

Project Schedule and Cost Report

Course: GNG1103–Engineering Design

Team Name: Five Alive

Date: [2025.02.09]

Team Members: Sam Stano, Owen Kaine, Aidin Moradi, Ziyi Wang

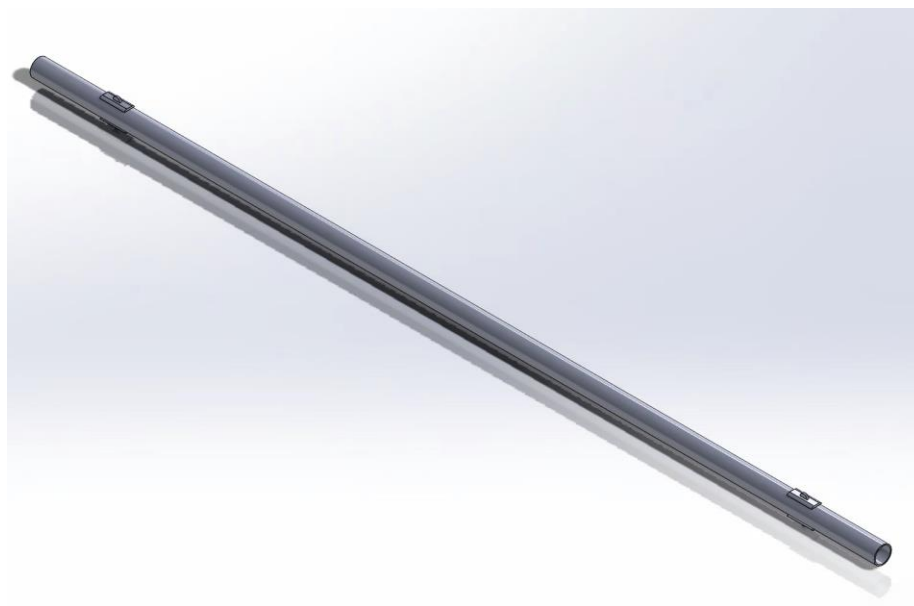
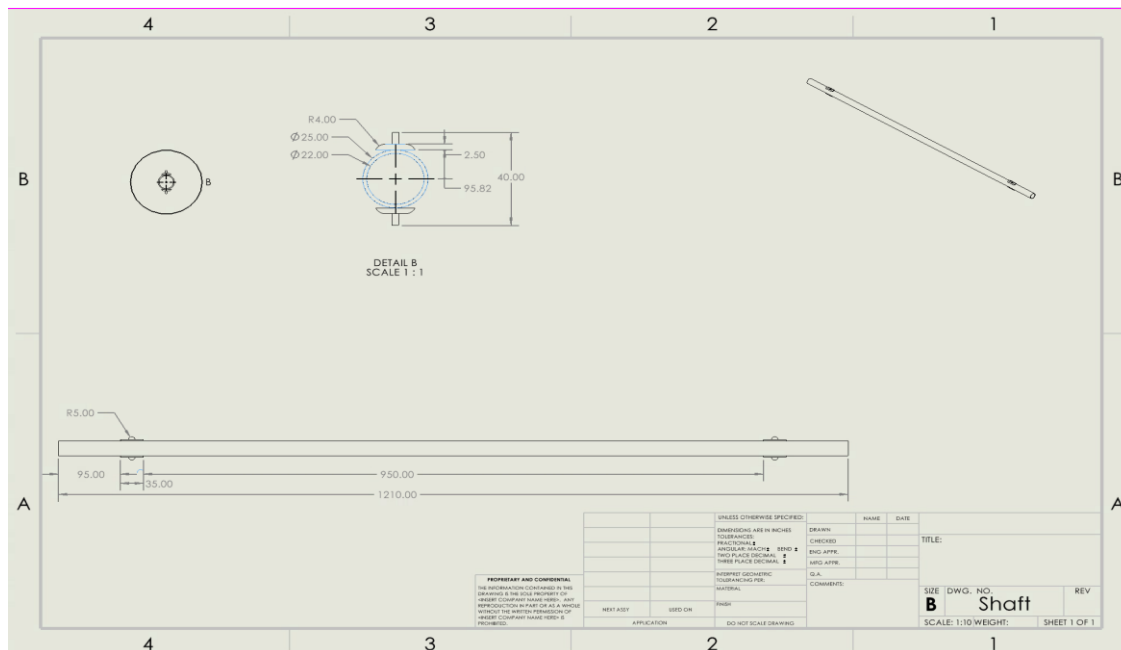
Table of Content

