

Hydraulic Trolley Jack Joint And Supported Plate Attachment With Trolley System For Garden Waste Bags Garden/Soil Bag Transportation.

Introduction

The project about defining trolley garden design as they exist trolley in the market are flimsy. The trolley should have the capability to hold and carry out the heavy waste sacks while transporting. The hazards of injury caused by lifting warrant a trolley system that can safely store a heavy garden waste bag on and transport it. This project aims to develop a conceptual design for the optimum solution and produce a working prototype, mainly focused on the farming market. The picture below shown the trolley garden holding heavy soil bags.



Aim

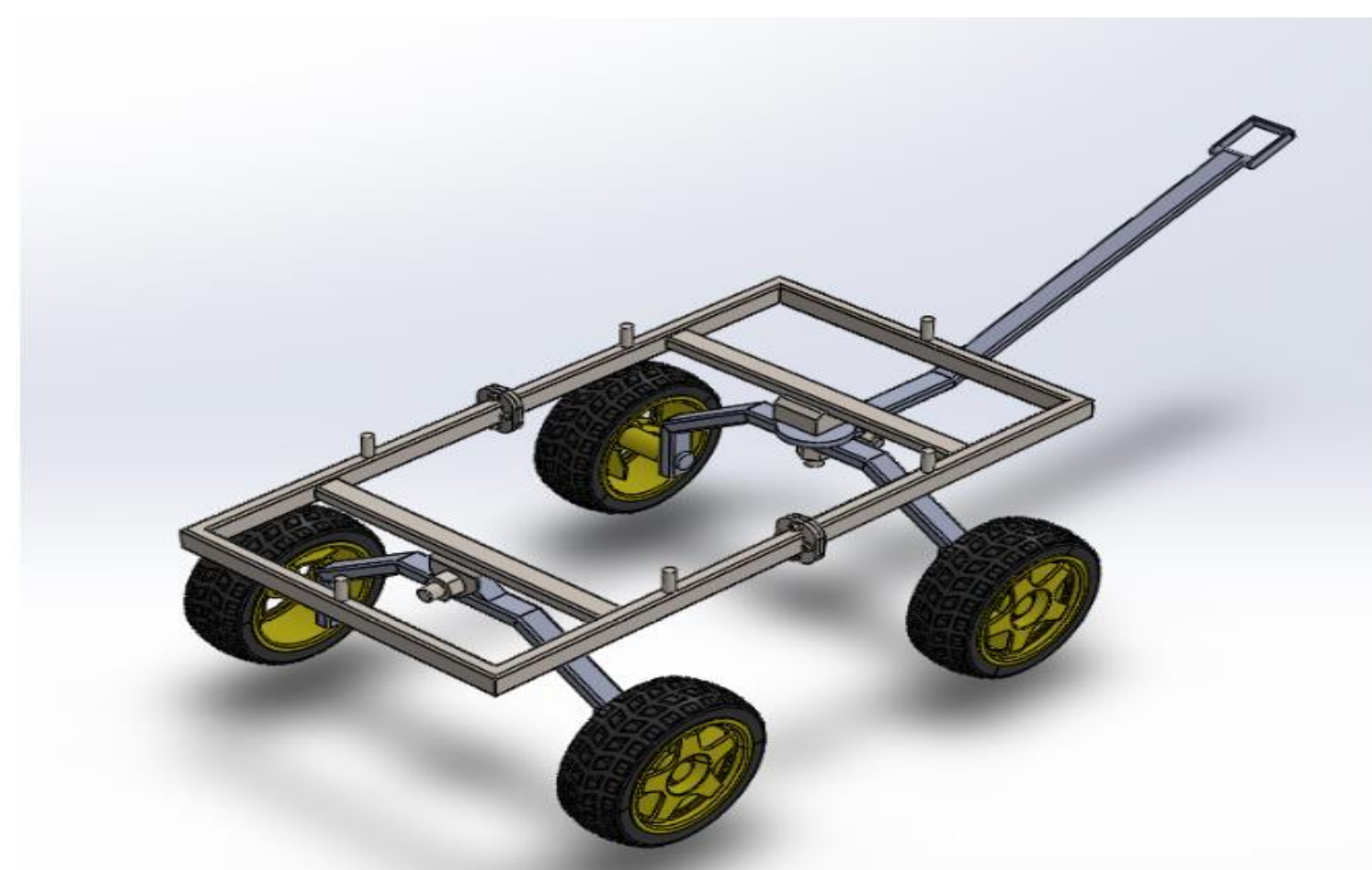
To design and evaluate a transportation system for garden trolley, including soil/rubble waste bags. The project will investigate transportation and lifting methods in conjunction with existing hydraulic lifting such as trolley jack. The project aims to allow the gardener or site worker to safely move heavier garden waste loads without the risk of injury or damage to the bags. Currently, little exists on the market for the movement of waste over small distances. This project needs a new design that will help hold the garden waste sack, the design will improve the trolley system effectively and make the movement very reliable.

