



A Visionary Project- The Oman Youth Hub: Empowering Young Innovators

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ABSTRACT

This paper will specify the main aim for the students to explore the principles of multi-disciplinary design for long span structures, that will emphasize the structural systems, materials, and details for the project size of 4000 – 7000 m² approx. The learning objectives are to enable the students understand the effects of site conditions and the social and cultural context on design. The learner should know how to examine information, define problems, apply the analysis and critical judgement and finally to formulate strategies for action. Students should understand multi-activity space designing. On completion of this paper, one will be able to analyze and integrate the site conditions as well as socio-cultural, climatic context into the design.

Keywords: Architecture Design, Youth innovation center, Space designing, Site-conditions, Sustainable approach.

1. Introduction

The Youth Innovation Nexus represents a forward-thinking initiative that brings together the elements of youth empowerment, technological innovation, and sustainable development in line with Oman's Vision 2040. This dynamic hub serves as a platform for fostering youth creativity, facilitating progress, encouraging collaboration, and promoting cultural enrichment.

Beyond being a mere physical space, the hub serves as a powerful symbol of empowerment for the youth. Through mentorship programs and workshops, it endeavours to empower young individuals by equipping them with the essential skills and knowledge required to excel in a rapidly evolving world.

2. Targets of the project

2.1 Cross disciplinary innovation

Oman Youth Hub offers an optimal environment for multi-disciplinary innovation, encompassing educational classrooms, innovation labs, and collaborative workspaces. Nurture creativity, stimulate critical thinking, and facilitate problem-solving through the facility's innovative design.

2.2 Eco friendly practices

Oman Youth Hub will prioritize environmental responsibility by implementing sustainable design principles and technologies.

2.3 Cultural perspective

In addition to the modern aesthetics, the hub is purposefully designed to respect tradition, fostering an ambiance that showcases the cultural heritage.

2.4 Encouraging community interaction and involvement

The hub strives to establish itself as a dynamic focal point for community involvement, fostering collaboration among young individuals, facilitating the exchange of ideas, and nurturing a sense of belonging.

3. Design pre-requisites

| ROOM | DESCRIPTION |
|---------------------------------------|--|
| Entrance Foyer | Welcoming space with information kiosks, reception, and seating for visitors. |
| Administration and Offices | Administrative offices, meeting rooms, and collaborative workspaces for OYIN staff. |
| Auditorium and Conference Center | Versatile space for conferences, workshops, and lectures with advanced audiovisual facilities. |
| Educational Classrooms | Multiple classrooms with modern teaching aids for programs on technology, innovation, and sustainability. |
| Research and Development Labs | Specialized labs for VR/AR development, sustainable technology research, and innovation prototyping. |
| Interactive Exhibition Area | Showcases interactive exhibits on technology, innovation, and sustainability. |
| Youth Co-Working Spaces | Flexible workspaces for collaboration and innovation, catering to young entrepreneurs and startup teams. |
| Digital Art and Design Studios | Creative spaces equipped with the latest design tools and software for artists and designers. |
| Innovation Auditorium | Multipurpose auditorium equipped with advanced audiovisual technologies. |
| Outdoor Recreation and Relaxation | Open-air spaces with recreational amenities, encouraging a balance between work and leisure. |
| Cafe and Networking Lounge | Vibrant cafe and lounge area providing a casual setting for networking, discussions, and social gatherings. |
| Youth Empowerment Center | Dedicated center offering mentorship programs, workshops, and resources to empower young individuals. |
| Tech Playground for Children | Specially designed area for children to explore technology in a playful and educational manner. |
| Illness and Meditation Room | Relaxing space for mindfulness and relaxation, equipped with YR-enhanced meditation facilities. |
| Community Garden | Outdoor green space for community gardening activities and learning about sustainable practices. |
| Tech Recycling Center | Dedicated area for recycling and repurposing electronic waste, emphasizing responsible technology consumption. |
| Energy Hub | Centralized hub showcasing renewable energy sources and providing information on sustainable energy practices. |
| Toilets and Washrooms | Strategically located throughout the facility for the convenience of visitors and occupants. |
| Prayer Halls (Separate for Men/Women) | Dedicated prayer spaces for religious practices, respecting cultural and religious diversity. |
| Circulation Areas and Corridors | Wide, well-designed corridors providing easy navigation and fostering chance encounters. |

4. Probable proposed location

Knowledge Oasis Muscat area is well connected to the major roads and is easily accessible from different parts of Muscat, providing convenience for visitors and occupants. Also, it is known for its modern infrastructure including office spaces, research facilities and technology-oriented environments. It already hosts several tech companies and startups.