Introduction	3
Chosen Design	3
Plans and Schedule	8
Project Risks & Contingency Plans	9
Prototyping test plan	9
Estimated Cost	11
List of Equipements	11
Trello Task Board Update	12
Conclusion.....	13

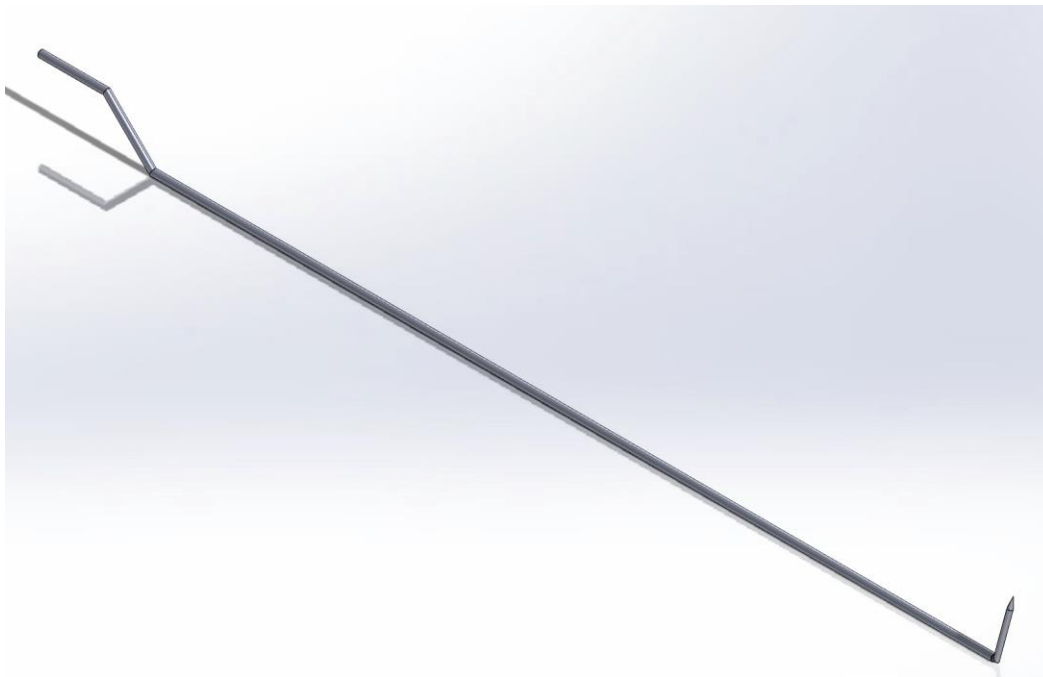
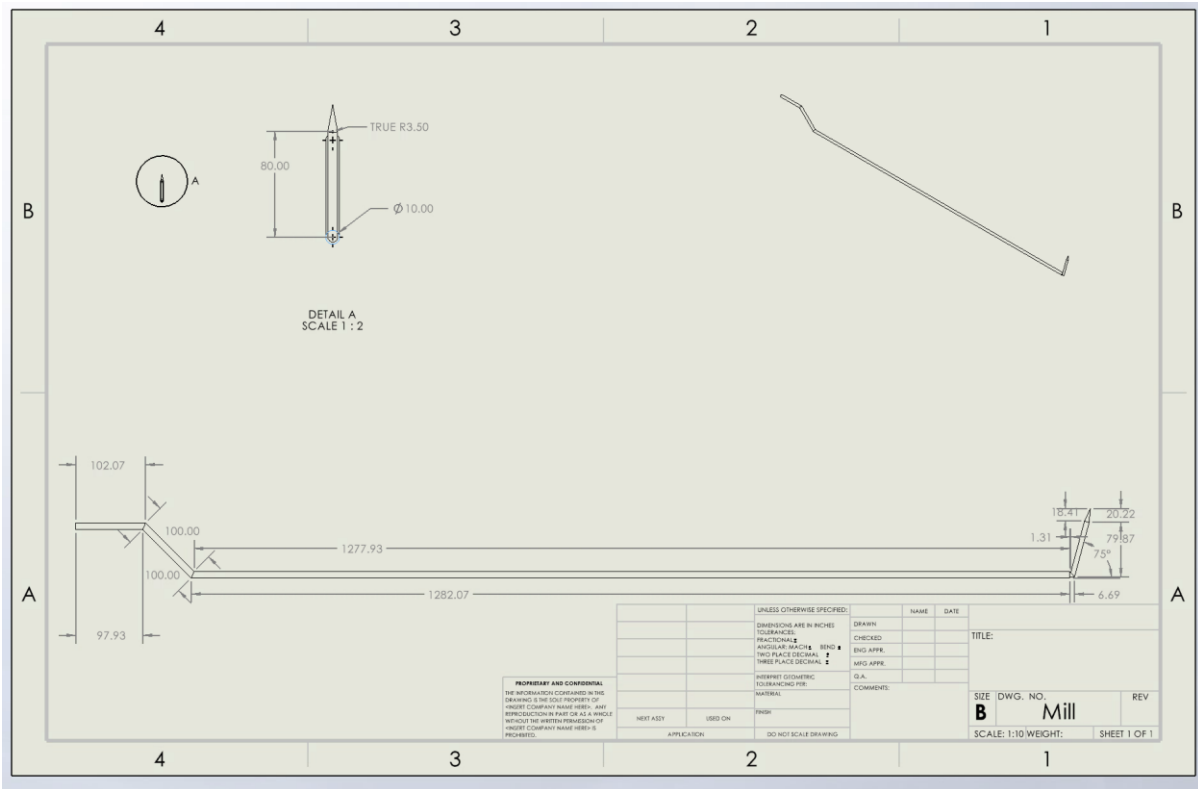
1. Introduction

