OEC JUNIOR DESIGN

PRESENTED BY: WAYNE, RYAN, KEVIN, YAJURVA

OUTLINE

1. Design Brief
2. Focus of Design
3. Key Features
4. Thinking Process
5. Sustainability / Costs
6. RoadMap for Success
7. Images/Video Of Design

DESIGN BRIEF

"Move as many objects as possible to and from the craters. Objects must be taken over the raised rim and down on the floor of the crater and vice versa."

"No contact shall be made with the device other than the input(s) after the one-minute demonstration has started. The only contact shall be for strictly UNLOADING and LOADING the weight load in if applicable for the particular component. "

GENERAL IDEA/ FOCUS POINT

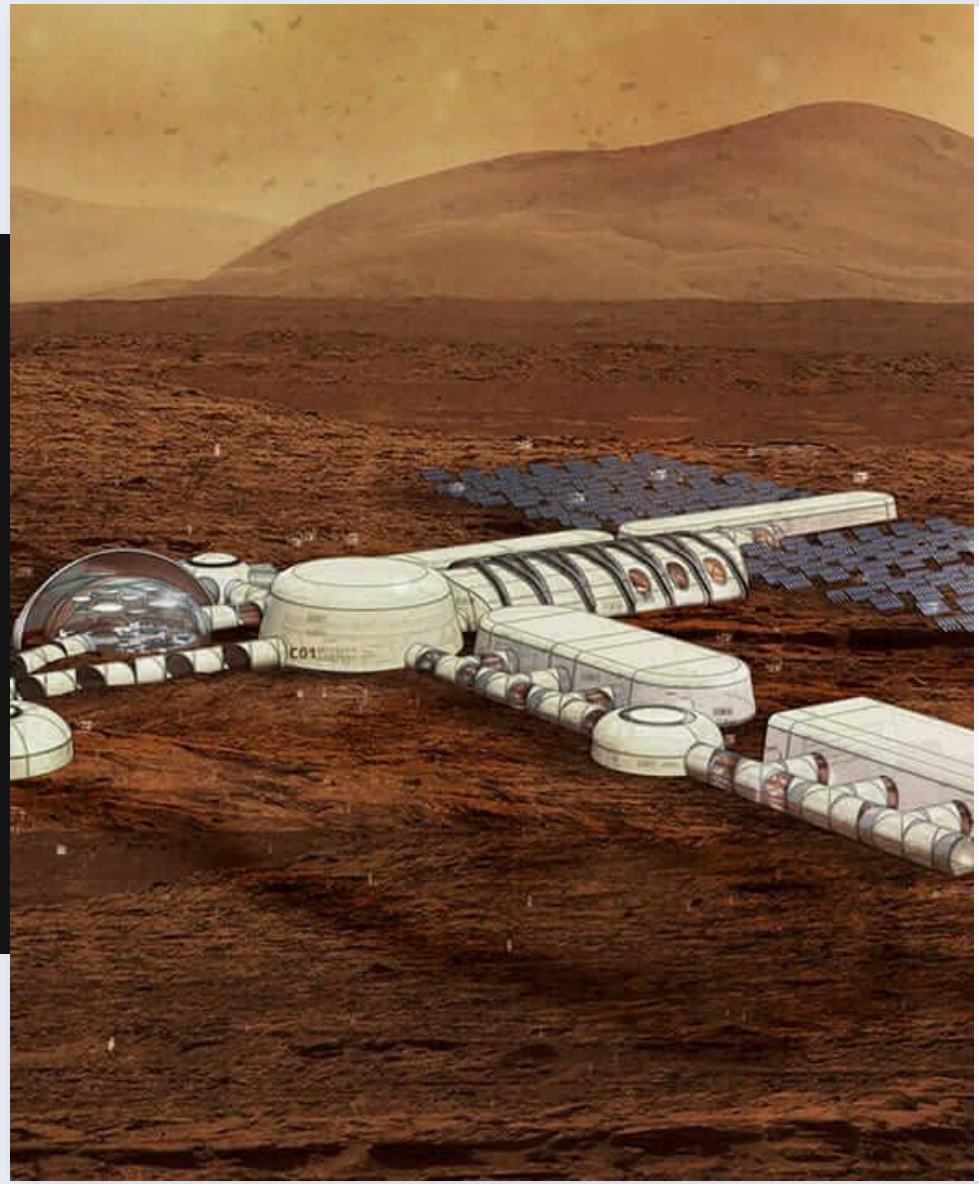
The task given at hand requires two unique solutions for each problem.

