

Construction Project Engineer - Career Exploration

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Abstract:

The construction industry is one of the most diverse job markets because of the variety of specialties involved. With such a wide range of skills and expertise needed for the same project, it is essential that students within the construction management field are not only prepared before entering the workforce but are also aware of the expectations and the work environment of the various options they have. This paper provides an overview of the skills and qualifications necessary to become a successful project engineer in the construction industry. Interviews, with three current project engineers, provide professional insight from career experts depicting what it takes to be a successful project engineer.

Introduction:

Within just one construction project there are a variety of tasks that must be addressed. This includes the many different positions within the construction industry that are involved in the completion and success of a project. Because the construction industry has seen rapid growth in the number of projects, the number of jobs has also increased (Luo et.al., 2017). The more complicated a project, the more professionals are needed and the more specific their job requirements will be. The complexity of a project also influences who is involved. Specifically, a project engineer is a key part of a construction project from start to finish because of their involvement in almost every aspect of the construction process. Since there are so many parts that go into a construction project, having one person involved in everything from the first meeting with the client to the end result is crucial to the continuity of the project.

Responsibilities of Project Engineers:

Project engineers have numerous responsibilities throughout the entirety of a project. From start to finish they plan, design, develop and manage the construction project. They work alongside superintendents who oversee the project from planning to completion. The project engineer is responsible for the small daily tasks such as specifications, scheduling and running materials while communicating with other members of the team and the client. Project engineers have a wide range of responsibilities since they work both on and off site during the project.

The main focus of a construction project engineer is to understand the needs of the project and find a way to execute those needs. Organization and attention to details are important in order to set up a proper timeline for the project. Once on the site, their job consists of ensuring safety for workers and resolving problems before they happen. They build relationships with the contractors, project manager, and owners to update everyone throughout the process (Novotny, 2018). The project engineer is a management position, but engineering knowledge is also required because project engineers must know the technical elements of a project. The ability to update construction documents and develop specifications are key responsibilities of a construction project engineer. The project engineer of a construction project is the “go-to” person

who makes sure everything runs smoothly and ensures the lines of communication are smooth between everyone else involved in the project.

The project engineer's responsibilities on a construction project are vast. Some of the day-to-day tasks that can be assigned to project engineers in construction companies include:

- Procuring of materials required for self-performing site teams.
- Communicating with sub-contractors and suppliers about addressing emerging issues on site.
- Following up with company's superintendents or subcontractors' project managers on schedules and look-ahead plans.
- Writing and documenting request for information (RFIs) that are sent to architects, engineers or owner representatives.
- Assisting in managing transmittal processes where the contractors require approvals on shop drawings, materials and methods that are to be used on site.
- Take-off material and estimating of changes orders.
- Assisting the project manager in handling project documentations including logs and reports.

Becoming a Project Engineer:

When deciding to become a project engineer in the construction field, a bachelor's degree in a construction or engineering program is preferred. An engineering degree provides the ability to interpret and comprehend technical elements required on the project (Novotny, 2018).

Management experience is also a very important component in properly managing the rest of the team involved with the project. Many project engineers in the construction field have a professional engineer's license that shows clients how reliable they are (Novotny, 2018).

Pay and Job Outlook for a Project Engineer:

According to payscale.com, the average base salary for a project engineer was \$61,358 as of March 2019. The more experienced project engineer (10-20 years) averaged \$72,378 while the top ten percent made over \$106,000. There is an exceptional pay difference by location, but an entry-level position as a project engineer can average \$58,000 a year. This proves that through experience and growth, this career path provides the possibility for advancement, and with the construction industry growing, one can forecast higher pay for more knowledgeable candidates.

Interviews with Project Engineers

Ball State University offers a baccalaureate degree in Construction Management and provides a minor in Construction Management for those majoring in others field but interested in gaining more construction/project management knowledge. The Construction Management program is accredited by the American Council for Construction Education (ACCE). In the past five years, the program has had 100% job placement in the construction management industry, including those who are placed as project engineers.

The program aims to prepare professionals who:

- Utilizing critical thinking and decision making to solve problems

- Possessing entry level technical knowledge and skills of construction science and management
- Applying effective leadership, team building and communication skills to the overall construction process
- Managing the construction project successfully from start to finish
- Integrating and apply knowledge to produce safe, efficient, economic, and sustainable solutions
- Exhibiting honesty, integrity and high ethical standards
- Demonstrating the ability to work effectively with diverse populations
- Analyzing needs and provide necessary training and/or feedback to improve desired outcomes
- Committing to continued professional growth and have the initiative to grow in their positions and assume leadership roles within their chosen profession

During the spring of 2018, three graduates of Ball State University's Construction Management program were interviewed, capturing specific insights to the field. Two of the interviewees have been working at the same company for two years while one has three years of experience. All three project engineers received their current job offers from the annual campus career fair.

When asked what a typical workday as a project engineer entails, all three project engineers explained their daily tasks change depending on what phase they are in with the current project. One of them explained in each phase, "there is lots of communication with the sub-contractors to figure out issues and to relay information". All three shared that they spend more time on-site than in the office. This of course depends on the time of year. "In the busy months (March to November), [he] spends about 60 percent of his time on site versus 40 percent in the office."

All three interviewees discussed that dealing with unexpected challenges was a common challenge. They all revealed every project is different, and one of the three specifically mentioned "turn-around time is a challenge because the sub-contractors expect an answer right away which coincides with what another project engineer said about having to make sure everyone involved like owners or general contractors are happy."

A consensus for the most enjoyable and rewarding part of their project engineer job was "when the final project comes together." One of the three specifically mentioned, "[he] likes to navigate through the challenges that come every day and [how he] learns something new every day."

Interpersonal skills become critical when working in this field. Communication was the number one skill discussed by the interviewees. One project engineer explained that, "the ability to have tough conversations with contractors is important", and another said "the ability to deal with different personalities is important since there are so many people involved in a project."

The three interviewees were past students enrolled in a bachelor's degree. They revealed that during the four years of their construction management degree, specific classes: scheduling, materials, specs, and electrical management helped them excel in their job. One project engineer suggested that an internship be considered at varying times of the year, not only in the summer. The second engineer emphasized the importance of job shadowing and on-site experience as well

as focusing on certification classes like LEED. His advice to students was “to participate in any extracurricular activities in construction to better prepare for the field”. When asked what skills were recommend for a current student to focus on before entering the industry. One of the three project engineers stated, “It is important to understand how to read drawings and get a full grasp on the details.” Another suggested, “...learning the specs and drawings quickly... and not to be afraid to ask questions”. The third project engineer stated, “it is important for students to build good relationships with their professors and mentors because those are the building blocks for their network. The relationships are potential job opportunities when the students graduate.”

All the project engineers interviewed had plans for their future that involved future growth in the construction management field. One of the three desired to eventually have more of a superintendent role so he could be more involved in field work. The second project engineer plans to “move up the ranks” in his current company and become an executive. The third, plans to own his own construction business by first becoming superintendent followed by becoming an estimator to gain all experience he can.

Conclusion:

Project engineers are essential to any smooth-running project in the construction industry. Since they are a critical part of the construction process, dependent on throughout the entirety of a construction project, they are required to have a wide range of skills, knowledge and experience. The attention to detail with the technical elements and the communication between contractors are vital skills they must obtain to be successful. Though this is a challenging profession filled with a different set of tasks each day, it is a rewarding way to start and advance a career in the construction industry.

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