

Company's Road to Success for Newly Hired CM Graduates

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Construction Management (CM) graduates are generally hired by a variety of organizations within the construction industry, including general contractors, subcontractors, construction management firms, and suppliers. Considering the diversity of employment opportunities, CM graduates need specific skills in order to work efficiently and contribute positively to the organization for which they work. CM graduates are often unfairly criticized by their employers because they are new to the workforce and thus have limited, if any, practical experience. Shawmut Design and Construction (SDC) decided to take a proactive role in solving this problem and developed a 3-year rotational program called Construction Management Skills Training (CMST) that exposes new graduates to different roles within the company and allows them to decide which career path they would like to pursue at the end of the program. This three-year program includes one year of experience in each of the three major operational roles within the company, including assistant project manager, assistant superintendent, and assistant estimator. The CMST program has helped SDC to prepare recent CM graduates for successful careers in leadership positions throughout the company.

Keywords: Construction Industry, CM Graduates, Project Management, Construction Experience

Introduction

The construction industry is dynamic, complex, and project-based. Each individual project involves a new team and new challenges where the end product is tailored to distinct client specifications. Due to this environment as well as changing demands within the construction industry, skilled and knowledgeable teams are required to adjust to diverse client needs to successfully complete a variety of projects (Druker *et al.*, 1996). Moreover, designers are utilizing a greater number of specialists and consultants than ever before to help them design the specifics of their projects, and as a result, construction projects have become even more complex, both technically and managerially.

Despite the industry's demand for skilled and professional staff, literature on training within construction companies has been very limited (Loosemore *et al.*, 2003). Researchers found that companies in the construction industry generally demonstrate significantly less commitment toward developing employees compared to their counterparts in other industries. However, a company's success, especially in construction, is highly dependent upon the quality and morale of its employees. Training provides a powerful approach to the development of high quality employees in many business sectors. Therefore, effective management and the development of talent requires a serious commitment to training (Tabassi *et al.*, 2011).

As buildings become more complex, construction companies demand greater technical and applied skills from new entrants to the job market and are seeking heightened skills from workers already in the workplace (Ikediash *et al.*, 2012). The construction industry has been greatly affected by technological change, contributing to this increased demand (Dada *et al.*, 2012; Adi *et al.*, 2012). Employers expect newly hired staff to reach full productivity as soon as possible, and thus require their employees to learn and adapt quickly.

It is often said that an organization is only as good as its people (Green *et al.*, 2004). Employees are the most important and valuable assets of an organization, especially in construction, a relatively labor-intensive industry. Educated and well-trained employees are a precondition for an organization to gain a competitive advantage, which leads to a company's success (Tung-Chun, 2001). Therefore, it is important that employees possess the required skills and knowledge as early on as possible so that their companies remain competitive and successful (Green, *et al.*, 2004).

Background

Major tasks in construction management include planning, organizing, scheduling, implementing, managing, monitoring, controlling, and tracking construction projects (Baharudin, 2006). According to Sears and Clough (1991) CM graduates must possess three essential attributes. First, they should have practical experience so they are thoroughly familiar with the workings and intricacies of the industry. Second, in order to ensure they are prepared to carry out tasks and responsibilities, graduates must be familiar with various tools and techniques for planning, scheduling and controlling construction operations. Thirdly, graduates must have the personality and insight that will enable them to work harmoniously with other people, often under very strained and demanding circumstances. Graduates should also be able to work with others to perform their duties due to an increasingly interdisciplinary nature of the industry. Effective training programs are crucial in ensuring that recent graduates and new employees possess all of these essential attributes. These attributes may be taught or improved through formal training seminars or on the job training as recent graduates perform required tasks under the supervision of a coach or manager.

According to Neilsen (1998), CM graduates are often unfairly criticized by their employers because they are new to the workforce and therefore have limited, if any, practical experience. To perform their daily tasks, solve problems, and work effectively with others, graduates must be good active listeners (Bucks and Saunders, 1998). Along with a strong academic record, employers want CM graduates who are team players and leaders. Also, according to Riggs (1988) employers want graduates who have information technology skills, communication skills, problem solving skills and good awareness of the business environment. While some of these requirements can be taught in the classroom, many require on the job training and experience within the industry. Therefore, employers must ensure that their newly hired CM graduates have all necessary knowledge and skills in order to accomplish their immediate tasks as well as to mature into effective managers and more importantly leaders within the company.

