



DESIGN IDEALS

Volume 8 | Issue 1 | 2026

PREFACE

Assalamu'alaikum wrt. wbt.

Dear worthy readers.

Wholehearted welcome and thanks to all for taking the time to read and review our first issue of the year 2026, the Design Ideals Journal (DIJ). In the previous issue 2 of Volume 7, 2025, the publication presented twelve (12) papers pertaining to the built environments. As for this issue, eleven (11) papers from our faculty and students that focus on the fields of Architecture, Planning, Landscape Architecture, Quantity Surveying, Building Technology Engineering, and Applied Arts and Design are presented for your construing. As pledged, it is our commitment to constantly creating a journal unambiguously dedicated to a well-thought of KAED community. As such, the principal aim of the Design Ideals Journalist to provide a platform for the students, lecturers and practitioners to extend their practical trust for nurturing the readers, be it general, students or professionals alike.

The journal offers an opportunity for researchers, research students and practitioners to share their views on either theoretical or empirical research findings and readers, especially academics and students to indulge and value its contents. We welcome the research reports and academic papers, short practice notes, design reviews and abstracts from portfolios and design theses on any aspects within the areas related to the built environment. With the production of this issue, we accomplish to publish the first of the two issues as our pledge for a biannual production in the year 2026. We hope to publish more issues in coming years. As usual, we humbly anticipate getting inspiring feedback from readers.

Lastly, I would like to thank the entire publication team, KAED and IIUM in general who had supported and give their commitment in completing the publication for this issue. To all the readers, I wish all a joyful reading and indefatigable support in our publication efforts. Thankyou.

Editor-in-Chief

EDITORIAL

Assalamu'alaikumwarahmatullahiwabarakatuh

As in the previous issue 2 of Volume 7, 2025, the publication presented twelve (12) papers addressing numerous subjects, challenges and solutions in the form of design concepts pertaining to the built environments. In this first issue of Volume 8, 2026, the publication presented eleven (11) papers dedicated to case studies comprising academicians, final year studio projects and the design thesis of the students guided and supervised by the lecturers.

The first paper is Translating Tai Chi Movements into Conceptual Interior Elements: A Design Application in an All-Female Martial Arts Academy by Sarah Sophia Safaraz, Arita Hanim Awang, Norzalifa Zainal Abidin and Raja Intan Suhaylah Raja Abdul Rahman. This paper explores the translation of *Tai Chi* movements into conceptual interior design elements, positioning movement as a generator of spatial form and experience. The design application is demonstrated through an all-female martial arts academy in Kuala Lumpur, serving as a contextual framework for testing the proposed approach. The findings reveal that Tai Chi movement principles such as flow, continuity, balance, and rhythm can be translated into curvilinear forms, spatial zoning strategies, and interior elements that enhance user experiences both physically and psychologically. The study contributes a conceptual framework for integrating movement-based abstraction into interior design processes, offering an alternative approach to generating spatial narratives beyond conventional stylistic references.

The second paper entitled Understanding Toddler Play Behaviour and Developmental Gains in Montessori Toy Interaction by Aishah Maisarah Mohd Zazali, Arita Hanim Awang, Julaila Abdul Rahman, Fadzli Irwan Bahrudin and Raja Intan Suhaylah Raja Abdul Rahman. The project examines the developmental needs of toddlers aged 1 to 4 years, with a focus on fine motor skill development through Montessori-inspired toys. The aim is to design a multifunctional product that supports children's growth while aligning with the values of parents and caregivers who seek safe, educational, and screen-free play experiences. Ultimately, the project presents a multifunctional toy design that promotes creativity, motor skills, and ethical design practices, thereby supporting the development of early childhood.

As for the third paper by Muhammad Arsyad Irsyaduddin Sarbini, Mohd Fairullazi Ayob, Khairul Syifa' Ramlee, Fatin Hazirah Rezuwan, Nurul Ain Shariful Ruzi, 'Ainan Nur 'Iffah Abd Hamid, Saiful Imran Saiful Nizam, Sufian Hamat, Julaila Abdul Rahman, Asiah Abdul Rahim, Masidah Abdul Majid, Raja Intan Suhaylah Raja Abdul Rahman, Nur Ulfah Awatif Umairah Alias, Roziha Che Haron and Siti Noorfairus Che Abdullah entitled Salingkait: Enhancement Project of Courtyard in KAED, IIUM. The KAED Courtyards, located within the Faculty of Architecture and Environmental Design, serve as essential outdoor areas for academic, social, and recreational activities. However, the existing courtyards face issues of limited functionality, lack of comfort, and underutilisation, which this initiative seeks to reconfigure Courtyards A and B into inclusive, polyvalent environments. The project aims to upgrade Courtyard A and Courtyard B of KAED into inclusive, multifunctional environments that encourage interaction, relaxation, and creative engagement among students, staff, and visitors. The outcomes are design proposals that emphasise environmental comfort, multifunctional use, and opportunities for income generation. Ultimately, this initiative seeks to transform the KAED Courtyards into dynamic, sustainable, and engaging hubs that enrich both academic and social experiences within the KAED community.

EDITORIAL

The fourth paper by Muhammad Qalis Naif Mohd Najib, Putri Haryati Ibrahim and Zainul Mukrim Baharuddin entitled *Therapeutic Landscape Design for Social Repair: Revitalizing The Sungai Buloh Leprosarium*. This study repositions the Sungai Buloh Leprosarium into an environment for potential social restoration through the lens of the therapeutic landscape theory, biophilic design principles, and human settlements development history. The research examines how spatial, environmental, and symbolic dimensions of the site may contribute to psychosocial healing and community reintegration. The first phase of the research presented in the paper will enable the subsequent phase to translate these strategies into a landscape master plan proposal. By framing landscape architecture as a form of social repair, this study contributes to design discourse on how historically stigmatised healthcare sites can be reimagined as resilient, healing environments grounded in human rights and collective memory.

The fifth paper entitled *Sponge Park as Flood-Resilient Landscape at Bertam Lake, Kepala Batas, Pulau Pinang* by Lukman Hakim Mohd Rizal, Mazlina Mansor, Mohd Ramzi Mohd Hussain, Izawati Tukiman and Zainul Mukrim Baharuddin. The research explores flood-resilient landscapes and the sponge city concept to address Malaysia's increasing urban flood risks due to climate change and rapid urbanisation. Through the incorporation of blue-green infrastructure (BGI) and nature-based solutions (NBS) into urban design, this project investigates how sponge city concepts can alleviate these challenges. Results indicate that the sponge city concept provides strategies for a flood-resilient landscape thus promotes urban livability, sustain biodiversity and increase flood resistance to Bertam Lake park. The research emphasizes that it is important for adaptive flood management techniques to be practiced to promote resilient and sustainable communities in Malaysia's urban landscapes.

The sixth paper by Sumayyah Binti Norisham, Masidah Abdul Majid, Raja Intan Suhaylah, Roziha Che Haron, Siti Noorfairus Che Abdullah and Nur Ulfah Awatif Umairah Alias entitled *Kampung Kita: Reinterpreting Kampung Spirit in Pocket Public Spaces for University Communities*. The beautification of Laman KAED at the International Islamic University Malaysia (IIUM) aims to enhance the quality of the faculty's outdoor environment through the integration of landscape design, cultural identity, and sustainable design principles. Conceived as a multifunctional public space, the project supports learning activities, relaxation, social interaction, and community engagement. Through the incorporation of vernacular references, passive environmental strategies, and community-oriented spatial planning, the project aspires to enrich user experience while demonstrating IIUM's commitment to holistic and value-driven educational spaces.

The seventh paper entitled *ILMSCAPE: Enhancement Project of Laman KAED in Kulliyah of Architecture and Environmental Design, IIUM as The "Garden of Knowledge and Virtue"* by Farah Nadia Abd Jalil, Masidah Abdul Majid, Roziha Che Haron, Nur Ulfah Awatif Umairah Alias, Raja Intan Suhaylah Raja Abdul Rahman and Siti Noorfairus Che Abdullah. Laman KAED holds strong potential as a significant academic and social hub. However, the space is currently underutilised due to limited facilities and minimal multifunctional features, which reduces its impact on community engagement and faculty identity. The project therefore aims to enhance Laman KAED's visibility, accessibility, and usability, encouraging increased interaction among students, staff, and visitors. Central to this enhancement is the introduction of ilmu spaces, outdoor settings that embrace comfort, creativity, and continuous learning while reflecting KAED's academic culture. The enhancement focuses on aesthetic improvement, flexible event areas, shading and landscaping improvements, and sustainable design integration. Additionally, it supports KAED's long-term vision of self-sustainability by introducing opportunities for rental-based activities and events, thereby strengthening both the faculty's image and its role as a cultural and academic landmark.

EDITORIAL

The eighth paper entitled Enhancement Project of Laman KAED Space Functionality Through The Concept of Tuma'ninah by Zahlia Maethilda Zulkarnain, Siti Noorfairus Che Abdullah, Masidah Abdul Majid, Raja Intan Suhaylah Raja Abdul Rahman, Roziha Che Haron and Nur Ulfah Awatif Umairah Alias. Laman KAED forms an integral part of the spatial identity and communal character of the Kulliyyah of Architecture and Environmental Design (KAED) at the International Islamic University Malaysia (IIUM). Nevertheless, several areas within the courtyard remain underutilised and lack functional integration within students' daily academic and social activities. This study therefore explores strategies to enhance the functionality and usability of Laman KAED in order to transform it into a vibrant, inclusive, and purposeful environment. The findings are expected to inform design interventions that encourage a sense of tuma'ninah tranquility, serenity, and emotional balance while simultaneously strengthening the role of the courtyard as an active communal hub within the campus environment.

The ninth paper by Muhammad Alif Mohd Hisham, Raja Intan Suhaylah Raja Abdul Rahman, Roziha Che Haron, Nur Ulfah Awatif Umairah Alias, Masidah Abdul Majid and Siti Noorfairus Che Abdullah entitled Reviving Souls: Enhancing Laman KAED as Communal Public Spaces in University. The study aims to revive and revitalize Laman KAED at the Kulliyyah of Architecture and Environmental Design (KAED), International Islamic University Malaysia (IIUM), transforming it into a vibrant hub that promotes interaction, creativity, and spiritual grounding. Laman KAED serves as a reflection of KAED's identity, embodying the harmony between nature, humanity, and divine principles while supporting academic and social development. The design emphasizes inclusivity, sustainability, and Shariah compliance. The proposed interventions seek to create a multifunctional, aesthetically pleasing, and meaningful environment. Finally, this initiative aspires to establish Laman KAED as an iconic landmark that represents the Kulliyyah's architectural excellence while nurturing a sense of belonging and community.

The tenth paper by Hidayatul Husna Huzailing, Asiah Abdul Rahim, Mohd. Fairullazi Ayob, Sufian Hamat and Julaila Abdul Rahman entitled A Space of Engagement: Proposing Enhancement of Courtyards in Kulliyyah of Architecture and Environmental Design, IIUM. The proposed enhancement of the KAED Courtyards at the Kulliyyah of Architecture and Environmental Design (IIUM) focuses on transforming underutilized outdoor areas into meaningful and engaging spaces for the campus community. The objectives are to strengthen the identity of KAED, create inclusive gathering spaces, maximize the use of open areas, and promote environmentally responsive design. The proposal emphasizes multifunctionality, sustainability, and community engagement, envisioning the courtyards as vibrant and adaptable hubs that support academic, social, and cultural activities while contributing to the long-term sustainability of the faculty.

The eleventh paper entitled The Overflow: Revitalization of Courtyards in KAED, IIUM Through The Concept of Oasis by Trisyia Nadhirah Suhaimi, Masidah Abdul Majid, Julaila Abdul Rahman, Sufian Hamat, Asiah Abdul Rahim and Fairullazi Ayob. The courtyards within the Kulliyyah of Architecture and Environmental Design (KAED), IIUM, have strong potential to enhance campus life but remain underutilised due to thermal discomfort, limited shading, and poor functionality. The Overflow: Oasis project aims to transform these spaces into comfortable and vibrant environments that support wellness, social interaction, and the identity of KAED. The proposal introduces two courtyard concepts: the Tranquility Oasis, a pocket garden for rest and reflection, and the Wellness Oasis, an outdoor activity and community space. Overall, the project demonstrates how neglected courtyards can be revitalised into sustainable, inclusive, and meaningful environments that promote well-being within the academic setting.

Prof. Dato' Sri Ar. Dr. Asiah Abdul Rahim
Editor-in-Chief
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01

TRANSLATING TAI CHI MOVEMENTS INTO CONCEPTUAL INTERIOR ELEMENTS: A DESIGN APPLICATION IN AN ALL-FEMALE MARTIAL ARTS ACADEMY

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ABSTRACT

This paper explores the translation of *Tai Chi* movements into conceptual interior design elements, positioning movement as a generator of spatial form and experience. While martial arts facilities are commonly designed based on functional and cultural references, the systematic transformation of bodily movement into interior spatial language remains underexplored. This study adopts a design-based approach in which Tai Chi movements are observed, abstracted into directional diagrams, and developed into conceptual models that inform spatial organisation and interior articulation. The design application is demonstrated through an all-female martial arts academy in Kuala Lumpur, serving as a contextual framework for testing the proposed approach. The findings reveal that Tai Chi movement principles such as flow, continuity, balance, and rhythm can be translated into curvilinear forms, spatial zoning strategies, and interior elements that enhance user experiences both physically and psychologically. The study contributes a conceptual framework for integrating movement-based abstraction into interior design processes, offering an alternative approach to generating spatial narratives beyond conventional stylistic references.

Keywords: Malaysian Female, Martial Arts and Self-Defence, Martial Arts Academy Design, Female Physiological Needs, Female Psychological Needs

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Females account for more than half of the Malaysian population. Unfortunately, gender discrimination, injustice, violence, and abuse have been estimated to affect up to 35 percent of the female population. In Malaysia, the current female population suffers numerous gender-related issues every day. The issues the Malaysian female population commonly face show the importance of self-defense for females of all ages. Children, teenagers, women, and the elderly who have been through traumatic experiences must be educated about how self-defense could positively affect them. The most famous and, inarguably, the best form of self-defense is martial arts. By learning martial arts, those who have been the target and victim of different types of violence and assaults must know that self-defense is highly important since it will allow them to fight against any attacker. With some martial arts training, those in the female community can learn techniques to help defend themselves and escape dangerous situations. Martial arts are also a great way to help them with their mental and emotional well-being by means of reducing stress and anxiety. Furthermore, martial arts training aids in improving physical health and strength, and gives the trainees a sense of empowerment and a confidence boost.

While the project is situated within the context of an all-female martial arts academy, the primary contribution of this paper lies in the conceptual design process rather than the building typology itself. Specifically, the study investigates how *Tai Chi* movements can be systematically translated into interior design elements and spatial flow. The academy serves as an application setting to demonstrate and evaluate this movement-based conceptual approach.

INTRODUCTION

Martial arts is an ancient form of combat consisting of various methods and techniques for fighting, defending oneself, and attacking. It encompasses physical, mental, and spiritual disciplines that help practitioners develop strength and skill. This academy is designed solely for the female community in Malaysia. As concerns surrounding female safety increase, it becomes increasingly important for girls and women of all ages to practice martial arts for self-defence purposes. Hence, academy is designed as a safe space where the Malaysian female community can practice martial arts in an all-female environment. The academy also caters to a female community and well-being centre. This project focuses on designing a brand new all-female martial arts academy for an existing martial arts centre known as SheFights Gym.

PROBLEM STATEMENT

Despite the increasing interest in concept-driven interior design, many projects rely on symbolic or stylistic references without clearly articulating how abstract ideas are translated into spatial form. In particular, the use of bodily movement as a conceptual generator remains insufficiently structured within design methodology. This study addresses this gap by proposing a systematic process for translating Tai Chi movements into interior spatial elements.

RESEARCH OBJECTIVES

This study aims to explore the potential of Tai Chi movements as a conceptual generator in interior design. The research objectives are as follows:

1. To analyse Tai Chi movement characteristics and translate them into abstract directional and conceptual design diagrams.
2. To develop a movement-to-space translation process that informs interior form, spatial flow, and design articulation.
3. To demonstrate the application of movement-based concepts within an interior design context, focusing on spatial experience and user well-being.

These objectives position the study within a conceptual design research framework rather than a purely project-based development.

METHODOLOGY

MOVEMENT-TO-SPACE TRANSLATION

This study adopts a design-based research approach focusing on the translation of Tai Chi movements into interior design elements. The process is structured into four stages:

Stage 1: Movement Observation

Tai Chi poses and sequences were analysed to identify key characteristics such as balance, rhythm, continuity, and directional flow.

Stage 2: Graphic Abstraction

The observed movements were simplified into directional diagrams using arrows and flow lines to represent motion and transitions.

Stage 3: Conceptual Modelling

The abstracted diagrams were transformed into three-dimensional conceptual models, exploring form, intersection, and spatial relationships.

Stage 4: Spatial Translation

The conceptual models were applied to interior design elements, including spatial zoning, circulation flow, ceiling articulation, partitions, and feature elements within the selected design context.

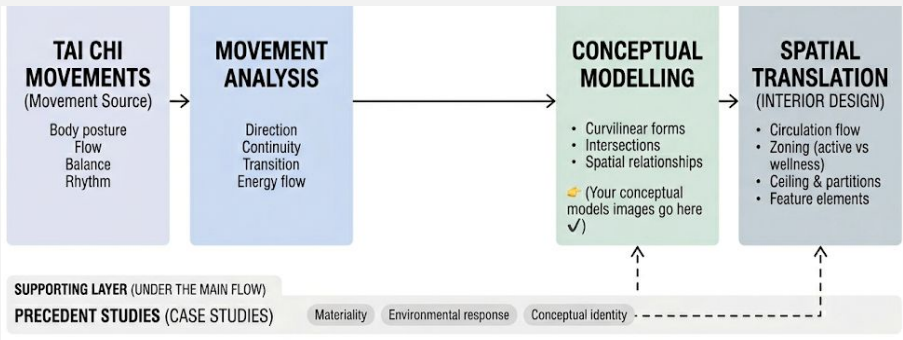


Figure 1: Conceptual Framework for Translating Tai Chi Movements into Interior Design Elements.
(Source: Author, 2025)

The framework (Figure 1) illustrates the process of translating Tai Chi movements into interior design elements, beginning with movement analysis and abstraction, followed by conceptual modelling and spatial translation. Precedent studies support the process by informing materiality, environmental response, and conceptual articulation.

As illustrated, the design process integrates both movement-based abstraction and precedent study analysis to ensure that the conceptual development is systematically translated into spatial design outcomes.

PRECEDENT STUDY ANALYSIS

In addition to the movement-based conceptual exploration, this study incorporates precedent analysis as a supporting method to inform the design translation process. The selected case studies are Hagius Sports Studio, Dojo Saigon, and Épinay-sur-Seine Dojo which were analysed to extract relevant design strategies related to materiality, spatial organisation, and conceptual expression in martial arts environments.

Rather than serving as direct stylistic references, these precedents function as comparative frameworks that support the interpretation and application of Tai Chi-derived concepts. Each case study contributes to a specific aspect of the design development process:

- **Materiality and haptic experience** (Hagius Sports Studio)
- **Environmental response and spatial orientation** (Dojo Saigon)
- **Conceptual identity and cultural expression** (Épinay-sur-Seine Dojo)

The integration of precedent study analysis with movement-based abstraction establishes a dual-layered design methodology that bridges conceptual exploration and spatial application. While Tai Chi movements act as the primary conceptual generator, the precedent studies provide critical references for materiality, spatial organisation, and environmental response. This combined approach ensures that the translation process is not merely symbolic but systematically grounded in both theoretical abstraction and practical design strategies, resulting in a coherent and contextually responsive interior outcome.

The insights derived from these analyses are integrated into the movement-to-space translation process, ensuring that the conceptual design is grounded in both theoretical abstraction and practical spatial strategies.

1. HAGIUS SPORTS STUDIO



Figure 2: HAGIUS SPORTS STUDIO
(Source: archdaily.com, 2023)

- Architects: Gonzalez Haase Architects
- Area: 600 m²
- Year: 2021
- Address: Torstraße 105, 10119 Berlin, Germany
- Working with unfinished, raw materials like untreated aluminium, maple, granite, linen and burlap, the textured materiality and overall palette provide a wholly haptic experience to highlight the physical nature of the venue.

2. DOJO SAIGON



Figure 3: Dojo Saigon
(Source: archdaily.com, 2023)

- Architects: T3 ARCHITECTS
- Area: 80 m²
- Year: 2020
- Address: Ho Chi Minh City, Vietnam
- T3 placed the Dojo correctly in the garden using the existing Villa to be protected and right-oriented to avoid the main heavy rains/winds and designing the openings accordingly. As the building is air-conditioned, the Dojo is built with full insulation in its walls, double glazing in all the openings and rice husk insulation for the roof, which is an ecological and affordable material. Thanks to all of this, the building has high-level energy efficiency providing low-energy consumption to the client.

3. ÉPINAY-SUR-SEINE DOJO



Figure 4: Épinay-sur-Seine Dojo
(Source: 88designbox.com, 2023)

- Architects: Nomade Architectes
- Area: 750 square metres
- Year: 2018
- Address: Épinay-sur-Seine, France
- Nomade Architectes constructed the Épinay-sur-Seine Dojo for the municipal council of Épinay-sur-Seine, France. The Dojo's design is heavily influenced by traditional Japanese architecture and the objective of the town council was to build a facility that not only provides a martial arts training centre but also serves as an urban landmark for the city.

Table 1: Comparative Analysis of Selected Case Studies

Case Study	Key Design Attributes	Lessons Learned & Translation to Project
Hagius Sports Studio (Berlin, Germany)	Uses unfinished, raw materials like untreated aluminium, granite, and burlap to provide a haptic experience.	Materiality: Inspired the use of organic, natural materials (wood, rattan) to highlight the physical nature of the martial arts academy.
Dojo Saigon (Ho Chi Minh City, Vietnam)	Features high energy efficiency through full insulation, rice husk roof insulation, and strategic orientation to avoid heavy rain/wind.	Sustainability & Comfort: Informed the "well-ventilated" and "airy" space planning to ensure a comfortable indoor environment in the Malaysian climate.
Épinay-sur-Seine Dojo (France)	Heavily influenced by traditional Japanese architecture, serving as both a training center and an urban landmark.	Conceptual Identity: Reinforced the decision to use East Asian design elements (shoji doors, Zen gardens) to signify the cultural origins of the martial arts practiced.

PROJECT PROPOSAL

The design of the martial arts academy is proposed at A Place Where - commonly known as APW, which is an event space in Bangsar, Kuala Lumpur. The academy will serve as not only a martial arts academy but is also meant to provide a female community and empowerment centre, as to educate girls and women of all ages on the importance of martial arts for the female community. The academy also caters for a female wellness centre whereby users and visitors will be able to enjoy spa treatments and be involved in group or one-on-one counselling sessions.

PROPOSED SITE

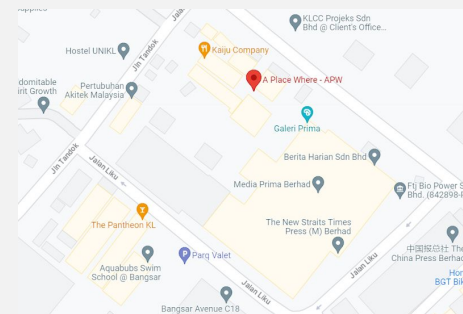


Figure 5: Key Plan of APW Bangsar (NTS)
(Source: Google Maps, 2023)



Figure 6: Façade of the main building of APW
(Source: Sarah Sophia, 2023)

The selected site is an event space called APW - short for A Place Where, located in 29, Jalan Riong, Bangsar, 59100 Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur. The site was once a family-owned newspaper printing company established in 1952 formerly known as Art Printing Works. Its original location was in Lebu Ampang, before relocating to its present Bangsar location in 1965. From the 60s to the 80s, Art Printing Works was one of the most prolific printers in Kuala Lumpur.

PROPOSED CLIENT

SheFights is an All-Women Martial Arts Gym where their accredited female coaches educate their clients on self-defence. The gym ensures that its clients learn and can apply their newly acquired skill sets. SheFights believes that women coaches are important because they can relate to young girls and women differently than men since they are same-sex role models. The client's mission is to empower women to understand better and clearly about personal safety and security skills with their mission statement, 'The Art of Self Defense & Self Defense is the State of Mind.' Their vision, on the other hand, is to support the health, safety and well-being of women and children, to keep women feeling a lot safer in any environment, and to empower all women to join martial arts and learn the proper education on self-defence.



Figure 7: SheFights logo
(Source: shefights.my, 2023)

CONCEPTUAL PROCESS, PROCEDURE AND SCHEMATIC



Figure 8: Design Inspiration
(Source: Pinterest.com, 2023)

The concept for the proposed project is called "Flow." The concept is taken from the idea of well-ventilated spaces found in a typical East Asian interior. It is also derived from the selected design element, namely the Tai Chi movements, in which the movements posed in the martial arts depict flowy rhythms. East Asian design elements inspire the concept for this martial arts academy. Since martial arts are dominantly practised in East Asian countries, namely Japan, China, and Korea, the design incorporates elements that signify the origins of martial arts, thus, the concept is selected based on the design features of the East Asian region.

The concept adopts airy and well-ventilated spaces, wooden walls and flooring, rattan and other organic and natural materials, yellow or warm lighting, simple and minimalist design, and moveable and modular furniture.

DESIGN APPROACH

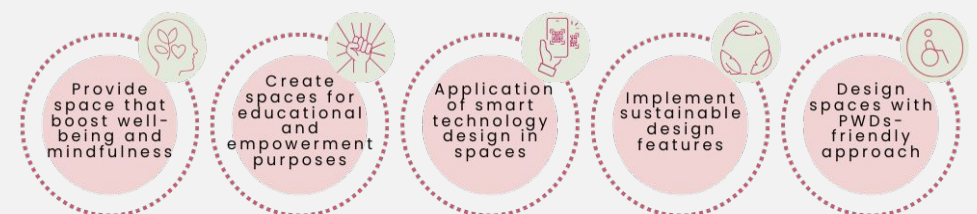


Figure 9: The selected design approach for the martial arts academy
(Source: Sarah Sophia, 2023)

SELECTED ELEMENT: TAI CHI MOVEMENTS

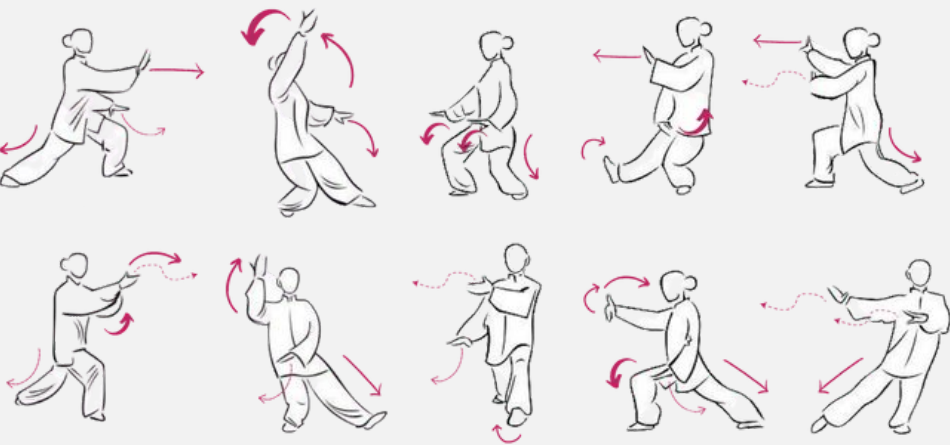


Figure 10: Tai Chi poses in various forms with arrows showing the movements
(Source: Sarah Sophia, 2023)

The above figures illustrate the movements taken from Tai Chi exercise formations. The selected element is extracted from the various flows and rhythms of the martial art in which its movements have been interpreted in the form of arrows as shown in the diagram above.

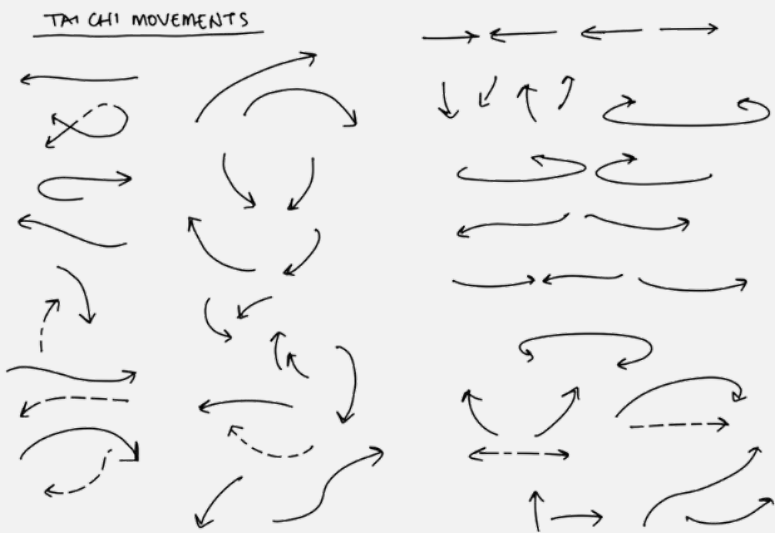


Figure 11: Arrows showing simplified directions of Tai Chi movements
(Source: Sarah Sophia, 2023)

The arrows represent the flow of the posed exercises and show the directional movements by the practitioner. From there, the 'directional arrows' are extracted to create the ideated shape and form of the selected element, which is then conceptualised through conceptual models.

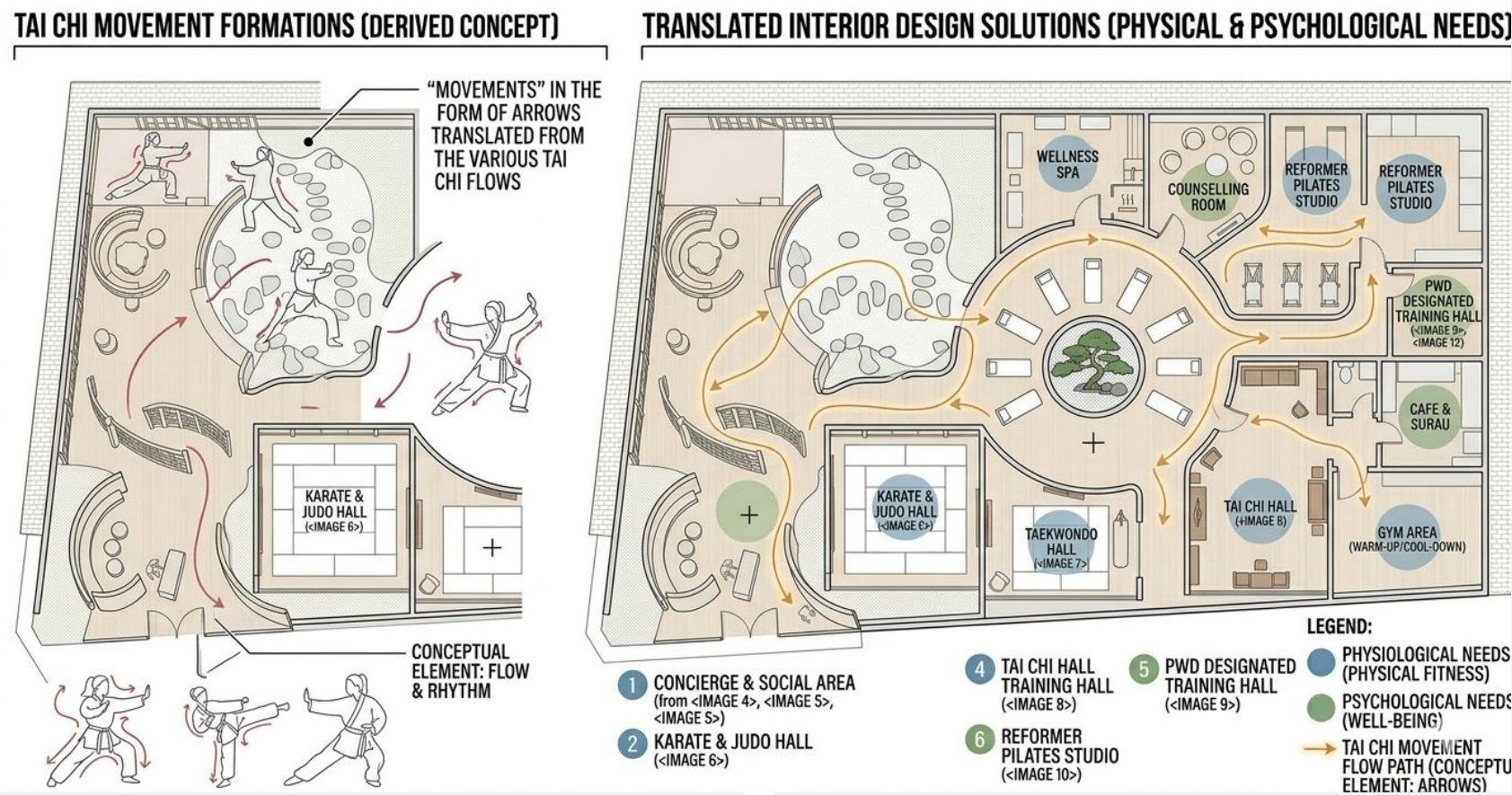


Figure 12: Comparative diagram image
(Source: Authors, 2026)

CONCEPTUAL MODELS



Figure 13: Concept models derived from the selected element, Tai Chi movements
(Source: Sarah Sophia, 2023)

Figure 13 shows the three different conceptual models transformed from the first attempt to the third and final attempt. The curved line intercepting each other represents the Tai Chi movements, in which the movements posed in the martial arts depict flowy rhythms. It also represents the name of the concept, “Flow”, which depicts well-ventilated spaces often found in the traditional East Asian designs. The interconnecting forms of the model can also be translated into the unison of the female community coming together to one place to create a strong relationship with one another, whereby they will be able to connect, assist, empower and motivate each other through the provided activities and services in the academy.

