



Sloan Career Cornerstone Center

Profiles of Civil Engineers



Judith Nitsch, P.E.

**President
Judith Nitsch Engineering, Inc.
Boston, MA**

Education:

B.S., Civil Engineering, Worcester Polytechnic Institute

Job Description:

"As President of my firm, I set the firm's overall direction in conjunction with other firm leaders. I oversee marketing and accounting functions for the firm. I act as Principal-in-Charge on select projects and do much of the firm's expert witness projects."

Advice to Students:

"Civil engineering students should focus on getting a summer job in an engineering firm. The experience will help you determine if engineering is right for you and will give you a hands-on feel for the materials being covered in the courses you're taking in school. The most important part of engineering is the desire to figure things out. There are opportunities for everyone, not just boys or straight A students."

Video Transcript 1:

"I started out as a math major because I didn't know what the different types of engineers were. I selected a college, Worcester Polytechnic Institute, and decided I was a math major, knowing I didn't want to be a math major, but not really knowing what my other choices were. And I checked out the majors that were available there, and ended up in civil. I got a job the summer after my sophomore year working for a civil engineering and land surveying firm. And that clinched it for me. I knew that's what I really wanted to do."

Video Transcript 2:

"The first thing I look for is that they've had a summer job or a co-op job in a civil engineering or related position. The second thing I look for is someone that has done more than just study at college. I want to see someone who has been involved in activities, whether it's an ASCE student chapter or, student government, class officer, Whatever it is, I want to see some other outside activity. And the absolute best person is the person that's had a leadership position in those activities."

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Video Transcript 3:

"A new engineer working in a firm like ours will be assigned technical tasks working under a project engineer or project manager. I don't really want someone that's only going to do the calculations and then give their spreadsheet or the printout back to the project manager. I want them to know and think about how does that relate to the whole project. And if something doesn't make sense I want them to proactively talk to the project manager and either ask, how does this fit in, why am I doing this? Or say, this doesn't look right. Tell me more about it so I can understand it."

Video Transcript 4:

"Oh I love what I do, no doubt about it. The thing I like about engineering and civil engineering in particular is that it is tangible. I can drive down roads I designed. I go into shopping centers and office parks that I know the building is there because I put it there."

Video Transcript 5:

"I think having a new employee, a new graduate engineer that has worked, whether on projects or in an office during college or a team to try to solve a problem is critical for them in their first job. It's the way that they will work at their job, and if they've had experience at it, and most importantly, successful experience at it, it certainly makes them more attractive to me as the employer."

Video Transcript 6:

"I think that should be the goal of every new graduate -- is to get registered as soon as they can. If an engineer has a Bachelor of Science from an accredited engineering college they can take the PE Exam - Professional Engineer Exam - once they've completed four years of experience in responsible charge. And I think for women engineers especially, when you have those initials, PE, after your name, people realize she's serious and qualified."

Video Transcript 7:

"I worked for a small firm in Connecticut. They had about 15 employees, and I worked as a draughter in the office. This was 1973, and the owner of the company did not allow the girls that were in the engineering department to work on the site. We were only allowed to work in the office. And working there for two summers I was only allowed to go out on a construction site once. That's because it was an emergency, that something had to get checked because something was due to a client that afternoon. So that was the only time I was allowed to go out on a job site. Things have changed a lot now."

Video Transcript 8:

"I think the best thing a student can do is try to get a job at an engineering firm. And then once you've worked at an engineering firm you'll be meeting people, whether they're, you know, the junior engineers in their office, or the principals of the firm, that you can then call on and talk to when you need advice, or you're looking for encouragement, or you're looking for a job. Networking is the key to my businesses' success."

Video Transcript 9:

"Well I think in 22 years of my career the civil engineering field has changed a lot in that we have a computer on every desk. Obviously another change is that there definitely are more women in engineering these days. And I think another change is that -- I think firms in general are understanding that people have to be a little more family-friendly than they used to in the past."

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Interview:

Nitsch: What I like most about being a civil engineer is that the work I do is tangible. For example, I can drive down roads I've designed and that gives me a tremendous feeling of accomplishment.

