

# Design 2

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Team: SDDec-24-02





# What is a substation?

A substation acts as a middleman in the electricity supply chain.

It takes voltage from one level to another.

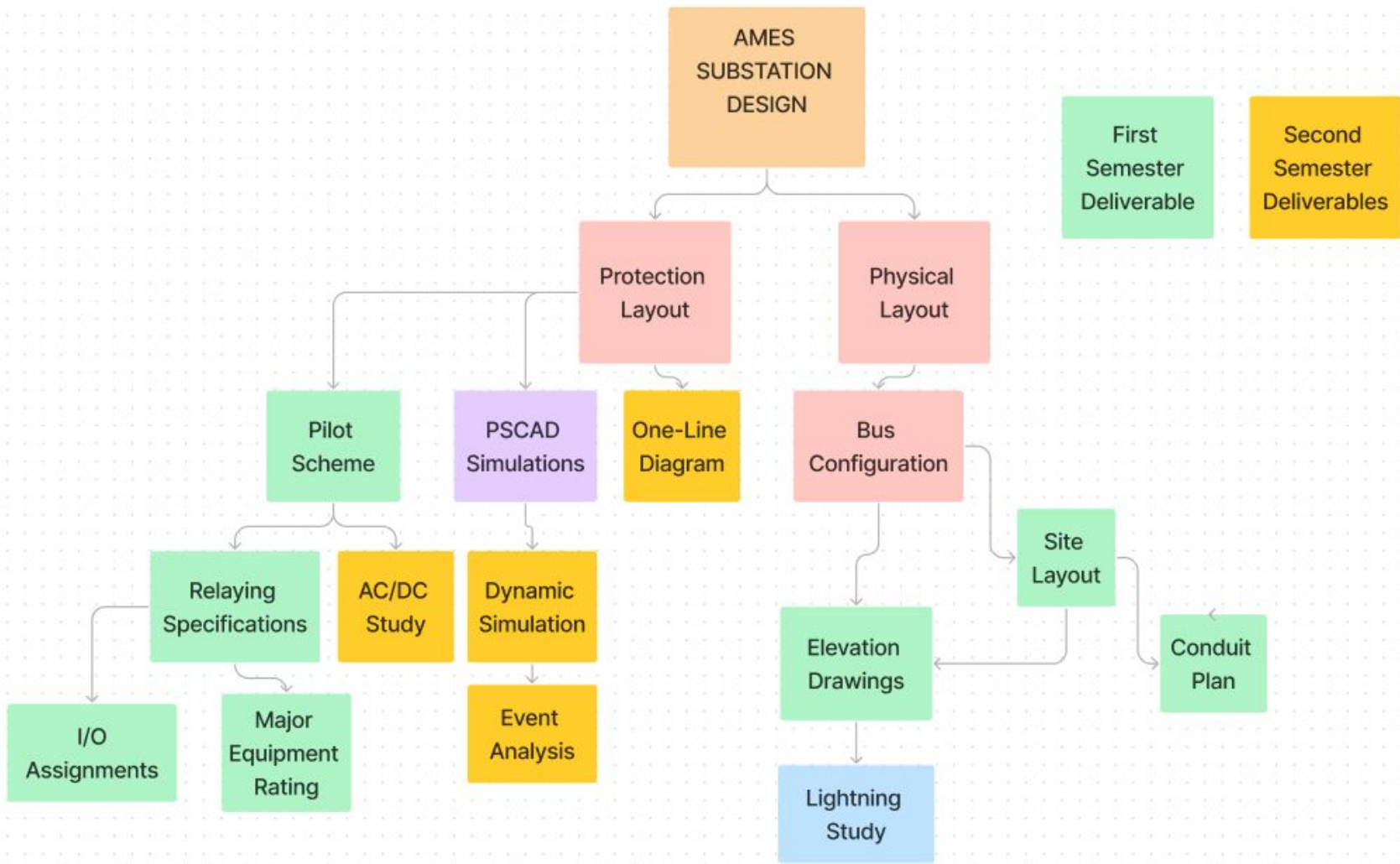
- Step up - low to high
- Step down - high to low

A Bus is system of uninsulated conductors that carry electricity from one point to another



