

Banksiaview Professional Services:

ELEVATED TANK LEDGES

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2.0 PROJECT OVERVIEW

2.1 Project Description

In the state of New South Wales Australia, laws and regulations regarding the storage of water for recreational purposes continue to change. Open storage devices such as a pool or drop tank which accumulate more than 30cm of water, require a barrier to protect vulnerable minorities such as children. Without these barriers, the consequences for these individuals may be catastrophic. Blockades such as fences for small decorative storage devices are considered an eye-sore from a landscapists point of view. In the context of this project, a drop tank (fed from a pools wet edge) will be considered.

The engineering project seeks to design and fabricate a minimalist solution to this contemporary regulation. Through manufacturing a platform that hovers over the water-line of a drop tank (with an appropriate underwater structure supporting the platform), this will have the potential to protect an individual from submerging into water upon impact.

2.2 Design Objectives

The following goals seek to establish a direction of design to be utilised throughout this project.

2.2.1 Resistance to Elements

Any structure that is composed must be sensitive to constant water, wind, temperature and salt exposure. The device mustn't interfere with the tank's PH levels and overall acidity.

2.2.2 Degradation

The longevity of the product must be considered a priority as decomposition from constant salt, force and water is certain. The products lifespan must be prolonged for an extended period of time without the need of regular conservation work.

2.2.3 Durability

The assembly must be hard-wearing against sudden, solid forces of significant mass. The structure must hard wearing and rigid to hold a constant mass of significant weight.

2.2.4 Safety

The assembly must consider the safety of an array of parties - occupants, tank maintenance staff and passing patrons. The construction must act as a deliberate and stable barrier between the outer environment and internal tank space. The product must have no insecure fragments that could impale or score any harm towards personages and present wildlife.

2.3 Statement of Requirements

The platform shall be able to withstand a constant force of 50kg.

The platform shall be able to withstand a sudden brute force of 70KG.

The platform shall be able to endure constant exposure to daylight for 10 years.

The platform shall be able to endure constant exposure to salt for 10 years.

The platform shall withstand constant immersion into water for 10 years.

The platform will not alter the tanks PH level above 7.5.

The platform will not alter the tanks salinity level above 4500ppm.

The platform will not alter the tanks calcium hardness above 450ppm

The platform shall be able to withstand wind thrusts of up to 100km/h.

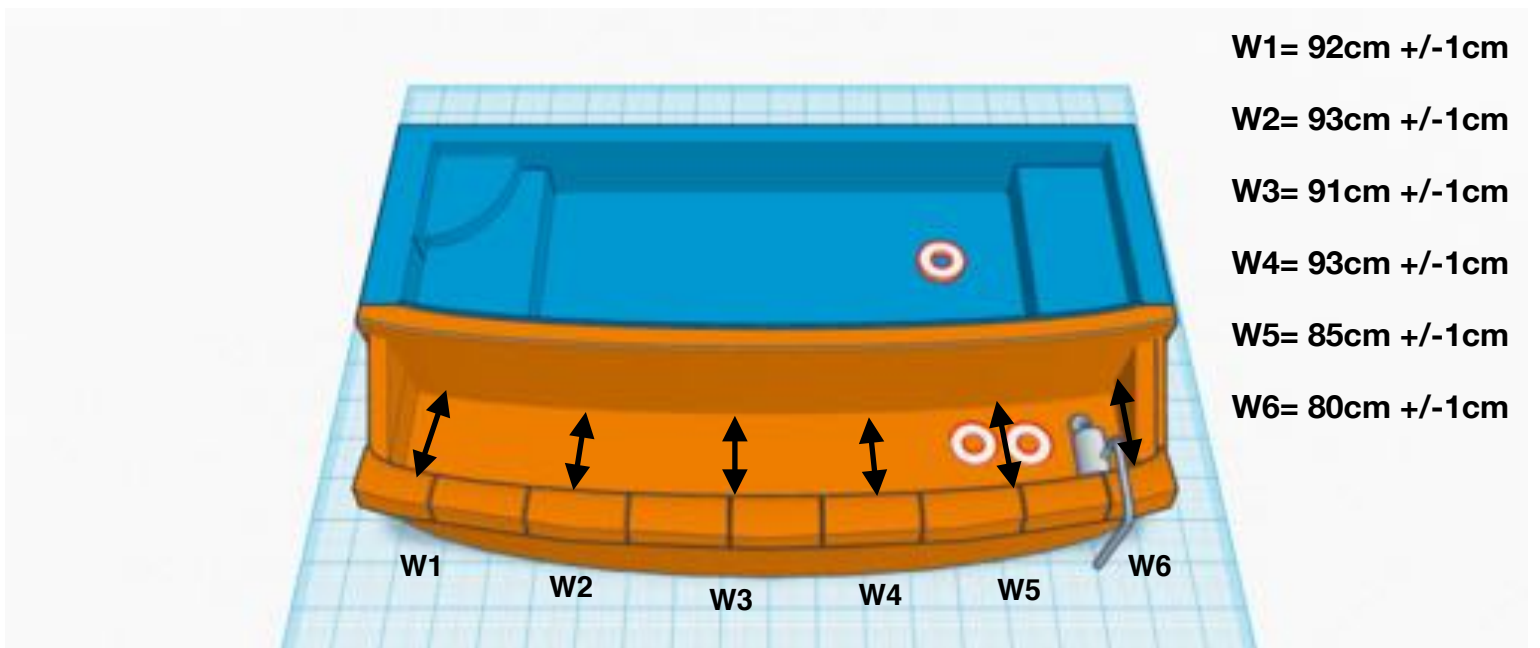
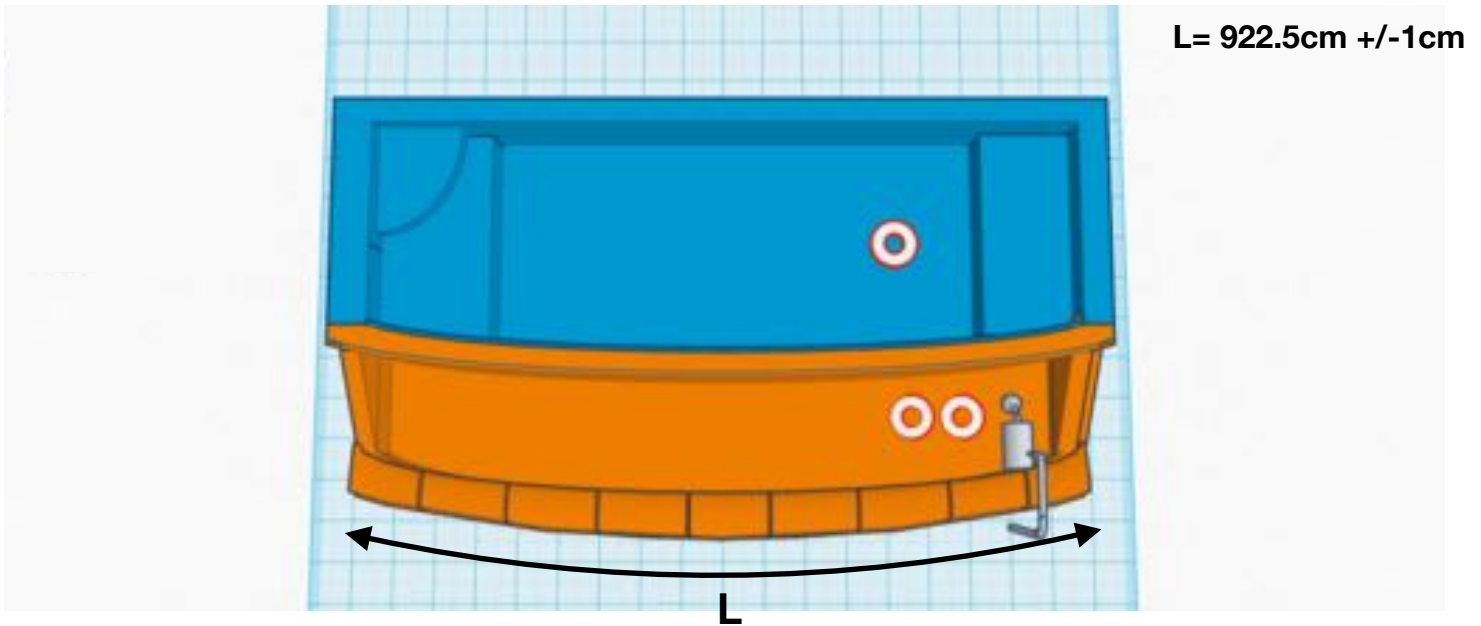
The platform structure shall be made from High Density Polyethylene HDPE.

The platform shall withstand constant exposure to temperatures up to 65 degrees celsius.

3.0 DIAGRAMS

The following 3D schematics are an engineers depiction of this storage tank before construction commences followed by an indication of the project upon conclusion.

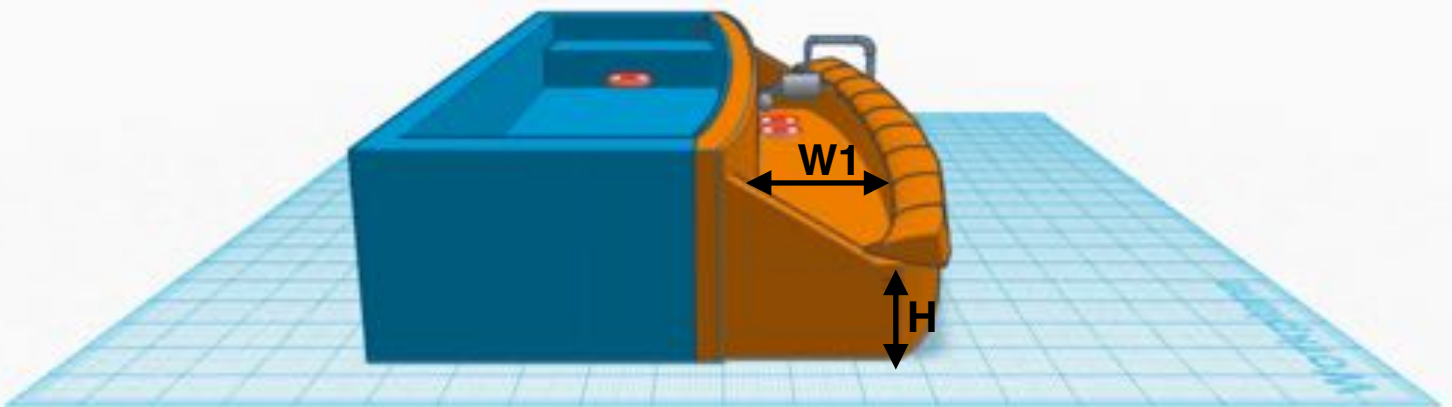
3.1 Before Construction 3.1.1 Top View



3.1.2 Side View

W1= 92cm +/-1cm

H=84cm +/- 1cm

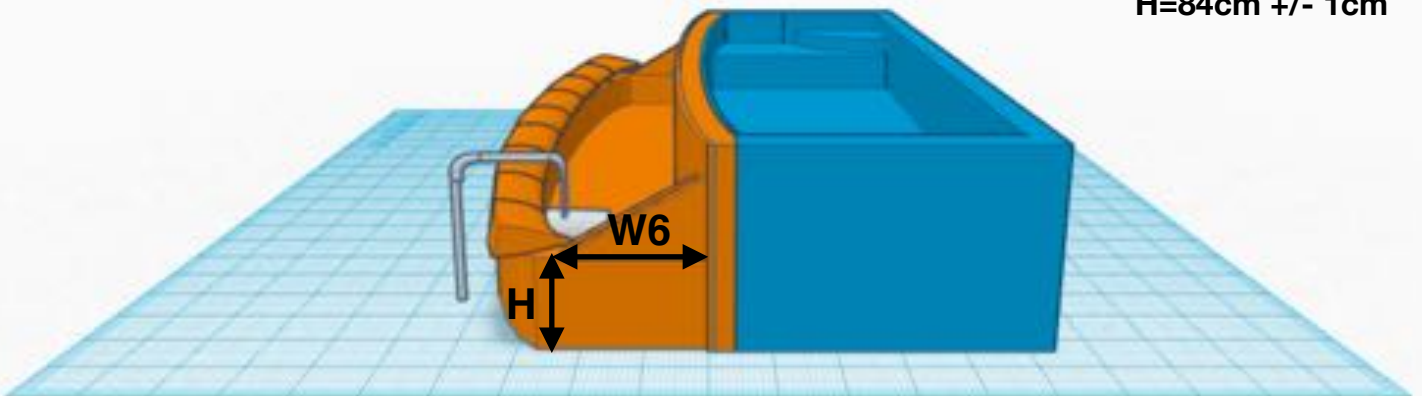


Height (H) measurements are calculated from the bottom of the interior drop tank to the bottom lip of the tiles.

