
EE/CprE/Se 491 WEEKLY REPORT 06

October 20, 2018- October 27, 2018

Group Number: sdmay19-17

Project Title: Substation Design

Client: Burns & McDonnell

Advisor: Craig Rupp

Team Members:

Jacob Heiller- Controls Engineer

Rebecca Franzen- Studies Engineer

Connor Mislivec- Quality Control Specialist

Riley O'Donnell- Administrator

Tom Kelly- Project Manager

Wilson Pietruszewski- AutoCAD Engineer

Weekly Summary:

This week, following our meeting with Burns and McDonnell, we finalized our grounding report and sent the final copy to them. Once the grounding report was sent to Burns and McDonnell, we focused on performing the lightning study for Cyclone Substation. We realized that in order to determine a zone of protection for the substation, we will need to determine how much equipment will be necessary to protect the substation. We then started designing the substation layout by referencing "Example" and "To Modify" drawings--given to us by Burns and McDonnell--in AutoCAD. During our conference call with BMcD, we noted that in order to complete the lightning study, the substation equipment/site layout would also need to be completed; the due date for the lightning study was postponed to November 30th.

We decided that it would be useful to have an AutoCAD training session since Wilson is the only group member who has worked extensively with AutoCAD. During this training session, we learned about the basics of AutoCAD and discussed Burns and McDonnell's design standards.

Past Week Accomplishments:

- Began Cyclone Substation lightning study - Tom and Connor
 - Referenced example of site layout drawing and client expectations

- Determined that we need a substation equipment/site layout in order to determine what equipment must be protected
- Discuss grounding study results after optimization with BMcD during the conference call - Everyone
 - Discussed typical fault current values
 - Determined if spacing for our project was typical for specified fault current
 - Recorded any changes that need to be made to finalize grounding design and report
- Made changes to grounding report after receiving feedback from Burns and McDonnell- Riley and Rebecca
 - Removed unnecessary details to ensure the report was short and concise
 - Included more information about safety criteria and why ground grids are necessary
 - Updated safety tables
 - Fixed obscure wording
 - Submitted final grounding report to Burns and McDonnell
- AutoCAD Training Session Preparation- Wilson
 - Determined basic functions required to create necessary drawings in the future
 - Reviewed typical Burns and McDonnell drawings to understand their standards for the drawings and what is required to be included on every drawing
 - Created a lesson plan for teaching the other group members about drawings
- Attended AutoCAD Training Session- Everyone
 - Learned common shortcuts used in AutoCAD
 - Studied the techniques for copying, moving, pasting, and creating objects within the AutoCAD environment
 - Received training for setting folder paths and pulling objects from existing files
- Began reviewing previous Physical Design Layout drawings - Jake
 - Reviewed the requirements and client's standards for Physical Layout in an effort to be prepared for discussion with the group about how to best design the physical layout.
 - Created a mock layout of the substation

Pending Issues:

- Need to obtain a list of deliverables for physical design due November 30.

Individual Contributions:

Name / Role	Individual Contribution	Hours this week	Cumulative Hours
Rebecca Franzen	Grounding report update & AutoCAD Training Session	7	57.5

Jacob Heiller	Reviewed Physical Layout requirements & AutoCAD Training Session	6.5	54
Tom Kelly	Cyclone Substation lightning study & AutoCAD training session	5	55.5
Connor Mislivec	Cyclone Substation lightning study & AutoCAD training session	5	55
Riley O'Donnell	Grounding report update & AutoCAD Training Session	7	57.5
Wilson Pietruszewski	AutoCAD Training Session Preparation & led AutoCAD Training Session	6.5	54.5

Comments and extended discussion:

Plan for coming week:

- Begin Physical Design Layout - Everyone
 - After discussion with Burns and McDonnell, it was determined that we will be required to create the plan view drawing as opposed to having it given to us from our client as was previously determined
 - Finalize and discuss the foundation plan with the client optimizing the needed supports for the major equipment and ensure that the foundations do not overlap with the grounding grid in a significant way
 - Familiarize ourselves with the elevation drawings to prepare ourselves for the completion of the site plan layout
- Modify AutoCAD drawing of plan view - Everyone
 - Incorporate the finalized grounding study to determine the layout for the substation and where the major equipment will be placed to optimize the fault current ratings
 - After familiarization of elevation drawings, begin modifying the AutoCAD drawings to reflect the design of the site layout with elevation drawings
 - Include Bill of Materials on drawings and include call-outs to the specified materials

Weekly Advisor Meeting Summary:

- Explained grounding study and grounding report

- Explained CDEGS software
 - Discussed rolling sphere method for determining lightning protection
- Discussed the purpose of a grounding grid
 - Why fault current level of 21 kA was used when performing grounding study
 - Why grounding grid extends 3 feet beyond fence that surrounds substation