Sloan Career Cornerstone Center

Profiles of Environmental Engineers

Carlton S. Serrette, E.I.T.

Project Engineer
Malcolm Pirnie, Inc.
White Plains, NY

Education:
B.S., Civil Engineering, Howard University
M.E., Howard University

Job Description:
"As a Project Engineer, my general duties include hydraulic analyses for pumping systems, preparation of engineering drawings and equipment specifications, engineering and construction cost estimates, preparation of design reports, and coordination of design efforts among specialty (structural, architectural, HVAC, electrical, and instrumentation) groups to design wastewater treatment facilities."

Advice to Students:
"As a freshman I think you should do a little research and see if this is what you really want to do. If you want to go into engineering try to get internships in the summer to see if this is what you really like, you know it helps a lot. And it will help you decide what you want to do."

Video Transcript 1:
"I have a mentor, my supervisor. And right now there are a couple of junior engineers below me that I mentor, so I try to teach them things that happened over the few years that I've been working. So yes, there are certain types of mentorship, you're not left out there to hang and dry, you're always given someone to help you along the way."

Video Transcript 2:
"I also do recruiting as part of my job, so I go back to universities to do recruiting, and, you know a lot of people think well we look for the highest GPA, but we don't really look for the highest GPA. GPA it's good but it's not the only thing we look for, see what their interests are, what their goals are and see if it fits in with the goals of the company. So my advice to somebody looking for a job is you've got to be well rounded you know, the books are okay, but you've got to be well rounded and know what you want to do."

Video Transcript 3:
"Well, there are a few things that you have to do once you get in, and one of them is getting your professional license. We have to wait a few years, get a few years experience before you

get it. I'm in the process of doing my exams to get licensed. As I see once you get licensed there's not turning back you know, the sky's the limit. And you're basically in control of your career, at Malcolm Pirnie there are different areas you can go into, and it's up to you to decide what you want to go into. So it's up to you."

Video Transcript 4:

"No there is actually no typical day. It varies it could be you're sitting at your desk writing memos, to get different memos out. It could be you're doing design of a certain system. It could be out in the field. Sometimes in between you know little emergencies, little emergencies come up here and there that we have to drop everything else that you're doing to try to solve these emergencies. So there's no typical day actually, every day is pretty much different from each other."

Interview:

Serrette: My name is Carlton Serrette, I'm a project engineer with Malcolm Pirnie, we are environmental engineers, consultant engineers, and we do various aspects of environmental engineering. My main purpose is, I'm a project engineer in the civil sanitary design. And my group mainly handles New York City projects, New York City has fourteen treatment plants and we're involved in some of the plants in terms of design. We have to understand that most of these plants were constructed back in the '30s you know early 1900s. So they're in dire need of upgrading. So there's several upgrading projects. This project is an upgrade which is called interplant upgrade. Where we are upgrading different sections of the plant. And there are three phases, right now we are in construction phase one of the three phases in construction. We are doing preliminary design of phase two. We just completed a interim plan expansion to put the plant up from two hundred and fifty million gallons a day to two hundred and seventy five million gallons a day.

Every state, the District of Columbia, and the U.S. territories have laws regulating the practice of professions including law, medicine, and engineering. These laws protect the public health, safety, and welfare by insuring that those receiving licenses to practice have at least met certain requirements of competence, ability, experience, and character. Licensure laws vary from state to state and are exclusively under the control of the individual state legislatures. But generally, the licensure laws for professional engineers require graduation from an accredited engineering curriculum followed by approximately four years of responsible engineering experience, and finally the successful completion of a written exam. Some states may waive the written exam on the basis of education and experience, but the trend is toward an examination requirement.

Almost all jobs in civil engineering require some sort of interaction with coworkers. Whether they are working in a team situation or just asking for advice, most engineers have to have the ability to communicate and work with other people.

Q: You explained earlier that you sometimes have to work with other consultants, how does that work?

Serrette: There are monthly meetings, which is called partner in meetings, it's partner in meetings so we can get together with the other construction management firm to discuss what issues are outstanding, and see what needs to be done in terms of getting the work done.

Q: So how many people would be at a meeting like that?

Serrette: Anywhere from about six to ten people from the two sides.

