

# APSC 162 Course Project Report

For students also taking APSC 101

Fall 2023

## Group Members

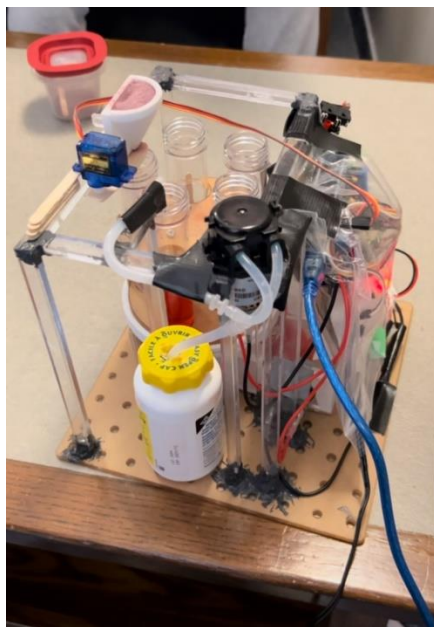
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**Statement of Originality:** We hereby certify that all the work described within this report is the original work of the authors. Any published (or unpublished) ideas and/or statements from the work of others are fully acknowledged in accordance with the standard referencing practices.

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## 1. Description of Design

Team 97's Automated Fluid Dispenser (AFD) is an assembly of mechanical and electronic components, each crucial to its function. The structure of the AFD is anchored by a mast made from durable acrylic, ensuring a stable framework that supports the operational components. At the top of the mast is the peristaltic pump, a critical component for the controlled dispensing of water. Its positioning is strategic, allowing for simultaneous work between the pump and the powder dispenser. The powder dispenser is adjacent to the pump, and it is a semi-cone funnel designed for precise concentrations to be released with its small hole. Beneath the funnel, a plate is connected to a servomotor. This allows for the exact release of the necessary concentration of powder. Working in tandem, the peristaltic pump and semi-cone funnel serve dual purposes, managing different substances and dispensing them into separate test tubes. This simultaneous operation is coordinated by an Arduino. The Arduino is located on the side of the AFD encased in a plastic bag for protection. The pump gets its water with a tube trailing down to the water reservoir located at the base of the AFD. The turntable is arguable the most crucial part of the AFD. It has five test tubes, each a perfect fit for the holes on the turntable and are filled in rotation. The turntable itself is perched on a ball bearing system designed to minimize friction, allowing for a smooth rotation.

