Boring Machine Anchoring and Alignment Device
Taylor Howard and T&K Utilities

PROBLEM STATEMENT
The team was tasked with developing an apparatus that will anchor, level, and align a boring machine in the workspace.

REQUIREMENTS

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<thead>
<tr>
<th>#</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Provide Pitch Adjustment</td>
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<tr>
<td>2</td>
<td>Provide Yaw Adjustment</td>
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<tr>
<td>3</td>
<td>Weigh Less Than 2000lb</td>
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<td>4</td>
<td>Anchor the Machine</td>
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<tr>
<td>5</td>
<td>Fit Within 1 Foot of Original Footprint (Width)</td>
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<tr>
<td>6</td>
<td>Easily Placed and Removed from Workspace</td>
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FINAL DESIGN, APPROACH, PLAN
Creo was used to model the device based on the decision matrix and any additions needed to meet the requirements.

RESULTS
Team 13 designed and fabricated a device that met all the specified requirements. Pitch, yaw, weight and ease of movement all surpassed our original requirements. The footprint and anchoring met expectations. Overall, the Anchoring and Alignment device will serve its purpose well.

SUMMARY AND CONCLUSIONS
Team 13 designed and developed a device that executed all the requirements set by the sponsor. In the process of this accomplishment, many lessons and skills were learned.

Skills Learned: Outsourcing (planning, communication, and technical relay of information with drawings), planning and tracking progress (spring journal, meeting minutes, task backlog)

Software’s: Altair Inspire FEA, Creo modeling

Machines: Enclosed CNC milling, open CNC milling, waterjet cutting, lathe turning, grinding (bench grinder & angle grinder), welding (TIG, MIG, and stick), cutting metal (horizontal and vertical bandsaw, plasma cutter, oxy-acetylene torch), tapping and thread identifying

FUTURE WORK
A professional welder employed by T&K Utilities will weld lift points onto the frame of the device. Since these lift points are crucial for the safety of the employees around the device while it’s being lifted, a professional is needed for this task.

TEAM & ACKNOWLEDGEMENTS
• Team Members from Left to Right: Timothy Ray (ET), Crate Hall (BSEME), Carson Weathers (BSEME), Matthew Waid (BSEME)
• Sponsor: Taylor Howard – T&K Utilities
• Faculty Mentor: Dr. Martin Tanaka
• Rapid Center: Brett Banther, Shawn Lyvers, Monty Graham
• Machine Shop: Dylan Bortell and Tom Spendlove

References
1. https://www.google.com/search?q=t+and+k+utilities&source=lnms&tbm=isch&sa=X&ved=2ahUKEwjxudnOlc3c3-AhXeD1kFHd87A1IQ0pQJegQIAxAG&biw=1920&bih=937&dpr=2#imgrc=n4mNkEWvpkbw8M

Decision Matrix

<table>
<thead>
<tr>
<th>Decision Matrix</th>
<th>Pitch</th>
<th>Yaw</th>
<th>Weight</th>
<th>Footprint</th>
<th>Ease of Movement</th>
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<td>Final Design</td>
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Bill of Materials