



Sloan Career Cornerstone Center

Profiles of Civil Engineers



Joel L. Volterra, E.I.T.

Geotechnical Engineer
Mueser Rutledge Consulting Engineers
New York, NY

Education:

B.S., Civil Engineering, Union College
M.E., Geotechnical Engineering, Cornell University

Job Description:

"As a Geotechnical Engineer, I have been involved with a number of engineering assignments including: planning and supervising of underground investigations and laboratory testing; settlement analysis; earth pressure computations; and geotechnical construction claims analysis."

Advice to Students:

"Pursue opportunities and internships at an engineering firm that performs the type of work you are interested in to get a first-hand exposure to the field."

Video Transcript 1:

"Being in the field is fun, it's a much different atmosphere than being here in the office, here in a shirt and tie today -- I've been in the office for the last couple of weeks -- but being out in the field is very different, I'm in jeans and work boots, tracking around in the mud sometimes and getting a little dirty, working with the contractors, it's a much different environment."

Video Transcript 2:

"I've had a pretty good time with balancing my work and my social life, and I've been able to keep up with those things outside of work that I enjoy doing... I'm fairly athletic, I play a lot of soccer, I'm still involved in a league where I play one day a week. I live here in New York City there's always quite a bit to do outside of work, have a good time with a lot of friends of mine I'm still in touch with from school who live in the area. Have a good time outside of work. The hours that I work are typically eight thirty to five, five thirty, six o'clock. When I do stay and work later it's unusual that I'm here past eight or nine at night. When I do work a normal day and I'm done at five thirty, six o'clock I have plenty of time to do other things outside of work."

Video Transcript 3:

"My first two years with Mueser Rutledge I spent quite a bit of time, probably on average half my time, out in the field, on the project, watching the project being constructed, taking the

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contract documents, working with -- I was the liaison between the contractor and the client -- and working towards those project goals and making sure things were done as they were prepared and planned."

Interview:

Volterra: Civil Engineering is a valuable field in furthering technological advancement. As urban environments continue to prosper, it is becoming ever more important to be able to remediate contaminated sites as well as develop in areas where space limitations exist. We are responsible for the implementation of the physical structures. I get a real feeling of accomplishment during design and construction of these projects. Once engineering was predominantly a field belonging to white males, as were most professions in the western world. This is arguably no longer the case, although there is still progress to be made. In the case of women, the percentage of engineering Bachelor's degrees awarded went from 0.8% in 1970 to 15.4% in 1990. (Engineering Manpower Commission cited in Women in Engineering: An Untapped Resource, published by Catalyst, 1992).

Q: When did you decide to study civil engineering?

Volterra: My strong points in high school were science and math. I knew I was interested in those areas of study. I didn't know a whole lot about civil engineering when I graduated from high school, but I decided to look into colleges that offered programs in civil engineering. And I dove into it my freshman year with the thought that I would go as far as I could until I ran into something that I disliked. And I ended up here quite some time later.

Q: So you went to graduate school as well as undergrad, give me your academic resume, please.

Volterra: I have a Bachelor of Science in Civil Engineering from Union College in Schenectady New York. And a Master of Engineering in Geotechnical Engineering from Cornell University.

Q: You said you were going to look into this until something turned you off. Did you consider any other fields of engineering?

Volterra: I enjoyed civil engineering when I looked into it as a field of study. It has a lot of communications and works in groups and deals with civilian structures, bridges and tunnels, subways, roadways, foundations. And I went to a liberal arts college, Union College so that I had the opportunity to go into other fields of study if I found something in civil engineering that I thought wasn't for me. So I continued to take courses and to follow the curriculum that was recommended for geotechnical or civil engineering. And I continued to take those courses with the intent of practicing civil engineering unless I really found something that would turn me off to it. And I didn't. I enjoyed it. And as I got further and further into it I found disciplines of, or branches of civil engineering that I liked more than others. I took a number of courses in college specifically geared towards geotechnical engineering, soils and foundation work. I took some structural engineering courses and environmental engineering courses that related to them also.

