



**CIVIL & ENVIRONMENTAL  
ENGINEERING**  
UNIVERSITY OF MICHIGAN

# WHAT TYPE OF ENGINEER DO YOU WANT TO BE?

## EXPLORE

career paths to find  
what's right for you

## LEARN

what to expect  
after graduation

## NETWORK

with CEE alumni and other  
professionals

Civil and Environmental Engineering (CEE) houses a wide variety of concentrations:

- geotechnical engineers designing foundations and dams
- hydrological engineers analyzing floodplains
- environmental engineers studying the interface between human and natural environments
- structural engineers and construction managers designing and building the world's landmark buildings
- transportation engineers building the systems that get us there

With so many options, it can be hard to choose the best fit for your career and interests. Come explore what it's like in these fields with CEE's Spring Break Externship Program!

Spend 3-5 days with our partner companies exploring, learning, and networking with alumni and other professionals.

## APPLY TO THE 2024 SPRING BREAK EXTERNSHIP PROGRAM

**Apply by 11/28/2023**

[cee.engin.umich.edu/undergraduate-studies/undergraduate-opportunities/undergraduate-externship/](https://cee.engin.umich.edu/undergraduate-studies/undergraduate-opportunities/undergraduate-externship/)

# **PARTICIPATING COMPANIES**

**Barton Malow**

**Black & Veatch**

**Coughlin Porter Lundeen**

**ERM**

**Geosyntec Consultants**

**Hensel Phelps**

**KPFF**

**Ramboll**

**Thornton Tomasetti**

The companies below have expressed an interest in participating for the 2024 Spring Externship Session. We hope that you will find one or more experiences here that appeal to you and help us to grow this exciting program!

For on site visits (where applicable): Please note that stipends are available to help defray costs for externships outside of Southeast Michigan, but do not cover the total housing and transportation cost. However, most companies will provide transportation between jobsites during the day. Students should expect to dress appropriately for the job setting, but specialty personal protective equipment (hardhats, vests, safety glasses, etc.) should be provided by the host company. Students should also expect to be asked to sign their matched company's release of liability form and/or confidentiality agreement.

**LIST OF PARTICIPATING COMPANIES FOR SPRING 2024 (Updated 10/11/2023)**

Opportunities in Southeast Michigan (Primary office location for externship)	Focus Areas	Website
Barton Malow Company (Southfield)	Construction Management	<a href="http://www.bartonmalow.com">www.bartonmalow.com</a>
Black & Veatch (Ann Arbor)	Structural Site/Civil	<a href="http://www.bv.com">www.bv.com</a>
Environmental Resources Management (Novi)	Environmental	<a href="http://www.erm.com">www.erm.com</a>
GeoSyntec Consultants (Ann Arbor)	Water Resources, Environmental Hydrology	<a href="http://www.geosyntec.com">www.geosyntec.com</a>
Ramboll (Ann Arbor)	Environmental	<a href="http://www.ramboll.com">www.ramboll.com</a>

Opportunities outside Southeast Michigan (Primary office location for externship)	Focus Areas	Website
Coughlin Porter Lundeen (Seattle)	Structural Site/Civil	<a href="http://www.cplinc.com">www.cplinc.com</a>
Hensel Phelps (Southern California)	Construction Management	<a href="http://www.henselphelps.com">www.henselphelps.com</a>
KPFF (Seattle)	Structural Site/Civil	<a href="http://www.kpff.com">www.kpff.com</a>
Thornton Tomasetti (San Francisco)	Sustainability Consulting	<a href="http://www.thorntontomasetti.com">www.thorntontomasetti.com</a>

