



MATC Summer Internship Report

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My MATC summer internship with the City of Lincoln was a great experience. In my experiences I learned a great deal about the entire process of construction projects. I enjoyed being able to work both in the office and also on the construction site, working around a variety of people, and working with several types of projects.

My position was in the materials testing laboratory in the design and construction division of public works and utilities. My job in the testing lab dealt with the testing of pavement and soils. The first pavement test is the testing of the aggregate. My tests involved going to the concrete or asphalt plants that were in production that day and taking aggregate samples. These samples were then brought back to the lab and a sieve analysis was done to ensure the aggregate had the correct distribution of sizes of particles. Each type of aggregate has its own specification for percent passing and retained on the standard sieves. Most of the time the aggregate met the specifications, but when it did not the producer was notified and was forced to change the aggregate to ensure the quality of the aggregate. The next test performed for concrete was the air entrainment test. Before the concrete is poured, a sample of the mix is taken and tested with a pressure meter to make sure it conforms to the specification for air entrainment. Then test cylinders are made and tested at a later date to ensure the placed concrete is suitable for traffic. The last type of testing I did was checking the depth of the placed pavement. Once the pavement was strong enough for traffic we would drill cores through the pavement to ensure the contractor had placed the required depth of pavement. The lab also tests asphalt. I did not do much of the asphalt testing as it is a much more in-depth process, but the tests are done to make sure it meets all

specifications and the city is paving with a quality product, and the contractor is doing a good job.

The next main thing performed in the laboratory was soil testing. On any job where dirt work is being performed, we test the compaction to protect against later failures. This involved testing the sub-grade before paving or testing backfill against pipes or other fixtures. In order to do the compaction tests we have to know the soil properties. To do this we would take a soil sample and run several tests on it. The main test done is the proctor compaction test. This test is done by testing the soil at different moisture contents and compacting it according to the standard proctor specification. This gives the dry density. This is done several times at different moisture contents and provides a graph of moisture versus dry density. From this curve the optimum moisture and maximum dry density can be found for that particular soil. From these numbers, the samples taken from the jobsite are compared and it is determined if the work is satisfactory, meaning the soil is at least 95 percent compacted and 2 percent below or 4 percent above the optimum moisture content. Another test performed on the soil is the hydrometer analysis. This is done by placing a soil sample in a fluid and measuring the time for the soil to settle. This allows us to determine the percent sand, silt, and clay in the sample based on particle size. This allows us to better classify our soil samples.

This MATC internship has provided me with a great experience. I really enjoyed seeing several parts of the infrastructure of the city and seeing the projects from design all the way through the completion of the project. It gave me reassurance that I am going into the right field of study and I am looking forward continuing my job and learning even more.