Q: Tell me, Judy. When did you decide to study civil engineering?

Nitsch: As a freshman in college. I started out as a math major because I didn't know what the different types of engineers were. I selected a college, Worcester Polytechnic Institute, and decided I was a math major, knowing I didn't want to be a math major, but not really knowing what my other choices were. And I checked out the majors that were available there, and ended up in civil.

Q: So, was that as a freshman, or sophomore?

Nitsch: End of my freshman year. So then sophomore year I took courses in the civil department. I got a job the summer after my sophomore year working for a civil engineering and land surveying firm. And that clinched it for me. I knew that's what I really wanted to do.

Q: Tell me about that job a little more.

Nitsch: Sure. I worked for a small firm in Connecticut. They had about 15 employees, and I worked as a draughter in the office. This was 1973, and the owner of the company did not allow the girls that were in the engineering department to work on the site. We were only allowed to work in the office. And working there for two summers I was only allowed to go out on a construction site once. That's because it was an emergency that something had to get checked because something was due to a client that afternoon. So that was the only time I was allowed to go out on a job site. Things have changed a lot now.

Q: How have they changed?

Nitsch: My business partner, her first job was as a field engineer working for the State Highway Department, and that was only nine years later. So -- I should let you know, though, there were other men that were working there for the summer, that were studying engineering same as I was. They were only allowed to work in survey crews and be on construction sites. And they resented the fact that they didn't get the office and computer experience that I got. So, although I was disappointed I didn't get field experience, they were just as disappointed they didn't get office experience.

Q: Training has certainly changed a lot. A lot of businesses have people working in teams now, and trying to simulate the real work environment. Do you think that's a good thing?

Nitsch: I think it's imperative. I think having a new employee, a new graduate engineer that has worked, whether on projects or in an office during college or a team to try to solve a problem is critical for them in their first job. It's the way that they will work at their job, and if they've had experience at it, and most importantly, successful experience at it, it certainly

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makes them more attractive to me as the employer. I know my alma mater, WPI, has a complete project-based program for their undergraduates. They do a project in their major. They do a project that is in a program that combines technology with humanities in some fashion. And then they have to do a sufficiency in a humanities-only program. So they have a lot of teamwork opportunities, and they continually get feedback that is important to the people who hire the graduates. And I know it's important to me when we hire people.

Q: Tell me what you look for when you're hiring someone.

Nitsch: First thing I look for is that they've had a summer job or a co-op job in a civil engineering or related position. Because we're a small firm -- I need to have someone that has an understanding of what their job will be like. And if all they've done is work at McDonald's or something they're just not attractive to me. The second thing I look for is someone that has done more than just study at college. I want to see someone who has been involved in activities, whether it's an ASCE student chapter or Society of Women Engineers, student government, class officer. Whatever it is, I want to see some other outside activity. And of those the absolute best person is the person that's had a leadership position in those activities. Again, it goes to how they would perform on the job. And you know that they would continue to be proactive, and they would do the things thinking ahead that you have to do as a leader in a student organization.

Q: Tell me a little bit more about what it's like to be on a job, then. Because I'm not sure I understand that proactivity as part of the job description.

Nitsch: Sure. A new engineer working in a firm like ours will be assigned technical tasks working under a project engineer or project manager. I don't really want someone that's only going to do the calculations and then give their spreadsheet or the printout back to the project manager. I want them to know and think about how that relates to the whole project. And if something doesn't make sense I want them to proactively talk to the project manager and either ask, how does this fit in, why am I doing this? Or say, this doesn't look right. Tell me more about it so I can understand it. And I think if someone has been in a leadership position they're more likely to be confident of themselves and to be thinking ahead about things. You can't really just do what's here and now on the job. You have to be thinking about how what we're doing interacts with the other members of our team. Often times we're a member of a team that consists for an architect or another larger engineering firm as our client. And then there's the owner, and there's usually other engineering consultants such as the mechanical engineer, the electrical engineer, structural engineer, and we have to all work as a team.

Q: What kind of engineering do you mostly do here?

