Episode 7 – WHOI DC1011
Podcast Transcript

Susannah Howe: Welcome to the Design Clinic Download. In this podcast, we dig into the experiences of design clinic teams and classmates through the years. I'm your host, Susannah Howe, from the Picker Engineering Program at Smith College.

This episode features four alums from the class of 2011: Katie Mackenzie, Courtney Murphy, Sarah Pedicini, and Sally Stulberg. Their Design Clinic project with the Woods Hole Oceanographic Institution, or WHOI, was on the design of a sparging chamber subsystem for underwater radon surveying.

So thank you so much for being here today. I'm really excited to get a chance to talk with you. I think we should start by just hearing about where you are right now. What are you doing at this moment? So Katie, why don't you tell us what are you doing work-wise right now?

Katie Mackenzie: Sure thing. I'm a mechanical engineer. I work in the HVAC industry. I'm currently located in Portland, Oregon, and I actually just gave my notice at firm I've been at with for 11 years that I start my new job in January.

Susannah Howe: Wow. What will you be doing for the new job?

Katie Mackenzie: Pretty much the same thing, but in a company that does design build instead of pure design consulting.

Susannah Howe: Excellent. That's really exciting. Congratulations.

Katie Mackenzie: Thank you.

Susannah Howe: Sarah, how about you? What are you doing now?

Sarah Pedicini: I work for an environmental consulting company called EA Engineering, Science and Technology. I've been there for about four years now. I am an environmental engineer, mainly in water and wastewater design, treatment design, mostly focusing in industrial wastewater design, and I live in Peabody, Massachusetts, which is right next to Salem.

Susannah Howe: Great. Courtney, how about you?

Courtney Murphy: Yeah, so I lead one half of the avionics North America business for General Electric. We were recently rebranded into GE Aerospace, and we are about to go through a split into three distinct companies, so excited about helping lead the business through that. I pivoted somewhat from engineering, although I still use those skills in my background to ask meaningful questions to my team, but currently work in supply chain, so a little bit of a different tack than where I originally started.
Susannah Howe: Where are you geographically?
Courtney Murphy: I'm in Clearwater, Florida.
Susannah Howe: All right, and Sally?
Sally Stulberg: Now I work as a civil and transportation engineer for the Department of Transportation for New York City. I focus on roadway bridges. I'm in the bridges unit, and my two projects that I work on are the BQE Central project and the Belt Parkway project.
Susannah Howe: Excellent, thanks. All right, so quite a wide range of things that you guys are all involved with. So I'd love to take it back to design clinic, when you were back working together as a team all those many years ago, and hoping that one or more of you can describe what your project was. Who were you working for? What was the title? What was the summary?
Sarah Pedicini: We worked with the Woods Hole Oceanographic Institution. That's why we were Team WHOI, and the project was to design an autonomous sparging chamber as part of a larger system that would measure radon at deep sea conditions, and part of the goal for why we would want to measure radon was to look at the impacts in deep sea ecosystems. So it wasn't necessarily the impact of just radon, but the correlations of other chemicals or elements that could impact the different stratifications or areas of deep sea ecosystems.
Susannah Howe: Good memory. It's been a long time since you've thought about this project.
Katie Mackenzie: I think about it all the time.
Sarah Pedicini: If I hear radon or sparging, I immediately screenshot it and send it to Katie, if not the whole group. So I think about it pretty often as well.
Sally Stulberg: Is that something that you hear often at work? Because I can tell you in bridges, we do not talk about sparging and radon.
Sarah Pedicini: Surprisingly, I do hear sparging more than radon, but I do remember when I bought my house, they asked me if I wanted radon testing for the basement, and I said, "No thank you. I could handle that myself."
Katie Mackenzie: In the built environment, definitely on the West Coast, they found higher concentrations of radon. So it's a really common thing that we have to include in our building design, whether it's passive or active. So I do think of radon quite a bit.
Susannah Howe: Excellent. So thinking back to when you started Design Clinic, what were your expectations coming into the course, and how did the reality match your expectations?
Courtney Murphy: I think it was an exciting time, because it's the kind of culmination of everything that we've done and all the skills that we've built upon to kind of get to that point, and because there were other classes before us, I think there were photos were up in the Design Clinic area, but there was a sense of legacy there in that we finally made it to the Design Clinic. I'll speak for myself, but I think... really looking forward to that experience, being more team-based and being able to work with a small group over a longer period of time. So exciting.

