



Sloan Career Cornerstone Center

Profiles of Civil Engineers



Michael W. Tantala

**Student
Princeton University
Princeton, NJ**

Education:

B.S. Civil Engineering, University of Pennsylvania

Job Description:

"I am currently studying full-time as a Student at Princeton and working part-time as an Intern at Tantala Associates, Philadelphia, PA. The most interesting internship project I worked on was the design of a three-story, heavy timber structure which is a night club in Philadelphia. I was able to work on all aspects of this project from foundations to structures to working with the architects and clients."

Advice to Students:

"Get active in ASCE. You'll get to meet leaders and have opportunities to develop professional skills. Students should not only master technical abilities, but should also become proficient in speaking and writing. Well-roundedness is an attribute of a good civil engineer."

Video Transcript 1:

"The most important thing to me when I pursue a job is will I be happy? And in that word happy there's a lot of things implied. Will I be challenged? Will I be given the opportunity for personal growth and professional growth? Will I be able to work with projects that I'm interested in?"

Video Transcript 2:

"My relationship with my mentor is, is very important. Now that I'm looking at graduate schools, one of the first things I'm going to look for is, is there going to be somebody there that I can work closely with? When I first came to Penn and I went through classes like everybody else, but then I started talking with a professor, we had similar interests, and that's really made the difference for me."

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Interview:

Q: When did you decide to study civil engineering?

Tantala: I decided to study civil engineering at a very young age, I guess, about ten. My father has been in the business and I always had an interest in structures and something technical as opposed to more liberal. And actually a funny story, my dad would always go out on jobs. And one time he took, took me. He said he was going to take me out on a job. And he took me out for about three hours to this arcade and let me play all the games I wanted to play and everything like that. And every time after he would tell me we're going out to the job and it was like Pavlov's dog, I would always go out with him to these jobs thinking I'd go to the arcade but it was really a job. So I guess a little bit of that is still in me and I always think about that.

Q: How do you think of Civil Engineering work?

Tantala: As fun. I think about work and working with different kind of projects, be it research, academic or out in the industry, I always think of it as fun, interesting and challenging. Challenging.

Q: And why did you decide to go Penn?

Tantala: I chose Penn because it is in the area. I wanted to stay in the area. My father and my brother each graduated from Penn in civil engineering. I liked their program, I think they have an interesting program that combines civil engineering -- the degree is called civil engineering systems here at Penn and it seeks to include not only the technical aspects of engineering but also the professional aspects. When you do an engineering job today, you don't just design the bridge, you have to determine why you are designing the bridge, where the bridge is going. There is a lot of political, social and economic factors involved with any kind of project you do today. And we can see that more as globalization takes part.

Q: How would you describe your course load?

Tantala: Course load? It's a fair amount of work. Like I said, I enjoy a challenge and I get a fair amount of the technical but Penn also has a liberal education so I have the opportunity to take business courses, law courses and that is all going to be a part of what I see myself going into. It is a lot of late hours working in engineering but it is also a lot of fun. I like the people I get to work with and it's interesting.

Q: What year are you?

Tantala: I'm a junior at Penn. Just finished classes and I'll be starting my senior year in September.

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Q: So what is your specialty? Or do you have a specialty within that program?

Tantala: My focus within civil engineering is structural engineering. Materials, structures. I also am interested in geotechnical engineering, foundations, soils, how structures and foundations interact, things like that.

Q: This concrete work you're doing is part of that?

Tantala: I'm doing research here at Penn with a new type of concrete. Concrete traditionally is made of -- has stone as a component. We are replacing a portion of that stone with rubber and that is part of my interest. Not only structures but also the materials that make up a structure. I like doing research and it's interesting.

Q: What other research do you do besides that?

Tantala: I like to try to have a hand in a lot of different research projects. We were working on another project, which is funded by the National Science Foundation and it is with the United States Army and it is to test the mechanics of an antifreeze, environmentally safe deicing agent. The army uses it for airplane runways and they are looking to commercialize it. Upstairs they're doing environment testing to determine if it's environmentally safe. We are doing mechanical testing to determine how it is going to affect friction, things like that. And that involves building a model to empirically verify certain results, conclusions, a lot of tests. So it's interesting.