FINAL DESIGN PROPOSAL

The final design of the martial arts academy considers the East Asian traditional concept and applies the right elements where it should. The colour palette follows the natural, earth scheme as portrayed in most traditional East Asian designs. Healing design features are made prominent in the design with the implementation of Japanese Zen gardens which are accessible from all martial arts training halls to allow fresh air and to enhance healing properties. The application of design elements derived from the Tai Chi movements is applied in areas of the academy where the design does not clash with the geometric elements often found in East Asian architecture and designs.

The spaces of the academy are divided based on physical fitness and psychological well-being areas. The ground floor is dedicated to physical fitness activities, where it includes the four different types of martial arts training halls namely for the use of taekwondo, karate and judo, tai chi, and a designated hall for PWDs. Another space is reserved for the gym area where users can warm up or cool down before and after their activities. The ground floor also consists of welcoming areas such as the concierge, lounge and lobby. The floor is also equipped with an interactive informative gallery on female martial arts in the lobby and a Japanese-inspired walk-in garden for visitors.

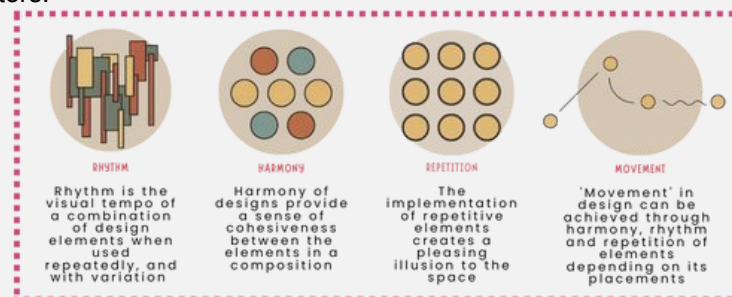


Figure 14: Design principles adopted in the design of the academy
(Source: Sarah Sophia, 2023)



Figure 15: The Karate and Judo training hall which is equipped with Japanese interior elements such as shoji doors, Japanese wall art, and wooden samurai swords for practice.



Figure 16: The Taekwondo training hall which consists of decorative elements taken from its country of origin, Korea, and is equipped with Korean traditional sliding doors and windows, traditional geometric designs, and wall paintings. Punching and kicking bags are added for the practitioners since Taekwondo focuses more on its kicking techniques



Figure 17: The Tai Chi training hall is designed with dark wood as the material of focus. Since Tai Chi originates from China, the training hall adopts Chinese decorative elements such as Chinese paintings and geometry.



Figure 18: This training hall is provided solely for people with disabilities. The training hall is equipped with safety railings for the balance and safety of PWD practitioners.



Figure 19: Inspired by the Japanese Zen gardens, this indoor glass garden is designed with oriental-style furnishings and decorative elements, instilled with traditionally used Asian trees and plantations such as bamboo, cherry blossom trees, and bonsai trees. This space allows users and visitors for a quick nature escape where they can relax and unwind from their activities.



Figure 20: Issues and design solutions for the Martial Arts Academy
(Source: Sarah Sophia, 2023)

The mezzanine floor is comprised of psychological well-being-related spaces where users can unwind and relax in the provided spa, sauna and massage rooms. It also consists of counselling rooms to treat the mental and emotional well-being of users, and two separate Pilates studios are provided. Although it is part of physical activity, Pilates are not strenuous in nature and relates more to healing and calming physical and mental well-being. The cafe and *surau* are also situated on the mezzanine floor.



Figure 21: The Reformer Pilates studio located on the mezzanine floor specifically caters for wellness activities. Pilates is known to increase physical strength, flexibility, and overall health.



Figure 22: Other than the reformer Pilates studio that uses training machines, the academy also offers a mat Pilates studio for mat workouts and stretches. It is also equipped with flying yoga hammocks that provide additional health benefits for women.



Figure 23: This group counseling area allows 10 to 12 people per session. Here, users and visitors can share their stories with one another and console each other

SELECTED AREA



Figure 24: Designed with natural materials that depict an East Asian-inspired concept, the concierge creates an inviting ambience upon entrance.



Figure 25: The lobby and social area are located right upon the entrance of the academy. It is an open space area and shares the same space with the concierge and interactive, digital gallery on female empowerment and martial arts education.

The selected area for this project is the lobby and lounge area of the academy, located on the ground floor upon the entrance and concierge. The lobby is chosen as the selected area due to the visible concept and element interpreted in the design. The concept, based on the East Asian traditional design, is portrayed in the form of using natural materials as the seats, tables and partitions in the lobby that depict East Asian designs. The elements, following the Tai Chi movements as shown in the concept models, are wavy and non-linear in form which are decorative elements in the lobby design.



Figure 26: The Exploded Details of the Seating Area and Feature Plant at the Lobby
(Source: Sarah Sophia, 2023)

Figure 25 shows the exploded details of the selected area, particularly of the seating area and the feature plant to show the structure of the two areas in detail. The two areas share similar design features that relate to the selected tai chi element, with curved design features seen below.

The blow-up detail drawing shown in Figure 26 is based on the wooden joinery system of the curvy, decorative ceiling element used in the seating area. The decorative ceiling element is created by joining two wooden curvy panels to make one full, long panel. To do this, the wooden structure must be attached with a tenon and mortise joinery system in which dowel pins are then attached for extra security.

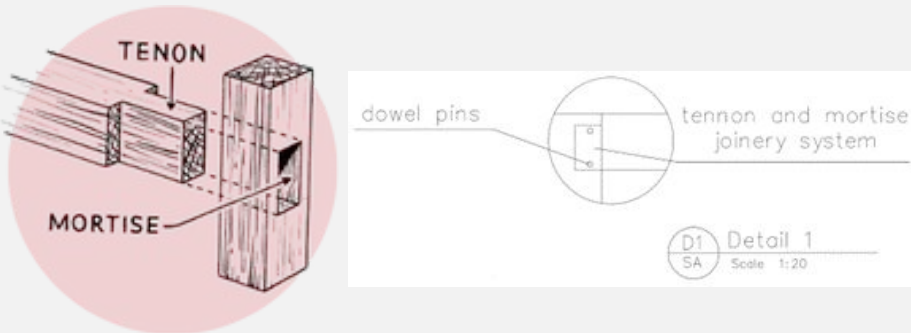


Figure 27: Detail Drawing of the Wooden Joinery System
(Source: Sarah Sophia, 2023)

ALL-FEMALE MARTIAL ARTS ACADEMY: DIAGRAMMATIC LAYOUT TRANSLATING TAI CHI MOVEMENTS AS CONCEPTUAL ELEMENTS

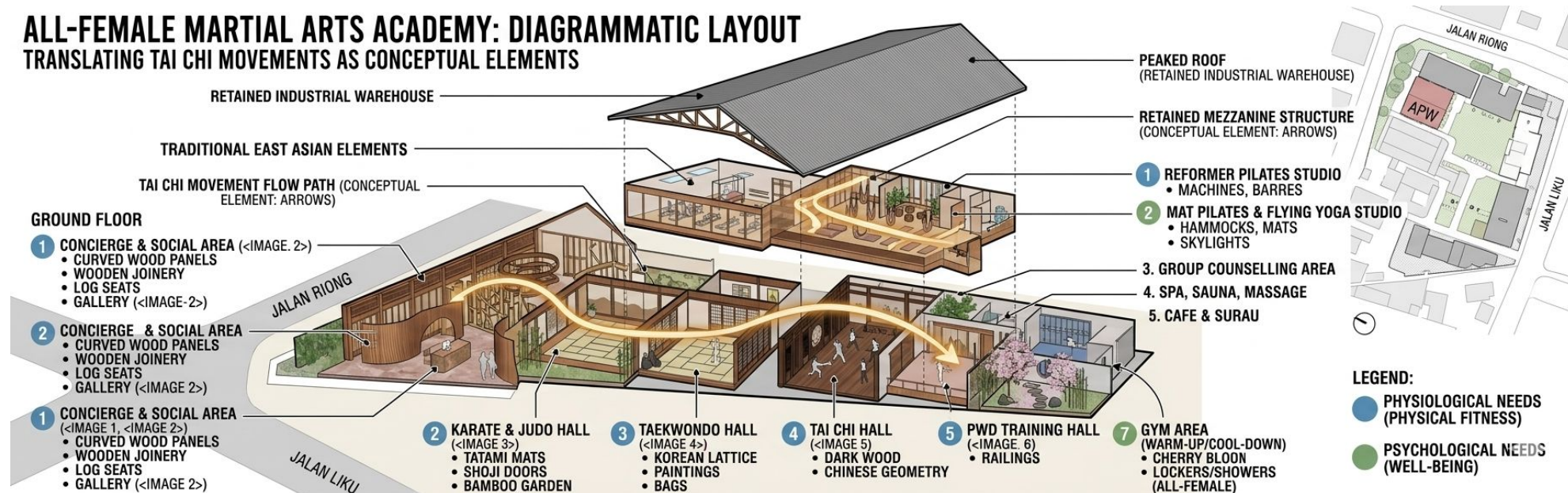


Figure 28: Diagrammatic explanation on translating the Tai-chi movement into the design elements
(Source: Authors, 2026)



Figure 29: Axonometric View of the Proposed All-Female Martial Arts Academy.
(Source: Sarah Sophia, 2023)

CONCLUSION

An all-female martial arts academy aims to educate the female community about the significance of martial arts and empower them to defend themselves against any physical, emotional, or psychological abuse.

This study demonstrates how Tai Chi movement can be translated into conceptual interior design elements through a structured movement-to-space process. The findings show that principles such as flow, continuity, and balance can inform spatial organisation, curvilinear forms, and user experience within interior environments. In addressing the project objectives, the proposed design provides a female-centred environment that supports physical training, psychological well-being, and community empowerment.

More importantly, the study contributes a conceptual framework that positions bodily movement as a generator of interior design ideas, offering an alternative to conventional stylistic or symbolic approaches. The application within an all-female martial arts academy highlights the potential of this approach to create meaningful and experiential spaces grounded in movement-based concepts.

ACKNOWLEDGEMENT

The authors would like to express utmost heartfelt gratitude and appreciation to the supervisors and lecturers of KAED for their immense and indispensable guidance and support throughout the duration of this project. Their expertise, mentorship, and unwavering dedication have played a pivotal role in the success of this project.

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02

UNDERSTANDING TODDLER PLAY BEHAVIOUR AND DEVELOPMENTAL GAINS IN MONTESSORI TOY INTERACTION

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ABSTRACT

The project examines the developmental needs of toddlers aged 1 to 4 years, with a focus on fine motor skill development through Montessori-inspired toys. The aim is to design a multifunctional product that supports children's growth while aligning with the values of parents and caregivers who seek safe, educational, and screen-free play experiences. To deepen understanding of the topic, several literature reviews were conducted covering child development, Montessori principles, and toy design. Data were collected through surveys, video analysis, and observational studies, specifically looking at behaviour and toy interaction among toddlers in Malaysia. These findings revealed user preferences and developmental gaps, which were addressed through the design of a compact and sustainable toy using PLA material. Ultimately, the project presents a multifunctional toy design that promotes creativity, motor skills, and ethical design practices, thereby supporting the development of early childhood.

Keywords: Toddler, Montessori Toy, Fine Motor Skills, Malaysia

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INTRODUCTION

The development of fine motor skills during early childhood represents a critical foundation for cognitive growth, learning abilities, and overall well-being. Within this domain, the concept of Learning Through Play (LTP) emerges as a pivotal approach, offering children opportunities to strengthen motor coordination through interactive and hands-on activities. Central to this practice are Montessori toys, which serve not only as educational tools but also as structured platforms for independent exploration and skill refinement. Despite their proven potential, the integration of Montessori toys in Malaysia faces challenges. Limited parental awareness of the significance of fine motor development, combined with the dominance of pretend play toys in the market, restricts children's access to resources that balance entertainment with developmental benefits. Moreover, Montessori and STEM-based toys often come at higher costs, thereby reducing their accessibility to families across varied socioeconomic backgrounds. This study seeks to investigate the role of Montessori-based educational toys in enhancing toddlers' fine motor skills. It explores behavioural patterns during play, identifies design features that facilitate effective engagement, and highlights the broader implications of toy market imbalances.

By situating the research within both developmental and socio-economic contexts, this work contributes to the discourse on purposeful play as a mechanism for early childhood development. In doing so, it aligns with global educational objectives while promoting inclusive, health-focused, and sustainable learning practices.

SHAPESCAPE



Figure 1: SHAPESCAPE Product 3D view

The final prototype of ShapeScape is presented early to provide a clear understanding of the design outcome. The toy integrates shape sorting and modular stacking features to support toddlers' fine motor skill development through interactive play.

LITERATURE STUDY

The Montessori philosophy, developed in the early twentieth century, emphasises child-centred and self-directed learning supported by structured materials and guided facilitation (Rosati, 2021; Meinke, 2019). Its holistic approach integrates moral, emotional, and cognitive development, with evidence linking Montessori practices such as tactile learning and peer collaboration to positive developmental outcomes (Culclasure et al., 2019; Darling-Hammond et al., 2019).

Unlike teacher-centred models, Montessori education encourages autonomy, creativity, and intrinsic motivation. Learning materials such as sensorial blocks and practical life tools provide structured opportunities for independence, fine motor control, and cognitive growth (Marshall, 2017; Mead, n.d.).

During the toddler years, between the ages of one and three, children experience rapid progress in language, autonomy, and motor skills. This development is strongly supported by unstructured play and parental involvement, which foster creativity, resilience, and emotional growth (Colson & Dworkin, 1997; Nidirect, 2018). Play is widely recognised as fundamental to early childhood as it supports cognitive, social, and emotional growth, while also nurturing problem-solving, collaboration, and creativity (Sutton-Smith, 1997; Yogman et al., 2018).

Fine motor skills, defined as the precise coordination of hand and finger movements, are essential for daily functioning and academic readiness. These abilities develop significantly during toddlerhood through activities such as stacking, drawing, and manipulating small objects (NHS Border, n.d.; Cleveland Clinic, 2023). Studies indicate that toy-based interactions at home and in educational settings enhance fine motor coordination, with parents and teachers playing a central role in sustaining developmental progress (Nik Roseli et al., 2023; Tucker, 2019). At the same time, delays in fine motor development may result from medical or neurological conditions, requiring interventions such as occupational therapy alongside play-based activities to strengthen children's abilities (Mandaya, 2025).

Overall, the literature highlights the importance of Montessori education, play, and toy design in fostering toddlers' fine motor development, while also emphasising accessibility and parental awareness as key factors in ensuring consistent developmental progress.

METHODOLOGY

This study employed a mixed-method approach combining quantitative and qualitative data collection. A questionnaire survey was distributed to parents to gather demographic information, assess awareness of fine motor development, and identify preferences and expectations regarding educational toys. The survey responses provided valuable insights into parental perspectives on toy selection and developmental priorities.

Complementing the survey, observational research was conducted in shopping malls in Gombak and Subang Jaya to compare the availability of Montessori-based toys with pretend play toys. This was undertaken to evaluate the imbalance in the local toy market. Additionally, video analysis of toddlers' play behaviour was carried out to examine their engagement with Montessori toys, focusing on hand-eye coordination, grip strength, and finger dexterity through a structured observation checklist.

The research instruments, including the survey and observation checklist, were developed based on relevant literature and established frameworks. These tools ensured that the data collected aligned with the study's objectives, particularly in identifying key design features of Montessori toys that enhance fine motor skill development.

SUMMARY OF QUESTIONNAIRE FINDINGS

The questionnaire findings offer valuable insights into current preferences, concerns, and expectations regarding toddler toys, particularly those designed to promote fine motor skill development. Key points from the analysis include:

- **Demographics:** The majority of respondents were female (56.3%), aged between 30 and 39 years, primarily consisting of parents, followed by guardians and educators, providing varied caregiving perspectives.
- **Child Development:** Most respondents reported having children aged 4 years old (62.5%), a critical stage for fine motor skill growth. Dressing up and brushing teeth were identified as everyday daily struggles.
- **Playtime Preferences:** Pretend play toys (65.6%) and digital toys (62.5%) were the most popular types of toys. Educational toys were used by children only occasionally, highlighting the potential for improvement in this area.
- **Play Challenges:** Shape sorter puzzles (72%) and stacking blocks (24%) were perceived as the most difficult toys. Some children struggled with connecting pieces or fastening small items.
- **Toy Avoidance & Reactions:** Most children did not avoid difficult toys (52%), but 40% would avoid them sometimes. When facing difficulty, 58% asked for help, while 40% kept trying.
- **Material Preference:** Eco-friendly materials (43.8%) and plastic (43.8%) were equally preferred, while wood was less favoured.
- **Accessibility:** Although 59.4% found Montessori toys accessible, 40.6% still experienced difficulty in sourcing them affordably or conveniently.
- **Fine Motor Importance:** Nearly all respondents rated the importance of fine motor skills development in toys as high (Scale 4 or 5), confirming the relevance of toys that target this specific growth area.
- **Suggestions:** Valuable ideas were shared, including adding lights or sound responses, creating child-friendly household role-play toys, and focusing on safe materials and storage solutions.

Overall, the data confirms the strong demand for a multifunctional Montessori toy that is engaging, accessible, and tailored to support fine motor skills in young children.

The findings indicate that toddlers face challenges in fine motor activities such as gripping, sorting, and coordinating hand movements. Additionally, the preference for engaging and interactive toys highlights the need for designs that balance learning and play. Therefore, the proposed design integrates simplified geometric forms, ergonomic sizing, and modular interaction features to directly address these developmental needs while maintaining engagement.

SAMPLE OF QUESTIONNAIRE FINDINGS

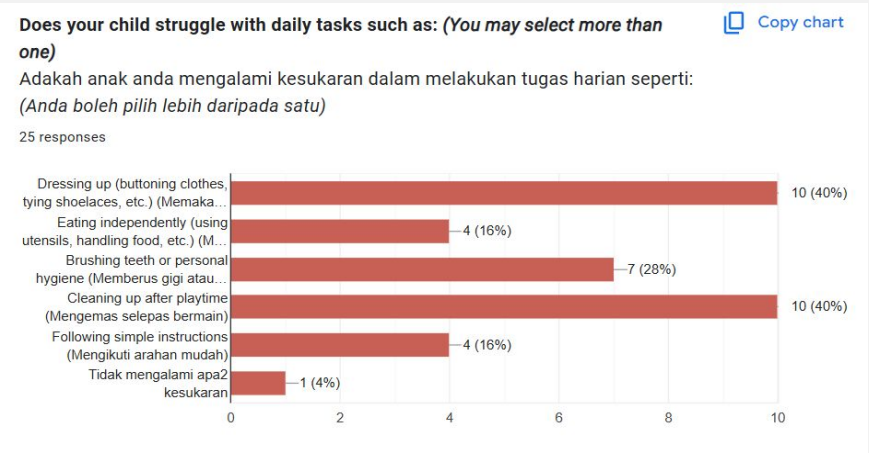


Figure 2: Child's Daily Task Struggle Bar Chart

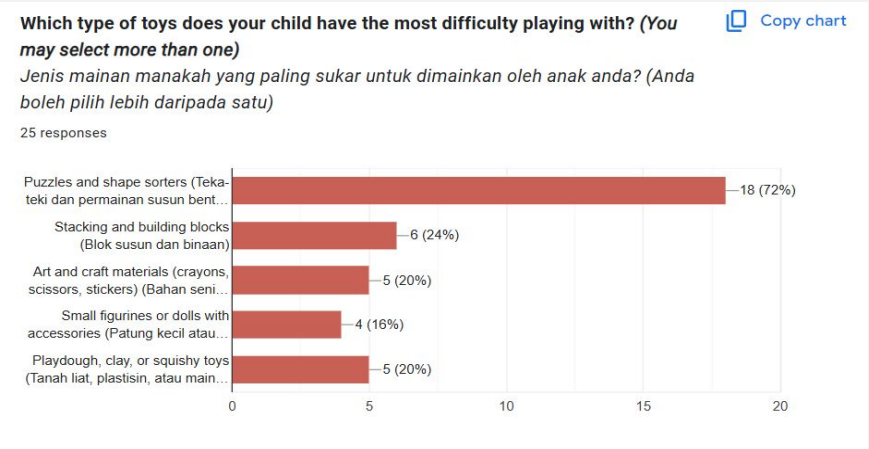


Figure 3: Child's Difficult Toys Bar Chart

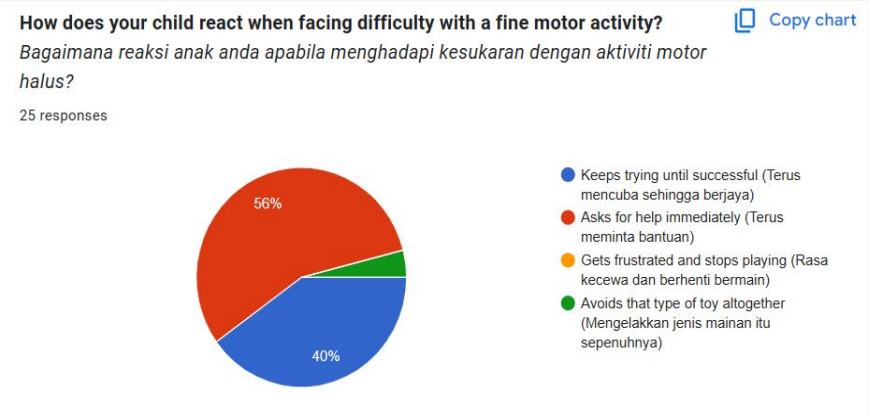


Figure 4: Child's Reaction to Fine Motor Activity Pie Chart

PRODUCT LINEUP

This section presents an analysis of 80 Montessori-inspired toys across four core categories of fine motor development:

- Grip Strength & Dexterity Improvement
- Hand-Eye Coordination Improvement
- Finger Manipulation & Precision Improvement
- Bilateral Coordination Improvement

PRODUCT LINEUP TABLE

CATEGORY 2: HAND-EYE COORDINATION IMPROVEMENT

PRODUCT					
AGE	1+ years old	1-3 years old	1 years old up	1+ years old	1+ years old
SHAPE	Other	Square	Square	Other	Square
TYPE OF TOYS	Building Block	Shape sorter	Shape sorter	Stack Toys	Shape Sorter
MATERIAL	Wood	Wood	Wood	Wood	Plastic
COLOUR	Light Pink	Colourful	Natural	Colourful	Colourful
THEMES	Castle	Basic	Animal	Basic	Basic

Figure 5:Product Lineup Table

OVERALL LINEUP FINDINGS

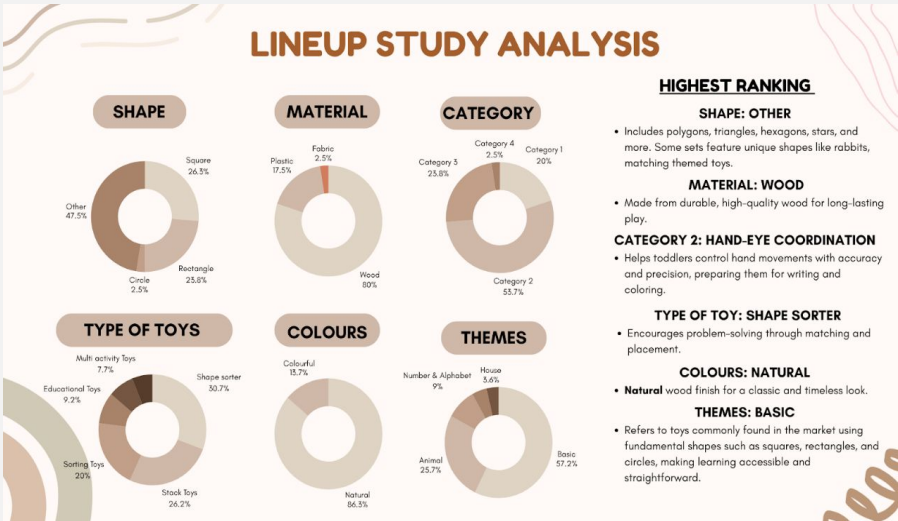


Figure 6: Lineup Study Analysis

Among all categories, the highest overall developmental focus was observed in the Hand-Eye Coordination Improvement category. This category emphasises activities that help toddlers develop accuracy in their hand movements, which is essential for early writing, drawing, and self-help tasks.

- **Shape:** The most frequent shape classification fell under "Other", which encompasses a variety of forms beyond typical geometry, including stars, polygons, triangles, hexagons, and creative shapes such as rabbits or themed figures. These enhance visual interest and shape-matching skills.
- **Material:** Wood was the most preferred material due to its high durability and alignment with Montessori philosophies. Its tactile and eco-conscious properties make it a favoured choice in quality educational toys.
- **Type of Toy:** The most represented toy type across the dataset was the shape sorter, known for its effectiveness in promoting problem-solving and logical reasoning.
- **Colour Palettes:** The use of natural wood finishes was prevalent in the broader study, reflecting a minimalist and calming aesthetic that aligns with Montessori design values.
- **Theme:** Basic shapes, such as squares, rectangles, and circles, were the most popular themes, making the toys intuitive and suitable for early learners.

SUMMARY LINEUP FINDINGS

The analysis of the product lineup for hand-eye coordination toys highlights the importance of incorporating basic shapes such as squares and rectangles, using durable wooden materials, and featuring visually engaging, colourful finishes. These elements were found to be the most prevalent and preferred across the evaluated products. This suggests that educational toys targeting hand-eye coordination should adopt these features to enhance both developmental effectiveness and child engagement, providing a valuable reference for future Montessori-inspired toy design.

PHYSICAL RETAIL OBSERVATION FINDINGS

Table 1 summarises the findings from physical observation conducted at five retail locations: AEON BiG Wangsa Maju, TF Value-Mart Batu Caves, Mydin Subang Jaya Hypermarket, Toys "R" Us, and Eco Shop @ Selayang Warta Lama. The aim was to evaluate the availability and accessibility of fine motor skill development toys, particularly those aligned with Montessori principles.

Table 1 : Physical Observation Findings at Selected Retail Store

No	Toy Store / Mall	Montessori Toys Available?	Pretend Play Toys?	Type of Montessori Toys Seen
1	AEON BiG Wangsa Maju	No	Yes	-
2	TF Value-Mart Batu Caves	Yes	Yes	Building block
3	Mydin Subang Jaya Hypermarket	No	Yes	-
4	Toys "R" Us Suria KLCC	Yes	Yes	Shape sorter, Building block, etc.
5	Eco-Shop @ Selayang Warta Lama	Yes	Yes	Building block

PRODUCT AVAILABILITY

All five locations consistently stocked pretend play toys, highlighting their popularity and demand in the Malaysian toy market. However, the availability of Montessori-inspired toys varied significantly by store type.



Figure 7:AEON Big Wangsa Maju Toys Observation



Figure 8:Mydin Subang Jaya Hypermarket Observation

AEON BiG Wangsa Maju and Mydin Subang Jaya Hypermarket did not offer Montessori toys, despite being large hypermarkets with extensive toy sections. This suggests that such stores prioritise general or mass-market toys rather than educational or skill-targeted options.



Figure 9:Toys "R" Us Observation

In contrast, Toys "R" Us offered a wider range of toys supporting fine motor development, including shape sorters, building blocks, and stacking toys, some of which align with Montessori principles.



Figure 10:TF Value Mart Observation



Figure 11:Eco Shop Observation

TF Value Mart and Eco Shop, although budget-oriented, also carried basic Montessori-style toys such as simple wooden puzzles, shape sorters, and block sets, indicating some accessibility even at lower price points.

CATEGORISATION & DISPLAY

None of the stores had a dedicated section for Montessori or fine motor skill development toys. Stores typically organise products by toy type or age group, rather than by developmental function. This makes it difficult for parents to identify toys that target specific skills, such as grip strength or bilateral coordination.

SUMMARY OF OBSERVATION

The physical retail study reveals that Montessori toys are not widely available in mainstream retail spaces, particularly in large hypermarkets. While educational toys are present in specialised stores like Toys "R" Us and to some extent in discount stores like Eco Shop, their presentation lacks precise developmental categorisation. This underscores a gap in the local market for clearly labelled, skill-specific educational toys that are both affordable and accessible to all income levels.

VIDEO ANALYSIS

Table 2 and 3 presents the findings obtained from an observational checklist used in the video analysis of toddler play sessions involving Montessori-inspired toys. The analysis focused on behavioral patterns, engagement duration, motor skills, and social-emotional responses to explore developmental behaviors during play.

OBSERVATION CHECKLIST FOR VIDEO ANALYSIS PART 1

Table 2 : Observation Checklist for Video Analysis

KIDS	Category 1: Behavioural Patterns				
	Insert the shape into the correct hole.	Rotates/manipulates the block.	Stacks blocks	Seeks help from an adult	Imitates adult/peer actions
1	X	X	X	/	X
2	/	X	X	/	/
3	/	/	/	/	/
4	/	X	/	X	/
5	/	X	/	/	/
6	/	/	/	/	/
7	X	/	/	/	/
8	X	/	X	/	/
9	X	/	X	/	/
10	X	X	X	X	X
KIDS	Category 2: Engagement Duration				
	Approximate total play duration (e.g., 5 min, 12 min)	Focused throughout or easily distracted?		Return to the toy after a distraction?	
1	3	X		/	
2	1- 2	X		X	
3	4	/		/	
4	2	X		X	
5	4	X		/	
6	3	X		/	
7	3	X		/	
8	2	X		/	
9	4	X		X	
10	3	/		/	

OBSERVATION CHECKLIST FOR VIDEO ANALYSIS PART 2

Table 3 : Observation Checklist for Video Analysis

KIDS	Category 3: Motor Skill Indicators (Fine Motor, Dexterity, Coordination)				
	Grasping blocks with a pincer grip / a whole hand	Transferring a block from one hand to another	Placing shapes into holes accurately	Stacking with coordination	Eye-hand coordination
1	X	X	X	X	X
2	/	/	/	X	X
3	/	X	/	/	/
4	/	/	X	/	/
5	/	/	/	/	/
6	/	/	/	/	/
7	/	/	/	/	/
8	/	/	X	/	/
9	/	/	X	X	/
10	/	/	X	X	X
KIDS	Category 4: Emotional and Social Responses				
	Smile / Laugh during play.	Shows frustration	Displays excitement	Attempt to communicate	Shows independence
1	/	/	/	X	/
2	/	X	X	X	X
3	/	X	/	X	X
4	/	/	X	X	X
5	/	/	/	X	X
6	/	/	/	/	/
7	/	X	X	X	X
8	/	X	/	X	/
9	/	X	/	/	/
10	/	/	/	X	X

DESIGN STATEMENT

ShapeScape is a Montessori-inspired toy that reimagines the classic shape sorter, utilising unique, architecture-based forms such as Roman arches. Made from safe, biodegradable PLA, ShapeScape supports sustainability and child safety. It also encourages interaction between children and caregivers, helping to develop communication and hand-eye coordination in a fun and meaningful way. Designed to boost creativity and fine motor skills, it offers a more engaging and visually appealing play experience. Its toddler-friendly size ensures an easy grip for independent play and problem-solving.

Unlike conventional Montessori toys, ShapeScape incorporates architecture-inspired forms such as arches and geometric structures, introducing an additional layer of spatial understanding alongside fine motor skill development.

PROBLEM STATEMENT

In recent years, there has been increasing concern about the developmental health of young children, especially in the area of fine motor skills. Factors like increased screen time, fewer outdoor activities, and a shift towards convenience in parenting have contributed to this problem. Additionally, the decline in reading for leisure among children has reduced their involvement in hands-on activities that support fine motor development. These lifestyle changes are creating developmental gaps during the vital early years, particularly in hand-eye coordination, grip strength, and finger dexterity. If left unaddressed, these issues could affect children's preparedness for school tasks and everyday life skills. Therefore, it is crucial to explore solutions that can support fine motor skill development in a more engaging and accessible manner.

DESIGN AIM

To design a multifunctional, ergonomic Montessori-inspired toy that combines shape sorting and block-building features to support toddlers' fine motor skill development.

DESIGN OBJECTIVES

- To develop a modular toy that integrates shape sorting and building activities suitable for children aged 1 to 4 years old.
- To ensure ergonomic sizing and tactile features that cater to toddlers with delayed motor skill development.
- To support both independent play and two-way communication between toddlers and parents through interactive design features.

TARGET USER

The main users of the proposed product are toddlers aged 1 to 4 years, who are in a vital stage of developing fine motor skills, hand-eye coordination, and cognitive abilities through active play. At this stage, children gain the most benefit from tactile, screen-free, and interactive activities that promote their physical and mental development.

Secondary users are parents and caregivers who increasingly seek educational, engaging toys that foster creativity, motor skills, and meaningful interaction without relying on digital devices. These users prioritise safe, developmentally suitable, and purposeful products that adhere to Montessori principles and provide alternatives to passive screen time.