Q: What's you role in terms of this particular part of the project?

Serrette: Well as part of IPU phase one the interim plan to upgrade phase one, there's reconstruction of the chlorination system and we also put in a skimming system. What we did was before construction begins we come out and survey the plant and there was something that we put together was a facility plan, getting through to this point in the system. So we had to design a skimming system to take off the sludge before it went out into the river. So at this point we had to design a removal system, and it's a system where we remove all the fluoride before it goes out, so that's how you see this tank is down here, they're in construction and they're putting that together for this tank, this part of this coming system.

Q: Tell me about where we are right now.

Serrette: Okay. Right now we are at the chlorination facility. This is the last point of contact the waste water before it goes into the river. This is a very important system, it's called the disinfection system, you disinfect with sodium hyperchloride ... before it goes into the river. We were faced with doing a reconstruction of this entire system. The really important thing was keeping the system in service while reconstructing it. So what we had to do was we had to put a temporary in service before demolishing the existing system. And then constructing the new system, and then putting that in service and then demolishing the existing service. Right now behind me you can see the permanent system is in construction right now, we have a temporary system in service. What we were faced with is keeping all this system in service and putting everything together.

Q: Tell me what we're hearing. What's the sound we hear?

Serrette: Well the sound your hearing right now is the effluent going out at the effluent part of the chlorine contact tanks, just entering their final discharge to go out into the river.

Q: How much is going by?

Serrette: At times average flow for the plant is two fifty, sometimes it gets as high as four hundred. The plant is rated for five hundred million gallons per day peak flow. In a really high flow time you can get up to that five hundred.

Q: Tell me what do you like about your job?

Serrette: I like the fact that we have to solve unique problems, and every problem is unique. We come out into the field we survey to see the different problems, and we have to come up with a way that we can solve these problems. And especially at a plant like this that you have

to keep the plant in service, you have to come up with a unique way of solving the problem, constructing and staging in a way that you would not impede the flow and operation of the plant.

Q: Okay. So as a problem solver have you always been interested in solving problems?

Serrette: I've always been interested in solving problems, and you get that knack from in college. You just like solving problems and this offers you the same thing.

Q: Just going to ask you just a quick question, when did you decide you wanted to be a engineer?

Serrette: That's a good question. I think from in high school I decided I wanted to be an engineer. It just seemed interesting, I didn't know what type of engineer I wanted to be, but I just knew I wanted to be an engineer. When I got to college I looked at the different areas, and then I decided civil engineering. But a natural environmental engineer I didn't decide I wanted to be an environmental engineer until I visited a plant at school as a field trip and that's when I decided I wanted to be an environmental engineer.

Q: What is it about environmental engineering that you like?

Serrette: Well the fact of solving these problems about the environment and the waste water treatment. I just liked the fact that if you know all these problems you can solve them.

Q: I don't get it though what's so good about these problems?

Serrette: What's so good? We have all these problems with the environment, this is just one part of it, but if we can make a difference and with these new technologies implement them then it does everybody a world of good, and I want to be a part of that.

Q: Where are we now?

Serrette: Well right now we're in the return sludge pump station and this is part of the construction of the new polymer addition system. The polymer addition system was implemented for solids. And right next to me here we have the polymer tanks and we're going to be putting polymer in the tanks. And just last week I went out to test the polymer units and they're going to be coming in soon to be installed.
This is part of the return sludge pump station, down below here we have our return sludge pumps which is part of the activated sludge system. The return sludge pump station, and the return sludge pumps are part of this activated sludge system, along with the panels of the tanks

Q: So, how do you deal with any kind of obstacles or setbacks that come up? What's the drill when there's a problem?

Serrette: Well whenever we have obstacles, setbacks, sometimes we get together and you know we have to survey the whole issue and see what's the best way to solve this. Well cost

is always a factor, sometimes to have to get it done the right way it might be costly, but your always concerned with the cost. Whenever that is a problem we try to sit down and discuss it, get different ideas as to how we should solve these problems. Then find a way, you know, of solving it.

Q: You don't usually come here to this location to do your work though. Tell me about the different places that you do your work.