Width (W) measurements are calculated from the left hand drop tank wall to the right hand drop tank wall under the lip of the tiles.

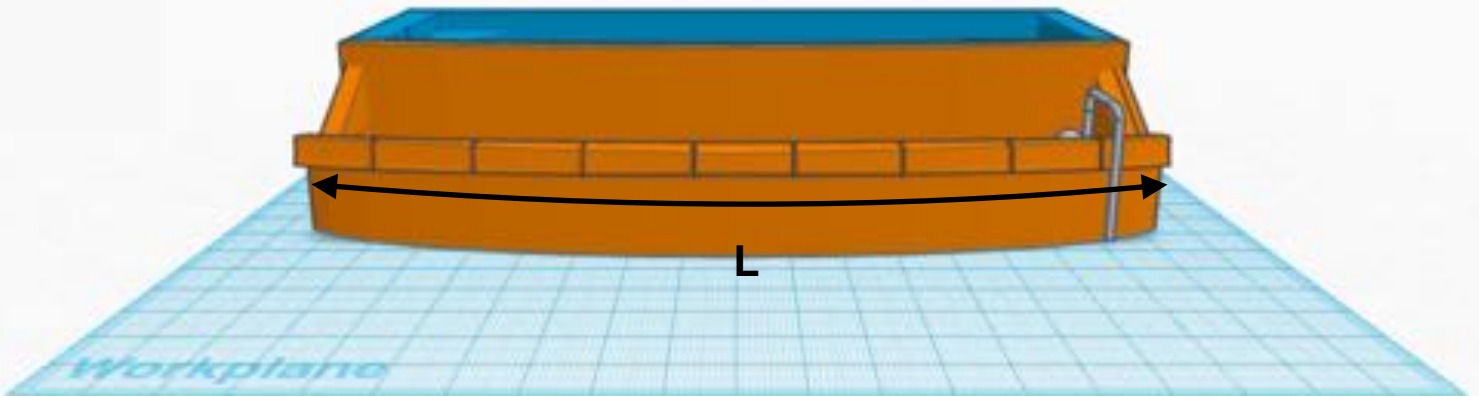
W6= 80cm +/-1cm

H=84cm +/- 1cm

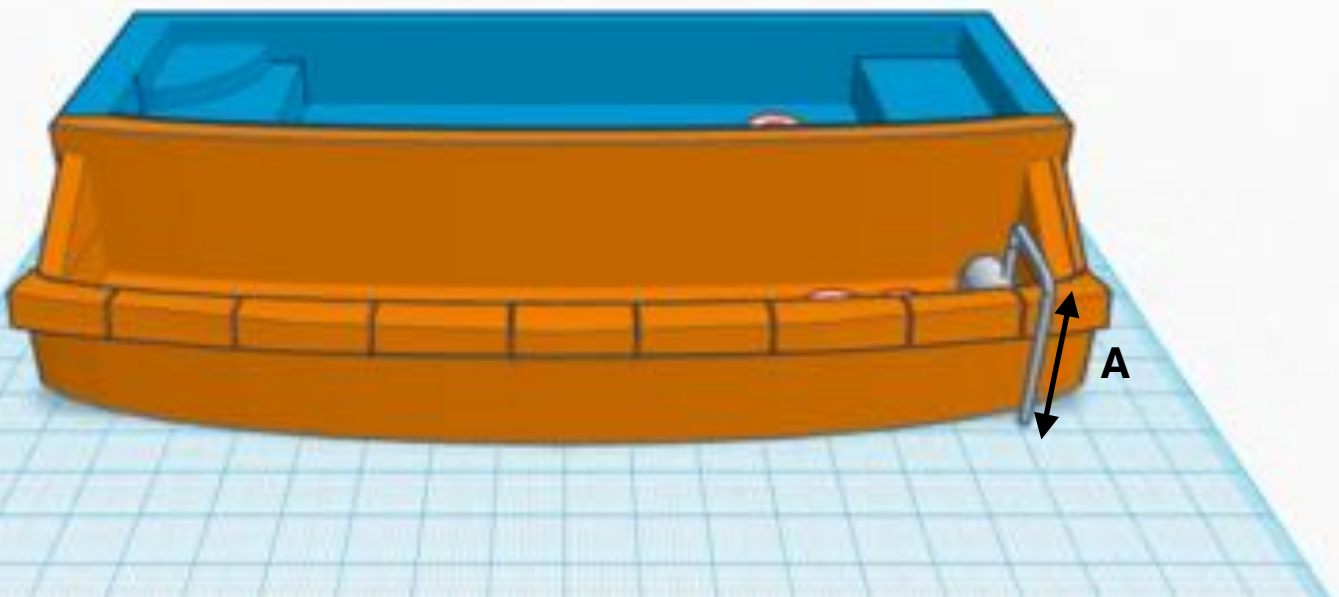


L= 922.5cm +/-1cm

3.1.3 Front View



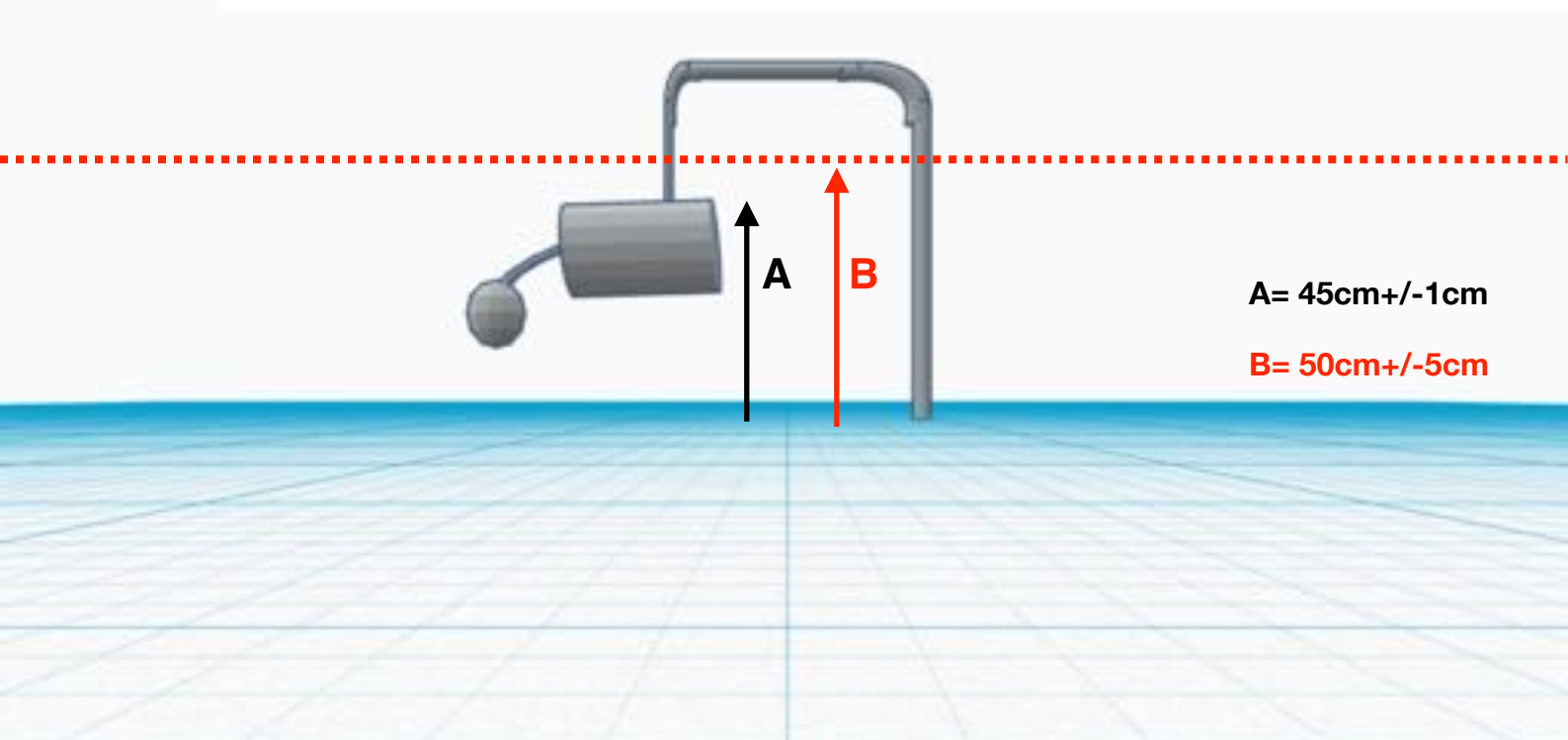
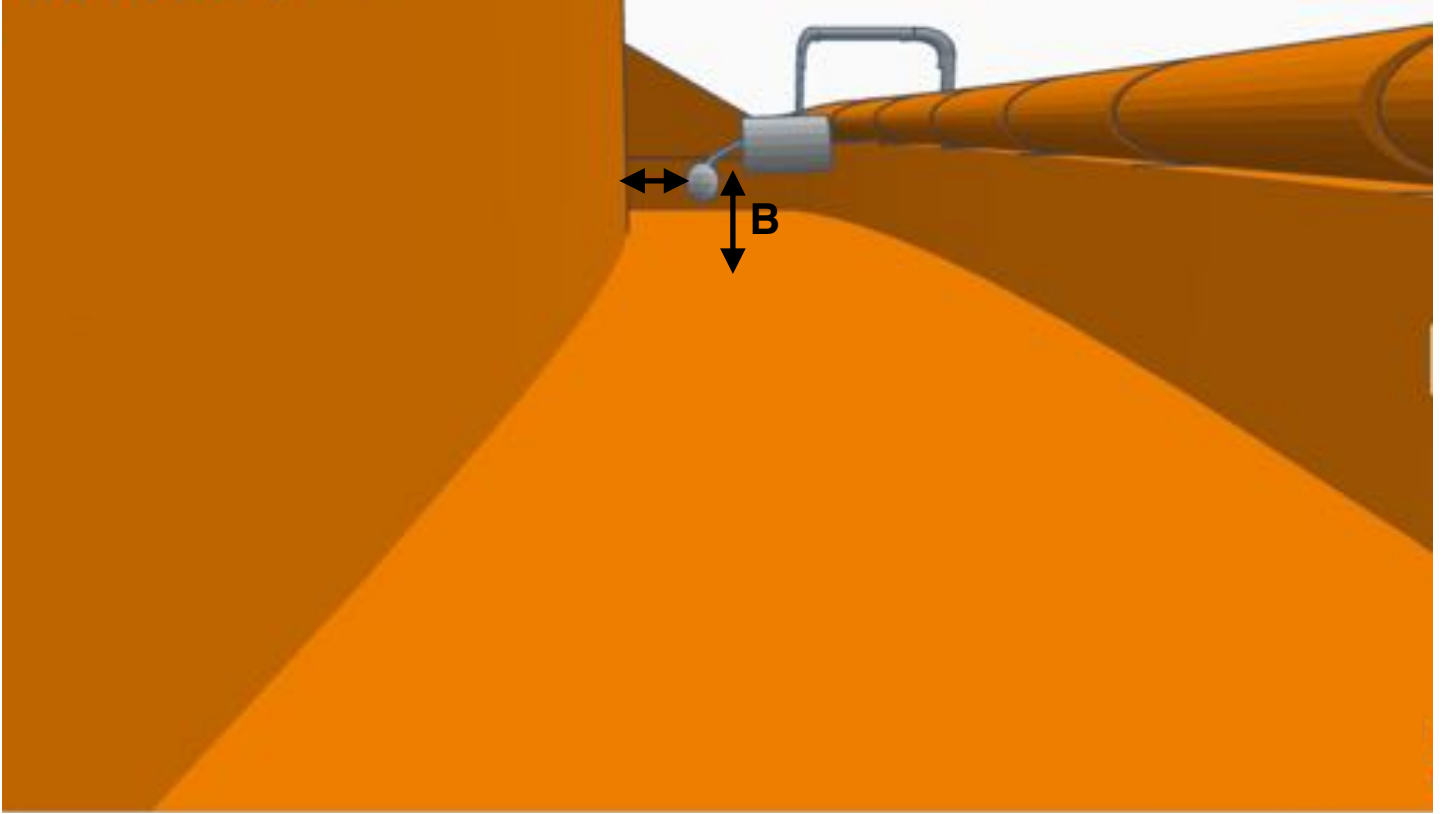
A=