# **OPPORTUNITIES IN SOUTHEAST MICHIGAN**

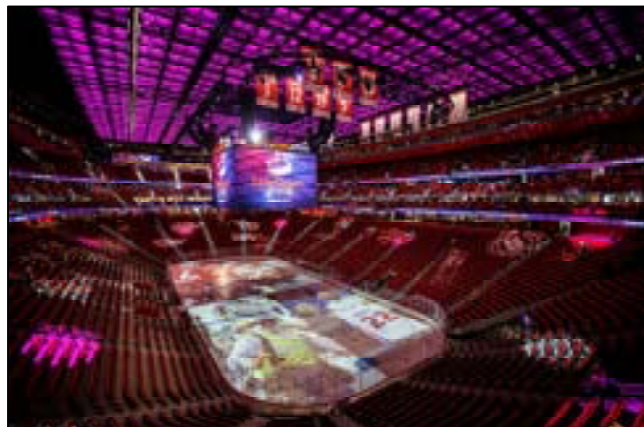
**Program Summary:**

The purpose of this shadowing program is to give students a better understanding of what they can expect if they were to work for a large commercial general contractor, such as Barton Malow Company. While Barton Malow's headquarters are in Michigan, there are ten regional offices throughout the United States. Barton Malow works in several diverse markets including Energy, Federal & Government, K12 Education, Health, Higher Education, Industrial, Special Projects and Sports & Special Events. Within these markets, Barton Malow provides clients with a range of services including BIM and VDC, Preconstruction Services, Construction Management, General Contracting and Self-Perform Trades.

Through this shadowing program, students will get to see projects that span several markets within the construction industry and learn about the many services general contractors provide to clients within the industry.

**What's Unique about Barton Malow:**

Barton Malow is an American-owned company that prides itself on building with the American Spirit – people, projects and communities. At Barton Malow, we operate according to our core values of integrity, partnership and empowerment to deliver our clients superior projects. We have an extensive portfolio that includes several projects on the University of Michigan Campus such as the UM Biological Sciences Building and Mott Children's Hospital. Other notable projects include the new Little Caesar's Arena and the 'Mega Slab' – a world-record setting 257,000 square foot continuous concrete placement at General Motor's Arlington Assembly Plant which recently won a Golden Trowel Award – a prestigious award that recognizes superior concrete self-perform work.



**Example Itinerary (subject to change based on current projects and alumni availability):**

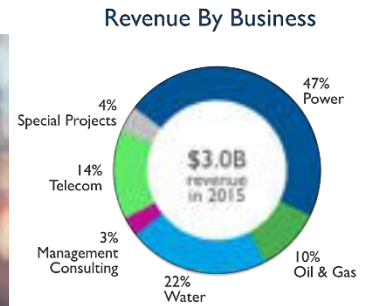
1. Day #1: Preconstruction/Virtual Design and Construction (Southfield, MI)
  - a. Tour of Barton Malow Headquarters
  - b. Shadow preconstruction (AM)
    - i. Estimating
    - ii. Scheduling
    - iii. Planning/Logistics
  - c. Shadow Virtual Design and Construction (PM)
    - i. Overview of tools/technology
    - ii. 3D Model Demo
    - iii. VR Demo
2. Day #2: Project Visit #1 (Construction Management Project)
  - a. Safety Orientation/Project Overview)
  - b. Shadow Project Engineer
    - i. RFIs
    - ii. Problem Solving
    - iii. Submittals
    - iv. Quality Control Processes
3. Day #3: Project Visit #2 (Self-Perform Project)
  - a. Safety Orientation/Project Overview)
  - b. Shadow Project Manager
    - i. Contracting
    - ii. Bonds/Insurance
    - iii. Cost Management
    - iv. Production Tracking
4. Day #4: Wrap-Up Day (?)



# **BLACK & VEATCH**

## **Summary:**

The purpose of this shadowing program is to give the student exposure to the various civil engineering design aspects of the Power industry. The student will be given the opportunity to rotate between different groups within the Ann Arbor office to see how the teams interact to develop comprehensive solutions for our clients in Power Delivery, Power Generation, and Renewables.