Serrette: Well in design we're at the office a lot, but the design system, you know different systems for this plant, you have to visit the plant from time to time and see what is actually happening at the plant. That way you'll get an idea and see, you know, what would best suit the plant itself. Every plant is unique, every problem is unique, so you have to come out to the plant and see what is happening. Talk to the operators, you know, talk to the plant superintendent, find out what problems they're having at the plant and actually see it for yourself, and not just you know look at the drawings and try to figure it out that way.

Q: Do you do a lot of traveling?

Serrette: There's some traveling involved. We do travel from time to time to go to different manufacturers to test their equipment. And you know a few engineers from time to time have to go out to test the equipment before it actually comes on site, you have to see that it's performing the way you want it to.

Q: What is this?

Serrette: Well this is this is a flow meter which gives you a signal tell you how much fluids are flowing in the pipe itself. And this is just a remote signal that comes from the actual -- there's a flow meter that's placed in line in the pipe sends a remote signal back to this telling you how much flow is actually going through the pipe. Therefore you can just check how much flow you're getting.

Q: How much flow is there?

Serrette: It's about sixty-six hundred gallons per minute.

Q: Is that a lot?

Serrette: Well this system was designed for as much as seventeen thousand gallons per minute. So there are four pumps in this system they're each fifty-eight hundred gallons a minute so that would be two pumps operating right now, two of the four pumps.

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

Serrette: It depends on what you consider successful. Is it successful making money, or is successful designing something that you'd at least see come into operation. For me right now it's seeing my design actually being built and going into operation. That's where I have my fun right now. I think to see something that you put down on paper well thought out from before actual go into construction. A young engineer, as myself where I have a few designs and it's

now in construction you get a chance to see the mistakes, not really mistakes, but things that you see that you know you could have done a little better. When it goes into construction you say well maybe I should have done it that way. Success -- to be successful I think it depends, you have to be very conscientious, I think, in the designs and who you're designing for. You know because your client has to be happy with your work. And so you have to be very conscientious in order to be successful.

Q: What are some of your concerns when designing?

Serrette: Whenever you're doing a design one of your main concerns is what if the system breaks down. So if the system breaks down you always have to have a backup system in place. Or if you have to repair the system you know what happens? So whenever we design we always put standby systems in case. If we have a system where we do a design and it takes three pumps to pump this system we always put four or five pumps in case a pump is down we have an extra pump. For instance a system like this, this is a strainer here an automatic strainer, normally when you're pumping with a strainer, it's an automatic strainer. That's always a concern of a design engineer. What if something happens and you have to go through all the scenarios to figure out how to come up with the best design. And there's always a backup system, you always put a backup system incase you have to do repairs.

Q: Tell me about the challenges of working with existing equipment.

Serrette: Okay. ... more challenges when you're dealing with existing equipment and facilities in terms of upgrading. But there are also challenges when you put in a new system in place. You have to decide what you're going to serve first. How you're going to put it into operation. How it's going to blend in with existing systems. And how are you going to make connections to the existing system. This system was put in as a new system, but it's going to run together with the existing plant. So what is interesting to us, an interesting problem to us was making connections to the existing plant so we can get flow from the existing plant. Which means tying in to existing lines without stopping the flow from the plant, and we had several areas where we had to tie into the existing plant. So when it comes to existing system construction, or you're faced with keeping the existing system in operation while you do reconstruction for when you're doing your design, when you design things you have to take all these things into consideration before you do it.

Q: What really motivates you?

Serrette: Seeing whatever you design in operation and working well, working the way it should be working that is what matters to me. Seeing a design, something that you put together or helped put together actually in operation being in operation, and being used successfully that is what matters to me.

Q: Tell me more about the teams you work in. Does everybody share the same values?

Serrette: Well, we all have the same goal which is to get a successful system up and running. We have different parts that we play, us as civil sanitary design, we carry the lead because there are a lot of other factors involved in getting a system up. We have electrical engineers involved, we have architects involved, we have HBAC, we just do the serious part, but we also

coordinate with all these other disciplines in order to get a full system in place. So everybody has, you know we have a part to play in a full design, so no-one in particular should take something it's a team effort.

Q: Do you ever have any problems balancing your work life. You ever had any problems balancing that with your personal life?