5. Location co-ordinates - 23°34'22"N - 58°09'30"E



Fig. 1 - Location of the site has been taken from Google map.

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7. Conceptual derivation

The project is based on the philosophical principle that places great significance on individuals and their active participation. Its purpose is to cater to the needs of young people, symbolizing a time of discovery and personal development. The floral design serves as a representation of this phase, with the youth symbolizing the community. The organic structure of the flower will harmoniously blend with the environment, mirroring its inherent geometric patterns.

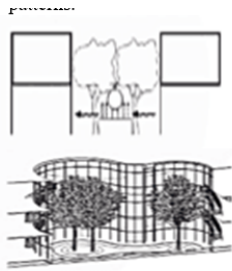


Fig. 2 - Conceptual Schemas prepared by author.

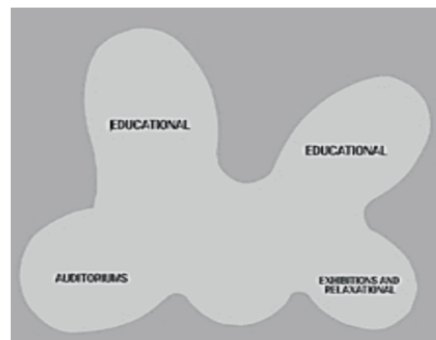


Fig. 3 - Conceptual Framework prepared by author.

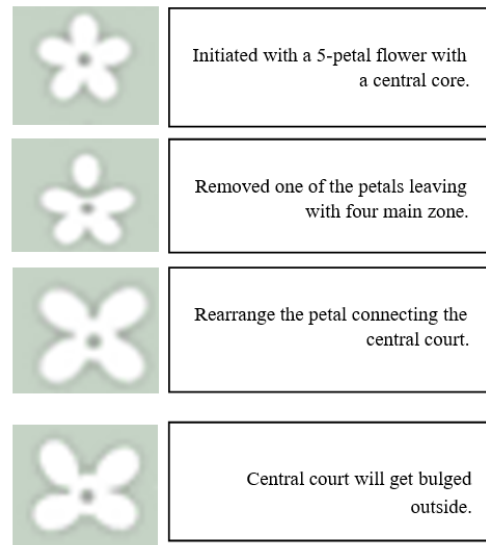


Fig.4 - Conceptual Development prepared by author

8. Thoughtful approach to a sustainable future

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8.1 Passive cooling system

The addition of diverse water features is essential in the development of an evaporative cooling system.

8.2 Courtyard

To infuse the interiors of the building with natural light, it is imperative to incorporate a central courtyard.

8.3 Green wall

To mitigate heat infiltration, consider integrating a vertical wall with climbers on the main southern side of the building.

8.4 Energy generation

The addition of solar panels facing the south side of the building and the integration of wind turbines can enhance the building's energy efficiency through the utilization of renewable energy.

8.5 Grey water usage

Through recycling, the water originating from the sinks and laboratories becomes suitable for irrigation and can also be utilized in the fountain.

8.6 Overhanging roofs

It forms shaded spots for the entryways and the pathway beside the building.

8.7 Native landscaping and strategic plantation

It contributes to cooling down the temperature, directing the airflow, and offering shade to the vicinity.

8.8 Misting system

The process involves spraying water droplets in an evaporative cooling system, causing them to evaporate quickly and cool down the temperature, thus creating a comfortable environment.

8.9 Shading devices

Shading devices are selectively integrated in areas where necessary, especially on the southern side, to minimize the impact of uncomfortable and energy- draining direct light.

8.10 Natural lighting

Incorporating skylights on the shell roof served the dual purpose of enhancing aesthetics and supporting sustainability efforts.