DESIGN PROCESS

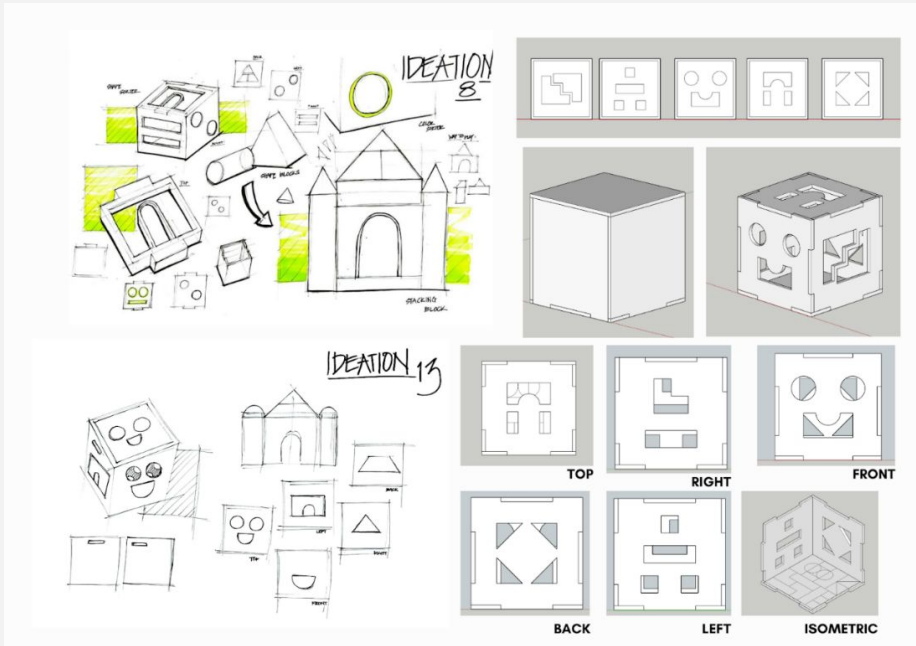


Figure 12: Compilation of Ideation

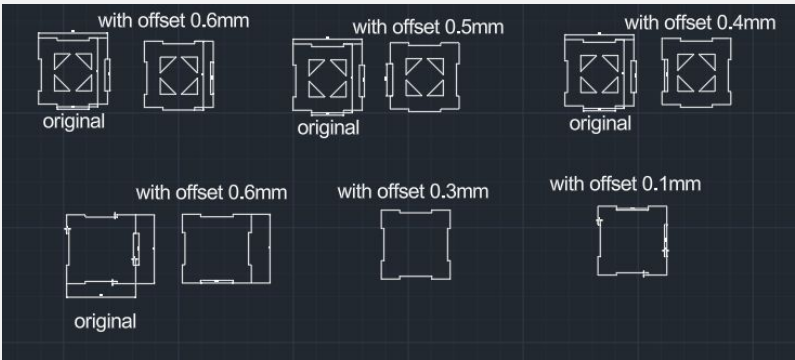


Figure 13: Model Process



Figure 14: Offset testing in AutoCAD

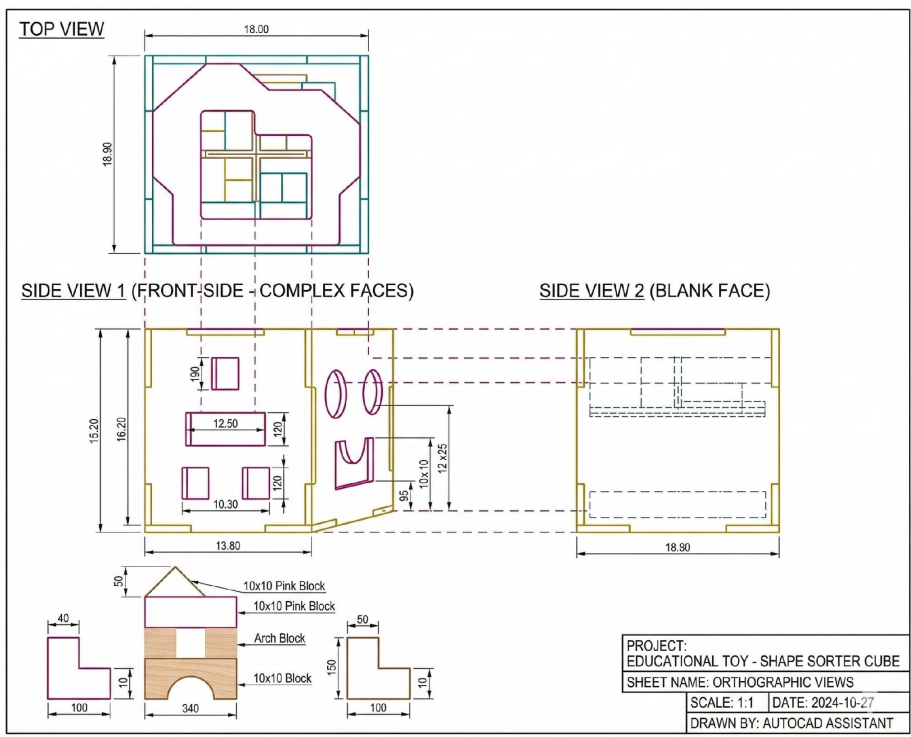


Figure 15: Technical Drawing

The final working prototype was produced using 3D printing with PLA filament, allowing a hands-on understanding of the toy's size, structure, and functionality. The model demonstrates how toddlers interact with the product — inserting shapes and stacking blocks — effectively promoting the development of fine motor skills. Photos of the final model showcase both its aesthetic and functional aspects, affirming its suitability for use in early childhood.



Figure 16: Colour Variant for ShapScape

The range of eco-friendly wooden ShapeScape, proposed in four curated color variants: the soft and sweet "Pastel Petals" (pink), the serene "Calm Coast" (blue), the grounded "Natural Elements" (green), and the warm "Sunlit Sands" (mustard). Each set is crafted from sustainable wood, designed to spark joy and develop essential cognitive skills through play. Perfect for nursery or playroom, these beautiful cubes are as pleasing to the eye as they are to the touch.

CONCLUSION

This research examined the developmental needs of toddlers with an emphasis on enhancing fine motor skills through Montessori-inspired toys. Parental feedback highlighted the importance of hand-eye coordination, finger dexterity, and bilateral coordination, while observational and video analyses confirmed that toddlers benefit most from simple, interactive toys that provide visual and tactile feedback.

Market observations showed that although educational toys are available, multifunctional designs that combine multiple developmental benefits remain limited. Parents also stressed the need for durability, safe materials, engaging features, and visual appeal. These insights guided the final design proposal, which demonstrates how Montessori-inspired multifunctional toys can effectively support fine motor development while promoting sustainable and ethical design practices.

This study contributes to the field of design by demonstrating how research-driven product development can support early childhood development. Future improvements may explore interactive features such as sensory feedback and expanded modular systems to enhance learning engagement.

ACKNOWLEDGEMENT

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03

SALINGKAIT: ENHANCEMENT PROJECT OF COURTYARD IN KAED, IIUM

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ABSTRACT

The KAED Courtyards, located within the Faculty of Architecture and Environmental Design, serve as essential outdoor areas for academic, social, and recreational activities. However, the existing courtyards face issues of limited functionality, lack of comfort, and underutilisation, which this initiative seeks to reconfigure Courtyards A and B into inclusive, polyvalent environments. The project aims to upgrade Courtyard A and Courtyard B of KAED into inclusive, multifunctional environments that encourage interaction, relaxation, and creative engagement among students, staff, and visitors. The objectives are to introduce climate-responsive design strategies, enhance social connectivity, and integrate sustainable features such as recycled materials and outdoor gym facilities. This alignment with Sustainable Development Goal 11: Sustainable Cities and Communities ensures the creation of inclusive, safe, resilient, and sustainable green public spaces for all. The method involves site analysis to assess spatial challenges, literature review to explore best practices in courtyard design, and precedent studies of similar academic spaces to guide effective solutions. The outcomes are design proposals that emphasise environmental comfort, multifunctional use, and opportunities for income generation. Ultimately, this initiative seeks to transform the KAED Courtyards into dynamic, sustainable, and engaging hubs that enrich both academic and social experiences within the KAED community.

Keywords: Courtyard, Enhancement, Sustainability, Multifunctional Space, Student Engagement, Climate-Responsive Design

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1.0 INTRODUCTION

The KAED Courtyards at the International Islamic University Malaysia (IIUM) are important outdoor spaces that support academic and social interaction within the faculty. However, the issues such as inadequate shading, limited facilities, and low utilisation reduce their effectiveness. This project aims to enhance Courtyard A and Courtyard B of KAED by introducing sustainable strategies such as recycled materials, greenery, and outdoor gym facilities to create a more engaging environment. The design also seeks alignment with Sustainable Development Goals 3, 11, and 13, as well as the IIUM Sejahtera Framework, which emphasises holistic well-being in physical, emotional, intellectual, and spiritual aspects (IIUM, 2020).

Undertaken through BAQS 2300 (Integrated Multi-Disciplinary Project), the initiative involves collaboration between students of Architecture, Applied Arts & Design, and Quantity Surveying. Over seven weeks, each team developed integrated design solutions to transform the two KAED Courtyards into dynamic, inclusive, and sustainable spaces for students, lecturers, and visitors.

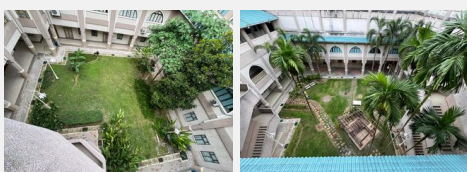


Figure 1: Site - Courtyard A & B
(Source: Authors, 2025)

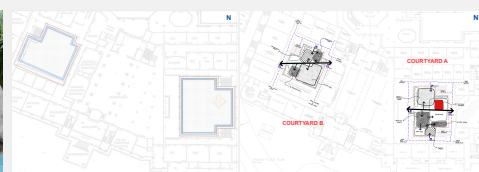


Figure 2: Site - Courtyard A & B with
Measurement (Source: Authors, 2025)

2.0 METHODOLOGY



Figure 3: Research methodology chart (Source: Authors, 2025)

3.0 LITERATURE REVIEW

• ROLE OF COURTYARDS IN ACADEMIC INSTITUTIONS

Empirical evidence suggests that bespoke courtyard interventions conducive to student diversity in educational settings, functioning as spaces that encourage interaction, relaxation, and learning. According to Muhaisen (2020), courtyards act as natural regulators of light and ventilation, making them sustainable spaces that enhance comfort while reducing energy dependence. Within universities, they also provide opportunities for informal learning and cultural exchange, supporting both academic and social development.

• SPATIAL ORGANISATION IN COURTYARDS

The design and spatial configuration of courtyards play a critical role in shaping their usability and effectiveness. Almhafdy et al. (2013) found that features such as circulation paths, seating zones, and shaded areas directly influence user interaction and microclimatic comfort in courtyard spaces CoLab. Well-planned layouts enhance accessibility and support multifunctional use—ranging from individual study to group collaboration—a factor especially vital in dense academic contexts where space optimisation is essential. This is echoed in studies like Kulliyyah of Architecture (2022), which recommend strategic courtyard configurations to maximise usability under tropical conditions

• CONNECTIVITY: PEOPLE, SPACES, AND ENGAGEMENT

Courtyards enhance connectivity by creating spatial nodes that link people, ideas, and activities across campus, thereby promoting collaboration, informal discussion, and peer-to-peer learning (Maali et al., 2022). Research also shows that thoughtfully designed courtyards tailored to students' diverse needs foster a stronger sense of belonging—which directly correlates with increased engagement, well-being, and academic participation (Gillen-O'Neel, 2021; Pinto et al., 2024).

• CHALLENGES IN COURTYARD ENHANCEMENT

Despite their potential, many courtyards suffer from poor maintenance, inadequate shade, and underuse. Research at Yale University (Banerjee, 2011) revealed that structural neglect and underplanting often render courtyards unwelcoming and underutilised on campus. Similarly, case studies of university public spaces report that a lack of shade and privacy discourages prolonged use, reducing courtyards to mere transitional zones rather than active communal environments. To prevent this, designers must prioritise climate-responsive strategies—such as greenery, shade structures, seating, and water features—and adopt user-centred planning to activate these spaces meaningfully.

• SUSTAINABLE DEVELOPMENT AND CLIMATE-RESPONSIVE DESIGN

Enhancing courtyards supports SDG 11: Sustainable Cities and Communities by fostering inclusive, resilient, and sustainable environments. Through climate-responsive design such as vegetation, water features, and shading devices, courtyards improve thermal comfort, reduce energy reliance, and mitigate heat gain (Muhaisen, 2006). Beyond environmental benefits, these enhancements create healthier, more dynamic settings that enrich both academic and social experiences on campus.

• USER-CENTRED AND MULTIFUNCTIONAL APPROACHES

Recent studies highlight the importance of user-centred design in courtyard planning. By addressing student preferences and activity patterns, courtyards can become multifunctional spaces for both learning and leisure. Flexible layouts with modular furniture, shade, and adaptable zones allow them to serve as outdoor classrooms, exhibition areas, relaxation spaces, or performance venues, maximising student engagement and campus life (Romyanond, 2023).

4.0 PRECEDENT STUDY AND CASE STUDY PRECEDENT STUDY

• TRX CITY PARK, TUN RAZAK EXCHANGE, KUALA LUMPUR

Located in the heart of Kuala Lumpur's financial district, TRX City Park is a vibrant urban green space developed as part of The Exchange TRX. Designed to offer a lush retreat amidst skyscrapers, the park spans 10 acres and features layered landscaping, native plant species, and pedestrian-friendly walkways. Seamlessly integrated with the surrounding retail and office developments, it embodies a sustainable city-in-a-park concept while promoting wellness, connectivity, and urban biodiversity. (The Exchange TRX, n.d.)

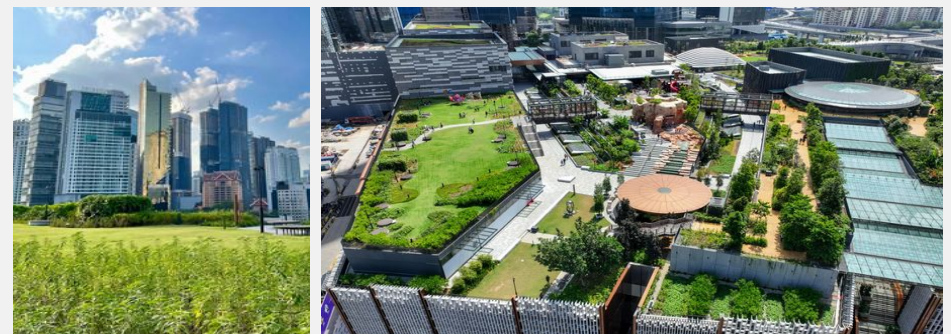


Figure 4: Site - TRX City Park
(Source: Pentago.com)

• TAMARIND SQUARE, CYBERJAYA, SELANGOR

Located in Cyberjaya, Tamarind Square is a modern urban sanctuary that reimagines the traditional town square for contemporary lifestyles. Blending nature with architecture, it features lush greenery, open courtyards, rooftop gardens, and pedestrian-friendly walkways intertwined with retail, dining, and office spaces. Designed as a living community hub, Tamarind Square embraces the "urban village" concept—where work, leisure, and nature coexist seamlessly. Its sustainable design fosters social interaction, creativity, and wellness, making it a vibrant green heart within Malaysia's tech-driven city. Tamarind Square is a business centre that aims to develop into an urban village where people can socialize (Amalina, 2024).



Figure 5: Site—Tamarind Square
(Source: erisgoesto.com)

CASE STUDY

• COURTYARD UNDER LONGAN TREES – QUANZHOU, CHINA

Located in Quanzhou, China, the Courtyard under Longan Trees is a serene residential and studio retreat designed by Wenkai Zhong of Spacework Architects. Nestled within a grove of longan trees, the 211 m² dwelling preserves the existing landscape by weaving architecture harmoniously around nature. Comprising five interconnected pavilions linked by a ring gallery, the design creates a sequence of courtyards that vary in size and character, each shaped by sunlight, access, and function. This symbiotic relationship between built form and trees fosters tranquility, intimacy, and a deep sense of place, embodying a sustainable vision where living and working blend seamlessly with the rhythms of the natural environment. (MAD Architects, 2020)



Figure 6: Site - Courtyard under Longan Trees

(Source: ArchDaily.com)

Infused with thoughtful spatial strategies, the courtyard design features:

- **Filtered sunlight in enclosed spaces** – directing natural light into shaded or hidden areas (such as under pergolas or inner rooms) to create soft illumination, reduce artificial lighting, and bring warmth without overheating.
- **Shading devices** – using trees, climbers, and green roofs to block direct sunlight, cool spaces naturally, and enhance a softer, nature-friendly ambiance.
- **Integration and communication with nature** – blending built spaces with the environment, allowing people to see, feel, and interact with natural elements like plants, light, wind, and water.

• FUNNEL HOUSE – NILAI, SEREMBAN

Located in a gated community called Planters' Haven in Nilai, Negeri Sembilan, Funnel House is a single-storey residence perched on a gently sloping one-acre site surrounded by mature durian trees. From the road, the house appears restrained—its narrow, funnel-shaped frontage gradually expands toward a dramatic garden beyond. A tunnel-like concrete entrance guides visitors inward and then unfolds into an open, semi-octagonal living and dining space with full-height glazing that celebrates the landscape beyond. According to MAPEI Malaysia (2018), the design of the house adheres to sustainable design principles. The flooring's natural cement finish was chosen to complement the design's natural and minimalist character.



Figure 7: Site - Funnel House

(Source: Archify.com)

Infused with thoughtful spatial strategies, the courtyard design features:

- **Pergola (green-inflected shading)** - Employs greenery—such as climbers or green roof elements—to soften harsh sunlight, naturally cool the space, and foster a gentle, nature-engaged ambiance.
- **Clay Brick** - Utilizes unpainted, local clay brick—a natural, durable material that maintains cool interiors, allows breathability, and introduces an earthy warmth and texture to the architecture.
- **Brick Pattern** - Implements patterned brick arrangements to enrich façades with visual interest, provide shade and ventilation, and deepen spatial texture.

• TAYLOR UNIVERSITY LAKESIDE – SUBANG JAYA

Taylor's University Lakeside Campus (TULC), Malaysia located in the west of Malaysia, in Subang Jaya, Selangor. Taylor's University Lakeside Campus is a landmark educational environment designed around a central man-made lake. The campus integrates academic blocks, student housing, and recreational areas with lush landscapes, creating a vibrant hub for learning, collaboration, and community life. The lake acts as the heart of the campus, enhancing natural ventilation, cooling, and scenic quality, while broad pedestrian walkways and open plazas encourage movement and social interaction. By blending architecture with ecology, the campus embodies a sustainable vision of holistic education in a garden-like setting. (NWKA, n.d.)



Figure 8: Site - Taylor University Lakeside

(Source: CommonGround.work.com)

Infused with thoughtful spatial strategies, the courtyard design feature:

- **Chess Tile Pattern** – employs alternating light and dark squares across floors and surfaces to create a timeless checkerboard effect, adding visual rhythm, contrast, and a sense of order within communal and transitional spaces.

• YUECHENG COURTYARD KINDERGARTEN – BEIJING

Located in Beijing, China, YueCheng Courtyard Kindergarten is a unique educational space that blends tradition and innovation. Designed within a restored siheyuan (traditional courtyard house) alongside contemporary additions, the kindergarten embraces cultural heritage while fostering a progressive learning environment. The campus integrates classrooms, reading areas, and communal facilities around courtyards that encourage openness, interaction, and connection with nature, as kindergarten building design plays an important role in the development of the child's personality (MAD Architects, 2020).



Figure 9: Site - YueCheng Courtyard Kindergarten

(Source: ArchiDaily.com)

Infused with thoughtful spatial strategies, the courtyard design features:

- **Layout** – an open-concept plan that incorporates teaching spaces, a library, a small theater, and a gymnasium. The spatial openness promotes inclusivity, freedom of movement, and a sense of shared community.
- **Curve Organizations** – curved walls introduced at regular intervals, originally structural supports, now shape a “borderless” learning environment. This encourages exploratory play, ubiquitous reading, and richer interaction between children and space.
- **Optimizing Spaces** – every area is carefully adapted for multiple uses, ensuring efficient circulation, flexible learning settings, and maximum engagement within limited urban land.

5.0 SITE ANALYSIS

Located on Ground Level of the KAED building at IIUM, the two KAED courtyard consist of two open-air landscaped spaces that enrich the faculty's environment. Courtyard A, positioned near the KAED Gallery, acts as a transitional zone for exhibitions, informal discussions, and student gatherings in a semi-open setting. Courtyard B, located beside Laman KAED and the workshops, serves as a green landscaped courtyard, offering a refreshing outdoor retreat that supports both relaxation and creative activities. Together, these courtyards bring natural light, ventilation, and social vibrancy into the academic block—merging landscape and architecture to foster a more engaging and inclusive atmosphere for students and staff.

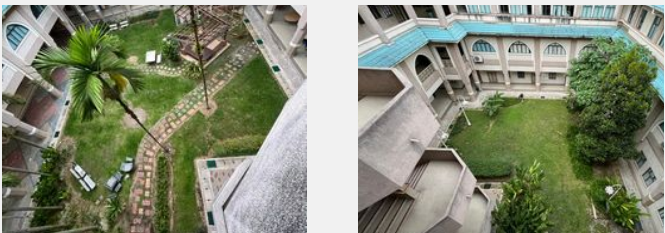


Figure 10: Site - Courtyard A & B
(Source: Authors, 2025)



Figure 11: Site - Courtyard A & B with Measurement
(Source: Authors, 2025)

SWOT Analysis

Table 1: The SWOT analysis table.

S	• Passive Design – Courtyards and arcades support cross-ventilation and natural lighting; building orientation follows sun path. • Natural Terrain – Terraced design matches landform, offering forest and hill views
W	• Unpleasant odor from cat droppings. • Hot due to lack of shading. • Few attractions or activities for students. • Poor management and maintenance. • Weak and muddy soil; flooding and slippery surfaces.
O	• Activate Outdoor Spaces – Add pergolas/trellises; turn open spaces into lounges, exhibitions, or small gardens. • Local & Climate-Friendly Materials – Use brick, timber, or stone for airflow, heat reduction, and local identity.
T	1. Heavy rain and strong sun affect semi-open spaces. 2. Student growth may cause overcrowding and noise. 3. Aging building envelope without maintenance. 4. Rigid layout limits modern upgrades.

There are 3 main type of neighbourhood context for site surrounding which are:

- Social
- Educational
- Service / Utilities

Access: Main users (students, staff, visitors) will likely approach the site from educational buildings (Lecture Theatre, Labs, Tutorial Rooms), which dominate the blue (educational) zones surrounding the site.

SITE ZONING

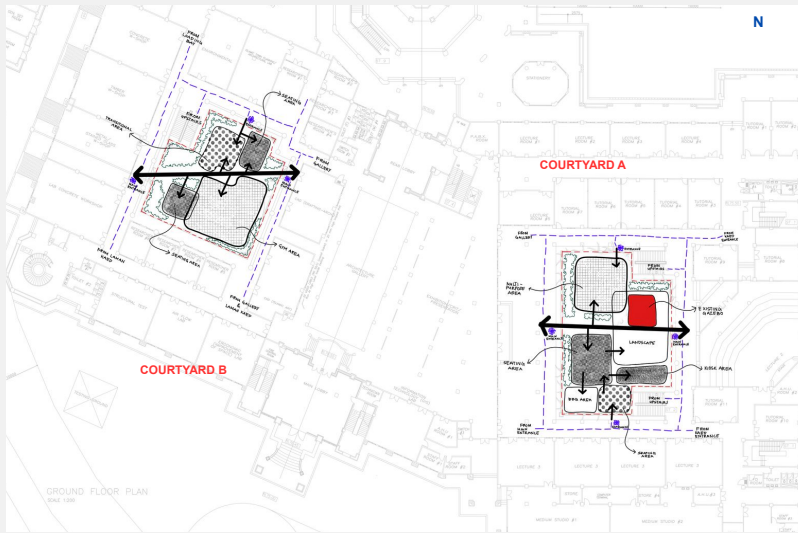


Figure 11 - Zoning Courtyard A & B
(Source: Authors, 2025)

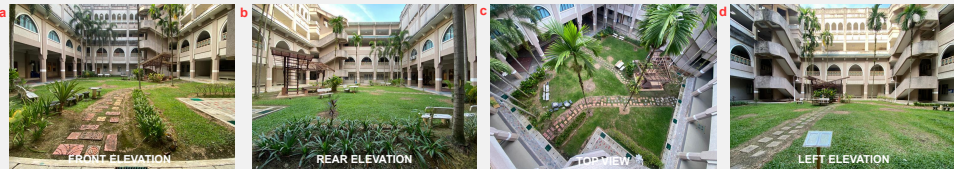


Figure 12: Site - Elevation Views of Courtyard A
(Source: Authors, 2025)

VIEWS INTO SITE :



Figure 13, A,B,C and D: Site - Views into Courtyard A
(Source: Authors, 2025)

VIEWS FROM SITE :



Figure 14, A,B,C and D: Site - Views from Courtyard A
(Source: Authors, 2025)

Acoustic analysis indicates that the primary noise contributors originate from the KAED Gallery and Theatre

All the view from site are KAED building

Main wind comes from the North-East, flowing directly into the site and shaded by building

The heliocentric path traverses from East to West. Solar gain is mitigated by the shading envelope of the adjacent four-story structure.

DATA COLLECTION	10 A.M	4 P.M
Temperature	27 °C	27.6 °C
Wind	1.6 m/s	1.03 m/s
Sound	55db	50.46db

Table 2: Environmental Data Collection - Courtyard A
(Source: Authors, 2025)

COURTYARD B

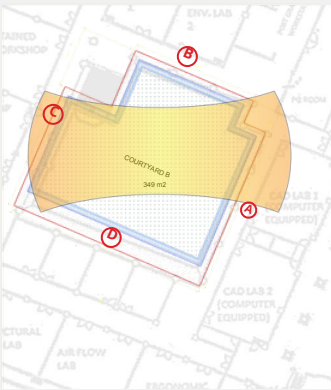


Figure 15: Site - Courtyard B Sensory & Climate Study (Source: Authors, 2025)



Figure 16: Site - Elevation Views of Courtyard B (Source: Authors, 2025)

VIEWS INTO SITE :

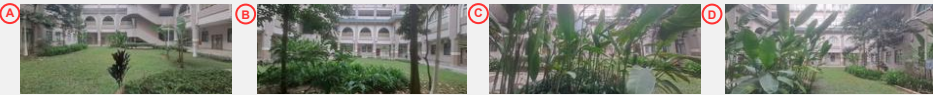


Figure 17, A,B,C and D: Site - Views into Courtyard B (Source: Authors, 2025)

VIEWS FROM SITE :



Figure 18, A,B,C and D: Site - Views from Courtyard B (Source: Authors, 2025)

Sounds come from cafe and lab

All the view from site are KAED building

Main wind comes from the North-East, flowing directly into the site and shaded by building
Sun moves East to West, but not fully exposed as it is shaded by 4 story building

DATA COLLECTION	10 A.M	4 P.M
Temperature	27 °C	27.6 °C
Wind	1.6 m/s	1.03 m/s
Sound	55db	50.46db

Table 3: Environmental Data Collection - Courtyard B (Source: Authors, 2025)

6.0 DESIGN CONCEPT

CONCEPT: WOVEN AXIS

The guiding concept of this landscape design, Woven Axis, is rooted in the values and identity of KAED as a multidisciplinary faculty. It draws upon two interrelated metaphors which are weaving and the axis to express both diversity and unity within the courtyard. The idea of woven captures the richness of KAED's five disciplines: Architecture, Landscape Architecture, Urban and Regional Planning, Quantity Surveying, and Applied Arts and Design. Each discipline is conceptualized as a distinct component, characterized by unique attributes and methodologies. While these strands remain autonomous, their interlacing facilitates a unified architectural fabric. This weaving process symbolises the collaborative spirit that underpins KAED, where interaction, dialogue, and the exchange of ideas strengthen the whole. Within the courtyard, this concept is expressed spatially through interconnected spaces—zones of learning, leisure, reflection, and gathering that overlap and merge rather than stand apart. Paths, nodes, and green areas are arranged in a manner that mirrors the interlacing of threads, reinforcing the sense of constant connection and exchange



- Woven: A blend of five unique disciplines interlacing to form a single, collaborative fabric of ideas.
- Axis: A central backbone that aligns movement and connects people across the courtyard.

Figure 19: Design Concept Illustration (Source: Authors, 2025)

The axis functions as the counterpart to weaving, acting as the structural backbone that holds the design together. While weaving brings diversity, the axis provides order and orientation. It establishes a main guiding line that links significant spaces, directs circulation, and aligns key visual corridors. In doing so, the axis not only organises movement but also becomes a symbolic connector, embodying the shared direction and common ground where all disciplines converge. Much like the warp threads in a loom that give stability to a fabric, the axis ensures coherence and clarity within the richness of woven layers.

Together, the integration of weaving and axis creates a courtyard that is both dynamic and harmonious. The weaving of spaces celebrates variety, interaction, and interdisciplinary collaboration, while the axis grounds the design with a sense of unity, flow, and orientation. This synthesis transforms the courtyard into more than a physical environment where it becomes a living expression of KAED's identity as a place where knowledge is shared, disciplines intersect, and communities thrive. The Woven Axis concept not only supports functional use of space but also communicates a deeper narrative of collaboration, inclusivity, and continuity, aligning with KAED's role as a hub of creativity and innovation.

7.0 DESIGN DEVELOPMENT

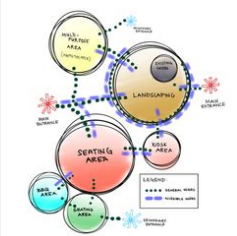


Diagram 1 - Bubble Diagram Courtyard A (Source: Authors, 2025)

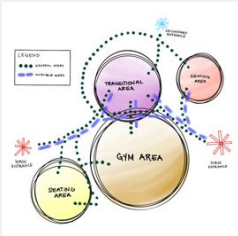


Diagram 2 - Bubble Diagram Courtyard B (Source: Authors, 2025)

COURTYARD A	COURTYARD B
1. The design utilizes the sun's path from sunrise to sunset to establish its primary visual axis.	1. The space is oriented so that the visual backbone follows the direct line of the sun's movement.
2. Multiple wind directions cross the site to form an integrated, woven spatial pattern.	2. The space integrates diverse wind flows into a complex woven pattern to connect the site.
3. The layout uses repetition and a clustered hierarchy to organize various functional zones.	3. Zones are arranged in a clustered layout that emphasizes hierarchy and structural repetition.
4. Primary and secondary paths guide movement through a unified series of social and recreational spaces.	4. Clear main and secondary circulation routes link the gym, seating, and transitional areas into a unified whole.

Table 4: Design Process of Courtyard A & Courtyard B (Source: Authors, 2025)

8.0 DESIGN FINALISATION

The final courtyard design of KAED IIUM embodies the Woven Axis concept by interlacing diverse functions, learning, leisure, reflection, and gathering, into a unified landscape. Like threads woven into a fabric, the courtyard integrates pathways, nodes, and green areas to represent the synergy of KAED's five disciplines, creating a cohesive environment that fosters interaction and collaboration. Beyond its physical form, the design also responds to the current lack of vibrancy and inclusivity by transforming the courtyard into a dynamic hub where students and staff from different fields can converge, exchange ideas, and build stronger cross-disciplinary connections. This final design not only enhances the courtyard's identity but also reinforces the values of unity, creativity, and collaboration that define KAED.

COURTYARD A



Figure 20: Entrance Courtyard A from KAED Gallery
(Source: Authors, 2025)



Figure 21: Entrance courtyard A
(Source: Authors, 2025)



Figure 22: Laman Suara (Multipurpose Area)
(Source: Authors, 2025)



Figure 23: Multipurpose Area
(Source: Authors, 2025)



Figure 24: Gazebo KAED
(Source: Authors, 2025)

This is the view of Courtyard A from the KAED Gallery, highlighting its position as an internal open space within the KAED building, framed by surrounding studios and circulation areas that define its role as a central landscape hub.

Upon entering Courtyard A from the KAED building, one immediately encounters Laman Suara (amphitheater) alongside the KAED gazebo

Upon entering Courtyard A from the KAED building, one immediately encounters Laman Suara (amphitheater) alongside the KAED gazebo, both serving as central features that enhance interaction within the courtyard's communal space.

Laman Suara (amphitheater) functions as a multipurpose area, supporting performances, discussions, and student activities while fostering interaction and engagement within the courtyard space.

The Gazebo KAED, an existing structure from a past project, is extended with a circular green grass area, enhancing its function as a relaxing and gathering spot.



Figure 25: Gazebo KAED
(Source: Authors, 2025)



Figure 26: Gazebo KAED
(Source: Authors, 2025)



Figure 27: Ruang Bichara
(Source: Authors, 2025)



Figure 28: Sudduth Tenang
(Source: Authors, 2025)



Figure 29: Barbeque Area
(Source: Authors, 2025)

COURTYARD B



Figure 30: Entrance courtyard B from Computer Lab
(Source: Authors, 2025)



Figure 31: Entrance courtyard B from Computer Lab
(Source: Authors, 2025)

At the entrance of Courtyard B, visitors are welcomed by Laman Bichara with its communal seating, Laman Sihat featuring outdoor gym facilities, and Laman Damai highlighted by semi-circular seating with a calming water feature for relaxation.