Sally Stulberg: I remember being pretty intimidated because of the classes before us. I had a handful of classes with the other engineers from the previous Design Clinics while they were in Design Clinic, and I just remember them being like, "You're going to have to sleep in the Design Clinic lab. It's going to be your whole life for your senior year," and I'll bring this up again later, but I remember being like, "I've got to pick people on my team that I will be able to stand for this amount of time," and that was very important to me, to kind of try and figure out who was interested in what, because I was so nervous about just the workload, and I don't think it was nearly as terrifying in reality as I expected it to be, but that's also kind of par for the course for everything that I'm anticipating in life. So it was hard. It wasn't insurmountable.

Sarah Pedicini: Yeah, I would have to agree. Definitely feeling intimidated about the time commitment, the projects that had been executed before, and the knowledge that they were able to present was the culmination of, "Okay, we're here. Are we going to be as impressive as everyone else we were impressed with, these people we'd put on pedestals before?" They're just normal people. They're just normal Smith students. They were just like us, and hopefully had as much fun and as much stress as we did too, because I wouldn't say it wasn't stressful, but it wasn't the scary or unattainable thing.

Katie Mackenzie: The only thing I would add is because we had, I would call them mini crash courses leading up to it, I always really appreciated the group focused learning that was provided at Smith. That was one of the reasons why I chose it. I just always felt more comfortable in group teams, because that's also how I wanted my career to be.

The Introduction to Engineering course had multiple group projects, but they used buildings as a case study to encompass all the various aspects of engineering, and so throughout the semester, we were learning about building design, and whether that's civil, mechanical, electrical, all these little tidbits, and we used a mock house, and that was our final project to build it however you wanted to, but had to "survive the outdoor temperatures of Massachusetts in December". Projects that led us up to Design Clinic in a way where we were already a really close group of students and friends, because we worked together for so long, and survived down to the last years, and then group projects, I think, were a really strong way for us to collaborate together. So it did not make it as bad as it could have been.
Susannah Howe: So it's been more than 11 years since you graduated. Time just flies, and I would love to hear about the pathway that you took between graduating and where you are now, and Sally, you already hinted at this a little bit, so maybe you can start, tell us about what you did and how you got to where you are now.

Sally Stulberg: Sure. I was convinced I was not going to be an engineer when I graduated. I was so sure that I was going to go into film, and so I worked in major motion pictures in post-production for three years. I had some excellent luck in getting the jobs that I got, and then in my second and a half year of working in post-production and working crazy late hours, having no overtime pay and no insurance all... I was under 27, so at the time, I was still able to get insurance from my parents, but there was no future for me to have real security, and, basically, I was like, "I can't do this anymore." One of the directors or producers at one point said, "If you love movies, you should watch movies. If you love making movies, then you should make movies," and I was like, "Oh, I just love watching movies. I am out of here."

So then I decided to go back to engineering, and I applied all over, wasn't really sure what I wanted to do, and just kind of ended up at New York City DOT in the Bridges unit, and worked kind of on some smaller projects. Ended up getting my master's degree at City College in Urban Sustainability, and then just by chance... Well, I don't know if it was by chance, but I was placed on this very large, very high profile project that's the Brooklyn Queens Expressway, and I was only supposed to be on that project for a month, just kind of trying to help do some research on design build contracts, and I have been on that project now for, I think, five years, and it's gotten, honestly, better and better. I'm now a project manager for the Belt Parkway, which is a four bridge parkway. (Buses are not allowed on it. We blame Robert Moses.) So now I've graduated into being a project manager at the agency and really learning a lot about what the agency does, and it's been really great. I'm very happy that I came back to engineering.