## **What's Unique about Black & Veatch?**

Committed to our Mission of *Building a World of Difference*®, Black & Veatch is an employee-owned company with more than 100 offices worldwide focused on solving our clients' most complex challenges with innovative and sustainable solutions. Black & Veatch gives its employees opportunities to grow by providing them with the training, mentorship, and resources they need to succeed.



## **Shadowing Position Key Points:**

- Concentration: Structural / Geotechnical / Hydrological Engineering
- Location: Ann Arbor
- Duration: 1 week
- Hours/Week: 40 hours/week
- Paid/Unpaid: Unpaid
- Transportation: Provided during workday activities (student is responsible for transportation to/from office)
- Contact: Marc Ranke (Civil/Structural Engineer)

### **Black & Veatch Example Itinerary:**

Students will be exposed to multiple projects within the Power industry by working with different civil engineering teams throughout the week. They will become familiar with various design codes and will support the development of calculations and drawings. The following areas will be covered (subject to change based on student interest and project availability):

1. Power Generation/Power Delivery – Geotechnical
  - a. Read, analyze, and interpret the results of a soil boring report
  - b. Determine optimal foundation type for project based on boring results
  - c. Develop foundation design parameters
2. Transmission Line – Structural
  - a. Begin introduction of 3D transmission line design software
  - b. Become familiar with clearance requirements and design codes
  - c. Develop drilled pier foundation design calculations and details
3. Substation – Structural
  - a. Determine environmental loading for substation equipment
  - b. Develop structural model of equipment-supporting structure
  - c. Create structure fabrication details based on design results
4. Substation/Power Plant Site Design – Hydrological
  - a. Become familiar with stormwater objectives and regulations
  - b. Establish site topography for achieving desired site drainage and earthwork characteristics
  - c. Perform runoff calculations to size on-site stormwater features
5. Power Generation – Structural
  - a. Support miscellaneous structural steel design tasks
  - b. Support miscellaneous foundation design tasks
  - c. Observe the 3D modeling process
6. Site Visit
  - a. Safety Overview
  - b. Tour project site (substation and/or power plant)



## **Shadowing Program with Geosyntec Consultants**

### **SUMMARY**

The purpose of this shadowing program is to give the student a better understanding of what they can expect working for an environmental consulting firm like Geosyntec. The majority of the Ann Arbor office's work involves investigating sites and addressing groundwater and soil contamination. Students will get experience in the field and in the office observing different career positions and project tasks.

### **WHAT'S UNIQUE ABOUT GEOSYNTEC?**

Geosyntec is a specialized consulting and engineering firm that works with private- and public-sector clients to solve complex problems involving our environment, natural resources, and civil infrastructure. We are an employee-owned firm with over 1,200 engineers, scientists, and related technical and project support staff with 80 offices in the United States, Canada, the United Kingdom, Ireland, and Australia. Our culture is collegial, collaborative, and intellectual; most of our professional staff has an advanced degree. We are recognized as leaders in vapor intrusion, bioremediation, and other fields. Our approach to consulting is the sell-manage-do model, which means practitioners at every level are involved with all aspects of consulting work.

### **SHADOWING POSITION KEY POINTS**

- Concentration: Environmental
- Location: Ann Arbor
- Duration: 1 week
- Hours/Week: 20-40 hours/week
- Paid/Unpaid: Unpaid
- Transportation: Not provided (Local)
- Contact: Bryan VanDuinen (Environmental Engineer, MSE '12, BSE '11)

## **EXAMPLE ACTIVITIES**

The actual itinerary will vary based on current projects, staff availability, and student interest but may include:

- Introduction to Geosyntec and consulting
- Description of current projects
- Participation in weekly project planning session
- Visit to a project site with an active remediation/mitigation system
- Evaluation of site data
- Lunches with entry-level, mid-level, and senior professionals
- Attending a brownbag or professional development seminar
- Conference calls or in-person meetings with professionals from Geosyntec's water resources and process engineering design groups
- Discussions of key topics in the site assessment/remediation field, such as:
  - Remediation technologies
  - Vapor intrusion
  - Emerging contaminants
  - GIS and data management & evaluation
- After-hours office social event (e.g., trivia night)