## 2. Working Drawings

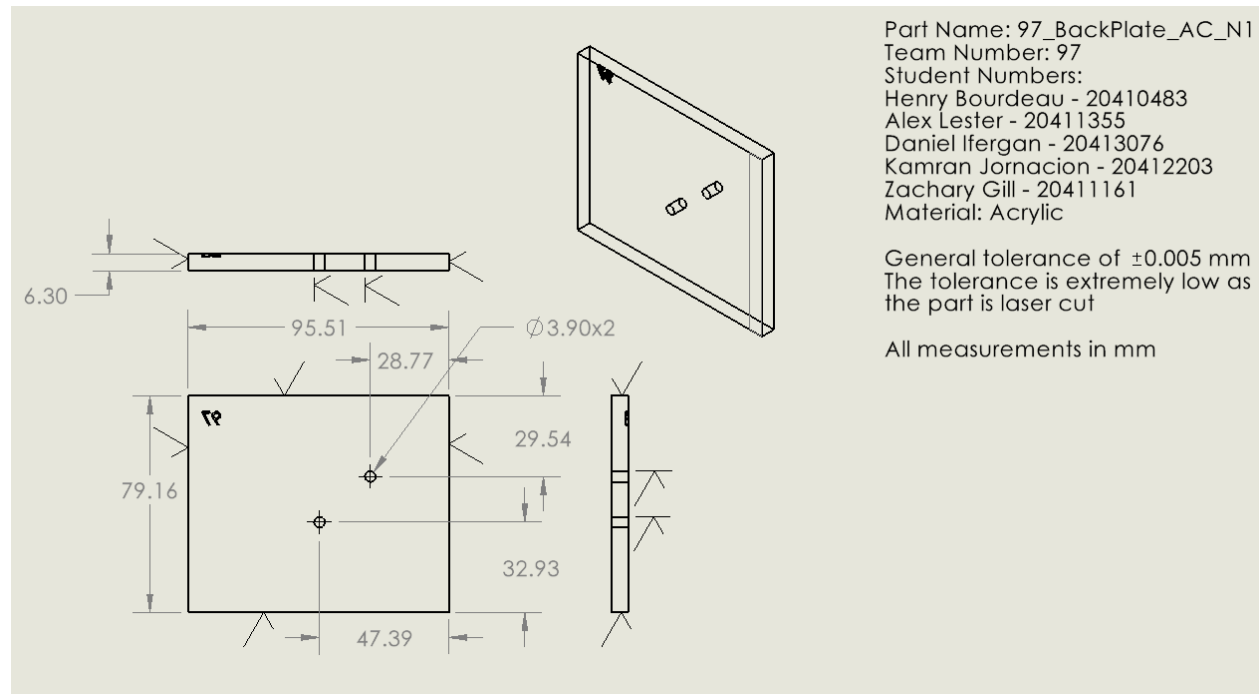


Figure 1: Working drawing for 97\_BackPlate\_AC\_N1

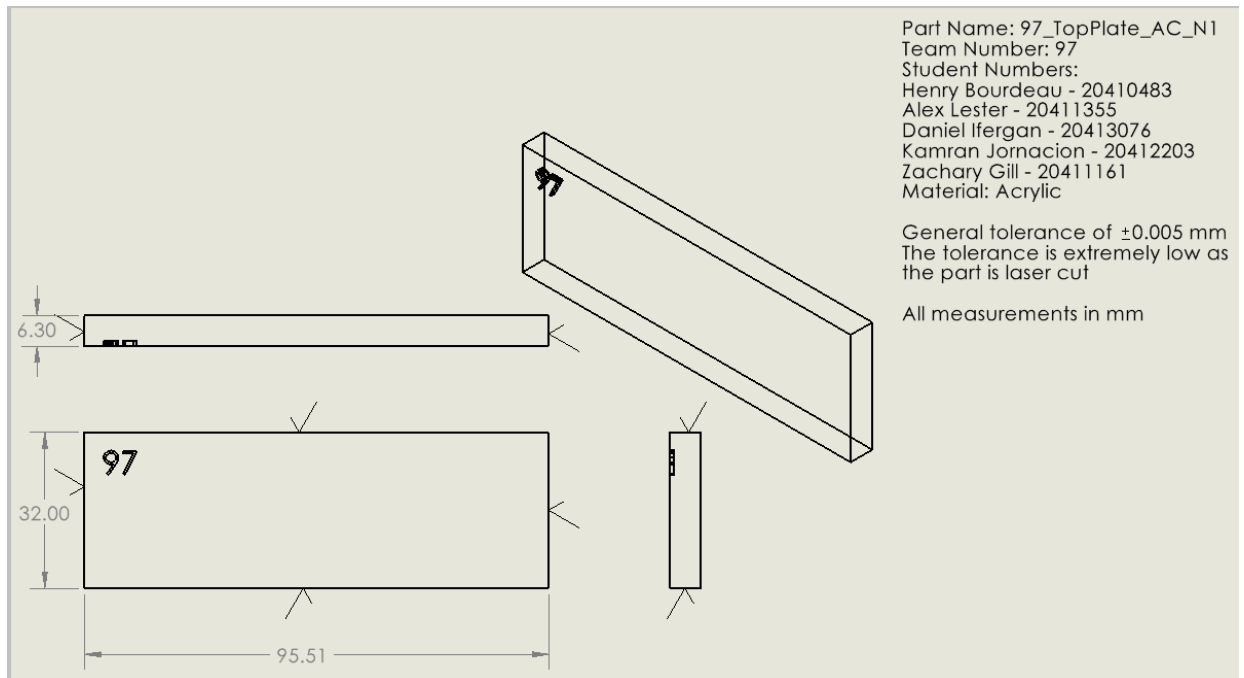


Figure 2: Working drawing for 97\_TopPlate\_AC\_N1

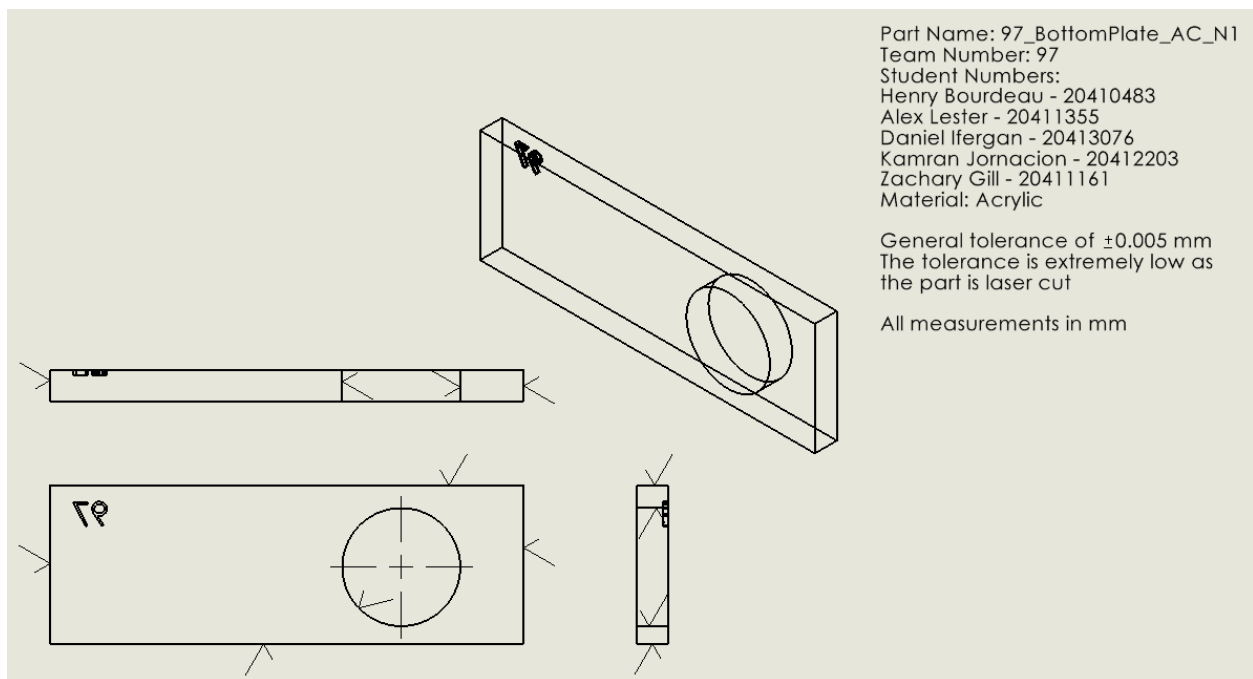


