Construction Management Technicians

An analysis of the current and future construction management technician workforce in the Delmarva Region

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**Vision:** The Center for Industry Research & Workforce Alignment strives to be Delaware’s key source of labor-market insight to enable educational institutions to better align their program and training resources to meet the skill demands of business and industry.

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Introduction
This occupational brief seeks to provide Delaware Tech faculty and administrators with data outcomes and recommendations specific to Construction Management Technology that will aid in course development, curriculum delivery and non-credit training and certifications that will give students an advantage in the job market upon graduation.

This survey data contained within this occupational brief was taken from a larger study that examines several disciplines of engineering technology within a 13-county mid-Atlantic region that includes the three counties in the State of Delaware and ten bordering counties where graduates of Delaware Tech are likely to find employment. The purpose of that labor market study was to examine current and projected employment levels, how these jobs are changing due to a variety of market drivers, and what Delaware Tech and other community colleges can do to ensure that associate degree programs accurately reflect the skill needs of employers in the near future.

This brief primarily highlights data and information specific to construction management technicians gleaned from an extensive workforce survey conducted in July of 2014 from a sample of over 7,400 companies in the region. Survey interviewers fully screened 400 firms for qualifying criteria. Surveying efforts resulted in 252 occupational-level completions from 153 firms. Several firms responded for more than a single occupation. Extrapolations of employment data were conducted to provide readers with a more comprehensive picture of current and projected workforce demographics and to perform a supply/demand gap analysis for the region. In addition, executive interviews were held with 17 individuals from 15 public and private sector firms and existing sources were researched for secondary supporting data.

A total of 43 employers responded to the regional survey for construction management technicians. The proceeding sections of this brief provide an overview of data outcomes and executive interviews held with employers of this occupation. Aggregate data for all occupations such as market drivers, soft skill needs, and can be found in the full labor market study available on the CIRWA web page at www.dtcc.edu/cirwa.

Construction Management Technicians - SOC 11-9021

Occupational Definition
Plan, direct, or coordinate, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures, facilities, and systems. Participate in the conceptual development of a construction project and oversee its organization, scheduling, budgeting, and implementation. Includes managers in specialized construction fields, such as carpentry or plumbing.1

Figure 1 - Hiring Difficulty
Forty-two percent of the 43 firms that responded for construction management technicians find it difficult or very difficult to find a quality candidate to fill their position vacancies. Seventy-nine percent find it at least somewhat difficult to find a well-qualified candidate.

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Table 1 - Current and Projected Employment – Survey Data (n=43)
The data in the table below reflects data from survey responses only. Projected job change, retirements and turnover were combined to determine total 3YR and annual openings.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>525</td>
<td>666</td>
<td>+141 (27%)</td>
<td>228</td>
<td>76</td>
</tr>
</tbody>
</table>

Table 2 - Universe of Firms and Employment – EXTRAPOLATED REGIONAL ESTIMATES
From the survey’s qualifying incidence rate (percentage of firms screened that hire the occupation), CIRWA was able to determine the estimated total number of firms in the region that employ construction management engineering technicians. After eliminating outliers out 2 standard deviations, CIRWA utilized adjusted employment means to extrapolate regional estimates for current and projected employment. Projected job change, retirements and turnover were combined to determine total 3YR and annual openings.

<table>
<thead>
<tr>
<th>Total Firms that Employ Construction Management Technicians</th>
<th>Current Employment</th>
<th>Projected Employment in 3 years</th>
<th>3YR Projected Openings</th>
<th>Total 3YR Openings incl. Growth</th>
<th>Annual Openings over next 3 yrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>188</td>
<td>1,428</td>
<td>1,844</td>
<td>+416 (29%)</td>
<td>674</td>
<td>225</td>
</tr>
</tbody>
</table>

Figure 2 - Educational Attainment of the Current Workforce – Survey Data (n=43)
CIRWA was unable to obtain current education level data for approximately 47% of the construction management technician workforce. Several firms responded “unknown” when asked what percentage of their workers have obtained each level of education. Approximately 38% of the workforce holds an associate degree or higher with about one quarter of the workforce holding a bachelor’s degree.
Figure 3 - Educational Hiring Requirements and Preferences – Survey Data (n=43)
The figures below demonstrate survey respondents’ required versus preferred educational attainment for construction management technician positions in their firm. More than half of the firms that completed the regional survey require only a high school diploma for employment. However, 49% would prefer workers have an associate degree. Another 35% prefer job candidates have a bachelor’s degree. **Thirty-two respondents (74%) indicated that they would prefer to hire at least one education level above what they currently require for employment.**

