



# FARMBOT EDU



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**Sponsor:** Rory Aronson

### Project Description

FarmBot Edu is the design of an advanced garden bed for the FarmBot CNC models. This project makes a garden bed that is mobile, modular, technologically capable and user friendly.

### FarmBot

A San Luis Obispo company that creates gardening CNC machines. Their products plant seeds, water, sample, and weed, among other tasks. With a market comprised of research and education, a garden bed with flexible and technical capabilities would be a popular product.



### Background

Raising Hope, educational institution focused on agriculture, developed a frame compatible with the FarmBot Genesis model. Includes water storage, removable garden beds, and caster wheels. This design heavily influenced our final product.



### Engineering Specifications

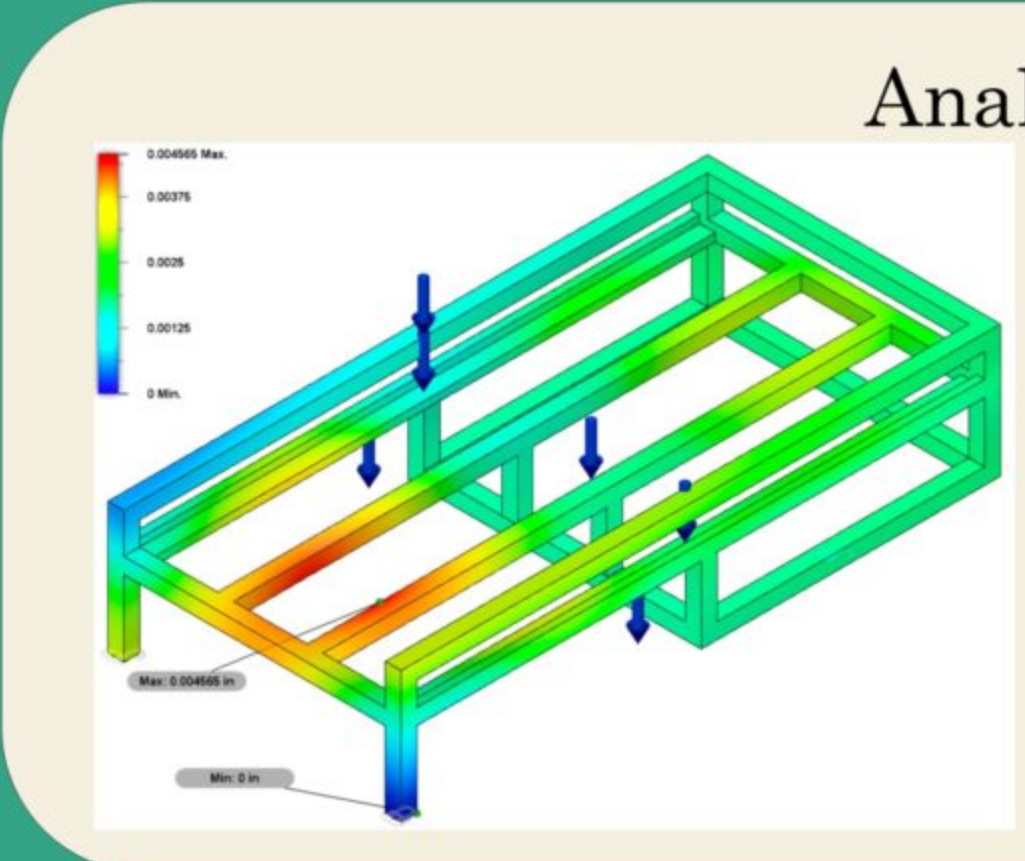
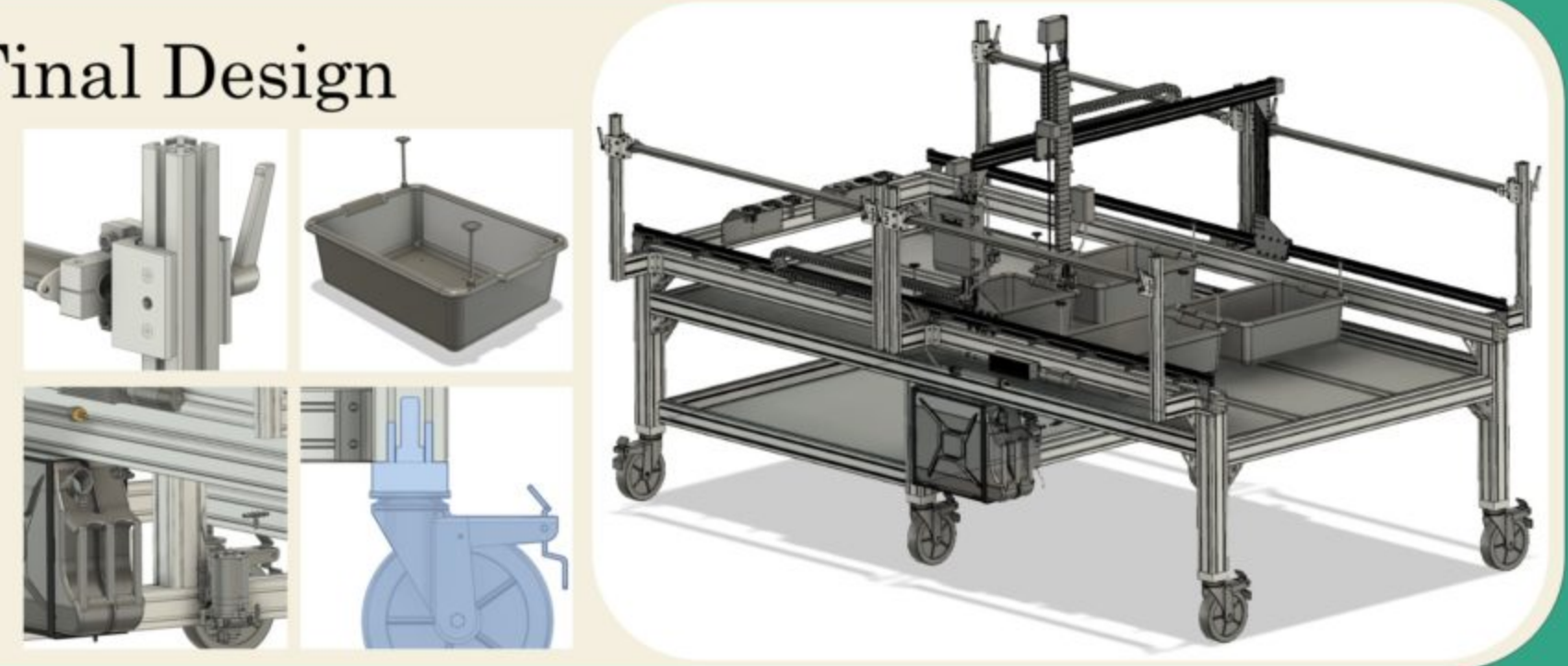
Spec. #	Parameter Description	Requirement or Target (units)	Tolerances
1	Weight (w/o soil)	1250 lbs	MAX
2	Length	120"	±4"
3	Width	60"	±4"
4	Height	80"	MAX
5	Base Cost	\$8,000	+\$500 -\$0.00
6	Construction Time	8 hours	±1 hour
7	Load Capacity (soil)	1750 lbs	MAX