Figure 3: Working drawing for 97\_BottomPlate\_AC\_N1

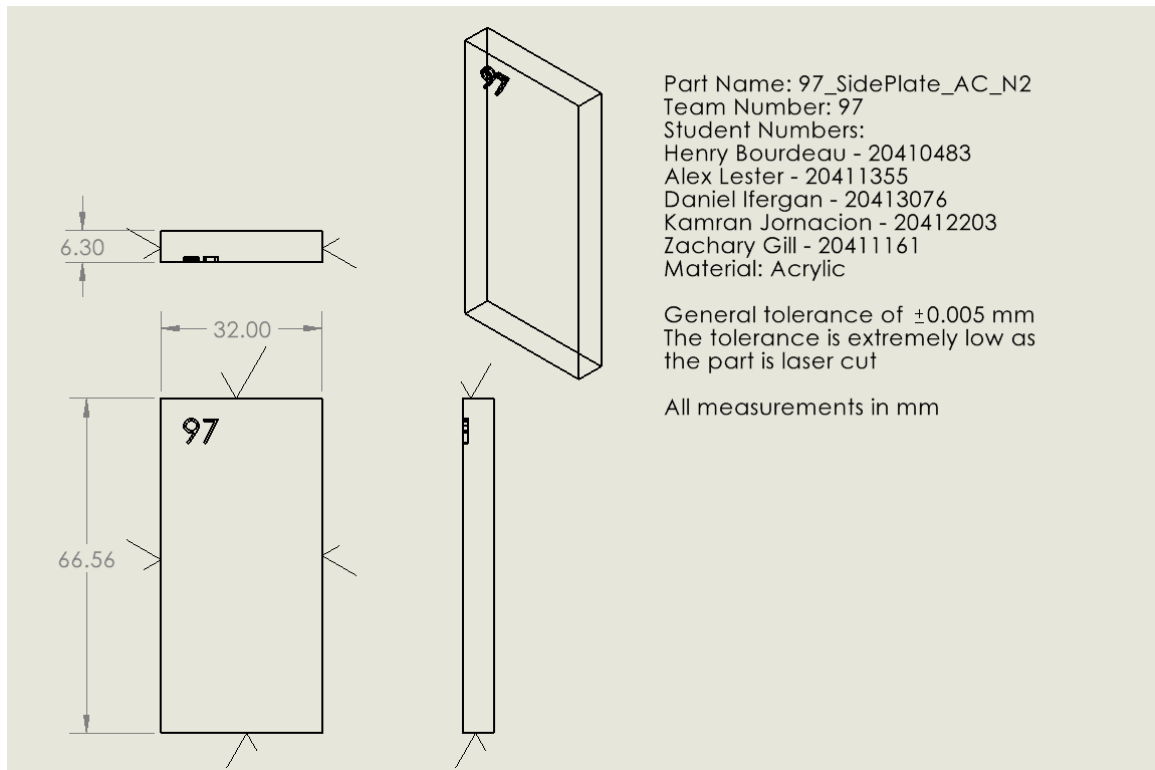


Figure 4: Working drawing for 97\_SidePlate\_AC\_N1

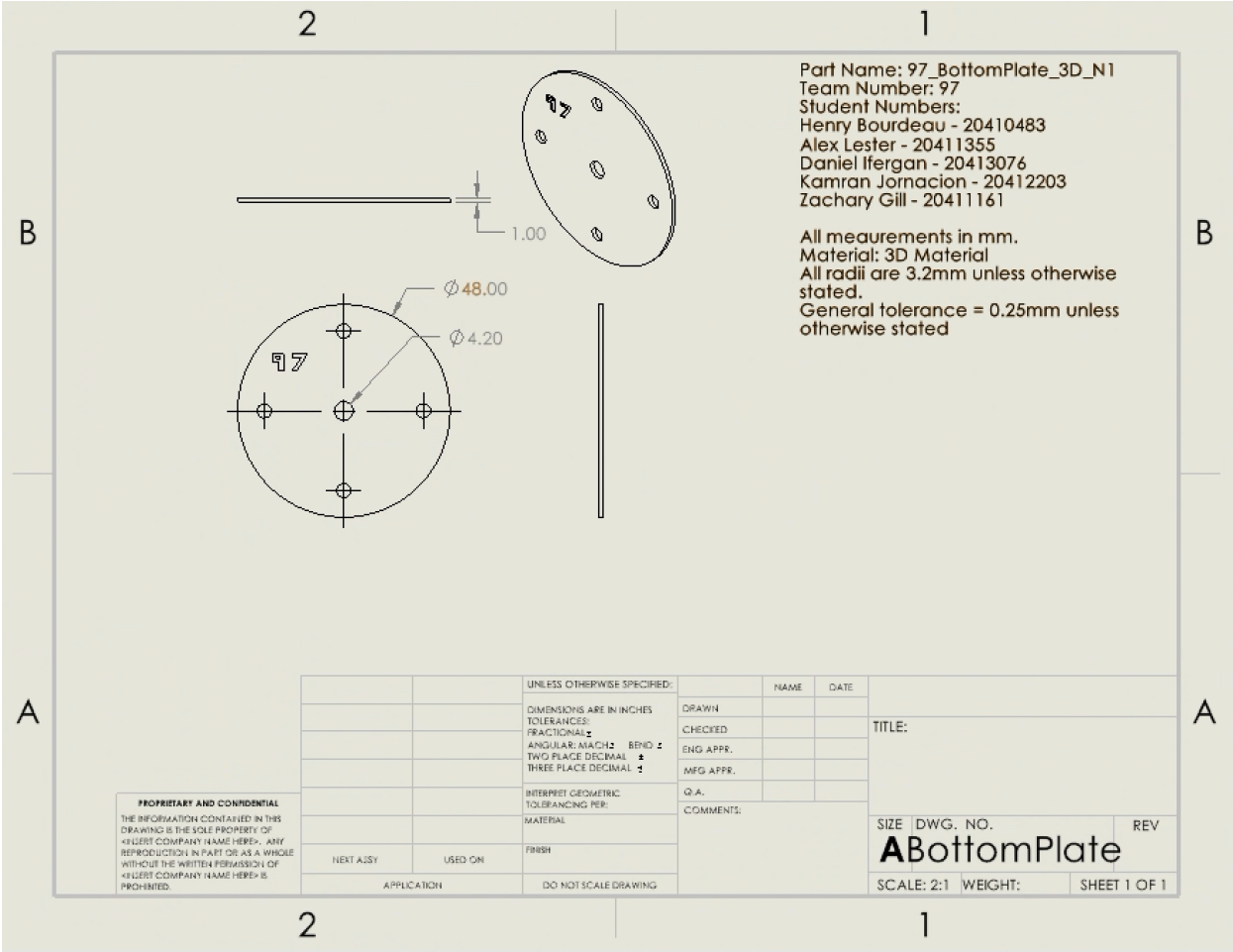


Figure 5: Working drawing for 97\_BottomPlate\_3D\_N1

