The Grasshopper
Pipeline Welding
Ground

*Universal Engineering Services, Inc.*

**Team:**
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**Advisor:**
Chris Haas

**Industry Representative:**
Mathew Michel

**Project Summary:**
Grasshoppers are used to ground electric current during pipeline welding operations in the field. Most grasshoppers are built and designed by each welder. Tommy Carter, a 60 year veteran of the industry, has his own version of a Grasshopper. Relatives of Tommy contacted Universal Engineering Services to create a manufacturable design that held true to Tommy Carter’s original. Universal Engineering Services then partnered with the University of St. Thomas Senior Design team to accomplish this goal.

**Design Goal:**
Provide a product that improves upon Tommy Carter’s original, in particular the manufacturability, without a dramatic redesign. The device must be manufactured for under $125 dollars, and safely ground electric current during pipeline welding. The team will provide Mathew Michel of Universal Engineering Services with testing plans, engineering drawings, and a manufacturing plan to immediately take the Grasshopper into production.

**Design Constraints:**
- Must be able to conduct a maximum of 400 Amps for 1 hour.
- Must adapt to diameters of pipe ranging from 4 to 60 inches.
- Must have a manufacturing cost of under $125.
- Device must be able to withstand falls from up to 40 feet.
- Device must look similar to Tommy Carter’s original design
- Setup time must be less than 90 seconds.