

# 2014 MATC Summer Internship Program



MID-AMERICA  
TRANSPORTATION CENTER

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Final Report



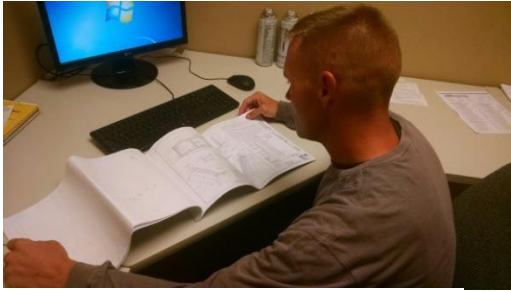
**SPEECE | LEWIS**  
**ENGINEERS**

Internship Sponsor: Speece-Lewis Engineers

An internship with Speece-Lewis Engineers offered a great opportunity to be able to view a lot of projects in different stages of development and completion. Through the internship experience, I have been able to learn and appreciate how much time and work can go into one single project. While interning at Speece-Lewis Engineers, I also had the opportunity to work with the survey crews and through this experience develop a better understanding of the layout of projects as well as the advantages of technology.

Speece-Lewis Engineers is a small, private engineering firm. While Speece-Lewis Engineers focuses on transportation engineering, their specialties include bridge design, reinforced concrete box culvert design, and roadway design. Speece-Lewis Engineers also offers services in the areas of surveying, construction inspection, and contract administration. Speece-Lewis Engineers employs approximately 28 people currently, including four interns. Out of those 28 people, 14 are Professional Engineers. Speece-Lewis Engineers has one location in Lincoln, NE.

My internship at Speece-Lewis Engineers began with me working with the construction inspection crews. The construction inspectors at Speece-Lewis Engineers are responsible for ensuring that contractors are building the projects to design and proper specifications. The construction inspectors are also responsible for keeping track of quantities of materials and project progress to ensure that the contractors are paid in a timely manner. Some of the projects that I had the opportunity to perform construction inspection duties on include a new bridge north of Hooper, NE, the Superior Street traffic improvement project, and the Lincoln sidewalk rehabilitation project. The Hooper, NE project consisted mainly of taking measurements and checking quantities to ensure the contractor was paid properly. The Superior Street traffic improvement project included checking concrete forms, checking base material and thickness,



*Studying plans before going to the jobsite*

concrete air testing, and making concrete cylinders. For the Lincoln sidewalk rehabilitation project, I was responsible for identifying sidewalks that met the criteria for repairs, marking the sidewalks and ramps in need of replacement, keeping track of the work quantities, and inspecting the contractor's work.

Another one of the primary tasks that I was able to conduct during my internship was surveying. Through this opportunity I was able to get a look into what goes into project planning as well as the process through which grading is completed on projects. The largest surveying project that I took part in was a 15 mile stretch of PWF Road near Fairbury, NE. This project consisted of a complete topographical survey of the area for the planning and design of a new roadway. The complete topographical survey included taking points at every major change in elevation (break lines), the edge of the bituminous roadway, field entrances, structures, and ground elevation shots. Points were taken approximately every 25 feet, 100 feet out from the right and left of the roadway centerline. The points were taken using Trimble GPS equipment and Sokkia Total Station equipment. In order to obtain some of the required data points it was necessary to trudge through thick tree lines as well as don hip-waders and slog through waterways. Another surveying task that I performed was staking paving hubs in order to provide proper alignment and slab thickness. A third survey task that I performed was slope staking to provide proper grading requirements for the edge of roadways. This task was performed while I was assisting in laying out the I-80 West expansion project.

One of the most valuable aspects that I learned during this internship was the need to remain flexible, because projects will not always go as designed due to unforeseen reasons during the planning. Another aspect that I gained through this internship was just an overall

appreciation for the expansive amount of work required to complete one project; from the preliminary planning and survey to the final reporting.

The internship with Speece-Lewis Engineers helped encourage me to remain focused on transportation-related engineering through exposure to a wide variety of projects. It allowed me to see that the field of transportation engineering is not specific to just roadways, but is actually quite expansive to many other aspects of transportation-related infrastructure.