Q: What do you like best about school?

Tantala: What do I like best about school? First and foremost, I like interacting with other students and as part of that, there is research, there are classes, there are social activities. And in interacting with these students, it makes a person complete because when I get out in the industry I am going to be interacting with people. So it's training on two levels. I really like the students I work with. I like putting in the late hours. You go out for drinks later; you can go out for a movie later. It's a complete package, it's really interesting.

Q: So do you think it's going to be harder to maintain that lifestyle when you're working as an engineer?

Tantala: I don't think so. I think the people you meet in college you're going to know them for the rest of your life and if you network with those people and network with their friends and network with new people you meet, I think I'll be able to enjoy that and just grow from that.

Q: In terms of school, what makes school harder or easier for you? In terms of the things that you do here in school to make life easier for yourself or the reverse. Is there something that is here that you can't do anything about but just makes your life harder?

Tantala: Interesting question. I guess the things I do here at school, what makes things difficult, are primarily dealing with deadlines and dealing with a large course load. There's not too many -- there's never been a situation where there's something I said I can't handle it.

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Maybe I've gone over a deadline once or twice but it's always good to finish the work and deal with it as best you can. I really haven't had any tough situations like that.

Q: Do you have a coop program here?

Tantala: We don't have a coop program like they do at Drexel but we definitely have the opportunity during summers to pursue a job at a local firm. Or what I've done, I've done research every summer that I've been here. I have a mentor within the engineering program and we work on a series of projects. We have a couple of projects lately for the summer that are with the government or the National Science Foundation.

Q: Tell me about your relationship with your mentor. Is that important to you?

Tantala: That is very important. My relationship with my mentor is, is very important. Now that I'm looking at graduate schools, one of the first things I'm going to look for is, is there going to be somebody there that I can work closely with? When I first came to Penn, I went through classes like everybody else, but then I started talking with a professor, we had similar interests, and that's really made the difference for me. And that's one of the things that I think has made me successful in what I do. Because I can always work on projects with him. I have somebody to talk, be it technical, professional or personal, any kind of issues that I have. And I always have a place to go to sit in his office and chat or go out to lunch with, things like that. So it's really made a lot of opportunities and it's almost like a father figure, a second father figure for me.

Q: How did you create that relationship?

Tantala: Actually, it was through ASCE. My freshman year I had written for the Shimizu essay contest and I won. And during an ASCE meeting, a Penn ASCE meeting, they announced it and he heard about it. And he called me into his office to talk to me, congratulate me, and asked me if I wanted to work on research with him that summer, which was really a big leap in terms of opportunities because freshmen engineering students at Penn usually don't get asked to do research during the summer. It was sort of like a foot in the door for me. And I've just worked with that every summer. So it was really ASCE that helped me find somebody with really similar interests.

Q: What other engineering activities do you take part in school?

Tantala: I'm President of the Penn ASCE chapter this year. Aside from that, I am an editor for the engineering magazine at the University of Pennsylvania. I am going to be editor-in-chief next year. And that magazine is the Triangle Magazine and we talk about different technical issues that are not only within the school but also in the surrounding community and even nationally. And not just technical but also professional issues. We have had a lot of interviews with different people who have really been leaders in the engineering community.

Q: Do you think it is going to be useful in terms of job hunting or your career?

Tantala: Yes. I think if I were looking to hire an employee, I wouldn't only look at their grades, I'd also look at how well rounded they are in terms of were they involved in research and what

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extracurriculars. And I would primarily look for involvement with ASCE. I think my involvement with the Triangle Magazine has been interesting because it's allowed me to sharpen my writing skills, my communications skills, my speaking skills, and I think that's really important for engineers to have. Funny, I go to a lot of ASCE dinners and functions and I always make it a point to ask the engineers what's the most important course you did take or could have taken? And these are older engineers, they're not fresh out of college. And 99% of the time, it's uncanny, they respond with I took a speech communication course and I can speak at ASCE functions or conventions. And that was the most important course that they always say. Not only speaking but writing. I think that's really important and should be stressed for civil engineering students.

