Mechanical Task – Mini supermarket

Eng. Asma

The task is to design a solution for automated Mini supermarket. The aim is to have robotic arm to collect items requested by customer in a basket. The process started when a robot is taking a basket from the table and fix it on a hanger in the same post where the arm is attached. The robot arm can rotate 180 degrees to move through shelves, take item from shelves to basket while the basket is held by a stationary holder during item collection.

How it works:

First the robot arm is idle at the canter. Once start the robot will do the following:

1- Pick a basket:
   Robot arm grabs the basket and fix it on the holder. The basket stays supported by a holder (so robot does not carry its weight fully)

2- Select shelf:
   Robot rotates to face a shelf within its 180-degree operational range.

3- Collect items

   Robot reaches out uses gripper/suction to take items and places it into the basket.

4- Repeat

   Robot moves to next shelf and repeats item collections.

5- End
   After all items are placed , robot returns basket.

   Zones description:
   - **Working area** front part of each shelf that the robot can easily reach and interact with
   - **Operational envelop:** the full 180-degree semicircle the robot can rotate and reach shelves.
   - **Dead area** behind the robot top shelves that are too high or deep inside the shelves and in the bottom.

   Please find below are skitch design for the proposed idea where you can see working area, operational envelop and dead area.

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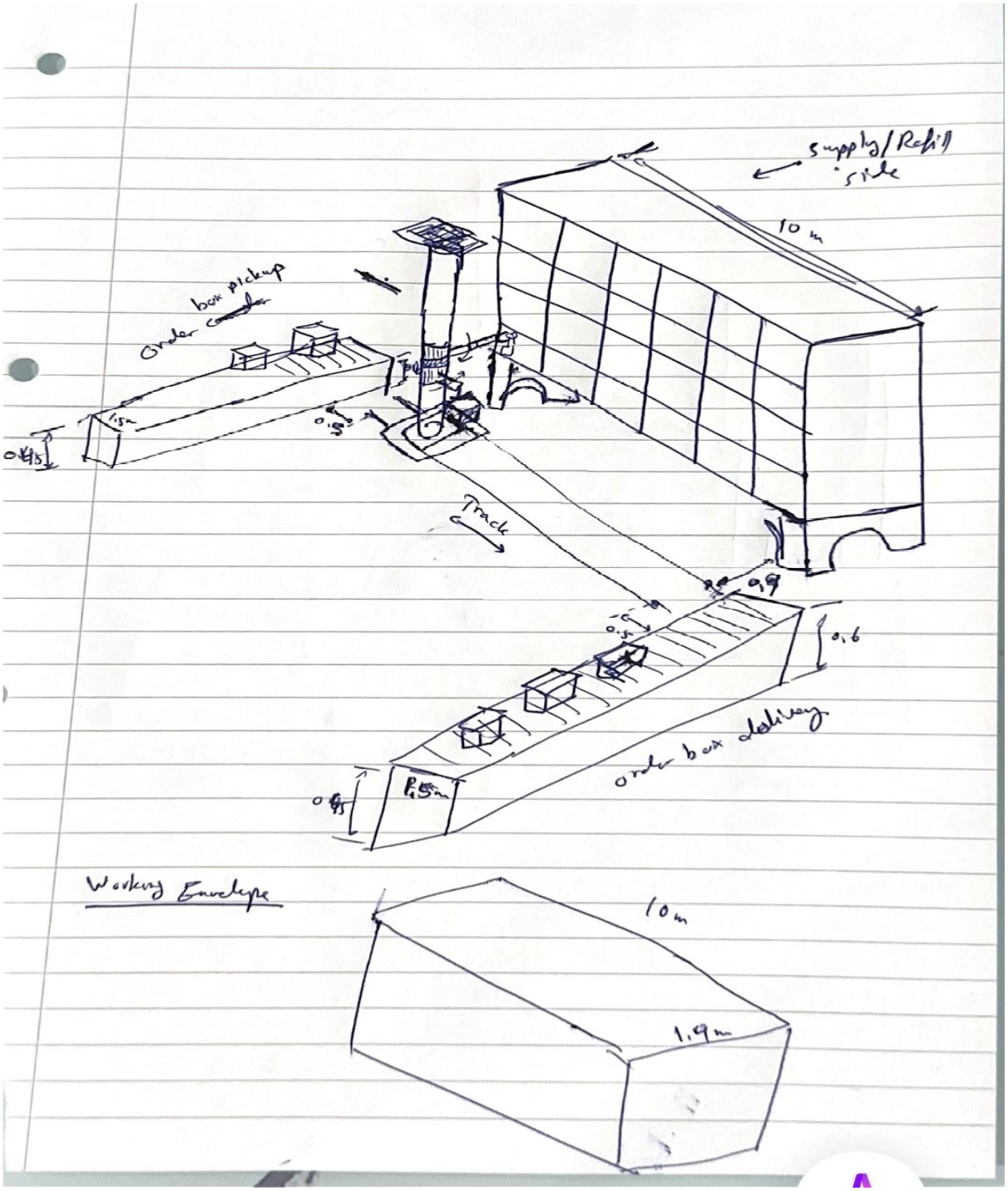

