

MATC Internship 2014

"Recollections"

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with

Speece Lewis Engineers

On the morning of my first day with Speece Lewis, the other interns and I stood in a cluster in the center of the office, unsure of what to do. After a brief meeting covering what was expected of us, another intern and I spent the day touring in-progress job sites, and I left unsure of what the summer would hold, or whether I was prepared. Now, with nearly three months behind me, I have spent long days practicing surveying with levels, transits, and lasers; visiting and documenting completed projects; and inspecting job sites. On several projects, including a 150 foot-long girder bridge in Bristow, NE, and several concrete box culverts near Lincoln, I have had the privilege of watching contractors progress through most of the construction life cycle, including excavation, construction, and backfilling, and was able to learn how they organize and execute their job sites. Consequently, I have a strong grasp of what surveyors, contractors, and inspectors go through in their work days, and I learned several important lessons as a result of my time in the field.

As with most things in life, communication is key to having a good relationship. It is no different with the contractor, but it's not everything. I learned quickly that while good communication skills are essential, they are still second to punctuality and collaboration. I have not met a contractor this summer who was not happy and prompt in fixing a problem, excepting when the inspector or engineer is late to the game. Contractors are only human, and we all make mistakes, but they aren't happy to have to re-tie steel mats in a structure once the forms for the concrete have been closed. If inspectors fail to be present during the work and only attempt to identify and address mistakes after the contractor moved on to building something else, relationships can become strained and construction can slow to a crawl. Being present during construction saves work in the long run. Respect also goes a long way, as I learned during a month working in Bristow. The senior inspector there told me he never orders the contractor to

do something, but rather says, "Please do me a favor," and is always thankful. He had the best relationship with the contractor on any site I visited this summer.

In tandem to being present with the contractor is the ability to adapt to changing circumstances. A number of times this summer, the plans didn't quite fit reality. Sometimes we seemed to be asked to put too many bars into a given wall, and sometimes errors in placement occur over long distances, especially if bars are placed close together. We sometimes needed to put in more or fewer bars than the plans requested. It is important to know when to make exceptions to the plan, and when to ask the contractor to redo their work. Completely resetting a wall of steel, for example, takes time and may damage the relationship with the contractor, but allowing shortcuts can also introduce further problems. A number of cold-joints appeared in one of the concrete box culverts I worked on this summer as a result of the contractor's unorthodox approach to pouring the concrete. An engineer pointed out to me how it could have been avoided by slowly filling the wall from the bottom and doing each wall by itself, which in the long run would have saved the contractor a couple days of grouting.

Finally, self-awareness is crucial in developing skills in any profession. I entered into the internship honestly bewildered, but my candor and earnest questions won me good answers from engineers, inspectors, surveyors, and contractors. Moreover, because I was open with myself about my lack of knowledge, I now often know more than simply *how* we are supposed to build a given structure; I know *why* we want to build a structure in a certain way. This will help me develop my knowledge and help guide contractors whenever I'm in the field, as well as serve as a strong foundation for future design work. More than ever, I'm confident that initial confusion or lack of knowledge is not a hindrance, but a natural and necessary part of professional development that can be used as an exceptional motivator.

Beyond these lessons, though, and the tools I've used and the skills I've acquired, this internship helped me remember the purpose behind everything we do as engineers in transportation. The chief financial officer of Kirkham Michael visited my section of Professional Practice and Management this semester, and offered a terse story about the pratfalls of politicking. He cited a bridge in Omaha in a cautionary tale. Its only purpose was to look good, and eventually the project went far over budget. "You thought you were going to do engineering to save the world?" he asked rhetorically. "No. It's just a bridge that goes nowhere." And perhaps this is sometimes true; egos exist in every industry, and people everywhere stumble on the hurdles of politics. But even if such issues are common in life, they aren't the rule.

Every project I worked on this summer was integral to Nebraska's agrarian economy and culture, with the each contractor taking pains to prevent erosion, storm water pollution, and disruption of the environment; the culverts I worked on are themselves a check against the failure of the older, smaller culvert pipes that could fail during a flood, ruining precious roads or damaging crops. The Bristow bridge is the town's only link to a paved road running to the highway, and is replacing an old bridge that can no longer sustain the loads from modern tractors and trucks that ship our state's crops. Every project I worked on was crucial to either solve a current problem or prevent a future issue.

And that's what engineering is, in the end: improving life. For Nebraskans, that means taking care of the land that takes care of us. I had the good pleasure to remember that we are doing important work in any section of civil engineering, and transportation unifies all disciplines, which granted me an opportunity to get a taste of each, reminding me of what I like, what I'm good at, and why I want to be a civil engineer.

And of course, it was a fine thing to spend most of each day in the summer sun.