Susannah Howe: Katie, how about you? You said you've got a new job. How did you get to where you are now?

Katie Mackenzie: When I was at Smith, I had the opportunity to work with various professors in things involving the built environment. A lot of it was researching existing buildings, looking at new building structures for different nearby cities and helping them do renovations, a bunch of side research projects, but I didn't quite understand how that entailed, I guess, with mechanical engineering, and I eventually found that path. And funny enough, I have an uncle, he used to be known as a controls contractor, so he works in heating, ventilation, air conditioning design, and he always explained it to me, but it never really quite clicked until my courses and what I was doing with professors like, "Oh, this is what you do. That sounds pretty interesting to me," and it really involved a lot of forward thinking, sustainable energy efficiency that I was interested in pursuing my career. That, to me, was a good focal point I wanted to have.
He happened to introduce me to this company, Glumac, and randomly knew the president of the company. So I was able to do a meet and greet with him, and I essentially tricked him into giving me an internship. I said, "We have this thing called J-term. I get three weeks off in January. Can I be an intern?", and he said, "Cool. Call my people in San Francisco. They need some help." So I went back that summer, and I was there for 11 years, first four years in San Francisco, and then I'm from Portland, Oregon, so I moved back seven years ago and had a great run, wore a lot of different hats there. Everything from... That's where I got my engineering license, did project management, learned a lot about business development, dabbed a little bit on the energy modeling side, but yeah, I just gave my notice literally last Monday, and I'm still doing design consulting, but for a group that does design build. So it's more on the contractor side, and I'm really excited just to try something different and maybe make my resume look a little bit different instead of one thing for so long.

Susannah Howe: Great. Thanks so much. That's exciting. All right, Sarah, how about you next? I know you've had a variety of different things you've done.

Sarah Pedicini: Yes. So right after Smith ended, I went to work as a full-time volunteer for a program called City Year, which is in urban public schools, where young people volunteer as tutor/mentor/role models. It wasn't a paid position. We made $7,000 before taxes that year, working a lot of hours, but volunteer.

So I did that for a year in Columbia, South Carolina, and while I was there, I still wasn't ready to get a big girl job. So I applied to go to grad school, and ended up going to Virginia Tech in Blacksburg, Virginia, where I studied for just over a year and a half. I was able to finish my degree, and I thought I wanted to do water treatment, and ended up being an intern for the sewer utility in the town of Blacksburg, and weirdly enough, I fell in love with wastewater.

Through a connection at Virginia Tech, company called Dewberry was hiring, and I got an interview. I did not get the position I interviewed for, but out of a long day of interviews with mostly men, my last sort of session was with these two women, and they said, "We like you, we're going to hire you for our department instead."

So I went to work for Disaster Recovery, where I ended up working between the DC area and in New York City on the Build It Back program in disaster recovery for about two years. I think I was at Dewberry for about two and a half years, and then was able to get a job working for these two gentlemen, Kelly and Chuck, at a company called Newfields, and about two years into Newfields, long story short, we all transitioned over to EA Engineering, but between my time in Newfields and EA, we've worked mainly, as I said before, in industrial wastewater treatment. We do a little waste water, regular municipal wastewater, as well as municipal water treatment, and I've worked on design projects from businesses like Colgate to pet food manufacturing, as well as water projects for municipalities, including some towns nearby.
Susannah Howe: Great, thanks. That’s exciting. Courtney, I think you might win the prize for the most locations since you graduated. Can you sort of briefly take us through that journey? Where have you been all over the world?

