

STUDENT WORK REPORT

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Please circle your current work session:

- > 3-session - 1 2 3
- > 5-session - (1) 2 3 4 5

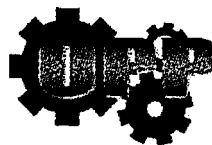
Co-Op Employer Information

Does the Work Report contain Proprietary Information? Y or (N) (please circle one)

May Purdue post the Work Report on the OPP website? (Y) or N (please circle one)

Co-op Employer: GRW Engineers, Inc
Supervisor Name: Rick Miller
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PROFESSIONAL PRACTICE (CO-OP) PROGRAMS



**Co-Op Work Report
Session #1
School of Civil Engineering**

Nick Wisnewski



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Co-Op Work Report Summary
Nick Wisnewski
GRW Engineers, Inc.
1st Session Fall Semester

I worked my first Co-Op session at a civil engineering firm called GRW Engineers, Inc. The firm is located in Indianapolis, IN and is one of the largest branches of the company. The firm is considered a consulting engineering firm and specializes in the hydrology portion of civil engineering. The company was founded in 1965 by Mr. G. Reynolds Watkins in Lexington, KY. The company headquarters still remains in Lexington, KY to this day. GRW has had a large amount of success in the engineering industry since its birth. The company has been in the Engineering News-Record Top 500 ranking since 1972 and has won other prestigious awards since its beginning.

I would classify my first session at GRW as an enormous learning experience. My experience level with engineering and computer software was almost non-existent. I was slowly shown how the AutoCAD program works and began working on minor revisions to design plans. I worked with AutoCAD for the first couple of weeks on small tasks such as text and style changes while I was trying to learn and grasp the program. After I had a grasp of AutoCAD, I began to do some of the larger tasks associated with making plans for a project.

Once I started to become skilled at AutoCAD I started interchanging my work between drafting and engineering. I worked on many different aspects of engineering and drafting on one specific project. The project was located in New Albany, IN and was designed to construct a new water main down a road called State St. I did a large portion of the drafting for this project after the survey was loaded onto the AutoCAD software. Once the draft design was complete I had the opportunity to go into the field and survey with the company surveyor. While in the field I helped survey and create detail sheets of all the existing manholes in our project path. I also conducted my own utility check using a special color coded set of plans I created. After I returned from surveying, it was my job to calculate all the conflicts with our proposed water main and the existing utilities. It was my responsibility to see whether our proposed water main had to go above or below the existing utilities based on a set of standards. Once I found all the conflicts, I inserted the information into the design plans. Throughout this project I worked on many different aspects of a project which helped me understand the process a project goes through.

While working at GRW Engineers, Inc. I have learned a large amount about the civil engineering profession. I have become more responsible with my time and am able to organize my time in an efficient manner to get work done. I also learned some basic engineering principles, the AutoCAD software, and the way a professional office is run. The amount of experience I have received at GRW has secured my decision to be a civil engineer.

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Introduction

The following report was written to evaluate and reflect on the first Co-Op session I had at GRW Engineers Inc. This report contains a brief history and explanation about GRW Engineers Inc. and also a reflection on what I have learned and the responsibilities I possessed while working with this company. The company branch of GRW that I worked for was located in Indianapolis, IN. This location is the second largest of the GRW branches.

Company History

GRW was founded in 1965 by Mr. G. Reynolds Watkins in Lexington, KY. Since 1965, GRW has continued to expand and grow into many branches which specialize in different aspects of Civil Engineering. There are currently ten company branches around the United States with the branch in Lexington, KY being the company headquarters. The company branch in Indianapolis, IN was opened in 1992 and is the second largest branch of GRW.

Company Performance

GRW's success is easily visible due to its revenue and large amount of rewards it has received since its existence. The company has been in the Engineering News-Record Top 500 ranking since 1972 and also was named Top 100 of "Giants" for Mechanical/ Electrical Engineers Consultants. GRW's success has allowed them to stay competitive and attract new clients while also having previous clients come back to them for more projects.

Indianapolis Branch Description

The GRW branch in Indianapolis focuses mostly on water resources engineering. A typical project would consist of designing a sanitary or storm sewer or a water main for a town or district. Although this branch of the company is not limited to these types of projects it is the majority of the work that they do.

Project Description

During my first session at GRW, I had the opportunity to work on many different projects. Since I have worked on a large amount of projects I am going to talk specifically on one project that I did the most amount of work. During this project I worked on many different aspects which gave me a clearer understanding of how projects are started and completed. I did work both in the office and in the field for this project.

