

VG100 Fall 2022

Introduction to Engineering

TC Lab2

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Strictly follow the nitty gritty in the template!

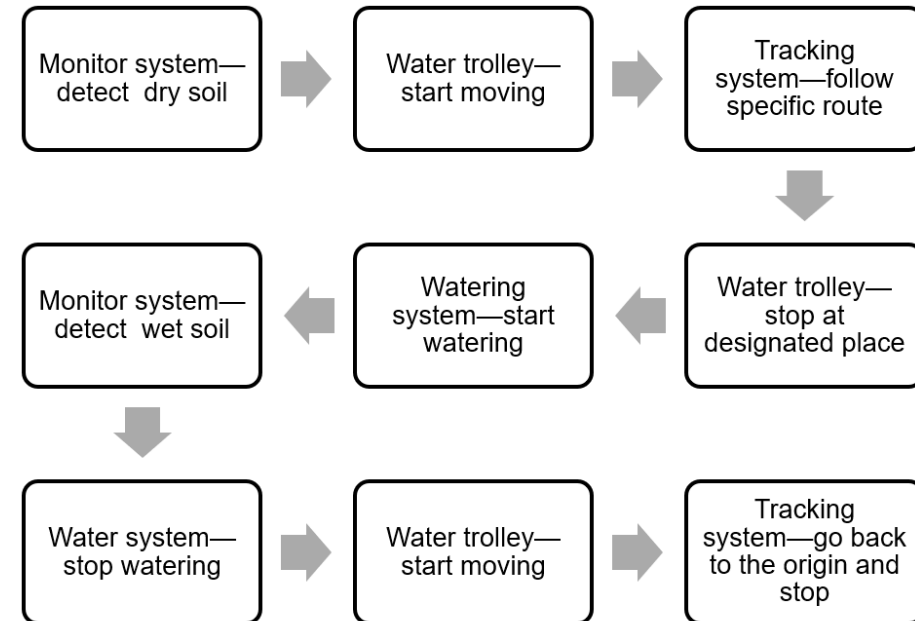
Source: VG100_Project_2_Final Report Template He&Murray

- Recommended to be written **last**
- For audience who will not read the whole report
- One paragraph (without references, bullet points, etc.), approximately 2/3 – 1.5 pages double spaced in length

Problem, Need, Solution



- **Problem:** Why are you designing this prototype? Has it been addressed before? What is the outcome? What impact is the problem causing? etc.
- **Need:** What is needed to be done to solve the problem?
- **Solution:** What did you do to meet the needs? How does your system actually function? How does each part function in detail? How are they actually meeting the needs and solving the problems?



Source: VG100 Group 4_Symposium Presentation

Objectives



- Desired goals and objectives to address the needs/problems
- Key benefits of reaching goals/objectives
- In other words, what in detail your team actually did to try to meet the needs/solve the problems, and the benefits such actions will bring.
- Each objective should be corresponding to one procedure exactly.

Procedures

- Describe in detail the steps you took to build up your prototype. Include all diagrams, photos, and other graphics.
- Testing procedures and statistical data included.
- ✖ **Validation is important**
- You may ask yourself----Can others reproduce or rebuild your product successfully based on the description of steps you introduced? With the validation done, can you prove that your prototype actually works well and is worth putting into use?

Table 4 Parameters of the group of prototypes

Prototypes	Weight	Horizontal deformation under 10N	Largest Vertical Weight
Final prototype	343.5g	5mm	7727g
Prototype A	400g	85mm	2050g
Prototype B	524g	9mm	12346g
Prototype C	333g	100mm	3530g
Prototype D	100g	500mm	1500g
Prototype E	261g	\\collapse	850g

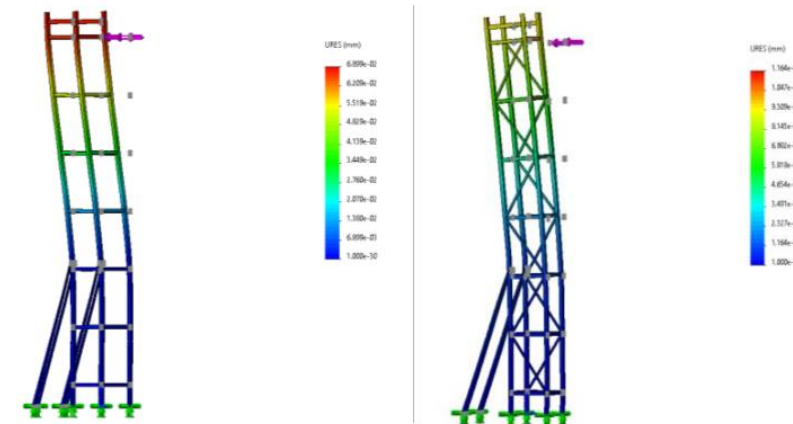


Fig. 7 Deformation with and without diagonal bars.

Source: VG100S2_SU22_Report_Final_Draft_group 4

Discussion



- Think critically. Think about what has been done and what can still be improved.
- If you have additional details considering validation not covered in former parts, you can add it here.