Figure 32: Laman Bichara
(Source: Authors, 2025)



Figure 33: Laman Bichara
(Source: Authors, 2025)



Figure 34 : Laman Bichara
(Source: Authors, 2025)



Figure 35: Entrance Courtyard B
from Laman KAED
(Source: Authors, 2025)

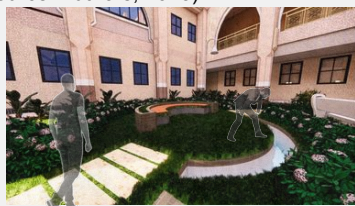


Figure 36: Semi-Circular Built in
Seating
(Source: Authors, 2025)

When entering the courtyard, the first view reveals Laman Bichara, where a set of table and chairs is complemented by a large seating pod, creating a welcoming space for students to gather, discuss, or simply relax together.

A large seating pod is provided, designed to accommodate bigger groups. It creates a relaxing and inclusive setting where students can gather, interact, or simply unwind together, promoting a sense of comfort, collaboration, and community.

Stepping stones and a paved walkway connect this area seamlessly to other courtyard spaces, encouraging movement, exploration, and continuous engagement across the landscape.

This courtyard includes a ramp to ensure accessibility for persons with disabilities (PWD), providing a smooth connection and serving as the main pathway leading directly towards Laman KAED.



Figure 37: Semi-Circular Built in
Seating
(Source: Authors, 2025)

Laman Damai features semi-circular seating combined with a complementary semi-circular water feature, creating a calm and reflective atmosphere. Strategically located near the entrance from Laman KAED, it welcomes users with a sense of tranquility and balance.



Figure 38: Gym Area
(Source: Authors, 2025)

Laman Sihat functions as an outdoor gym equipped with exercise facilities that promote health and well-being. The space also provides several seating benches, allowing users to rest, socialize, or observe activities, balancing fitness with relaxation in the courtyard.

The upgraded KAED Courtyard - SALINGKAIT embodies the Woven Axis concept by integrating diverse spaces that balance learning, leisure, interaction, and well-being. Laman Suara (amphitheater) and Gazebo KAED encourage gatherings and performances, while Ruang Bichara and Sudduth Tenang offer shaded seating for discussions and quiet reflection. Laman Panggang adds vibrancy through communal dining, and flexible kiosk spots support future activities. Meanwhile, Laman Damai promotes relaxation with water features, and Laman Sihat encourages fitness with outdoor gym facilities. Together, these interconnected spaces create a dynamic, inclusive, and sustainable courtyard that strengthens KAED's identity as a hub of creativity and collaboration.

9.0 ELEVATION AND SECTION DRAWINGS

Courtyard A

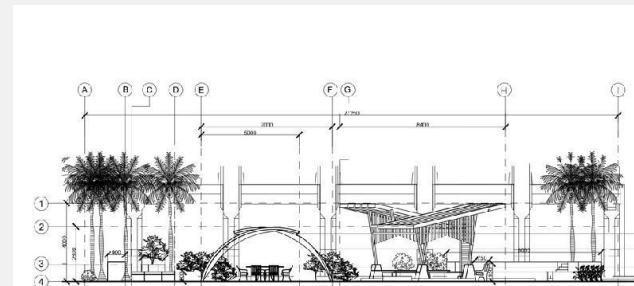


Figure 39: South Elevation, Courtyard A (Not to scale)
(Source: Authors, 2025)

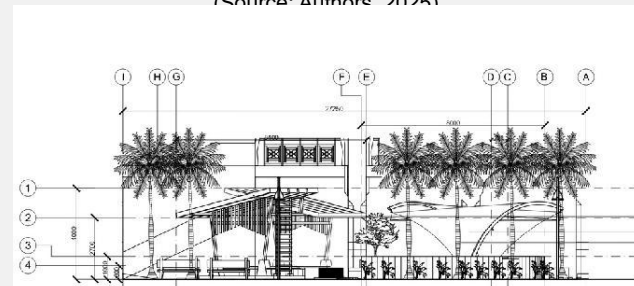


Figure 40: North Elevation, Courtyard A (Not to scale)
(Source: Authors, 2025)

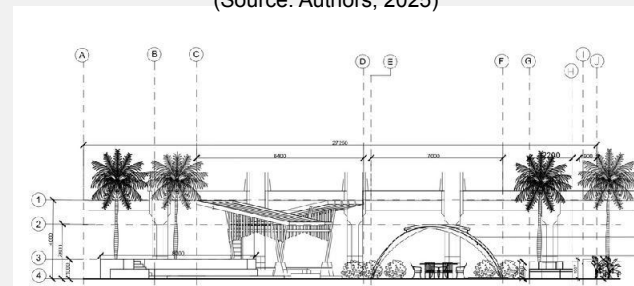


Figure 41: East Elevation, Courtyard A (Not to scale)
(Source: Authors, 2025)

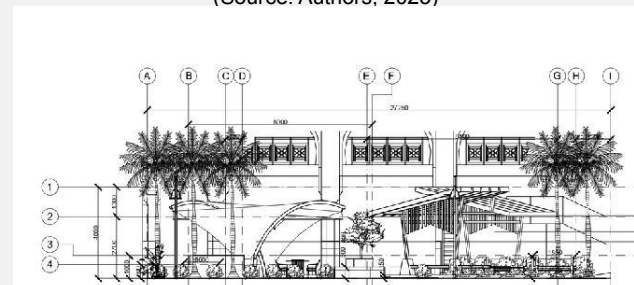


Figure 42: West Elevation, Courtyard A (Not to scale)
(Source: Authors, 2025)

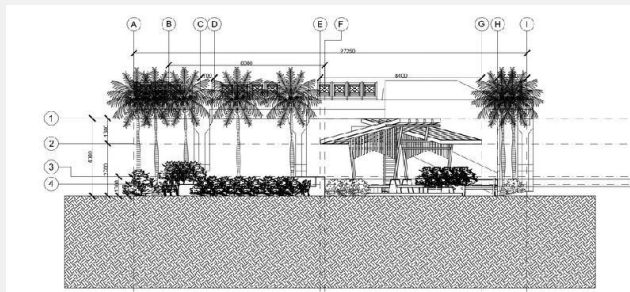


Figure 43: Section A-A, Courtyard A (Not to scale)
(Source: Authors, 2025)

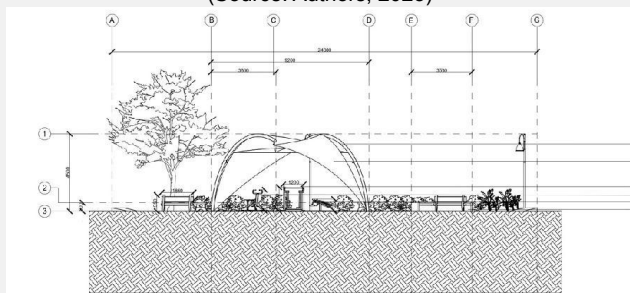


Figure 44: Section B-B, Courtyard A (Not to scale)
(Source: Authors, 2025)

Courtyard B

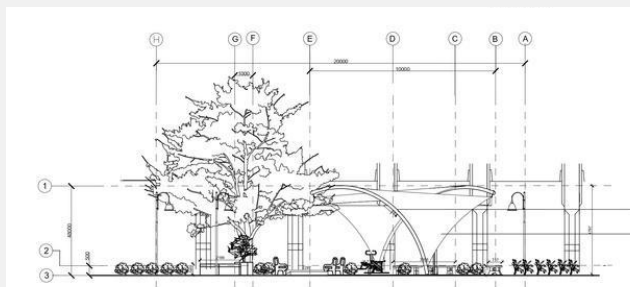


Figure 45: East Elevation, Courtyard A (Not to scale)
(Source: Authors, 2025)

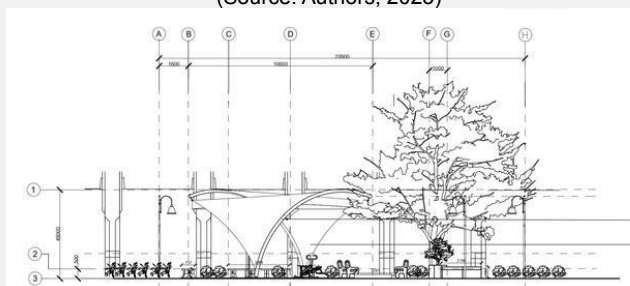


Figure 46: North Elevation, Courtyard B (Not to scale)
(Source: Authors, 2025)

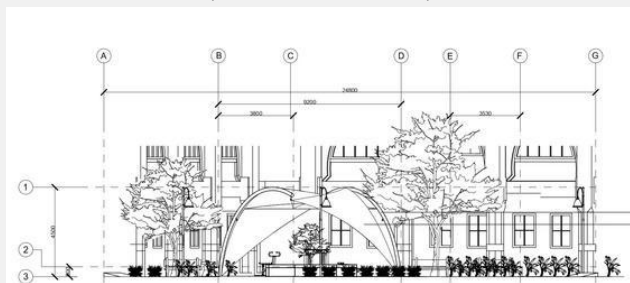


Figure 47: East Elevation, Courtyard B (Not to scale)
(Source: Authors, 2025)

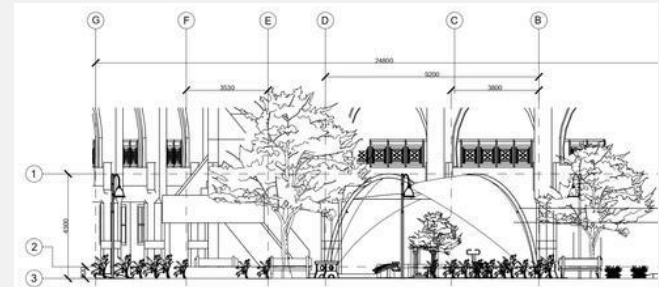


Figure 48: West Elevation, Courtyard B (Not to scale)
(Source: Authors, 2025)

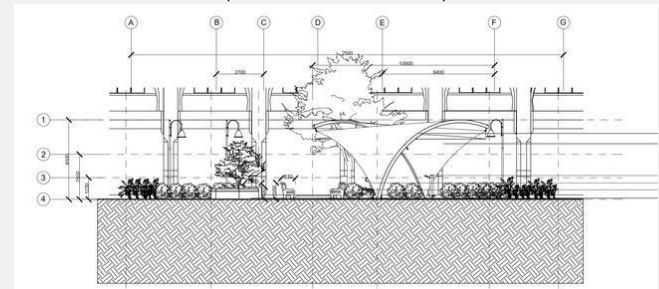


Figure 49: Section A-A, Courtyard B (Not to scale)
(Source: Authors, 2025)

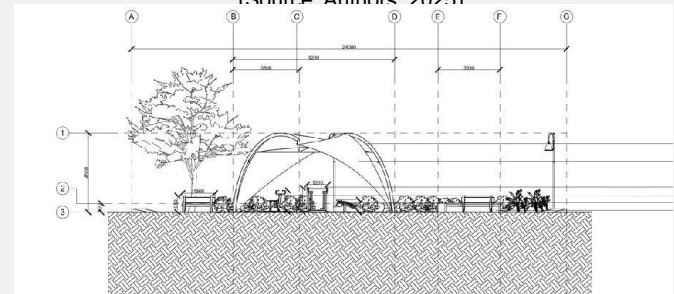


Figure 50: Section B-B, Courtyard B (Not to scale)
(Source: Authors, 2025)

10.0 COST ESTIMATION & SPECIFICATION

Weaving practicality into creativity is highly possible if one could ensure that every vision drawn can be grounded in cost reality, material efficiency, and budgetary balance. Through the design proposed, circulation challenges, underutilised spaces, and outdated elements are being addressed while being framed within a feasible financial logic. As the design aspires to flexibilize through various ideas these aspirations shall be translated into sustainable choices of materials and long-term value. In essence, the courtyard's vibrancy is not only imagined, but also attainable, resilient, and enduring over time.



Figure 51: Overall Cost Percentage Breakdown (Source: Authors, 2025)

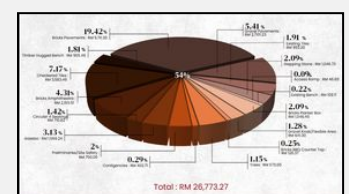


Figure 52: Percentage Breakdown for Courtyard A (Source: Authors, 2025)

This chart illustrates the total project cost of RM 50,000.00, highlighting the proportion allocated to various components. It provides an overview of how the budget is distributed across all courtyards and materials.

This pie chart details the cost allocation within Courtyard A, showing how expenses are divided among elements such as hardscapes, landscapes, and finishes. It emphasizes which components take up the largest share of the courtyard's budget.

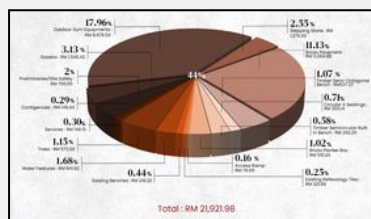


Figure 53: Percentage Breakdown for
Courtyard B
(Source: Authors, 2025)

This chart presents the cost distribution specific to Courtyard B, illustrating how the budget is spread between landscape elements, seating, flooring, and other design components.



Figure 54: Cost Distribution for Courtyard
A's Components)
(Source: Authors, 2025)

This diagram links the floor plan of Courtyard A with its cost allocation. It visualizes how different design elements, such as pathways, planting zones, and seating areas, contribute to the overall expenditure.



Figure 55: Cost Distribution for Courtyard
B's Components)
(Source: Authors, 2025)

This figure connects Courtyard B's layout to its expenditure breakdown, showing where investment is concentrated across the space, from major structural works to smaller furnishing and landscaping details.



Figure 56: Cost Distribution by Material I
(Source: Authors, 2025)

This breakdown highlights the costs of materials used in the project (e.g., timber, steel, stone, and concrete). It helps identify the most cost-intensive materials and ensures material selection aligns with budget feasibility.

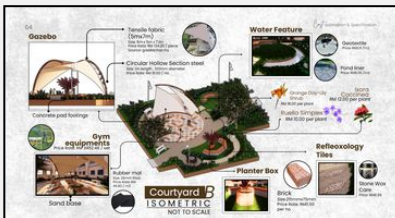


Figure 57: Cost Distribution by Material II
(Source: Authors, 2025)

A continuation of the material breakdown, this figure shows additional materials applied in the project. It reinforces how material choices affect the overall cost and demonstrates a balance between functionality, durability, and design intent.

CONCLUSION

This paper has presented the outcome of the study on the enhancement of the KAED Courtyard. The project has transformed the courtyard into a more vibrant and meaningful space that strengthens connectivity within the faculty. The design introduces improved accessibility, comfortable seating, and sustainable features, creating an environment that supports interaction, reflection, and community engagement. This revitalisation not only enhances the courtyard's practicality but also elevates its role as a central gathering place in KAED.

Overall, the enhancement of the KAED Courtyard demonstrates how thoughtful design can improve both functionality and atmosphere, benefiting the entire community. The upgraded space is now more inviting, inclusive, and adaptable, ensuring it continues to serve as an important part of campus life for years to come.

ACKNOWLEDGEMENT

This project has been a transformative experience for the members of Group 7, Sanggar Seri. The group is eager to apply the insights gained and the relationships built in future projects, with the aim of achieving outstanding results. The authors extend their sincere appreciation to the lecturers of BAQS 2300 Integrated Multi-Disciplinary Project, 2024/2025, at the Kulliyah of Architecture and Environmental Design (KAED), IIUM, as well as to all other contributing parties and institutions for their significant role in making this project a success.

Essentially, the outcome of this project has been presented elsewhere by the team in the form of infographic poster and design model, and won two (2) Awards in the Exhibition of BAQS2300 Multi-Disciplinary Project session 2024/2025. as shown follows:

1. Award of People's Choice
2. Award of Dean's Choice

Lectures:

1. Mohd. Fairullazi Ayob
2. Asiah Abdul Rahim
3. Sufian Hamat
4. Julaila Abdul Rahman
5. Masidah Abdul Majid
6. Raja Intan Suhaylah Raja Abdul Rahman
7. Nur Ulfah Awatif Umairah Alias
8. Roziha Che Haron
9. Siti Noorfairus Che Abdullah

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1.	Saiful Imran bin Saiful Nizam	2315281
2.	Muhammad Arsyad Irsyaduddin bin Sarbini	2217761
3.	Nurshazaratul Ain binti Zanal Abiddin	2314778
4.	Nurul Ain binti Shariful Ruzi	2315518
5.	Fatin Hazirah binti Rezuwan	2315800
6.	Fadzlina binti Fazlan	2217798
7.	Najah binti Rahmat	2217758
8.	Siti Hajar binti Salihin	2315114
9.	Hasya Hana binti Zulkarnain	2315008
10.	Qamarina binti Mohamed	2315934
11.	'Ainan Nur 'Iffah binti Abd Hamid	2314928
12.	Fatin Suhailah binti Suliaman	2314364
13.	Haidah Al Zahra binti Haidil Mustafa	2315292
14.	Adam Syamim bin Azmi	2315277
15.	Annur Yasmin binti Basuni	2314906
16.	Nurin Hayani binti Ruzi Haizad	2314280
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04

THERAPEUTIC LANDSCAPE DESIGN FOR SOCIAL REPAIR: REVITALIZING THE SUNGAI BULOH LEPROSARIUM

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ABSTRACT

This study repositions the Sungai Buloh Leprosarium into an environment for potential social restoration through the lens of the therapeutic landscape theory, biophilic design principles, and human settlements development history. The research examines how spatial, environmental, and symbolic dimensions of the site may contribute to psychosocial healing and community reintegration. The methodology employed by the study are on-site observation and systematic photographic documentation of the current spatial organisation, environmental condition, architectural heritage, and landscape character of the site. Through qualitative site synthesis, the research establishes the most important narrative layers of environmental and social elements embedded within the settlement. The output from the first phase of the research is a comprehensive site synthesis and articulation of preliminary therapeutic landscape design strategies to transform the leprosarium into a dignified, memorable, and inclusive public engagement space. The first phase of the research presented in the paper will enable the subsequent phase to translate these strategies into a landscape master plan proposal. By framing landscape architecture as a form of social repair, this study contributes to design discourse on how historically stigmatised healthcare sites can be reimagined as resilient, healing environments grounded in human rights and collective memory.

Keywords: Therapeutic Landscape, Social Repair, Leprosarium Heritage

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INTRODUCTION

Leprosy, or Hansen's disease, continues to be a global health issue despite being declared eradicated as a public health threat in 2000. Approximately 250,000 new cases are diagnosed every year, primarily in developing countries (World Health Organisation, 2021b, 2025). With the advent of multi-drug therapy (MDT), leprosy can now be cured (Huang et al., 2024). However, many who have been affected by the disease will suffer from long-term stigma, disability, and social exclusion. Historically, public health policy related to leprosy emphasised segregation through forced isolation. These sites became symbolic of fear and separation (Wang & Kim, 2024). The Sungai Buloh Leprosarium in Malaysia, shown in Figure 1, exemplifies these practices in its design. While the initial planning for the site included more humane design approaches and settlement principles similar to those of villages (Koh, 2022), it was still viewed as a place of exclusion. The site is now recognised for its cultural significance and has even been listed as a Tentative World Heritage Site by UNESCO (UNESCO World Heritage Centre, 2019). However, it is still socially influenced by its past. Global strategies currently address not only stopping the spread of leprosy, but also eliminating stigma and discrimination (WHO, 2021a). Despite efforts to reduce stigma, a major challenge remains in the recovery process, which affects mental wellness, delays diagnosis, and prevents social reintegration (Prakoewa et al., 2020; Wang & Kim, 2024). It requires social and spatial changes. By redefining the leprosarium as a therapeutic landscape rather than an exclusionary one, this research demonstrates how landscape architecture can help reduce historical stigma and support more inclusive, resilient communities.

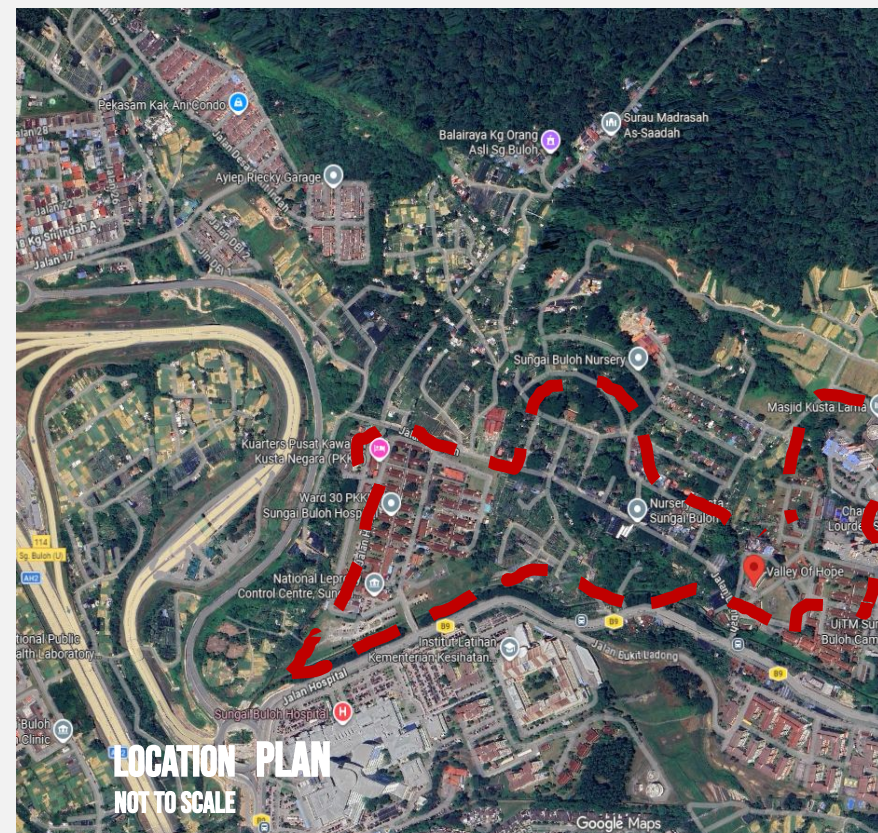


Figure 1: Location of Sungai Buloh Leprosarium at Bukit Lagong, Sungai Buloh, Selangor.

LITERATURE STUDY

HISTORICAL LEGACY OF SUNGAI BULOH LEPROSARIUM

In the early twentieth century, the Sungai Buloh Leprosarium was established (see Figure 2). At that time, it was considered one of the largest leprosy settlement areas in the region. While the Sungai Buloh Leprosarium was intended for isolation at the time of its establishment, the area's design eventually adopted a village-like approach that incorporated environmental and community elements (Koh, 2022). Today, the area is recognised for its cultural heritage values and is included on UNESCO's Tentative World Heritage List (UNESCO World Heritage Centre, 2019). Nonetheless, the Sungai Buloh Leprosarium remains an institution most well-known for its role in segregation. As there are today modern global initiatives to achieve "zero transmission, zero disability, and zero stigma" (WHO, 2019), this represents a movement away from segregation and toward rehabilitation, inclusion, and human rights. Stigma remains, however, very entrenched and affects the quality of life of individuals impacted by leprosy (Prakoewa et al., 2020).

LEPROSY AS AN ONGOING PUBLIC HEALTH SOCIAL CHALLENGE

Although leprosy is curable with multidrug therapy (MDT), new cases continue to be reported annually (WHO, 2019, 2025). The disease primarily affects the skin and peripheral nerves, and delayed diagnosis can lead to permanent disability (Huang et al., 2024). Beyond medical complications, stigma often results in psychological distress, social isolation, and delayed treatment. Environmental conditions also play an important role in disease persistence. Poor housing quality, inadequate ventilation, limited natural lighting, and overcrowding have been linked to higher leprosy incidence (Romadhani & Sulistyorini, 2020; Rizal et al., 2021).

THERAPEUTIC LANDSCAPE THEORY

Therapeutic landscape theory provides a conceptual framework for understanding how environments contribute to the healing process. The term was first used by Gesler (1992), who described where natural, built, social, and symbolic elements work together to support well-being. The therapeutic landscape perspective, rather than viewing environments simply as a backdrop or setting for life's events, sees environments as contributing factors to health outcomes. Studies have demonstrated that the availability of parks, daylight, clean air, and intentional and supportive spatial planning can reduce stress levels and increase overall mental well-being (El Barmelgy, 2013; Guo et al., 2023). More recently, research has highlighted the importance of the sensory experience and embodied experiences of interacting with nature in creating healing environments (Bell et al., 2023; Sillmann et al., 2024). Thus, within the context of Sungai Buloh, therapeutic landscape theory is used to reinterpret the site as a location not just for the preservation of cultural heritage, but also as an environment for promoting psychosocial recovery and integrating those recovering from trauma or illness into communities.

FROM SEGREGATION TO SOCIAL REPAIR

The literature suggests an interest in understanding leprosaria as sites of confinement and social exclusion. However, there is an opportunity to reimagine leprosaria as educational environments, memorials, and spaces of healing and community. Because leprosy has historically been associated with stigma, defined by physical separation from society and symbolic exclusion, the application of landscape principles, combined with new interpretations of the built heritage at the Sungai Buloh Leprosarium, offers the potential to challenge or alter public perceptions of the stigma associated with leprosy.

METHODOLOGY

This study adopts a qualitative, site-based research approach to examine the spatial, environmental and symbolic dimensions of the Sungai Buloh Leprosarium. Data were collected through systematic on-site observation and photographic documentation focusing on landscape condition, architectural heritage, circulation, vegetation, open space, and environmental factors such as ventilation, daylight, and spatial enclosure. The observations were guided by predefined criteria related to therapeutic landscape principles, including sensory experience, accessibility, and environmental comfort. Photographs were used as analytical tools to examine spatial relationships, material properties, and social activity. The collected data were then analysed using thematic interpretation to identify key environmental, historical and social layers of the site. This process resulted in a comprehensive, evidence-based site analysis that informed the development of preliminary therapeutic landscape design strategies.

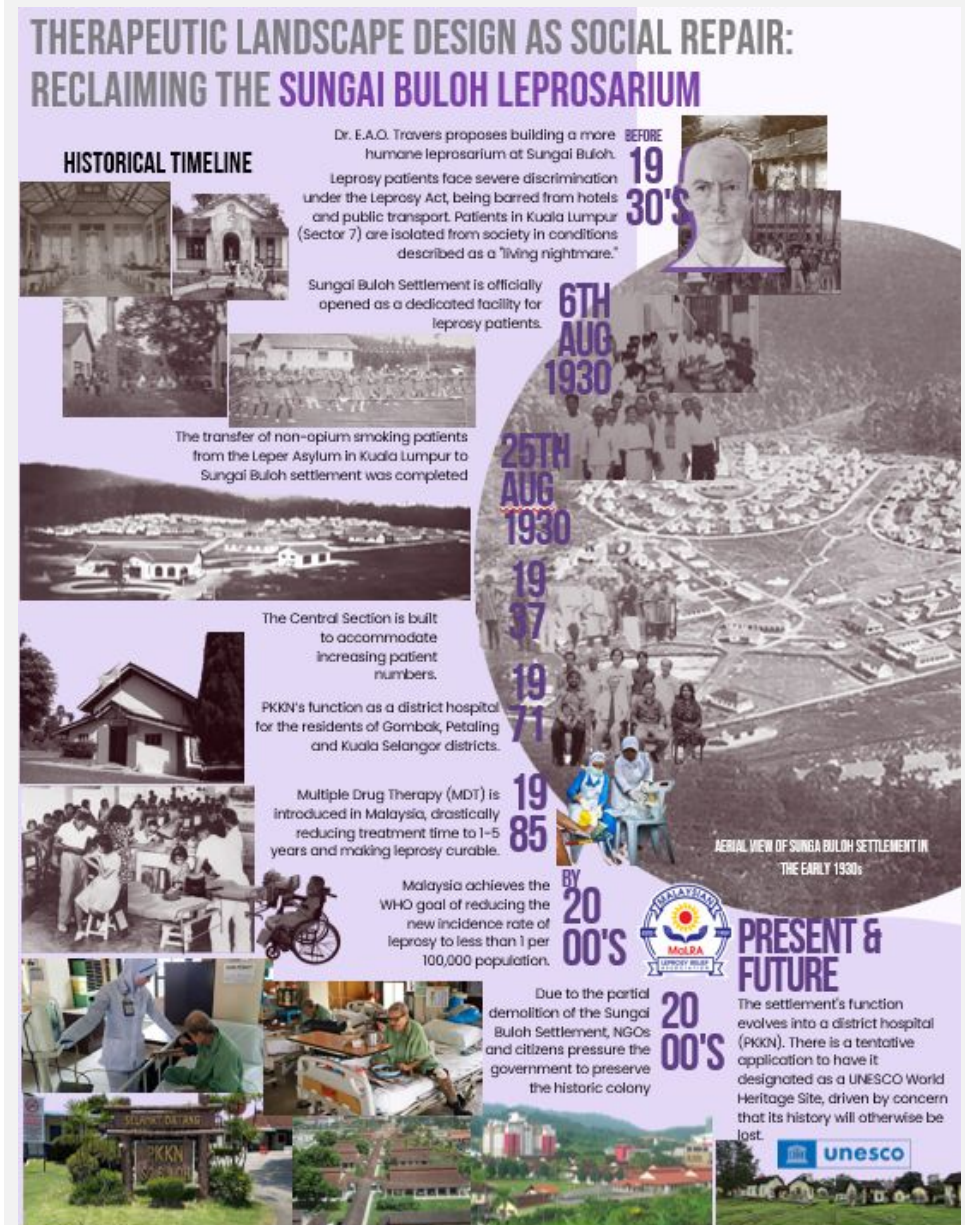


Figure 2: Historical timeline and transformation of the Sungai Buloh Leprosarium.

ANALYSIS OF MICROCLIMATE AND ENVIRONMENTAL FEATURES

Figure 3 shows that the site is strongly influenced by its valley setting, with higher humidity, morning fog, and lower wind speeds. Meteoblue data (2026) indicates average humidity levels of about 85–90%, with morning humidity often above 90%, and temperatures around 32–33°C. Wind speeds are generally low, ranging from 1.0 to 2.5 m/s, due to obstruction by the surrounding valley walls. As a result, the site experiences calmer conditions but higher moisture levels, especially in the low-lying areas. Building designs traditionally used on the site incorporate bioclimatic elements, such as high ceilings, large openings, cross-ventilation, and overhanging rooflines, to enhance indoor temperature regulation and airflow. Sunlight exposure also significantly impacts the site, as it helps achieve sufficient solar penetration and ventilation, thereby lowering moisture content and creating a less favourable environment for bacterial persistence. Mature trees provide shaded areas that offer thermal comfort, and the open lawn allows wind to circulate and sunlight to penetrate. As a result, the site requires a balance of shade, airflow, and sunlight exposure to enhance comfort, reduce humidity, and promote a healthy, therapeutic landscape.

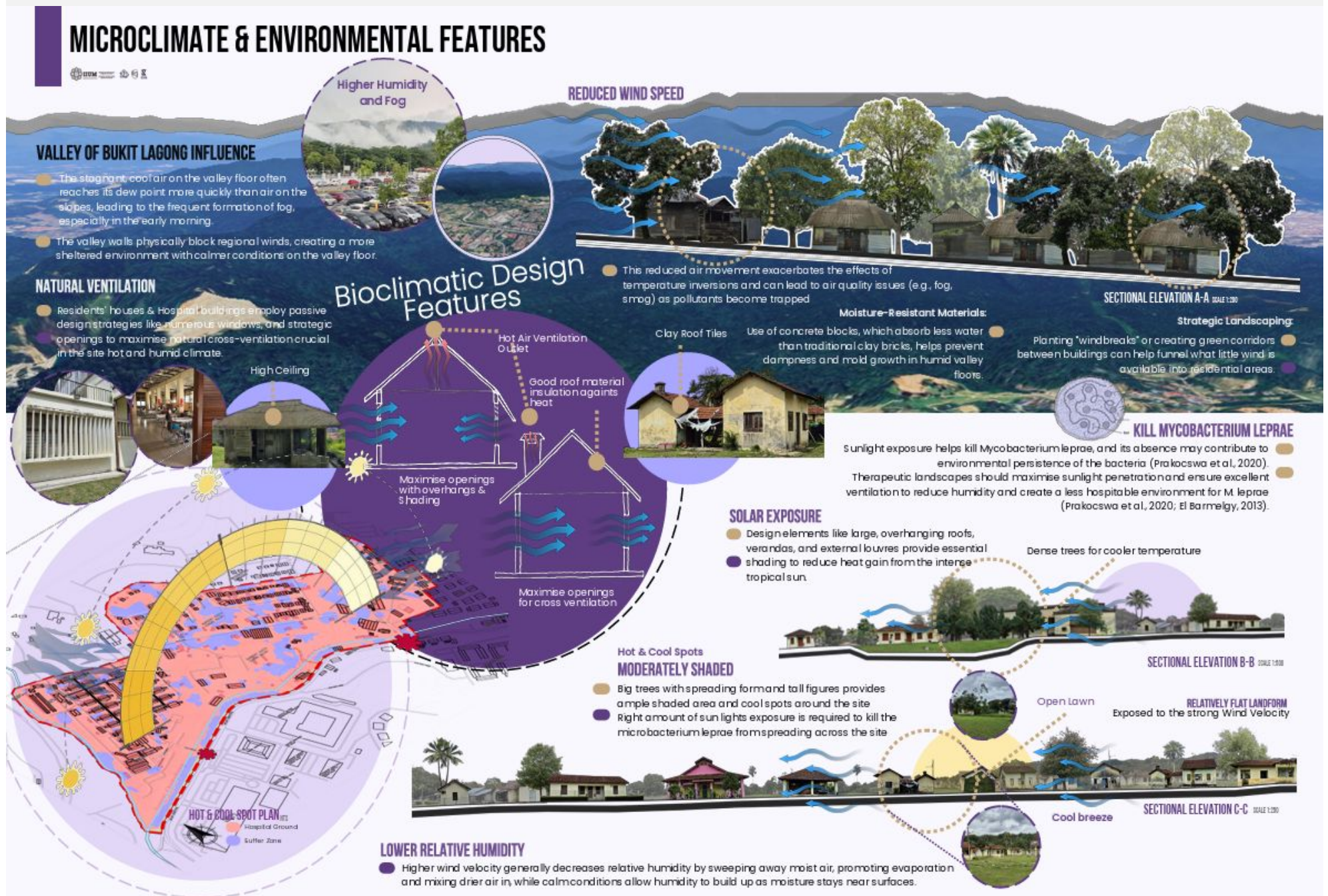


Figure 3: Analysis of microclimate and environmental features of Sungai Buloh Leprosarium.