Q: So you're going to go to graduate school?

Tantala: Yes, I plan definitely to go to graduate school. I have one more year left at Penn and I don't know exactly which graduate school I'm going to go to yet but I'm really looking forward to it. I think it's important. It's important for me to have a Masters but also its important to become a licensed engineer, I think. I'm going to also pursue getting my PE license, Professional Engineering license so I can practice.

Q: When are you going to work?

Tantala: When am I going to work? Well, after graduate school I'm going to decide whether or not I want to pursue my Ph.D. and my life plan, my ultimate goal, is to spend some time in academia, perhaps teaching, and also spend time, the majority of my time, in industry working. My father has a civil engineering company, Tantala Associates in Philadelphia, Pennsylvania and I've worked there since I was about ten. Every year during the summers I've spent some time and during the year I've spent some time working there. I guess after graduate school, if I choose to pursue my Ph.D., which my dad says I have to pursue, after that I'm going to start working in the industry. But I've already had a foot in it somewhat and I think that's an advantage that a lot of students don't have is that I've worked since I was young, at a very young age I got put right in there with these technical projects and I got to meet the people in licensing and inspectioning and in different fields. It's really fun.

Q: Some colleges are teaching in teams now because that seems to be kind of the way the field is going. Does Penn do that?

Tantala: In terms of teams, I think that's a really important thing. I don't think a student should be isolated from other students. Each of our classes, just about every engineering class you take at Penn has a group project and you can't work on your project by yourself, you have to work with three or four other students. And it's really important because you learn a lot of skills. I find that personally, before I came to Penn, I was the type of student who would want to do the whole project or do very little. And generally I'd opt to do the whole project because I would have a different standard and it would be difficult to work with other people. But after I've had all these classes and all these group projects, it's easy to rely on people, to delegate to them and have them delegate to you and not just work technically but socially. And you learn things about the people, about what their ideas are, and that's really important. And not only within the classroom or university setting, but also you get that a lot through ASCE, their student involvement. ASCE has a really active student program and they have leadership

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conferences, and competitive conferences like the Concrete Canoe and other things. And you get to interact as a group with students on those types of projects, competing against them or in cooperation with them. And I think that's really important because, you know, these are the people who are going to be in the industry when I'm in the industry. These are my peers so it's best to network with them now rather than later. And ASCE really facilitates that. That's one of the fun things about it.

Q: When you're working on your summer jobs, what do you do?

Tantala: Speaking as an engineer, I've worked during summers for my dad's company and also I worked for the Navy for two summers. And parallel to that, I've done research at Penn. And I can tell you, research and work in academia is very different than work in industry. There's a lot more deadlines, there's a lot more stress. You always have to wear a tie. It's not a laid back setting, it's a very professional setting. And a typical day, I guess, you get into work around 8:00 a.m. It's a lot of group work, a lot of group projects. Short, small meetings or big, long meetings, big groups. You have to have a plan. You lay out what you want to do, what your objectives are, and while you're doing the technical part of the project, you always have to keep in mind, you know, the economics behind it. Am I going to go over budget, things like that, am I going to meet my time deadline? Those things are really important. You have to deal with people. And you have to have a lot of insight. It's not just a nine to five, nine to six job anymore, it's really, when you work on a project, you know, you stay up late at night and you obsess. Did I do that right? Was that number right? And if it's not right, there's going to be consequences. But that whole process is, you know, getting up in the morning, going through it, worrying about it at night, that's all part of the engineering process and that's all part of the process, why the process if fun.

Q: Do you have a sense of a big picture in engineering, like how the field is changing?

