River.

Project Design Engineer (November 1999 – September 2000)
Appian Consulting Engineers, P.A, Wake Forest, North Carolina

Senior Engineer responsible for developing designs for municipal, commercial and residential development, evaluating water resources for industries and municipalities, preparing land use plans, and developing designs to protect against potential flood hazards for a local engineering firm specializing in servicing developers and municipalities in Central and Eastern North Carolina. **Primary responsibilities included:**

- Designing and developing subdivision plans and master plan layouts for various commercial and residential subdivisions,
- Designing infrastructure development and/or refurbishment projects for various municipalities,
- Developing designs for industrial business parks and individual commercial sites,
- Managing projects from the preliminary design phase, through the preparation of the erosion control plans, utility plans, and construction plat, and concluding in construction administration,
- Conducting flood studies and developing plans to mitigate flood hazards for commercial developers, industrial clients and municipalities,

Key Projects:

Walker Ross Printing Company, Rocky Mount, North Carolina - Served as Project Manager for an industrial client trying to obtain a Letter of Map Revision (LOMR) and/or a Federal Emergency Management Agency (FEMA) Map Amendment for a manufacturing complex adjacent to the Tar River by constructing a combination of levees and floodwalls to protect the five acre facility from a 100 year flood event.

Chanterelle Subdivision, Wake Forest, North Carolina - Served as Project Manager for a 125-acre property being developed into a combination of commercial facilities, office buildings, apartments, townhomes and single-family residences. Responsible for the development of sedimentation and erosion control plans to protect an existing lake and the Neuse River, which forms the property boundary. Responsible for interfacing with representatives from the Town of Wake Forest and other state and local regulatory agencies, as well as serving as the principal contact for the client.

Sedgefield Farms and Flaherty Farms Subdivisions, Wake Forest, North Carolina - Designed the horizontal and vertical layout for two residential subdivisions. Included as part of this work was evaluating the effectiveness of the stormwater system to handle various storm flows, tying in the sanitary sewer system to existing municipal sewer mains, determining the road surface elevation which will best service future residents, and providing adequate fire protection coverage to homes. The road and utility layout was developed to match current topographical features while protecting sensitive environmental features such as wetlands and/or Neuse River Buffer areas.

The Park at St. Andrews Planned Unit Development, Wake Forest, North Carolina - Served as part of the project team that developed the Master Plan for a six hundred unit residential subdivision. Included as part of the plan were preliminary lot, street, open space and utility layouts. Additionally, an existing dam, pond, wetlands, and supplying tributaries were all incorporated in to the Master Plan.

Research Assistant (May 1996 – April 1997)
Department of Civil and Environmental Engineering, Duke University, Durham, North Carolina

Served as programmer on a team that developed a comprehensive computer decision and optimization package for the U.S. Army Corps of Engineers. **Primary responsibilities included:**

- Designing and developing the program structure, architecture and user interface,
- Assisting in the preparation of the technical report and user's manual, and
- Presenting and demonstrating the capabilities of the package in the final contract meeting.

Project Engineer (June 1991 – August 1995)
Parsons Engineering Science, Inc., Cleveland, Ohio

Project Engineer for one of the largest engineering firms in the nation. **Primary responsibilities included:**

- Designing and developing plans and specifications for fluid handling systems, waste mitigation alternatives and remedial actions for RCRA and CERCLA sites including active industrial facilities and inactive disposal sites,
- Conducting feasibility studies by evaluating and analyzing the economic and engineering considerations of multiple design alternatives,
- Performing stormwater and industrial hygiene surveys and developing pollution prevention plans,
- Serving as site engineer responsible for construction oversight, supervision of subcontractors and system construction,
- Obtaining extensive experience with innovative remedial techniques and conducting comprehensive pumping, air sparging, soil vapor extraction, bioventing, and respirometry tests, and
- Facilitating and coordinating the collaborative effort of a team of nationally recognized experts as part of being lead engineer in the development of the U.S. Department of Energy's technology evaluation computer package titled *Air Sparging Decision Tool*.

Key Projects:

U.S. Department of Energy **-** Facilitated and coordinated the collaborative effort of a team of nationally recognized experts as part of being lead engineer in the development of the U.S. Department of Energy's technology evaluation computer package titled *Air Sparging Decision Tool*.

Air National Guard Base, Sioux City, Iowa - Conducted a comprehensive air sparging, soil vapor extraction, and respirometry pilot study at a former fuel distribution facility. Analyzed and interpreted all data collected. Specified and designed the remedial approach of air sparging combined with soil vapor extraction to address the impacted soil and groundwater beneath the site.

Air National Guard Base, Columbus, Ohio **-** Performed feasibility studies and subsequently designed and specified soil removal and treatment for two sites on the base. One area was a drum storage pad and the other was a waste oil disposal pit.

Regional Transit Authority Bus Garage, Cleveland, Ohio **-** Served as part of a team that maintained and remotely monitored a remediation system for an active bus garage with over one hundred monitoring wells.

Air Force Base, Newark, Ohio **-** Conducted a stormwater survey and prepared a stormwater pollution prevention plan for a 55 acre industrial complex.

Asphalt Batch Plant, Springdale, Pennsylvania **-** Served as part of a team that conducted an extensive air sparging and soil vapor extraction test at an active asphalt plant in western Pennsylvania. The plant is situated along the banks of the Allegheny River and chlorinated solvents used during testing at the on-site laboratory at the facility had impacted a municipal well field located hydraulically downgradient of the plant. Decomposed the data and served as part of the team which developed the conceptual design of the remediation system for the facility.

Sanitary Landfill, Londonderry Township, Pennsylvania **-** Conducted an evaluation of a proposed groundwater pump and treatment approach that was developed to control the transport of chlorinated hydrocarbons and protect community drinking water wells. The landfill was a former Department of Defense disposal area used to contain chemicals (solvents) generated as part of aircraft maintenance operations.

Jet Propulsion Unit Manufacturer, Euclid, Ohio - Served as part of the team that designed a six hundred-foot long interceptor trench for a hazardous waste site at an industrial facility. Responsibilities included surveying and laying out the trench location and preparation of design plans and specifications.

U.S. EPA Region V Demonstration Project, Cleveland, Ohio - Managed and interpreted data collected at a U.S. EPA Region V Air Sparging Demonstration Project.

Various Army National Guard Bases, Western Pennsylvania - Part of a team responsible for the removal and replacement of USTs with ASTs at eight military sites.

Local Newspaper, Kent, Ohio - Responsible for providing construction oversight for the decommissioning of three ink tanks for a local newspaper.

Bulk Fuel Facilities, Cleveland, Ohio - Served as Site Engineer responsible for monitoring and maintaining recovery systems at two bulk fuel facilities adjacent to the Cuyahoga River in downtown Cleveland, Ohio.