ANALYSIS OF ACCESSIBILITIES AND CIRCULATION

Figure 4 provides evidence that this site has accessible public transportation and shaded walkways to support pedestrian flow. However, narrow streets, insufficient designated parking, and informal roadside parking frequently limit street width, leading to increased congestion at peak times. The poor maintenance of some of the streets in residential areas, characterised by gravel, broken pavement, or dirt pathways, makes them less safe. The narrow streets on the site help slow traffic due to the site's initial pedestrian-oriented design; however, these characteristics can hinder accessibility for elderly residents and visitors with mobility impairments.

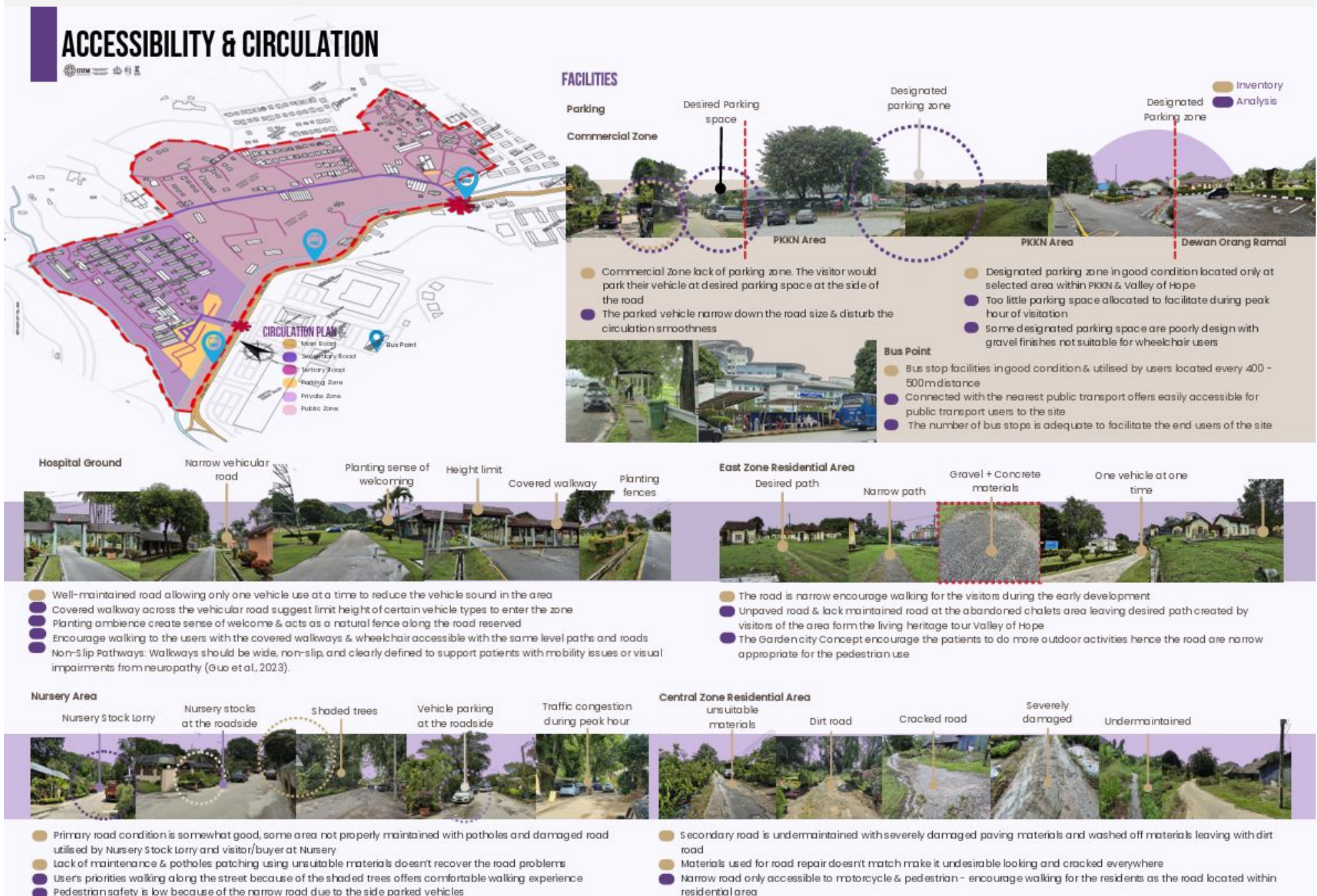


Figure 4: Analysis of accessibility and circulation at Sungai Buloh Leprosarium.

ANALYSIS OF SPACES AND ACTIVITIES

As indicated in Figure 5, the Spaces and Activities Analysis shows that the Sungai Buloh Leprosarium is a multi-layered site that combines health-related services, community care, heritage preservation, and economic development. The site operates today as a treatment and rehabilitation centre while continuing to house elderly former patients, indicating continued health-related services. The site generates income through gardening, operating a nursery, selling flowers, and providing small-scale craft products, supporting the local economy. Guided tours, the *Valley of Hope Story Gallery*, and open museum explorations preserve the site's history and provide educational opportunities, reduce stigma and allow the general public to connect with the site's past. The site hosts community events, raises awareness, and offers recreation programs that promote social interaction among residents, visitors, and researchers.



Figure 5: Analysis of spaces and activities at Sungai Buloh Leprosarium

ANALYSIS OF FLORA AND FAUNA

The site, as illustrated in Figure 6, is part of a larger ecological network with the Sungai Buloh River and the Bukit Lagong Forest Reserve functioning as key habitats. The site has a diversity of riparian vegetation, including large canopy trees, fruit trees, and medicinal plants, developed historically through the site's self-sufficient and agroforestry practices. Heritage trees, such as *Hydnocarpus castaneus* (a source of chaulmoogra oil, historically used to treat leprosy), have significant cultural and medical value to the site. The diversity of plant species supports bird life and other small wildlife. A limited riparian buffer zone presents an opportunity to increase blue-green corridor connectivity and enhance biodiversity. Therefore, the site has significant ecological potential to utilise conservation, habitat restoration, and therapeutic planting techniques to improve both its environmental sustainability and heritage identity.



Figure 6: Analysis of flora and fauna at Sungai Buloh Leprosarium

ANALYSIS OF PERCEPTUAL AND IMAGEABILITY STUDY

The Perceptual and Imageability Analysis based on Kevin Lynch's principles indicates that the site has a clear visual structure with recognisable paths, edges, districts, nodes, and landmarks as defined by Lynch (1964). The surrounding hills of Bukit Lagong serve as a natural landmark and borrowed landscape, defining the site's identity and enhancing its psychological refuge. The original Garden City plan and vernacular architectural style foster feelings of home, normalcy, and dignity, countering the previous stigma of isolation. However, abandoned and under-maintained buildings negatively affect the site's visual appeal and contribute to reduced overall visual quality and safety. Trees planted throughout the site help hide unsightly views and frame aesthetically pleasing vistas, thereby creating aesthetic and therapeutic benefits. Figure 7 illustrates that the site has high imageability due to its landscape character and heritage identity. To improve legibility, comfort, and public perception, the site will require careful restoration and visual enhancements.

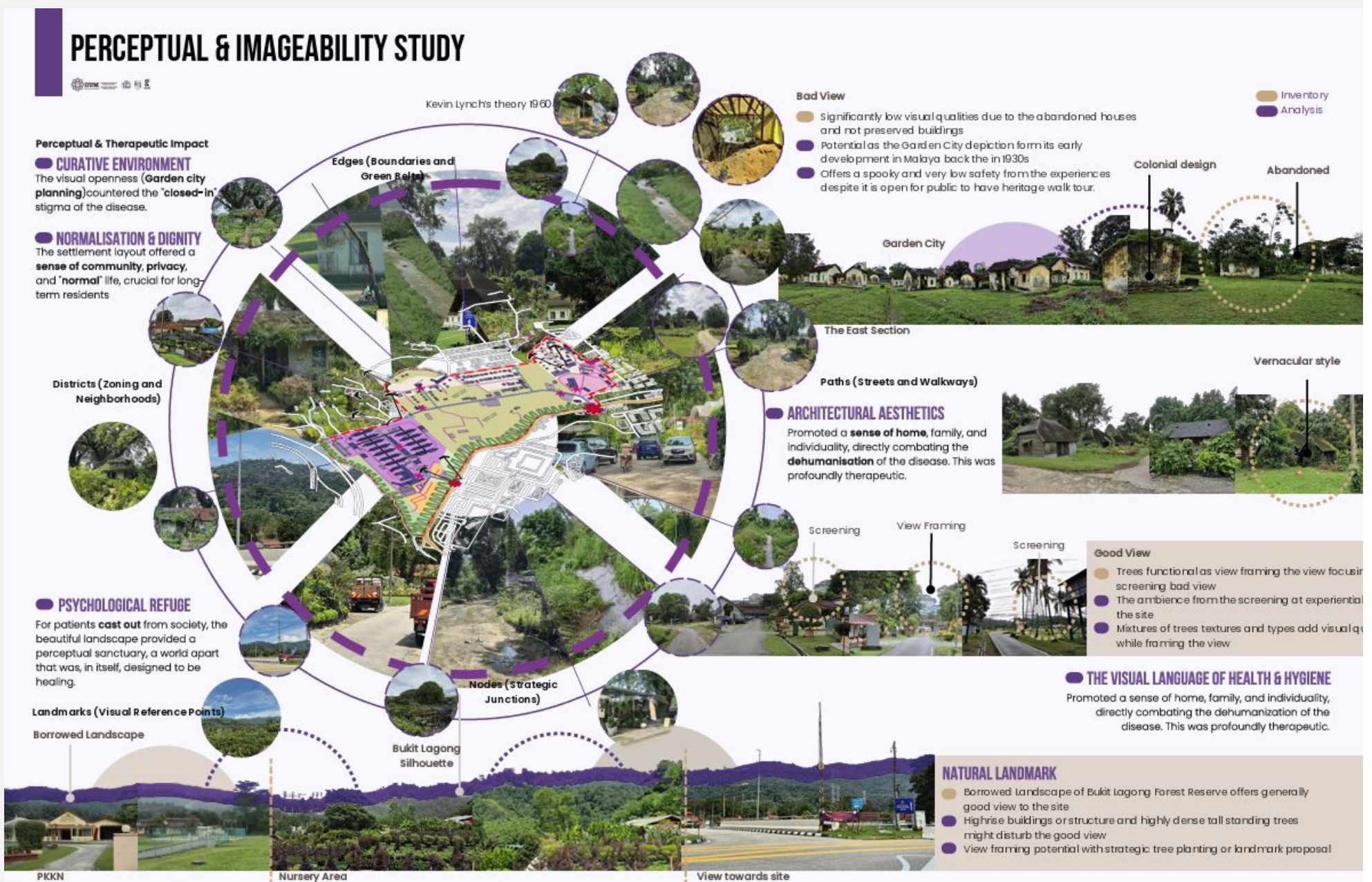


Figure 7: Analysis of perceptual and imageability study at Sungai Buloh Leprosarium

ANALYSIS OF ARCHITECTURAL SIGNIFICANCE AND TANGIBLE HERITAGE

The analysis of the site in Figure 8 shows that the Sungai Buloh Leprosarium has been historically and culturally significant due to the preservation of both colonial and vernacular architectural typologies throughout the site. The site contains various types of buildings, including residential cottages, chalets, administrative buildings, hospital wards, community halls, and public facilities, all part of a self-sufficient model that supports residents and provides a more humane way of living, rather than one based on institutional incarceration. Although many of the structures still contain their original materials (clay tile roofs, weatherboarded timbers, brick and concrete) and have climate-responsive features (high ceilings, large window openings, deep roof overhangs), some of the buildings are in disrepair and need to be preserved in order to support both contemporary uses and the architectural integrity of the buildings. The analysis shows that the tangible heritage of the site goes beyond the value of the architecture itself to represent a social aspect of the site, which is rare in the world: a planned medical community settlement that supports health care, community, quality of life, and environmental sustainability.

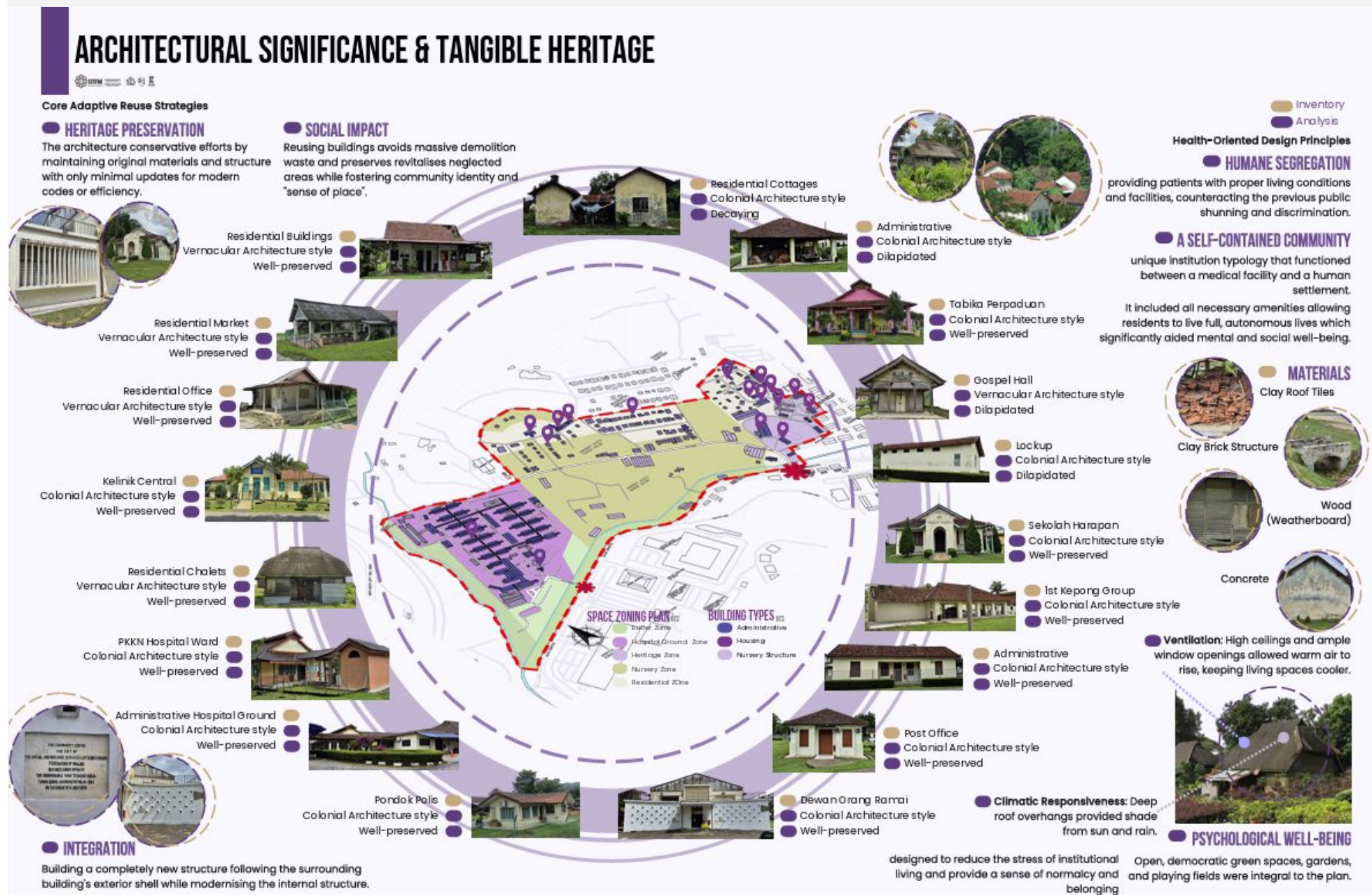


Figure 8: Analysis of architectural significance and tangible heritage at Sungai Buloh Leprosarium

SITE SYNTHESIS

Figure 9 displays the integration of the environmental, historical and social aspects of the site to reposition the Sungai Buloh Leprosarium as a therapeutic landscape that incorporates restoration and adaptive reuse by improving the river corridors, creating better pedestrian connectivity and creating additional programmatic areas (rehabilitation gardens, ethnobotany and others) that will allow the existing physical structure of the site to be transformed from an exclusive space for healing and recovery to a space where everyone can heal and recover together.

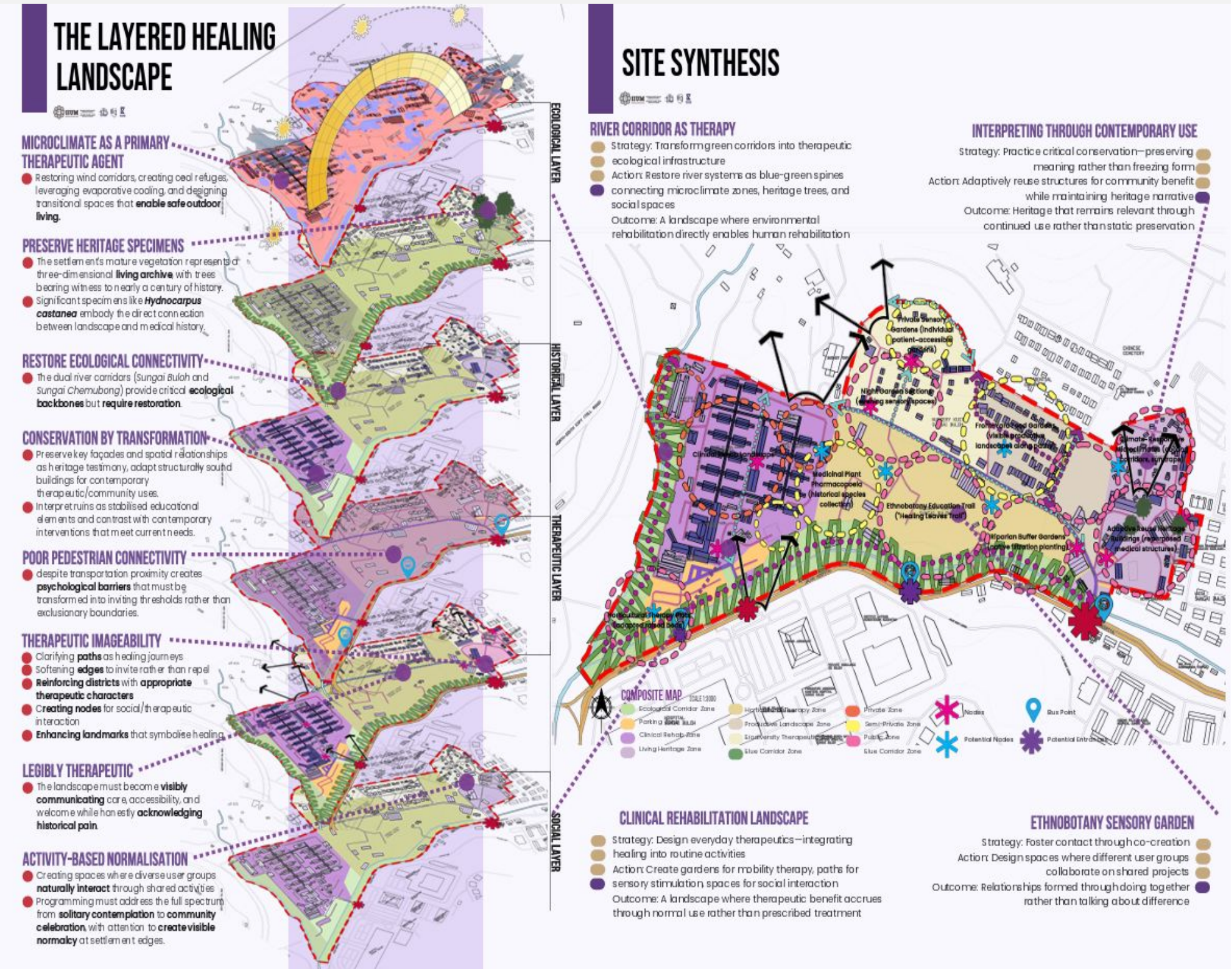


Figure 9: Site synthesis of Sungai Buloh Leprosarium

DESIGN STRATEGIES

The design strategy displayed in Figure 10 organised the site into thematic areas that integrated ecological restoration, clinical rehabilitation, ethnobotany, heritage conservation and social empowerment into a single framework for a unified approach to therapy. Through the re-establishment of river corridors, the activation of productive landscapes, the adaptation of existing historic buildings, and the placement of everyday healing spaces within the site, the proposal transforms the former leper colony into a living landscape of health, dignity, and community belonging.



Figure 10: Design strategies according to zones for Sungai Buloh Leprosarium

CONCLUSION

The study repositions the Sungai Buloh Leprosarium from a historical site of segregation to a potential landscape of social repair. While biomedical advances have proven that leprosy is curable, the spatial and symbolic legacy of isolation continues to shape public perception and lived experience. Through site-based observation and photographic analysis, this research reveals that the settlement retains strong ecological structure, heritage architecture, productive landscapes, and therapeutic spatial qualities that can be strategically enhanced rather than erased.

The synthesis demonstrates that healing elements at Sungai Buloh operate across multiple layers, including microclimate biodiversity, architecture, heritage, and everyday social activity. River corridors, mature trees, vernacular buildings, and horticultural traditions collectively form a foundation for a therapeutic landscape that integrates environmental restoration with psychosocial rehabilitation. However, issues such as poor pedestrian connectivity, underutilised heritage structures, visual deterioration, and ecological fragmentation require targeted design intervention.

By framing landscape architecture as an instrument of social repair, this study argues that transformation need not entail demolition or erasure, but rather careful reinterpretation and adaptive reuse. The first phase establishes a strategic framework that reconnects ecological systems, restores dignity through spatial design and activates heritage through contemporary use. From this phase, the subsequent phase will translate this synthesis into a comprehensive landscape master plan.

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05

SPONGE PARK AS FLOOD-RESILIENT LANDSCAPE AT BERTAM LAKE, KEPALA BATAS, PULAU PINANG

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ABSTRACT

The research explores flood-resilient landscapes and the sponge city concept to address Malaysia's increasing urban flood risks due to climate change and rapid urbanisation. The lack of effective urban stormwater management in urban areas, especially in flood-prone regions, exacerbates both infrastructure damage and socio-economic impacts. Through the incorporation of blue-green infrastructure (BGI) and nature-based solutions (NBS) into urban design, this project investigates how sponge city concepts can alleviate these challenges. To find successful design elements such as permeable pavements, bioretention systems, rainwater harvesting, rain gardens, and green roofs, information was gathered through literature reviews and precedent studies. Results indicate that the sponge city concept provides strategies for a flood-resilient landscape. Thus, it promotes urban livability, sustain biodiversity, and increase flood resistance to Bertam Lake park. The research emphasizes that it is important for adaptive flood management techniques to be practiced to promote resilient and sustainable communities in Malaysia's urban landscapes.

Keywords: blue-green infrastructure (BGI), flood-resilient landscape, nature-based solutions (NBS), sponge city, urban stormwater management

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PROJECT INTRODUCTION

The project explores flood issues in an urban area of Malaysia and how a flood-resilient landscape, which is inspired by the sponge city concept can help mitigate the climate adversity. Two objectives are set for the research, which are to identify how flood-resilient landscape strategies can mitigate the impact of climate-related challenges, and second, to explore the integration of the sponge city concept into urban design, focusing on enhancing stormwater management. The site for the project is Bertam Lake park in Kepala Batas, Pulau Pinang. There is a significant benefit from this research as it is believed that sponge city can influence the future development of the urban landscape in Malaysia by enhancing its resilience against flooding (Ahmad & Ayob, 2023).

Flood Map and Timeline



Figure 1: The site showing flood spots on the site and surrounding areas



Site Issues

The followings are issues of the site and its surrounding area:

- RISING FLASH FLOOD**
The site's surrounding has been noticing an increase of flooding.
- RAPID URBANISATION**
Residential and commercial areas are being rapidly developed within Kepala Batas area.
- DAMAGED INFRASTRUCTURES**
The flooding directly led to damage of important structures like highways and roads.

LITERATURE REVIEW

In response to increasing climate-related challenges, particularly urban flooding, the concept of flood-resilient landscapes has gained momentum as a sustainable approach to water-sensitive urban design. Central to this is the *sponge city* concept, which has emerged as a leading strategy in contemporary stormwater management. This literature review forms the theoretical foundation for the design proposal, which explores how sponge city principles can be adapted to the Malaysian context to develop a multifunctional, flood-resilient public space.

Drawing upon key studies, including Ferreira et al. (2021), Rau (2022), and Adedeji et al. (2019), this review examines the integration of nature-based solutions (NBS) such as permeable surfaces, wetlands, rain gardens, and green infrastructure to mimic natural hydrological processes in urban environments. These strategies aim to retain, absorb, and filter excess stormwater, ultimately restoring the urban water cycle to a more natural state. By emphasising both ecological performance and urban resilience, the sponge city model provides a practical and adaptable framework for landscape architecture in flood-prone areas like at Bertam Lake, Kepala Batas, Pulau Pinang.

RESEARCH METHODOLOGY

For the data collection, two methods were used: primary data and secondary data. The primary data is the on-site inventory using an observation checklist. An analysis from the observation was carried out to identify the site's opportunities and limitations. Meanwhile, the secondary data was taken from journal articles and government sources including the District Local Plan (RTD).

The collected data was analysed and synthesised to develop possible solutions or alternatives for the site to adapt a sponge park concept. Meanwhile, document analysis provides additional background and supporting information about the site (Figure 2). The analysis is presented in the following sub-sections according to the inventory attributes.

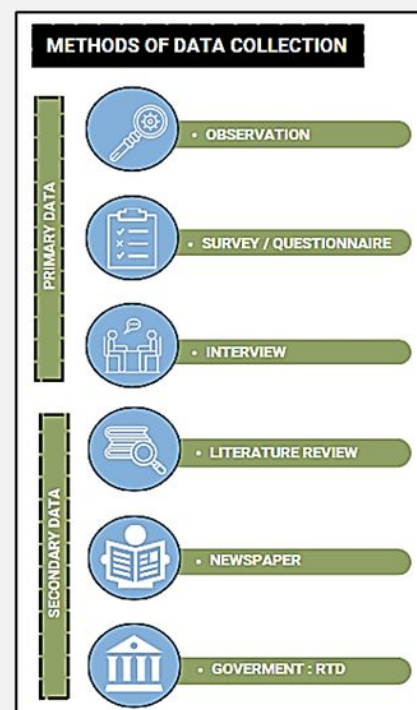


Figure 2: Data Collection Methods

PRECEDENT STUDIES

This section highlights landscapes that use the sponge city concept or the same design strategies.

i. **Benjakitti Park** is an urban park located on the site of a former tobacco factory. It has been transformed into a low-maintenance regenerative system that reduces the destructive force of stormwater, filters contaminated water, and offers much-needed wildlife habitat.



Figure 3: Benjakitti Park during dry season
(Authors, 2024)

ii. **The Starry Sky Park** in Shanghai is the world's largest sponge park. Located near the Shanghai Astronomy Museum in Lingang New City, it spans 54 hectares, including 16 hectares of water. The park features typical sponge city elements such as permeable pavements and green spaces that help purify, store, and reuse rainwater.



Figure 4: The Starry Sky Park
(<http://en.sasac.gov.cn/>)

SITE INVENTORY AND ANALYSIS

1. LANDSCAPE EVOLUTION

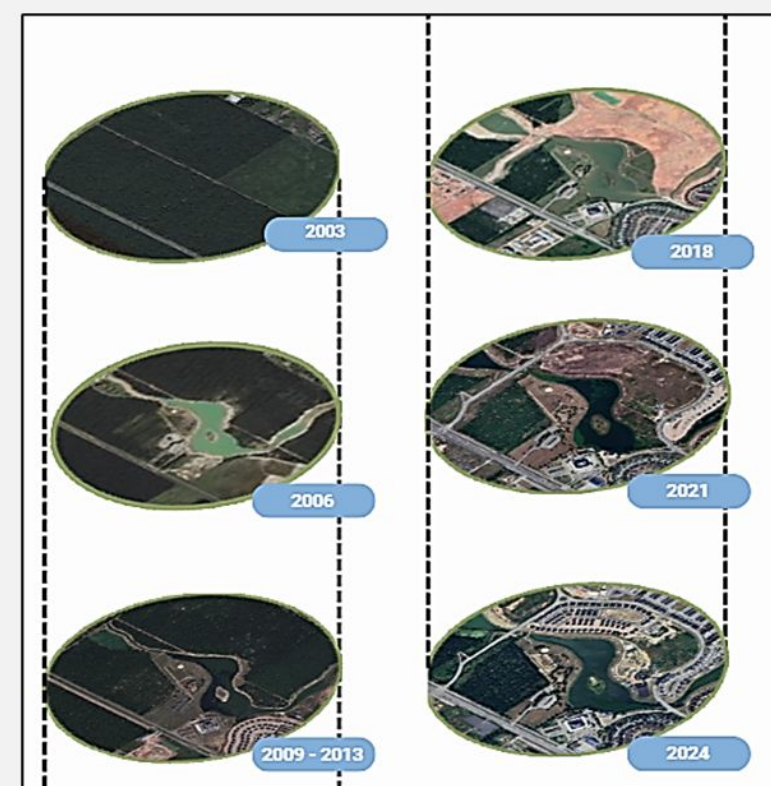


Figure 5: Landscape Evolution Timeline

SITE INVENTORY AND ANALYSIS

2. HYDROLOGY

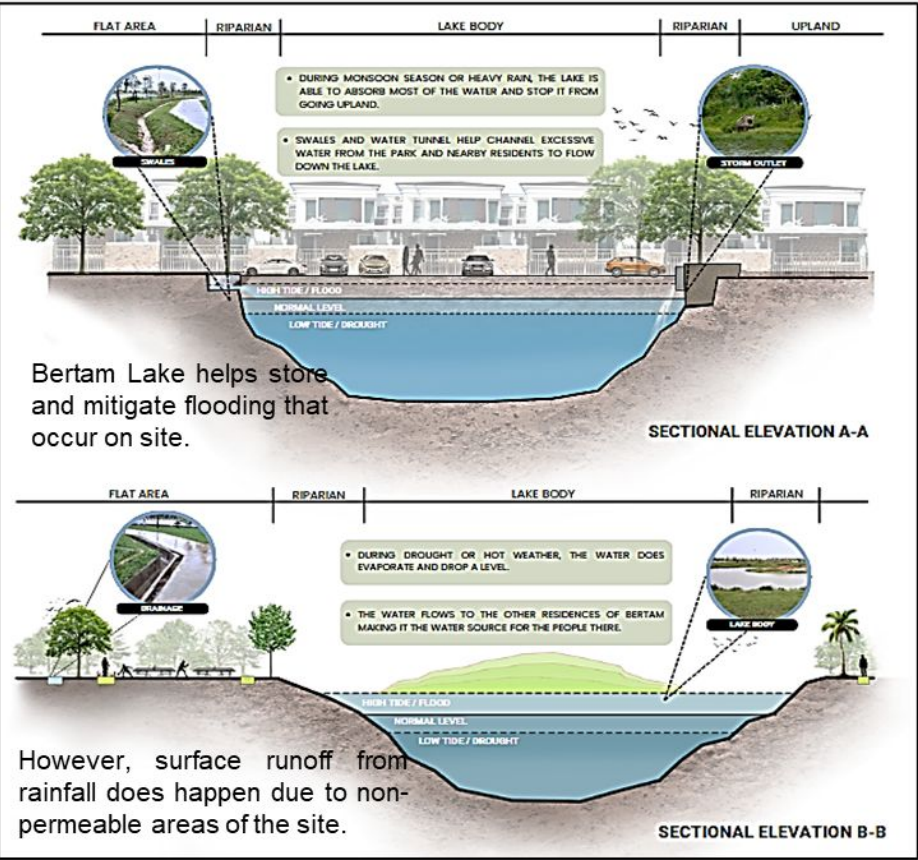


Figure 6: Sections showing the water level of the lake.