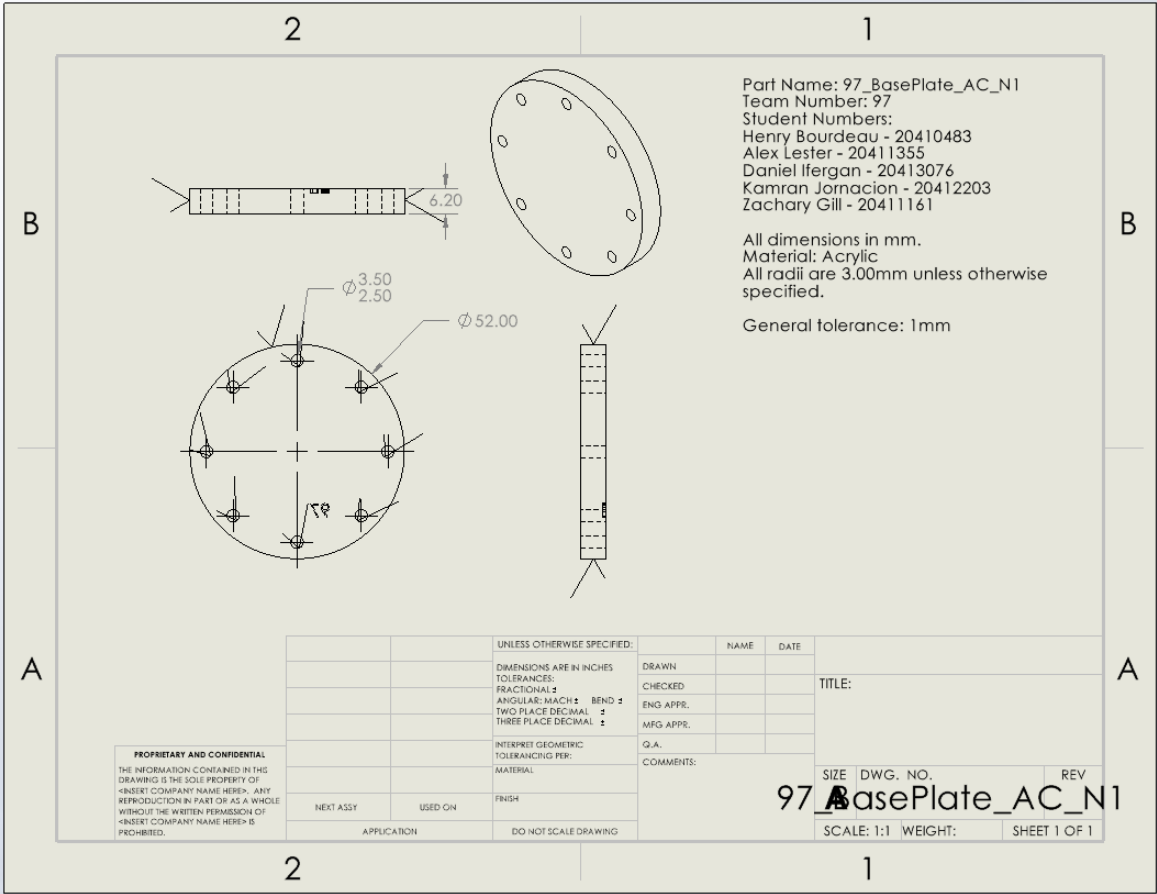


Figure 6: Working drawing for 97\_BasePlate\_AC\_N1

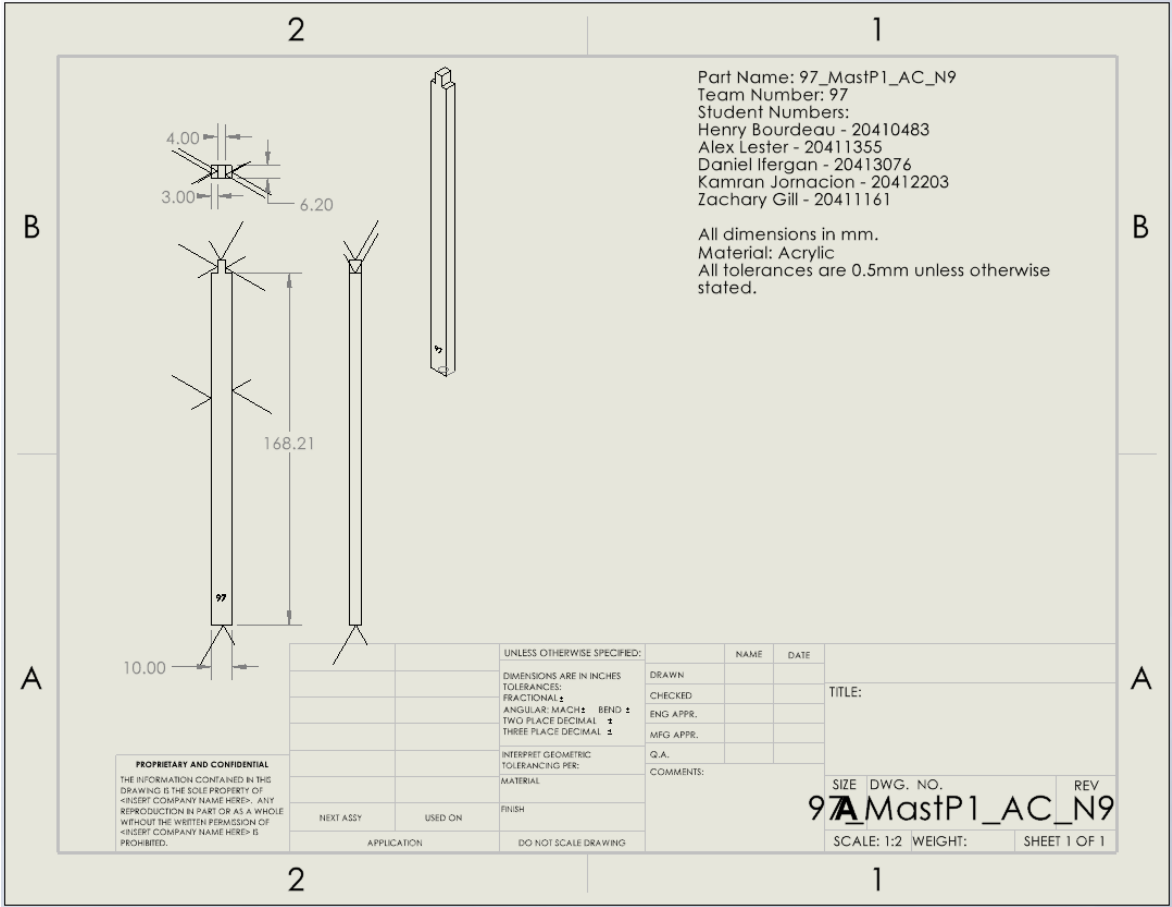


Figure 7: Working drawing for 97\_MastP1\_AC\_N1



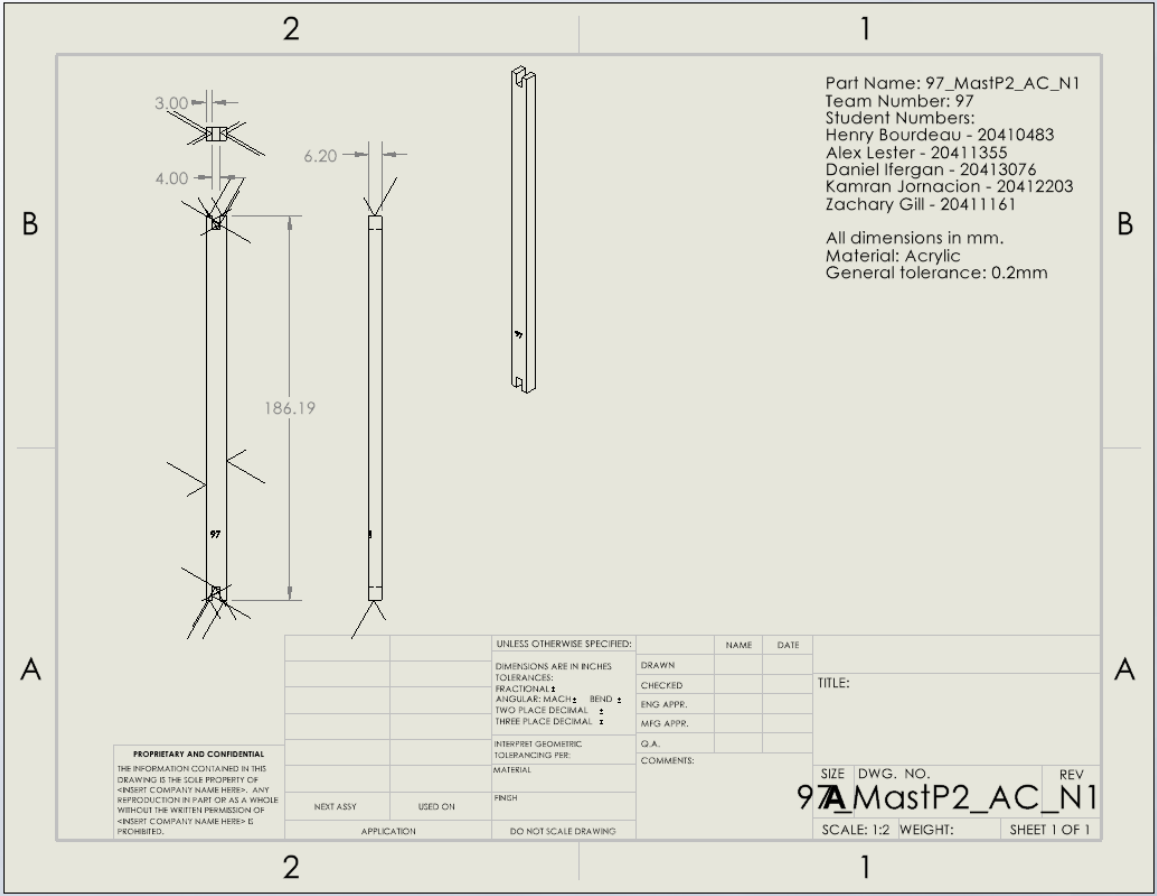


