

DESIGN EXPO

Scissor Lift Project

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Mechanical Engineering

ME 415 Section 2 – Team D22

Problem Statement: Complete a model scale replica of the Iowa State Campanile that is accessible, functional, and can withstand against the elements.

Customer Requirements

- Height is 1/5 of actual campanile (~22 ft).
- Fully functional carillon.
- Ease of assembly/disassembly.
- Will not break under normal wear and tear.
- Portable and easy to transport.
- Can withstand winds up to 50 mph.
- Weight under 3000 lbs.
- Matches likeness of the Campanile in sound and looks.

Project History

- 8th semester of ongoing project.
- Multiple redesigns and fabrications.
- The model Campanile has not been assembled prior to this semester.
- Strict deadline of October 27th – Bells of Iowa State Gala Anniversary Concert.

Problems Encountered

- No instructions on how to assemble the scissor lifts.
- Most of previous semester files were corrupt or nonexistent.
- All parts for the 6-ft scissor lift assembly were missing.
- Acme screw on the 6-ft scissor lift buckled.
- T-bars bowed because of horizontal force from acme screw.
- 6-ft scissor lift did not reach maximum height.



Key Accomplishments

- Redesigned and modified multiple parts of both 4-ft and 6-ft scissor lifts.
- Assembled 4-ft scissor lift on top of the 6-ft scissor lift for the first time.
- Fully assembled model Campanile with the façade team.
- Met strict deadline for the Bells of Iowa State Gala Anniversary Concert.
- Completed complex math model analysis of the scissor lifts.



Future Project Goals

- Modify the T-bar on 6-ft scissor lift to address the issue of it not reaching its maximum 6-ft height.
- Possible resizing of acme screw on the 6-ft scissor lift.
- Repair acme screw on 4-ft scissor lift.
- Adjust scissor lift as needed to counteract leaning issue.