



## TCE-HBTU 36 Hrs Hackathon

### SEWAGE BLOCK REMOVER & WASTE SEGREGATION

**Team Name:** HACK ELITE

**Team Leader Name(Dept, Year):** Abhinav G (Mechanical Engineering, II year, TCE)

**Team Member(Dept, Year):** Daljin J (Mechanical Engineering, II year, TCE)

**Team Leader Name(Dept, Year):** Siddharth Gautam(Computer Science, I Year, HBTU)

**Team Member(Dept, Year):** Mayank Khanna(Chemical Engineering, I Year, HBTU)

**Mentor Name (Dept):** MR. Sankar B (Mechanical Engineering, TCE)

**Mentor Name (Dept):** MR. A.K. Rathore (Chemical Engineering H.B.T.U.)

**Problem Statement Selected from the list given:**

Sewage tank automated blockage cleaning removal with waste segregation.

**PROJECT TITLE:** SEWAGE BLOCK REMOVER WITH AUTOMATED WASTE  
SEGREGATION MACHINE

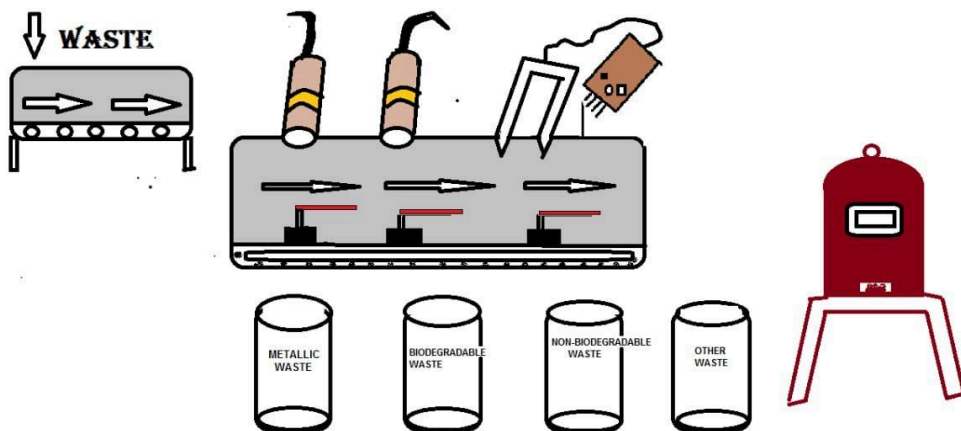
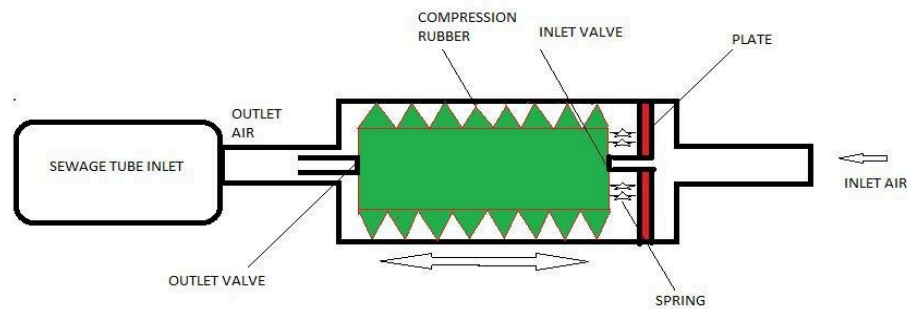
#### **PROBLEM DEFINITION:**

To remove blockages in sewage with a sophisticated device that is economical by applying high pressure air, and allowing the free flow of water. Waste management can be the best strategy to reduce pollution. We see that most of the city's waste is not segregated properly and it accumulates into huge problems and it becomes hazardous for every being living around it. "Waste segregation" means dividing waste into dry and wet waste. Waste can be solid, liquid, or gas and each type has different methods of disposal and WASTE management. This process is then followed by **INCINERATION**. Incineration is a waste treatment process that involves the combustion of organic substances contained

in waste material and it is converted into energy by further processing. This energy can be utilised in several different sectors.

