Portable Girder Builder

Overview
High Steel Structures LLC desires a portable girder builder to hold together steel plating for tack welding into I-beams. The device would provide the company with a more flexible method of tack welding girders by eliminating the need to transport materials to the current fixed device that is in operation.

Objectives
The team will generate a concept for a portable girder builder that meets the sponsor’s requirements and will develop detailed CAD design drawings of the concept. The team will also develop a small-scale prototype to model the concept and represent its functions.

Approach
- The team evaluated the current girder building process and made initial observations of its drawbacks.
- Two initial high level concepts were generated and analysed for their costs and benefits
- The team down selected the concepts down to one concept to move forward with into the detailed design phase.
- The chosen concept was further developed into detailed CAD drawings that include the different mechanisms for the device’s operation.
- A small-scale prototype was developed to model some of the device’s features.

Outcomes
The project resulted in a design for a portable girder builder that:
- the sponsor can further develop and eventually manufacture for full use.
- is portable and can be mounted on girders, allowing for multiple work cells.
- will reduce floor space usage and labor costs due to less material handling
- decreases overall setup time by eliminating material handling
- has the flexibility to handle the range of girders that High Steel Structures requested.