Courtney Murphy: Sure, happy to do that. Yeah. So right after Smith, I had a quick stint with a company called LBI, which took our project from Woods Hole and almost directly applied it as part of an unmanned underwater business, where we made autonomous vehicles, and then after that, I knew I wanted to get my master’s degree, so I joined the UTC umbrella of companies, and there, I worked on the 787 aircraft as part of its flight test, and then from there, I joined a rotational program that they had for their engineering associates. So I actually did four rotations, one in the UK for about six months, one in Japan for about two years, working a flight test program for Mitsubishi, and then another year and a half in Brazil working on the Embraer E2 program, and then my last rotation was actually back at Windsor Locks working digital factory in integration with our fuel control program.

After that, I outplaced in Southern California working non aerospace projects, which were infrared and night vision goggles for the military. From there, I decided I want to go back to aerospace, which was kind of my roots, and joined General Electric Aerospace, what was then aviation in Michigan. So I worked as a product engineering manager there for about a year before COVID hit, and then at that point, they asked me to lead the original equipment business and supply chain. So I actually pivoted from engineering to supply chain at that point. Was there for about eight months, and then they asked me to come down to Clearwater, Florida, which is where I am now, to lead one half of the Avionics North America business, and down here, we make printed circuit boards for a lot of the Avionics computers, and also the black boxes for aircraft, which are actually orange, not black.

Susannah Howe: Excellent, and you got your master’s degree, you said, while you were at the UTC umbrella?

Courtney Murphy: Yes, I did. So I started my MBA, actually, in 2012, and I just finished it last year.

Susannah Howe: All right. So it sounds like you’ve all had really interesting and engaging paths since graduating. I’m curious if you could talk a little bit about what skills did you learn in Design Clinic that you have used since graduating, and what has transferred from Design Clinic to your life after Smith? Yeah, Katie?

Katie Mackenzie: So this group knows that as soon as we found out our Design Clinic project involved constructing something, I was the first to go run into the machine shop. I was all about being in the machine shop as much as possible. I don’t build anything now, per se, but we did use SolidWorks quite a bit, and AutoCAD, and for me, I just thought that was the most fun. I had taken a few courses learning how to use that software.
Our design was not the most complicated, yet I took it down to a level of detail that was not necessary, but I just really wanted to build the sub chamber in SolidWorks down to each screw, and that ended up translating pretty well in my career, because by the time I started my job, the industry was just shifting from using AutoCAD 2D to using 3D, and primarily that was Autodesk Revit. I loved it because going from SolidWorks to that was a really quick transition. For me, that was a really great skillset that, to this day, I still use that software for a lot of different things that I do.

Courtney Murphy: The things that I use the most is, I would say, the presentation skills. We all knew going into the project that we had a presentation at the end, and I think working up to that, working on the presentation itself in terms of PowerPoint, but also how we were going to deliver it, later realizing that's going to be my pretty much daily life, is having to give these presentations. It was a nice segue into what I'll call the real world of engineering and business. So that was great.

I also really appreciated the teamwork. I think working in a team really, I guess, mimics what you're dealing with in real life. I think up to this point, we were very much focused individually as students, where we had some smaller projects, but the success of this project kind of depended on everyone. So it mirrors, I think, very closely, what you'll get in any kind of business or engineering firm.

Susannah Howe: So what would you say was your most memorable or impactful Design Clinic experience?

Sarah Pedicini: Our cubicles were divided. Our team and another team made up of Chelsea and Iris, and it was divided by a bookshelf, so it wasn't an actual cubicle wall. So every day for I don't know how many days, we moved the bookshelf about a half an inch into the other team's cubicle, and mind you, Chelsea is six foot, six foot one. She's not a short woman, but it still took her, I think, most of the semester to realize that her cubicle was getting smaller, and it was just the most genius thing, but we had the argument that there were four of us and only two of her.

Katie Mackenzie: I'm going to add, it doesn't sound like anything that funny, because it's really not that funny of a thing, but it was the timing, she figured it out. I'm pretty sure it was on a really stressful day where we had to do some kind of paper, or there was something we had to present or turn into class. So she's having something go awry, something was going wrong with her computer, I remember, and then she's like, "And why is this space so small?", and we all just lost it, because she had no idea this entire time we had been making the space smaller and smaller, and probably adding to her stress level.