SDC decided to take a proactive role in new employee training and developed a 3- year rotational program called Construction Management Skills Training (CMST) that exposes fresh graduates to different roles within the company and allows them to find their own niche upon graduation from the 3-year program. The CMST program aims to train newly hired employees in three of SDC's most relevant positions from their first day with the company, allowing them to develop skills necessary for each role before choosing a career track. In addition to the technical skills CMST participants learn on the job, there is an established curriculum that introduces the recent graduates to leadership skills. While this level of leadership training is generally reserved for employees moving into executive roles, SDC believes that by starting leadership training at this level, in conjunction with the technical training, it will allow CMSTs to mature both skillsets in tandem and that the CMSTs will be able to step into leadership roles shortly after graduating from the program.

Program Description

Shawmut's CMST program consists of three, one-year assignments as an Assistant Project Manager (APM), Assistant Superintendent, and an Assistant Estimator. CMSTs perform the duties required in each of the three roles in order to gain experience and understanding of each role within the company at the same level of responsibility as any other employee holding these positions, regardless of whether other employees are in this training program. This requires CMSTs to actively participate on projects in the role to which they are assigned to. This rotational program offers a "road map" for recent graduates, providing structure and comfort for recent college graduates who may not know yet what their 5-year or 10-year career goals are. This structure allows recent grads to learn what their options are and helps them shape their long-term career goals as a result (T. Scott, Personal Communication, January 27, 2016).

Transitions between the three roles occur in one-year intervals in order to ensure a well-rounded knowledge base for CMST graduates, but this happens case by case, based upon the needs of the company. Some CMSTs will stay in a rotation for a couple of months more or less than the one-year baseline as a result of business demand at that time. In recent years, this rotation has become much more regimented, with participants transitioning to the next position

more often at the one-year mark, demonstrating SDC's commitment to ensuring a well-rounded, consistent education for all CMST graduates (Joe R., Personal Communication, October 9, 2015).

The CMST Program began in 1998 when management at SDC realized that there was a major benefit to allowing junior staff to work in each of the major areas of construction operations. It would allow junior staff to be more productive, filling in gaps within project staffing wherever needed as a result of their experience, as well as gaining a first-hand understanding of how a construction project is carried out from conception through completion. The idea originally came from junior staff rotating between positions simply due to business needs. Upper management realized that the rotation made these staff members stronger and decided to implement a training program based upon that rotation. The formalization of the program in 1998 and the general path for the participants has been a constant ever since. The CMST program graduates employees who can be successful in a variety of operations and positions. Graduates develop an understanding of how project teams work together during a project from estimating and procurement through project closeout.

Since its inception, the CMST Program has grown tremendously, with the majority of newly-hired college graduates going through the program rather than starting out in a set role. Program participation has consistently increased, with the exception of 2008 and 2009 when the economy did not allow for new hires within the company and numbers dwindled. Since then, the program has steadily built back up, with more participants each year. In 2010, management noticed that recent CMST graduates were technically strong as they completed daily activities but lacked leadership and management skills. Therefore, a new "Leadership Development Program" was created as an additional facet of CMST training. This proved to be a unique approach since this training is typically reserved for experienced managers in most companies. Additional training allowed junior staff to quickly and seamlessly transition to a management position. SDC's "Leadership Development Program" consists of 6 classroom-based courses over two years and a one-year capstone project during the 3-year CMST rotation. Trainings are designed to encourage CMSTs to work together across roles and office locations and to develop into effective leaders within SDC.

Recently, SDC has introduced the option of a supplemental rotation. These rotations include Surveying, BIM and MEP Services, Group Finance, and Scheduling. These rotations are still under development, and they will be added into the three-year program time-period, rather than extending it. However, for participants to qualify for a supplemental rotation, they must first demonstrate proficiency in whichever rotation(s) they are cutting short to create time for the additional rotation. As with the baseline rotations, time CMSTs spend in these supplemental rotations is based upon business needs.

CMSTs are paired with managers, based primarily on business needs. However, Libby F., the CMST Program Manager, determines the best possible manager for each participant when possible, to ensure CMSTs gain as much as they can from the program. Participants can contact her with any questions or concerns regarding their experience as a CMST. In addition, she coordinates the transitions between rotations for CMST participants. Managers understand that while CMSTs have the responsibility of any other full-time employee, their work is also a learning experience (S. Masucci, Personal Communication, January 27, 2016). Therefore, managers often provide CMSTs with on the job training throughout their rotation.

As of October 2015, there were 92 CMSTs in the program, making up roughly 10% of SDC's total employee base. The CMST program continues to change and develop as SDC's training and business needs evolve. For example, a new CMST training program requires every participant within the company to attend a two-day training seminar in SDC's Boston office so that all CMST participants are exposed to the same training, at the same time, in the same place. In addition to the formal training they receive at this seminar, participants are able to meet other people occupying similar positions from offices across the country as well as network with each other and with the Shawmut executive team. SDC's constant commitment to the CMST program allows the company to develop its next generation of leaders and managers, as well as to generate great strength for the company's mid-level management, historically a difficult level to recruit for within the construction industry.

