

**To:** Dr. Oman and GTA Amy Swartz

**From:** Team 23 Clean Room

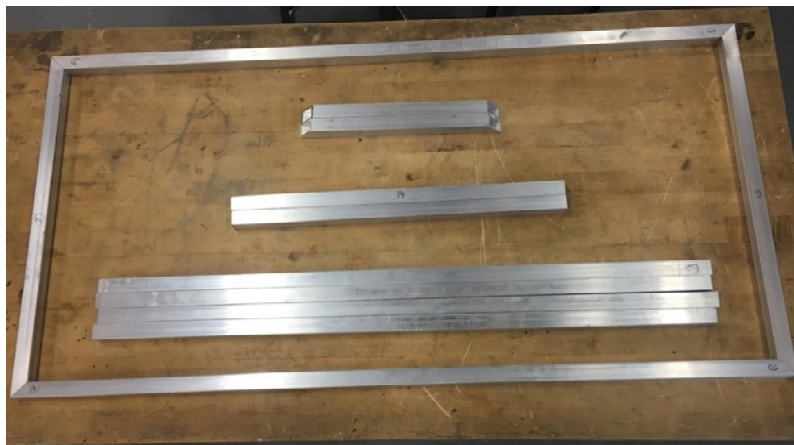
**Subject:** Hardware Review 1

**Date:** 2/22/2019

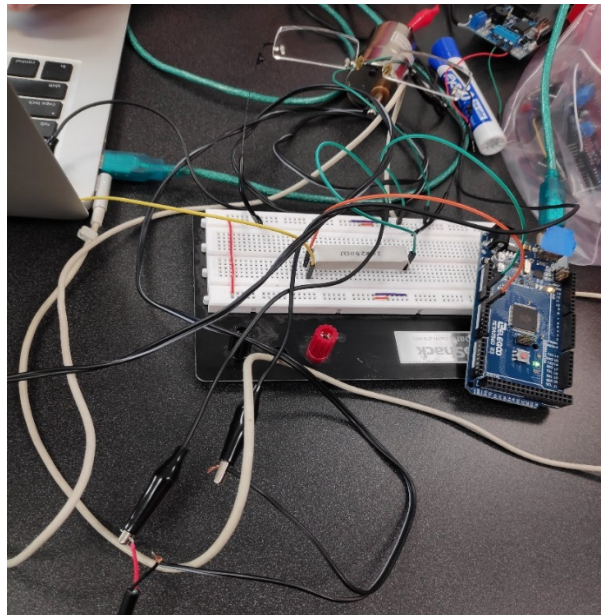
### **Introduction**

This memo outlines hardware review 1 completed with Dr. Oman on Tuesday, February 19, 2019 at 2:45pm to 3:15. It shows an overview of the materials in the team's possession, current ordering status, the CAD drawings for each system, a list missing parts, and team member hardware responsibilities.

