Eastern
Engineering Group
INTERNSHIP

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ME Major, Graduation Year 2021

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Purpose

The purpose of the internship I formed part of was to learn how to work and interact in a working environment, develop new skills with the computer programs they provided, and improve the overall working skills necessary to join a company in the future. Eastern Engineering Group offered me the opportunity to learn from the knowledge of a group led by some professional engineers of a small company as this one is. The job was offered as AutoCAD drafter looking for a full-time intern.

Company Background

Eastern Engineering Group is a Structural and Civil engineering consulting firm, founded in Doral, FL, 2005. Their experienced engineers and effective workflow allow them to consistently deliver the highest quality of work.

Being able to provide multiple engineering services under one company while embracing technology, makes their firm unique. We have the expertise of designing the structural shell of a structure, taking into consideration the components that will added to it, which will make the calculations of a project significantly accurate. Furthermore, their constant drive for innovation, has guided the company to keep up with technological advances in our field to provide the best services.

The firm provides structural design services to the public and private sectors in the following fields:

New construction, remodeling and renovations of existing structures, structural assessments and reports, threshold inspections, construction administration, 40-year recertification's, new NOA's

and One Time Approvals, specialty engineering components such as: canopies, trellises, railings, stairs, windows, doors, storefronts, curtain walls.

Their practice has extensive experience designing structures of reinforced concrete, post-tensioned concrete, precast concrete, structural steel, masonry, aluminum and timber.

Mission

Provide high-quality engineering services while meeting their client's standards for excellence. They want to help customers with everything a project requires from the structural shell to all its components. Simultaneously, the firm seeks to assemble a team of well-trained employees that can work in an enjoyable environment where everyone feels respected and supported.

What is civil engineering

Civil engineering is arguably the oldest engineering discipline. It deals with the built environment and can be dated to the first time someone placed a roof over his or her head or laid a tree trunk across a river to make it easier to get across. Civil engineers create, improve and make sure that we preserve the environment in which we live. They plan, design and oversee construction and maintenance of building, structures and infrastructure, such as roads, railways, airports, bridges, harbors, dams, irrigation projects, power plants, and water and sewerage systems. They also design and build tall buildings and large structures that can withstand all weather conditions.

Generally, civil engineers fall into two types: consulting engineers and contracting engineers. Consultants are responsible for the design work of projects and work predominantly in an office.

Contractors then take the designs and implement them during construction. Contractors work on site, managing the construction of the structure.

What is structural engineering?

It is a specialty within the field of civil engineering that focuses on the framework of structures, and on designing those structures to withstand the stresses and pressures of their environment and remain safe, stable and secure throughout their use. In other words, structural engineers make sure that buildings don't fall down and bridges don't collapse.

Structures are subject to vertical, or "Gravity" Loads and horizontal, or "Lateral" Loads. Gravity loads include "dead", or permanent, load, which is the weight of the structure, including its walls, floors, finishes, and mechanical systems, and "live", or temporary load, which is the weight of a structure's contents and occupants, including the weight of snow. Lateral loads include those generated by the wind, earthquakes, or explosions. Structural elements must be designed so that, as a system, the structure can resist all loads that will act upon it.

Services offered

Civil engineering

- Paving and drainage plans
- Grading plans
- Water and sewer on site and of site plans
- Stripping and signage plans

- Drainage inspections

Structural engineering

- Addition/Renovation
- Single/Multi- family homes
- Structural repairs
- Low/Mid rise
- Special/miscellaneous structures

Specialty engineering

Windows and doors

- Curtain walls
- One-time approvals
- Notice of acceptance (NOA)
- Skyline system
- Wind load certificate

Structural components

- Gazebos and trellises
- Fences, stairs and railings
- Awnings and screens

Structural inspections

- Structural Assessments Inspection
- Special Inspections
- Thresholds Inspections