The Assistant Estimator Role

Assistant Estimators in the CMST program perform many of the duties expected from full-fledged estimators within the company, working on both progress budgets and hard bids. Assistant Estimators ensure that proper documentation is in place prior to the beginning of the estimating process. In addition, they are required to identify all necessary information regarding a job to produce a responsible estimate from the provided documents. Assistant Estimators perform quantity takeoffs for all relevant and necessary building components in order to check that the quantities they receive from the subcontractors' proposals are correct or to include within an in-house budget. Also, they must create bid lists, develop relationships with qualified subcontractors and ensure that the best bids are obtained for each trade based on specific project needs. As with every role within construction procurement and operations, this requires an in-depth knowledge of the project's contract documents. Assistant Estimators will also arrange and attend walkthroughs in order to learn how site conditions will affect pricing. During their Assistant Estimator role, CMSTs work with their managers and estimating teams on specific projects, participating in bid or budget review meetings and often times, they hand-deliver hard bids.

Charlie F. of SDC recently completed his first rotation in the CMST program in the Estimating Department. According to Charlie, one of the most valuable things he learned was how to turn the plans and specifications into specific scopes of work for each trade. This can be tricky because it is easy to miss pieces, creating a scope gap or overlap work, creating scope creep. After each scope has been written out, he needed to evaluate proposals, ensuring that subcontractors had a good understanding of the project itself and that they included all the required scope (Charlie F., Personal Communication, October 19, 2015). In addition, Charlie learned where attention to details matters most and how to prioritize his limited time when preparing a proposal.

This rotation is valuable because many CM graduates start out working on the operations side of the business. Many will never be exposed to daily activities in the life of an estimator. This creates a gap between operations and procurement. With a year of experience in estimating, many Project Managers and Superintendents at SDC develop an understanding of and appreciation for the basic mindset of an Estimator and how to support them.

The Assistant Project Manager Role

Assistant Project Managers (APMs) take care of the necessary documentation and project control to keep a construction project running. During this rotation, CMSTs assist with project and job site documentation and material procurement throughout the project by processing submittals and RFIs. APMs also assist with financial management of a project by processing owner billing and subcontractor change orders, learning the different software that SDC uses for these purposes through both formal and on the job training. APMs also have the opportunity to run subcontractor meetings, work on trade coordination on projects, and support the punch list process.

APMs also participate in subcontractor meetings, and record and distribute meeting minutes. APMs are also involved in subcontractor coordination, especially for Mechanical, Electrical, Plumbing and Fire Protection (MEPF) work. They interact with the Superintendent on the job regularly, ensuring that all work is completed correctly and in a timely manner. If there is a problem with productivity, manpower, material delivery, or documentation with a subcontractor, it is expected that an APM will work with the superintendent to rectify the situation. They also manage any potential subcontractor change orders. Especially in this position, CMSTs are given a lot of the responsibility of a full-time employee rather than that of a trainee, interacting with the client as well as assisting with subcontractor management. Through these interactions, the CMST learns different contractual and professional relationships involved on a construction project.

The Assistant Superintendent Role

During the Assistant Superintendent rotation, CMSTs learn the parts and pieces that make up a building. They assist with management of the physical construction of a building on a daily basis and have plenty of opportunity to see each component of a building put in place. Assistant Superintendents get to translate the project documents into real life (C. Gallo, Personal Communication, January 27, 2016). Witnessing the construction of the project and the associated means and methods used in the industry is arguably the most valuable aspect of this rotation as it helps

CMSTs to develop a deeper understanding of systems, materials, and subcontractor interactions (Joe R., Personal Communication, October 9, 2015).

Assistant Superintendents have a variety of duties, including determining project constructability, securing licenses and permits to initiate a job, and confirming materials and methods specified within the project documents. They track and manage subcontractors' work through project progress photos, ensure site safety, write daily reports, perform head counts for each trade, and communicate with foremen on a daily basis. In addition, Assistant Superintendents handle field-related questions from the trades and draft corresponding RFIs. As changes are made, they must also ensure that the changes are posted on project documents to ensure they are always current and up-to-date.

Assistant Superintendents are in constant contact with subcontractors during construction operations and they support the physical construction of a building. This rotation is typically saved for the third year to ensure Assistant Superintendents have as much knowledge of the business as possible prior to these interactions.