In this deliverable we will take the feedback from the client meeting to refine our multiple ideas into one sketch and find parts to build the final prototype. We will plan how to create a tangible first prototype, test specific areas of the system, and estimate the cost of the whole process.

2. Chosen Design:

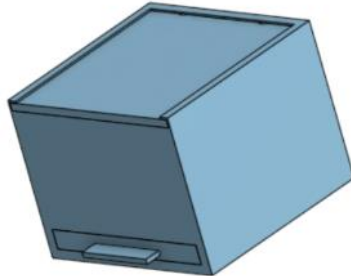


This is a representation of one of the 3 4ft sections of PVC pipe that would be connected in series

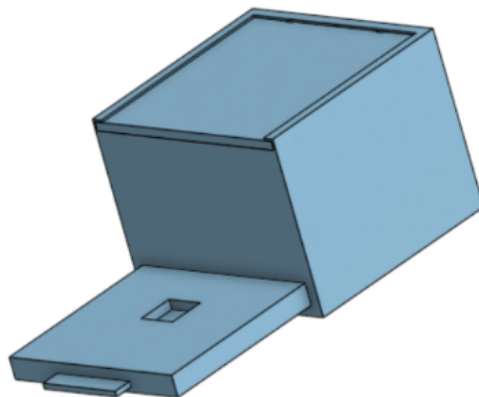


This is a representation of the screw mechanism for milling and scraper the sample from the pipe wall.

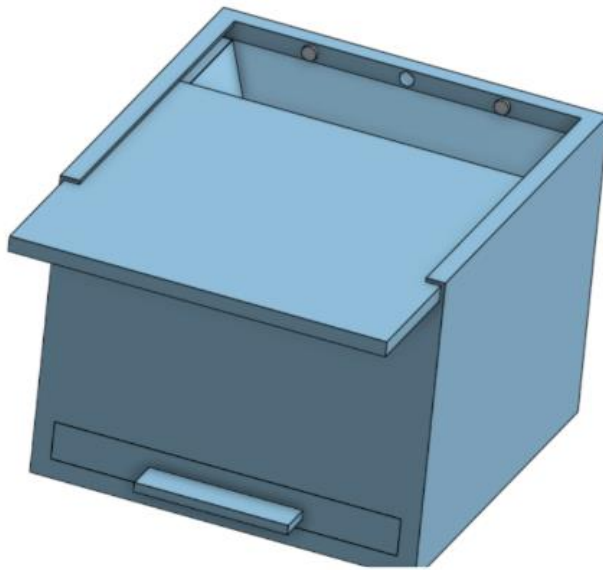
Sample Collection Container:



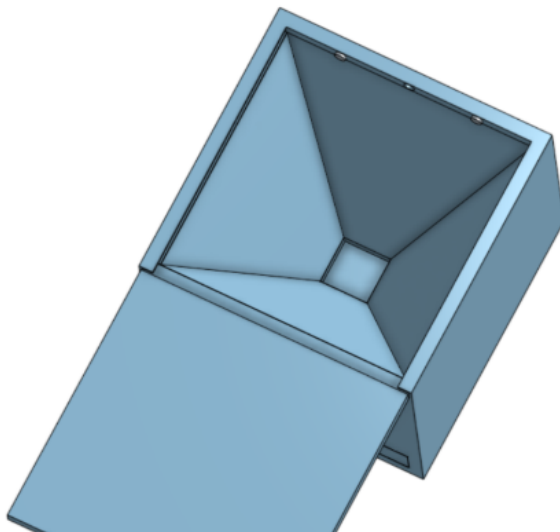
There is the main body (the cube is 2in x 2in x 2in). This whole cube would attach to the end of the tool. It can be easily detached for transportation to the lab.



