DESIGN DAY

Title Slide: Design OTT

Welcome all! We are DesignOTT and we are proud to present our erosion testing system.

Slide 1: Motivation - Lauren

Unplanned failure of expensive and large-scale systems can be be costly both in terms of time and money. Our original client, CNL, faced this issue before and has come to this class for innovative solutions. We believe we have met and exceeded their needs when you consider the budget allocated to us.

Safety is the number-one priority for the client and for us as well. We maintained conditions that pose no harm to humans and installed a kill switch to be used in the case of emergencies.

Slide 2: Requirements - Lauren

These requirements are the main 5 of the 13 that were generated by our team and approved by the client. They constitute:

- How the results will be collected for analysis
- The size of the sample
- The rotational velocity of the mechanism
- Durability and robustness for testing without delays
- Water causes erosion but should be minimized in case of leakage and to reduce weight

Slide 3: Critical Elements - Ahmad

Filtration:

Choosing to implement a dual-layer filter was an idea that came from the user benchmarking we did at the beginning of the project. It was determined that the small and large particles resulting from erosion should be analyzed separately. The larger particles will be stopped by the fine metal mesh and the fibrous filter will collect the remainder. When the time for the test has elapsed, the chain will be pulled, removing the plug, and all the water will drain through along with the particles. The water will be stored in a separate compartment but the particles will be caught in the filter. The filter will then be weighed and the initial mass of the filter components subtracted.

Circulation: - Yusra

The selected method of erosion is to use the kinetic energy of water to wear away at the sample. The motor torque is high to keep it rotating the water at a steady speed. The load will be high because the goal is to move as much water around the sample as possible. A high turbulence level while avoiding a vortex will allow maximum forces on the outer surface of the sample during testing.

Temperature control: Gurshaan

Varying the temperature will affect the level of erosion and can be implemented to accelerate the testing or determine the performance in different conditions. By cooling the water, the density is increased, providing more mass per the same volume. As we know, force is proportional to mass, so the cooling process increases the force on the sample.

Compact design: Sendwe

Tinfoil is the insulation for the cooling system rather than styrofoam since it's easily recyclable. The small-scale design uses only the minimum volume of water required: this is a two-fold benefit to the environment. Less water is used per test and the energy needed to cool the water is reduced.

SCHEDULE

Time	Who's Here?
Setup-10	Lauren, Yusra, Ahmad
10-11	Gurshaan, Sendwe
PRESENT 11-11:10	EVERYONE
11:10-11:30	Lauren, Gurshaan, Sendwe
11:30-12	?
12-12:30	?
12:30-1	Lauren
1-2	Lauren, Sendwe
Takedown	Lauren, Sendwe

- Stand still (hands behind back?)
- Look over the audience and at the person who is speaking without being distracting ("waiting to be activated")
- Other teams did not have benchmarking or criteria
- Wear fanciest clothes (seems like we are wearing neutrals: i.e. beige, navy blue, black)
- Rearrange motor slides into only one slide
- 3 & 2 people on each side (walk across if you have the mic)