3.1.4 Re-fill Float Apparatus

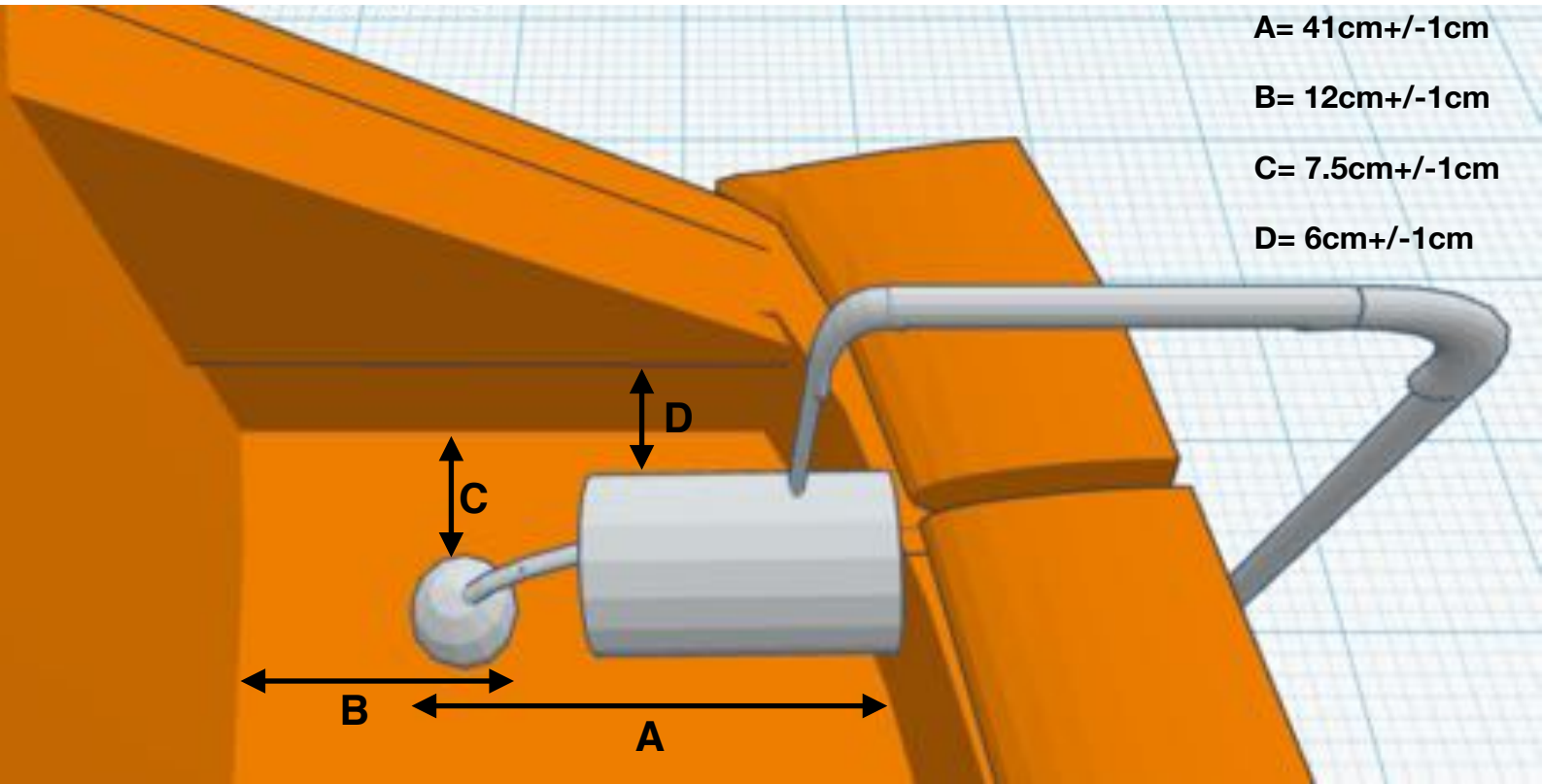
A= 12cm+/-1cm

B= 12cm+/-1cm



A= 45cm+/-1cm

B= 50cm+/-5cm

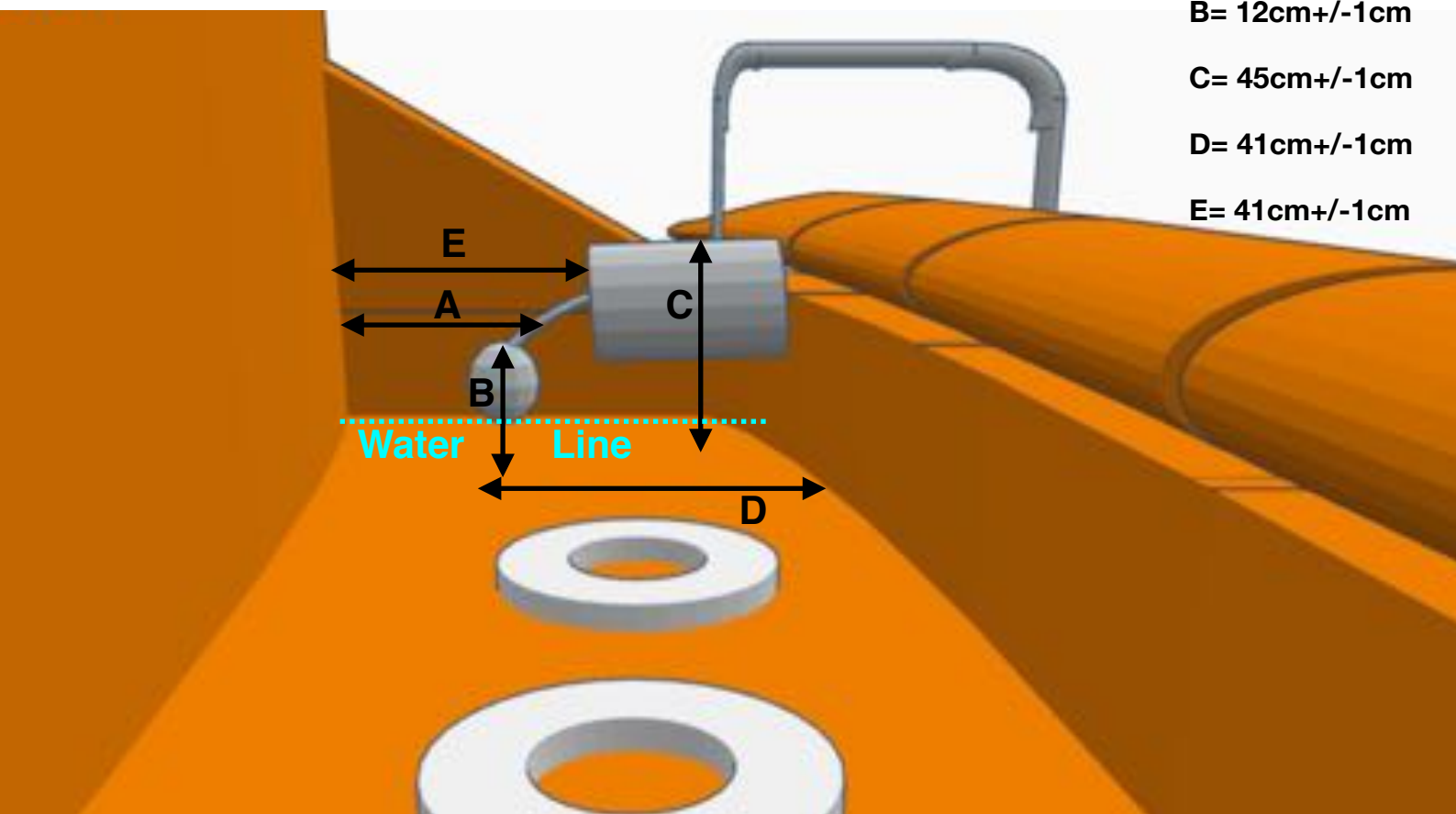


A= 41cm+/-1cm

B= 12cm+/-1cm

C= 7.5cm+/-1cm

D= 6cm+/-1cm



A= 12cm+/-1cm

B= 12cm+/-1cm

C= 45cm+/-1cm

D= 41cm+/-1cm

E= 41cm+/-1cm

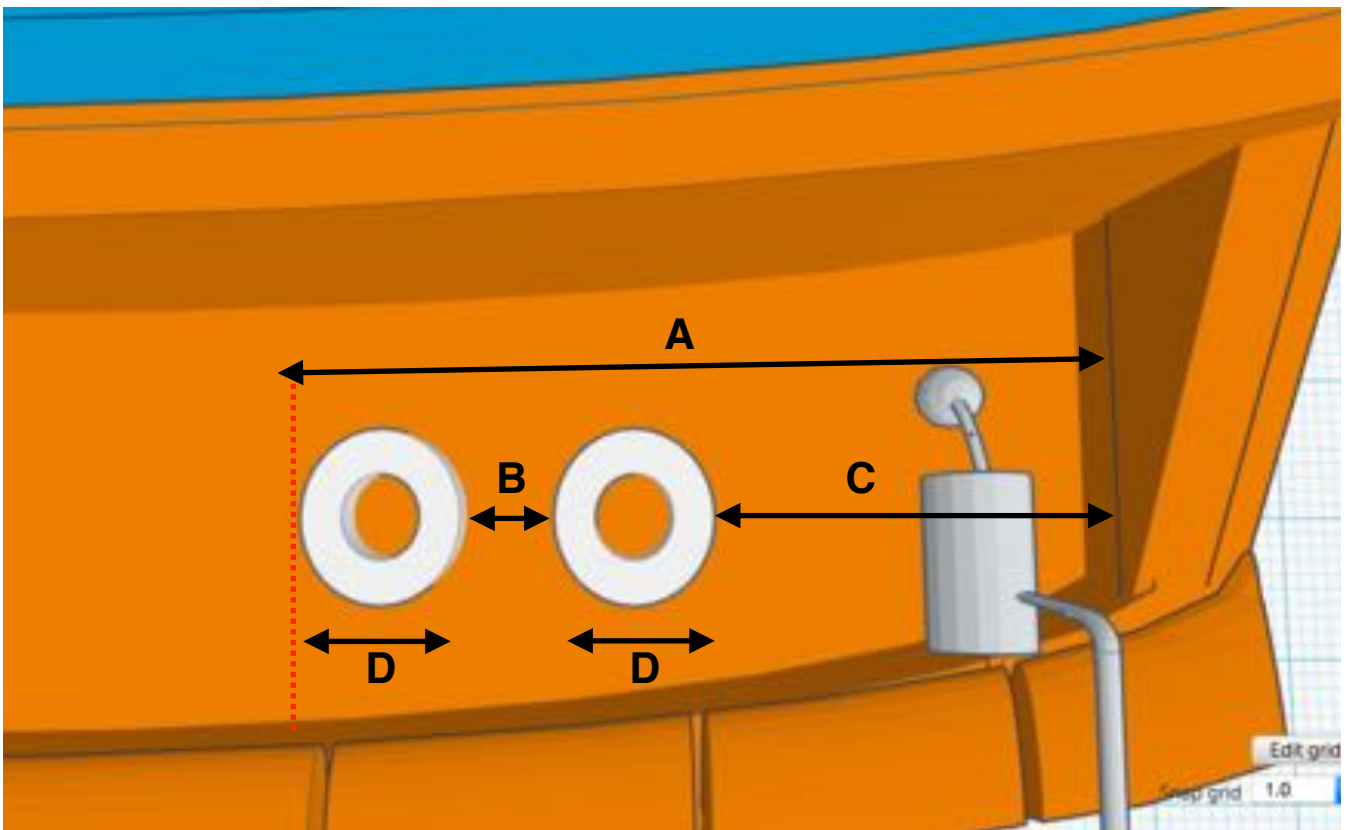
3.1.5 Drop Tank Drainage/Pump Ports

A= 56cm+/-1cm

B= 10cm+/-1cm

C= 22cm+/-1cm

D= 12cm+/-1cm



3.2 During Construction

3.2.1 Plastic Materials Required Vs Tank Dimensions

| Material | Material Width (mm) | Drop Tank Length (mm) | Material Qty Required |
|-----------------------|---------------------|-----------------------|-----------------------|
| Square Enclosure | 362 | 9,225 | 25.5 |
| Rectangular Enclosure | 606 | 9,225 | 15.2 |
| Lattice Material | 2430 | 9,225 | 3.8 |

3.2.2 Raw Materials Required

| Material | Drop Tank Length (cm) | Drop Tank Width (cm) | Structure Proposed Height (cm)+15% | Total Material Required |
|------------------------------|-----------------------|----------------------|------------------------------------|-------------------------|