Serrette: No. It can become hectic at times where you have to go through some long hours at times, but to me it's worthwhile you learn a lot, you learn something every day as far as I see. And as far as I see, if you put a quarter in you get a quarter in. So you know if I have to put a lot in then I'm going to be seeing a lot coming out. And I learn a lot from it, that's that way I look at it.

Q: What advice do you have for students say a freshman in college who's thinking about a career in engineering?

Serrette: Do a little research into what you actually want to do, don't wait too late. I've seen a lot of people wait too late to make a decision as to what they want out of life and what they want as a career. So as a freshman I think you should do a little research and see if this is what you really want to do. If you want to go into engineering try to get internships in the summer to see if this is what you really like, you know it helps a lot. And it will help you decide what you want to do.

Q: What about people who are actively looking for a job, what advice would you have for them?

Serrette: Well, if you're an environmental engineer, I also do recruiting as part of my job, so I go back to universities to do recruiting, and, you know a lot of people thing well we look for the highest GPA, but we don't really look for the highest GPA, we talk to people and see what their interests are. GPA it's good but it's not the only thing we look for, see what their interests are, what their goals are and see if it fits in with the goals of the company. So you know it's just not about your grades it's about what you want in life and what you want to do. So my advice to somebody looking for a job is you've got to be well rounded you know, the books are okay, but you've got to be well rounded and know what you want to do.

Q: How about you in terms of managing your career. What do you do?

Serrette: Well, there are a few things that you have to do once you get in, and one of them is getting your professional license. We have to wait a few years, get a few years experience before you get it. I'm in the process of doing my exams to get licensed. As I see once you get licensed there's not turning back you know, the sky's the limit. And you're basically in control of your career, at Malcolm Prinny there are different areas you can go into, and it's up to you to decide what you want to go into. So it's up to you.

Q: So what are you doing to prepare for your own license?

Serrette: There are classes that we have and then you take the professional exam. To take the professional exam you have to have three years experience with a masters degree, or I

think maybe five or six years with a bachelors degree, and your professional exams there are classes you take before you do the exam. There's one of two exams you take, that's the second part of the exam. The first exam is the engineering training, you can do that while you're in school a junior or above, or you can do it when you come out. So once you get that then you go on to do the professional exams.

Q: Do you have a masters degree?

Serrette: I have a masters degree in civil engineering from Howard University. I also did my bachelors degree at Howard University and I've been working at Malcolm Prinny straight out of school. And it's been a learning experience, you learn a lot on the job. But the foundation you get at school helps you, helps you a great deal. You learn a lot of the work on the job itself, but you need the foundation from school. This is the central control panel which helps you the design is that you can operate it automatically or you can operate it locally from the pump. So this is a central control where you can operate anything from this one panel. So the operator comes, it's for ease of operation. So the operator can operate everything from this panel automatically, so it's ease of operation. And if there's a problem he could also operate it remotely and the operator can also operate the equipment itself.

Q: Carlton, I asked you before what you did to manage your own career, sort of where you saw yourself going, can you tell me a little more about that?

Serrette: First of all to get where you want to go in this business you've got to be licensed. So your first goal as an engineer, you know, working in the industry is to try to get licensed. And that way if you do all your exams, you get licensed, then you can look into which areas you want to go. And whether you like it or not it comes up to management.

Q: In terms of managing your own career do you see your career being entirely at Malcolm Pirnie or not?

Serrette: I enjoy working at Malcolm Pirnie right now there are a lot of opportunities there for me to move up. And right now I'm enjoying myself. You never know where it's going to take you. So I'm happy where I'm at right now and can see where I'm going. To say if see your career at Malcolm Pirnie, it's a bright future right now.

Q: Do you have a mentor?

Serrette: Yes. At some point or another you do get a mentor, and I have a mentor, my supervisor. And right now there are a couple of junior engineers below me that I mentor, so I try to teach them things that happened over the few years that I've been working. So yes, there are certain types of mentorship, you're not left out there to hang and dry, you're always given someone to help you along the way. Because we understand that when you come in a company you're a lot of people think that you're expected to know everything right away, you're not expected to know everything. So it's okay to say you don't know.

Q: How about networking. Do you network outside the company?