Figure 8: Working drawing for 97\_MastP2\_AC\_N1

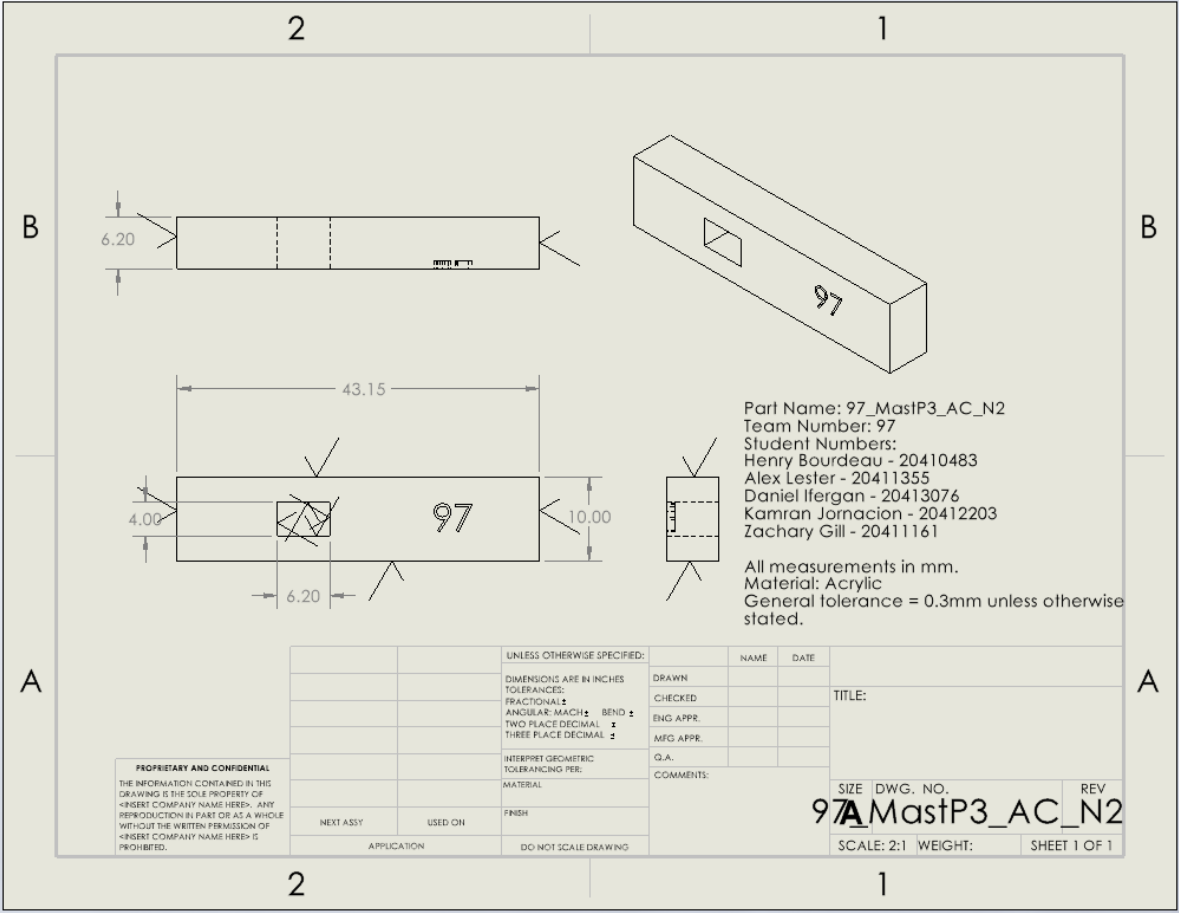


Figure 9: Working drawing for 97\_MastP3\_AC\_N2

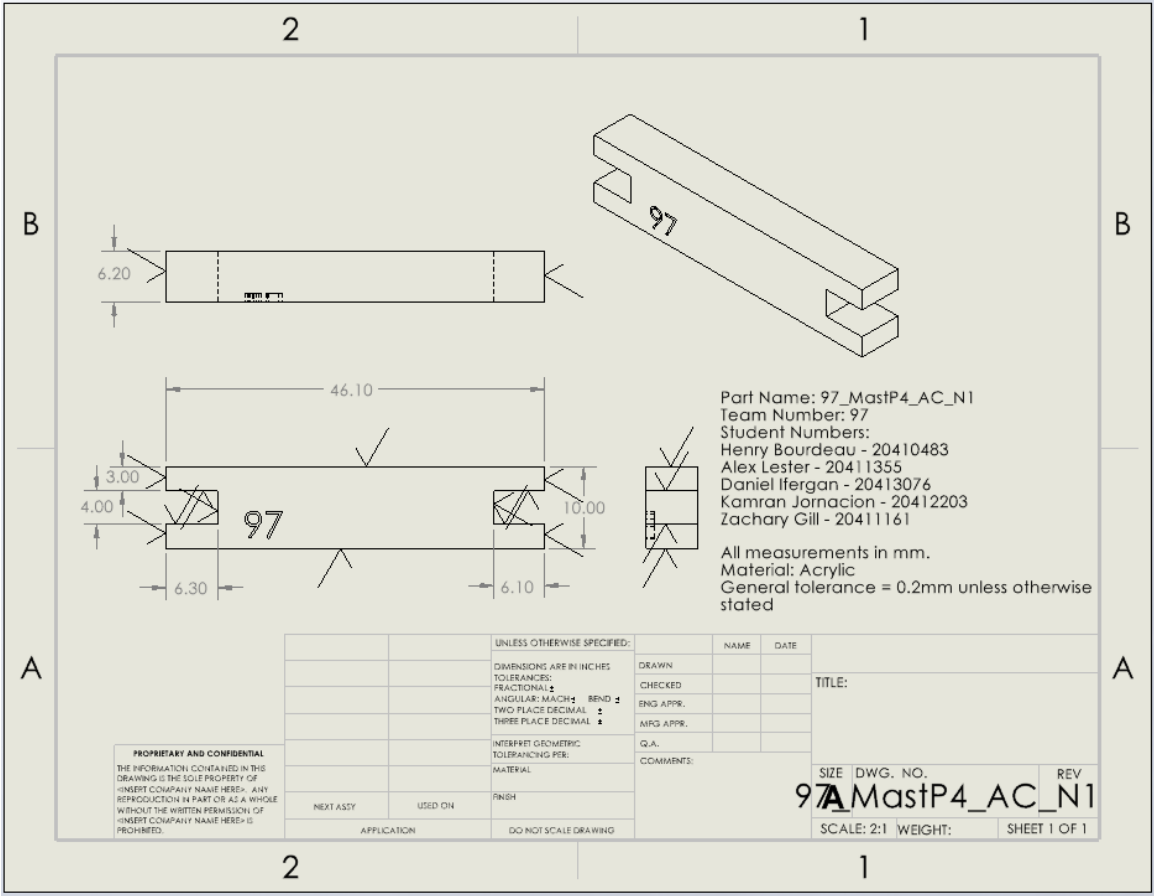


Figure 10: Working drawing for 97\_MastP4\_AC\_N1