Sally Stulberg: I'm pretty sure that they retaliated by stealing our snacks, which I know that Katie and I were very protective of.
Katie Mackenzie: I was trying to be the fun project manager, and that was my take, and I thought it would be a fun way to make us all lighten up a little bit.

Courtney Murphy: I have two pretty fond memories. I feel like one of them was going to meet our customer down in WHOI. That was a really fun trip, not only to spend time with the team and bond, but also kind of see Woods Hole for the first time and get to meet our sponsors, and also see Alvin, the deep sea submersible that found the Titanic, which is really cool, and also be part of the radon technology meeting, which was really neat and interesting.

The second fun, not so fun thing. Do you guys remember the night before our presentation?

Sarah Pedicini: I know it, because Courtney got food poisoning.

Courtney Murphy: It was challenging, in that everyone was trying to memorize my piece of the presentation just in case I didn't make it. I made it. I think I was white as a sheet the whole time, but we did it. It was great. It was a good presentation, but I think that makes it especially memorable that I almost wasn't there.

Susannah Howe: So with the benefit of hindsight, how do you see Design Clinic fitting into your overall engineering experience at Smith? How does it fit in in terms of getting you prepared as an undergraduate to go off into the world

Sarah Pedicini: I think it prepared us more than many other undergraduates and other programs. I think the Smith program in general does a great job preparing you, especially for grad school. We were more prepared for Design Clinic than we thought, and I think Design Clinic trickles into so much of after school than we think most days.

Katie Mackenzie: You're always going to show up to a job where you're not going to know what to do, right? No one's going to say, "This is how you do your job." They might guide you and mentor you the best as possible, but at some point, you're going to have to figure things out on your own a little bit, and I think that's what made the project so great, because you can tell all of us have gone in different directions, but also what we took in our core classes had the fundamentals of engineering and math and science, but none of us knew anything about this topic, and we all had to research it, and I think about that a lot when I'm throwing really challenging problems, and that's because of the work we did in that project.

Susannah Howe: So what advice do you have for future Design Clinic students to make the most of their experience?

Sally Stulberg: Pick your team more than you pick your project. Having people that you can trust and that you know work well with is crucial for a year-long project.
Courtney Murphy: Make sure that you are really focused and can scope your project down. I think we went in a lot of different directions. We each took a role in the team, which I think was really great. I do feel like we may have been more successful if we failed faster and kind of changed our prototype more. I think my advice would be fail fast, see if you can just really focus on one piece of the project and really do that well.

Sally Stulberg: I think one of the really important things that has nothing to do with our specific project, but I know that we relied on Google tools like Google Docs, Google Sheets and Google Slides long before it was commonplace, and just finding a really good collaborative system where you can see what other people are editing, have your comments addressed, you're not going through a zillion drafts, and then also learning how to create a good project schedule, and I have to do that now all the time for work, and it is invaluable to be able to track everything that you're doing and all of the different responsibilities.

Katie Mackenzie: My advice to all Smithies is "Please get sleep. Please get sleep as much as possible." I'm still learning that lesson, though.

Susannah Howe: Is there anything else that you want to share that you haven't had a chance to share?

Courtney Murphy: I just want to thank you for your leadership and kind of creation of this program. As we look back, there have been so many different groups that have kind of come through this program, and you've really put so much of your time and love kind of into this, and it really does show.

Susannah Howe: It's been really fun. The 20 years have gone by crazy fast, and it's working with people like you that just makes it so enjoyable all the time.

So thanks so much for your time. It's been fabulous talking with all of you, and I'm really enjoying this trip down memory lane and hearing about what WHOI did and what WHOI has done since. So thank you all for coming.

Sally Stulberg: Thank you.

Katie Mackenzie: Thank you.

Courtney Murphy: Thanks so much for having us.