

Austin Larsen, Colby Klipping, James Hadacek, Steven Langel, Michael E. Anderson*, Jacek A. Koziel*

Henderson Part Removal from Laser Table

Client: Henderson Products, Manchester, Iowa

Problem Statement

- Henderson has multiple large cut tables with parts of various weights that require the operators to climb/crawl on the table to remove parts. Operators have a high risk of back and shoulder strains due to lifting or stretching to remove parts from the center of the table. Seven (7) injuries have been recorded in this area over the past two (2) years.

Objective

- Design a tool to pick up cut sheet metal parts that weigh less than 50 lbs off a laser cut table
- Eliminate the need to crawl on top of the table surface

Constraints

- Max Budget of \$2500
- Full digital mockup of prototype completed by May 2021
- ROI \leq eight (8) months

Scope

- To create a highly detailed digital mockup of prototype that can be used safely by the machine operators to remove parts from the cutting tables.

Laser Table Part Removal System



Methods/Approach

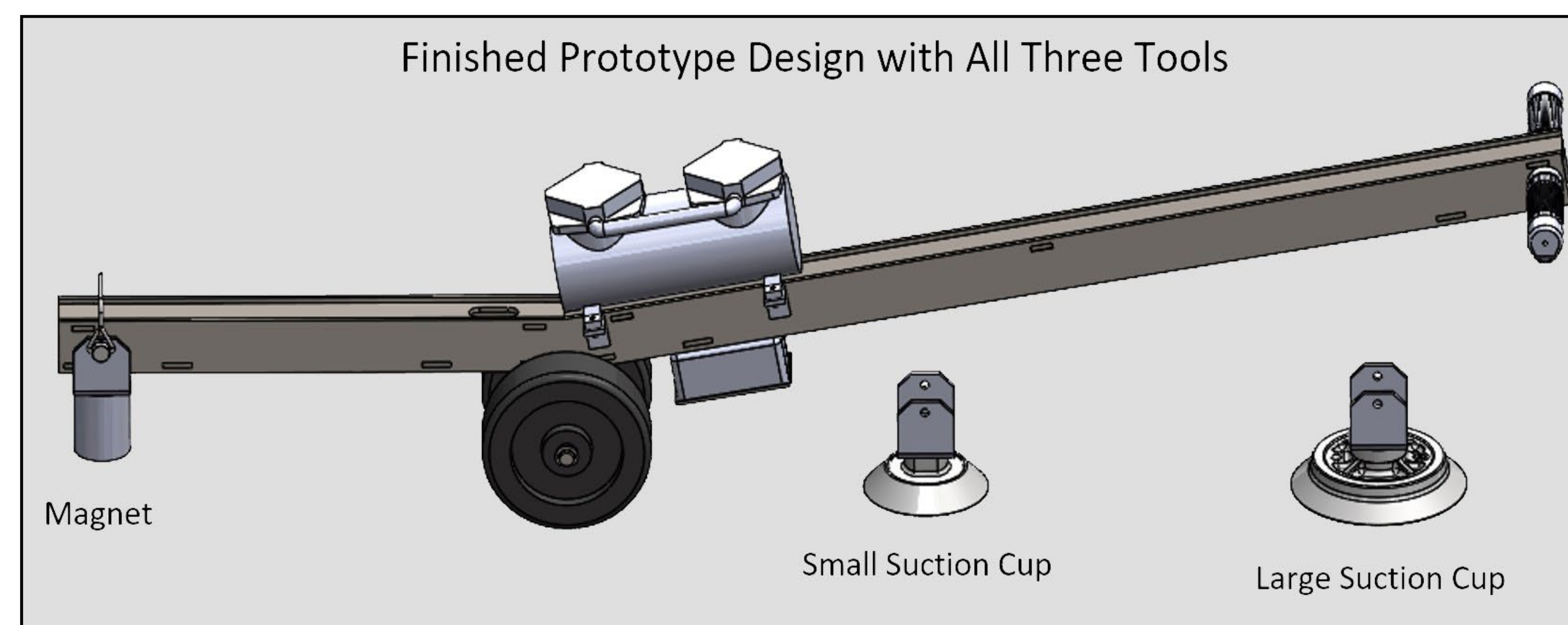
- Analyze part removal procedure
- Using SolidWorks to create CAD models and engineering drawings

Major Deliverables

- Complete highly detailed digital prototype model
- REBA conducted with score of three (3) or less
- RULA conducted with a score of two (2) or less

Measures of success

- ROI \leq eight (8) months
- Reporting minimal to no injuries with use of product



Prototype Design

- Our prototype uses a dolly fulcrum to lift parts off the cut table. It uses a long handle to produce the leverage needed to lift off the parts. It has three interchangeable ends. Two ends are vacuum cups powered by a vacuum pump. The third is an AC magnet for magnetic parts.