



1. Natural Ventilation

The design has a natural ventilation system of cross ventilation and stack ventilation systems implemented within it. This ventilation system maximizes natural air flow within spaces. This is achieved by opening the space and creating an open space area with windows in both directions which allows the air to circulate, furthermore it also has an atrium roof that can be open and allow air in as a stack ventilation system.

2. Rainwater management

Rain water strategy is used to naturally filter the water as it travels through the roof due to the rocks and gravels placed on top of it. It is then collected and stored in a filter system to be reused for hydroponics and urban farming as the main source of usage. It can further be used for alternative functions such as sinks and public w/c.

3. Solar Power strategy

Photovoltaic panels placed on top of the roof which is rotatable to gain maximum solar gain. The energy generated from solar energy is utilized to power the functions of the building by providing a sustainable and renewable form of energy.

4. Thermal heating strategy

Underground thermal heating systems have been placed to generate energy to heat the building. The energy generated is used to heat water up which travels through pipes that has been implemented under each flooring in order for heat to travel within the building.

5. Passive solar gain

The building is south facing which maximizes daylight penetration within the building. One of the materials used is glass which allows sunlight within the building therefore it is one of the essential strategies for hydroponic growth within the building.

The winter sun is 30 degrees and the summer sun is 58 degrees therefore maximum passive gain is essential throughout the seasons for vegetables to grow.

6. Outdoor comfort

Outdoor space designed for micro climate social spaces for communities to gather and unite them as well as have a fresh breeze. It is a social aspect for creating an outdoor space for the community.



Ensure healthy lives and promote well-being for all at all ages



Ensure availability and sustainable management of water and sanitation for all



Ensure access to affordable, reliable, sustainable and modern energy for all



Ensure sustainable consumption and production patterns

PASSIVE HOUSE COMPONENT & PERFORMANCE CRITERIA



THERMAL INSULATION
All opaque surfaces must be sufficiently insulated to achieve U-values of 0.15 W/(m²K) or less.



VENTILATION
A ventilation system with heat recovery (MVHR) circulates fresh, room temperature air through the building.



AIRTIGHTNESS
Air leakage must be less than 0.6 of total house volume, per hour, at 50 Pascals pressure (0.6 ACH or less).



THERMAL BRIDGING ELIMINATED
Detailed planning is required to eliminate thermal bridging wherever possible.