| Polished Jade (Over) #1 | 923 | 93 | 17.3 | 1,479,920.625 |
| Polished Jade (Under) #2 | 950 | 86.5 | 17.3 | 1,421,627.5 |
| Polished Jade Average | | | | 1,450,774.0625 |

3.2.3 3rd Party Products

| Material | Length (mm) | Width(mm) | Proposed Height (mm) | Qty | Total Material Required |
|------------------|-------------|-----------|----------------------|-------|-------------------------|
| Solid PVC Piping | | | | | |
| Lattice Sheets | 930 | 606 | | | |
| Cable Ties | 450 | 7.6 | 2.0 | 500.0 | 0.0 |

3.2.4 Source Materials

| Material | Manufacturer | Qty | Unit Price | Cost |
|-----------------------|-------------------------|-----|------------|-----------------|
| Square Enclosure | Your Plastics & Storage | 26 | \$ 13 | \$ 325 |
| Rectangular Enclosure | Your Plastics & Storage | 16 | \$ 20 | \$ 320 |
| Polished Jade | Artisan Stone | 20 | \$ 48 | \$ 960 |
| Cable Ties | Bunnings Warehouse | 500 | \$ 0.300 | \$ 150 |
| Lattice Sheets | People in Plastics | 4 | \$ 50 | \$ 200 |
| Plastic Rod | | 4 | | \$ 0 |
| Total | | | | \$ 1,955 |

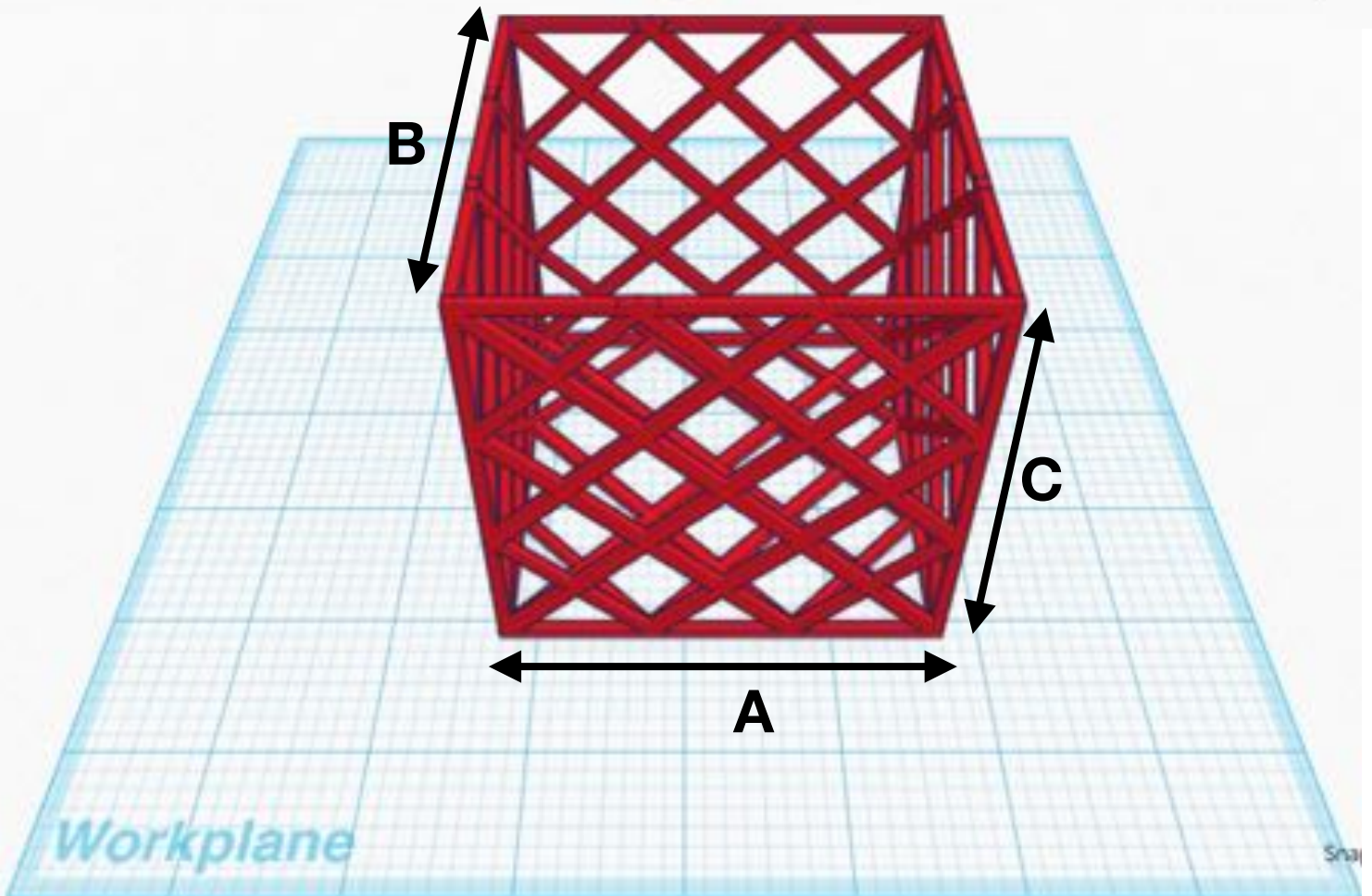
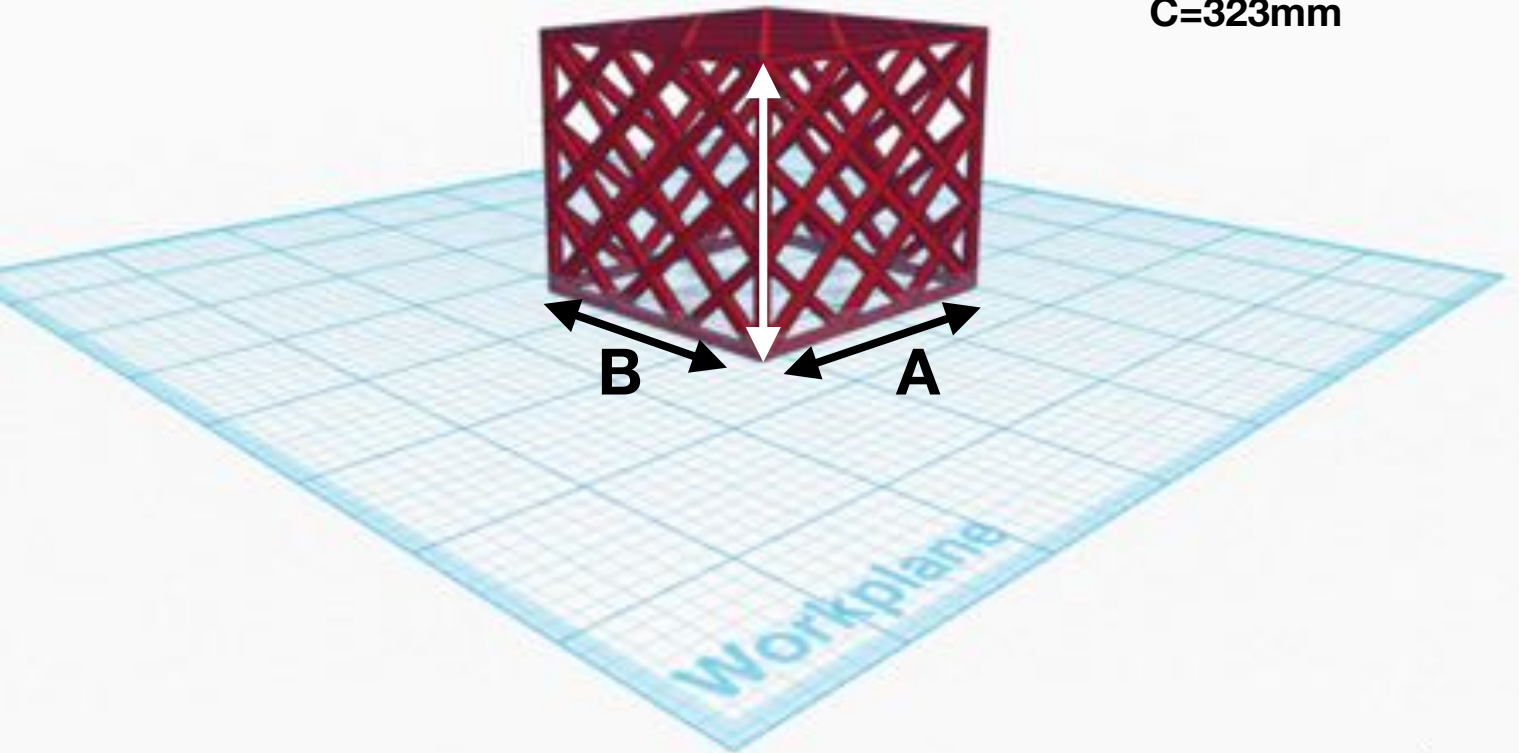
3.2.5 Materials