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Q: What are some of the more interesting projects that you've worked on recently?

Volterra: One project I worked on in Baltimore, Maryland, Shorefront Development Project. It was an old, chemical manufacturing plant that had been closed down. The Maryland Department of Environment and the EPA, along with the client, had signed a consent decree to clean up the site and to contain the contaminants on site for future development. I spent about a year and a half, on site, as a resident engineer helping to work with the contractor and provide daily field reports of the work being performed. The project was to contain ground water from leaving the site and contaminating the nearby harbor, the adjacent harbor. We installed about 80 foot deep wall which forms a barrier between the site and off-site to prevent cross contaminating adjacent areas. And that project now is in the stages of forming the landfill cap that will prevent rain water from infiltrating the site. And the perimeter system has already been installed. That was quite an interesting project.

Q: You mentioned you worked with interesting teams. Tell me about the teams you worked for.

Volterra: We have here in this office about 90 engineers. And on each job we have seven partners and each job has a partner assigned to them and a senior associate, an associate and someone at the staff engineering level, which is where I am. And each project has a team of engineers who work together towards a project's goal. The work is split up amongst the different people on the job. And there's a lot of teamwork, a lot of coordination - not a lot of competition, but somehow there's a bit of push towards reaching that goal. And people are asked to do different amounts of work on the project depending on what level they're at.

Q: You work long hours?

Volterra: The hours early on are dependent really upon the project schedule. There are times in which you put in quite a few extra hours to meet the project goals. I think our office does a pretty good job at keeping the extra hours, overtime hours, down to a minimum, unless they're absolutely necessary.

Q: How do you feel about putting in that extra time?

Volterra: If it's a project that's interesting, I don't mind staying a couple of hours to work on a project. You get a real feeling of satisfaction towards getting things done on your own, and having your name putting on the calculations that are performed. And taking part in putting a report out, and finalizing a project.

Q: How does the reward system work? Does it get acknowledged, do they throw you a party at the end of a project? How does it work?

Volterra: That's a tough question. I don't know how to answer that. We really, our office, we get paid basically at an hourly rate. We're on salary, but if we stay to work extra hours we will be paid for the extra time on an hourly rate. So the more time you put in here, the more money you make here.

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Q: Is the money good?

Volterra: I think civil engineering in general, students when they come out of school are hired at a fairly decent pay scale and compared to some other professions can make quite a bit of money in their early years. I think one of the things that tends to bother some people later on in civil engineering is that there may be a salary cap, so to speak, that it doesn't continue to go up as fast as some of the other professions. It's a slower pay increase per year.

Q: Let's go back to the sort of environment you work in. How do you characterize this environment. I mean is it - you're saying it's driven by teams - but what are the challenges that get your juices going?

Volterra: I think my job - I've been here for three and a half years - it's been very teamwork oriented, often working towards a project goal. Yet, there's a lot of communication between the teams, and going in I always feel free to walk in and sit down and talk to a partner and ask some advice and get some information from that person. One thing that's so ever-important for this field is experience. Civil engineering in general there's a lot of judgment involved, especially in geotechnical engineering. That the experience of the people who have been in the field for many years outweighs, in a sense, some of the practical and theoretical knowledge that comes out of schooling. That we really rely on their experience to guide us through some of these projects.

Q: Do you have a mentor?

Volterra: I look towards people who have been at this company for a number of years to help me with questions that I have and the amount I've learned from them in the past couple of years is incredible. It's really helped me to move towards my professional goals here at Mueser Rutledge.

Q: Tell me about those goals?

Volterra: My short-term goals - I've been out of college for three and a half years - are to pass the PE, I should be taking that later this year. I took part one of the EIT when I graduated from school. I was fortunate to pass that. And I'm looking forward to getting my PE and continuing on in this field.

Q: Are you doing anything in particular to prepare for that?