<table>
<thead>
<tr>
<th>REQUIRED</th>
<th>PREFERRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School Diploma/GED</td>
<td>4</td>
</tr>
<tr>
<td>Associate Degree or Equivalent</td>
<td>13</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>3</td>
</tr>
<tr>
<td>Post Graduate Degree</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 4 - Entry-Level Wages – Survey Data (n=43)
Construction management technicians are shown to receive the highest average starting salaries of all jobs examined in this study with 16 of 43 (37%) firms offering an entry-level salary between $40,000 and $49,000 a year. In addition, eight firms offer starting salaries of $50,000 a year or higher.

**Entry-Level Wages - Construction Management Technicians (n=43)**

<table>
<thead>
<tr>
<th>Wage Range</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>$60-69,000</td>
<td>2</td>
</tr>
<tr>
<td>$50-$59,000</td>
<td>6</td>
</tr>
<tr>
<td>$40-$49,000</td>
<td>16</td>
</tr>
<tr>
<td>$30-$39,000</td>
<td>10</td>
</tr>
<tr>
<td>Less than $30,000</td>
<td>9</td>
</tr>
</tbody>
</table>

Figure 5 – Barriers to Hiring Qualified Construction Management Technicians – Survey Data (n=43)
Forty-two percent (42%) of firms that employ construction management technicians find it either difficult or very difficult to find a highly-qualified worker for these positions. Respondents were asked to indicate all of the challenges they encounter during the resume review and interview processes. Responses are summarized below:

- Lack of Relevant Work Experience: 58.8%
- Lack of Required Education/Training: 38.2%
- Lack of Job Position-Related Technical Skills: 58.8%
- Lack of “Soft” or “Employability” Skills: 61.8%
- Lack of Applicants: 38.2%
- None of the Above: 0.0%
**Figure 6 - Top Technical Skill Needs based on Survey Data (n=43)**

The figure to the right illustrates the skills most frequently selected as “Extremely” or “Very Important” on a 5-point scale with an option for “Not applicable”. Larger circles reflect higher response counts. Of the 43 firms that completed the survey, 95% indicated that *Knowledge of Building Processes, Sequences, and Durations* is an “Extremely” or “Very Important” skill needed for their workers. Additional knowledge and skills frequently chosen as “Extremely” or “Very Important” include *Knowledge of and Adherence to OSHA Standards, Data Collection, Analysis, and Management, Identifying, Analyzing, and Solving Engineering Problems* and *Surveying for Construction Layout*.

**Figure 7 - Preferred and Required Industry Certifications – Survey Data (n=43)**

Survey completers were provided with a list of industry recognized certifications for construction management technicians and asked to indicate which certifications they require for employment and which they prefer. Employers were also provided a “neutral” option if they had no preference. A summary of responses is provided below:

- **OSHA 10-Hour**: 10 Required, 15 Preferred, 18 Neutral
- **OSHA 30-Hour**: 4 Required, 12 Preferred, 27 Neutral
- **Crane Awareness**: 1 Required, 15 Preferred, 27 Neutral
- **Certified Construction Reviewer (CCR)**: 2 Required, 14 Preferred, 27 Neutral
- **Contractors Certification (Blue Card)**: 1 Required, 14 Preferred, 28 Neutral
- **Construction Health and Safety Technician (CHST)**: 2 Required, 19 Preferred, 22 Neutral
- **LEED Green Associate**: 11 Required, 32 Preferred, 22 Neutral
- **Program Management Professional (PMP)**: 12 Required, 31 Preferred, 22 Neutral

The most frequently required certification for construction management technicians is the OSHA 10-Hour. OSHA 10-Hour is also one of the most preferred certifications (for employers that do not already require it) along with Construction Health and Safety Technician (CHST). Crane awareness, Certified Construction Reviewer (CCR) and Contractors Certification (Blue Card) were frequently selected as well.
In an effort to determine what software programs students should be exposed to, employers of construction management technicians were given a list of software commonly used in the industry. They were asked to select all of the programs that their technicians use on a day-to-day basis. The chart below provides a summary of the selected software:

**Employer Insight Based on Executive Interviews**

Eleven out of 15 employers interviewed for this study spoke to how valuable construction site experience is for many of the jobs included in this study. While several of these occupations are not directly involved in the on-site building process, knowledge of how construction sites function, how building components fit together, and the processes and sequence of activities for a construction project are very helpful for drafters and technicians to know. Several firms mentioned that previous construction site experience would make a job application much more appealing than those without experience on a job site.