3.2.5.1 Square Enclosure

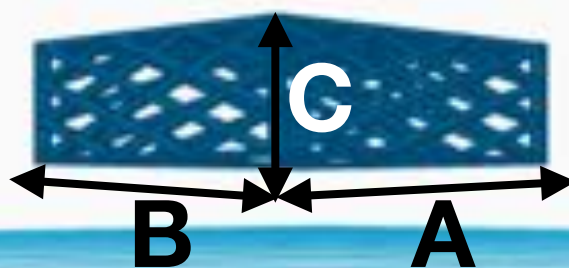
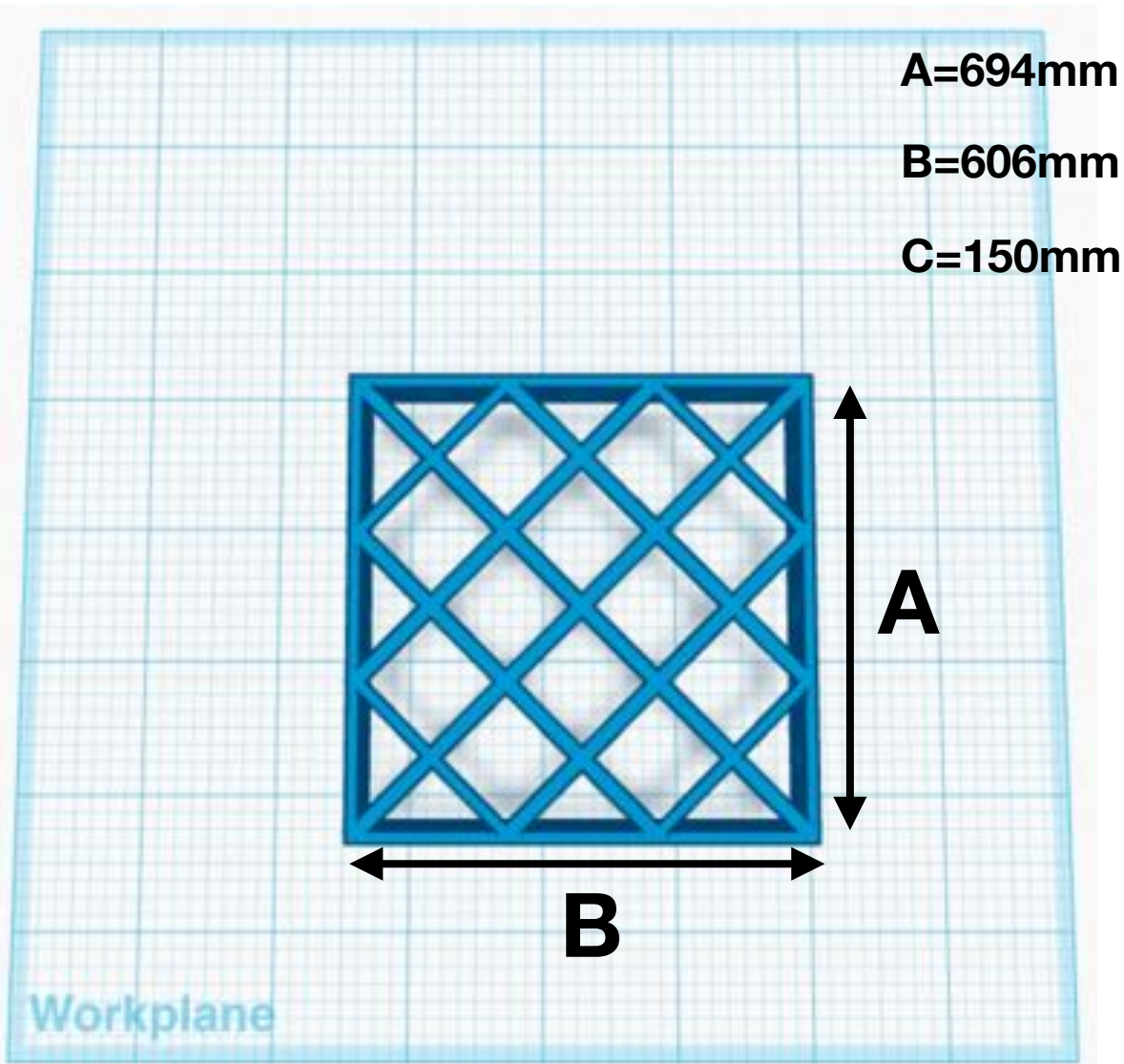
A= 362mm

B=362mm

C=323mm



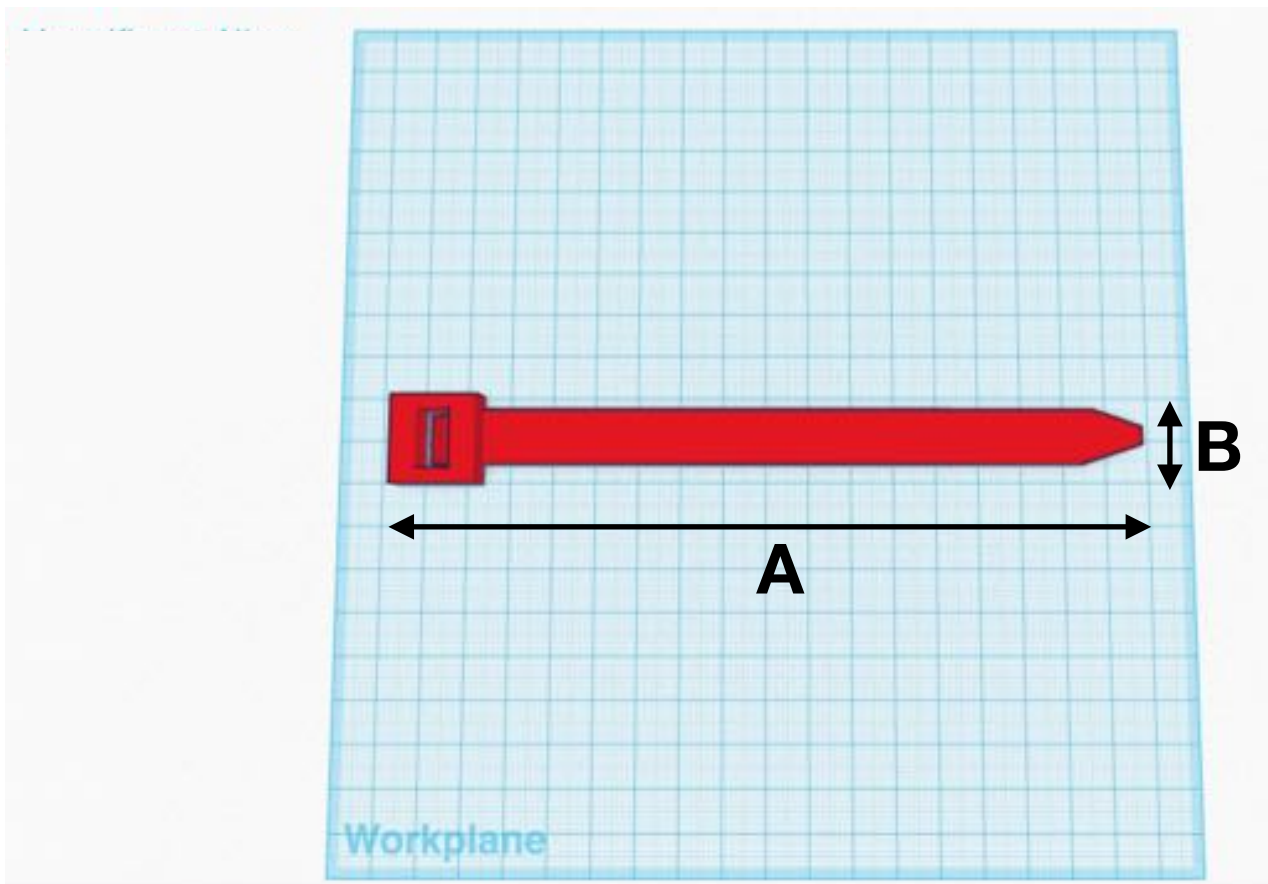
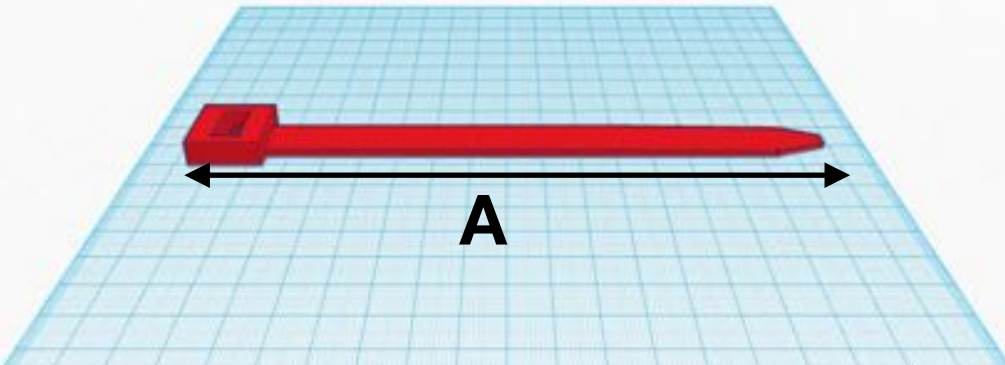
3.2.5.2 Rectangular Enclosure