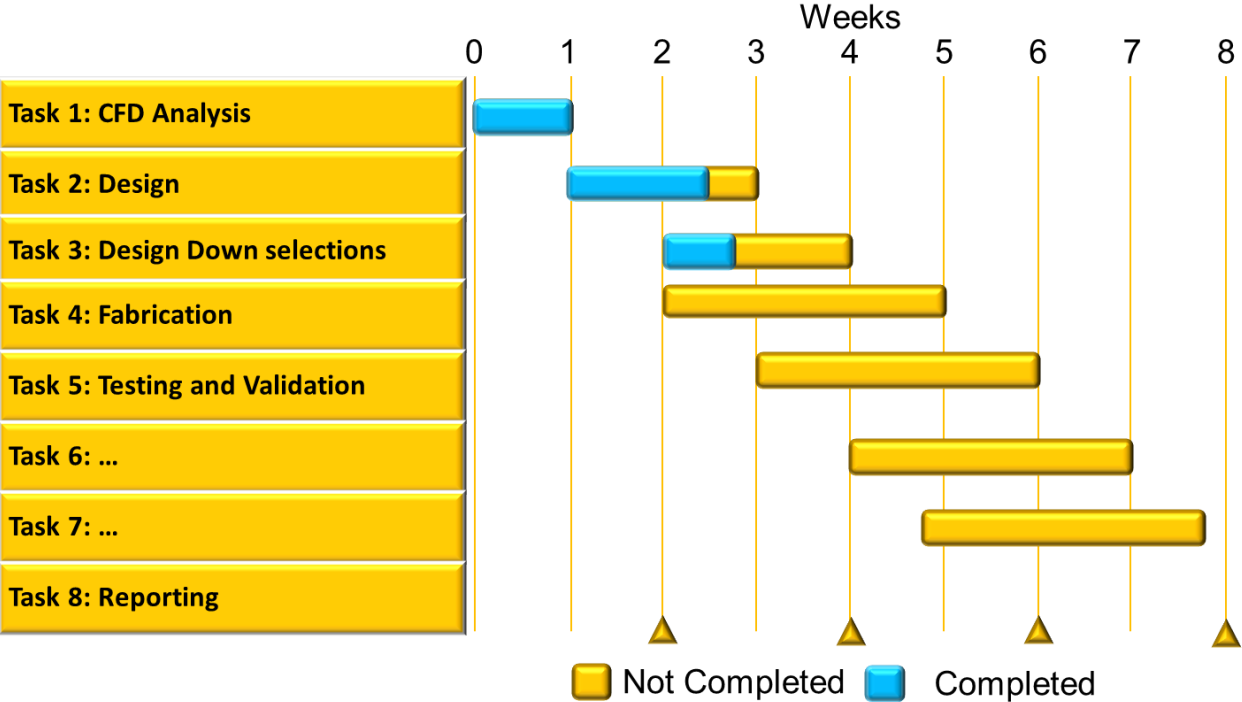
(“Show off” if you can!)

Conclusion



- A summary of your achievement.
- Have your goals been successfully achieved?
- What are the highlights of your prototype?
- How do you achieve those highlights?
- What significance does this design have in our society/on a larger scale?

Schedule, Bill of Materials, Key Personnel



Quantity	Part Description	Purchased From	Part Number	Price (each)
1	OEM Intermediate Exhaust Pipe	Taobao Vendor ¹	3C3Z-6K854-DA	\$173.45
1	24" T304 Stainless Steel SCH40 Pipe	Taobao Vendor ¹	4813K81	\$42.34
	Metal Foam Sections	Porvair Fuel Cell Tech.		\$0.00
1	100 ct. 5/16"x1/4"-20 Set Screw	McMaster-Carr*	90289A534	\$9.77
1	10 ct. 5/16"x1/4"-20 Weld Nut	McMaster-Carr*	90860A110	\$7.68
2	1/2" NPT Half Coupling T304 Stainless Steel	McMaster-Carr*	4464K224	\$1.63
4	Male Connector, 1/8" NPT to 3/16" Tubing	H.E. Lennon	SS-300-1-2	\$5.40
	Deionized Water	University of Michigan		\$0.00
	Polyvinyl Alcohol	University of Michigan		\$0.00
	Aluminum Isopropoxide	University of Michigan		\$0.00
	70% Nitric Acid, 1 lb	University of Michigan		\$0.00
	Aluminum Oxide, 100 g	University of Michigan		\$0.00
1	Dihydrogen Hexachloroplatinate (IV), 5 g	Alfa Aesar**	11051	\$172.00

*<http://www.mcmaster.com>

**<http://www.alfa.com>

¹http://detail.tmall.com/item.htm?spm=a230r.1.14.5.xOd8hS&id=25929604569&ad_id=&am_id=&cm_id=140105335

Total = \$430.10

Source: VG100_Project_2_Final Report Template He&Murray

References



- VG100_Project_2_Final Report Template He&Murray, 2022.
- Bai, Xiaoyan, Sun, Haojia, TC lab4, 2022.
- VG100S2_SU22_Group 4.