# Retractable Pool Cover

## Midpoint Review

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# Overview

- Bill of Materials
- Frame Design
- Frame Load Simulation
- Plate Design
- Hinges
- Rails
- Wheels
- Extra Photos
- What’s Left
- Conclusion

# Bill of Materials

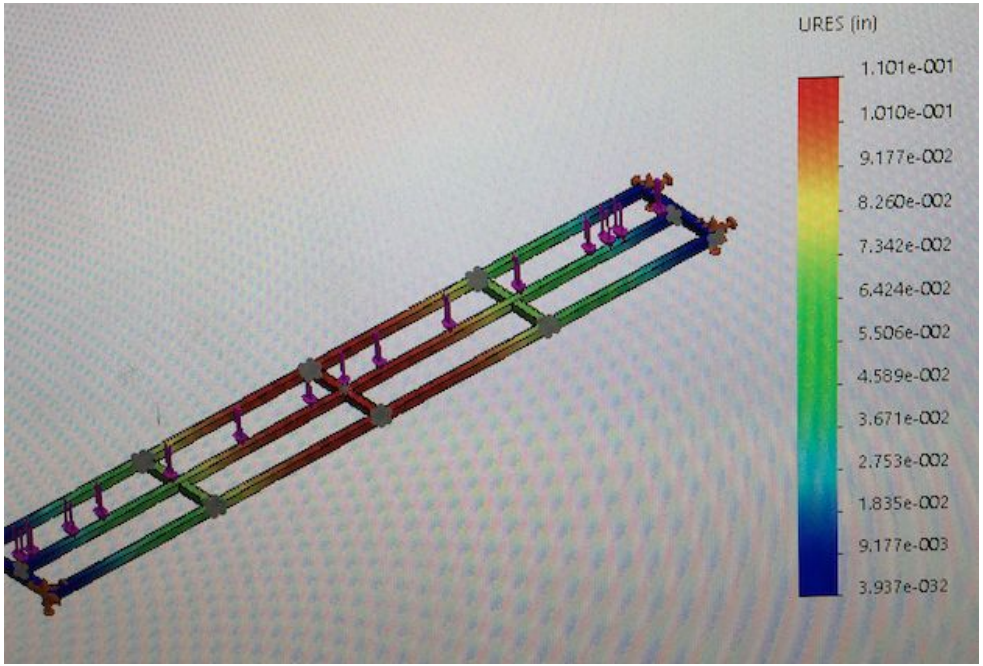
| Materials | Quantity/Dimension | Price |
|---|---|---|
| Rails | 2 | $1093.12 |
| Wheels | 28 | $586.40 |
| Aluminum Frame | 364’ of 1” X 1” square tubing | $547.20 |
| Aluminum Sheet | 14 (1’ X 4’) | $320.68 |
| Hinges | 30 | $102 |
| **Total Price** | **-** | **$2649.40** |

# Frame Design

- Original frame was aluminum blading (1” X 0.125”)
- Changed to square aluminum pipes (1” X 1”)(0.125” walls)

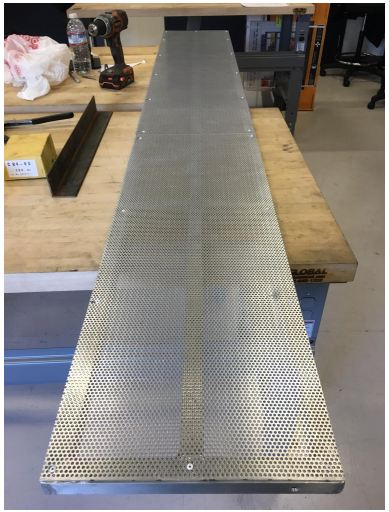
# Frame Load Simulation

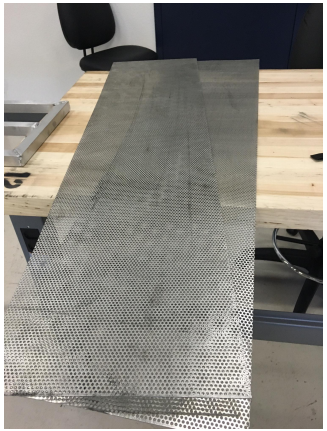
- Under 200lbs simulated loading the frame had minimal bending
- Downward displacement at the center shown is 0.11 inches