3.2.5.3 Cable Ties

A = 450mm

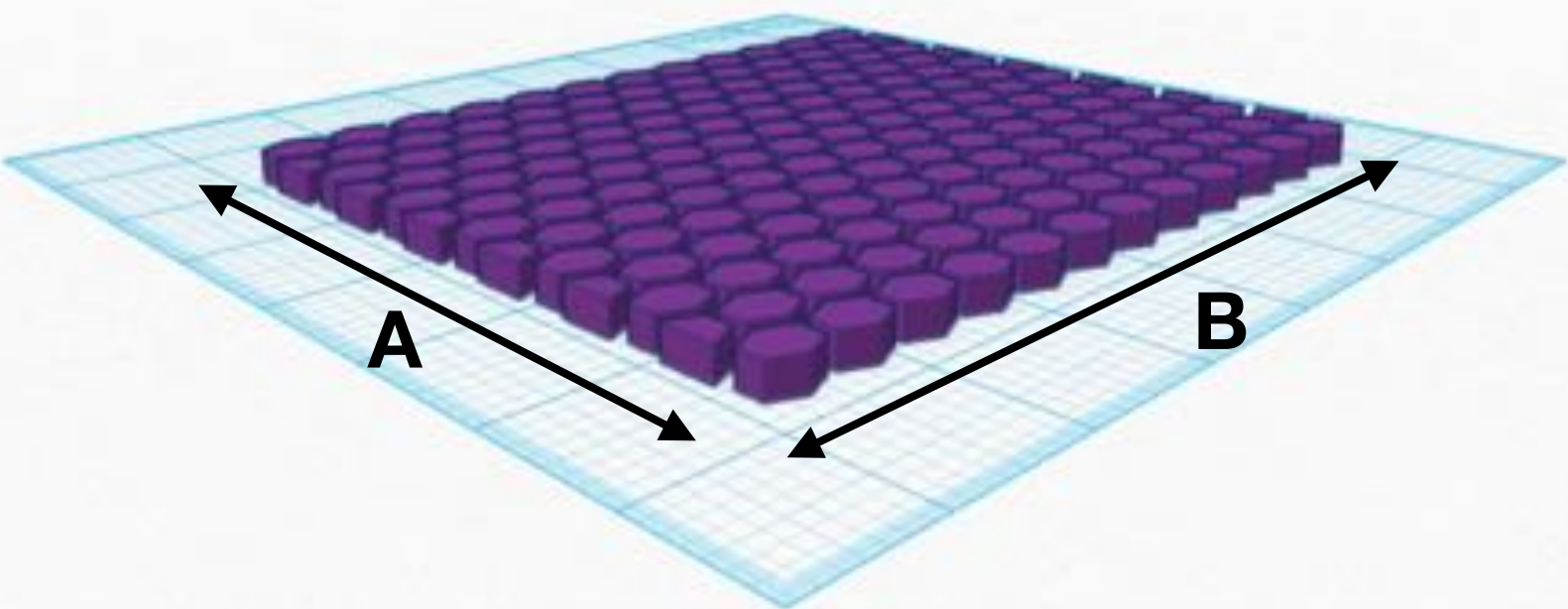
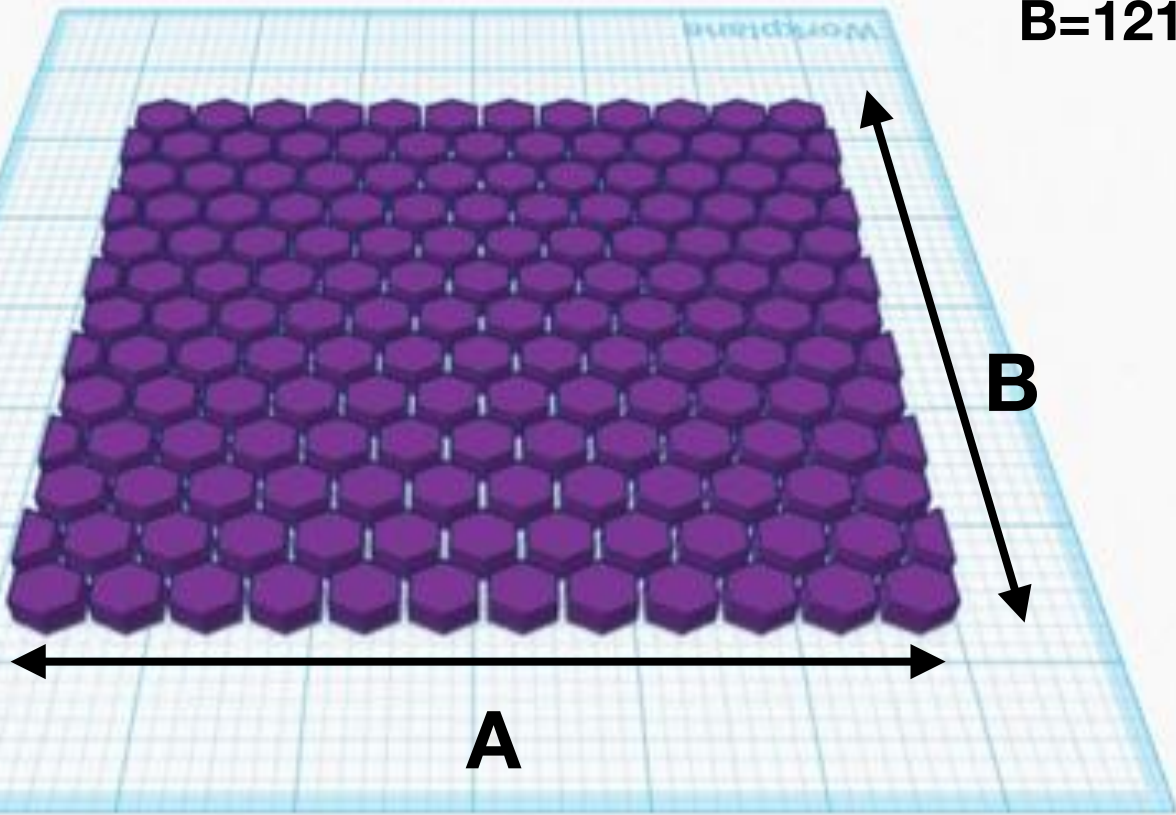
B = 7.6mm