Nitsch: We are civil engineers and land surveyors. On the civil engineering side we do site development projects, which includes parking lot design, road design, drainage, sewer and water. All the infrastructure related to a new development. We often work with architects. I like to describe it that the architect does the site, does the project from the building walls in, and we do the project from the building walls out and cover the site. On large public infrastructure projects we may be on the team with an engineering firm that's doing, say, highway design. Our component may be drainage design as part of their highway design. But we're often times a team member with other people.

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Q: Let me ask you about your job now. You're running your own company. Is it very common for a woman to be running a civil engineering firm?

Nitsch: No, it is not common at all for a woman to run her own engineering firm. We see more and more, but I think it's a very small subset of the engineering firm owners. You may see women that are shareholders or -- a shareholder with other people in a firm. But there aren't all that many that are women-owned businesses like mine is.

Q: How did it come about?

Nitsch: Well, I've worked at three different firms since I graduated from college. The first firm I worked at, I was there for seven years. And after about four years with the firm I managed a branch office. I was a vice president. I was invited to be a shareholder in the firm but I chose not to at the time. My second job, I think I started as a senior project manager. And within a year I was invited to become a shareholder, which I did take them up on. I was the minority shareholder of three owners, and that firm was bought in 1989. At the time of the buyout I decided to just sell all of my stock and start my own business. The economy was in horrible condition at the time. I knew I would be up against difficult times because there wasn't a lot of engineering work to be had at the time. But I was confident in my abilities and I knew that we would be able to survive. I had no idea we would be thriving the way we are today and be the size we are today. But it's been seven and a half years, and I'm quite pleased with the way things have turned out for my firm.

Q: How big are you?

Nitsch: Right now we're I believe 54 employees. We will be 60 people by the end of this year, and that's about a 50-50 split between our surveying department and our engineering department.

Q: Do you want to tell me about this INC. Magazine?

Nitsch: Sure. MY company was named to the INC. five hundred, INC. Magazine's listing of the fastest growing businesses in the United States. We were number 172 last year and that gives us the distinction of being the fastest-growing women-owned engineering firm in the country and the second-fastest-growing civil engineering firm overall. We are quite pleased with the distinction, and it's -- it was unusual -- the growth that our firm has had, we knew it was quite unusual, but we had no idea that it was this unusual.

Q: What's the biggest project you're working on right now?

Nitsch: Actually, can I add something to the thing I just did? One thing which I've said for many years that has helped my firm achieve this distinction is, we have wonderful, wonderful projects on which we're working. Our clients are terrific. But most importantly, I have a wonderful staff. They're very dedicated. They work hard, and they work at doing the right thing the right way. And I think that's the one thing that distinguishes our firm: we really work at not being known as a women-owned business. We work at being known as a good engineering firm. And I believe we've achieved that. There are plenty of other firms that were started at the same time I started my business that haven't grown to the size we've grown.

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And I think it's because so many of our clients appreciate the quality of our work. They come back, and our repeat clients are a very, very large part of our backlog. The biggest project that we're working on right now is the Central Artery Tunnel Project in Boston. We have six different contracts on which we're participating on the engineering team. We're a sub-consultant. On most of the projects we're doing land surveying, and some type of civil engineering. On one contract we did all the drainage design. On another one we're doing pump station design. On the third one we're doing the design of five different city streets which have to be relocated as part of the new tunnel project. Another project we're doing quantity and cost estimating, and cross sections. So we've had a variety of tasks as a member of a team, and the individual projects that we've had have been huge projects in and of themselves, even though we're a subconsultant.

Q: Let me ask you some things about the professional world in general. How's the field of engineering changing, civil engineering particularly?