Fig.5 – Ground floor plan prepared by author

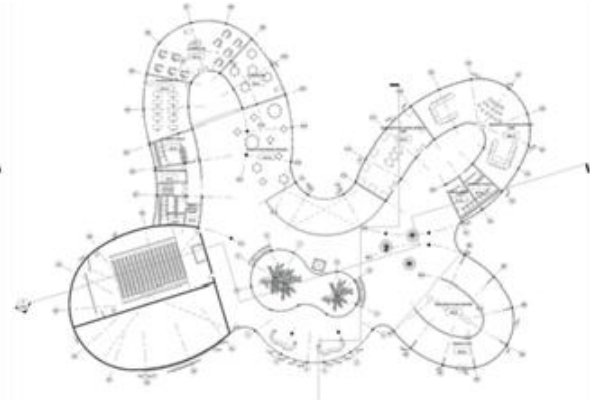


Fig.6 – First floor plan prepared by author

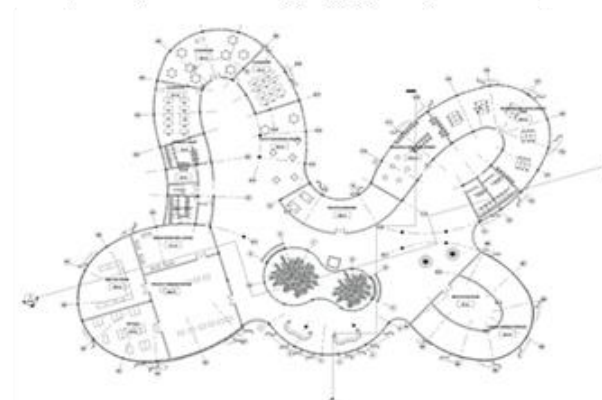


Fig.7 – Second floor plan prepared by author

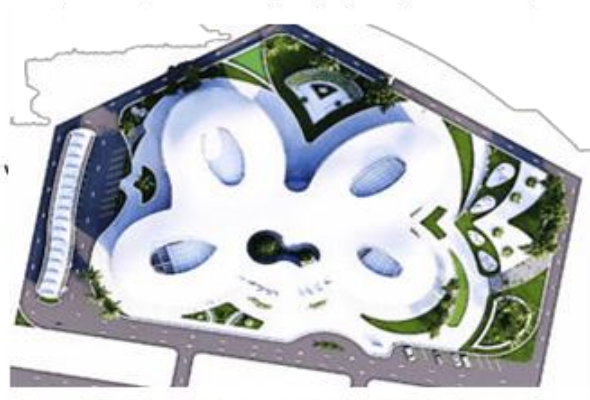


Fig.8 - Site Plan prepared by Lama (author) showing some of the

9. Conclusion

We would like to conclude with some of the structural elements.

9.1 Shell roof

The addition of Fiberglass Reinforced Plastic is warranted as it possesses the desirable qualities of being lightweight, sturdy, and corrosion resistant.

9.2 Shear wall

The auditoriums are designed without columns to ensure proper distribution of seating and spaces.

9.3 Columns

Most columns are installed within 7 meters, with wider columns utilized when fewer columns are required to alleviate pressure on other areas. Rectangular columns are employed within walls, while circular columns are utilized in open areas.



Fig.9 – 3-Dimensional view of the site prepared by Lama

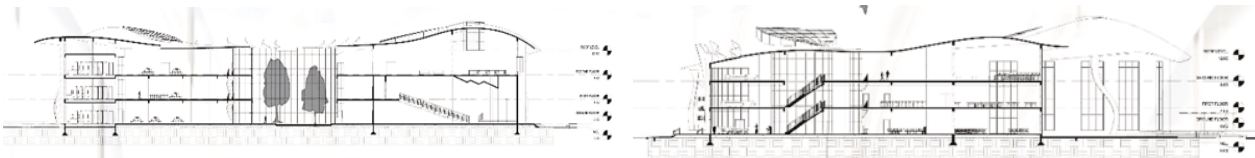


Fig.10 – Sections prepared by Lama, through site showing all the level differences



Fig.11 – Elevations of the site prepared by Lama

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