Serrette: To some point you have to network when it comes to the clients you know because we are a consulting firm, so you have to network with the clients and different people, you know to find out what's out there, the types of jobs so you can put in proposals and such. So you do a little bit of networking here and there.

Q: What else do you do in real life, what are your hobbies your interests?

Serrette: My interests? Well in college I played on the varsity soccer team, so it wasn't just all about engineering, I had other things to do. So I played college soccer, and I still play soccer from time to time. So that's my main hobby.

Q: And now you keep up athletics or anything like that?

Serrette: Yes. I just try to run here and there. Sometimes it's not feasible to do, you know I don't have the time to do, but I try to do it from time to time. Not just engineering.

Q: Is there anything that you don't like about the job?

Serrette: Meetings. I don't like meetings. But it's a necessity, you have to go, and that's where you go and you talk about all the issues that are involved. Sometimes they get a little bit long but you have to do it. But hat's the only thing I think I don't like, the meetings. But I do it because I have to. And you know sometimes you solve problems by just getting together and just talking it out.

Q: Do you find the designing work challenging?

Serrette: Well you have very interesting problems that come up when you try to do a design, you know you just don't dive into it, you have to actually study and think how am I going to do this? How best am I going to solve this problem? How efficiently I'm going to do it? When you have a new facility that you're putting up you might think there are no problems you just put up a new facility. But there are certain things that you have to look into before you actually do a new construction you know. Who you going to serve, you know? How best you can put it together? When you have an existing plant or an existing system that you have to reconstruct while keeping the existing system in operation, there's a different type of problem here where you have to keep the system up and running, while you're doing your construction. So your design basically not only puts in new equipment or new facilities, but you also have to think about how am I going to keep this in operation while I'm doing it. So it's a different type of problem you have there.

Q: You get satisfaction from both sides of that I guess?

Serrette: Well, yes, because it's a different problem. Every day you're facing a different problem and you have to solve these problems. My satisfaction is coming out on top and seeing well, we've overcome whatever problems we've had.

Q: Let me ask you about diversity in this field. What kind of people do you work with? Is it pretty homogeneous is it the same kind of people every day, or do you work with people from different countries, different cultures, how does it work?

Serrette: Even at Malcolm Pirnie it's very diverse. You work with different people, people from different countries. We have people a lot of different backgrounds you know, different personalities. And one of the things at work you have to deal with different personalities. It's all about adaptability, so you have to adapt to your environment. And when you get into a room with a lot of different people to solve a problem your idea might not be the best idea, their idea might not be the best idea, but you've got to come upon some common ground, and you have to know how to deal with the different personalities. So you know realize that one of the things you have to be able to do is to adapt to your environment. One of the keys to being successful, you know as an engineer, is being able to adapt to your environment, and to different people and personalities, because you have to work together with a lot of people to come upon a solution.

Q: Tell me again what your life is like day to day. Talk me through a day.

Serrette: A typical day would be me coming into the office. What I like to do is I like to keep a to do list on my desk. And you know I come in I check what I have to do and see what I can do for the day. In between doing all that you get a lot of calls from you know sometimes the contractor, sometimes you have unexpected problems that may come up during the day that you have to leave everything your doing and try to solve those problems. So I would get to the office and try to take care of a few things. It may be design or it may be just taking care of writing a memo, you know it may be just writing a memo to get some information out. So you know that can take you through the day.

Q: Some tell me that there is no a typical day.

Serrette: No there is actually no typical day. It varies it could me you're sitting at your desk writing memos, to get different memos out. It could be your doing design of a certain system. It could be in the field. Sometimes in between you know little emergencies, little emergencies come up here and there that we have to drop everything else that you're doing to try to solve these emergencies. So there's no typical day actually, every day is pretty much different from each other.

Q: Is that good?

Serrette: That's good because it gives you a shake up in what you're doing. You don't want to be doing the same thing over and over then you get all tired, you know, and it becomes uninteresting. So that's what's good about it, there's not typical day.

Q: Is there anything that you have to do in this job you never expected you'd be doing when you were in school? Surprises.

Serrette: Client contact. It's a lot of client contact. You know when you're in college the idea you have of being an engineer is just you're sitting and you're working problems out, you know solving problems but apart from that you have to interact a lot with people.