ARCC / CIBSE: Green Infrastructure challenge

Green Infrastructure for Global Recycling Centres

**Design Strategy for Building and Urban Environment**

**The Technology**

In this age of urbanisation, the need to reduce our carbon footprint and adapt to a greener future is more critical than ever. This project is focused on creating green buildings that not only provide comfort and functionality for their occupants but also contribute positively to the environment. The key objectives of this project include:

- **Improved energy efficiency:** through the use of sustainable materials and technologies. For instance, glass roof skylights allow natural light to enter the building, reducing reliance on artificial lighting. This not only reduces energy consumption but also creates a healthier and more enjoyable indoor environment.

- **Enhanced water conservation:** passive solar water heating systems are employed to reduce the need for hot water, thereby conserving energy and reducing the environmental impact of water heating.

- **Increased use of renewable energy:** the building features solar panels to harness solar energy and reduce our dependence on non-renewable energy sources.

- **Enhanced waste management:** composting and recycling systems are installed to reduce waste and promote sustainability.

- **Improved air quality:** the building's design incorporates features such as green roofs and walls to improve indoor air quality and promote health.

- **Enhanced biodiversity:** the use of native plants and the inclusion of green spaces to support local wildlife. This not only enhances the aesthetic appeal of the building but also contributes to the local biodiversity.

**Overview**

- **The Building:** The proposed building is a multi-use facility that includes office spaces, classrooms, and community rooms. The building is designed to be LEED Platinum certified, ensuring its sustainability and energy efficiency.

- **The Idea:** The project aims to create a building that not only meets modern design standards but also integrates with the surrounding environment. This is achieved through the use of natural materials, innovative green technologies, and a focus on sustainability and energy efficiency.

- **The Impact:** The building will have a significant positive impact on the environment and the community, contributing to the creation of a greener future. The project will demonstrate the feasibility of incorporating green technologies into modern architecture, paving the way for similar initiatives in the future.
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**Landscape Strategy**

The building wraps around the green wall and uses podium planters in the vicinity of the main entrance and lower levels of the building. The green wall is located behind the podium level where the glazed facades meet the podium levels. The facade blurs the boundaries between the podium and roof spaces, and provides an alternative to the traditional green wall. The podium planters provide a sense of enclosure and help to reinforce the building’s identity.

**Hydroponic Vertical Farming**

The light levels inside buildings with low glazing ratios present a problem for growing the walls away from South facing windows.

To overcome this, we have installed RedBlue LED clusters in the roof void to boost the available ultra violet light spectrum to the plants required.

The plants are grown in Hydroponic units which can be fitted with edible specimens for consumption by the workforce.

Tending the plants and harvesting the yields brings the therapeutic aspects of Biophilic Design.

**Hydroponic Units**

Plant - a scientists suggested a work-based experiment where some of the planting space was given over to the cultivation of Chlamydomonas, a plant which yields the highest electrical outputs.

Employees could take responsibility for the units making sure current levels of moisture and light were present to effect photosynthesis.

In the process they would learn the workings of the new ground-breaking way to produce electricity, while adding to the vertical farming process.

**Atrium Extension**

To overcome the issue of low light levels caused by the low glazing ratio at the front of the building we have broken out the stairwell voids and installed an atrium which has natural ventilation.

The building is scheduled for further extensions where we see further floors added to accommodate a new intake of staff.

We suggest that both the internal and external treatments of the existing building are extended upwards to the new top floor.