

Team Members: Alex Smith, Mark Rich, Mitchell Trinh, & Nick Svendsen
 Mentor: David Merrick

Customer Background

Our customer is the Bechtel Innovation and Design Center. Students use the Bechtel Center to work on class assignments, develop club projects, build design competition entries, create a product prototype for an entrepreneurial endeavor, or design innovative solutions for their own enjoyment.

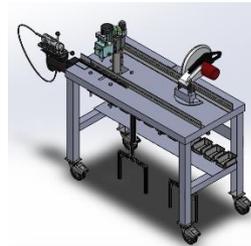
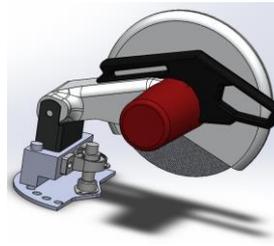
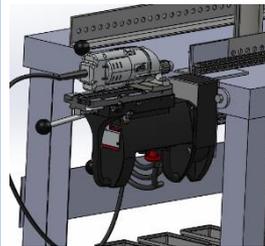
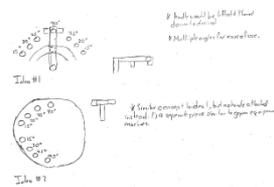
Problem Statement / Scope of Work

The purpose of this project is to produce a compact and mobile workstation that can cut and machine extruded aluminum structural members ready for assembly.

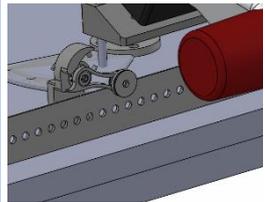
Major Requirements

1. Must be able to mill 80/20 workpieces
2. Must be able to cut 80/20 workpieces
3. Must be able to tap the ends of 80/20 workpieces
4. Must be able to accurately measure workpieces up to 0.01"

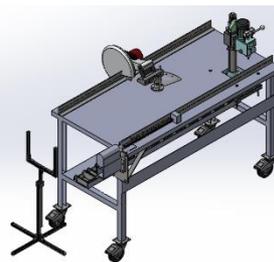
Experimentation and Concepts



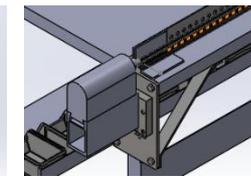
Final Design



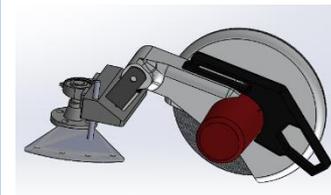
Measurement Device Design



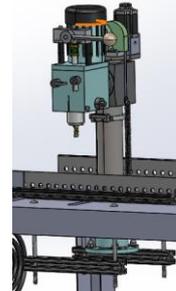
Workstation Design



Tapper Design



Saw Design



Mill Design

FMEA

- **What could fail**
 - The Tapping Station
- **How**
 - It doesn't line up with the holes needed tapped
- **Why**
 - The mounted feature is not in desired location
- **Severity Potential**
 - 7
- **Occurrence Potential**
 - 3
- **Current Detection**
 - Inspection to confirm compliance to drawing
- **Detection Rating**
 - 2
- **Preventative Action**
 - Adjust with micro measurements
- **DFEAMA AP**
 - Low

Testing

Test Name	Test Method	Requirement
Cutting	Cutting a desired length	Clean cut through 80/20
Precision Testing	Take average measurement of five sample cuts	Tolerance of 0.01"
Moveability	Being able to move with 100 lb-f or less	Being able to move
Storage	Hold at least five fasteners	Being able to store spare parts
Squareness	Saw, Mill, and Tap are square to table	Square to table