### Testing

Due to the current quarantine restrictions, our team was unable to build or perform physical testing on our product. Instead, we have created physical testing instructions that will be provided to our sponsor. He will be able to use these instructions to test the durability and stability of our design, as well as drainage performance. Furthermore, computer vision design will be verified with testing to ensure that the QR locating scheme is successful

### Final Design

The final design of the FarmBot Edu includes systems of grow lights, water supply, drainage, storage, and removable grow trays on a mobile 80/20 frame. The design's width may be altered to accommodate the FarmBot Express and Genesis CNC models as needed. Furthermore, a compact frame has also been designed for those who do not wish to have such a large system. The FarmBot Edu is a stable platform supporting education and research tasks while maintaining the open source flexibility needed by makers and hobbyists. The water supply holds up to 10 gallons for multiple day storage. Any excess water from the FarmBot is funneled by drainage to a bucket or drain. The grow trays can hold over 1500 lbs. of soil total. Grow lights provide total illumination to the grow area. Storage allows for the collection of necessary tools and Laboratory equipment. Finally, locking casters ensure that the FarmBot Edu remains safe in use



FarmBot Edu was analyzed using the FEA functionality within Fusion 360. Our maximum displacement was found to be 0.004". This verified our hand calculations and fell within our acceptable displacement range. FarmBot Edu is designed for safety, and this is reflected in the calculated factor of safety of 15.

### Manufacturing Instructions

In lieu of restrictions stemming from a global pandemic, FarmBot Edu was unable to be built by the team. However, we took this time to ensure that the build was seamless for the FarmBot team, and possibly future customers, by setting a precedent of visual and easy to follow instructions. Inspired by the Lego manuals that were so formative for all of us, we created assembly instructions for the frame, water supply, lights, and grow trays.