Tantala: I think it's important to know where your profession is going if you want to be an active part of it. And a great marker to look at is at ASCE again, the magazines or publications, you can always get a good idea of where the profession is going. And especially if you go to the conferences. And I think a lot of the changes, we're looking at globalization in the future, 24 hour engineering, and this calls into a lot of issues about, about more liberally educated and how to communicate with people. It's not uncommon today for an engineering student to elect a third or fourth language. You have to be culturally aware, you know, if you go work in another country, you have to be able to adapt to their culture. I think globalization, that's important. Also, I think public image is an important focus within the profession. In a lot of other countries, especially when I went to Japan for the ASCE Shimizu award, I noticed that engineers are really the heros in these other countries. And I think that's a focus that has to be addressed for the United States engineers. You look at the TV shows and you have "ER" and "L.A. Law," things that glorify the legal profession and the medical profession. Even down to books. I don't see too much of that in the United States and I think there should be more of that. I mean, there are a lot of books out there that are good to read. McCullough wrote a few books on the Panama Canal and things like that that really -- and his stories, you know, engineers are the heros. So I think that's important. And once we have a better public image, I think, that will change your starting salary and things like that. Also I think engineers as a globalization public image, engineers need to be more involved in ASCE. And it's amazing how many times I'll hear a student graduate from Penn and they will just lose activity with their

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profession. And that's like cutting themselves off from any kind of success that they can hope to achieve professionally, you know, not getting involved in ASCE, not attending the conferences. I always say that ASCE really rolls out the red carpet for their people. I mean, they'll make themselves flexible, make opportunities for their people.

Q: Have you ever been presented with an awkward ethical situation in the work that you've had to do?

Tantala: It's interesting, for this, for the Triangle Magazine at Penn, I just wrote an article on engineering ethics and the heroes in our profession. It's called "Engineering Ethics and the Heroes of Our Profession." And I did an examination of some ethical issues that could arise in engineering and I interviewed some leaders in the industry. And one of them was Dr. Lemesure, who designed a building in New York, and a student had subsequently called him and he noticed the problem with the building, and that there was a chance that the building could have fallen down. And he had to, in a sense, blow the whistle on his company to save lives and do the ethical thing, rather than keep quiet. And I think ethics is an important part of an education that you can get. And a lot of students might think that engineering is just technical but there's a lot of professional issues involved. Personally, I haven't had too many ethical situations that, you know, are just civil engineering specific. You know, there is obvious issues of somebody else's exam is right in front of me, you know, I don't want to look at that, that's unethical I think that is faced by every student. When you see polls on these different issues, engineers are always rated highly ethical, high level of honest, very respectable. And you asked me about one of the changes in the engineering profession, you know, with globalization there's a lot of ethical issues that arise, like kickbacks to local governments, things like that. So I think any project, be it technical or professional, there's going to be an ethical issue.

Q: When you go out to the job market, what is the first thing you're looking for? What is the main criteria you have?

Tantala: When I pursue a job? Salary really isn't that important to me as long as, you know, it's reasonable. The most important thing to me when I pursue a job is will I be happy? And in that word happy there's a lot of things implied. Will I be challenged? Will I be given the opportunity for personal growth and professional growth? Will I be able to work with projects that I'm interested in? I guess those are the things that are implied when I speak about my happiness in a job. Other things, you know, am I going to be happy with the people that I work with? Those are the main things.

Q: Do you have a sense of what a career is like in civil engineering in terms of what the stages are that an engineer has to go through?

Tantala: I really can't speak from my own personal experience because I'm just about to get into what my stages are going to be and how I develop. I'm going to change? I don't know particularly how I will change. I mean, I think there's constants throughout all the stages of your development as an engineer. I think continuing education is a constant, you know. There's very few successful engineers that I know who, when they finish college or anything like that, they say I'm done with my education, now I can work. Constantly learning, because there's constantly paradigm shifts in your industry. There's new materials, new design

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methodologies, things like that. So that's one of the constants in your profession is continuing education. Another constant is involvement with ASCE. I think at the undergraduate level, in my first stage, and my Masters education, my second stage, when I start out in the industry, there are leadership opportunities within ASCE and there's opportunities with different kinds of publications, all the way until the end to look at some of the new people coming into the profession. I think those are constants that you need to consider when you're looking at your future.

Q: I want to go back a step here. When you're talking about the things that motivate you, you didn't mention anything about improving the quality of life or anything external. You talk about your own happiness and your own internal motivations. Do you have external motivations as well?