All of the construction management firms interviewed feel that mobile technology is a key factor influencing technical skill needs in this occupation. The widespread use of tablets and other smart devices to instantly view blueprints or mark-ups is drastically changing the way construction sites operate and the speed at which work can be done. The increased use of Building Information Modeling (BIM) and Revit software in the field are also driving the need for workers with knowledge and experience on these systems.

Finally, in general, firms felt there are an adequate number of education programs in the region for technicians, but unless interest from younger people increases, the industry could be facing significant challenges as a large number of older workers reach retirement age in the coming years. Two firms mentioned that there seems to be fewer young people interested in advancing into higher ranking positions than there has been in the past which is adding to this concern.

**Supply and Demand Gap Analysis**

Table 3 on the next page provides data on regional program completions for construction management technicians. An annual average was calculated by pulling program (CIP code) completion data from the IPEDS database for a 3-year period (2011, 2012, and 2013) for all schools within the region that offer these programs and report completions to IPEDS. These average annual completions were added together to produce a total annual completion number for the region.

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**Figure 8 - Top Software Needs for Construction Management Technicians – Survey Data (n=43)**

In an effort to determine what software programs students should be exposed to, employers of construction management technicians were given a list of software commonly used in the industry. They were asked to select all of the programs that their technicians use on a day-to-day basis. The chart below provides a summary of the selected software:

<table>
<thead>
<tr>
<th>Software</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excel Spreadsheets</td>
<td>38</td>
</tr>
<tr>
<td>Microsoft Project</td>
<td>19</td>
</tr>
<tr>
<td>Primavera Project Planner</td>
<td>9</td>
</tr>
<tr>
<td>Timberline</td>
<td>5</td>
</tr>
<tr>
<td>Constructware</td>
<td>3</td>
</tr>
<tr>
<td>ProContractor MX</td>
<td>3</td>
</tr>
<tr>
<td>Prolog</td>
<td>1</td>
</tr>
<tr>
<td>HCSS</td>
<td>1</td>
</tr>
</tbody>
</table>
The data in Table 3 shows that Delaware Tech and Delaware County Community College together are producing approximately 11 graduates per year for this field. When those 11 graduates are compared to projected job openings, the data shows that the region could be facing a significant supply shortage for construction management technicians over the next few years. Table 4, below, summarizes supply versus demand.

Table 4 - Extrapolated Employment Demand versus Supply

<table>
<thead>
<tr>
<th></th>
<th>3YR Position Openings</th>
<th>3YR Supply/Demand Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3YR Growth</td>
<td>3YR Retirements</td>
</tr>
<tr>
<td>Current Employment</td>
<td>Employment in 3 Years</td>
<td>+416 (29%)</td>
</tr>
<tr>
<td>1,428</td>
<td>1,844</td>
<td></td>
</tr>
</tbody>
</table>

Estimates show that the region could be facing a shortage of up to 214 workers per year and more than 640 workers over the next 3 years for this occupation. While the supply gap seems large, it is important to remember that both CIRWA and EMSI employment data show that a large percentage of this workforce does not possess any formal degree. EMSI reports that approximately one-third (34%) of workers in this field do not possess any college education and that another 25% possess some college, but no degree. Therefore, this supply gap does not specifically represent a shortage of associate degree-prepared workers, but rather people to fill these positions in general. In addition, growth projections taken from survey data may be slightly inflated due to inherent bias of self-reported data provided by responding firms.

Conclusions and Recommendations

Overall, the employment outlook for construction management technicians in the region appears positive. Survey completers are generally optimistic about their ability to add jobs to the workforce over the next three years. Of the 247 firms screened that do not currently employ any of the engineering technicians examined in the survey, 22 firms indicated that they plan to hire for 29 new construction management technician positions over the next 3 years. These conclusions were taken from the full study and have been adapted to reflect findings specific to construction management technology.

Conclusions

1. The region is not producing enough of these types of technicians to fill the replacement or growth need projected through 2018. Table 1 shows that survey takers are predicting approximately 87 position openings over the next 3 years due solely to replacements needed within their firms. Without extrapolating the data and
without factoring in any growth, the region is still not producing enough graduates to fill the predicted number of replacement openings identified by survey completers. Until the region is able to increase the supply of associate degree-prepared workers to enter these jobs, employers will be forced to continue hiring individuals that may not have the level of educational preparation and experience they desire for employment at their firms.