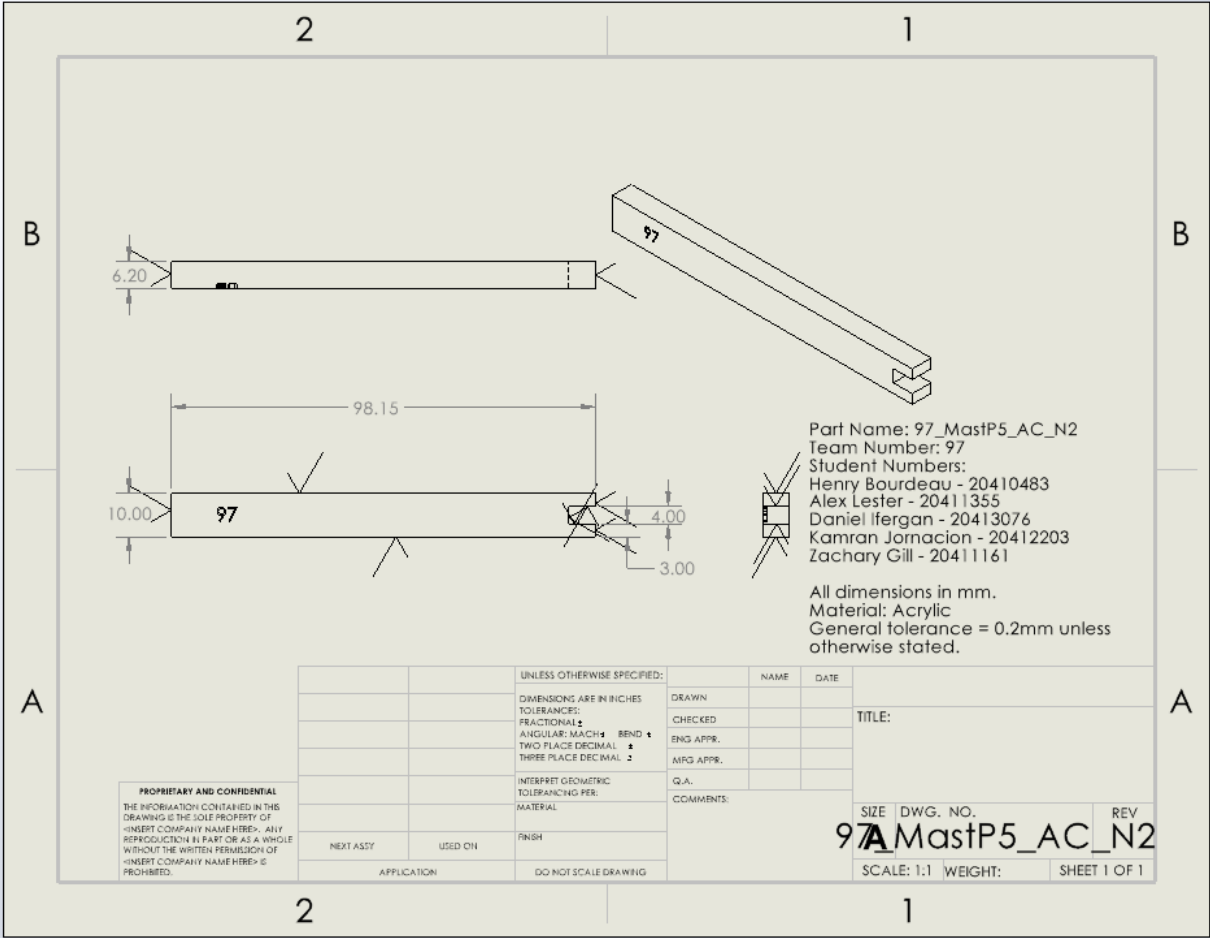


Figure 11: Working drawing for 97\_MastP5\_AC\_N2

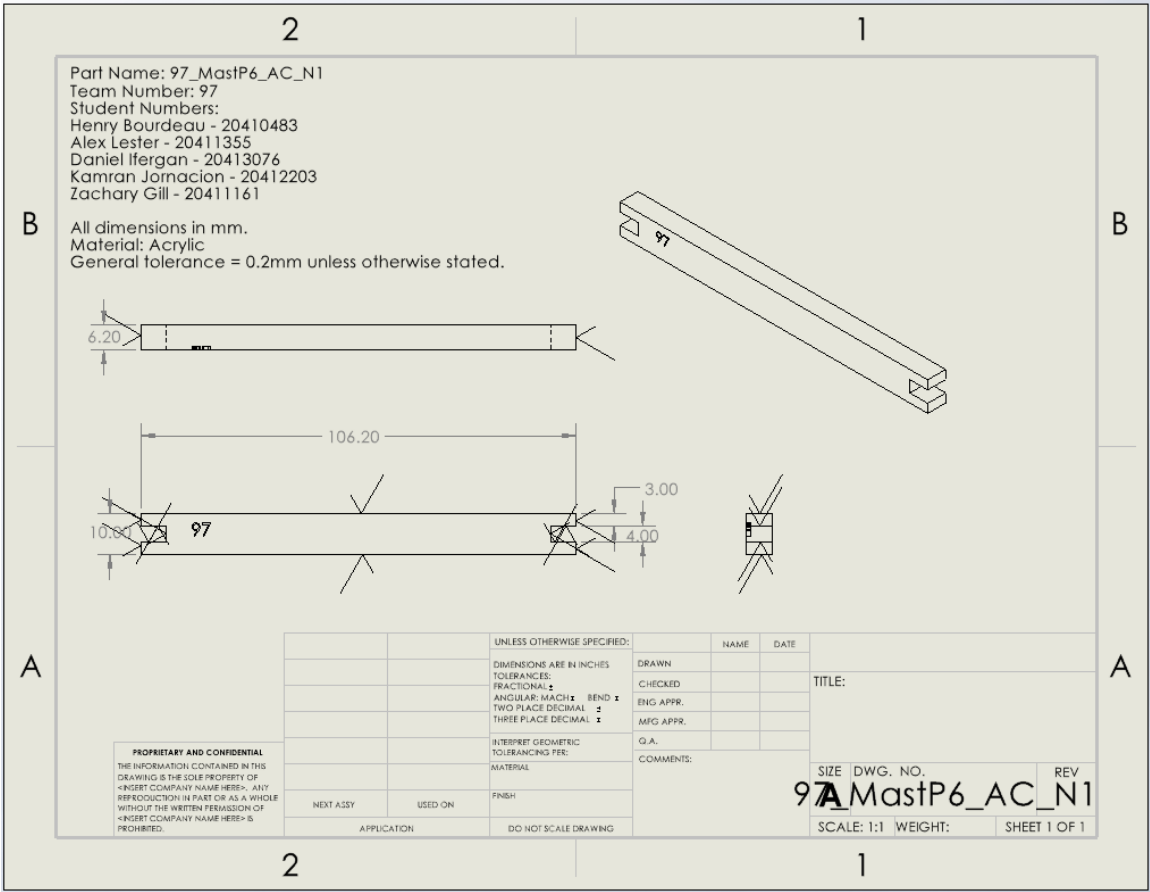


Figure 12: Working drawing for 97\_MastP6\_AC\_N1

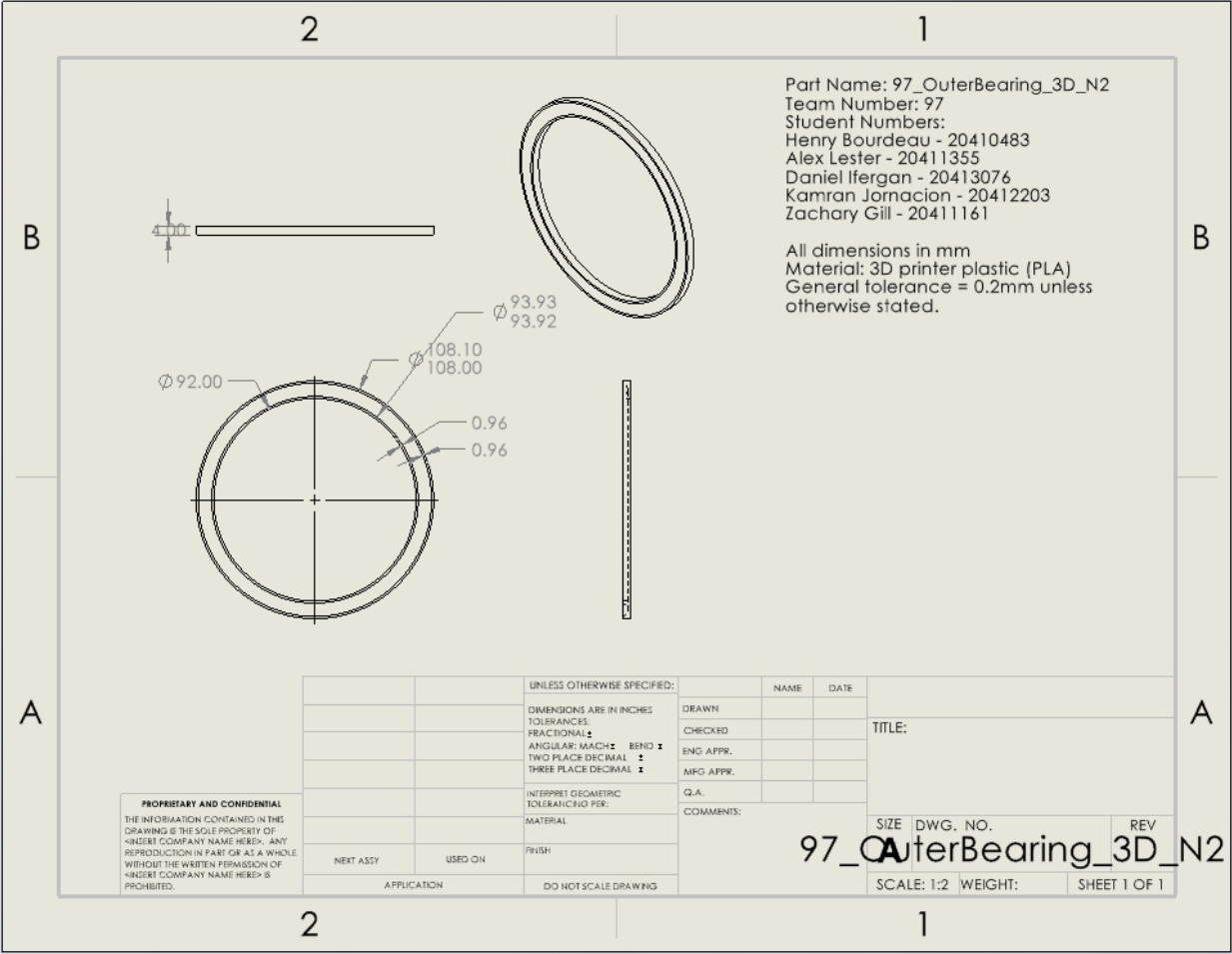


Figure 13: Working drawing for 97\_OuterBearing\_3D\_N2

