

Wetland Delineations, Soil Erosion and Sediment Control Inspections at a Private Engineering Firm

An Internship at Christopher B. Burke Engineering West, Ltd.

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Introduction

Christopher B. Burke Engineering West, Ltd. (CBBEWL) is a private engineering firm located in Saint Charles, Illinois. CBBEWL specializes in site development, stormwater management, municipal engineering, and wetland consulting. My internship with CBBEWL went from June '06 to December '06. I worked in the Natural Sciences Division at CBBEWL under the direction of Patrick Kelsey. In the Natural Sciences Division, our focus is on wetland delineations, wetland reviews, tree inventories, Indiana bat surveys, soil sampling, and soil erosion and sediment control inspections. □□□□



Figure 1 – Taking a soil sample can be very messy, but also rewarding when hydric soil (sign of a wetland) is found.

Miscellaneous Projects

I was involved many miscellaneous projects during my time at CBBEWL.

Wetland Reviews

I performed a few wetland reviews. A wetland review is a site visit to make sure there are no wetlands on site. It is a quick check because these sites do not have wetlands.

Tree Inventory and Indiana Bat Surveys

I also learned how to perform a tree inventory and an Indiana bat survey. Tree inventories determine the quality and quantity of the trees on a site that is being developed. Many municipalities have ordinances that require a tree to be planted for every tree removed or a certain amount of inches of trees to be planted for every inch of tree removed. Indiana bat surveys look at the trees for potential bat habitat and usually are performed after a tree inventory. The bat surveys rate the tree for low, medium or high potential of bat habitat based off the condition of the tree. Trees with exfoliating bark or other dead areas have high potential for Indiana bat habitat.

Surveying

I also surveyed many sites with co-workers. Some of the surveying was done with a level and rod while other areas required only the use of the handheld GPS unit. This was a great opportunity to use my skills learned in my environmental surveying techniques class. □□



Figure 2 – Placing lathe to outline the boundaries of a wetland on the banks of the Fox River.

Wetland Delineation

According to the 1987 Corps of Engineers Wetlands Delineation Manual, a wetland is classified using three characteristics

- Hydric Vegetation – Vegetation that grows in water or in saturated soil conditions
- Hydric Soils – Soils that have a high moisture content
- Wetland Hydrology – Surface or subsurface water conditions that contribute to creating a wetland

My work at CBBEWL consisted of many wetland delineations based on the method out in the 1987 Corps Manual. A wetland delineation usually began back at the office with the creation of site location exhibits, soil survey maps, aerial photos, floodplain maps, USGS topographic maps are just some of the exhibits that are used in the field as reference and then in the reports as final exhibits.

Figure 3 – A co-worker and I work to identify the plants and determine if there is a wetland on the project site.



Generally, if a site has an area that satisfies two of the three above characteristics, it is a wetland. If wetland is found on site, a line is delineated between the non-wetland and wetland areas of the site using pink flags. These flags are surveyed using a handheld GPS unit (Figure 4) and the surveyed data will be inserted into exhibits for the report. A data point is taken inside and outside of the delineated wetland. The vegetation, soil, and hydrology is taken in each data point. For every wetland on site, two data points are taken (one inside the wetland and one outside the wetland).



Figure 4 – Placing the wetland boundary flags and surveying the points.

The vegetation, soil, and hydrological data are taken back to the office and inserted into a 1987 Corps Manual data form. The vegetation data is also inserted into a Florist Quality Index (FQI) program that determines the FQI and Mean – C value of the wetland. These values help determine the quality of the wetland and help in the permitting process.

The ultimate goal of a wetland delineation performed at CBBEWL is to assist the client in receiving any permitting that allows for the impact of a wetland during the development of a site. A final report that contains all of the collected data and narrative for the site is sent to the client and to any necessary permitting agency. Permits are obtained normally from the US Army Corps of Engineers.

Soil Erosion and Sediment Control Inspections

Soil erosion and sediment control (SESC) inspections were the favorite part of my internship. In June, my co-workers and I attended a conference on proper SESC techniques and protective measures for construction sites. SESC is concerned with protecting the site from soil loss due to the sediment becoming transportable by air and/or water. After the conference, my boss asked me to create a form that can be taken to a site and used to evaluate the soil erosion and sediment control practices on site (Figures 5a&b).

Figures 5a & b – The two page SESC inspection form I created with a co-worker.

Proper SESC measures are necessary at construction sites because of the Clean Water Act, which states that no construction sites are allowed to discharge sediment laden water. The National Pollutant Discharge Elimination System (NPDES) permitting program is part of the Clean Water Act and in place to regulate point sources that discharge pollutants into waters of the United States. Every construction site must receive a NPDES permit and stay in compliance with the permit throughout the construction.

I performed SESC inspections on ten sites throughout my time at CBBEWL. Each site is required to be inspected every two weeks or after a precipitation event greater than 0.5". The sites were continually changing, so my inspections change every time I inspected.

The inspection form is a checklist that allows for an efficient inspection, but is still detailed enough to assist the contractor in fixing any problems that the site may have. It is important to inform the contractor as soon as possible if there is a problem on the site. If the problem is not resolved and the site is found not in compliance with the NPDES permit, it will be fined a large amount of money.

I really enjoyed the inspections because I was put in charge of them and my boss trusted me with the work. It was great to have to work through issues with my report system and to report out exactly what I wanted to be on the inspection checklist. I also had to work through issues that our clients had with my reports and with clients that had problems at their site.

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Lessons Learned

I learned so much during my six months at CBBEWL. I think the most important and interesting thing I learned was about the private engineering firm. I have worked for the government, but the private sector is completely different. One of the reasons that makes the private sector so different is that everything is always changing. I really enjoy having to always modify my approach and methods on any given day for any client.

Projects that I worked on, learned about, and wrote reports for at CBBEWL were:

- Wetland Delineations
- Wetland Reviews
- Tree Inventories
- Indiana Bat Surveys
- Soil Sampling
- Soil Erosion and Sediment Control Inspections
- Surveying

Another lesson I learned about was to be very precise and exact when reporting anything to a client. It is crucial to make sure everything sounds the way it should before you release anything to a client.

A third lesson I learned was to always be prepared out in the field. It is important to have all the right equipment that is necessary to work at a site. □



Figure 6 – Sometimes you just have to hug a tree. □□

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For further information

Please contact bbeeh@cbbel.com if need any additional information. More information on this and related projects can be obtained at www.taylor.edu/mes.

