CAPSTONE 2024: "Automation for Mortensen"
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NDSU COMPUTER SCIENCE
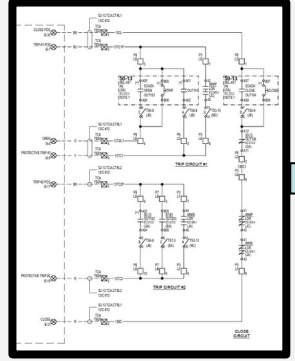
Capstone 2024

NDSU

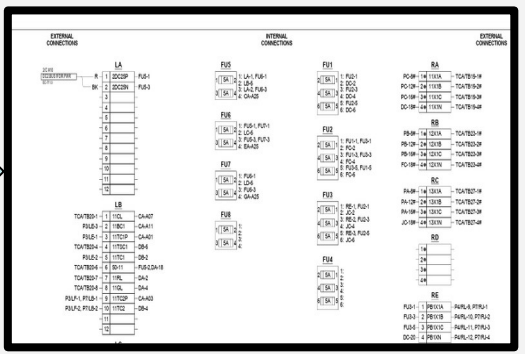Mortenson

Who is Mortenson

Mortensen is one of America's top 25 construction firms, having completed numerous high profile projects across more than half the states. Allegiant Stadium in Las Vegas and U.S. Bank Stadium in Minneapolis are two of their biggest projects, though they also work on many more smaller commercial sized projects. Mortensen's electrical division develops various aspects between planning and construction for renewable energy stations and substations.

The Capstone Team worked with this electrical division to develop documentation to help develop a software product that will automate part of their workflow, saving months of manpower.
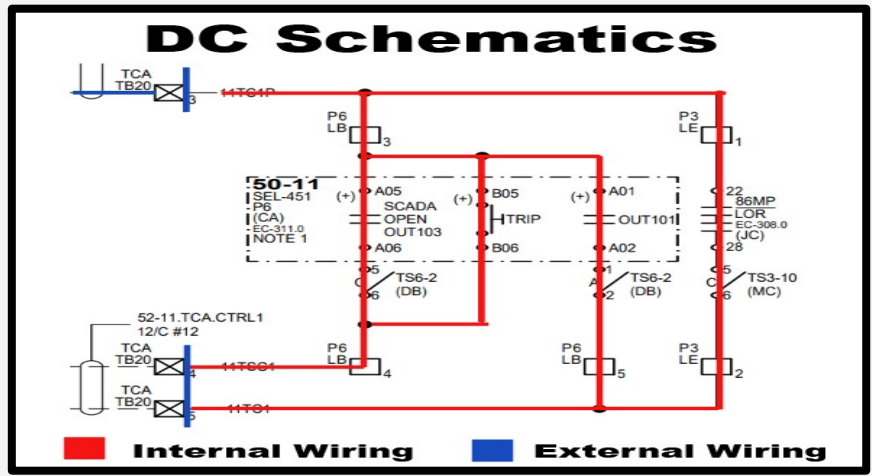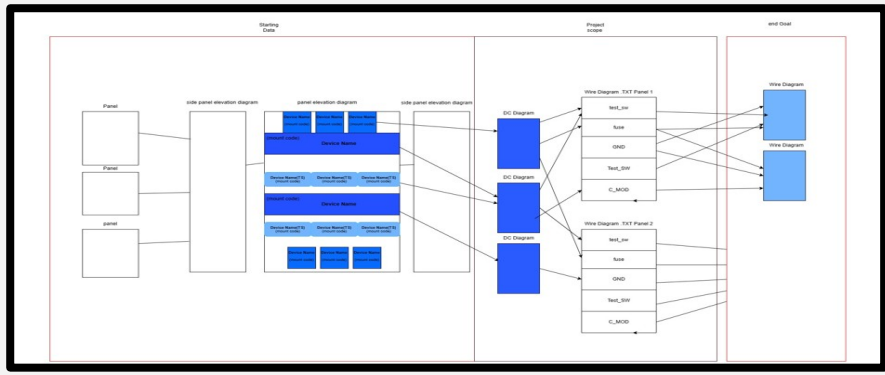
From DC Schematics   **To a Wiring Diagram**

Documentation the Process

DC Schematics

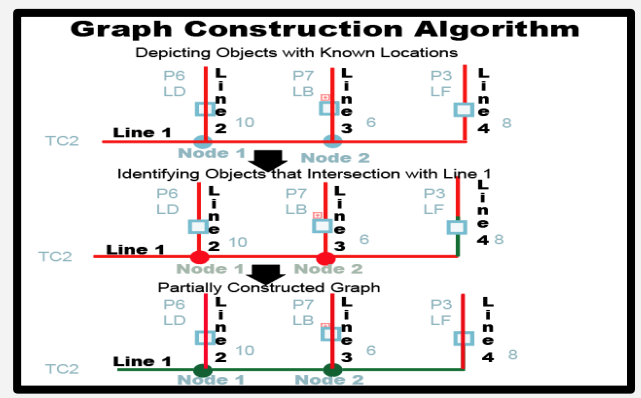**Internal Wiring**   **External Wiring**

In order to facilitate work on the software, the Capstone team documented the entire work process that Mortensen's electrical division undertakes in filling out a Wiring Diagram.

Program Design

In constructing a program design document, considerations were made for the use of algorithms to speed up the data intense process.

Graph Construction Algorithm
Depicting Objects with Known Locations

Identifying Objects that Intersection with Line 1

Partially Constructed Graph

Creating diagrams of the infrastructure and design of the code allows for critical parts of the program to be developed while allowing for future expansions to the product.

Class Diagram