

POWER TRANSMISSION FOUNDATION DESIGN

Project ID: CEEEn-2016CPST-005

by

MDT Engineering

McKay Harper

Todd Weichers

Daniel Pope

Mikayla Hatch

Project Management Plan

Matt Hawley

Kiewit Infrastructure Engineers Co.

Department of Civil and Environmental Engineering

Brigham Young University

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Vision Statement

MDT Engineering seeks to develop our engineering skills through thorough research and application of our acquired knowledge. We are diligent, strive to work well as a team, and are not afraid to seek help when necessary.

Purpose of Project

MDT Engineering will be designing two foundations for power transmission lines located in East Hanover, NJ. Kiewit has previously designed and installed the foundations for 16 Lattice Towers and eight monopoles located in meadowlands and an existing rail yard of East Hanover. MDT Engineering will complete their own design of one monopole foundation in the meadowlands and one lattice structure foundation in the rail yard. As part of the designs, MDT will provide erection plans aided to guide the construction.

General Scope of Project

MDT Engineering will review the provided design basis, design codes, power transmission dimensions and loads, and each site's geotechnical data to develop parameters for each tower foundation. These designs will include details for deep foundations, pile caps, steel connections, and concrete reinforcement as required. The final deliverables will include detailed plans and calculations for each tower as well as code checks, design approaches, construction schemes, and a bill of materials. A presentation of the completed project will be given to Kiewit along with a report and poster reflecting a summary of the designed project.

Contact Information:

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Organization Structure

Our group leader is McKay Harper as is the point of contact for the group. Todd Weicher is the head of organizing AutoCAD and providing finished drawings for the deliverables. Daniel Pope ensures quality within calculations and designs. Together, all work is spread throughout the members depending on each person's specific strength and skills. All issues and concerns will be resolved using the chain as follows: graduate mentor, Mikayla Hatch, faculty advisor, Kyle Rollins, and then sponsor contact, Matt Hawley.

Name	Role	Description
McKay Harper	Team Liaison	Intermediary between team members, Kiewit Engineering, Mikayla Hatch, and Dr. Rollins to standardize and simplify communication efforts.
	Construction Specialist	Organize the creation of all construction schemes
Todd Weichers	CAD Specialist	Head and organize creation of all CAD files
	Project Manager	Organize team meetings, establish deadlines, and lead the creation of progress reports.
Daniel Pope	Quality Assurance Supervisor	Organize quality assurance efforts between team members, ensuring accurate calculations and results
	GIS Specialist	Head and organize creation of all GIS maps for the use of construction schemes and CAD files

Scope of Work Summary

Our analysis phase will begin with analyzing geotechnical boring data for each site to determine the proper foundation parameters for the in-place soil type. Load demands for each foundation will be calculated based on the given lattice tower and monopole load charts. We will provide design calculations to meet local and national codes and to achieve a minimum 80-year design life for each foundation. These calculations will be performed by McKay Harper and Todd Weichers and reviewed by Daniel Pope in order to provide the highest quality design. Once the analysis phase is complete, we will begin the design phase. During the design phase, we will develop detailed plans for each foundation, pile caps, bill of materials, and detailed construction schemes. Throughout the project we will examine and propose innovative ideas to reduce costs and ensure quality results.

Schedule

Our team will meet three hours each week to coordinate and discuss progress, challenges, and plans to approach the next phase of work. Team meetings will be held on the campus of Brigham Young University (BYU) where we will have access to resources including computer programs and our faculty advisor, Dr. Rollins. Each member of the team will individually contribute at least five hours each week towards the completion of this project; the work will be completed by 10 April 2017. At the completion of the project, we will summarize our results and present our recommendations in a final report, poster, and presentation to Kiewit.

Budget

All budget and time expectations are shown below.

	Team Expenses	Team Liaison/ Construction Specialist (McKay Harper)	Project Manager/ CAD Specialist (Todd Weichers)	QA Supervisor/ GIS Specialist (Daniel Pope)	Item Cost
Poster	50				\$ 50.00
Trip to Monopole	20				\$ 20.00
Team Building Lunch	100				\$ 100.00
Lunch with Matt	50				\$ 50.00
Total Hours		96	96	96	288

Total Spent \$ 220.00

Communication Plan

On the last Friday of every month, monthly reports on progress, challenges, and innovative ideas will be sent to our graduate mentor, Mikayla Hatch, and sponsor contact, Matt Hawley in a memo. Each team member has allocated 3 hours every Wednesday and Friday from 3:00 pm to 6:00 pm to meet, design, and discuss issues regarding the project. Monthly time will be reported to our graduate mentor. Each Wednesday, a scheduled meeting with Mikayla Hatch will be held. This weekly meeting will consist of reporting time and efforts of the group, issues, questions, and possible solutions.