
EE/CprE/Se 491 WEEKLY REPORT 09

November 12, 2018- November 16, 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, we continued to work on the three deliverables that are due November 30. Last week, we assigned each deliverable to a group of two members, so those members have continued to work on their respective project. This week with the grounding study we ran the study in CDEGS after incorporating all changes and analyzed the results to ensure that the study was still passing. We then updated the grounding report to incorporate the new design based on the plan view. This week with the lightning study we have confirmed the location and heights of the lightning masts and determined the area that is protected based off the lightning mast height. During the design of the lightning protection, we ensured that we were following industry standards and IEEE 998. After determining the location and heights of the lightning masts, the lightning protection team and the site layout team met to incorporate the lightning protection on the plan view drawing. During this process, we also considered future masts if more equipment is to be added to the substation. This week with the physical design we worked on the elevation view and the bill of materials. We had to estimate lengths and determine the type and size of equipment we wanted to use in the substation for the bill of materials. The elevation view involved coordinating between various different drawings to ensure the location of the equipment is in the right place and the heights match.

Past Week Accomplishments:

- Ran grounding study and updated grounding report- Riley and Rebecca
 - Used MALZ program in CDEGS to run grounding study incorporating all changes
 - Analyzed results of MALZ to ensure the study is passing in both step potential and touch potential
 - Updated pictures, graphs, and tables with results from the new ground grid design
 - Made changes to equations and numbers based on in-depth review of calculations found in IEEE 80.
- Lightning protection design and study- Connor and Tom
 - Followed methods and equations outlined in IEEE 998 for design of lightning protection
 - Confirmed the location and heights of the lightning masts based off the heights of equipment in the substation
 - Determined the area that is protected based off the chosen location and height of the lightning masts
- Met to plan how to incorporate lightning protection on plan view- Wilson, Jake, Tom, and Connor
 - Determined if the chosen size and location of the lightning mast was feasible and if the masts would protect each breaker and the transformer
 - Researched different types of lightning masts and determined which one must be needed for the lightning protection design of this substation
 - Discussed and determined future positions for additional lightning masts if equipment were to be added the substation
- Created Bill of Materials- Wilson and Jake
 - Made a list of all equipment within the substation
 - Determined the information given for each piece of equipment
 - Researched manufacturers of equipment and materials within the substation to determine what should be used
 - Estimated lengths of cables and copper conductors based on estimated routes from the plan view
- Elevation view of layout- Wilson and Jake
 - Determined the necessary elevation views to satisfy the clients demands and ensure the substation is clearly laid out
 - Began drafting the equipment using AutoCAD by referencing the exact location of equipment based off the plan view
 - Determine necessary elevation views to satisfy client demands
 - Coordinated between all elevation drawings to ensure that all bus heights matched

Pending Issues:

- Receive feedback from client regarding physical design

Individual Contributions:

Name / Role	Individual Contribution	Hours this week	Cumulative Hours
Rebecca Franzen	Grounding report	6	79
Jacob Heiller	Elevation view, lightning protection, bill of materials	6.5	79.5
Tom Kelly	Lightning Protection	7	79
Connor Mislivec	Lightning Protection	7	78.5
Riley O'Donnell	Grounding report	6	79
Wilson Pietruszewski	Elevation view, lightning protection, bill of materials	6.5	80

Comments and extended discussion:

Plan for coming week:

- Finalize grounding study and report-Riley and Rebecca
 - Ensure grounding design matches the plan view drawings
 - Correct obscure language in the grounding report
 - Review and check calculations performed in grounding report
- Finalize physical design- Wilson and Jake
 - Incorporate comments given by Burns and McDonnell
 - Clean up all drawings and ensure client standards are met
 - Create pdf versions for all physical design drawings
 - Add BOM to plan view drawing
- Finalize lightning protection- Tom and Connor
 - Perform necessary calculations for lightning protection study
 - Review previous Burns and McDonnell lightning study reports
 - Draft a lightning study report for Cyclone Substation
 - Make revisions based on client feedback

Weekly Advisor Meeting Summary:

- Weekly advisor meeting was canceled due to Thanksgiving break