3. SOIL AND TOPOGRAPHY

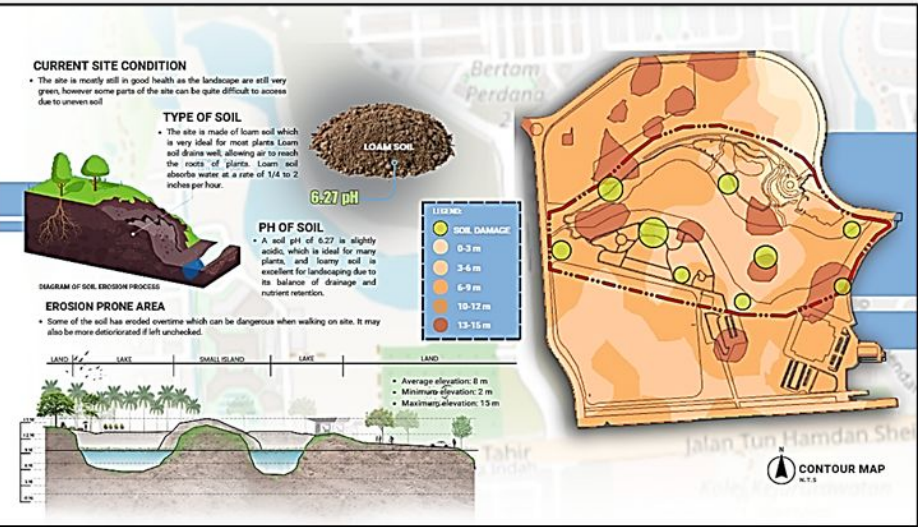


Figure 7: Diagram of Soil and Topography Analysis

The soil on the site appears healthy, supporting plenty of plant growth. The area is mostly flat, with pathways designed to meet the design standards. However, some parts are damaged or eroded due to usage and runoff water, which pose safety risks.

4. MICROCLIMATE

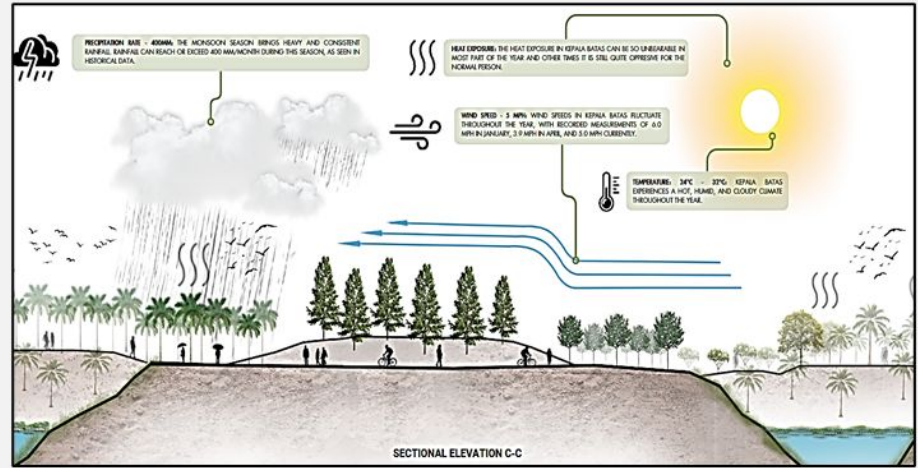


Figure 8: Section on Microclimate Analysis

Unpredictable weather poses threat to the site as flooding had occurred quite often in Kepala Batas town. Not to mention, the heat exposure before the monsoon season, which is quite unbearable and makes it harder for people to visit Bertam Lake park. In addition, the park lacks in comfortable spaces such as shaded trees and shading structures.

5. ACCESSIBILITY

The site is easily accessible, especially for nearby residents, with a direct entrance and available parking areas. However, it lacks inclusive design features for people with disabilities, such as tactile paving for the visually impaired and wheelchair-accessible paths in many areas. The materials should also be non-slip and permeable that aligned with the sponge city concept.

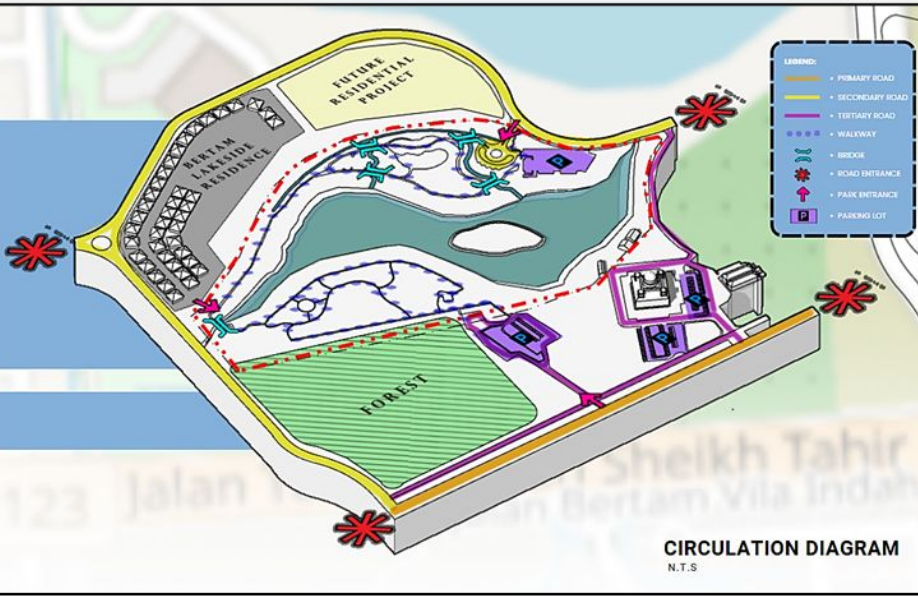


Figure 9: Accessibility analysis diagram

SITE INVENTORY AND ANALYSIS

6. SOCIO-CULTURAL



Figure 10: Socio-cultural Analysis Map

The park provides spaces for recreation and leisure, promoting a healthier lifestyle for the community. Green areas, with a variety of trees, enhance the park's sense of place and visual appeal. The site is welcoming and inviting, and local residents, schools, and organisations often hold events and activities, making it a lively and enjoyable space.

7. FLORA AND FAUNA



Figure 11: Existing Flora and Fauna and planting palette

The site has a mix of native and exotic trees, including *Tembusu* (*Cyrtophyllum fragrans*), *Merawan* (*Hopea odorata*), *Rhu Bukit* (*Gymnostoma sumatranum*), *Golden Penda* (*Xanthostemon chrysanthus*), and *Tecoma* (*Tecoma stans*). They provide shade, beauty, and support biodiversity. Large trees like Raintree (*Samanea saman*) and *Kayu Raja* (*Agathis borneensis*) offer canopy cover, while palms like Chinese fan palm (*Livistona chinensis*) and *Pisang Kipas* (*Ravenala madagascariensis*) add height and variety. This mix enhances both the ecological and visual value of the site. However, the main issue is the overgrowth of *Kiambang* (e.g. *Salvinia molesta*) in the lake, which needs to be addressed by ecological system, which is recommended in the sponge city concept. There is also a noticeable lack of wildlife in the area.

SITE INVENTORY AND ANALYSIS

8. FACILITIES AND UTILITIES

Most facilities on the site are still usable, though some, like broken benches and lights, need fixing. The upper park has more and better facilities, including a maintenance shed, since it is newer. A common complaint from users is the lack of shaded areas, especially in the lower park where gazebos are too far apart. Recreational facilities in the lower park also feel outdated compared to the upper park. Some areas, like the jetty and stepping-stone paths, seem neglected and are rarely used.



Figure 12: Facilities and utilities for Lower and Upper Park

9. VIEW AND SENSES

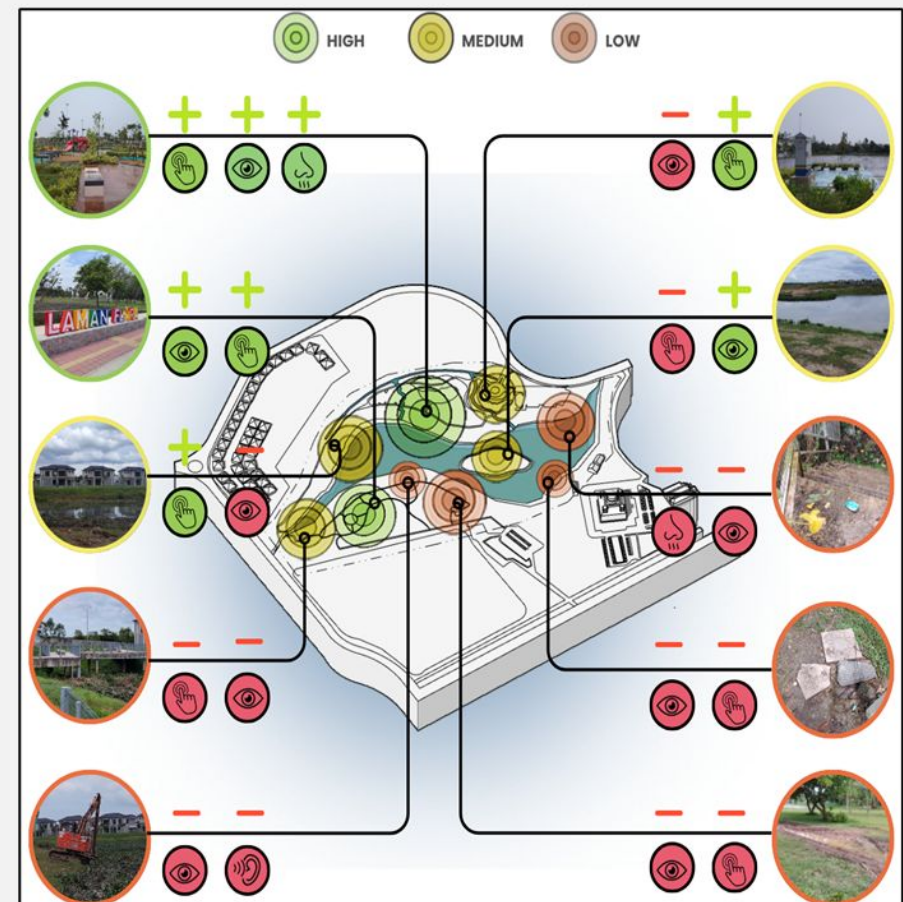


Figure 13: View and Senses Analysis Map

The site does not offer much visual or sensory appeal, except for a few nice spots. The smells and sounds are generally unpleasant due to traffic and water pollution from overgrown *kiambang* plants. Overall, the site needs more scenic views and sensory features to make it more enjoyable.

SITE SYNTHESIS

Based on the site inventory and analysis map, the site was synthesised according to its suitability to the sponge park concept, as follows:

SPONGE CORE - The heart of water retention and ecological balance. This central area acts as the main catchment zone.

POROUS CONNECTION - A network of trails that encourages water infiltration while guiding visitors through key areas.

STORMWATER GROVE - Act as a vegetated stormwater management hub, using trees, shrubs, and terraces to direct, filter, and slow stormwater runoff.

RESILIENT INTERACTIVITY - This area integrates interactive features for education and recreation, emphasising the site's resilience to flooding.

SITE SYNTHESIS
SYNTHESIS

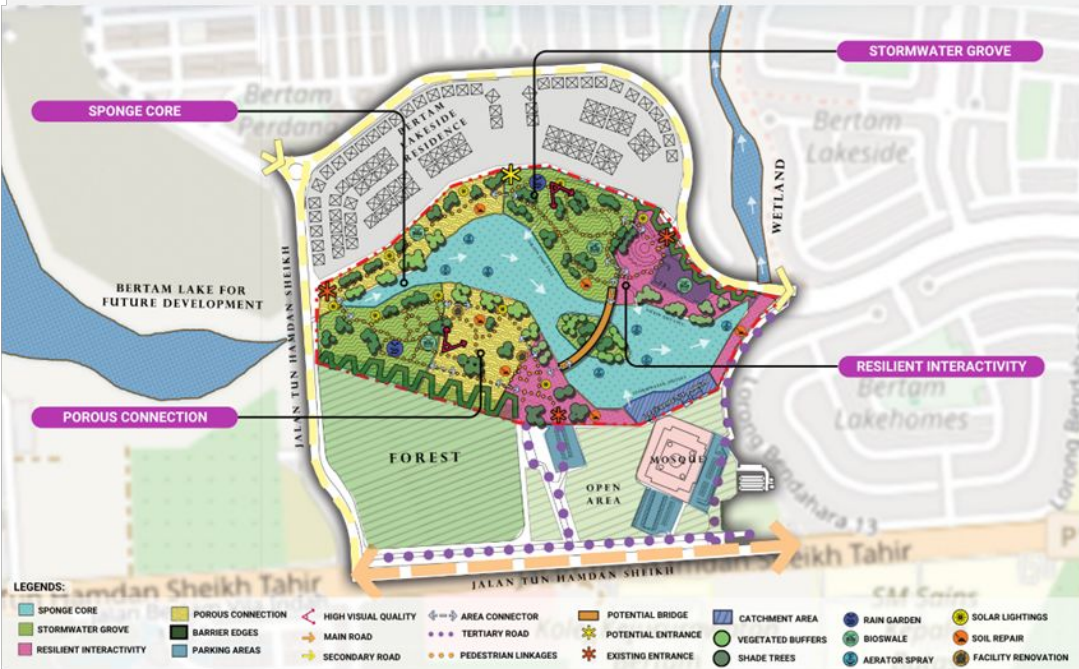


Figure 14: Synthesis Map

DESIGN STRATEGIES

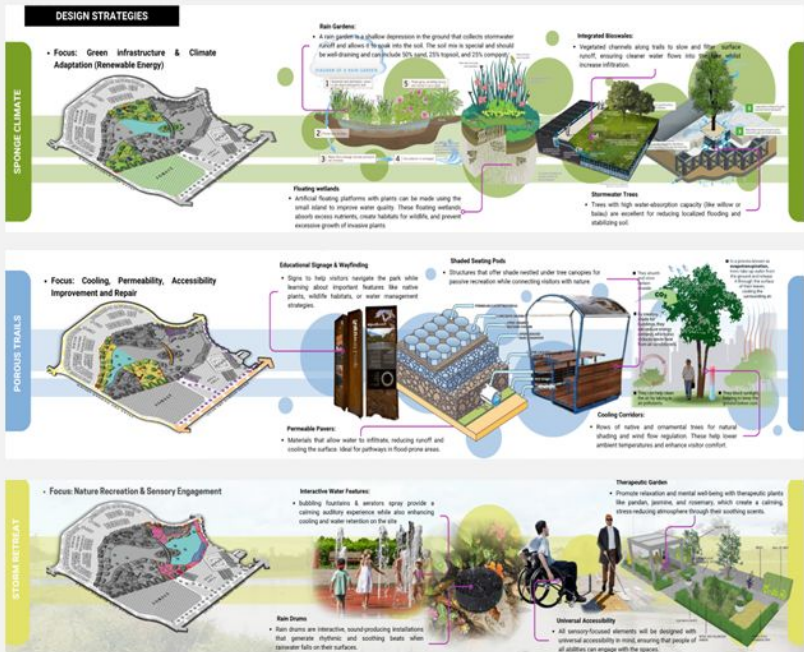


Figure 15: Design Strategies

LANDSCAPE MASTERPLAN

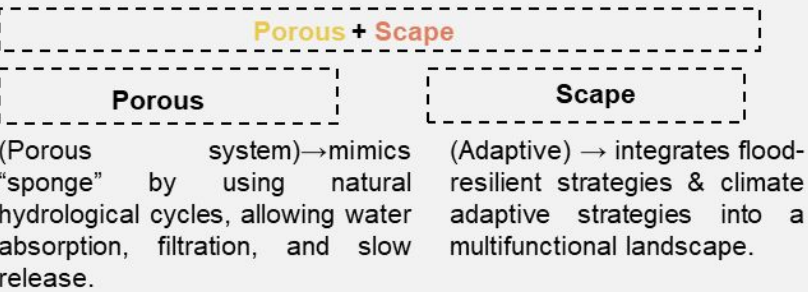
DESIGN CONCEPT

The design concept of this project is 'Porous-Scape', which means a landscape that can breathe and absorb water naturally. *Porous* represents the site's ability to soak up and filter rainwater using green features like wetlands and swales. *Scape* refers to the overall transformation of the area into a more livable and flood-resilient space. This concept helps reduce flooding, supports nature, and creates a healthier environment for the community.

DESIGN AIM

To develop a flood-resilient landscape at Bertam Lake, Kepala Batas, that enhances water retention, mitigates flooding, and promotes ecological sustainability through porous and adaptive design strategies, while integrating renewable energy and multifunctional spaces.

CONCEPT BREAKDOWN



DESIGN OBJECTIVES

1. Enhance water resilience by implementing flood-mitigation strategies, optimising water retention, and integrating blue-green infrastructure.
2. Integrate climate-adaptive solutions through renewable energy, passive cooling, and adaptive design strategies for long-term sustainability.
3. Create a renewed multifunctional and connected landscape that balances stormwater management, biodiversity conservation, and recreation.

DESIGN PROCESS

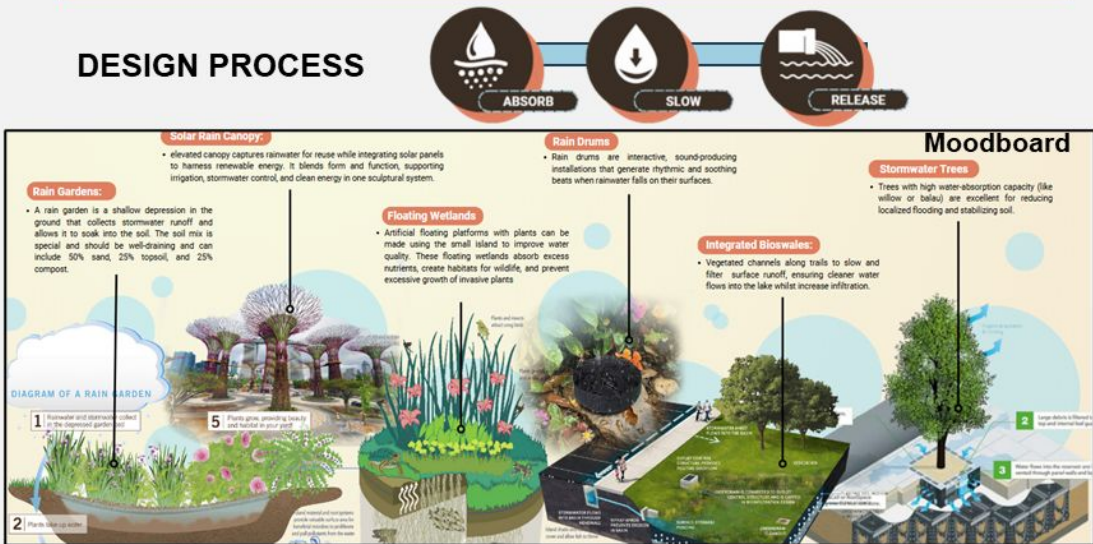
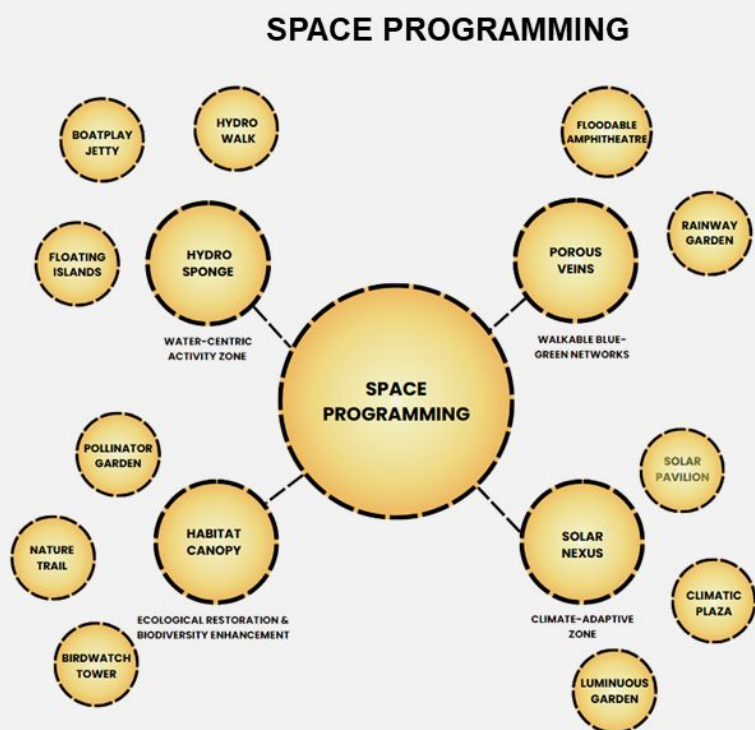
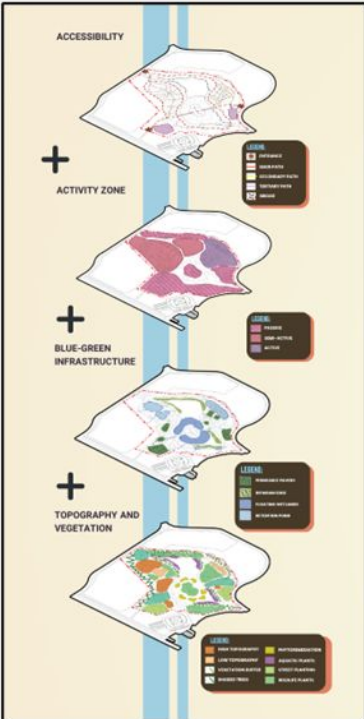


Figure 16: Mood board showing ideas in sponge park concept

LANDSCAPE MASTERPLAN



FUNCTIONAL DIAGRAMS



CONCEPTUAL PLAN

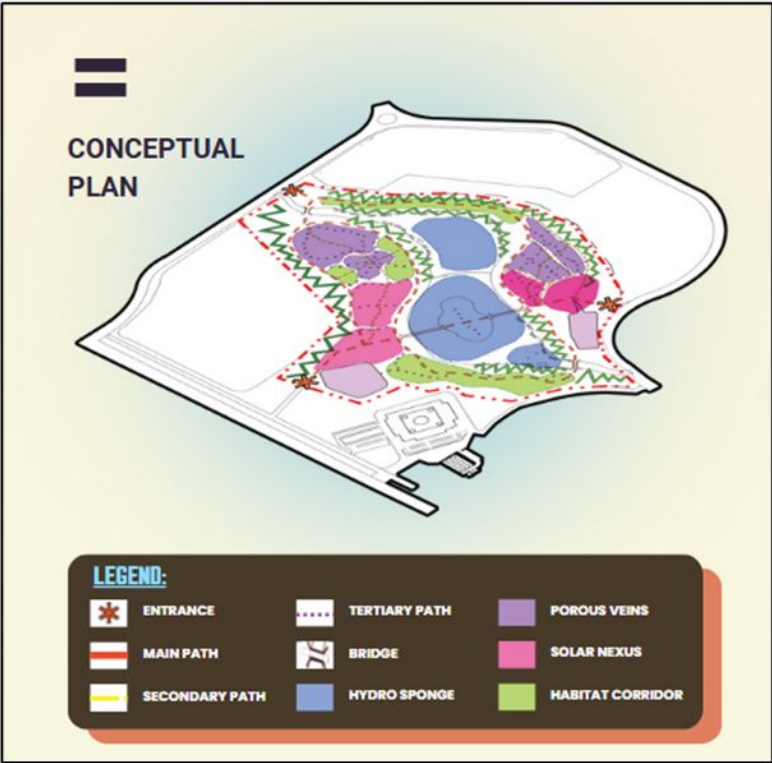


Figure 17 Layered Functional Diagrams

SCHEMATIC PLAN



Figure 18: Space programming, Conceptual and Schematic Plans

PLANTING CONCEPT

The planting concept for the project is 'Verdant Sponge'. It is a multifunctional green infrastructure strategy that combines aesthetic planting design with hydrological performance. Acting like a living sponge, the park absorbs rainfall, filters pollutants, cools the air, and supports wildlife. Strategically planted layers slow down stormwater, allow it to percolate, and transform runoff into a resource.

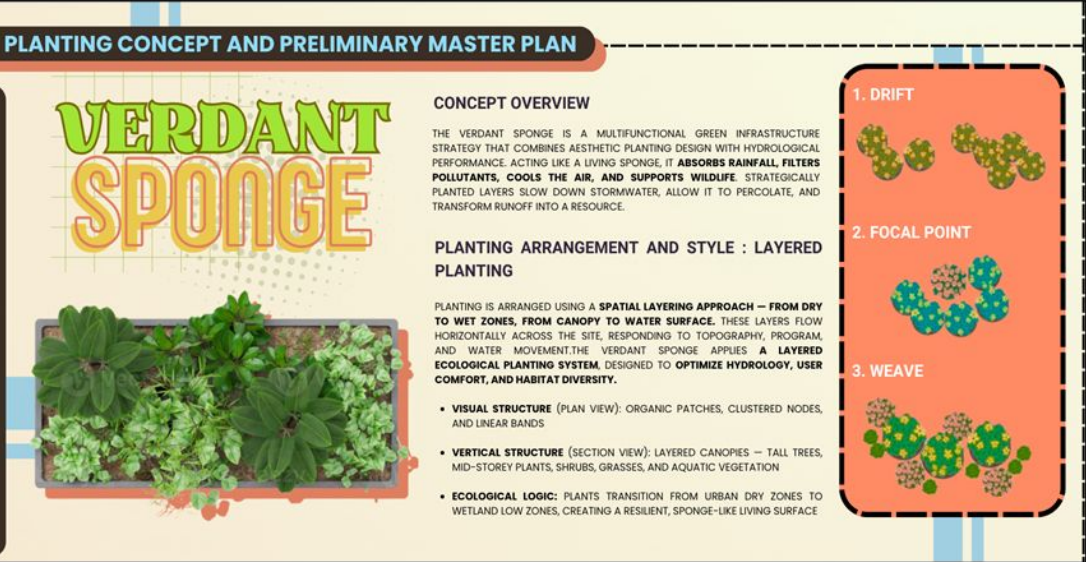


Figure 19: Planting Concept and Arrangement

LANDSCAPE MASTERPLAN

PRELIMINARY MASTER PLAN



Figure 20: Preliminary Master Plan

SECTIONS AND PERSPECTIVES

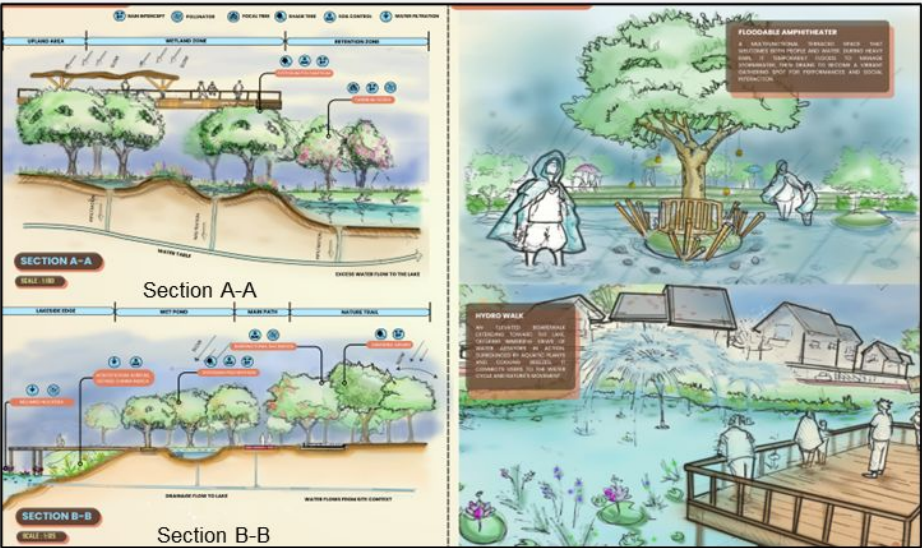


Figure 21: Sections and perspective drawings of the site

MASTER PLAN

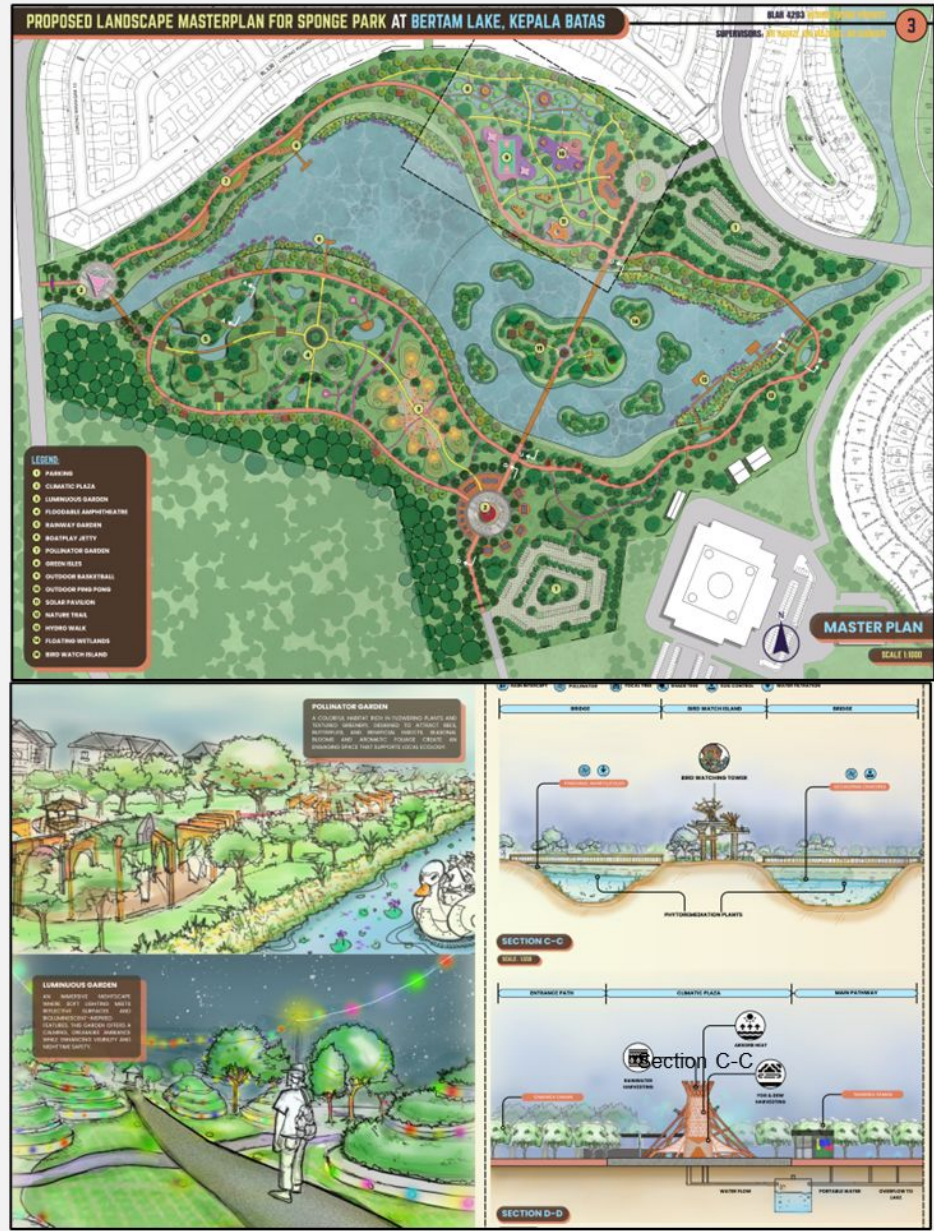


Figure 22: Master Plan andS

Section A-A is called Rainway Garden where terraces is created to help create a zone that will help flow runoff water into wetlands that are connected to the lake.

Section B-B is dedicated to the Nature Trail. There can be seen canopies of trees to slow down the water as well as wet pond as retention area.

Section C-C for the Bird Watch Island. It is surrounded by floating wetlands and a big tower on the island to oversee the natural beauty of the site.

Section D-D is for Climatic Plaza which acts as the main hub of the lower park, offering a central gathering space for visitors.

DETAILED DEVELOPMENT PLAN



Figure 23: The detailed development plan presents a refined layout of the proposed intervention, highlighting spatial hierarchy, functional zoning, user circulation, and ecological systems

STORMWATER MANAGEMENT

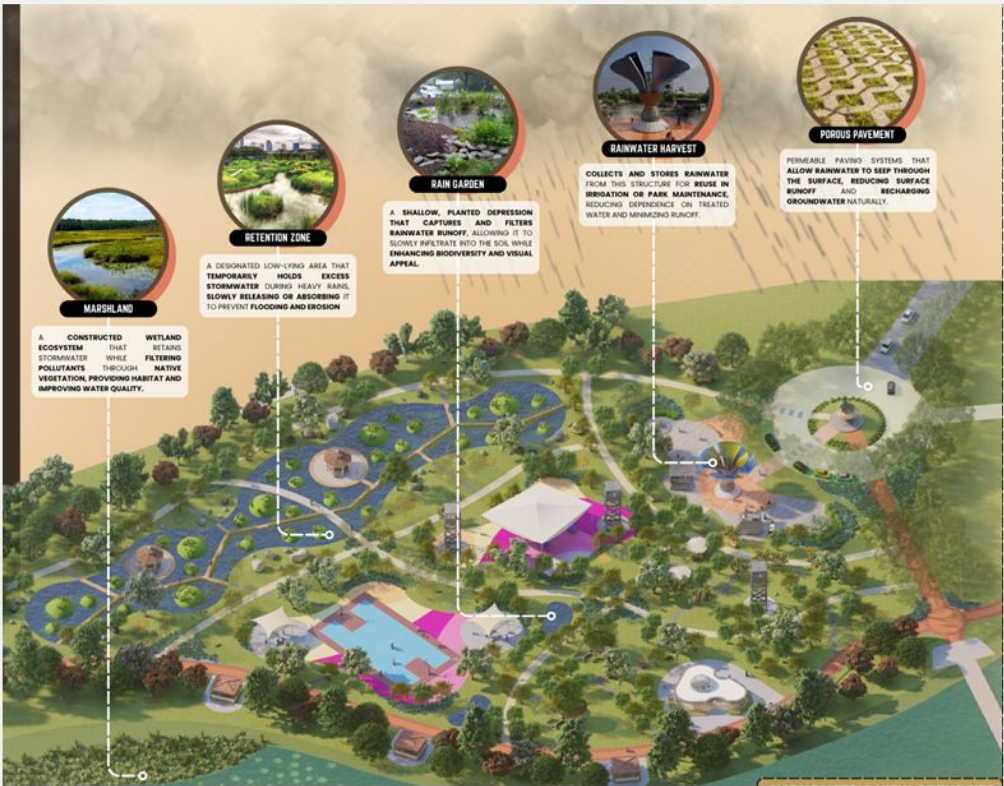


Figure 24: This section highlights how stormwater is managed on site using a sponge city approach. Following the "absorb, slow, and release" principle, the design uses green features like rain gardens, marshlands, retention areas, and permeable surfaces. For example, the proposed design will exceptionally increase the permeable surface of the site.

