Overview
The GreenTower vertical farming system uses rotational motion to move a conveyor of carriages within a vertical plane, accomplishing even distribution of sunlight/lighting as well as maintenance accessibility. Green Towers developed the first two iterations of the prototype and tasked the team with updating the third iteration into a more desirable and sellable consumer product focusing on ease of use, durability, and aesthetics.

Objectives
- Update third iteration to have a sleeker, more integrated consumer product look than previous prototypes
- Increase durability and strength of frame from previous models
- Keep plant sunlight exposure at current levels for optimal vegetation growth

Approach
- The team began by researching patents to understand what other products were on the market for the product's competition and found no relevant products are being sold.
- The team then constructed an AHP matrix to determine a ranking of importance of customer needs for the product.
- Upon assessing customer needs, the team developed four potential prototypes for the third iteration of the tower.
- Using a concept selection matrix, the team narrowed the concepts down to the one that would move forward: aluminium frame, 5” x 20” planters, higher rated coupling, and A-frame structure.
- Material and component selections were made to begin construction: zinc plated axels chosen for durability, t-slotted aluminium frame for durability and ease of assembly, and aluminium angle to reduce the weight of the carriages.
- Construction of the prototype was completed and testing was performed by applying the carriages to the drive train evenly before testing the rotational motion of the system.

Outcomes
- Third iteration complete and working with an integrated market-ready look for the customer.
- Weight of the carriages reduced by 80% to decrease load on motor coupling and increase durability.
- Cost of prototype was $1,203.00 leaving the company with a 20% profit margin considering a $1,500.00 price point.