The Tralas

Overview
Traditionally, roofers lay down tarps to collect shingles thrown off the roof. The shingles are then painstakingly transferred by hand into a waste bin. This task is labor intensive and time consuming which increases project cost.

Objectives
- Create a device to move shingles from the roof to a waste bin for disposal without the need to re-handle shingles.
- The device should be able to extend 20 to 25 feet from the roof and rotate ± 90°.
- The device needs to withstand a 30 pound load of shingles.

Approach
- Research and analyse of current shingle removing process and techniques
- Interviewed local State College contractors and send out questionnaires
- Research shingle removing patents and existing products used in the process
- Generation of concepts that were presented to sponsor to narrow down design
- Generation of concept selection chart to find best design
- Generate CAD models of ladder, slide, stand, and funnel using SolidWorks
- Calculated the deflection by approximating the slide as a beam
- Gather feedback from local fabricator businesses Season-aire and Reihart
- Perform FEA analysis utilizing ANSYS 14.0 to test different material usage
- Created video animations of the Tralas
- Compared the FEA analysis to the beam approximation
- Built a miniature prototype using rapid prototyping of the Tralas and a sectional model of the sliding mechanism incorporated in the team’s design

Outcomes
- Developed an inexpensive device that can transport shingles from the roof to a waste bin
- The Tralas will cost approximately $2,500 compared to the $32,000 cost of the Equipter
- Roofers will save time, energy and money by using the Tralas
- The Tralas is a unique and new way of removing shingles from residential housing