Nitsch: I think in 22 years of my career the civil engineering field has changed a lot in that we have a computer on every desk. When I was first starting out we probably had one computer in the whole office. So every engineer has to be computer literate. We look for that in our new hires to see if they've taken an Autocad course, that they know a word processing program, and that they know a spreadsheet program. I don't care if it's not exactly the software that we use. If they know one, they can learn the one that we use here. Obviously another change is that there definitely are more women in engineering these days. And I think another change is that -- I think firms in general are understanding that people have to be a little more family-friendly than they used to in the past. That they don't just work for the company; you're really working for your own self-fulfillment, and you have a life outside of the office. And I think employers need to recognize that. Although some do it kicking and screaming, I think others embrace that, and understand that's what it takes to keep good employees. We work at that at my office. I can't say that we're perfect at it by any means, but, for example, we have flex time. And we hear more often from the men in the office that flex time is terrific, because they can get their kids ready for school or for day care, and drop them off, and give their spouse a break. We recently had a discussion about making a rigid starting time in the morning for one group of our employees, and they all said no, it's not fair, it's not fair to my wife that I can't bring my daughter to day care, for example, two days a week as I do now. I like the flexibility that we have. So we offer that, and I really don't see a down side to it as an employer's point of view. But I know a lot of firms don't offer flex time. It's a no-cost benefit to the employer, and it's a real benefit to the employee.

Q: Let's see, are all your projects local to Boston? Are you involved in any global, international work? Are you competing with firms from abroad? What's your take on globalization?

Nitsch: My firm has grown substantially over the last seven years by concentrating on the Boston market. We really haven't marketed outside of this area because we knew it was all we could do to control the quality of our work on just the work that was coming in. We've grown over 1300% over the last five years, so not looking at opportunities outside of our area has really not been a problem for us. We have been involved in projects in other states, and we have done one proposal for a project in Saudi Arabia. We did not win that project. We don't look for projects overseas, really. We're not a large enough firm to do that type of work. I

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think, the large firms that are, you know, multi offices are more suited for the overseas work. In my prior job, I worked on projects for General Cinema Corporation all over the country. I had my PE registration in fifteen different states and I got registered in different states because of these projects for General Cinema. They were building theaters all over the country and my job was to do the site design to take their standard building and fit it to the piece of real estate that they were able to put an option on in different states. The one thing that I learned which was quite interesting is that doing site design and permitting in Massachusetts is absolutely wonderful training to go anyplace else in the country because the permitting requirements and development regulations here are very strict and very unusual. Other parts of the country are nowhere near as stringent or as anti-development either as Massachusetts is.

Q: Sounds to me like you really love engineering.

Nitsch: Oh I love what I do, no doubt about it. The thing I like about engineering and civil engineering in particular is that it is tangible. I can drive down roads I designed. I go into shopping centers and office parks that I know the building is there because I put it there. The first job I did in the summer of 1975 was a road design in the town of Weston, a road called Wellesley Street. To this day if I'm in Weston I'll drive down Wellesley Street to check it out. Every time I see a, you know, a trench cut, or, you know, see that they've done something to the road I wonder, hmm, what happened here, why did they do this. But it's been over 20 years, so of course they're going to make some changes to my design. But that was my first design, and it was a job that I loved. I learned a lot doing it, I had a great rapport with the town engineer who was my client. My supervisor at the time really gave me a lot of leeway on the design, and I did the horizontal and the vertical layout of the road. We widened and flattened out the hill on a winding, country type of road. We added a sidewalk. It had very historic stone walls along the road, so we had to move those. I had an interesting experience on that job, though. I designed it in the summer of '75, and it was constructed in the summer of '76. I went to the job site for a construction observation visit. It was unscheduled, but I was a design engineer, and it was pretty normal for me to go out and look at the construction. And they had police at each end of the roadway to keep everyone but local traffic from going down the street. I could not get onto the job site. The policeman would not let me onto the job site. He didn't believe that I was the engineer responsible for the construction. I look at it and I chuckle at it now. Obviously it frustrated me then.

Q: Does that kind of thing still happen?

Nitsch: It doesn't happen to me, but I would imagine it still happens occasionally. I talk to a lot of young engineers when they're starting their careers about what to expect at the job site, and, you know -- especially the women. You know, are you going to expect harassment or what. And I like to tell people, think about what's happening if you are in a situation and ask yourself, are they doing this to me because I am a young rookie engineer? And most often, the answer is yes. Of course people are going to tease, you know, the new kid on the block. They're not doing it just because you're a woman, in my opinion, in most instances. That's not to say that you don't have problems, but I think you need to really look at the context of the situation and see, you know, is this because I'm a woman or is this because I'm just a rookie?