Volterra: I've recently started looking at some review books. I'm not planning on taking a review course, many of which are offered in the area. But I plan on going through the review studies and I have some notes back from when I was in school probably still hanging around. And I just plan on structuring my own study period to go back and look at that.

Q: Will you get a promotion or something when you pass that?

Volterra: We have a minimum promotion here for passing the PE. There is a requirement here that associates with the firm have their professional engineering license, their PE. So people work towards that. There's a small pay increase that comes along with obtaining a PE.

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Q: What does it take to be successful in this line of work?

Volterra: I really encourage people to work on their communication skills. It's a very team-oriented profession. And you can't underestimate the power of those skills that are sometimes overlooked in classroom studies of engineering. There are very few courses in most programs that are dedicated towards presentation of data, and giving presentations, and preparing reports, writing skills.

Q: How did you find this job?

Volterra: When I was in graduate school my advisor helped to move me in the direction of finding work and helped me with my resume with some cover letters, and gave me an idea of the type of place I might want to work. Gave me some names of firms that I might be interested in. And gave me some contacts of who to call and who to be in touch with and who to write those letters to. That was a big help. I encourage people to talk to their professors who know quite a bit about the field. When I graduated from undergraduate, although I had the educational background, I knew very little about what practice would be like, about what my daily tasks would be. But, I looked towards my professors to sort of point me in that direction.

Q: Tell me about these daily tasks.

Volterra: My first two years with Mueser Rutledge I spent quite a bit of time, probably on average, half of my time, out in the field, on the project, watching the project being constructed, taking the contract documents, working with -- I was the liaison between the contractor and the client -- and working towards those project goals and making sure things were done as they were prepared and planned. Half of my time that was spent in the office, I spent quite a bit of time preparing proposals for work, doing some calculations, some foundations work, looking at the different designs and what would need to be done in the field. But having the knowledge of knowing who's doing the work in the field, and really what's going on out in the field, is invaluable, is irreplaceable really with that, being able to perform the calculations you really have to have a feel for how things are done out in the field.

Q: What is it like in the field?

Volterra: Being in the field is fun it's a much different atmosphere than being here in the office, here in a shirt and tie today -- I've been in the office for the last couple of weeks -- but being out in the field is very different, I'm in jeans and work boots, tracking around in the mud sometimes and getting a little dirty, working with the contractors, it's a much different environment. The contractors can be a lot of fun, they have their own tasks to be performed. And you really need to know how to present yourself with them so as not to be the young college boy coming out of school, and telling someone who's been working in contracting for fifty years how to do their job. Sometimes there's a great deal of animosity between the more experienced contractor who may not have the educational background, but knows what he's doing and the skills that he needs to do the job. And he can sometimes become irritated with being told what to do by someone like myself who comes out, and really doesn't have a lot of field knowledge, and is pretty green in the area, but comes out and has a job to do. I think

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going about it correctly and developing that sort of a relationship with a contractor is very important towards reaching the project goal.

Q: Have you ever had any real problems in that area?

Volterra: There are times out in the field where it's difficult to get things done. You have a contractor who refuses to take your advice, sometimes it comes down to a monetary issue where he's being paid to do something, and maybe what you're asking him to do is outside of the project goal, out side of what's been written in the specifications. That's unusual, I think the way we work that here really is that I have the support of the office behind me. That I feel free and comfortable to pick up the phone and call and get somebody that's maybe a little more senior than I am to be in contact with the contractor. To talk to the contractor and make sure that things are being done correctly.

Q: What else do you do in real life?

Volterra: I have quite a few other interests outside of work. I'm fairly athletic, I play a lot of soccer, I'm still involved in a league where I play one day a week. I live here in New York City there's always quite a bit to do outside of work, have a good time with a lot of friends of mine I'm still in touch with from school who live in the area. Have a good time outside of work. The hours that I work are typically eight thirty to five, five thirty, six o'clock. When I do stay and work later it's unusual that I'm here past eight or nine at night. When I do work a normal day and I'm done at five thirty, six o'clock I have plenty of time to do other things outside of work.