The button dish slides out with the exact volume for a sample of 50mg (dimensions to be determined with the exact testing sample material as it varies with density). Once at the lab, this dish can be removed to reveal an acceptable amount of sample in the centre square. Any excess sample will be left in the main cube as it wouldn't fit in the centre square. Any excess left in the cube that falls into the dish chamber can be cleaned out in the lab easily.



The lid is attached via magnets to the top of the box and can be sealed by pulling a string that would run through the top centre of the back wall of the box. The grey magnets seen above would be small and weak enough to not catch samples falling into the box. The magnets are meant to seal the container once the operator pulls the string after collection is complete.



When the lid is only, the sample scraped off can fall into the top of the container. The sample will funnel to the bottom of the box into the square chamber that would be the volume for about 50 mg of the sample material.

For vertical orientation, there may be a second box with a flipping closed lid so it would fit the diameter of the pipe.

* Box dimensions are not fixed and may vary.

Link to sample collection container:

<https://cad.onshape.com/documents/1d76baf4ed31beaa17c1a6dc/w/32e2c9b7139efed3f95b0>

3. Project Plans and Schedule

We have agreed on the same start date for all our projects, being February 16th. That way all our projects are being done simultaneously by different people so we can finish on time. The people with easier tasks can assist with the harder tasks once they complete theirs.

Tasks to be completed

Task	Estimated duration	Who	Due Date
Deliverable E - Project plan and cost estimate	1 week	All team members	February 23
Build Prototype I	1-3 Days	All team members	March 2
Test Prototype I	1-2 Days	All team members	March 2
Deliverable F - Prototype I and Customer Feedback	1 week	All team members	March 2
Build Prototype II	3-4 Days	All team members	March 9
Test Prototype II	2-3 Days	All team members	March 9
Deliverable G - Prototype II and Customer Feedback	1 week	All team members	March 9
Build Prototype III	1-2 weeks	All team members	March 23
Testing Prototype III	2-4 days	All team members	March 23
Deliverable H - Prototype III and Customer Feedback	2 weeks	All team members	March 23
Prepare Presentation	1 week	All team members	March 23
Deliverable I - Design Day Presentation Material	2 hours	All team members	March 26
Deliverable J - Project Presentations	Undetermined	All team members	Undetermined

Deliverable K - User and Product Manual	1 week	All team members	April 4

4. Project Risks & Contingency Plans

Risks	Probability	Impact	Contingency Plan
Group Conflicts	Low	High	Ensure adequate communication over teams and equal distribution of tasks
Project timeline and testing delays	Moderate	Moderate/High	Set strict deadlines and follow a structured schedule
Precision and accuracy of sample collection	Moderate	High	Perform various testing on the sampling mechanism
Delays in sourcing materials	Low/ Moderate	High	Find substitute materials from home or around school

5. Prototyping test plan

For our team to develop a prototyping test plan, we decided to have a clear schedule outlining the required task to do each and the member responsible for each task.

Test ID	Test Objective (Why)	Description of Prototype used and Basic Test Method (What)	Description of Results to be Recorded and how these results will be Used (How)	Estimated Test duration and planned start date (When)
1	To see if the Arduino feedback functions as required	Take input from the scale and pressure sensors and send feedback to the user. For example, green light if the mass of the sample is within the accepted range, red if it is not.	The main test is whether the controller can control the normal operation of other components when	This task will also be a more difficult task to complete. We assume this could take 2-3

			linked to them. Test whether the signal from the sensors can make it back to the user accurately.	weeks with our start date February 16 th .
2	To ensure the lid of the collection container can be closed remotely	We need a container to collect the sample that can be closed via a rope and sealed with small, weak magnets.	Create a container out of cardboard with a closable lid using a sliding system. We would test its ability to close using a rope in different orientations.	This will be one of the easier tasks. We assume this could take 1-2 weeks and we would start on February 16th.
3	Collecting System	A funnel system inside the main collection container that feeds the sample it into a smaller chamber that is the volume of 50mg of aluminum or other metal. This small precise chamber is on a dish that can slide out once in the lab that leaves any excess in the main container.	Test different funnels to make sure that nothing gets stuck and that it collects all the sample.	This task will require the use of AutoCAD and 3D printing to make a box to the required specifications. We assume it will take 1-2 weeks, and we start February 16 th .