- Concrete restauration and inspection
- Special components inspections

Personal Experience

Routine

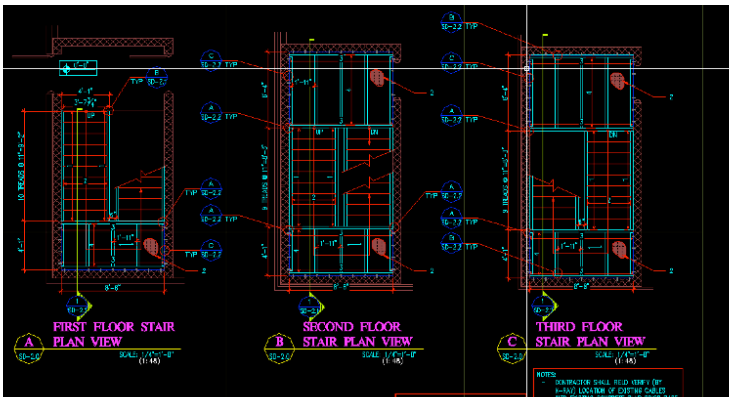
My schedule was Monday to Friday from 7 am until 4 pm. Every day was a little different, but it would always come to similar tasks. I would get to the company to meet directly with my superior Jorge Morrina and we would talk about the jobs I had to do during the day. Once we were done, I would usually get to work but I also took the first two hours of work to do other jobs related with the company except AutoCAD. My other tasks were based on helping improve the company's efficiency. I would do the cabling of the new computers and get them ready to run, do updates, basically I would help with most of the maintenance stuff from 7-9 because the workers don't start until then. After working on that I would focus on the jobs that I agreed with my supervisor. These jobs could be in three different departments:

Structural Department

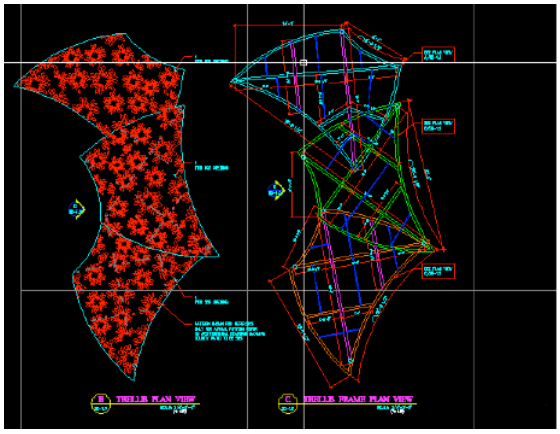
Within this department I had a variety of specialties in which I would have to work at. One kind of work would be receiving a new project and preparing a proposal for the client. The proposal consisted of a word document where I specified the material that I would use like aluminum or steel. Also, I would include the type of anchors that would go with the design. Besides that, I would have to prepare a plan view of the house,

building, or public space with the area of work highlighted with a rectangle to signal where the job is going to be performed.

Once I sent the proposal, I would start the design on AutoCAD. These drawings could vary from stair railings to trellises. Working with the program makes you separate your drawing in plan view, elevation and sections if necessary. By doing this the final result is more detailed and it helps the process of construction.