3.2.5.4 Lattice Sheets

A=2430mm

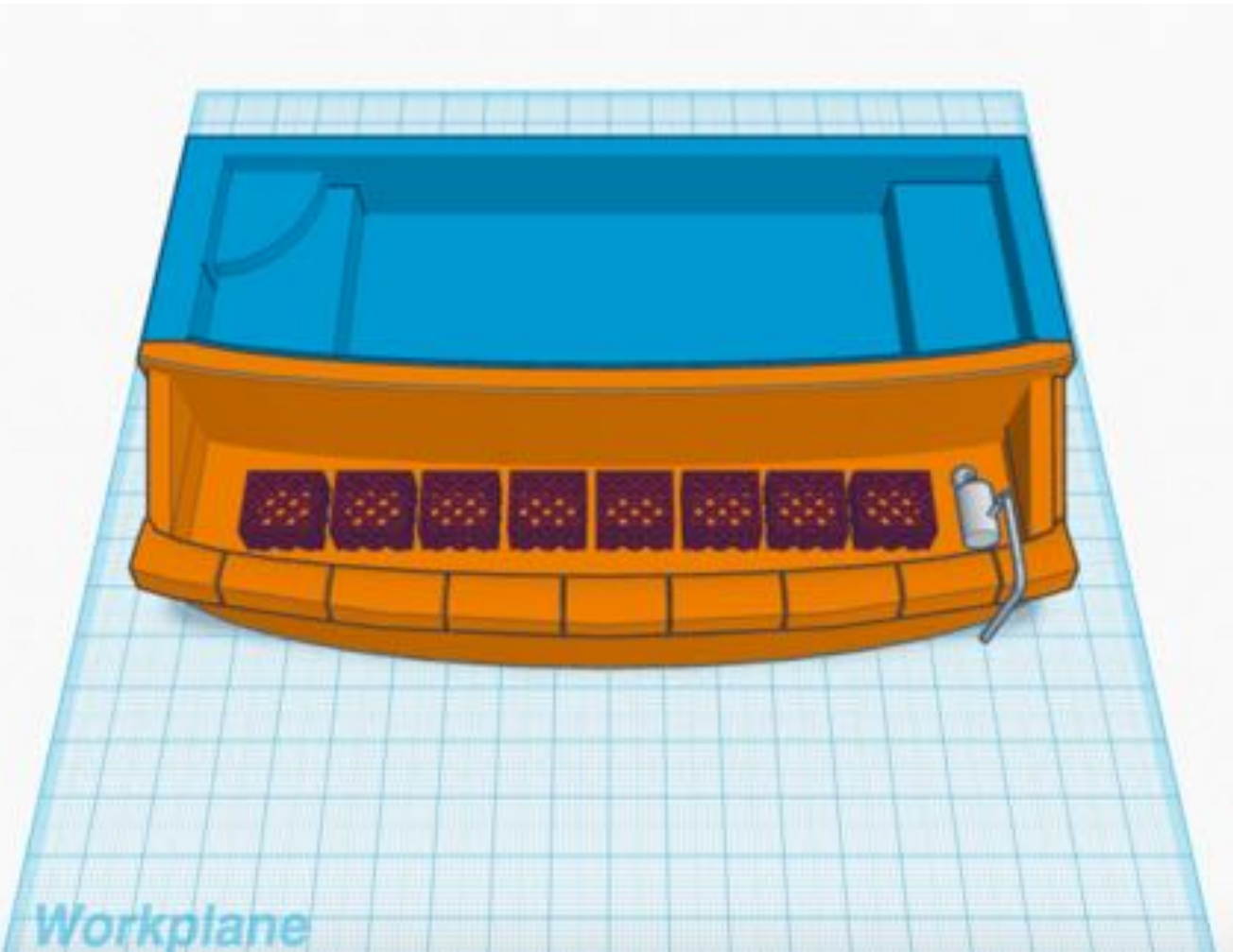
B=1215mm



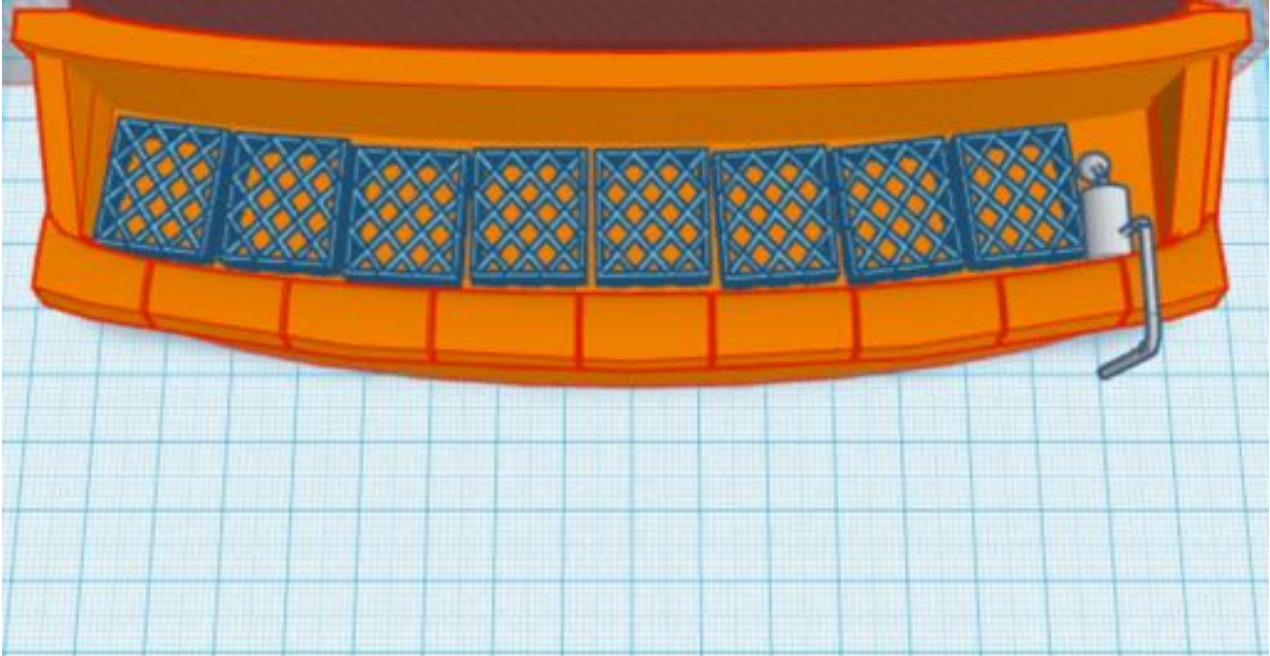
3.2.6 Construction Procedure

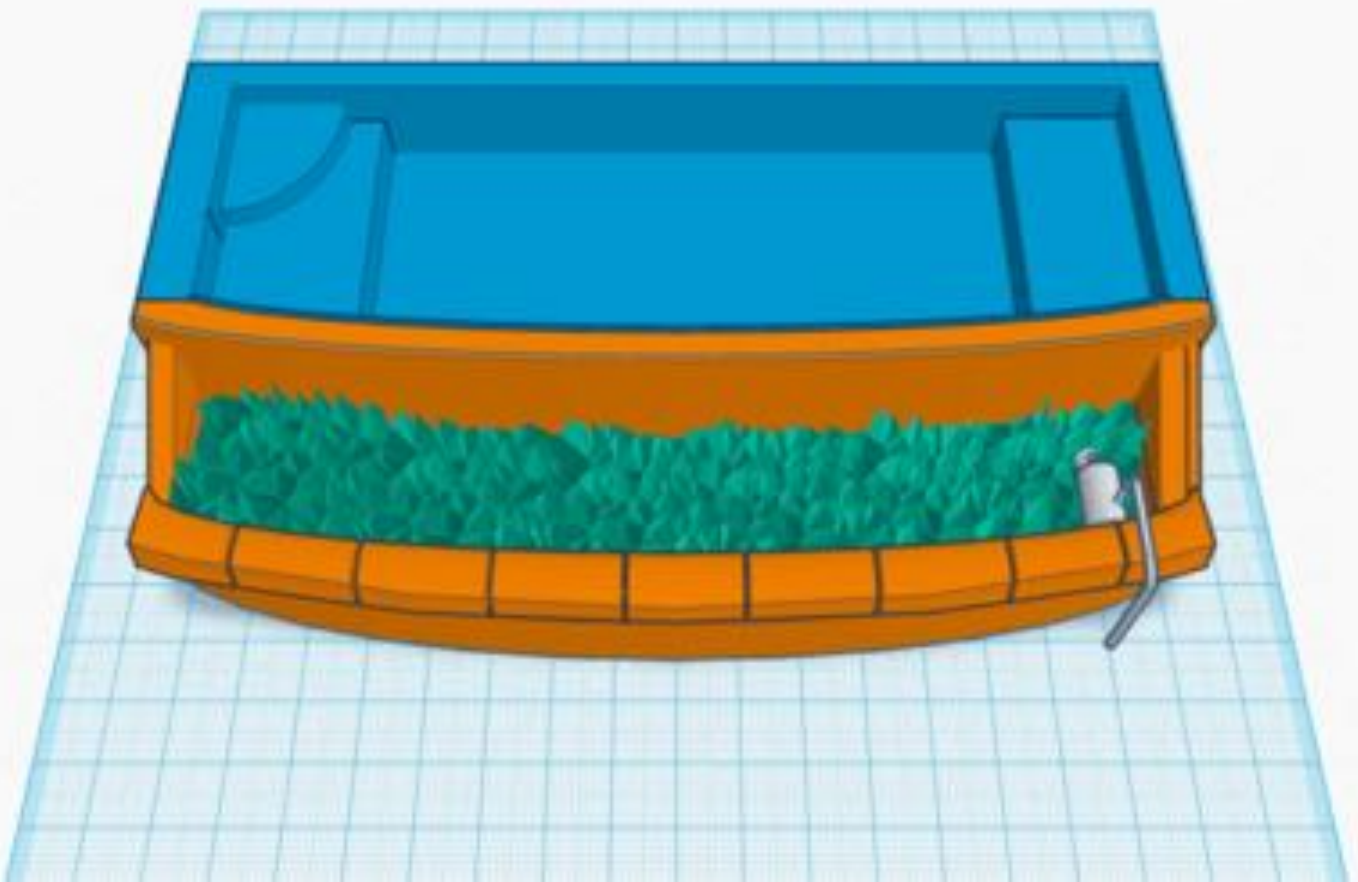
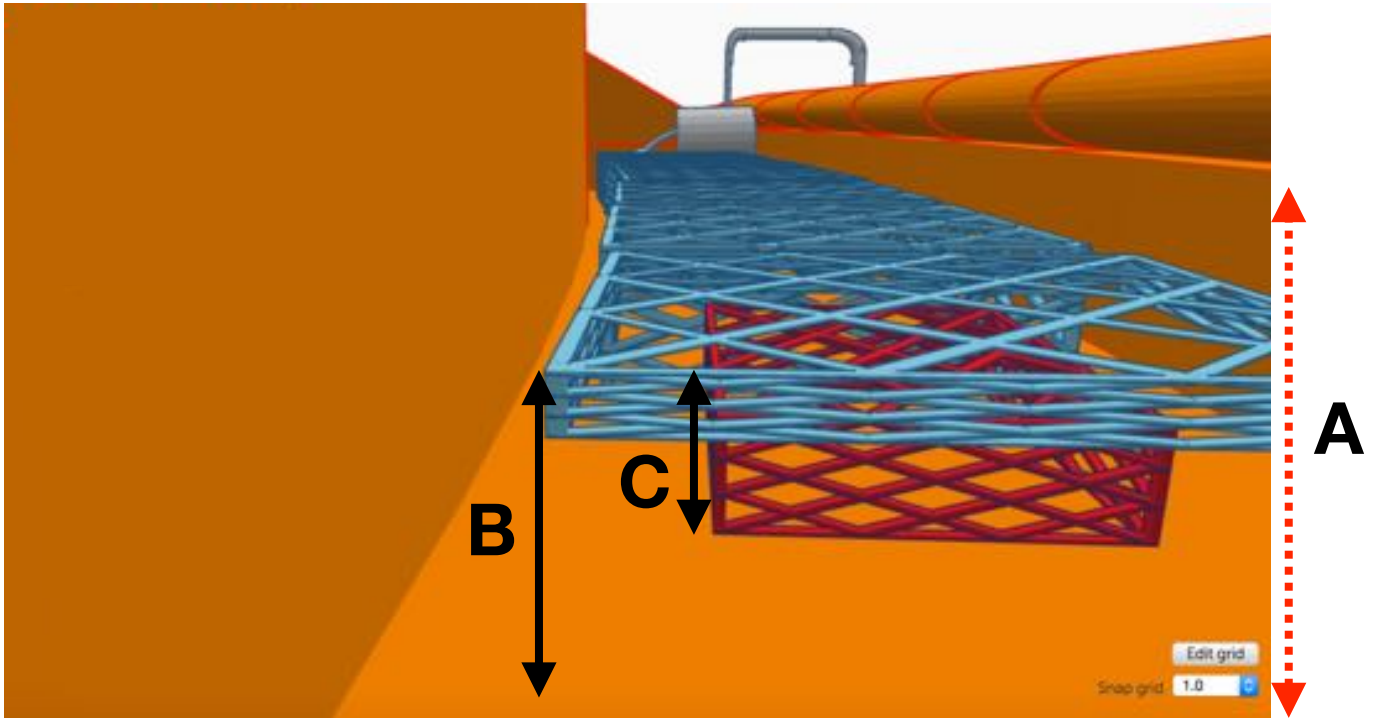
The following steps are designed to assist a contractor in assembling this product in an efficient manner.