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Q: Let's talk about your taking on responsibility as a role model.

Nitsch: I believe it's my responsibility as a woman civil engineer with 22 years' experience that I need to be a role model. I never had any when I was going to college. In fact, I worked for nine years after college before I worked with another woman engineer. That's a very, very lonely position to be in. And after nine years of working I actually hired a woman engineer. I had a position open in my department, interviewed several people, decided this was the best qualified candidate. And then I went to talk to the president of the firm to say, this is my choice. I'm concerned that there will be a perception if I hire her by the rest of the men in the company that the only reason she was hired is because she was a woman. And the president of the firm said to me, well, you know, why are you hiring her? I said, well she's the most qualified. I looked at her calculations she sent, and the reports and her designs. And you know, I think she'll fit in perfectly with us, and she's got exactly the background I want. He said well, hire her. And if we have a problem with the men in the office we'll deal with it. But I think, you know, you're hiring for the right reason. She's the best person for us, let's get her in here.

Q: What is the importance of a role model, and how do you get one if you're a student?

Nitsch: Well, as I said earlier, I think the best thing a student can do is to try to get a job in an engineering firm. And I would say whatever you can do to get in the door, you know, whatever job it is, you should take advantage of it. I think it's good experience for a civil engineer to work in a survey field crew for a summer, work as a drafter for a summer. Whatever the opportunity is. You don't need to have the word engineer in your title. And I think if the firm sees your potential and sees you perform they'll certainly feed you the kind of projects that you're looking to do if you're capable of doing it. And then once you've worked at an engineering firm you'll be meeting people, whether they're, you know, the junior engineers in their office, or the principals of the firm, that you can then call on and talk to when you need advice, or you're looking for encouragement, or you're looking for a job. And quite frankly, the people that you work for summers are the people that I as your next employer would call for a reference on you. So it's really important to get good experience and to show those people how good you are.

Q: What about networking?

Nitsch: Networking is the key to my business's success. Unbeknownst to me at the time, I did a lot of work as a young engineer with organizations like the Boston Society of Civil Engineers' section of ASCE. Everyone I met in the late 1970's on committees of BSCES are people that ended up being my clients today. And I think the key ingredient for me is really two things. One is, there was never a question if I was a civil engineer or not when I started my own business. And there's often that question on women-owned businesses. Whether, you know, are they a front, are they legitimate. The reason the name of my company is Judith Nitsch Engineering is because I wanted those people that knew me to know this my company, this is who you're getting, and that was probably the easiest and the best decision I made when I started my firm.

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Q: What's an average day like for you?

Nitsch: Well, I think my average day as the owner of a company is quite different from everyone else on my staff. But I get up at 5:30, I generally work for an hour at home, have a cup of coffee, and I have the morning news on. I try to get to work by eight. We have flex time here, so my partner gets in very early. I tend to get in a little later than she does, but then I stay pretty late at night. I try to leave by seven at night. I usually bring a briefcase home. Sometimes I open it, sometimes I don't. During my day I spend most of the time on the phone or in meetings. I don't do a lot of design work any more. I mostly get involved in contract negotiation or writing proposals or making decisions on teaming from new projects. I will often times review work that's designed by other people in my office, so for me it's kind of a quick hit. Only about five to ten percent of my time in any week is on billable projects, though. My responsibilities in the firm relate to the marketing of the businesses as a whole and the financial side of the business. My partner, Lisa Brothers, is in charge of operations of the company. So getting the work done, scheduling it, and so forth is really her responsibility in the office. We've divvied up responsibilities for several reasons. One, she's a lot better dealing with people than I am and getting the work out of the office than I am. And two, I like being out of the office, meeting new clients, and doing the marketing. And I can't be in charge of what happens in the office if I'm not here. So it works very well for the two of us to have a split in the responsibilities that way.

Q: What about location? Do you think location's important to a young engineer?