The one project that I gained the most experience with was on a project in New Albany, IN. Indiana American Water Company, INAWC, hired GRW to design a new water main through a main part of the city to give the hospital and other building more water pressure. The street that the project was on was called State St. which ran through a large part of the city. I worked closely with a project engineer on this project by helping with the design, the survey, and the conflict calculations.

The first aspect on this project that I worked on was with the design of the project in AutoCAD. The CAD technicians drew the project in the model portion of AutoCAD through a survey that was conducted in the field. After the project was drawn in model space individual sheets were made which is where I started my work. Individual sheets are a zoomed in shots of the project in sequential order. These are the sheets used by the contractor to construct the project. Once the sheets were cut I began my work on the sheets by adding stationing, footage of the water main, and the profile to each sheet. The profile is a horizontal view of the water main so different depths and conflicts can be seen. I also added different labels and symbols to the sheets that are standard for all projects. Once the sheets were completed I printed off a set for myself and the surveyor for the work that we had in the field.

The second portion of work I did on this project was in the field. I teamed up with a surveyor and headed up to New Albany, IN to survey. I was giving two major responsibilities while I was up in New Albany. The first one was to do a utilities locate for State St. This required a city utility locator to come out and paint the telephone, gas, electric, storm, sewer, and water lines that are located under the road. I used these paint marks to go through a set of plans and confirm that our survey of the utilities matched the actual location of the utility lines. For example, if there were three orange lines in a row painted on the road and I didn't have a fiber optic telephone line drawn on my plans, then I had to draw this on the sheet and call the engineer in the office to notify him or her of the change. I did this utility locate for the entire project on State St. The other responsibility I had while in the field was verifying the different structures within the project. This required us to remove manholes and verify whether the manhole was sanitary or storm. After we had verified the type of manhole we measured the inverts of the pipes in the manhole. By measuring the inverts of the pipe we were able to tell the direction of flow through the pipe. Also, if there was a manhole that was not on the plans we used GPS positioning equipment to get the exact coordinates and elevation of the structure. I spent three days in the field with the surveyor doing utility locates and verifying structures.

The third aspect of this project that I worked on was doing calculations with different conflicts. The conflicts consisted of our water main crossing another utility like a gas or electric line. The calculation was used to determine whether the water main had to go above or below the utility. In order to do this calculation I needed some important information. First the conflict needed to be located in the project. Once the conflict was located, the manholes before and after the conflict were located. Once I had all that information I used the elevations, inverts, and the distance between the manholes, which I found out during my work in the field, to find the slope of the utility line between those two manholes. After the slope of the utility line was calculated, the distance was found between the conflict and the manhole before the conflict. This distance allows the depth of utility line at the conflict to be calculated using the slope of the utility line. The depth of the utility then allowed me to calculate whether or not the water main needed to go above or below the utility line. I used a set of standards which told me certain minimum distances the water main had to be from the utility to see whether the main should go above or below the utility. After all the conflicts were calculated I drew conflict boxes in AutoCAD.

These boxes are used by the contractor to point out conflicts and also to tell whether or not the main should go above or below the utility. Once all these conflict boxes were added to the sheet set and the different changes were made with the utilities located the project engineer reviewed and marked the set up. I made the changes after her mark ups and printed off a complete set for the professional engineer to review. The professional engineer reviewed the sheets and sent the mark ups back. I fixed the mark ups which usually consist of different text and style changes and printed out a final set for the client to review.

Overall, I feel like I learned a lot about the different aspects involved in a project through my efforts with this project. I was given more and more responsibility with it as I progressed along and started to grasp the different concepts that I was being taught. This project has shown me many different steps needed in the completion of a project, and I have benefitted from being part of it.

Responsibilities

During my first session as a Co-Op, I was not given a lot of responsibilities since I had no previous experience. The first couple of weeks were essentially a learning period where I learned how the office operated on a daily basis. I started my work with AutoCAD and the CAD technicians. I had no previous experience with AutoCAD or any other drafting software so my responsibilities were very small in the beginning. My supervisor since my start has been slowly increasing our work load with AutoCAD which has increased my drafting skills dramatically. My responsibilities have grown proportionally as my skills have increased with drafting software and also my comfort level with different aspects of engineering. I have been given certain deadlines with AutoCAD related work. Other than AutoCAD related work responsibilities, I have not been given a significant amount of responsibility yet. I anticipate the level of responsibility I am given will increase as I gain more experience and continue my education at Purdue.

Professional Development

I feel that I have gained a lot of experience in my first session as a Co-Op. I feel like I have a strong grasp on how different parts of a project are finished. I have been exposed to the AutoCAD portion of a project and have greatly increased my drafting skills. I feel confident in my major now that I have worked for GRW, and I also have an interest in water resources engineering as well. Working my first session at GRW has reaffirmed my interest in engineering and I look forward to continuing my other sessions in the future.