# Plate Design

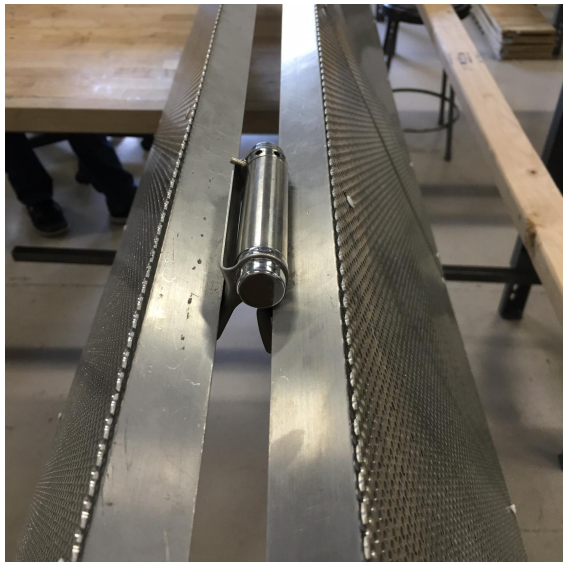
- Perforated aluminum sheeting covers the frame
- Perforation decreases total weight
- Completed cover will include 14 hinged plates





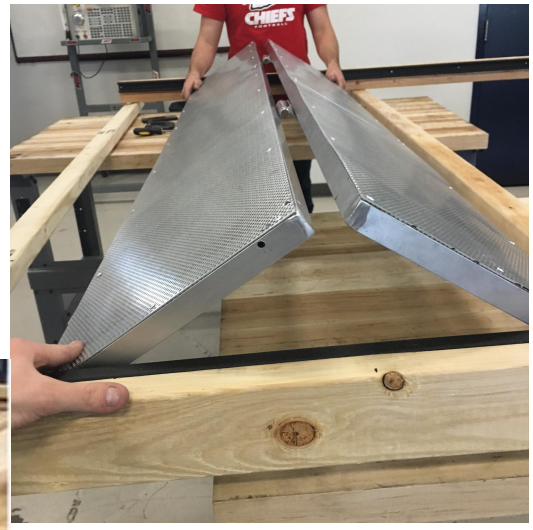
# Hinges

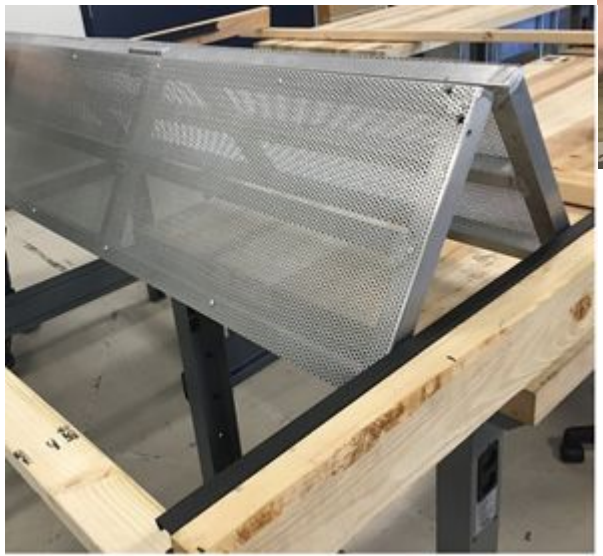
- Vertical Stacking
- Spring Loaded Hinges - used to replace the bump
- Problems with hinges buckling in center



# Rails

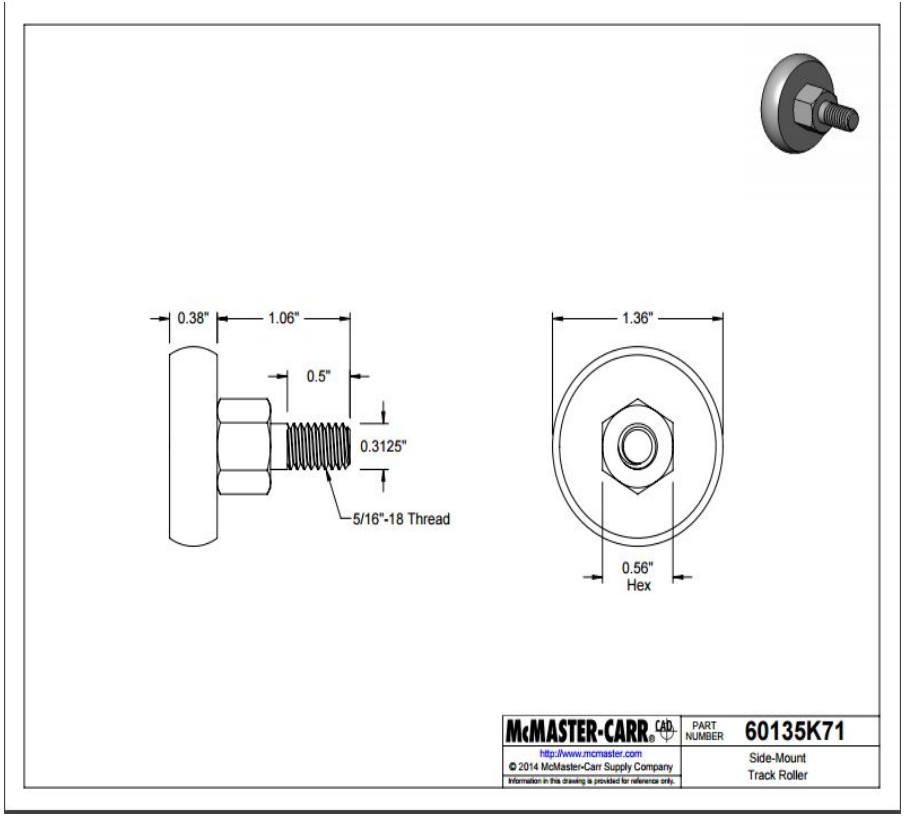
- Reconstruct frame
- Make screws flush inside railing
- Wheels are tight in rails
- Take top “C” off of rails