6. Estimated Cost

Item	Cost (\$)	Source
2 PVC pipes	19 +tax	Home Hardware
3 male PVC couplings	5.37+tax	Home Hardware
3 female PVC couplings	5.37+tax	Home Hardware
PVC glue	Free	Already in possession
Arduino nano	8.00 +tax	MakerRepo
5ft wire x3	4.8 +tax	MakerRepo

Filament for 3d printing (ABS)	0.13/g +tax	MakerRepo
Led lights	1.40 +tax	MakerRepo
String, cord or fishing line	Free	Already in possession
Small magnets to close container	5.49 +tax	https://canada.michaels.com/product/pro-mag-button-magnets-5-10579102?gQT=1
Chisel	8.49+tax	Irwin Steel Cold Chisel - 0.5-in x 6-in IRHT82535 RONA
Hot glue gun	Free	Already in possession
Steel Sheet	8.97 +tax	homedepot
Arduino button	1.70 +tax	MakerRepo
Estimated Total \approx	\$77.42	(tax is included in the final cost calculation to the left)

Link to Excel Sheet (BOM): [Project Deliverable E \(Prototype\).xlsx](#)

6.1 List of Equipements:

List of Equipment for Prototype 1:

1. Cardboard Box
2. Tape Measure/ruler
3. Arduino IDE (Software)
4. Breadboard
5. Glue/Staples
6. Scissors
7. Chisel

List of Equipment for Prototype 2:

1. Chisel attached to 3ft pole
2. Weighing system
3. Small bits of material to test weighing system

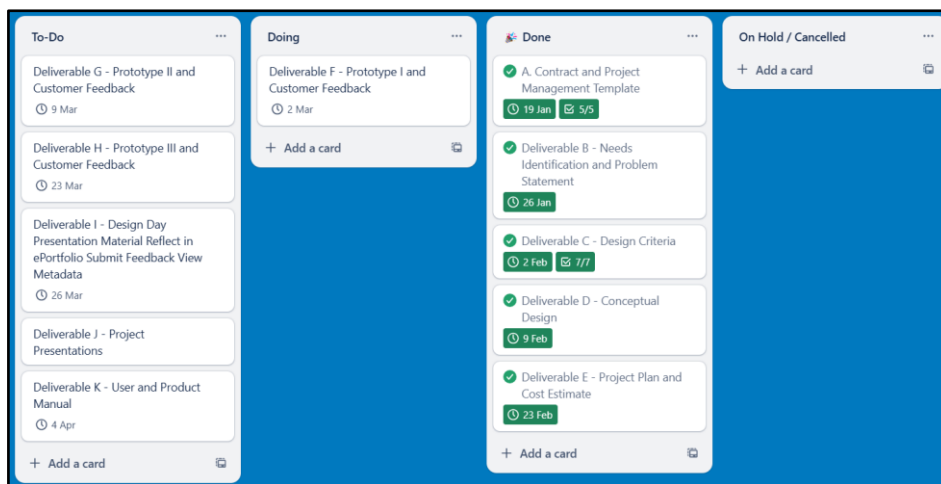
List of Equipment for Prototype 3:

1. PVC glue
2. 10ft PVC 1in diameter x2
3. Female coupling for PVC x3
4. Male coupling for PVC x3
5. Saw
6. Chisel
7. 3d printed box
8. Arduino nano
9. 15ft of wire
10. Breadboard
11. 3d printed case for light system
12. Arduino lights

7.0 Trello Task Board Update:

Team Member	Tasks Completed Last Week	Current Tasks (In Progress)	Tasks On Hold or Canceled	Estimated task duration
Aidin	Deliverable D	Deal with any group issues or disagreements and develop strategies to help with conflicts.	None	2 Days
Owen	Deliverable D	Determine what tasks have been finished, what upcoming tasks are and if anything needs to be put on hold or cancelled.	None	2 Days
Ziyi	Deliverable D	Verify and update task start dates and consider everyone's	None	2 Days

		availability over the next two weeks.		
Sam	Deliverable D	Update Trello to account for Deliverable E and create more detailed sub tasks for upcoming weeks.	None	2 Days



8.0 Conclusion:

This delivery provides a comprehensive project schedule and cost estimation for our design. Through structured planning. The estimated cost breakdown ensures that the project remains within budget while maintaining the necessary quality standards. The prototyping test plan will allow us to validate our design through iterative testing and refinements. We left a generous amount of time for each prototype to ensure that we get each done well in advance. Our Trello was updated to align with our new plans.