WATER FLOW DIAGRAMS

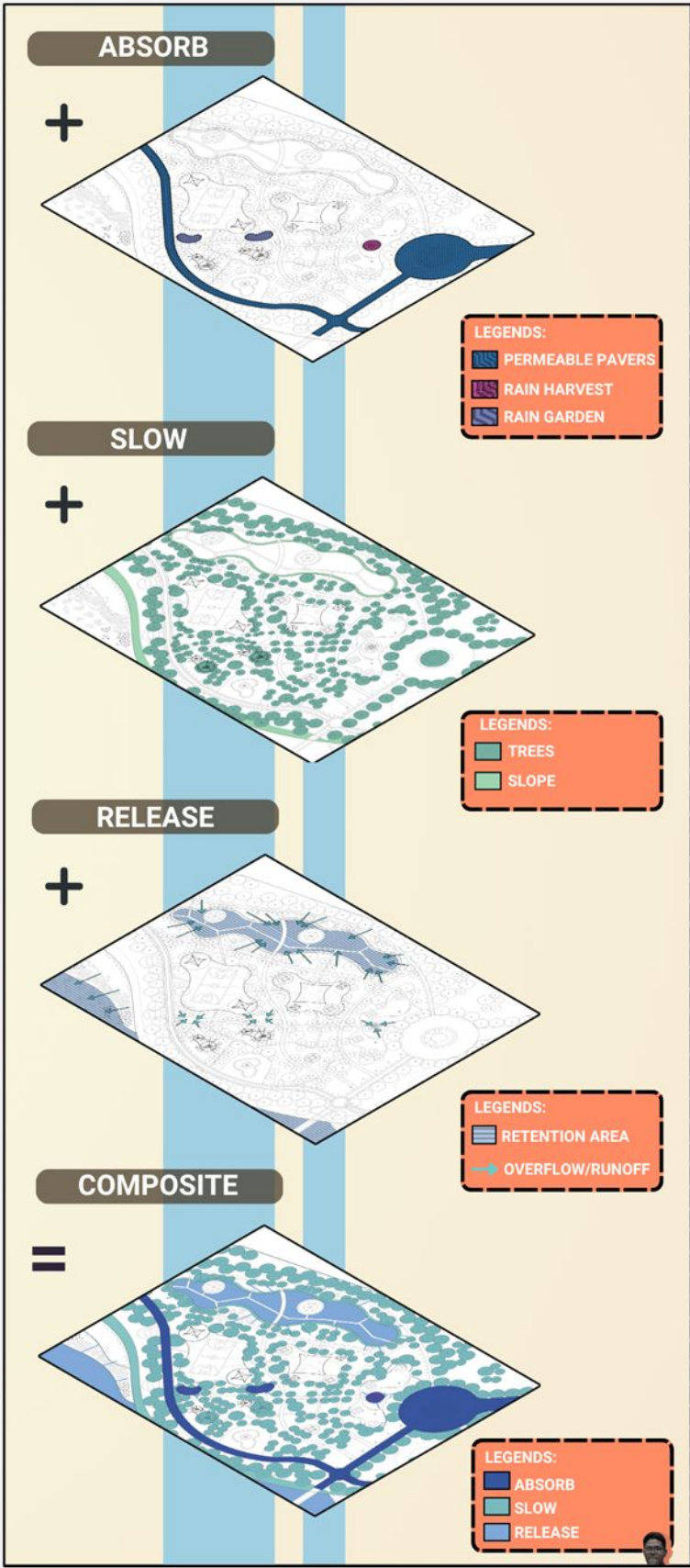
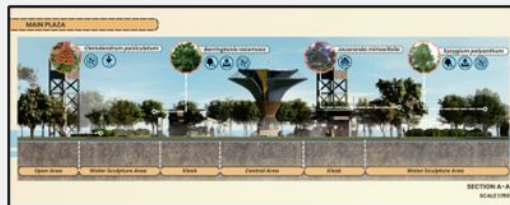


Figure 25: Layered Key Process Diagrams

SECTIONS AND PERSPECTIVES



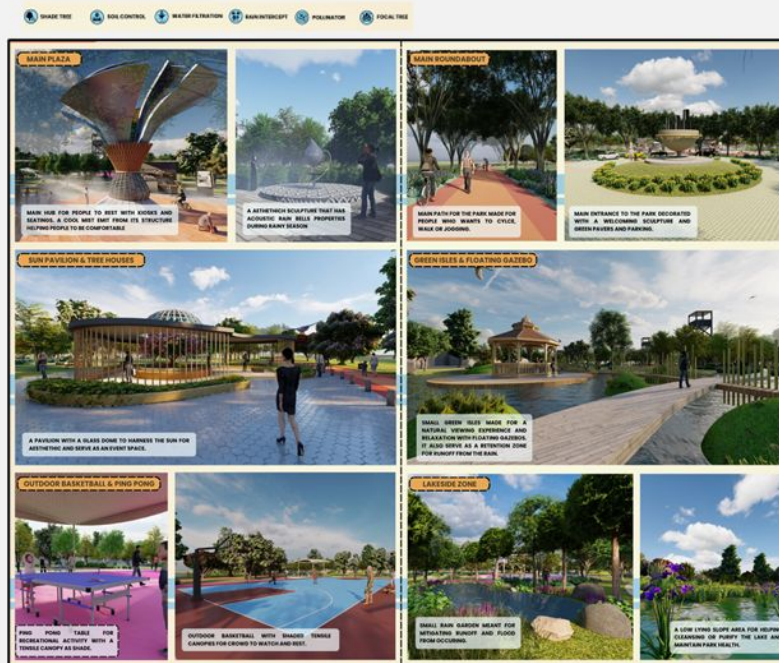
Section A-A is the main plaza. It functions as the main hub for the park, decorated with benches, kiosks, rainwater harvesting, and sculptures.



Section B-B shows the Sun Pavilion and Tree Houses. The pavilion is a relaxing spot with a sunlight dome and Tree Houses are a play area for kids.



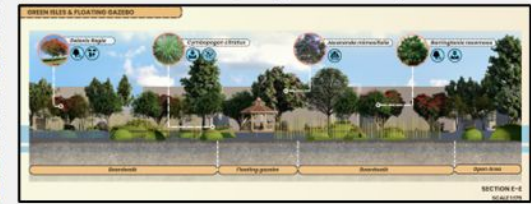
Section C-C has Outdoor Basketball and Ping Pong area. They are covered by tensile canopy for users' comfort and function as a highly active space.



The perspective renderings visualise key experiential moments within the site, showing how people engage with various elements like vegetation, open spaces, and water features. These visual scenes help communicate the atmosphere and character of the design, giving a sense of how it feels to move through and experience the space.



Section D-D is Main Roundabout. It is a direct entrance to the site and is created with permeable pavers and act as drop-off point for the park.



Section E-E is called Green Isles. This area includes floating gazebos and green isles that offer peaceful spots for visitors to relax.



Section F-F is the Lakeside Zone. It features marshland and wetland plants that help clean the water through a process called phytoremediation. They help in nutrient uptake that starves invasive weeds and solve *kiambang* issue.

Figure 26: Compilations of Perspectives Images

INNOVATIVE DESIGN ELEMENT : SPIN DROP TOWER

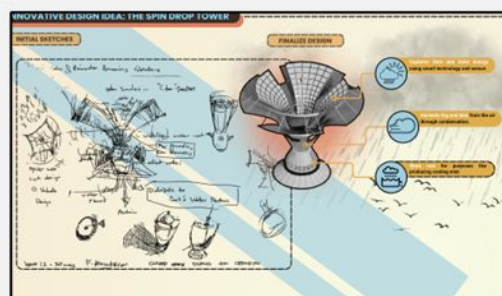


Figure 27: Design stage of Spin Drop Tower

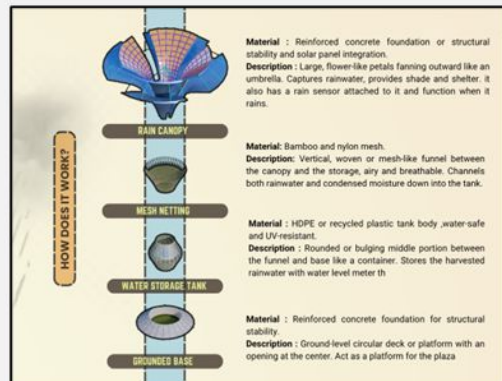


Figure 28: Material Breakdown

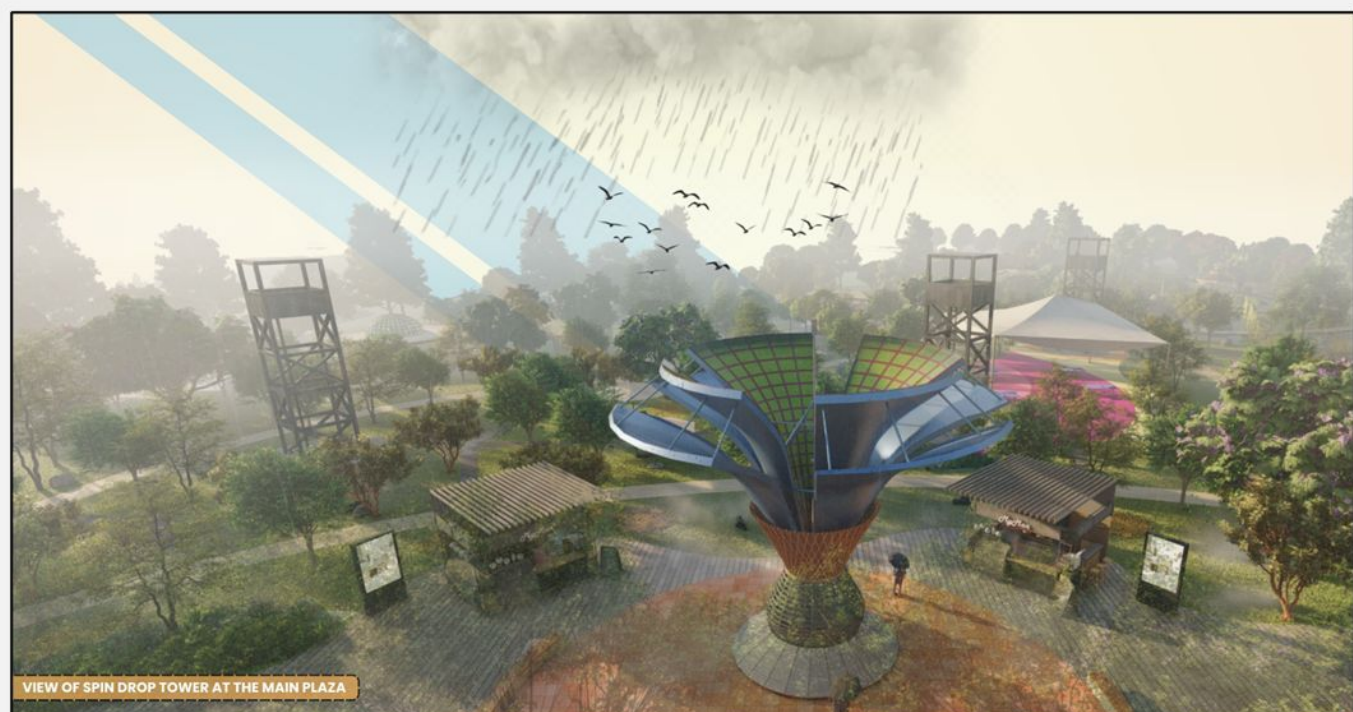


Figure 29: Perspective of Spin Drop Tower

SOFTSCAPE PLAN

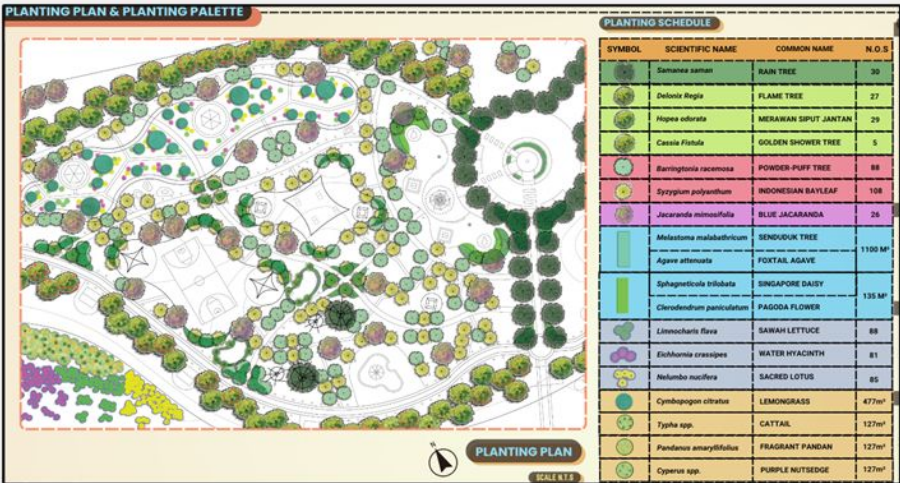


Figure 30: Softscape Plan and Softscape Schedule

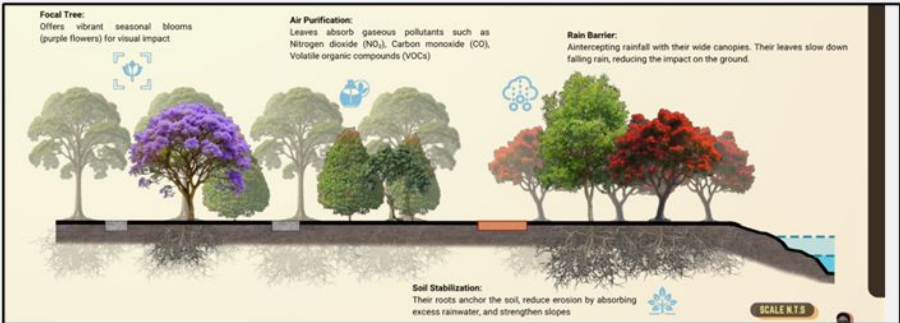


Figure 31: Typical Sectional Elevation for Tree Functions

HARDSCAPE PLAN



Figure 32: Hardscape Plan and Hardscape Schedule



Figure 33: Hardscape Palette



Figure 34: Aerial View of Current Bertam Lake park

CONCLUSION

This project began with an investigation into the ongoing flooding and ecological issues affecting Bertam Lake park and the surrounding area in Kepala Batas. Through primary and secondary data collection, the project identified key factors contributing to the site's vulnerability, including outdated drainage systems, altered land use, and poor water management. These findings laid the groundwork for a design approach using the sponge city concept centered on resilience, sustainability, and ecological healing.

The design process translated this research into a comprehensive master plan and detailed development strategy that reimagines the park as a climate-responsive, multifunctional landscape. By focusing on stormwater management, habitat restoration, and improved public access, the proposal not only addresses the immediate flooding concerns but also enhances long-term ecological health and user experience. This project aims to serve as a replicable model for other flood-prone areas, showing how thoughtful landscape interventions can turn degraded urban green spaces into vibrant, adaptive systems that benefit both the environment and the wider community of Kepala Batas, Pulau Pinang.

ACKNOWLEDGEMENT

The authors would like to thank the Landscape Department of Seberang Perai Township Council for their support and for providing helpful information during site visit and data collection. Special thanks also go to all fellow students, lecturers, and members of the local community who contributed their time and input for the data collection process. Your contributions are truly appreciated.

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06

KAMPONG KITA: REINTERPRETING KAMPUNG SPIRIT IN POCKET PUBLIC SPACES FOR UNIVERSITY COMMUNITIES

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International Islamic University Malaysia

ABSTRACT

The beautification of Laman KAED at the International Islamic University Malaysia (IIUM) aims to enhance the quality of the faculty's outdoor environment through the integration of landscape design, cultural identity, and sustainable design principles. Conceived as a multifunctional public space, the project supports learning activities, relaxation, social interaction, and community engagement. Furthermore, the proposal reflects the architectural values and educational philosophy of the Kulliyyah of Architecture and Environmental Design (KAED) by strengthening the relationship between the built and natural environments. Through the incorporation of vernacular references, passive environmental strategies, and community-oriented spatial planning, the project aspires to enrich user experience while demonstrating IIUM's commitment to holistic and value-driven educational spaces.

Keywords: Laman KAED, Malay Vernacular Architecture, Sustainable Landscape Design, Cultural Identity in Architecture, Community-Based Design Approaches, Entrepreneurship in Built Environment

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1.0 INTRODUCTION

Laman KAED, located within the Kulliyyah of Architecture and Environmental Design (KAED) at the International Islamic University Malaysia (IIUM), functions as a central outdoor space that reflects the identity, aspirations, and values of the faculty. As a communal hub, the space accommodates students' academic, social, and recreational activities while simultaneously offering opportunities for small-scale entrepreneurial engagement, including student-led stalls and community events. Consequently, the enhancement of this space is essential to improve its functionality, visual quality, and socio-economic value.

In response to these needs, the proposed beautification initiative seeks to integrate landscape elements, sustainable design approaches, and architectural harmony in order to create a more conducive and engaging environment. In addition, the project aims to strengthen community interaction, encourage outdoor learning experiences, and support IIUM's holistic educational philosophy. By combining cultural references with contemporary design strategies, the proposal aspires to transform Laman KAED into a vibrant and meaningful public space for the university community.

1.1 VISION

To lead in transforming local culture into vibrant, sustainable design experiences that inspire communities and celebrate identity.

1.2 MISSION

To craft thoughtful, place-based designs that merge tradition with innovation empowering communities, preserving heritage, and creating engaging, inclusive spaces through art, architecture, and storytelling.

2.0 LITERATURE REVIEW

2.1 MALAY KAMPUNG IDENTITY CULTURAL MAKING

Malay kampung identity is deeply rooted in vernacular architectural traditions, community-built environments, and spatial practices that reflect socio-cultural values and environmental adaptation. According to Ng (2022), Kampung Morten in Melaka demonstrates how vernacular dwellings function as living cultural traditions, whereby residents continuously adapt and reinterpret architectural elements in response to contemporary urban pressures while maintaining their cultural identity. Similarly, Ruhizar, Harun, and Zakaria (2023) emphasise that the architectural uniqueness of Kampung Pulau Sekati in Melak including the use of timber construction, multifunctional spaces, and integration with natural surroundings contributes significantly to socio-cultural cohesion and a strong sense of place.

Furthermore, Zakaria, Hussein, and Md Dali (2021) highlight that vernacular landscape features within Perak Malay kampung settlements align closely with the Malaysian Garden Concept, where landscape elements function not only as practical components but also as identity-defining features within the built environment. Collectively, these studies demonstrate that Malay kampung identity is not formed solely through physical architecture; rather, it emerges through dynamic and context-sensitive cultural processes that intertwine environmental wisdom, collective memory, and communal living practices.

2.2 PLACEMAKING IN PUBLIC SPACES

Placemaking, as a conceptual and practical approach, emphasizes how communities imbue spaces with meaningful cultural and social value. Lew (2017) defines placemaking from a cultural geography lens as “how a cultural group imprints its values, perceptions, memories, and traditions on a landscape and gives meaning to geographic space” (p. 449), highlighting the role of cultural narratives in shaping place identity (Lew, 2017). Schneekloth and Shibley (2000, as cited in Perlego summary) extend this by framing placemaking as a democratic, ongoing cultural process, one that co-produces places through collaboration and cultural labor rather than top-down planning (Schneekloth & Shibley, 2000). Sweeney et al. (2018) further reconceptualize placemaking as an open-ended assemblage, showing how long-term community maintenance and affective labor—beyond initial design—help regenerate and sustain urban spaces (Sweeney et al., 2018). Together, these perspectives reveal placemaking as a dynamic interplay of cultural expression, collective work, and spatial transformation, where public spaces are continuously made and remade to reflect evolving community values and identities.

2.3 SUSTAINABLE DESIGN IDEALS

Sustainable design is a holistic approach that seeks to balance human well-being with ecological stewardship by minimizing environmental impact while enhancing the quality of built environments. McLennan (2004) defines it as a philosophy aimed at improving life quality while reducing harm to natural systems, an idea further developed through principles such as life-cycle thinking, responsible resource use, and biomimicry (Kibert, 2016). In practice, sustainable architectural strategies include integrating green infrastructure, using low-impact or recycled materials, and adapting designs to local climatic and cultural contexts, thereby ensuring resilience and long-term relevance (Hosey, 2012; Stevanović, 2020). Collectively, these ideals emphasize that sustainable design is not merely a technical exercise but a cultural and ethical commitment to create environments that are ecologically responsible, socially inclusive, and adaptable to future challenges.

3.0 LITERATURE STUDY OF MALAY HOUSE

3.1 MALAY KAMPUNG and PONDOK

The Rumah Melayu, or traditional Malay house, represents one of the most significant forms of vernacular architecture in Malaysia, embodying harmony between climate, culture, and community life. Typically constructed on stilts using timber, the house features steeply pitched roofs and open interior layouts that naturally respond to the tropical climate while encouraging social interaction and communal living. Regional variations, such as the Rumah Kutai in Perak and Rumah Limas in Johor, further illustrate the richness of local craftsmanship and cultural identity embedded within Malay architecture.

More importantly, the traditional Malay house functioned not merely as a dwelling, but also as the social centre of kampung life, where gatherings, ceremonies, and everyday communal activities took place.

The elevated roof structures, together with openings such as tingkap jendela and tebar layar, facilitate natural cross-ventilation by allowing hot air to escape while drawing cooler air into interior spaces. These passive environmental strategies demonstrate the environmental sensitivity and climatic responsiveness of Malay vernacular architecture (Nasir, 1985; Lim, 1987).



Figure 1: Ventilation Openings in the Roof of Traditional Malay House.
(Source: Center of Built in the Malay World (KALAM), 1986.)

Malay vernacular architecture traditionally emphasizes the use of locally available materials as a cost-effective approach. In contemporary practice, materials such as concrete are often considered more accessible and economical than timber or steel. A notable example is the Negeri Sembilan State Mosque, which incorporates a series of intersecting reinforced concrete conoids as an abstraction of the horn-shaped gable roofs characteristic of Minangkabau traditional architecture. Rather than adopting a simplistic revivalist approach, the architect reinterpreted the bumbung gonjong in a modern yet expressive manner. The subtle curvature of the roof reduces the need for heavy structural support, thereby creating an unobstructed, expansive prayer hall below. Perforated, lace-like walls further enhance the design by enabling natural cross-ventilation, echoing the openness of traditional Malay mosques that maximize air flow for thermal comfort. Additionally, because the walls are non-load-bearing, they could be ornamented with intricate carvings, resonating with the decorative traditions of Malay houses.



Figure 2: Masjid Negeri Sembilan.
(Source: Utusan Malaysia, 2021)

3.2 DOUBLE HOWE TRUSS

The Double Howe truss is a structural system formed by placing two Howe trusses side-by-side or mirrored along the ridge, connected by purlins. This configuration is particularly suitable for supporting lightweight bamboo roofs due to its efficiency in transferring roof thrust directly to the ground. The system employs the side lattice as secondary bracing to counter lateral loads such as wind and accidental sway, while simultaneously functioning as a load path from eave to eave. To enhance stability, the design requires at least one rigidly braced bay, incorporating the lattice side, along with a cross-brace or diaphragm at the roof plane. These measures ensure that the pavilion behaves as a unified structural unit, demonstrating both practicality and adaptability for bamboo-based architectural applications.

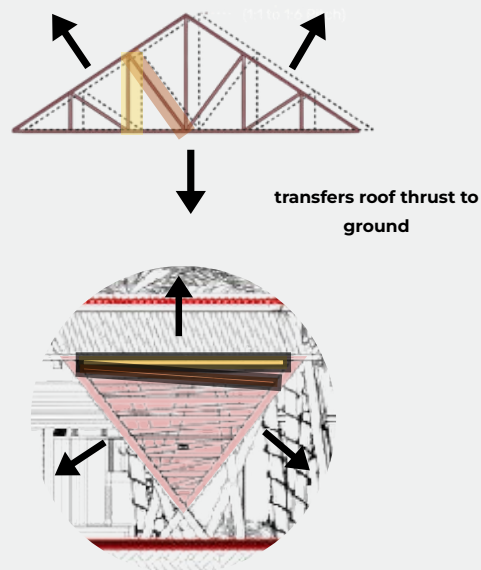


Figure 3: Example of Transfers Roof Thrust to The Ground.

3.3 SHARMA SPRINGS BY IBUKU

Sharma Springs, a six-storey private residence in Bali designed by Ibuku, exemplifies innovative bamboo architecture through its dramatic vaulted and arched forms as well as intersecting bamboo members. The project illustrates how bamboo can be bundled and configured to form triangulated shells, effectively distributing lateral forces and axial compression. This triangulated weaving reduces footing demand and provides a comparable structural concept to cross-braced bamboo at the base of a pavilion. Furthermore, Sharma Springs highlights the advantages of combining bamboo's natural properties with engineered solutions such as steel gussets and bolted connections. This integration of natural material behavior with modern detailing methods demonstrates how bamboo can achieve structural resilience and architectural expressiveness simultaneously, making it a valuable precedent for sustainable pavilion design.

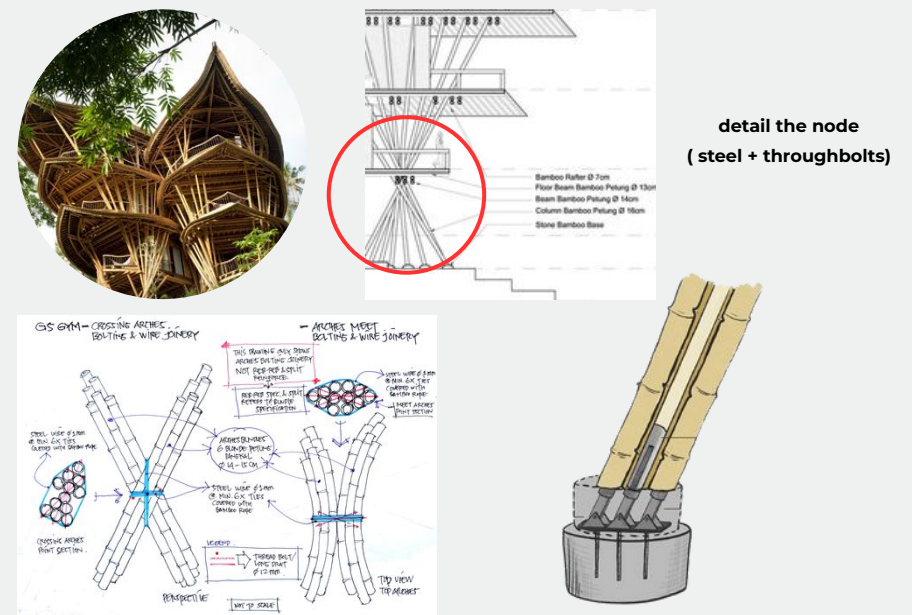


Figure 4: Example of Detail Node with Steel and Through bolts.

4.0 CASE STUDY

1) I-CITY, SHAH ALAM

i-City is a pioneering 72-acre ICT-based urban development situated in Section 7, Shah Alam, Selangor, Malaysia, along the Federal Highway. Designed by architect Jon A. Jerde, it embodies the concept of a fully integrated “intelligent city,” encompassing corporate, residential, and leisure components such as office towers, a regional shopping mall (~1 million sq ft), Cybercentre suites, hotels, apartments, data centres, and an innovation centre.

Figure 5: *i-City, Shah Alam.*

(Source: Tripadvisor, 2025)

I-City Shah Alam, famously known as the “City of Digital Lights”, is a leisure and lifestyle destination that has become a landmark for immersive night-time experiences in Malaysia. Its signature lighting concept transforms the urban park into a glowing wonderland through the use of over one million energy-efficient LED installations (i-City, 2021).

It is designed not only as a visual spectacle but also as an interactive environment, featuring thematic sculptures, illuminated trees, and dynamic displays that change with the seasons and special events. This combination of aesthetic creativity, sustainable technology, and experiential design makes i-City’s lighting a distinctive case study in contemporary urban placemaking and the integration of interior and exterior lighting.



Figure 6: i-City LED Lights
(Source: Tripadvisor, 2025)

From a design perspective, the park integrates Human-Centred Design (HCD) principles that prioritize accessibility, inclusivity, and emotional engagement (Ergonomics of Human-System Interaction, 2019). Clear pathways lit with warm-toned LEDs improve navigability for diverse groups, including children, the elderly, and persons with disabilities, while ambient lighting in crowded spaces enhances safety and comfort.

The use of low-heat LED technology contributes to thermal comfort, especially for visitors strolling in the evenings. At the same time, dynamic light shows and themed seasonal displays evoke emotional responses such as wonder and excitement, fostering both repeat visitation and cultural resonance.

The design of i-City also responds to the contemporary tourist economy shaped by digital culture. Lighting installations are deliberately configured to be “photo-friendly,” optimizing angles and minimizing glare to encourage visitor photography.

This transforms guests into active promoters of the brand through user-generated social media content, thereby extending the visibility of the site beyond its physical boundaries. Moreover, the intuitive use of lighting as a spatial guide reduces the reliance on signage, leading visitors naturally from one attraction to another. Such strategies illustrate how i-City not only merges architecture with technology but also actively integrates user experience and digital engagement into its urban identity.

Table 1: Types of Lightings Used in I-City.

Lighting Type		Lighting Type
LED Light Installations		Creates immersive forests, sculptures, and seasonal displays with color dynamics
LED	Thematic Structures	Festive lanterns enhance cultural and thematic storytelling
Water & Laser Shows		Combines lasers with water choreography for dramatic, multi-sensory illumination
LED	Architectural Highlighting	Illuminates structures sustainably while reinforcing branding and atmosphere

The findings from the i-City study suggest that the innovative lighting solutions observed there could greatly improve the atmosphere and usability of Laman KAED in various ways. For example, these lighting options can be utilized to craft a more welcoming and captivating environment for visitors by accentuating architectural details and landscaping features.

Table 2: Types of Lightings Implemented in Laman KAED Beautification Design.

Type	Placement	Benefits
Solar Path Lights	Along the yellow-and-black curb or garden beds	Enhances safety, aesthetic appeal
Solar Wall Washers / Spotlights	Pointed at the "Laman KAED" signage or facade	Highlights architectural features
Solar Pole Lamps	Bus Cafe Area	Provides wider coverage for visibility
Solar String Lights / Decorative LEDs	Roof awning or trees	Creates ambient night-time charm

5.0 METHODOLOGY

This study adopts a qualitative and design-based case study approach to explore how the traditional kampung spirit may be reinterpreted within a contemporary public space at Laman KAED.

STAGE 1: PREPARATIONS

The preparation of references for this project is based on materials obtained from Laman KAED course briefing and lecture inputs. These sessions provided essential background knowledge on the project site, its design requirements, and the intended thematic direction. Information gathered from the briefings and lectures serves as the foundation for understanding the project objectives, guiding the development of the design concept, and ensuring that the proposal aligns with the academic and cultural framework set for Laman KAED.

STAGE 2: DATA COLLECTIONS

On this stage of process focuses on data collection, which begins with a literature review and a preliminary study. The preliminary study involves examining precedent and case studies, understanding client needs, identifying special requirements and regulations, as well as considering sustainability aspects such as SDG, ESG, and IIUM Sejahtera. This is followed by a detailed site analysis that looks into site inventory and zoning, user behavior, ventilation, circulation, features, and existing site issues to gather comprehensive information for the project.

STAGE 3: DESIGN PROPOSALS

The final stage of the design proposal involves several key steps to ensure a complete and refined outcome. It begins with developing the design concept, followed by consultation to gather feedback and improve ideas. Next, the project moves into design development, where details are worked out, and then into design finalization, where the proposal is polished and completed. Finally, the work is prepared for submission in different formats such as an Magazine, Design Ideals Journal, poster, or technical report.

6.0 SITE ANALYSIS & FINDINGS

6.1 ANALYSIS OF THE SITE

The Laman KAED is a landscape for exhibition place of the Kulliyyah of Architecture and Environmental Design (KAED) at the International Islamic University Malaysia (IIUM), Gombak campus. It serves a function as a platform for students and staffs to showcase their creative works, conduct design-related events, and experience learning outside the classroom. The space reflects cultural and environmental values, often inspired by local traditions and Islamic principles.