### PROTOTYPE DESIGN:

The design consists of a compression chamber connected to an inlet and outlet for air. Both inlet and outlet have check valves. Air is taken in through the inlet valve and the valve is closed. By compressing the chamber, pressure of air is increased. Once required pressure is achieved, the outlet valve is opened such that high pressure air flows out in the form of a pulse. This pulse hits the target (clogged area or blockages) and opens them up. The waste from the blockages are then sent into a chamber where the waste is segregated into dry, wet & metallic waste. The waste is then converted into useful energy using the principle of **INCINERATION**.

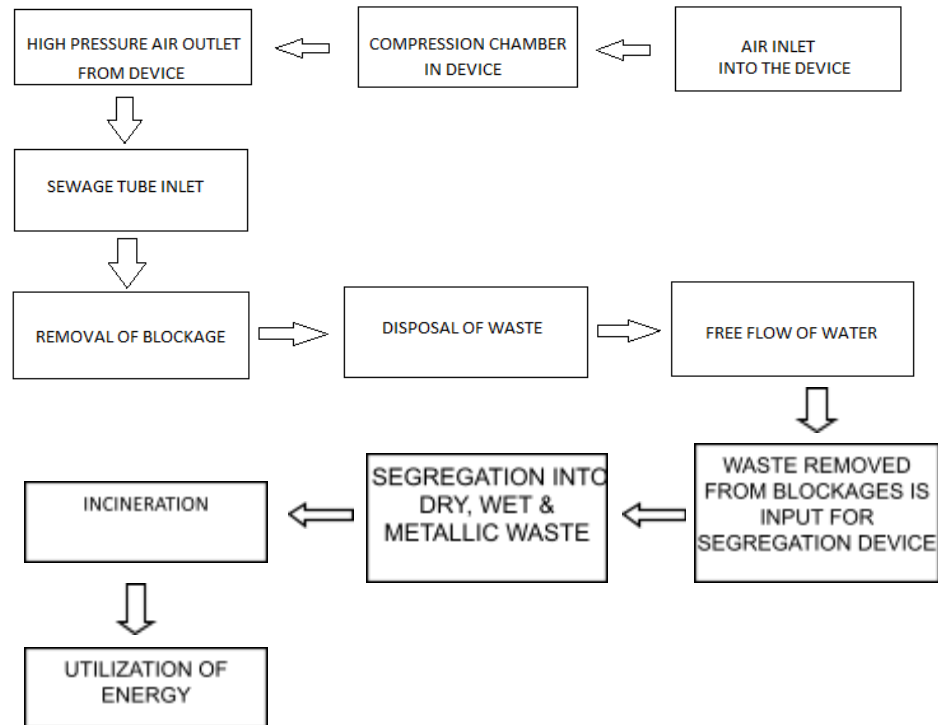




### **PROJECT BENEFITS:**

1. Helps in removing the blockages and clogged parts.
2. Elimination of human intervention in clearing blockages.
3. Low maintenance of the equipment.
4. Can be automated.
5. Easy to use when compared to other existing technique.
6. Segregation paper, cardboard, plastic, metal and glass at source unless it is technically or economically unfeasible.
7. Effective segregation of wastes means that less waste goes to landfill which makes it cheaper and better for people and the environment.

### **SUMMARY BLOCK DIAGRAM:**



## UNIQUENESS OF THE PROJECT:

This device can be used in household sewage transport system and it can be made compatible with any other systems. The cost for this equipment is also considerably low. And no skilled labour is required to operate this device. The removed waste blockages can be segregated and can be converted as useful energy. Thus this project is unique in nature.

## Components Used

\*1.ArduinoUno\*

\*2.Bluetooth Module\*



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- \*3.Node Mcu\*
  - \*4.Gear,Chain ,conveyer\* \*Belt ,Bearings\*
  - \*5.Inductive Proximity\* \*Sensor\*
  - \*6.Capacitive Proximity Sensor\*
  - \*7.Wet Sensor\*
  - \*8.L2938 Motor Driver(2 pieces)\*
  - \*9.Motors (8 pieces)300 RPM\*
  - \*10.wires(20m)\*
  - \*11.hot glue gun with glue sticks\*
  - \*12.screw driver kit\*
  - \*13.wire cutter\*
  - \*14.Jumper wires(male to male male to female)\*
  - \*15.Nut bolts \*
  - \*\*16.all accessories required to assemble them \*\*