Tantala: Yeah, yeah, I'd definitely say I have external motivations. I think the important thing that civil engineers need to keep in mind as a society and individually is to definitely improve the quality of life. I guess that's the most important purpose of engineering, to be honest in what you do, to produce a good product that is useful or a good design that is useful and that is safe. Because engineers, that's a key issue where ethics comes into play. That one example that I talked about with Lemesure, now if he didn't go back and change his designs and just let it be, then, then his engineering education and his projects, especially his work on that project, is really useless and harmful to society. And that's definitely a goal, to make contributions. And I think that's important, ASCE really stresses that with volunteerism and community service. At Penn ASCE we're doing a project to make a contribution to society, to benefit society. We're building a playground at a local YWCA which is in a depressed area and there's really no playgrounds surrounding the area. So it's really been an interesting project. We're working with children to come up with a design. We're going to have them do colorings of what kind of playground they would imagine, what kind of playground we wanted. They are our client. So we figured out that, we put that into a design and set that project in phase. And we designed the project, we procured the materials, raised the money, handled the liability issues. And it's been a complicated project and challenging but it's really been fun and something that is really at the heart of civil engineering and what ASCE really tries to express, community service and helping society, enhancing society.

Q: So what kind of advice do you have for a student? I mean, you're in a position where you are further along and the students who are starting out in their college years, what would you want to say to them?

Tantala: I guess the main advice I would have for new students or students looking towards civil engineering, first and foremost, try and make a plan for yourself. When I first came to Penn, I set goals. Whether those goals were realistic or not, that is beyond the point, but I set goals and said, you know, I wanted to get involved with ASCE and have a leadership position with ASCE. I wanted to get involved and develop my writing skills and I got involved with the Triangle. I wanted to do well, and academics always comes first for me. I wanted to do well in my classes. And I had a general idea of where I wanted to go, what I wanted to focus on, structures. Secondly, get involved. That's a key issue. A lot of students might come to school just to go to classes and come home or work on something else. Getting involved in activities helps you meet your fellow students, helps you be able to work in teams, and it really enhances, makes you a complete package, I'd say. ASCE holds a lot of functions for students;

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aside from the competitions and things like that, they also have that leadership conference once a year for each zone within ASCE. And at that conference, you know, you learn different types of management principles, leadership principles. You get to meet people in the profession. You get to interact with other students on a social level. So I think that's really important, getting involved, because it really makes things worthwhile. And you know, sometimes I think if I weren't involved in some of my activities my college would go really slow and it wouldn't be as exciting. Academics always comes first, your classes always comes first, but getting involved in activities and taking on what you can handle really fills out your experience in college. So make a plan and get involved. Also, I would highly recommend to students if they could get involved in research while they're in undergraduate, study not only technical things but also professional things. Do some reading on different types of engineering ethics articles or things like that. Or where the profession is headed. And that will help them. ASCE always has a lot of contests, professional contests that they can apply their knowledge and skills and what they learned, too. Technical research has always been really fun for me because it's been an opportunity to experiment with something new. When I do research with rubber including concrete, I can actually say that nobody has figured out this relationship before. Nobody has figured out what the strength of this new material is. And that's something that's new and exciting. And it also opens up the opportunity for me to write technical papers and get published as a student which is really, really interesting. One of the papers that I wrote with the professor here is going to be published at the International Conference, Concrete Conference in Australia in Adelaide this May. So I'm really looking forward to that trip because I'll get to present my ideas, I'll get to interact with other people who have similar interests and ASCE is something that really facilitates this. And they have other conferences like this so it's generally a win/win situation.

Q: When you go out to look for your first job, does location count for you? Is location a consideration?

Tantala: Location really isn't a consideration because when I look for a job, I'm hoping to contribute meaningfully to the company but also to work with projects that are all over the area. A lot of companies that do international work, their jobs they may never see. They may do work on and have data from but they may never see their project. The profession isn't like it was 30 or 40 years ago where it's a centralized location and you work around that area. With advances in transportation and telecommunications, things like the Internet and E-mail, it's really becoming a global society. I mean, I can send an E-mail to Japan and they'll get it within minutes. Or I can talk live with people in different countries and I can coordinate things. So I really think whatever job you take, there aren't going to be many geographic boundaries. You can sort of set your own speed limit and your own, your own map.

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