CMST Evaluation

During their first week, each CMST participants is given a Core Competency work sheet related to their role. Core Competencies include topics which CMSTs must understand as well as specific duties to be fulfilled. Each Core Competency sheet essentially outlines the specifics of the role's job profile. The Core Competencies were developed by Libby F. in an effort to create a road map of what CMSTs are expected to learn for each year. Each rotation is associated with a list of 20 to 30 required Core Competencies (see Appendix A for an example of a core competency sheet). This allows CMSTs to set expectations with their new managers based upon their working relationship and the tasks ahead of them. CMSTs sit down with their manager after six months and review the Core Competencies, detailing items in which they have exposure, experience, or competency. This presents an opportunity to make any notes detailing concerns that either party may have, especially pertaining to the CMST's development and whether or not they are on schedule when compared to their peers. The outcome of the conversation and the completed work sheet are shared with the CMST Program Manager. If there are any concerns with the CMST's development, a plan is created at that time to get them back on track. The Core Competency work sheet is reviewed again at the end of the rotation to ensure the CMST had sufficient exposure and experience in all relevant areas and that they are ready to rotate to the next position. It is not expected that the CMST is competent in each deliverable on the sheet, but that they had exposure and experience in each. CMSTs are, however, expected to be proficient in at least a few Core Competencies as a result of their year of experience within the position. In addition to the Core Competency Sheet, the CMST is formally assessed by their manager as part of Shawmut's Performance Management process. This includes both the CMST and manager completing a performance appraisal, as well as gathering feedback from a variety of colleagues the CMST worked with over the past year.

CMSTs must eventually demonstrate Core Competencies such as the ones listed in Appendix A for the Assistant Superintendent role. This allows recent graduates to develop technical skills in each career option within SDC. CMSTs are expected to take their careers and education into their own hands rather than depending on someone else. Because there are many core competencies required from CMST participants, meeting each one of these requirements is dependent on participants' motivation and dedication to their careers. At the end of the three year rotation, CMSTs meet with their managers as well as the CMST Program Manager, Libby F., to determine which role they will ultimately fill based upon which rotation they enjoyed as well as an evaluation of strengths and weaknesses.

Program Success Stories

The CMST program often receives praise from its participants and graduates. Current CMSTs see and interact with living examples of the program's success every day, which in turn motivates them to advance their careers within the company (E. Murphy, Personal Communication, January 27, 2016). The CMST program at SDC has produced some of the company's top-performing employees who have quickly progressed throughout their careers. For example, Chris M., now a Project Executive, began his time at SDC in the CMST program 17 years ago, one of the

first to try out the program. Andrew P., a Project Manager, graduated from the CMST program in 2014. Because of the skills he learned throughout the CMST program, Andrew was promoted from Assistant Project Manager to Project Manager within a year of his CMST graduation. Upon beginning the training program, Andrew, a recent college graduate with a CM degree, knew he wanted to work as either a Superintendent or a Project Manager, and his experience in the CMST program helped him decide between the two career tracks (Andrew P., Personal Communication, October 9, 2015). Joe R., also a Project Manager at SDC, started out as a CMST after graduating college with a degree in Engineering. Although he grew up around the construction business, he was unsure of which career track he would enjoy best until he completed his rotation. Joe worked with great managers whom he considers to be experts in their field, so he learned quickly from them. This, along with useful trainings specifically for CMSTs, enabled him to choose his favorite position and progress into a successful project manager (Joe R., Personal Communication, October 9, 2015).

One of the many contributing factors to the sheer number of successes resulting from the program is the amount of responsibility given to CMSTs. Although it is considered a training program, participants are treated just like other full-time employees and their responsibilities reflect that (Charlie F., Personal Communication, October 19, 2015). CMSTs are given ample responsibility and held accountable for their own work. This teaches CMST participants the quality of work and level of responsibility expected from them throughout their careers at SDC.

As with any entry-level position, the success of employee training and development greatly depends upon the relationship between CMSTs and their managers. Some managers are great to work with, while others are a bit less helpful to a newly hired employee (Joe R., Personal Communication, October 9, 2015). At SDC, the responsibility lies on both the manager and the CMST. The manager should be helpful and teach their CMST, but the CMST must ask questions to determine what is expected of them. CMST participants are placed with the best managers possible to ensure that they are learning from experts in their field and therefore learn as much as possible. With 92 CMSTs, it is not always possible to pair each individual with SDC's best managers, so there is also a focus on learning from managers who are more difficult to work with. Upon completing the CMST program, there is no time requirement before an employee is eligible for a promotion or recognition of a job well done; this is solely based upon an employee's skill, expertise, and effort (Joe R., Personal Communication, October 9, 2015).