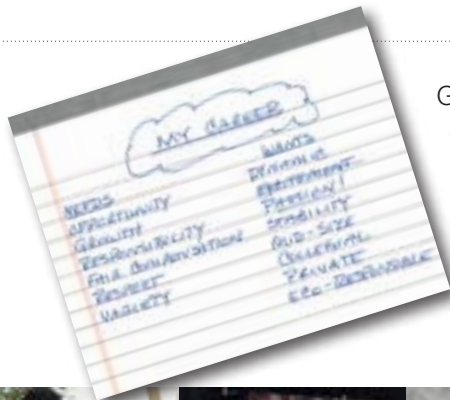
# Geosyntec

consultants

engineers | scientists | innovators

Each person, project, and success makes every day at Geosyntec exciting and rewarding. I enjoy coming to work to see what each day brings.

Rachel, M.S. Civil Engineering,  
University of Virginia, 2009



Geosyntec Consultants is a great choice for growing a career. Our team of engineers, scientists, and innovators values your commitment to becoming a technology leader and developing your project management, communication, and consulting skills. We offer a collaborative environment that allows our professionals to build reputations as trusted solution providers.



## our practice areas

- Site Assessment and Remediation
- Environmental Risk Assessment
- Environmental Management
- Industrial Wastewater Treatment
- Water Resources Supply
- Landfill Design
- Geotechnical Infrastructure/Foundations
- Stormwater Management
- Erosion and Sediment Control
- NEPA Studies and Compliance
- Water Quality Studies and Permitting
- Data Management/GIS



Our employees work with stakeholders to provide solutions of exceptional value to our clients.

Geosyntec engineers and project managers focus their energy and creativity on addressing our clients' most exciting ventures and complex challenges – such as our award-winning effort to revitalize an urban park with updated infrastructure that improves water quality and enhances recreational opportunities.

## about us

Since 1983, Geosyntec's scientists and engineers have provided our public and private clients with consulting and design services in the areas of environmental, geotechnical, and water resources engineering. An employee-owned firm, we are recognized nationally for our practice leadership, client service, and innovation. Our professionals continue to develop new technology applications and capabilities, and our applied research partnerships help define the cutting edge for all of our practice areas. We strive to provide a stimulating, progressive, and friendly work environment that will enable you to develop your career as you provide the best possible service and value to our clients.



## CAREER OPPORTUNITIES

### Do you:

Hold an advanced degree in engineering or science?

Have a superior academic track record reflecting technology leadership?

Aspire to advance the state of the art in your field?

### Learn more!

[www.geosyntec.com/employment](http://www.geosyntec.com/employment)

We are an Equal Opportunity/Affirmative Action/Equal Access employer. Qualified applicants are considered for employment without regard to age, race, color, religion, sex, national origin, sexual orientation, disability, veteran status or citizenship.

[Geosyntec.com](http://Geosyntec.com)



## Summary of the shadowing program at Ramboll (Ann Arbor)

The purpose of this shadowing program is to give students an appreciation of the type of interesting and complex projects that they can expect to be involved in when working for a large engineering, design, and consultancy company such as Ramboll. Our shadowing program offers challenging hands-on assignments and interaction with full-time consultants in the office and in the field for a dynamic, worthwhile experience.

Students will be based in our Ann Arbor, Michigan office, where we work across multiple disciplines within the environmental consulting field, including: site investigation and remediation, due diligence, and health and safety compliance.