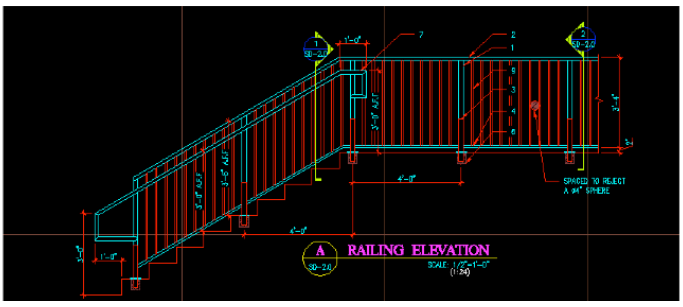


Railing Plan View

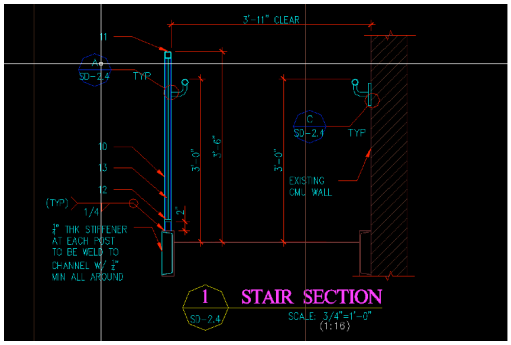


Trellises Plan View

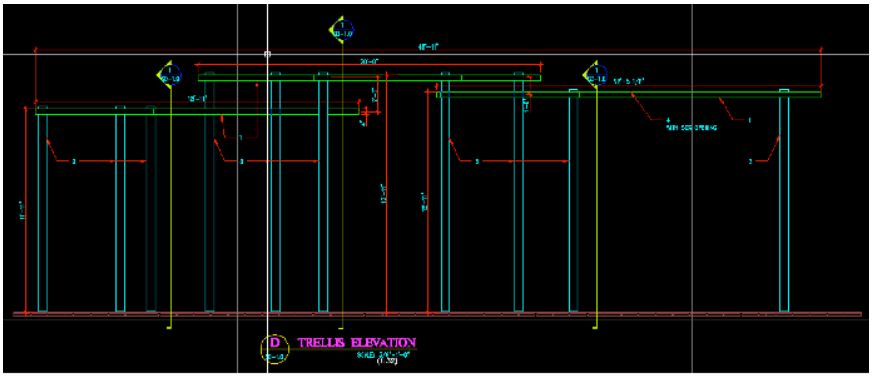
In the plan view you can see a more general view of the drawing from the top. Within the plan view or top view, I would call for some details or section and elevation cuts. That helps people see where the section or the elevation is on the plan view.



Railing Elevation

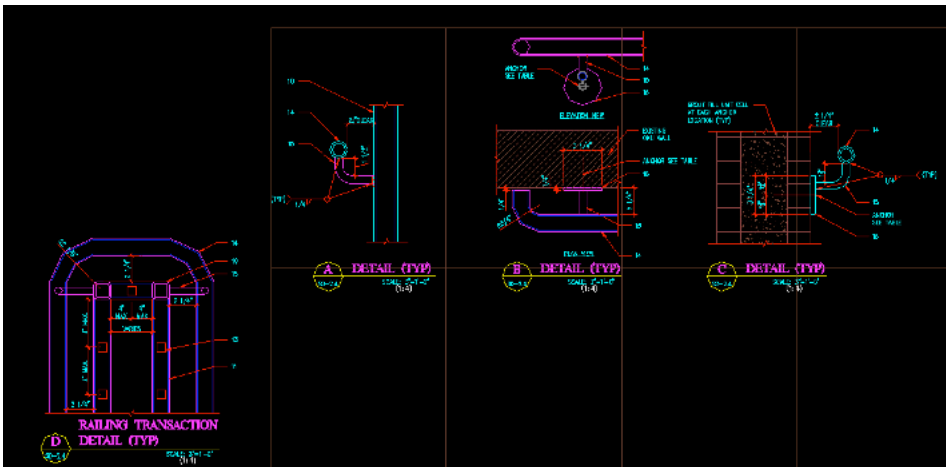


Railing Section



Trellises Elevation

In the elevations and sections, you can appreciate the measurements of the drawings on the x-y plane. In the elevations there are some cuts that became the sections, which basically are a more detailed drawing that cuts the object in half. Within the sections there are annotations because they are usually in a smaller scale and you can see specific measurements that are shown to enforce the Florida building code.



Hand Rail Details

Finally, we have the details. The details are usually in a smaller scale that the elevations, sections, and plan view. They are the drawings that show the most detail, and usually are used to represent welds, anchors, and type of hand rails.

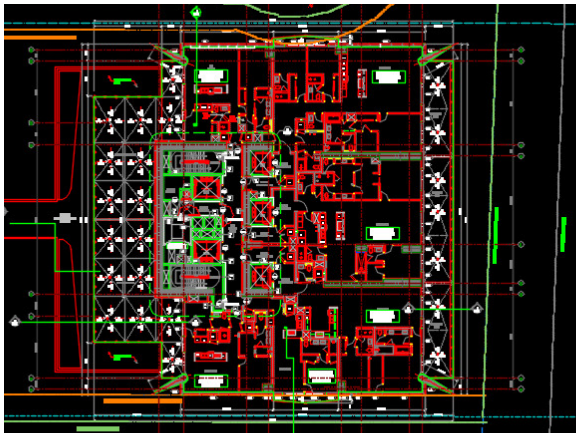
Windows & Doors department

Within this department I could work with either dynamic blocks or any current project. Dynamic blocks contain rules and restrictions that control the appearance and behavior of a block when it is inserted into a drawing or when it's later modified. A variety of controls and behaviors are available for adding flexibility and efficiency of working with blocks. You could automatically align a block to the geometric objects that represent a wall or a pipe, create additional movement grips on a block, control the size or shape of a block to standard increments such as the length of a fastener or width of a door…