# Project Overview-Ames Substation

- Our main goal is to tap in a 69kV, 2 MW solar farm into an existing substation
- This station already has 3 input lines, the solar farm would make four
- Each lines requires a different pilot/relaying (communication of system) scheme based on its specific needs and standards
- Must design a bus configuration system that will implement the new line with a high level of reliability and a relatively low level of complexity to make both designing and maintenance easier
- End goal is to have a dynamic simulation with an event analysis report



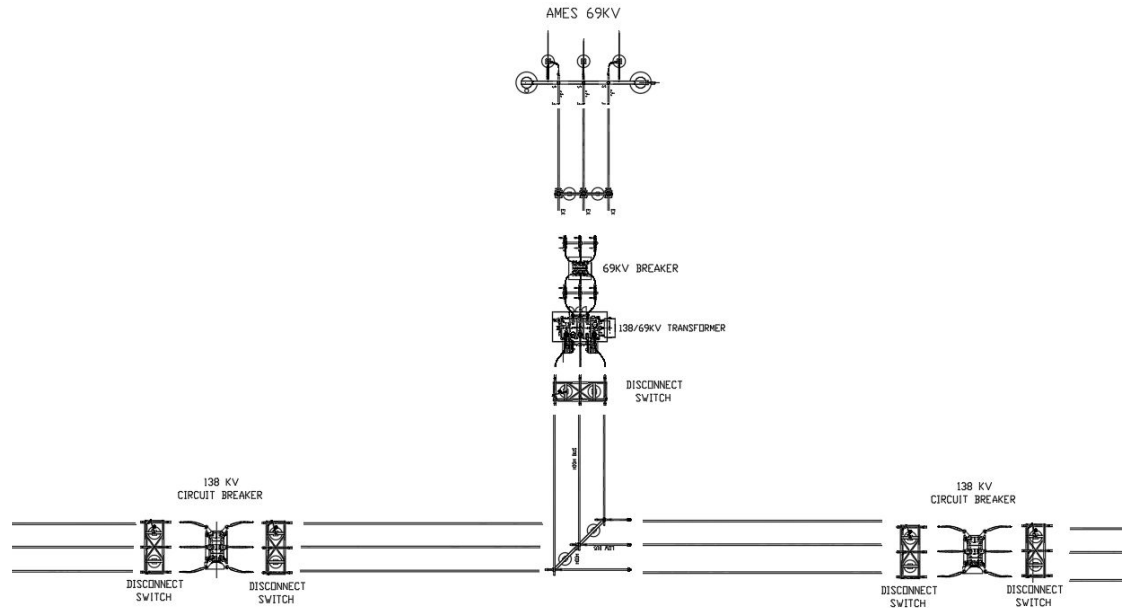
# Design and Visuals - Site Layout

Shows bus configuration and electrical equipment

Shows equipment rating and equipment names as well any connections

Shows lines coming in and out of the station

Document is to-scale





# Functionality

Our design is intended to provide power to the residents of Ames with reliability and simplicity.

- Redundant fault protection schemes to minimize damage
- Optimally rated equipment
- Thorough documentation





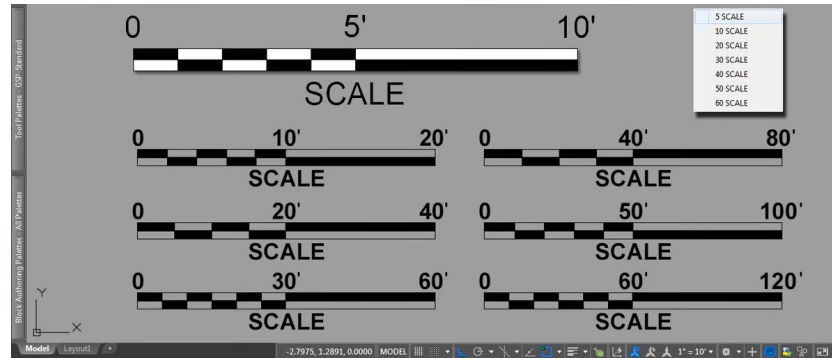


# Areas of Concern/Development

Currently our design would almost satisfy the user's needs.

## Primary Concerns

- Optimally rated equipment
- I/O DC connections
- Accurate scaling of the substation







# Conclusions

Our project focuses on the design and visuals aspects of this presentation

- Our deliverables are mainly drawings
- Design reports/documents explain the decisions we have made regarding specific equipment usage and site layout
- Many of our deliverables build on one another
  - Flowchart to keep track of what should be done first