Objective

- Formulate an appropriate product design Specification (PDS) for this new product.
- Undertake a risk assessment design for the safe utilisation by the user.
- Designing plate attachment for a hydraulic jack that can be used in conjunction with a tailored trolley system for the movement of garden waste (including the soil).
- Carry out a complete materials selection analysis for the project.
- Undertake a risk assessment design for safety.
- Carry out testing of a prototype in the laboratory.
- Evaluating the final design through finite element modelling and prototype testing.
- Synthesis a business proposal for a marketable product

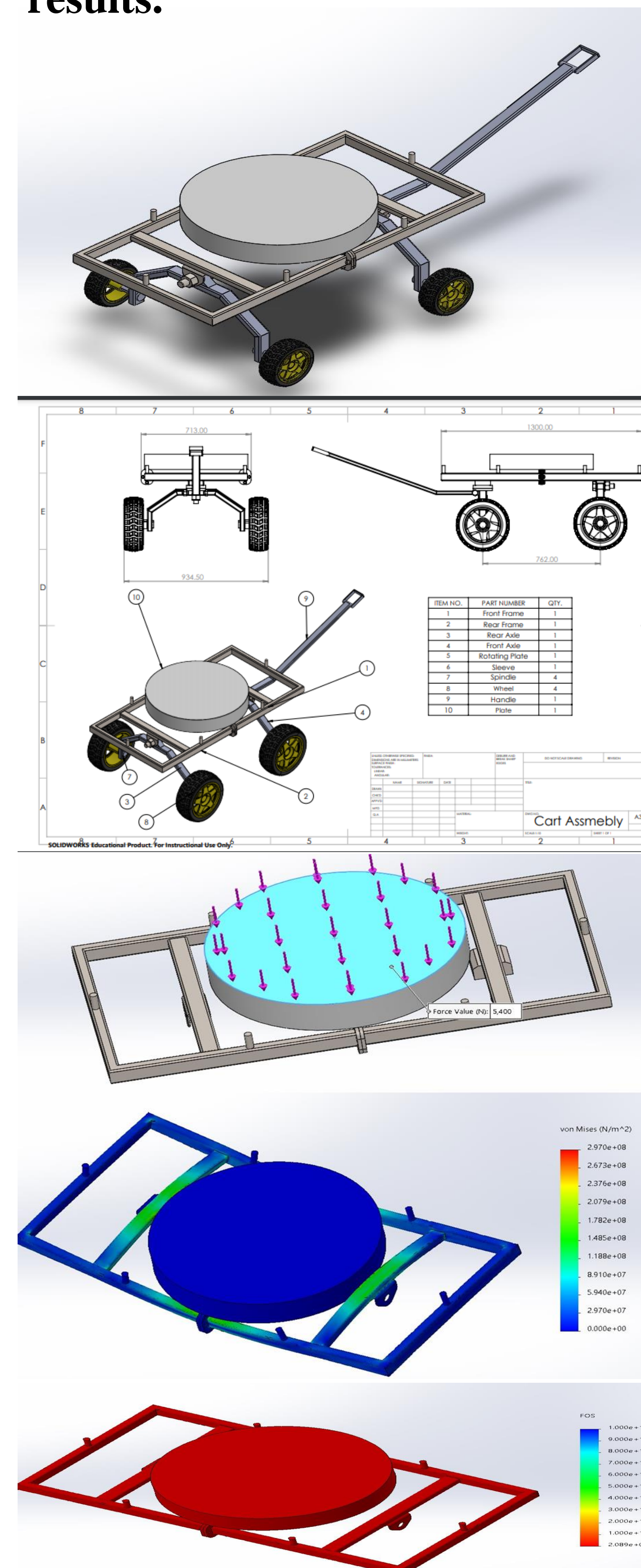
Design

The project design is very unique and not exist, the product are very durable, flexible and tough. The design simulated and tested through Solid Works design software such as stress, deformation, and factor of safety test. The material selections applied into the project design to protect it from cracking or fail. The frame material was iron ductile, the plate was composite polyester.