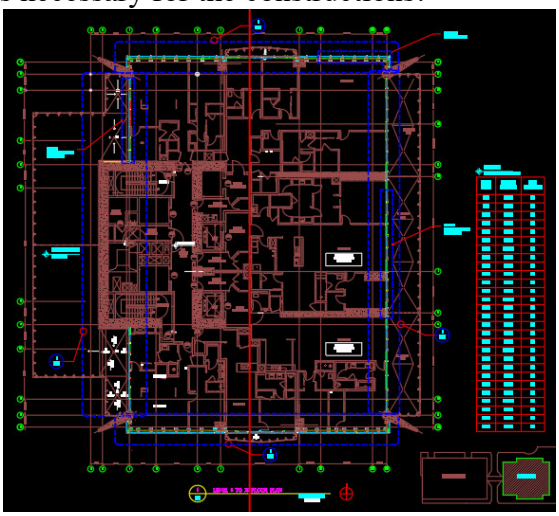
Whit the current projects I could be working cleaning drawings for the department or drawing the windows and doors that would be placed on buildings or houses. Cleaning a drawing was a simple but tedious task. Basically, I would get the drawings from the architect and simplify it to only show the details that I wanted to work on. Those drawings would come in full detail (Dirty drawing), and I would erase the extra lines and objects that are not necessary or crucial to understand what is drawn. It would depend on who I was cleaning the drawing for because people feel more comfortable showing some things better than others.

When drawing the windows and doors, I would follow the proposal that we sent to the client. It has the specifications as well as the NOA that we would be using. The Notice of acceptance tells us that the window system has been approved by the city. Once I had the

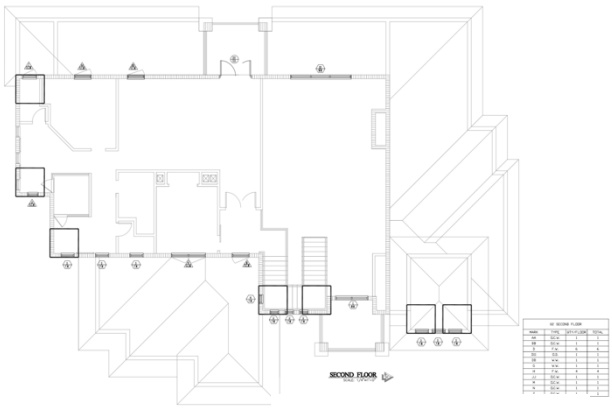
model of the window system, I would get the drawings from our database and scale and edit them as the client wants. Every drawing has the same subsections that I explained before with the plan views, elevations, sections and details. The only difference is that for the windows and door department I have to do it with the combination of the building and windows (House elevation), but also the windows and doors by themselves (Window elevation). It makes the work load double, but it is necessary for the constructions.



Dirty Drawing

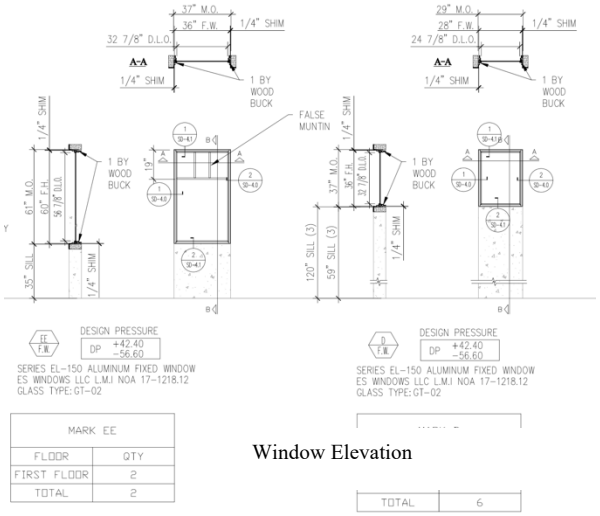


Cleaned drawing



House Plan View

House Elevation



Window Elevation

Inspection department

Within this department I had to wear boots, safety glasses and a helmet. My task was to go with the inspector and check that everything is going by the book. Basically, the client would contract us to inspect specific parts of the building or house and we will give and approval depending if they follow the Florida building code.

Conclusion

This internship was very useful for me to gain experience in the work field. It improved my overall fluency and precision working the provided software, in this case AutoCAD. It helped me develop better work-related communication skills and deeper understanding of what it would be asked for me in a work environment. All of these qualities will help me in the future in any engineering related jobs. Particularly, working with dynamic blocks and specialty engineering department made me realize the relationship between mechanical engineering and civil

engineering. Finally, I would definitely recommend this internship to anyone interested in developing working skills and learning how to draw in AutoCAD under a deadline pressure.

Work cited

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