### **Photos of Materials**



*Figure 1. Metal Frame Components for Hood*



*Figure 2. Arduino Board for Transducer*

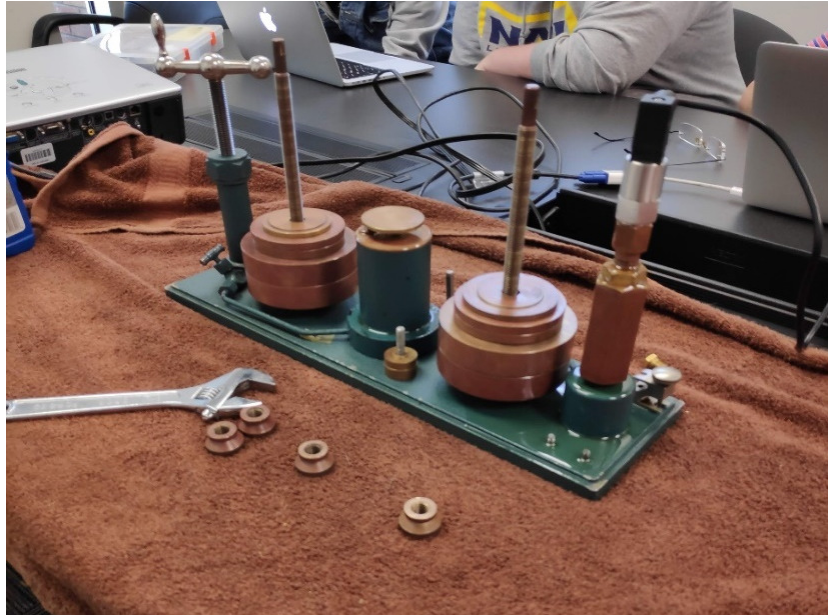


Figure 3. Deadweight for Transducer Calibration



Figure 4. Polycarbonate for Hood



Figure 5. Terra Universal 2' x 4' Fan Filter Unit

## CAD Designs



Figure 6. Room Cad Assembly

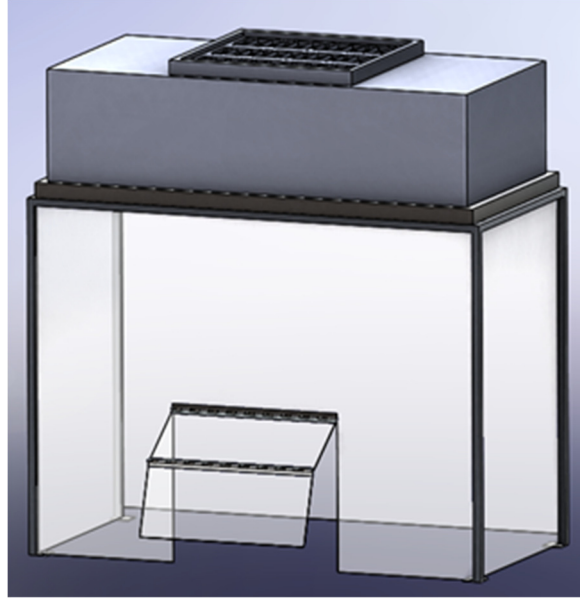


Figure 7. Clean Hood Cad Assembly

**Evidence of Order Parts/Parts Missing**

At this point there are no items ordered. There are 5 remaining hood parts that need to be purchased. The epoxy, magnets, hinges, crews, and rubber lining are the remain parts with the team plans to purchase by February 27, 2019. The deadline to purchase the remaining hood items has been pushed back due to weather conditions. None of the portable room is to be purchased until final quotes are obtained from Mayorga's Welding for the steel frame and Mountain Shine for the powder coat. In Figure 8 below are pricing of square steel tubes: 2"x 1/16", 2"x 1/8", 1 1/2"x 1/8", and 1 1/2"x 1/16" pricing per foot of steel.

QTY.	BILL OF MATERIALS	OFFICE USE ONLY	TIME CLOCK
	1 1/2 x 1/16" 4'	2.01	
	1 1/2 x 1/8" 4'	2.97	
	2 x 1/16" 4'	2.18	
	2 x 1/8" 4'	4.13	

6/16 in 10 ft and 20 ft lengths to cut 95/hour

LABOR \_\_\_\_\_  
SHOP SUPPLIES 5% \_\_\_\_\_  
MATERIAL \_\_\_\_\_  
TAX \_\_\_\_\_  
TOTAL \_\_\_\_\_ TOTAL HOURS \_\_\_\_\_

Figure 8. Mayorga's Welding Quote on Steel Framing (price per foot)



In Figure 9 below everything highlighted yellow are parts that the team still needs to purchase.

Bill of Materials			
Clean Dream Team			
Portable Hood			
Part #	Part Name	Qty	Description
1	Aluminum Frame	6	Hood Frame DONATED -98C
2	Polycarbonate	1	For 3 sheets Material For Hood
3	Epoxy	3	seals the polycarbonate
4	Rubber lining	2	cushions FFU to frame
5	Magnets	1	Holds door
6	Machine Screws	1	tightens hinges
7	Hinges	1	hinges for hood
Total Cost Estimate:			
Portable Room			
Part #	Part Name	Qty	Description
8	Steel Frame	84'	Steel - 60' for 8' sections - 2"x 2"x 3/16" - 24' for 6' sections - 2"x 2"x 3/16"
9	White Powder Coat	1	Powder coat the steel frame
10	Plastic Sheeting Roll	1	Plastic to Wrap Room
11	DuraGrip Brand Adhesi	4	Adhesion for plastic Wrap
12	Steel Joints	16	Joints to support Frame
13	Shear Pins	4	Holds legs in place
14	Heavy Duty Swivel Ca	4	600lb capacity swivel caster wheels - DONATED
Total Cost Estimate:			
Overall Total Estimate:			
Total Budget:			
Remaining Budget:			

*Figure 9. Materials to be Purchased*

## Hardware Responsibilities of Team Members

### Daniel

For most of the hardware that the team has come up with have been mainly implemented by the entire team. Given that we are a small team by comparison to other capstone we rely on working together to accomplish tasks. The team met at 98c to manufacture the 1-inch aluminum square bars needed for the hood. The team mainly separates task when it comes to research, and the different possibilities that we can incorporate in our design. An aspect of the hardware that may come would be to weld the steel frame for the room since students are not allowed to weld aluminum, I will have to wait to weld the room. Another opportunity to do hardware for me is to finish the pressure transducer which I have a basic code and the Arduino to work with but still need to create a code that evaluates two different pressures and compares as to whether a positive pressure occurs.

### Katie Hoffman

Most of the manufacturing of the hood has been completed as a team in 98C, as well as picking up the polycarbonate. When it comes to any research, pricing, and obtaining of certain materials the tasks are delegated evenly between each member. I performed most of the research and choosing of the Fan Filter Unit (FFU), as well as communicate with the client on the purchasing of the FFUs. I have gone to Home Depot, Mayorga's Welding, and called a few other locations in search of framing material for the portable room. I came to find that steel was the best and cheapest option and that Mayorga's may be the best option. The writing is usually split between members and each member is held accountable for completing any writing needed to be done. For future hardware the team plans to manufacture any and all material together as one and evenly delegate all tasks as needed.



**Hannah Reed**

The team completes most task together, like the cutting of the aluminum for the clean hood and retrieving materials. Individually I have completed the research for the polycarbonate, this included finding the correct specifications, property treatments of the plastic, and communicating with Becker to have him order the material. I did the research for the power cords for the fan units and found the correct wire gauge and connection for the cord at the Home Depot. I also did the research for the vinyl sheeting for the clean room and found a dealer online, after physically checking different fabric and hardware stores in town. I have found all the remaining materials needed for the hood at the Home Depot and was planning to purchase them on Thursday the 21, but due to weather conditions it will have to wait till the following week. I am looking to set up a meeting with the shop teacher at Coconino High School to see if they can mill the polycarbonate for the team and inquiring if they can also cut the vinyl for us. Lastly, I did the material count for the steel we are planning to purchase from Mayorga's, finding how many bars of each length the team would need in order to physically build the rooms frame.