Group Members:

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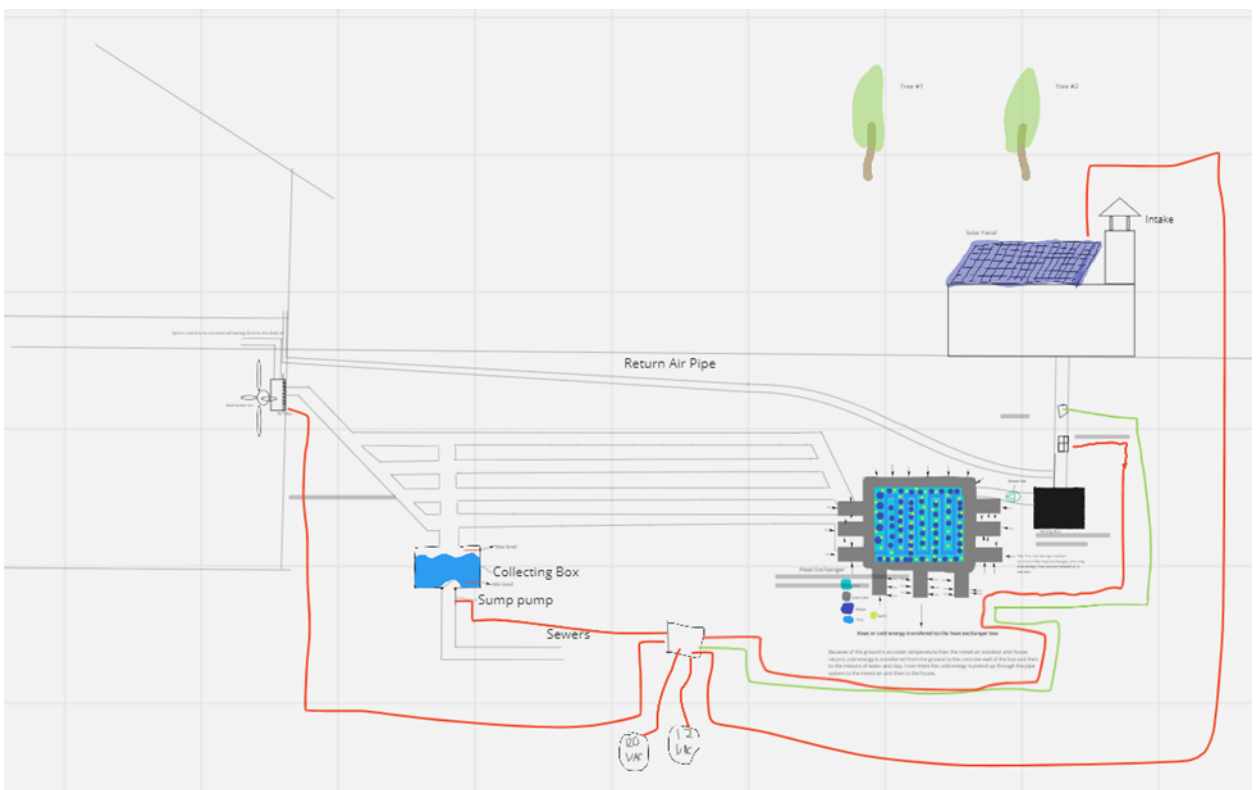
Objective:

Develop project tasks with a schedule view to ensure that your team can complete all three project prototypes from now until the end of the semester and provide an estimation of the costs and the components that will be required for your project. Devise a test plan for your first prototype.

1.0 Detailed Diagram for the Chosen Solution



Link to the full diagram on miro:

https://miro.com/welcomeonboard/RjI4N3JYTjhXdWxmcVQxYTgyYlRFQTVSVjVMd1IzRUs0cTlrSjR3UlFUNG5tbVJEWkRHZFNlOTFKbTlvWkdPaXwzMDc0NDU3MzY2MDMxMTM0OTUz?invite_link_id=482712607596

2.0 Cost of Materials

Please see the spreadsheet

https://docs.google.com/spreadsheets/d/1VB9ZVOpTjB_MHBV5SynNCFETa6jPehzFs2HOb9Wy5cU/edit?usp=sharing

3.0 List of Equipments Needed for the Prototype

Material needed	What the material is needed for
Arduino	System Automation, main interface
Photovoltaic panels	Renewable energy source for the system
Temperature Sensor x2	System automation, detecting outside and inside temperature
Solenoid valve	System automation, closing inlet pipe
12V Battery 10AH or more	System automation, backup power
Inverter 12VDC —> 120VAC	System automation, allows for the blower fans to be operated with renewable energy
120VAC Blower Fan	System
Voltage regulator	System, ensures the voltage coming from the solar panels is useable and increases/decreases voltages if needed
Inverter 120VAC —> 12VDC	System automation, allows the systems to run on “normal” electricity
Sump Pump	System, allows removal of water
Float Switch	System automation, automatically engages and disengages the sump pump

16 AWG wire	System, allows electrical circuits to function
Paper towel rolls	Pipes
Tape	Hold things together
Concrete mix	Concrete mix to build the box
Sand	Storage medium sand to be mixed with clay and water
Water	Storage medium water to be mixed with clay and water
Clay	Storage medium clay to be mixed with clay and water

4.0 Analysis of Potential Risks

Teams must outline a list of the significant project risks and their associated contingency plans to mitigate the critical risks that are reasonably likely, in addition to the task plan update.

As a team, one of the largest risks for us is to go over budget. Our prototype has quite a few components to it. To keep us under budget, we have chosen the cheapest versions of components available online. However, this is also risky as sometimes cheaper products don't do their jobs correctly. To mitigate these risks, we have read online reviews for almost all of the products we hope to purchase for our prototype and ensured that they are generally very positive. This will lessen the risk that the components will be faulty, and therefore lessen the risk of needing to spend more on another component if the first doesn't work.

Another risk is the time constraint. We have an ambitious design, and assembling it will take time, as will ensuring it's functionality. We are aware that we are working on a strict time-line and therefore have opted to work very efficiently. Each team member has agreed to allocate a few hours on top of our regular meeting time and the time we take to complete the deliverables to work on the prototype when the time comes. We are remaining very organized and by now, we have found a solid rhythm and structure that works very well for our team, so we will continue to build on this and we all strongly believe that we will not have any problems finishing our design project on the given timeline.

As the electrical system in our design is complex, this brings up a larger chance of things going wrong. Thankfully, this group consists of four electrical engineering students who work quite well together. Since nothing is ever fail-safe, we are all fairly easy-going and our minds are

not set in stone regarding the electrical system. Although it would be nice to have our electrical system operate the blower fan, the valves and the sump pump, we have all agreed that this is potentially an idealist hope, and that representations of these subsystems are satisfactory, rather than having the subsystems actually work.