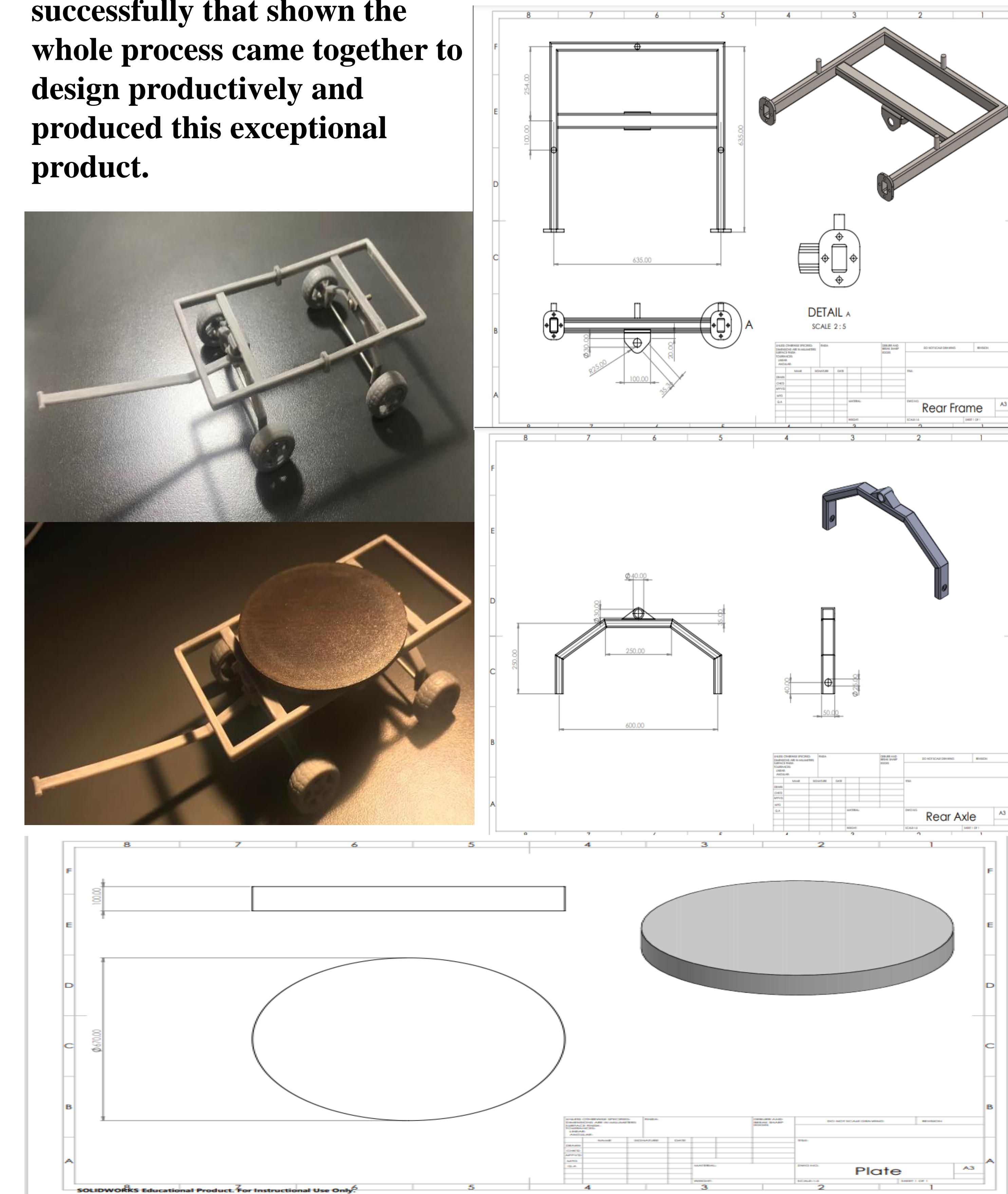
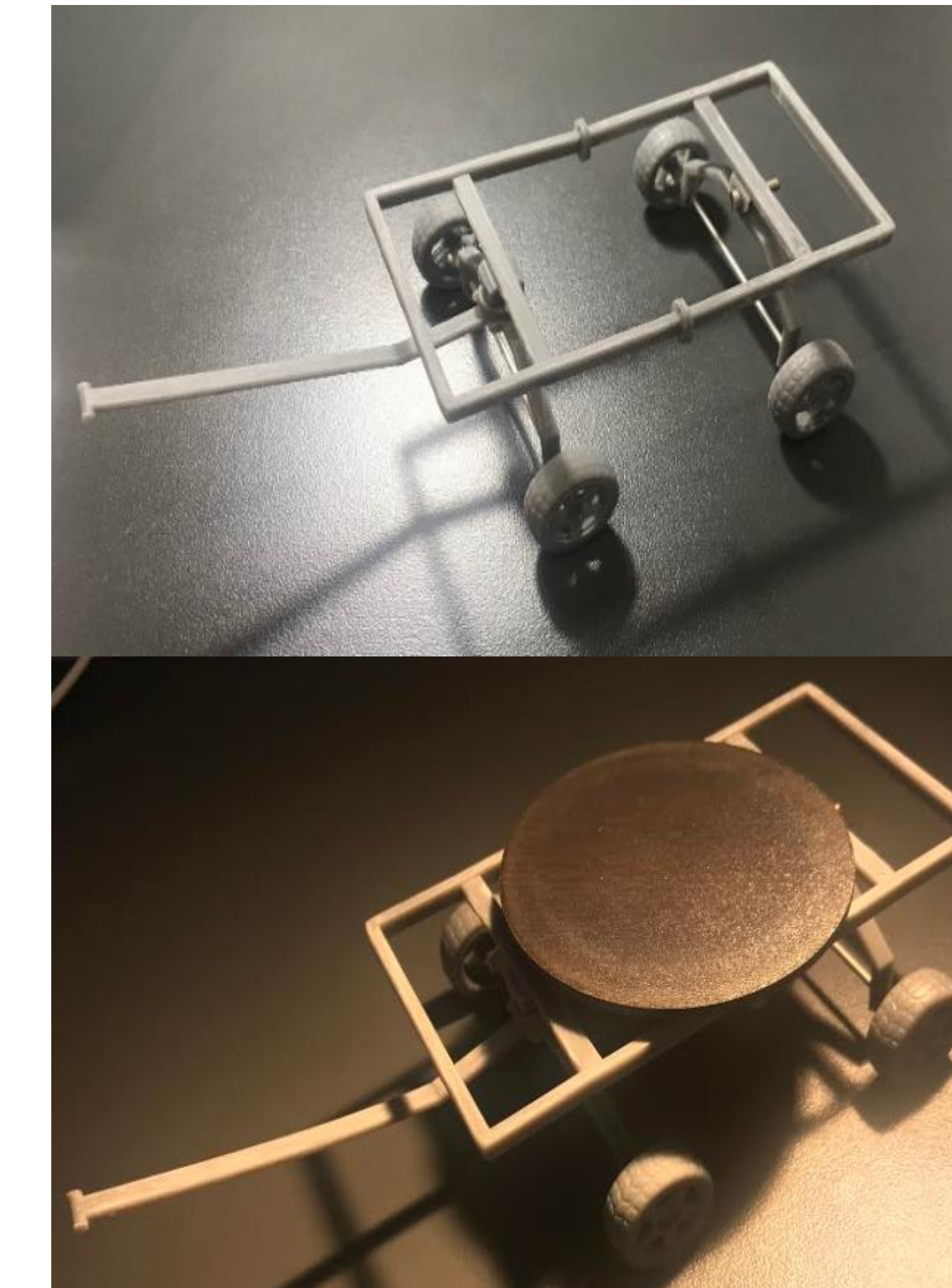
Results

The results proved the trolley design attached with plate, has very high ability to resist the maximum load weight 1200 lbs. The simulations results approved the design structure safety is pass the factor of safety with $2.1 < 3$. The time was very short but it was manageable to complete the whole experiments, with an affective results. This allowed the product to produced through the 3D Printing machine. The pictures below shown the main frame, drawing, and simulations results.



Prototype

The prototype made through the 3D printing machine successfully that shown the whole process came together to design productively and produced this exceptional product.



Conclusion

The project was matching the aim and objective criteria effectively. As shown through the whole manufacturing process of designing the trolley. Hydraulic trolley garden are innovative product used for the farming purposes to transport the heavy goods, waste garden or soil bags safely with very stability.