Conclusions and Recommendations

The CMST Program allows recent CM graduates to develop a wide range of skills by performing the tasks required within each rotation. This allows graduates to gain an understanding of each of the three major roles before deciding which career path they will venture. Understanding how various departments operate helps interdepartmental communication thus increases overall productivity. Understanding what others do within one's company, especially through personal experience, allows them to develop an understanding and appreciation for other positions. Upon completion of the training program, employees are well versed in how SDC operates and recognize all of the work behind each task (Joe R., Personal Communication, October 9, 2015).

Many CM programs teach students higher level management skills rather than the day to day processes required for each position within the industry (Andrew P., Personal Communication, October 9, 2015). In addition, students learn how to use certain software and understand the basics of certain processes, but they are only able to learn certain applications of these tools without sufficient practical industry experience. Due to the variation in positions available in construction as well as the different processes that each company has, it is not feasible for CM programs to focus on the specifics, such as how to process a submittal (Joe R., Personal Communication, October 9, 2015). Teaching new hires the specific skills and processes as they pertain to their position within a specific company is critical to the success of a company and employee.

Along with any position within the construction industry, the CMST program involves case-by-case learning to bridge the gap between the academic experience and construction industry. For example, participants learn about a wall assembly specific to one project, which may be different from an assembly used on a different job. This project-specific learning allows CMSTs to understand in-depth the specific pieces of a building as well as the specific processes involved that may not necessarily be taught in a classroom.

Many construction companies allow recent CM graduates to choose whether they would like to work in project management, as a superintendent, or in estimating from day one. However, many recent graduates do not have enough experience in all three areas to make an informed decision. Other companies have a rotation between the field and the office built into more concrete career progressions. While these companies give a more well-rounded experience, many do not give the employee a choice between areas for five to six years. The CMST program is an example of a “happy medium” between these two extremes. It gives graduates a taste of possible career options within the company while they develop relevant skills in each. At the end of their rotation, they make an informed decision based upon their experiences in each role, taking into account their interests, strengths and weaknesses. This process offers a logical approach to determining a long-term career track in the construction industry, which in turn helps SDC to develop competent and high-quality staff.

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Appendix A

Hire
Date:

Coach: _____

Date: _____

CMST: _____

Assistant Superintendent

Deliverables		N/A	Exposure to	Experience In	Competent in	CMST Comments	Coaches Comments
Drawing, Document Review & Maintenance	Reviews and learns project documents including project plans, submittals, shop drawings, etc.						
	Continually updates project documents for new information including RFI's (Requests for Information), Bulletins, etc.						
	Maintains project files with the latest information such as submittals, project correspondence, and other critical information						
	Distributes required information to subcontractors such as Bulletins and answered RFI's to maintain proper flow on project and ensure the information is there to build project as required						
Project Execution	Is able to effectively work with the Superintendent to manage the project on a daily basis. Observes and learns how to manage the process of getting subcontractors to perform project requirements correctly and in the time allotted.						
	Walks the site regularly to ensure what is being built on site conforms to project documents including RFI's and submittals. Proactively addresses discrepancies and ensures that they are corrected.						
	Continually monitors site safety, making sure all individuals working on site as well as the general public, are safe. Makes sure that both subcontractors and site visitors are compliant with SDC's safety standards.						
	Works with and/or observes the Super on MEP coordination for the project.						
Project Schedule	Learns how to create and maintain a schedule; routinely updates and modifies master project schedule.						
	Works with the Super to create and monitor the 3WLA (3-Week Look Ahead); as rotation proceeds learns how to create 3WLA independently and can effectively present to sub and client.						
Weekly Reporting	Accurately completes daily reports with pertinent information including manpower counts, weather, activities on site and special occurrences.						
	Executes safety meetings with proper meeting minutes; completes weekly reports noting areas for safety-related improvement; follows up and closes the loop on any safety issues noted in a timely manner.						
	Takes weekly pictures of progress and of other critical on site activities; saves photos to the job folder.						
Financial Management	Creates Extra Work Authorizations at Superintendent's direction; submits to project management in a timely manner.						
	Tracks the internal budget, ensuring that the project is within budget and brings issues to the teams attention.						
Permitting	Learns the correct types of permits for the given project.						
	Assists Superintendent in procuring required permits.						
Project Close Out	Helps Superintendent create the punch list, sorts and distributes to the correct parties. Pushes for the execution of the punch list, tracking on site what has and hasn't been completed.						
	Learns any specific inspection and close out processes that may be applicable to the municipality the project is in.						
	Upon completion of project, ensures that all site files and original documents are collected and sent back to the office for dead filing.						

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