Nitsch: I think location is important, but I think it's a personal decision. If someone is happier in a small town rather than a big city I think it's important to look for a job in a small town. I also think that the person needs to be aware, though, that their number of opportunities in a small town or in a very rural area are going to be quite limited. So if that job doesn't work out they may have to move for their next job. I think if you go to work in a large city you've got to realize your cost of living will be a lot more, but your opportunities will also be a lot more. Whether it's an opportunity to go to professional society meetings, or cultural opportunities, or whatever. I think you have a lot more available to you in big city. I think the other thing a young engineer needs to think about is what are the requirements of their job. They may be in a job, for example, in construction, where every year or two they're at a new construction site so they're getting up and moving. And they could be in a city year and at a very rural site next year. For me that would not be enticing. I'd rather find a locale and know that I'm going to be there for quite a while. But I think for a young engineer, having the opportunity to work on a number of different projects and see a little bit of the country is quite exciting. So if you think that might be of interest to you take advantage of it in your first job, because I think it's a harder thing to do when you're married or have a family and so forth.

Q: Now, you were going to talk about registration?

Nitsch: I think one of the best things a young engineer can do for themselves is, while they're a senior in college, to take the EIT Exam, the Engineering Intern Exam. It's a national exam, eight hours long. It's only given twice a year, but it covers all of the subjects that you took in college. You really don't use those subjects at work, so you really need to take that test while you're in school and pass it. And it's good forever. It doesn't expire. That's the first step towards getting registered as an engineer. And I think that should be the goal of every new

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graduate -- is to get registered as soon as they can. If an engineer has a Bachelor of Science from an accredited engineering college they can take the PE Exam, once they've completed four years of experience in responsible charge. And I think every engineer should work towards getting that. I think it does two things for you. The first thing it does is it gets you credibility that you don't have otherwise. And I think for women engineers especially, when you have those initials, PE, after your name, people realize she's serious and qualified. I know for me as soon as I got registered, all of a sudden people had a different first impression of me because they saw my card with PE after it. The second thing it does for you, it gives a message to your employer that you're interested in being a professional. I've interviewed people who have a degree, 20 years' experience, never got registered. And I always have a question: why didn't they get registered? And I can't have that person be the principal on a project or the project manager be the only one involved because they can't stamp their own design. So as your career goes along it becomes a detriment to not have that designation. I think we're going to be finding more and more that a Masters Degree is important. Right now in my field a Masters is not required. In fact, I often will tell students this on a career day, in consulting engineering, having your PE license is more important than having a Ph.D. And the main reason is state law requires someone practicing consulting engineering to be registered in that state as a PE. So that's not to discredit a Ph.D. by any means, but it's just to put some reality spin on the importance of four years of experience and passing that second national exam.

Q: What are the three courses that you took that you always use?

Nitsch: I like to tell students when I do a career day that there's three courses I took in college that I use virtually every day: sewer design, surveying, and speech. Speech I took as an easy A last semester senior year. It is the one course I took that I use by far more than anything else. I think college courses give you the fundamentals. You learn on your first job how to use those technical courses to do the kind of work your firm does. But no matter what it is that you're doing technically you have to explain it to people. And in my case we have to explain site design to conservation commissions, planning boards, boards of appeals, and clients who are not technically literate. So we have to explain technical terms in language that a layman can understand. And to do that in a way that people understand it, you have to make sure that you're loud, that you're clear, that you're concise, and that you give a sense of confidence that you know what you're doing. And it's so important to have a good speech background. I didn't really have a good speech background when I first graduated from college, so what I did is, I did career days as often as I could. The only thing I had to worry about on the career day was not saying uhms and ahs, and speaking slowly enough, speaking loudly enough, not having my knees bang together, and to just get comfortable speaking in front of a group. Then when I had to make technical presentations for work I wasn't worried about those things. All I had to worry about then was what was the topic, what was I trying to convince the audience of. And I found doing career days was a real, real big help to me. And it also was personally satisfying. As I said, I didn't have many of those opportunities at all, and I want to make sure that either I continue to do that or I give another young engineer in my office the opportunity to do a career day. What I try to do now as the owner of a business is talk about what it's like to run a business. If someone asks me to speak about being a woman engineer I'll ask my partner or one of the woman engineers on my staff to speak. Because again, I think they need that experience, and I also feel that I'd rather be known as a consulting engineer that owns her own firm, not as a woman engineer.

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