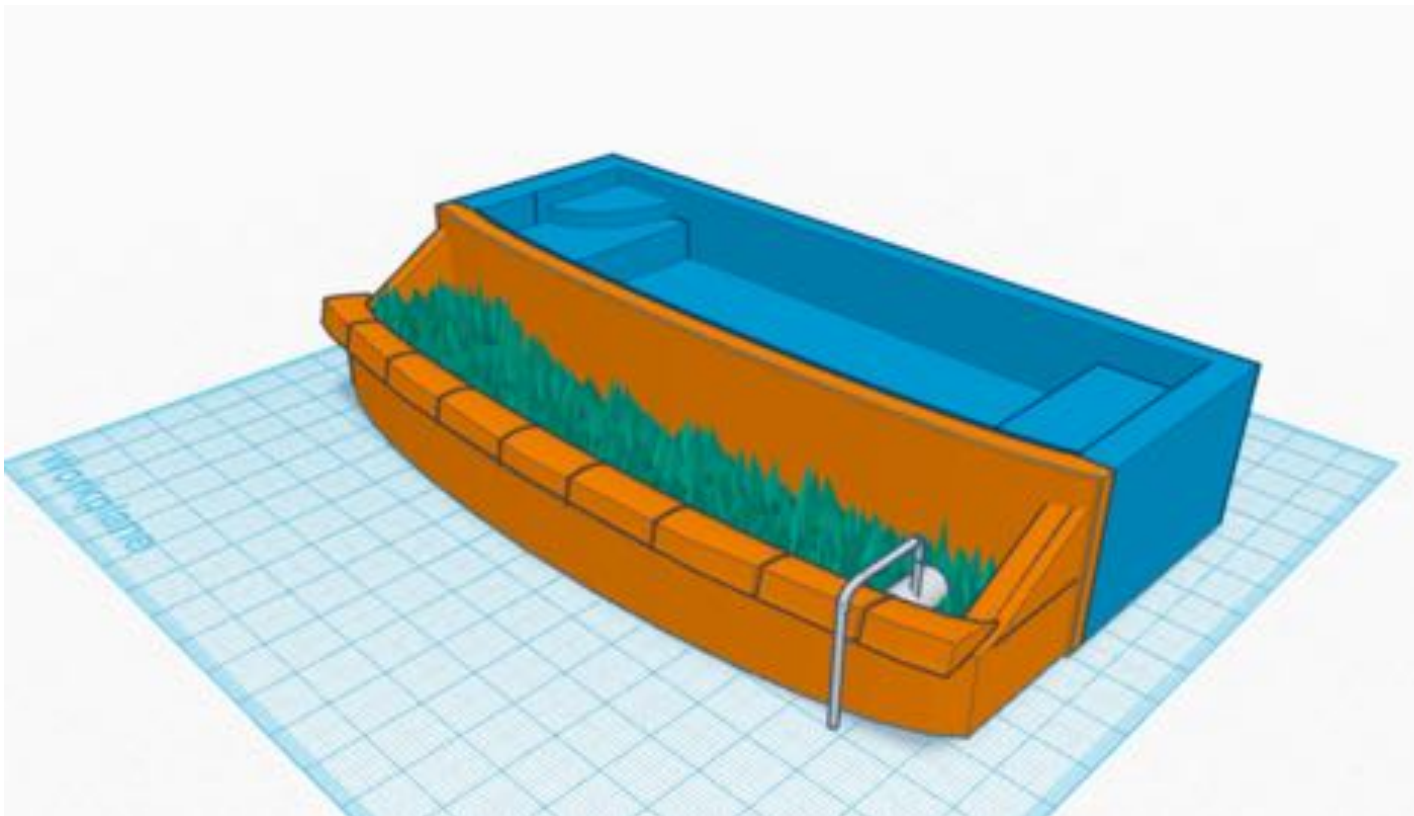
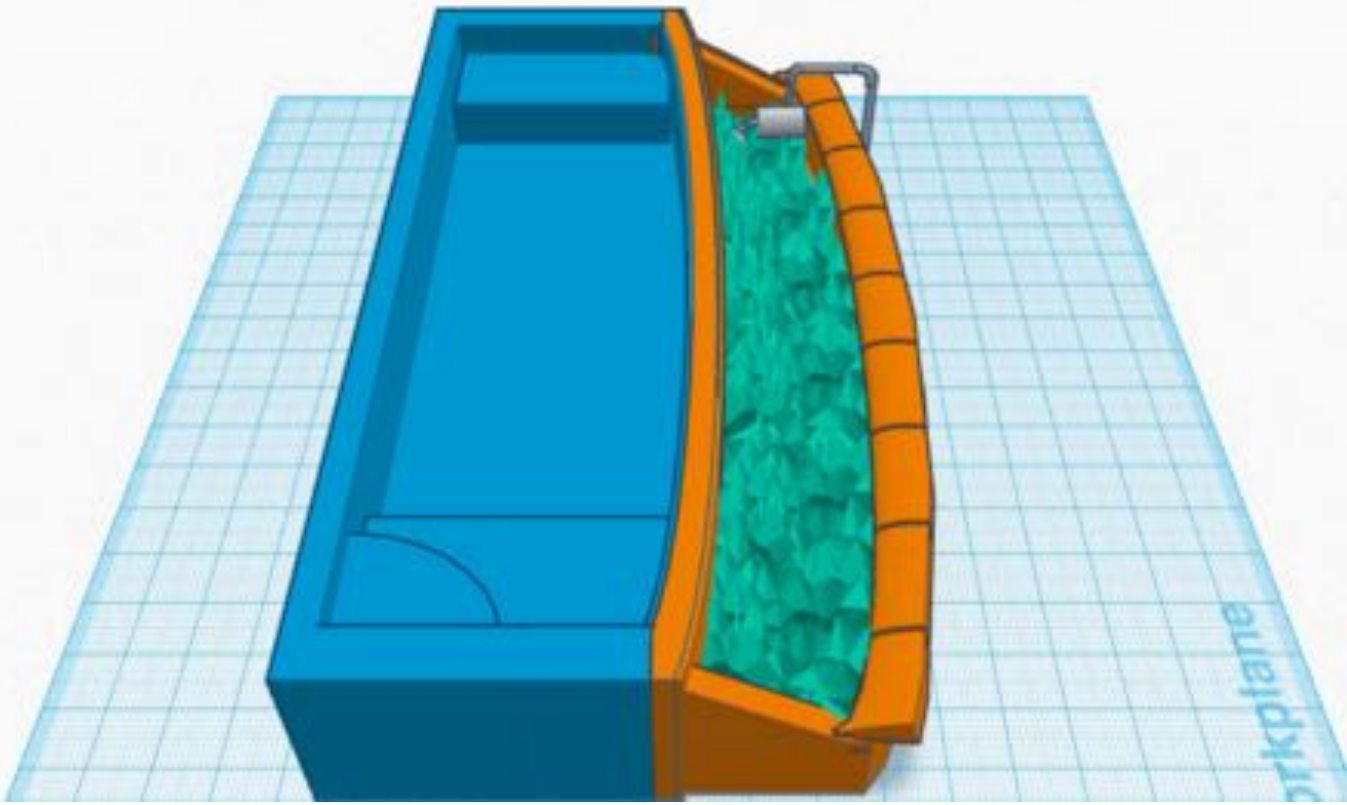
- 1) Place the Square Enclosures onto the drop tank (with equal spacing between crates).

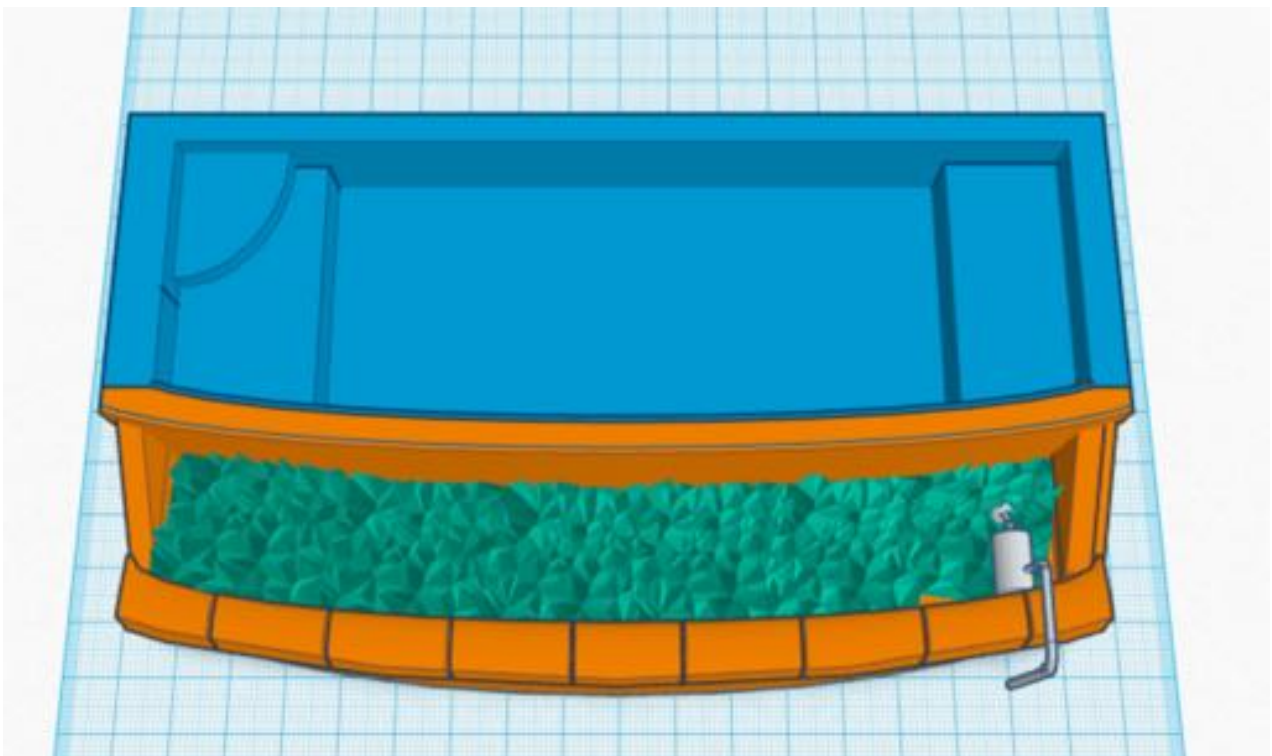
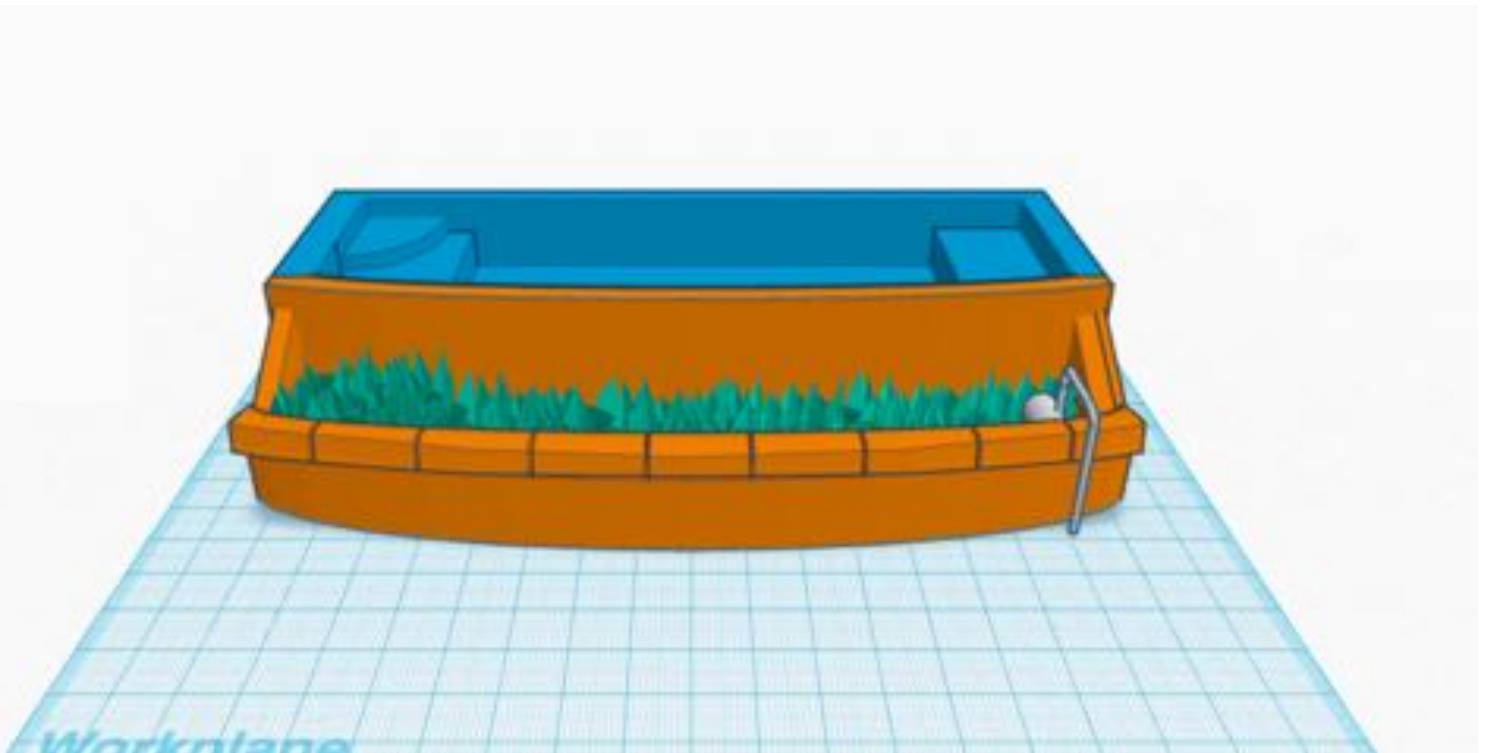


2) Place the Rectangular Enclosures on top of the Square Enclosures (with equal spacing between crates).











9000mm



865mm



3.2.5.5 Raw Material

The pebble based material that will be utilised for the exterior of the platform was chosen based upon its colour and overall aesthetics. The rock based material will allow a current of water to trickel through the material - blocking any leaf based matter from entering into the drop tank. The pebbles will act as a form of defence against any sudden impact from a person attempting to enter the water.

The material is called 'Polished Jade' and will be sourced and shipped from Sydney, NSW.