## Position key points:

Concentration:	Environmental
Location:	Ann Arbor
Duration:	1 week
Hours:	20-40
Paid/Unpaid:	Unpaid
Transportation:	Student is responsible for transport to/from office
Contact:	Danielle Amber, P.E. (Senior Managing Consultant)

## Itinerary

Students will be exposed to multiple projects in the environmental field through working with different teams during the week. The itinerary for the shadowing program is subject to change based on student interest and staff/project availability. Below are examples of the activities that could be expected during the shadowing week:

- Introductions to staff in the Ramboll Ann Arbor office
- Participation in staff meetings
- Overview of projects we are currently working on
- Shadowing of staff during day-to-day work activities
- Lunchtime brown bag presentations with Ann Arbor staff
- Review and evaluation of site datasets
- Introductions to visualization software (GIS, CAD, etc.)



### What's unique about Ramboll?

Ramboll is a leading engineering, design and consultancy company. Working at one of our 300 offices in 35 countries you will join 15,000 fellow bright minds in creating innovative and sustainable solutions within Buildings, Transport, Energy, Environment & Health, Water and Management Consulting. Combining local experience with global knowledge, we help shape the society of tomorrow.

Our mission is to create sustainable societies where people and nature flourish. Our vision is to be a globally-leading consultancy delivering integrated and sustainable solutions, shaping today and tomorrow.

Ramboll develops innovative, scientifically sound solutions that help increase liveability by reducing pollution and restoring natural environments. As one of the world's leading environmental and health consultancies, our experts are trusted by clients to manage their most challenging environmental, health and social issues.

At Ramboll you feel invited and guided to unfold your ingenuity and develop your excellence. You contribute to a sustainable future in an open, collaborative and empowering culture, where we bring engineering, design and consultancy into play. Together, we lead and leave an impact as Sustainable Society Consultants.

**OPPORTUNITIES  
OUTSIDE  
SOUTHEAST  
MICHIGAN**



## STUDENT SHADOW PROGRAM AT COUGHLIN PORTER LUNDEEN

### Program Summary

The shadowing program at Coughlin Porter Lundeen is designed to give students a better understanding of what to expect if they were to work for a civil/structural engineering consultancy. Coughlin Porter Lundeen is a Seattle based firm that works in a diverse set of market sectors, including urban office, seismic rehabilitation, K-12, higher education, healthcare, and multifamily residential.

Through the shadowing program, students will have the opportunity to learn about multiple projects at various stages of design, from concept design through construction-administration

### What's Unique about Coughlin Porter Lundeen

Coughlin Porter Lundeen partners with clients across markets to bring unique project visions to life. We were founded with the goal of exceeding the standards and services provided by engineering firms, and today, more than twenty years later, that vision continues to guide all that we do.

We provide exceptional production in our drawings and designs, but to us, "exceeding standards" means much more. It means understanding a project's big picture and employing a comprehensive vision to lead and manage coordination among design partners and contractors.

### Shadowing Program Key Points

- / Concentration: Civil or Structural Engineering
- / Location: Seattle, WA
- / Duration: 3 days
- / Paid/Unpaid: Unpaid
- / Transportation: Provided for workday activities
- / Contact: Marie Ternes (Project Engineer),



## Sample Itinerary

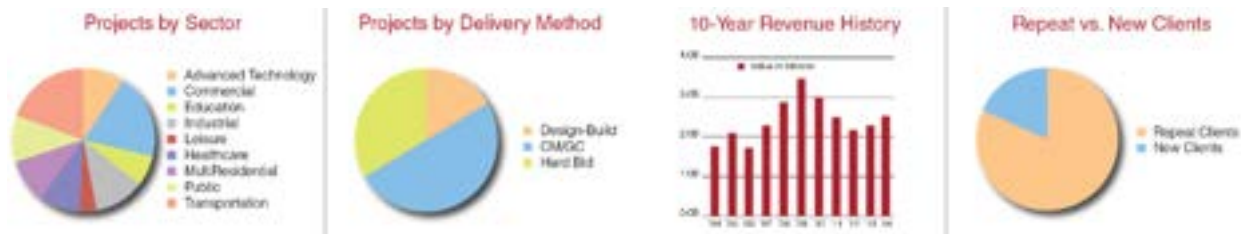
Students will have an opportunity to see both civil and structural engineering projects. They will engage with various project teams through multiple stages of design. The topics listed below will be covered, although specific itinerary will be established based on interest and project availability:

