

**Thesis Portfolio**

**Design of Suspended Bridge for Guayabitos, Bolivia**  
(Technical Report)

**A Collective Vision: Analyzing the Failed Consensus-Building of the Dakota Access Pipeline Using the Social Construction of Technology**  
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
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Bachelor of Science, School of Engineering

Marlene McGraw  
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Department of Civil Engineering

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## **Sociotechnical Synthesis**

The development of major infrastructure can have profound impacts on the communities near it, for good or for ill. This thesis considers these impacts and the role of the engineer in solving socio-political impacts created from long-term consequences of colonization and oppression from both a technical and a social perspective.

In the technical thesis, a bridge design is created for a rural community in Guayabitos, Bolivia, working collaboratively with the non-profit organization Engineers in Action to leverage technical skills and work alongside the community to create this infrastructure, which will have long-term, structural benefits for the community. The design team leveraged their skills to create design drawings for a suspended bridge design, ensuring a conservative design that will maximize usage of materials to decrease the total economic cost to the team and community. In addition, construction and safety plans are developed and explained, and fundraising efforts to contribute to the creation of the bridge are carried out, despite the team's inability to travel and construct the bridge due to COVID-19.

In the STS thesis, the construction of the Dakota Access Pipeline (DAPL) and the associated #NoDAPL movement are analyzed through the Social Construction of Technology (SCOT) STS framework in order to better understand how social groups can influence and change energy infrastructure's global meaning and significance through various closure mechanisms. After this analysis, the political-social-cultural roots of engineering ethics framework is used to discuss the complexities introduced by different relationships to the land found in settler and indigenous communities, and an exploration of the form closure mechanisms take in the United States, whether they can be said to be accomplishing stated goals, and how they might improve to better facilitate actor-to-actor communication.