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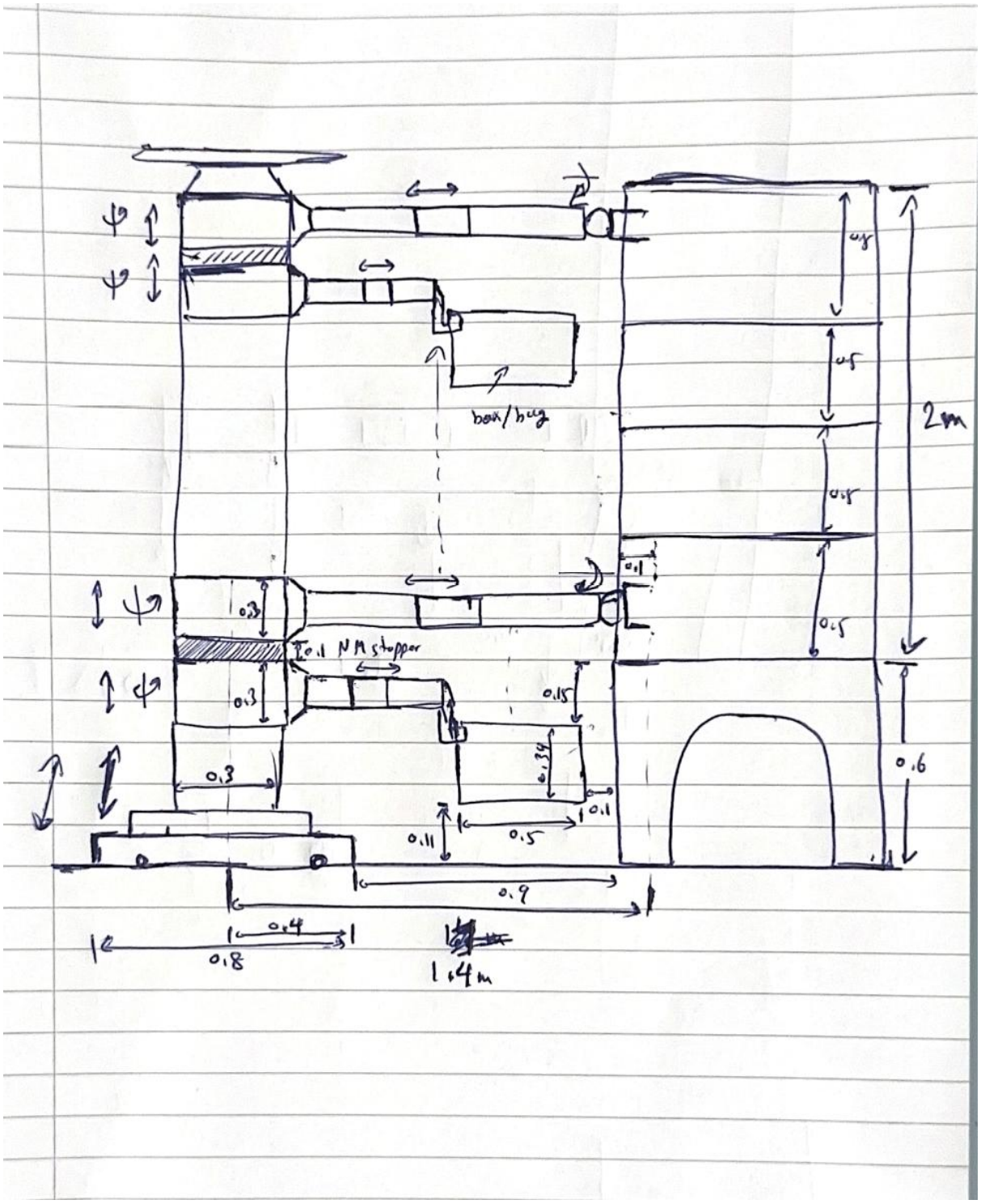

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