Mechanical System used for the Korolev Crater that has a slope of 2 on the inner section and a slope of 1 on the outer slope region.

Hydraulic System used for the Hellas Crater that is almost vertical slope on the inner section.

PROJECT FEATURES

HYDRAULIC VERTICAL LIFT	CONVEYOR BELT TRANSPORTATION
Utilized 2 syringes to allow for upward/lift motion	Created crank using makeshift pulley system using cardboard
Supply Crates lifted using Hydraulics, but Loaded/Unloaded Manually	Belt transports supply crates from outside – inside Korolev Crater using Conveyor



LOGIC BEHIND THE DESIGN

1. Mars is a hostile planet with unknown dangers; therefore, system must design to protect humans from weather/atmospheric conditions
2. We decided to implement a conveyor belt that would utilize industrialized motors to transport materials to and from the bottom of the Korolev Crater.
3. For the Hellas Crater using a conveyor best is out of the question as the motion would be almost 90°.
4. Our inspiration came from the vertical elevators used in warehouses.

https://redshift.autodesk.com/designing-mars-virtual-reality/

FUNCTIONALITY / COSTS

HYDRAULIC LIFT SYSTEM	CONVEYOR BELT
Would utilize metal infrastructure for real world scenarios	Would utilize metal infrastructure, electrical motors for real world scenarios

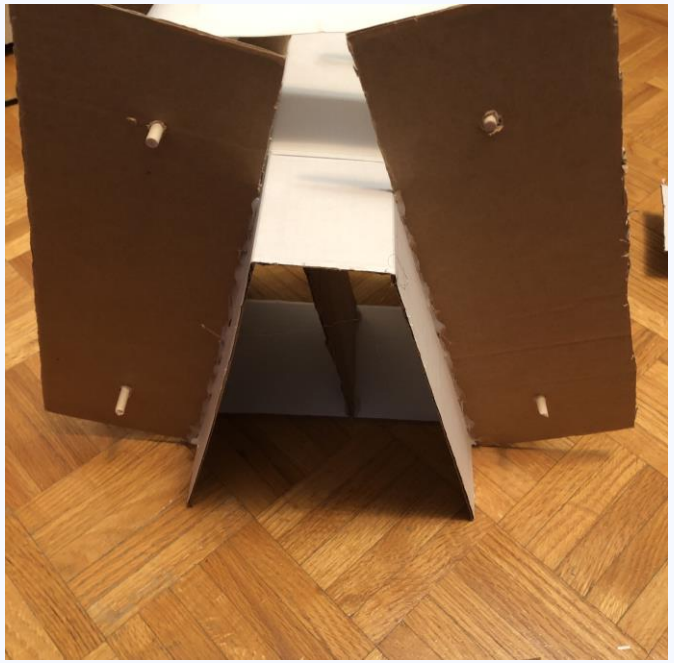
We understand that an expedition to another planet requires millions of dollars to fund, and to optimize the design both cost wise and functionality wise was our priority.

After conducting research, we noticed that Mars has significantly less gravitational force, as a result tall pulley system would be easily ripped apart/damaged.

The vertical elevator lift is designed on the inside wall of Hellas; thus, it is supported by both the wall, metal infrastructure, and harnesses.

Both designs utilize their surrounding environment to their advantage and allow for the system to be constructed in the most sustainable, cheap, and functional ways.

PROJECT IMAGES



CONVEYOR BELT

CONVEYOR TOP VIEW

ELECTRICAL LIFT

VIDEO DEMONSTRATION SLIDE

CLOSING REMARKS