Outline

- My Story and Current Career
- Society of Women Engineers
- Richmond Joint Engineers Council
Introduction

- Sarah S. Bettinger, PE
- Structural Engineer with Austin Brockenbrough and Associates
- Nontraditional path to engineering
- BS Physics Rhodes College, BS Civil Engineering Missouri University of Science and Technology, MS Civil Engineering (Structural) University of Alabama-Birmingham
- Gaps in work to care for relatives, to teach, and to go back to school
Structural Engineering

- Design of structures to resist forces
  - Concrete, steel, wood, masonry
- Structures can be buildings, bridges, towers, tanks, dams, or monuments
  - Gravity loads: Weight of structure, weight of contents and occupants, snow, rain, ice
  - Lateral loads: Wind (Hurricane and Tornado), Water (Flood and Tsunami) Earthquake, Blast
- Main focuses are
  - 1) life safety and code compliance
  - 2) efficiency, cost, and constructability
Structural Engineering
Necessary Student Skills

- Problem Solving and critical thinking
- Curiosity and focus to explore that curiosity
- Math and Science technical skills, including software
- Communication, both written and oral
- Confidence and a strong moral foundation

For students who are strong in science and math, develop those skills, but also encourage communication and interpersonal skills
Consulting Engineering firm serving (mostly) Governmental Clients

Surveying, Civil- Utilities, Civil-Site Design, Architectural, Structural, Mechanical- Piping, Mechanical- Plumbing/HVAC, Electrical

Most clients are Governmental, either Agency (City, County, VDOT, State Parks) or Military (Army Corps of Engineers, Naval Facilities Command)

Fuels infrastructure for Military Clients (inspection and maintenance of existing facilities, design of new facilities)

Site, Buildings, Electrical, and HVAC services for Agency Clients
My Daily Brockenbrough

- Structural Project Engineer
- Supporting Design: designing, drafting, coordinating with other disciplines, checking work of other engineers, developing
- Site visits to assess existing conditions or to ensure that construction is progressing according to our drawings
- Attend training to maintain current standards of practice and code compliance, as well as improve our services
Brockenbrough Travel

Darwin, Australia

Canberra, Australia
Support for Outreach Activities through Professional Societies

High school shadow program
- 2-4 students per year
- Students shadow engineers in different departments to see what their field’s day-to-day is

Additional outreach as requested
- Career Days at Schools
- Science Fair and Technical Competition Judging
Society of Women Engineers
Outreach
The Richmond Society of Women Engineers (SWE) invites all technical women in the Richmond area to connect with us for networking, outreach, and social opportunities. We encompass multiple engineering and computer science disciplines across Richmond, Petersburg, Charlottesville, and throughout Central Virginia. Our members work at large and small companies and academic institutions, and we span the career spectrum from new engineers to executives.

For more information on section activities, please email swe.richmond@gmail.com.
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tr>
<td>September 16, 2018</td>
<td>Kickoff Potluck</td>
<td>Planning</td>
<td>Rocketts Landing</td>
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<td>October 6, 2018</td>
<td>RVA Makerfest</td>
<td>Outreach</td>
<td>Science Museum of Virginia</td>
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<td>November 14, 2018</td>
<td>Engineering Women's Happy Hour</td>
<td>Networking &amp; PD</td>
<td>Tang &amp; Biscuit</td>
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<td>December 1, 2018</td>
<td>Girls in Math Day</td>
<td>Outreach</td>
<td>MathScience Innovation Ctr.</td>
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<td>December 16, 2018</td>
<td>Hot Chocolate &amp; Ornaments</td>
<td>Networking</td>
<td>Melissa's House</td>
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<td>January 14, 2019</td>
<td>Engineering Panel for HS Students</td>
<td>Outreach</td>
<td>Twin Hickory Library</td>
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<td>February 8-9, 2019</td>
<td>WE Local Conference</td>
<td>Professional Development</td>
<td>Baltimore, MD</td>
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<td>February 17, 2019</td>
<td>EWeek- Celebrate Engineering Ingenuity (CEI) Day</td>
<td>Outreach</td>
<td>Science Museum of Virginia</td>
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<td>March 13, 2019</td>
<td>Women in Engineering Panel</td>
<td>Outreach</td>
<td>VCU</td>
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<td>March 23, 2019</td>
<td>Girls in Science</td>
<td>Outreach</td>
<td>Science Museum of Virginia</td>
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<td>April 24, 2019</td>
<td>DuPont Tour</td>
<td>Professional Development</td>
<td>DuPont Spruance Site</td>
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<td>May 15, 2019</td>
<td>Escape Room &amp; Dinner</td>
<td>Networking</td>
<td>Warehouse 29 - Legend Brewing</td>
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<td>June 1, 2019</td>
<td>End of Year Picnic</td>
<td>Networking</td>
<td>Maymont Nature Center</td>
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<td>June 29, 2019</td>
<td>Full STEAM Ahead Conference</td>
<td>Outreach</td>
<td>VCU Engineering Building</td>
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Richmond SWE Additional Outreach