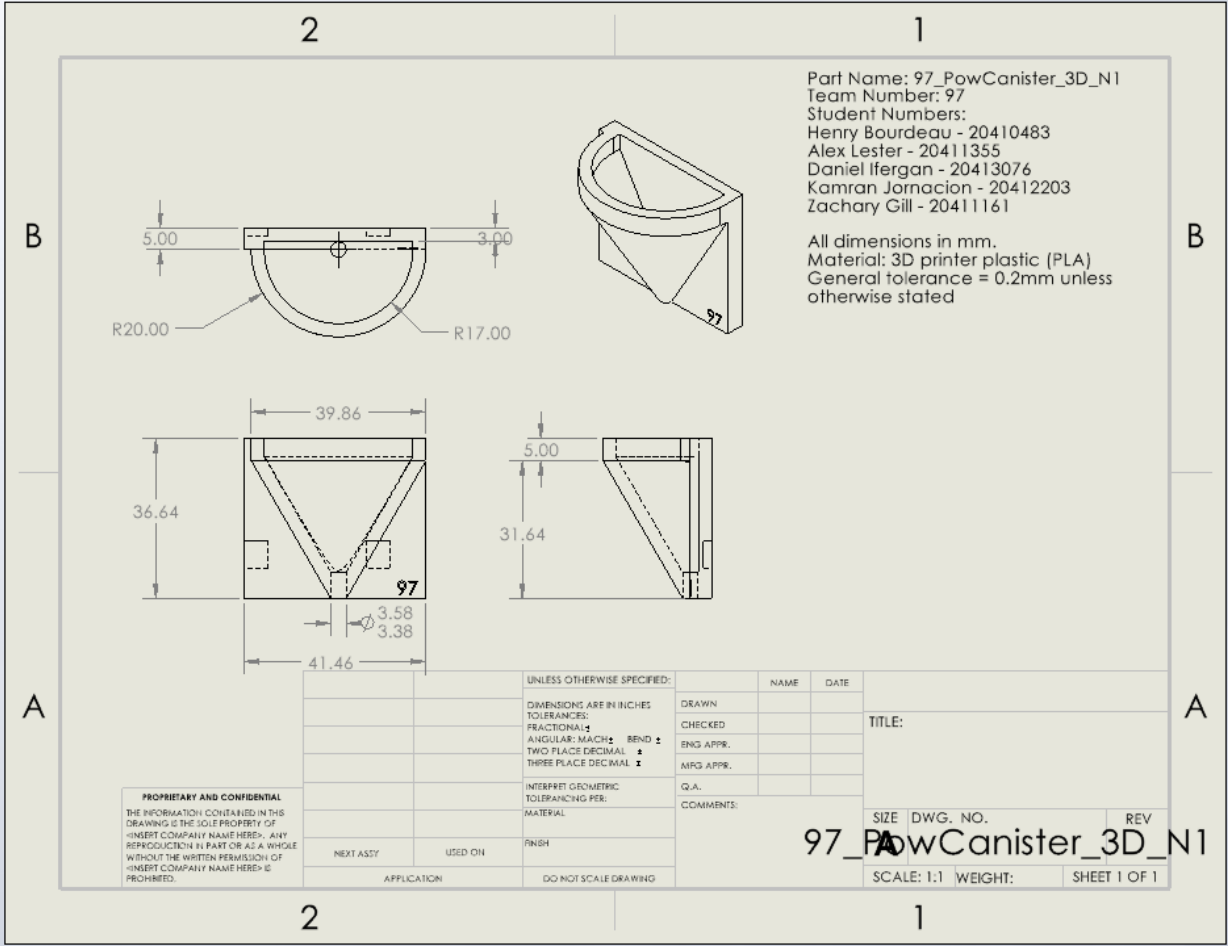


Figure 14: Working drawing for 97\_PowCanister\_3D\_N1

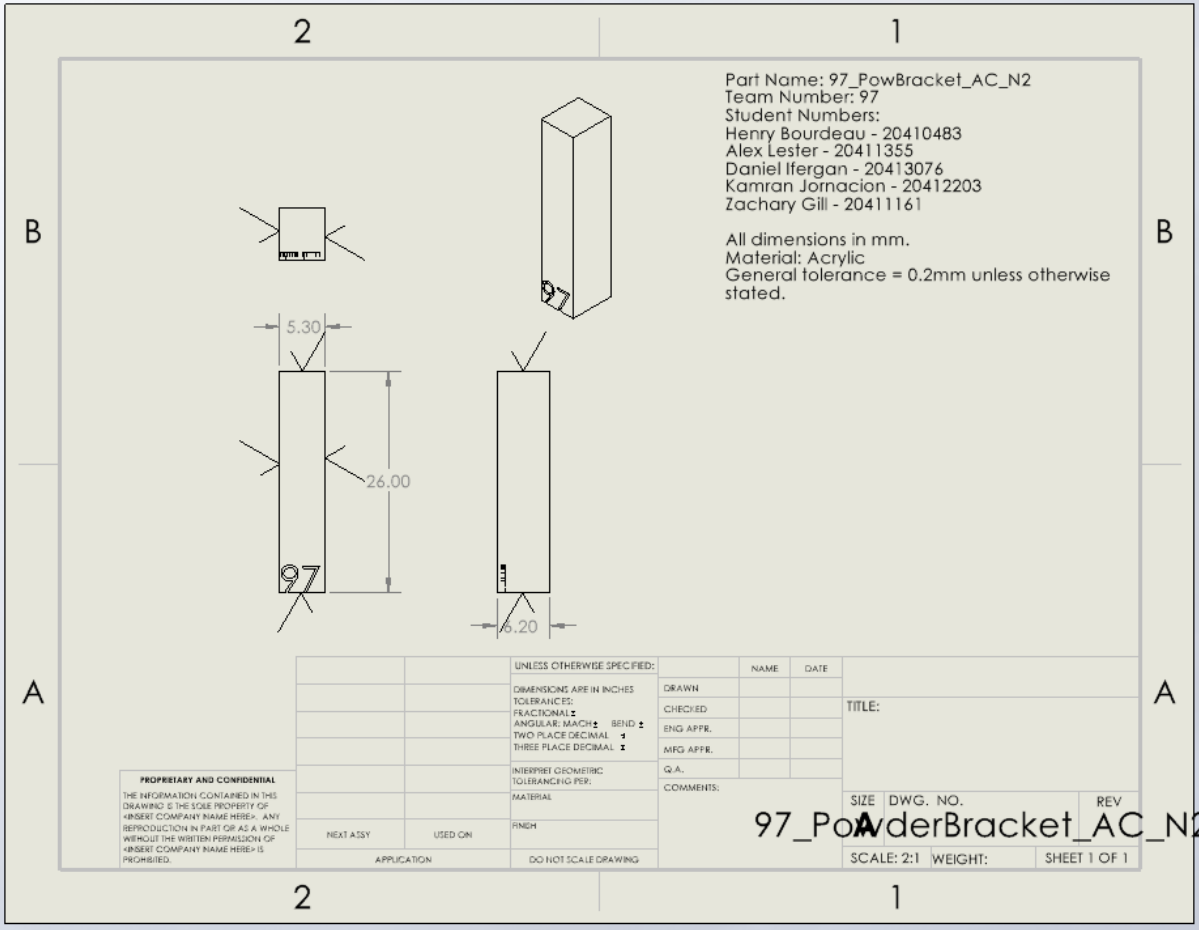


Figure 15: Working drawing for 97\_PowBracket\_AC\_N2



3. Pictorial View of Final Assembly

