

Presentation 1 - Background



ME 476C Kinetic Sculpture 2018-2019
Team 18F02 Kinetic A

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Project Description

- Team is to design and build a kinetic sculpture that will be displayed in the Engineering building. The sculptor must illustrate, as well as describe, at least three engineering principles.
- The project sponsor and client is Dr. Sarah Oman.
- Stakeholders include current and future students and faculty.
- Project Purpose: to provide a physical example of Mechanical Engineering principles in a fun and engaging manner and representing the Mechanical Engineering department in a positive, marketable light.

Background and Benchmarking

- Kinetic art started in 1910's with Jean Tinguely [1]
- Modern kinetic sculptures blossomed and developed in the 1950's [1]

<https://www.youtube.com/watch?v=--O9eyKlubY> - Kinetic Wall Sculpture

- Powered by wind or a motor
- Renown Kinetic Sculpture Artists: David Roy, Clayton Boyer, and Anthony Howe

<https://www.youtube.com/watch?v=RJu5i1SMaiw> - Anthony Howe Octo

Customer and Engineering Requirements

Customer/Sponsor Requirements

- Movable (Can Fit Through Door)
- Cost Effective
- Durable
- Represent Engineering In a Positive Fashion
- Visually Pleasing
- Reliable

Engineering Requirements Were Generated By Attempting to Quantify the Customer Requirements

QFD (House of Quality)

PHASE I QFD	referred (up or down)											
	Specifications											
Customer Weights	Less than 150 lbs											
	Less than 3x3x6											
	Under \$5000											
	Material Strength											
	Material Hardness											
	Corrosion Rate											
	Factor of Safety											
	At Least 3 Principles											
	Operational For 30min W/out Power											
	Least Power Required											
	9/10 People Like											
Design Objectives												
Moveable (Can Fit Through Door)	3.875	9	9					3				
Cost Effective	2.5	3	3	9					1	1		
Durable	2.75	1	1	3	9	3	3					
Represent Engineering Positively	4.25								3	1		3
Visually Pleasing	4								3	1		9
Reliable	4				1	1	1	3		3	3	
ATI	45.125	45.125	30.75	28.75	12.25	12.25	23.625	27.25	22.75	12	48.75	
RTI	15%	15%	10%	9%	4%	4%	8%	9%	7%	4%	16%	
Unit of Measure	lbs	ft ³	\$	kpsi	B	mm/year		min	W	People		
Technical Target												

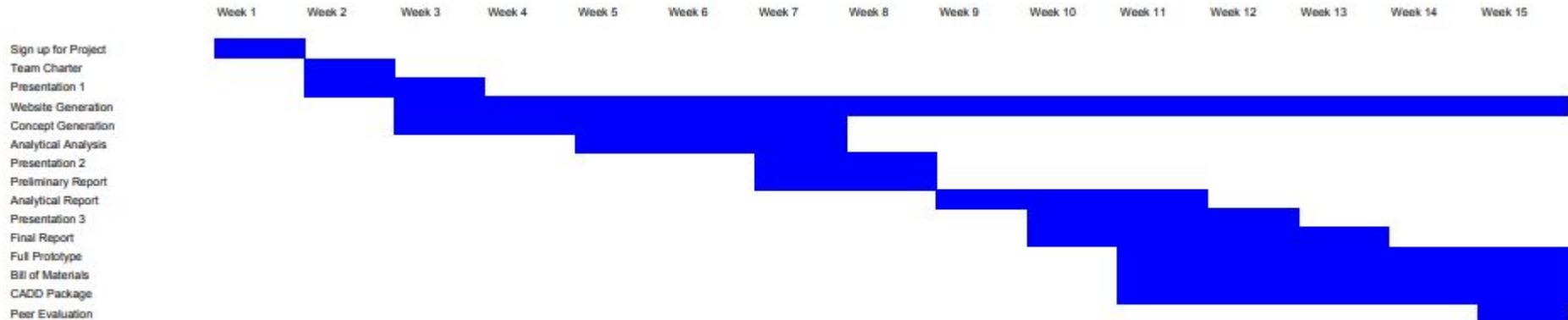
QFD (House of Quality) Roof Matrix

Roof Matrix											
Less than 150 lbs										<i>NO INPUT IN THIS AREA</i>	
Less than 3x3x6	**									** Strong Pos. Correlation	
Under \$5000	*	*								* Positive Correlation	
Material Strength	*	-								No Correlation	
Material Hardness	*	-	*							- Negative Correlation	
Corrosion Rate		*	*	*						-- Strong Neg. Correlation	
Factor of Safety		*	*	*	**						
At Least 3 Principles		*			*						
Operational For 30min W/out Power							-				
Least Power Required							*	-			
9/10 People Like											
PHASE I QFD	referred (up or down)										
	Specifications										
Customer Weights	Less than 150 lbs	Less than 3x3x6	Under \$5000	Material Strength	Material Hardness	Corrosion Rate	Factor of Safety	At Least 3 Principles	Operational For 30min W/out Power	Least Power Required	9/10 People Like

Schedule and Budget

Jonathan Walgren
September 17, 2018
Kinetic Sculpture
Team 18F02 Kinetic A

Budget of \$500-\$5000



References

[1] Intlkineticartevent.org. (2018). *History of Kinetic Art | 2019 International Kinetic Art Exhibit & Symposium*. [online]

Available at: http://intlkineticartevent.org/?page_id=107 [Accessed 12 Sep. 2018].