Q: So you don't have any problem with balancing your personal and business life?

Volterra: No. I've had a pretty good time with balancing my work and my social life, and I've been able to keep up with those things outside of work that I enjoy doing.

Q: Does location matter to you, did you choose New York as the place you wanted to work? Does it matter where you would -- you know if they had said we want you to go to Afghanistan would you do it?

Volterra: I graduated from school, I was looking at different job opportunities, mostly centralized towards the east coast. I was born and raised on the east coast, and I thought I might enjoy living in New York City, living in Boston. I looked at different firms in both of those cities, and I selected Mueser Rutledge, I was excited about coming to New York City. While I've been here with Mueser Rutledge I have traveled somewhat. I spent a year and a half in Baltimore, I spent a month or so in Arkansas. We do have currently active jobs in Panama, in Japan, Taipei. We have a job in Puerto Rico. We have quite a few international sites. We do, not a while lot of traveling, but often in the first couple of years. I mentioned we've done some amount of field work, spent some time out in the field. And we do travel somewhat.

Q: Do you like that?

Volterra: It's a nice break I think for people that live and work in the city. Sometimes it's a little chaotic, I'm not sure if it has much to do with the field itself I think -- I work for a consulting firm and part of consulting is travel and going to see different sites for different clients. And I think,

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now that I've been with a company for three, three and a half years I'm traveling less, I'm spending more time here in the city. And that's been good. I had a good time out in the field I think I took from it what I needed to. I learned quite a bit while I was there. And now I'm looking forward to spending some time here in the office, and putting the experience to work for me.

Q: Do you think your work has a larger social purpose, do you ever think about that? Some engineers are really very conscious about the way in which engineering is good for society in some way. For others it's the technical challenges that excite them. Where do you stand in that spectrum?

Volterra: I think civil engineering is a good balance between technical skills and communication skills. And I think its impact on society is often unrealized. Many of the bridges and tunnels and structures that we use on everyday that we pass in and out of are overlooked, and many of those things we rely upon every day people don't really know goes into their construction, and having them come to be and be realized. And there's a lot of balance between political concerns of funding projects, many of the projects we work on are state or federal or city local projects. And many are private clients.

Q: When you came here to Mueser Rutledge did you consider any other kinds of firms or was consulting engineer what you really wanted to do?

Volterra: The only time I really looked at different types of jobs was when I was graduating from undergraduate with a bachelor of science in civil engineering, I was unsure if I wanted to go directly into a graduate program or if I wanted to look for work. I did both, I applied to graduate schools and I looked for work, some of the problems I had with going straight to work at that point was that I knew very little about the field, even then after four years of study in the field, I still thought -- I didn't know a lot about what I wanted to do -- when I had the opportunity and I got accepted into a graduate program I decided to go with it, to have the extra schooling. And to dive a little deeper into the portions of civil engineering that I enjoy which were geotechnical engineering. And I think that added, for me it was one year masters program, really helped to firm up my understanding of not only the subject matter, but to give me some direction in the field itself and what my daily tasks would be like.

Q: Is there anything that you do that you really didn't expect to be doing, that came as a big surprise to you when you started your job?

Volterra: I think coming out of school, the transition from the life of a student to full-time work was really something that I don't know if I was as well prepared for it as I could have been. I've enjoyed it, there's something about not having homework that's due the next day, not having exams to study for, although projects are ongoing, and that you sort of take your work home with you in the sense that you still think about the project. When I leave work I'm done until the next morning. And I'm able to set that aside and do other things, and not have it looming over me. Although in some cases you know when deadlines approach there are late nights here and there, and there are times in which the pressure is kicked up a notch to get things done. In general when I leave the office I leave my work here, I don't take my work home with me very often at all.

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Q: So do you ever work on weekends? What's the biggest crunch you ever had to go through?