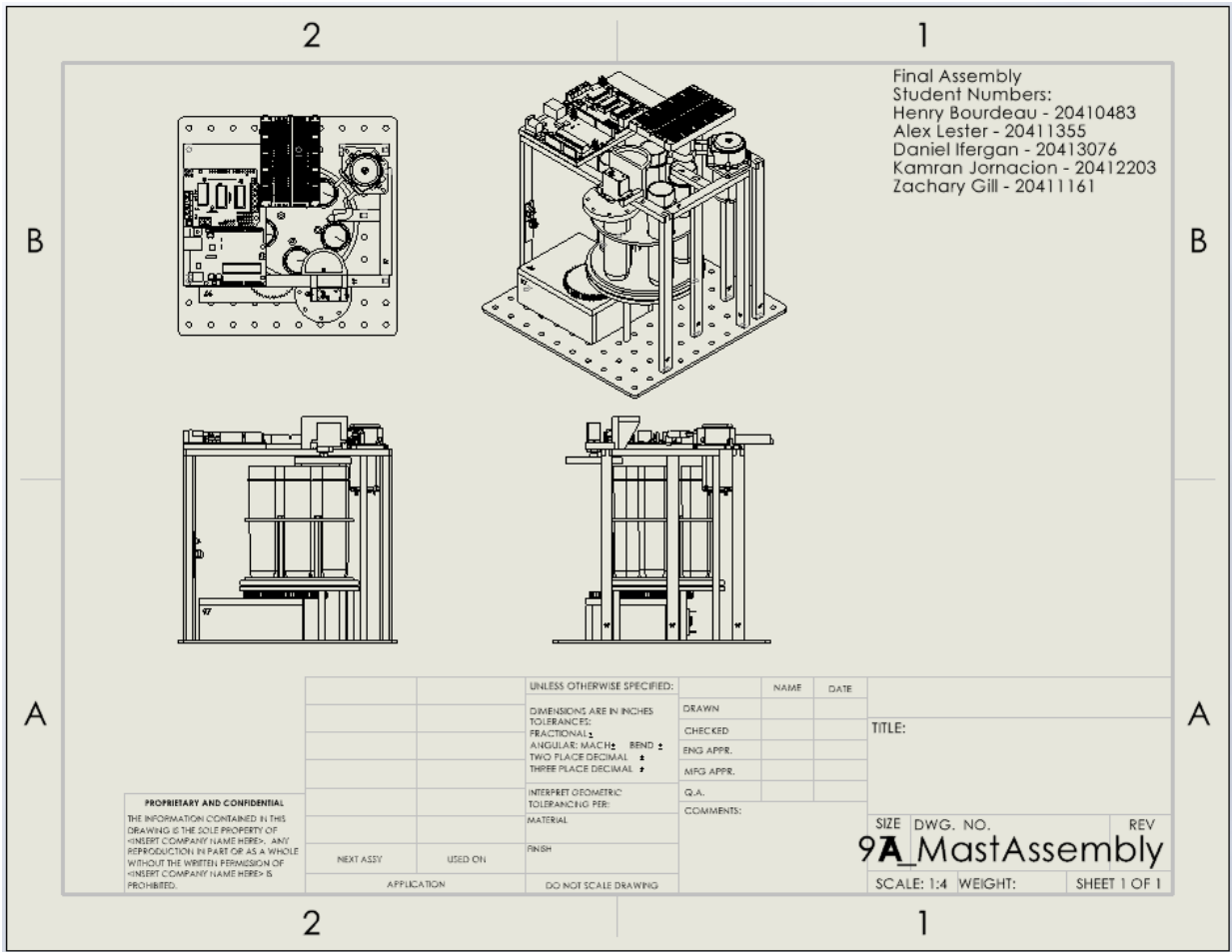


Figure 16: Pictorial Views of Final Design.

## 4. Final Assembly

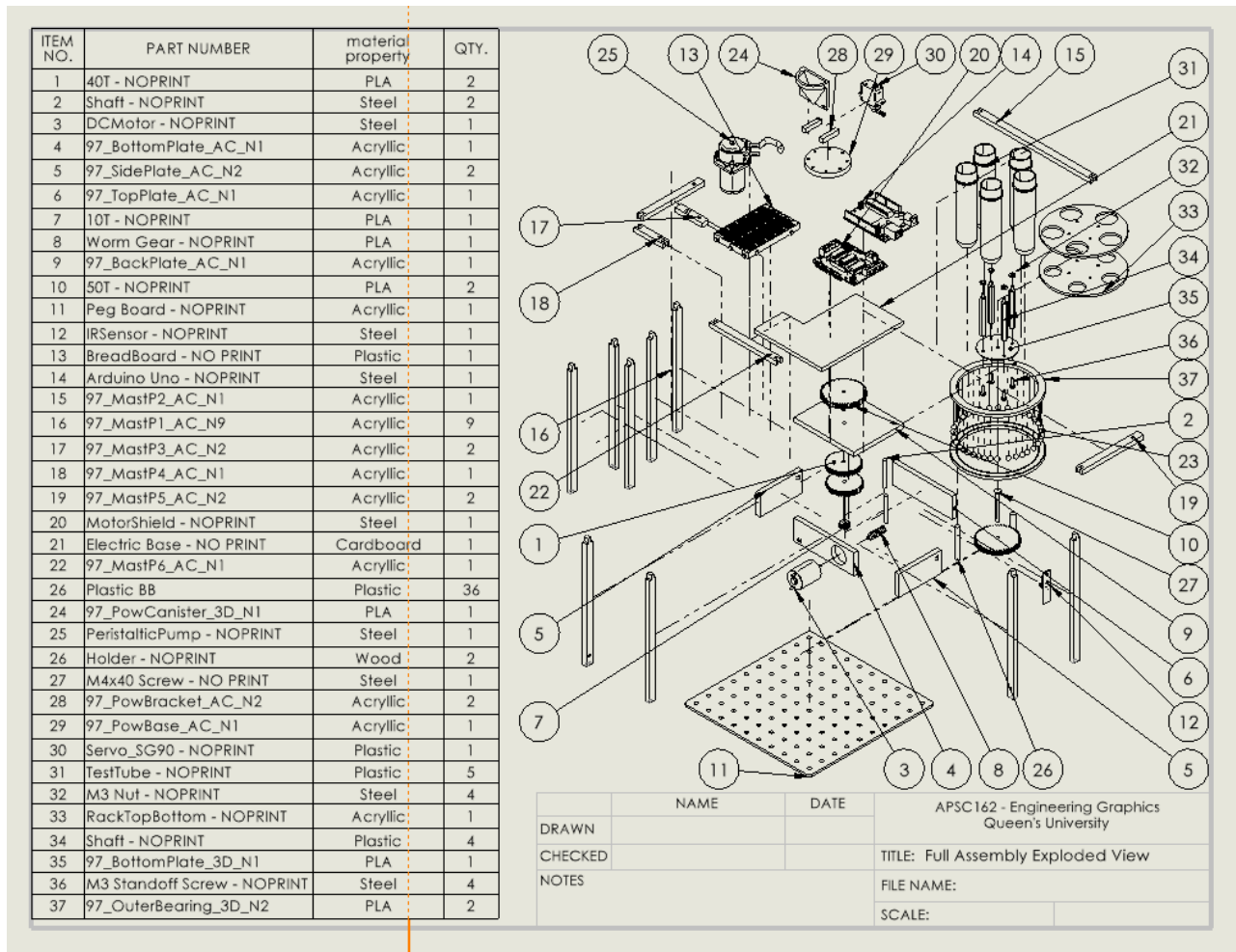


Figure 17: Full assembly of entire AFD with bill of materials on the left hand side