- VDOT Student Bridge Competition: judging, testing, and volunteering
- Technology Student Association (TSA) of Henrico County: judging for South Central Regional Fair
- Quioccasin Middle School Career Day: guest speakers at Career Day
- SWE Day with First Robotics at Deep Run
- Engineers Week Workshop at Manchester YMCA
- Networking Breakfast with Governor’s Academy for Engineering Studies at L.C. Bird High School
- Engineering Night with Bellwood Elementary School Kindergarten
Free program for girls K-12
Includes events, scholarships, activities, and online resources
In person clubs
http://societyofwomenengineers.swe.org/swenext
Richmond Joint Engineering Council

E-Week Essay Contest, CEI Day, Speakers Bureau
RJEC Member Societies

- ACEC: American Council of Engineering Companies
- AIChE: American Institute of Chemical Engineers
- ASCE: American Society of Civil Engineers
- ASHE: American Society of Highway Engineers
- ASHRAE: American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- ASM Intl: ASM International
- ASME: American Society of Mechanical Engineers
- ASNT: American Society of Nondestructive Testing
- ASSE: American Society of Safety Engineers
- IEEE: Institute of Electrical and Electronics Engineers
- IISE: Institute of Industrial Engineers
- NSBE: National Society of Black Engineers
- RMEP: Richmond Minorities in Engineering Partnership
- DES: Dominion Engineers Society
- SAME: Society of American Military Engineers
- SFPE: Society of Fire Protection Engineers
- SME: Society of Manufacturing Engineers
- SWE: Society of Women Engineers
- VASITE: Virginia Section of Institute of Transportation Engineers
- VWEA: Virginia Water Environment Association
- ASQ: American Society for Quality
- BMES: Biomedical Engineering Society
- CSI: Construction Specifications Institute
- HPS: Health Physics Society
- ISA: International Society for Automation
- NACE: National Association of Corrosion Engineers
- NAWIC: National Association of Women In Construction
RJEC Speakers Bureau

- One contact to request speakers to Central Virginia schools and educational associations for in-class discussions on what Engineers do, to assist with special classroom activities related to Engineering, and for special events where an Engineering speaker is wanted.

- The overall goal of the Speakers Bureau is to better inform students, teachers, and the public about opportunities in math, science, and engineering careers.

- Speakers consist of members of many engineering societies who are available to speak on topics such as civil, structural, mechanical, electrical, industrial, chemical, biomedical, and other engineering disciplines.

- Speakers are provided free of charge upon request.

- Past examples: Science Fair judges, class speakers, Engineering Field Day/Summer Camp mentors, MathScience Innovation Center panel speakers for teacher training programs.

- Current Speakers Bureau Chair: Sarah Bettinger, PE.
RJEC E-Week Essay Contest

- Annual contest open to middle and high school students
- Essay (500 word) and Video (3-4 minute) contest
- Cash prizes for top three entrants in each category ($100, $50, $25)
- Each participating teacher sends their top three entries to be judged
- Topic: Research and learn what an engineer does in their daily work.
- Flier goes out by November, essay due end of January
RJEC Celebrate Engineering Ingenuity (CEI) Day

- Annual engineering fair at the Science Museum of Virginia during E-Week
- Engineering Societies sponsor contests including CO2 Car, Egg Drop, and Popsicle Bridge
- Additional engineering societies have booths with information and activities