Volterra: There was a period of time here where I worked on the Boston central artery project, and my specific tasks were checking that the excavation for construction of the multi-laned highway was going to be safe against failure. And that was a period of time where the more time I had the more time I was able to put into the project. I did stay some late nights to get things done, to try and get things out of the way. I did work weekends. That lasted for about a period of a month that we really did things and did things over again and check things to make sure that we were correct.

Q: What advice do you have to students who are contemplating a career in civil engineering?

Volterra: I would encourage students to talk to their professors a lot about what the job might be like, about whether they want to go to work for a consultant firm. Some of my friends have gone to work for contractors as engineers with a contractor. They really need to ask a lot of questions, talk to people. If they know people who are civil engineers, friends of family, talk to them. Get involved in whatever organizations there are on campus, ASCE is one of them, that they could get involved with and find out more about the firm or the profession.

Q: Where would you arrange job security in your personal spectrum of values?

Volterra: I think, my experience with civil engineering is that it's a very secure job. Our firm at least tends not to over hire, we've been basically the same number since the firm started eighty some odd years ago. And people tend to come into the field and stay with one company for quite a long time. We have some of our partners who are retiring who have been here for forty years or more. And I think that -- at least as far as I would think -- that's pretty much a standard in the industry. My experience here with Mueser Rutledge is that people tend to stay here for a quite a long period of time. We have some partners who are retiring who have been here for over forty years. I think people tend to come into the profession and stay with the profession, maybe partly because of the schooling that's required to get to this level, and really the input of time into becoming a professional engineer. The experience that's gained, although the skills are very marketable we are somewhat specialized.

Q: What's your personal plan for your career, are you going to stay here?

Volterra: I would like to stay here, I think this has been a great experience for me, I've had fun while I've been here, enjoy the people I work with, and the projects that I've been working on. They've been very diverse from small projects that I've worked on for a day or two, to projects that I spent almost a year and a half on. So that's been interesting. It's always a different look at things.

Q: If that's your plan, what concrete steps do you take to promote yourself in this organization?

Volterra: I'm working a lot right now to improving my writing skills, I've been pleased with my performance thus far here at Mueser Rutledge, but there are some things that I think

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everybody needs to work on, to continue to grow, and to learn more, and to try and be a better engineer, and to do more things.

Q: Let's go back to one more question I had about your day to day life. You said you usually come in about eight thirty, what do you do first? Is the phone ringing? Is the voice mail box full? Is your computer loaded up with e-mail?

Volterra: Mueser Rutledge is pretty flexible towards the working day I think. Usually when I come in in the morning I have my coffee, sit down at my desk and continue what I was working on the previous evening when I left. I rely quite a bit on my supervisors to guide me, to tell me what the next step is, and feel comfortable in going in and asking them what I should next. And how long do you think it should take me. And to get a feel for what's in the budget to work on that job. And my day is pretty much left to me to get my work done. And I have the opportunity to work with others and to ask them to guide me through that.

Q: Do you ever have to skip lunch and work through, or do you always take lunch, do you go out and play racquet ball for an hour and a half in the middle of the day? What's the pace like?

Volterra: I personally work while I'm at work, I try not to go off on long breaks to go outside and take a break. Usually when I'm here from eight thirty to five, five thirty, six o'clock I work pretty hard, and I try and get things done. And I'd rather do that and leave at five thirty, six o'clock than take more breaks and have to stay later to get things done.

Q: Is there any particular challenge for you as a geotech specialist in that kind of work? I know you're not working on that project but what's the technical task there that requires your company's expertise?

Volterra: The portion of that project that we did quite a bit of work on is actually at this point buried, much of the work that we do is often underground, and hard to see to the casual observer who's working on the ground surface, or even on the inside of the tunnel as the subway passes. Much of what we've done is underneath that structure that supports the structure below. So we won't be able to see quite everything that our company has done out there, but we should be able to see an idea of what a project site looks like. Our current site there's quite a bit of construction activity going on, some large pieces of construction equipment and we should be able to see some workers who are currently doing their daily tasks to get things done.

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