- / Day 1
  - Tour of Coughlin Porter Lundeen
  - Introduction to structural and civil engineering consulting
    - Coughlin Porter Lundeen's role on a project
    - Internal and external project teams
    - Description of current projects
  - Lunch with entry-level engineer
  - Shadow project meeting with architect/design partner
  - Site Visit #1
- / Day 2
  - Civil Engineering Shadow
    - Stormwater management (detention systems, stormwater filtration, conveyance analysis)
    - Grading (AutoCAD 3D, ADA ramps, setting building elevations)
    - Utility connections to building (water, sewer, storm, gas, etc.)
    - Deliverables typically include Plans, Stormwater Calculations, CAD file
  - Lunch with mid-level engineer
  - Site Visit #2
- / Day 3
  - Structural Engineering Shadow
    - Structural engineering programs (ETABS, RAM, RISA)
    - Seismic Design (steel, concrete, wood)
    - Project document development (Plans, Revit, Permit Calculations)
    - Construction administration (RFI's, submittals, site visit responsibilities)
  - Lunch with upper-level engineer
  - Site Visit #3



### Summary:

The purpose of this shadowing program is to give the student a better understanding of what they can expect if they were to work for a large commercial general contractor like Hensel Phelps. Hensel Phelps builds nationwide for a wide variety of public and private clients and in a wide variety of sectors. Students will get experience both in the field and in the office observing several different career positions and projects.



### What's Unique about Hensel Phelps?

Hensel Phelps is an employee owned S-Corporation. Salaried employees receive their first S-units when they are promoted from field/office engineers to project engineers (generally around year 4-6). Hensel Phelps also strongly believes in cross training, and all salaried employees spend time both in the field (as field engineers and area superintendents) and in the office (as office engineers and project engineers) before choosing their path as a project manager or project superintendent.

### Shadowing Position Key Points:

- Concentration: Construction Management
- Location: Southern California
- Duration: 1 week
- Hours/Week: 40 hours/week
- Paid/Unpaid: Unpaid
- Transportation: Provided for workday activities
- Contact: Evan Avery (Project Engineer)





**HENSEL PHELPS**  
Plan. Build. Manage.

Example Itinerary (Changes each year based on current projects and alumni availability):

1. Tour Kaiser San Diego
  - a. Jobsite tour and exposure to Field Engineer experience – Elizabeth Wong
    - i. Layout/surveying
    - ii. Trade management
    - iii. Safety responsibilities
    - iv. Dinner with project field engineers
2. Tour San Diego/OC Project (Office, hotel, military, something other than medical or aviation)
  - a. Intro to Office Engineer experience – Sean Tarmidi
    - i. RFIs
    - ii. Problem solving – working with designers and other team members
    - iii. Submittals
    - iv. Material tracking
    - v. QC process
3. Tour District Office – Evan Avery
  - a. Shadow estimating team
  - b. Lunch with upper level executive – Vitas Rugienius
  - c. Current BIM and Virtual Design projects
  - d. Michigan Team dinner and hand off from SD/OC to LA Team
4. Tour LAX Southwest
  - a. Intro to Project Engineer/Project Manager experience – Lisandra Pagan
    - i. Contracting
    - ii. Bonds and Insurance
    - iii. Management
    - iv. Cost management and change orders
    - v. Interface with the client
    - vi. Design management
5. Tour LA Project
  - a. Tour of Metro project
  - b. Shadowing Area Superintendent – Greg White
    - i. Scheduling
    - ii. Sub Management
    - iii. Planning/Logistics
    - iv. Interface with the client