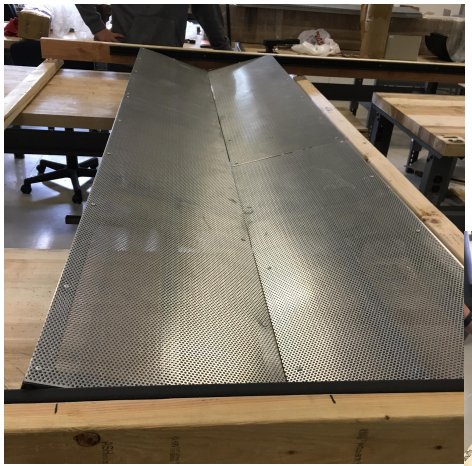


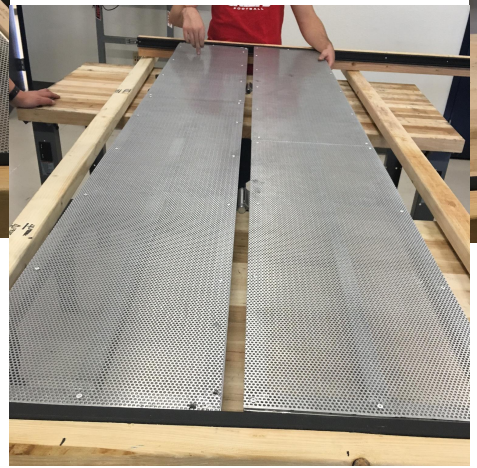
# Wheels

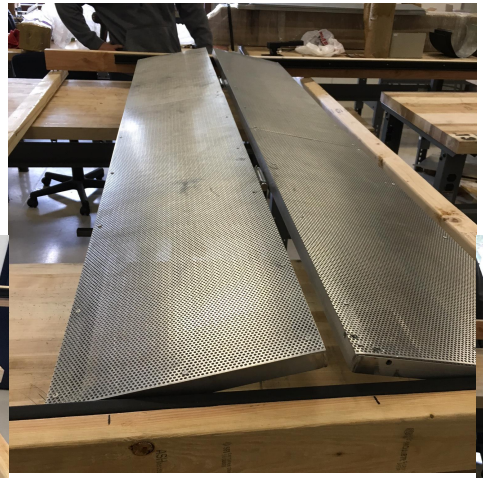
- Material: Stainless steel
- 2 wheels per plate
- Threaded standoff inserted into holes to attach wheels
- Considering adding 2 more wheels per plate

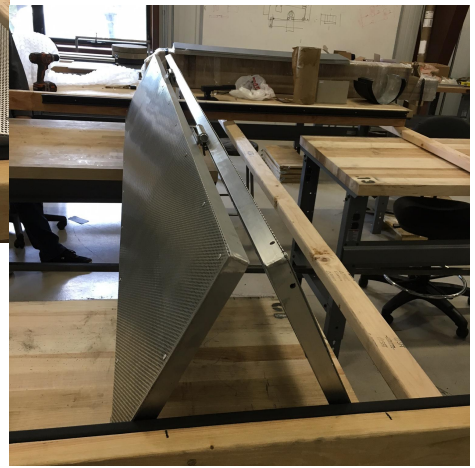


# Extra Photos









# What’s Left

- Hinges
- Housing Design
- Motor Configuration
- Pulley system

# Conclusion

- Bill of Materials
- Problems
- Solutions

# Questions