2. **Computer technology and software applications are changing the “must-have” skills needed for these jobs.** Forty-nine percent (49%) of all survey respondents feel that advancements in technology, particularly software packages, is a key factor that will impact technical skill need over the next few years. The integration of hand-held technology into everyday work responsibilities and the continued advancement of 3D drafting, GPS/GIS applicability and project management software are changing the way these firms do business and remain competitive in the marketplace. As a result, knowledge of these programs is in high-demand and, over the next few years, could become “must-have” for employment. In addition, federal, state and local codes, regulations and mandates such as Delaware’s new stormwater management regulations are constantly changing and technicians must put in the necessary time and effort to remain knowledgeable on all of these requirements to avoid heavy fines and penalties for their employer or clients.

3. **On-site work experience (preferably on a construction site) gives new program graduates a significant advantage over job applicants lacking this experience.** Eleven out of 15 firms (more than 70%) noted that they prefer to see some sort of construction experience on a job applicant’s resume. Familiarity with scheduling, budgeting, safety protocol and the sequence of activities that occur on a job site gives job candidates the perspective needed to plan, anticipate and predict which results in a more effective and productive worker. It also exposes the student to several of the local, state, and federal codes, standards and regulations that govern these industries.

4. **Employers in the region are cautiously optimistic about the growth and resurgence of construction management technology jobs.** Survey data shows that firms in the region are anticipating significant growth of their workforce over the coming 3 years. Raw survey data for construction management technicians shows an overall 3-year growth rate of roughly 27% for these jobs. Much of this growth they attribute to the slow, but steady, recovery of the economy and stricter regulatory requirements. This is good news for educational institutions that are faced with the opportunity to provide employers throughout the region with highly-skilled, experienced workers that not only meet their hiring requirements, but also their preferences for hire.

**Recommendations**

The recommendations below are listed so as to correspond to the conclusions listed above and can be generalized into two broad objectives:

- Closing the Gap in Projected Demand; and
- Improving Educational Programs to Better Meet Employer Needs.

1. **Promote involvement and partnerships with K-12 and other related organizations in an effort to increase teachers’, counselors’, parents’, and middle and high school students’ awareness of engineering technology options available to them.** Addressing a shortage of workers to meet demand begins with targeted efforts to boost awareness, interest, and enrollment in these programs. These efforts can be bolstered by developing statewide and regional strategies that engage not only K-12 education, but also organizations such as the Delaware STEM Council, trade associations, and other business and economic development agencies. Several
survey respondents indicated that one of the drivers for increased technician employment will be greater recognition of the affordability and return on investment of 2-year degrees. The College would be well-served to emphasize these aspects to individuals looking to enter into a STEM occupation or who are currently in the process of choosing a career path.

2. Consider adopting a cooperative workplace education experience or internship as a requirement for graduation. Similar to the last CIRWA study focused on Mechanical and Electrical-related engineering technologies, interviewees were surprised to find that this is not already a requirement for Delaware Tech graduates given that many employers are moving away from hiring graduates without relevant experience. This requirement would help Delaware Tech accomplish the following:

   a. Expand the College’s network of companies that hire program graduates;
   b. Expose a greater number of companies to the variety of programs offered at the college;
   c. Demonstrate the skills and abilities of Delaware Tech program graduates over other hiring options available to companies;
   d. Provide students with relevant, real-life workplace experiences and situations that will enable them to be more competitive and attractive to local employers upon graduation; and
   e. Open students up to the possibility of securing employment prior to graduation which may, in effect, provide increased incentive to complete the program and improve graduation and placements rates for the College.

3. Consider curriculum updates or changes that would place increased emphasis on exposing students to software applications, state codes and regulations and the importance of developing interpersonal and networking skills. Programs may be well-served to integrate more exercises that utilize the software programs and applications identified by employers in this scan. In addition, emphasizing the importance and implications of federal, state, and local mandates and codes will help students recognize that continually staying updated and knowledgeable about regulatory changes is a requirement of these jobs. Finally, exercises or group projects that focus on developing a student’s professionalism and confidence as well as business and marketing skills will help enable graduates to facilitate relationships and catalyze business opportunities for their employer.

The full labor market scan available at www.dtcc.edu/cirwa contains more generalized data for construction management technology and other related occupations. Supplemental employment data for construction management technicians is provided in Appendix B of the full study. For further detail on the methodology of extrapolating employment estimates, please see the Methodology section in Appendix C of the full study.
Delaware Technical Community College established the Center for Industry Research & Workforce Alignment (CIRWA) in October 2011 as part of a U.S. Department of Labor Trade Adjustment Assistance Community College Career Training Grant.

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