Figure 7 :Laman KAED

Nevertheless, the existence of The Bus Cafe at Laman KAED is a creative reuse project that transforms an old bus into a vibrant social space for students and visitors. Students or outside vendors can use the opportunity to expand their business to generate their income. For example, such as student open a kiosk or outside tenderers have food trucks or stalls during events or during normal days. By this, it encourages students entrepreneurship skills, creativity, and collaboration with students aligning with KAED's vision which is hands-on learning. The landscape and environment of the Laman KAED provide a welcoming vibes and a spot for gathering, discussion, and relaxation, blending functionality with cultural and environmental awareness.



Figure 8 : Laman KAED Leisure Area

Laman KAED is strategically located within the heart of the KAED compound, making it easily accessible to students, staff, and visitors for various academic and social activities. Designed with an eco-friendly approach, the area incorporates green landscapes, shaded walkways, and open spaces that encourage natural ventilation and reduce reliance on artificial cooling. Its layout fosters interaction and community engagement, while the surrounding greenery creates a refreshing environment that supports relaxation and outdoor learning. The integration of sustainable elements, such as adaptive reuse structures, native plants, and energy-conscious design, positions Laman KAED as not only a functional gathering space but also serves as an example of environmentally responsible planning.

6.2 FINDINGS

Table 3: SWOT Analysis.

CATEGORIES	DESCRIPTIONS
STRENGTH	Strategic Location: Situated within the KAED compound, easily accessible to students, staff, and visitors.
WEAKNESS	Limited Facilities: May lack permanent infrastructure such as weatherproof seating, lighting, or proper utilities to support large-scale activities.
OPPORTUNITIES	Entrepreneurial Growth: Expansion of student-run creative stalls during events to generate income.
THREATS	Weather Dependency: Outdoor setting makes activities vulnerable to heavy rain or extreme heat, which may reduce usability.

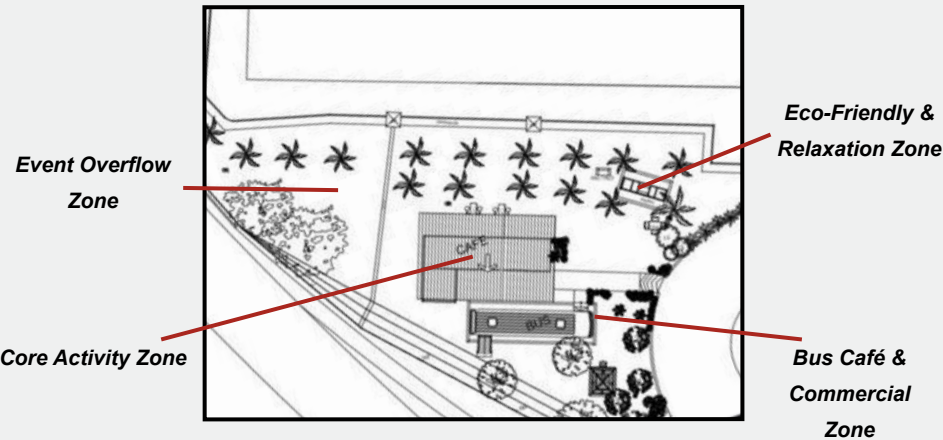


Figure 9: Overview of The Laman KAED Layout showing The Arrangement of The Key Areas

Table 4: Zone Analysis

ZONE	DESCRIPTIONS
Core Activity Zone	- The heart of Laman KAED, designed as the main open plaza for flexible use. - Leverages the strengths of accessibility and centrality. Its open space allows dynamic rearrangement depending on the event size. - Functions: Exhibitions, academic showcases, outdoor lectures, communal activities, and design workshops.
Bus Café & Commercial Zone	- Located around the repurposed Bus Café, this zone anchors social and entrepreneurial activities. - Opportunities for student entrepreneurship and creates an iconic attraction at Laman KAED. - Functions: Food stalls, kiosks, food trucks, and student businesses.

Eco-Friendly & Relaxation Zone	- The greener peripheral areas with gazebos, shaded walkways, and trees. - Builds on the strength of Laman KAED's eco-friendly landscape, while enhancing its identity as a sustainable space. - Functions: Quiet study areas, group discussions, and eco-learning.
Event Overflow Zone	- Open lawn area on the lower edge of the site, adaptable for temporary functions - Mitigates threats of space constraints by providing a flexible buffer zone for expansion.

7.0 DISCUSSION

The findings from the literature review, case studies, and site analysis highlight the importance of integrating cultural identity, sustainability, and functionality in the beautification of Laman KAED. The existing site offers strong potential as a communal hub but faces challenges such as limited infrastructure, weak visual identity, and weather dependency. Precedent studies, such as the reinterpretation of Malay vernacular architecture and the innovative lighting strategies from i-City, demonstrate how traditional values and modern technology can be harmonized to create meaningful, vibrant spaces. Moreover, the inclusion of entrepreneurship opportunities aligns with IIUM's holistic educational vision, reinforcing the role of Laman KAED not only as a place for learning and leisure but also as a platform for economic growth and community engagement. These insights provide the foundation for the development of a concept proposal that addresses current issues while celebrating cultural heritage and sustainability.

8.0 DESIGN CONCEPT
PROJECT NAME: KAMPONG KITA

8.1 CONCEPT STATEMENT
The concept of Kampung Kita is rooted in Kampung Life, inspired by Lat's The Kampung Boy, which reflects the warmth, simplicity, and communal spirit of the traditional Malay village. At Laman KAED, this kampung spirit is reinterpreted through site circulation that mirrors the spatial qualities of traditional Malay houses. Furthermore, this orientation not only organizes movement but also symbolizes unity, direction, and belonging, shaping the space into a welcoming ground for the KAED community.

8.2 DESIGN STATEMENT

The proposed bamboo pavilion at Laman KAED integrates traditional Malay architectural values with contemporary sustainable design strategies. Constructed primarily from locally sourced bamboo, the pavilion promotes natural ventilation, passive shading, and environmental responsiveness while simultaneously reflecting cultural identity and local craftsmanship.



Figure 10: The Design Concept Visualization and The Related SDGs.

8.3 DESIGN DEVELOPMENT

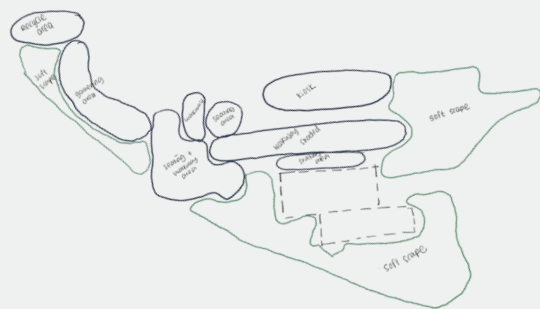


Figure 11: Bubble Diagram.

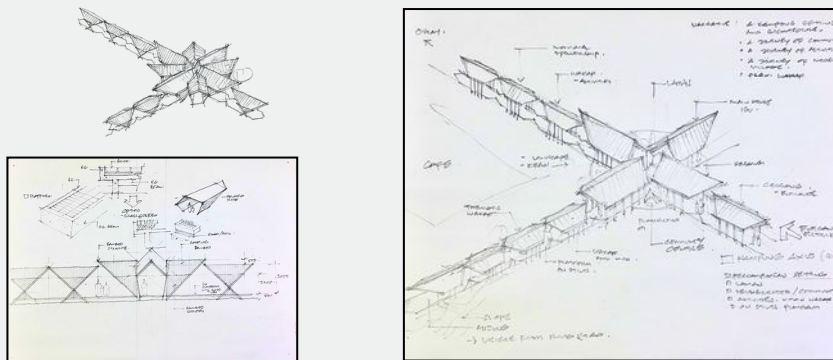


Figure 12 & 13: Development of The Design.

9.0 DESIGN FINALIZATION

Kampung Kita draws inspiration from Lat's The Kampung Boy, reflecting the warmth, simplicity, and communal spirit of the Malay village. At Laman KAED, this spirit is reinterpreted through site circulation, symbolizing unity, direction, and belonging while shaping a welcoming space for the KAED community.



Figure 14: Kampung Boy.
(Source: IMDB, n/a)

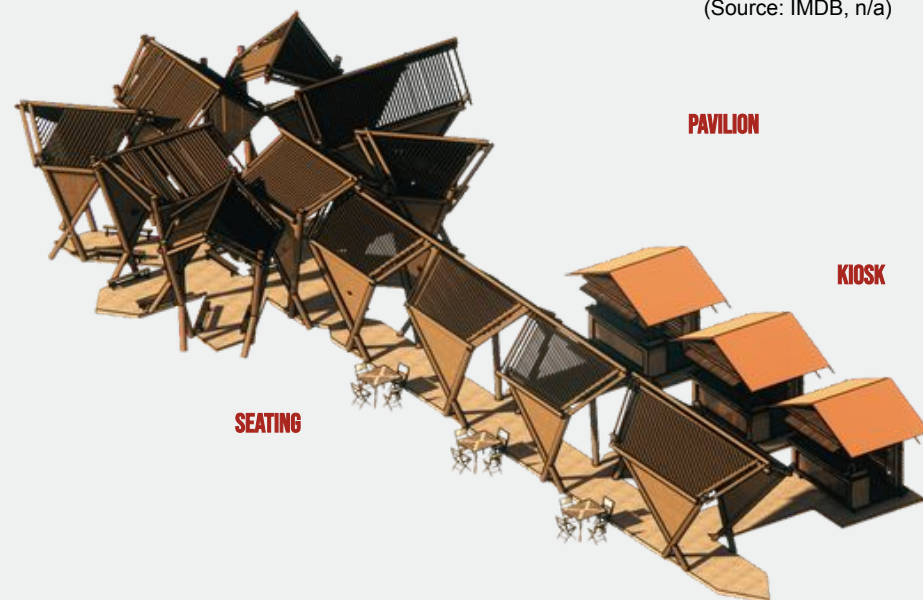


Figure 15: Axonometric View of Kampung Kita.



Figure 16: Axonometric
View of The Kiosks.



Figure 17: Axonometric
View of The Recycle
Waste Area.



Figure 18: Axonometric View of The Pangkin under The Coconut Tree.



Figure 19: Perspective View of The Kiosks (i).

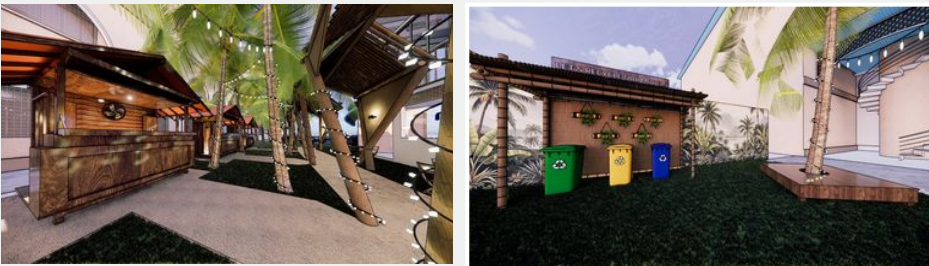


Figure 20: Perspective View of The Kiosks (ii).

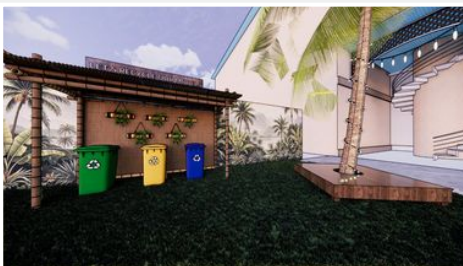


Figure 21: Perspective View of The Recycle and Pangkin Zone.



Figure 22: Perspective View of The Pavilion Seating.

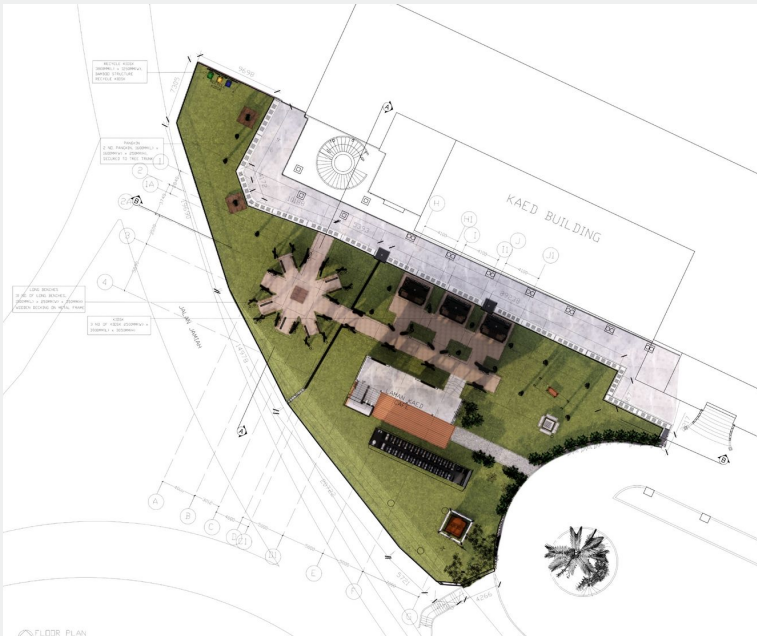


Figure 23: Rendered Floor Plan.



Figure 24: Section A-A'

SECTION A-A
NOT TO SCALE



Figure 25: Section B-B'

SECTION B-B
NOT TO SCALE



Figure 26: North Elevation.

NORTH ELEVATION
NOT TO SCALE



Figure 27: East Elevation.

EAST ELEVATION
NOT TO SCALE

CONCLUSION

The Kampong Kita pavilion proposal at Laman KAED envisions a harmonious integration of tradition, sustainability, and innovation in design. By utilizing locally sourced bamboo and incorporating passive strategies such as natural ventilation, shading, and orientation to the Qibla, the pavilion is intended to embody the cultural essence of Malay kampung houses while addressing the climatic needs of Malaysia. As a proposed communal hub, it aspires to serve not only as a space for learning, interaction, and cultural exchange among students, but also as a future cultural landmark and event venue that can support community programs and income-generating activities. Ultimately, this proposal aims to demonstrate how vernacular values may be reinterpreted into contemporary contexts, offering a vision of Laman KAED as a vibrant ground where heritage, sustainability, and innovation converge.

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07

ILMSCAPE: ENHANCEMENT PROJECT OF LAMAN KAED IN KULLIYYAH OF ARCHITECTURE AND ENVIRONMENTAL DESIGN, IIUM AS THE “GARDEN OF KNOWLEDGE AND VIRTUE”

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ABSTRACT

Laman KAED, the outdoor courtyard of the Kulliyyah of Architecture and Environmental Design (KAED), holds strong potential as a significant academic and social hub. However, the space is currently underutilised due to limited facilities and minimal multifunctional features, which reduces its impact on community engagement and faculty identity. The project therefore aims to enhance Laman KAED’s visibility, accessibility, and usability, encouraging increased interaction among students, staff, and visitors. Central to this enhancement is the introduction of ilmu spaces, outdoor settings that embrace comfort, creativity, and continuous learning while reflecting KAED’s academic culture. The goals are to transform the courtyard into a multifunctional and aesthetically pleasing landscape, to promote environmental sustainability, and to generate sustainable income opportunities for the faculty. The methodology involves comprehensive site analysis, literature review, and precedent studies to establish design strategies that integrate shading, landscaping, flexible gathering spaces, and sustainable infrastructure. The enhancement focuses on aesthetic improvement, flexible event areas, shading and landscaping improvements, and sustainable design integration. Additionally, it supports KAED’s long-term vision of self-sustainability by introducing opportunities for rental-based activities and events, thereby strengthening both the faculty’s image and its role as a cultural and academic landmark.

Keywords: Laman KAED, Outdoor Courtyard, Landscape Design, Knowledge, Sustainability

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INTRODUCTION

Courtyards, commonly defined as outdoor spaces enclosed on three or four sides, offer a way to bring natural daylight, ventilation, and greenery into built environments, enhancing comfort and well-being (Khairuddin & Denan, 2024). Laman KAED at the International Islamic University Malaysia (IIUM) is an outdoor courtyard within the Kulliyyah of Architecture and Environmental Design (KAED) that connects academic blocks and circulation routes. Despite its strategic position, the space is currently underutilised and lacks a distinctive identity, limiting its potential as a hub for academic, social, and cultural activities. The absence of adequate facilities and minimal multifunctional features further reduce user comfort and discourage prolonged use of the courtyard.

This project aims to enhance Laman KAED by addressing these issues and creating a multifunctional, sustainable, and aesthetically pleasing courtyard that reflects KAED’s architectural values. Beyond aesthetics, the proposal seeks to integrate sustainable strategies, encourage inclusive participation, and explore opportunities for income generation through rental-based spaces for events and activities. The design also introduces the concept of ‘ilm’ spaces, outdoor settings envisioned to promote knowledge-sharing, creativity, and reflective learning in harmony with the academic spirit of KAED.

The approaches that prioritise community gathering, environmental sustainability, and economic viability, in line with Sustainable Development Goals 3 and 11, which highlight holistic well-being and sustainable living which ultimately enhancing community engagement and reinforcing KAED’s identity.

This project is carried out in conjunction with BAQS 2300 (Integrated Multi-Disciplinary Project), involving students from three departments: Architecture, Applied Arts & Design, and Quantity Surveying. Over a duration of five weeks, each team developed design solutions aimed at revitalising Laman KAED into a comfortable, inclusive, and engaging courtyard that supports academic, recreational, and cultural activities for students, lecturers, and visitors.

The collaborative process also fostered interdisciplinary learning and encouraged innovative approaches to sustainable campus design.



Figure 1. Site - Laman KAED.

(Source: Author, 2025)

METHODOLOGY

Figure 3 illustrates the project flow to achieve the design project objectives.

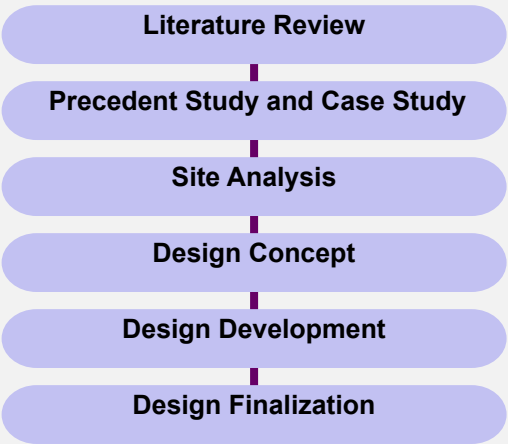


Figure 2. Methodology.
(Source: Author, 2025)

LITERATURE REVIEW

The design of academic courtyards plays an important role in shaping the social, cultural, and environmental experience of a campus. Recent studies emphasise that well-planned outdoor learning environments foster interaction, inclusivity, and a sense of belonging within higher education institutions (Bruwer et al., 2025). Courtyards and open spaces are increasingly recognised as extensions of the classroom, supporting informal learning, collaboration, and community engagement while enhancing student well-being (Johnson et al., 2024).

Ilmu and Learning Spaces

The concept of *ilmu* spaces extends learning beyond the classroom by embedding comfort, inclusivity, and opportunities for reflection into outdoor environments. Geister et al. (2025) highlight that features such as well-designed seating, spatial openness, and integration with greenery promote informal learning and collaborative knowledge exchange. These qualities not only foster creativity but also provide a supportive setting for academic growth, reinforcing the idea of knowledge-sharing communities within higher education (Liu et al., 2022). Moreover, such spaces improve students’ overall well-being by reducing stress and encouraging meaningful social interaction, making them essential components of holistic campus design (Zhang et al., 2024).

Multifunctionality and Inclusivity

Courtyards designed for flexibility can accommodate a wide range of uses, from informal gatherings to academic events. Gupta et al. (2025) emphasise that public open spaces should adopt inclusive design principles to serve diverse user groups. Features such as seating, shaded structures, and event-friendly layouts make these spaces adaptable to changing needs while fostering inclusivity across academic, social, and cultural activities. For Laman KAED, this means creating a courtyard that is adaptable for study groups, exhibitions, and informal meetups, but also accessible and welcoming to all, reflecting KAED’s commitment to inclusive, user-centered design.

Campus Well-Being and User Comfort

User comfort is a fundamental aspect of courtyard design. Research shows that thermal comfort, visual appeal, and accessibility are major factors influencing user satisfaction and the likelihood of prolonged use of outdoor spaces. Internal factors such as physical attributes, available facilities, and maintenance directly affect people’s perceptions and levels of satisfaction. Meanwhile, external factors, though not directly linked to perception can still influence overall user experience (Liu & Xiao, 2020). In tropical climates like Malaysia, incorporating shade, greenery, and natural ventilation is especially important for creating comfortable spaces that encourage longer stays, social interactions, and active participation.

Colour Psychology in Learning Environments

Colour plays a pivotal role in shaping behaviour, perception, and engagement within learning settings. Evidence suggests that the use of natural tones, coloured glass, and carefully placed vibrant accents can improve mood, concentration, and creativity among students. Research further shows that colour strongly influences human emotions, well-being, and daily experiences, as the brain reacts differently to each hue, affecting mood, health, and even human energy (Jaglarz, 2023). In the context of courtyards, thoughtful integration of colour enhances spatial experience, strengthens social interaction, and stimulates active participation, making it an effective design strategy for developing *ilmu*-centred academic environments.

PRECEDENT STUDY & CASE STUDY

Case Study 1: Taman Tasik Titiwangsa, Kuala Lumpur

Taman Tasik Titiwangsa is a 57-hectare urban park located just 3 km from the heart of Kuala Lumpur. First opened in 1980 and later revitalized under the DBKL’s River of Life project, the park blends natural beauty with modern recreational facilities. The park, which first opened in 1980 and was later revitalised as part of the River of Life project, combines natural beauty with modern recreational facilities. The central lake is surrounded by jogging and cycling trails, inclusive playgrounds, and family-friendly areas that welcome people of all ages and abilities. With features such as water play areas, sports courts, event lawns, and scenic views of the city skyline, Taman Tasik Titiwangsa has become both a recreational hub for locals and a must-visit attraction for tourists.



Figure 3. Aerial view of Taman Tasik Titiwangsa.
(Source: David Farago, 2024)

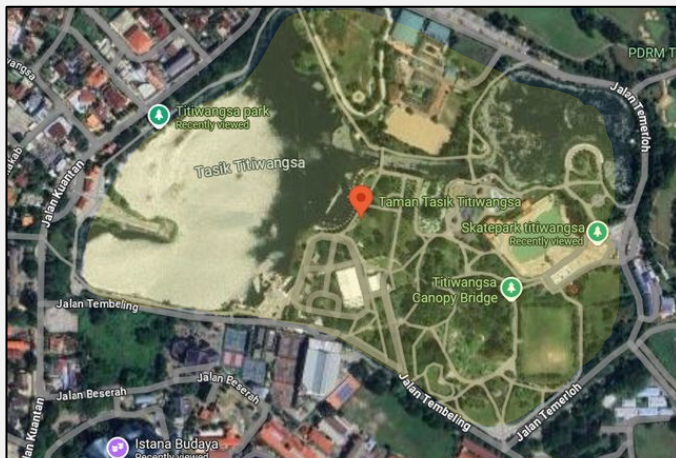


Figure 4. Map of Taman Tasik Titiwangsa.

(Source: Google Maps, 2025)

Key Design Features and Strategies: Taman Tasik Titiwangsa

1. Human Interaction and Social Function

- Central lake surrounded by jogging and cycling tracks, boating, children's play areas, waterplay, sports courts, and picnic lawns.
- Promotes recreation, family bonding, and community engagement.

2. Site Context and Environmental Integration

- Located at Titiwangsa District, redeveloped under KL's River of Life program, transforming 57 hectares of lake and green space.
- Restores colonial-era mining backwaters while blending natural landscapes with urban surroundings.

3. Design Innovation & Aesthetic Expression

- Features Kanopi Banjaran, Laman Kerawang maze garden with LED butterflies, and a 100m fountain jet.
- Bridges provide scenic views of KLCC and Istana Budaya, reinforcing the park's identity as a city landmark.

4. Functional Design Elements

- Inclusive playgrounds catering to diverse needs, including children with autism or cerebral palsy.
- OKU-friendly and stroller-accessible paths with shaded rest facilities.

5. Safety, Accessibility & Inclusivity

- Operates 6AM–10PM with consistent lighting for evening use.
- Universal design ensures accessibility and safety for all users.

Case Study 2: TRX City Park, Tun Razak Exchange, Kuala Lumpur

TRX City Park is a 10-acre elevated urban park situated at the heart of Kuala Lumpur's Tun Razak Exchange (TRX) financial district. Positioned above a retail mall, the park serves as a green social hub that integrates tropical planting with contemporary design elements, including event lawns, plazas, sculptural bridges, and light installations.

Other than its aesthetic appeal, the park provides a balance of ecological functions, recreational amenities, and cultural spaces. Its pedestrian-friendly layout enhances accessibility, supported by direct connections to the TRX MRT station, making it an inclusive urban space that encourages social interaction, leisure, and community engagement within the dense city centre.



Figure 5. Aerial view of TRX City Park.

(Source: OCULUS, 2024)



Figure 6. TRX City Park and its surrounding landmark.

(Source: OCULUS, 2024)

Key Design Features and Strategies: TRX City Park

1. Human Interaction and Social Function

- Features event lawns, Play City & Play Cave, plazas, and café seating.
- Designed as a vibrant social hub in Kuala Lumpur's financial district, encouraging workplace communities to gather, rest, or hold events.

2. Site Context and Environmental Integration

- Located above a three-storey retail mall within the TRX development.
- Reflects Malaysia's diverse topography through ethnobotanical planting, representing forest edges, limestone outcrops, ravines, and coastal lowlands.

3. Design Innovation & Aesthetic Expression

- Combines sculptural bridge structures, abstract art pieces, and immersive light installations.
- Internationally benchmarked design by Grimshaw and collaborating firms from Kuala Lumpur, Penang, and GDP.
- Presents a unique elevated park narrative adapted for tropical climate.

4. Functional Design Elements

- Landscape layout integrates a curved central promenade with interlinking paths leading to a pocket garden.
- Includes signage, name-labeled plantings, restrooms, nursery rooms, prayer facilities, stroller/wheelchair rentals, ramps, and accessible circulation to ensure usability for all visitors.

5. Safety, Accessibility & Inclusivity

- Pedestrian-friendly circulation and landscaped plazas strengthen comfort and visual security.
- Fully accessible via TRX MRT station, with clear walkways, ramps, and mobility aids.
- Ensures seamless connectivity between district and park.

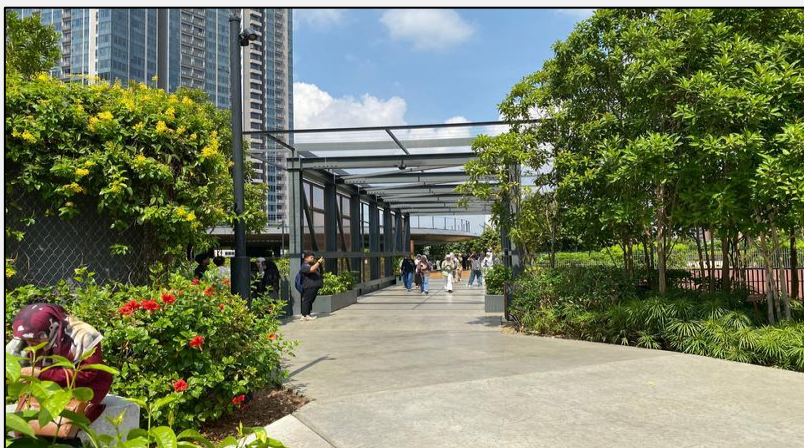


Figure 7. Walkway at TRX City Park.
(Source: Author, 2025)

Case Study 3: University of Melbourne Student Pavilion, Parkville VIC 3010, Australia

The Student Pavilion features an open, flexible courtyard that integrates rain gardens, shaded walkways, and amphitheatre-style seating to support student life and events. Designed for inclusivity, it provides universal access, promotes sustainability through drought-tolerant planting, and creates a comfortable social hub for learning, recreation, and cultural exchange.

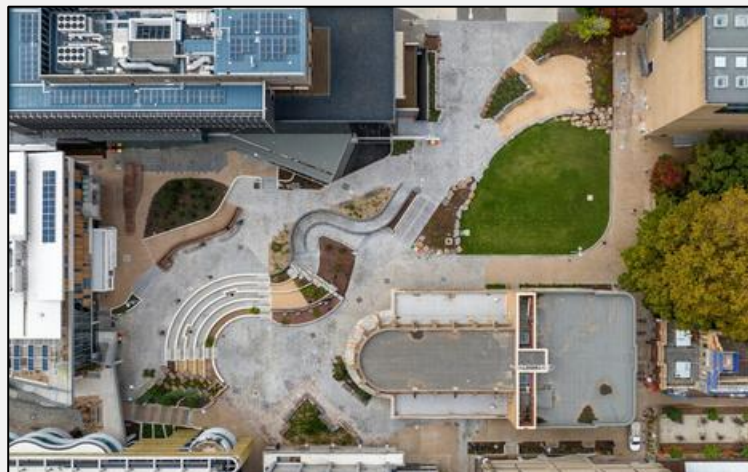


Figure 8. Aerial View of University Melbourne Student Pavilion.
(Source: Google, 2024)

Key Design Features and Strategies: University of Melbourne Student Pavilion

1. Flexible Open Lawn

- Space for informal sports, student activities, and outdoor events.
- Provides recreation and social interaction for nearby student and faculty buildings.

2. Tiered Seating & Amphitheatre Steps

- Encourages group discussions, outdoor learning, and performances.
- Integrated landscape contours for multifunctional use.



Figure 9. Tiered Seating at the Student Pavilion.
(Source: Kane Construction, 2023)

3. Shaded Walkways & Pergolas

- Enhance comfort and protection from heat.
- Climbing plants add aesthetic value and cooling.

4. Native Planting & Rain Gardens

- Low-maintenance, drought-tolerant native species.
- Biofiltration gardens support stormwater management and biodiversity.

5. Paving & Accessibility

- Ramps, textured paving, and wayfinding signage.
- Ensures universal access for all users, including those with mobility aids.

SITE ANALYSIS LAMAN KAED

Laman KAED is located within the International Islamic University Malaysia (IIUM) Gombak campus, directly adjacent to the Kulliyyah of Architecture and Environmental Design (KAED) building. Originally an underutilised open area, the site has since been transformed into a centralised outdoor space designed as a creative and experimental platform for architectural learning. Surrounded by academic buildings, student facilities, and open green areas, it functions as a natural extension of KAED's learning environment while serving as a strategic hub for student activities. The site is highly accessible through pedestrian walkways, roads, and nearby parking areas, allowing convenient access for both students and staff. Its close proximity to studios, lecture halls, workshops, and the KAED Gallery further strengthens its role as an integrated node that merges academic, cultural, and recreational functions. This integration makes Laman KAED a unique platform that combines learning with leisure, providing opportunities for collaboration, entrepreneurship, and community engagement within a landscaped setting that blends built and natural environments.



Figure 10, 11 and 12. Student activities at Laman KAED.
(Source: Author, 2023)



Figure 13 and 14. Entrance and walkway to Laman KAED.
(Source: Author, 2025)

Although Laman KAED has the potential to evolve into a vibrant cultural, academic, and social hub, several existing challenges continue to hinder its effectiveness. Accessibility is a key concern, as circulation within the site is poorly defined and does not adequately cater to persons with disabilities (PwDs). Combined with its somewhat secluded location, these limitations reduce convenience and inclusivity. The overall aesthetics are uninviting, with a dull and outdated design that lacks vibrant colours, thematic elements, or interactive features to capture student interest. Seating arrangements are also poorly considered, with benches placed in random spots that create discomfort and fail to encourage meaningful interaction. Moreover, the site currently functions more as a transitional space rather than a destination, offering minimal attraction for students to linger or engage in extended activities.



Figure 15. No designated walkway.
(Source: Author, 2025)



Figure 16. Lack of safety barrier on site.
(Source: Author, 2025)



Figure 17, 18 and 19. Seating provided at Laman KAED.
(Source: Author, 2023)

In addition, the site lacks the functional facilities necessary to support long-term use and active engagement. The absence of charging points, Wi-Fi spots, and a variety of kiosks offering food, beverages, or student-run businesses reduces its appeal as a daily destination. Without these features and stronger attractions, students are less likely to stay beyond short breaks, limiting the site's role as a true social and academic hub.

SWOT ANALYSIS

Strengths	• Strategically located within KAED and easily accessible to students and staff. • Presence of greenery that enhances comfort and microclimate. • Potential for outdoor learning, exhibitions, and student gatherings.
Weaknesses	• Limited accessibility with unclear circulation and lack of PWD-friendly routes. • Outdated and uninviting aesthetics with dull design elements. • Minimal attraction to sustain long-term engagement.
Opportunities	• Potential to develop into a vibrant cultural and academic hub. • Integration of interactive and thematic design to increase student interest. • Space for eco-education, cultural activities, and student-run businesses.
Threats	• Competition from other active student spaces on campus. • Weather conditions (rain/heat) may limit outdoor use without proper shading. • Maintenance challenges leading to further deterioration.

Table 1. SWOT analysis of Laman KAED.
(Source: Author, 2025)

DESIGN CONCEPT

The Green Gateway

is a landscape sanctuary within architecture faculty. By creating a hidden escape from the intensity of studio life. It's a place where are students and staff can momentarily step away from deadlines and distractions, reconnect with nature and find inner calm. Inspired by the dual meaning of "getaway" as both physical escape and mental relief. The design embraces serenity, simplicity and sensory engagement.



Figure 22. Design concept for Laman KAED. (Source: Author, 2025)

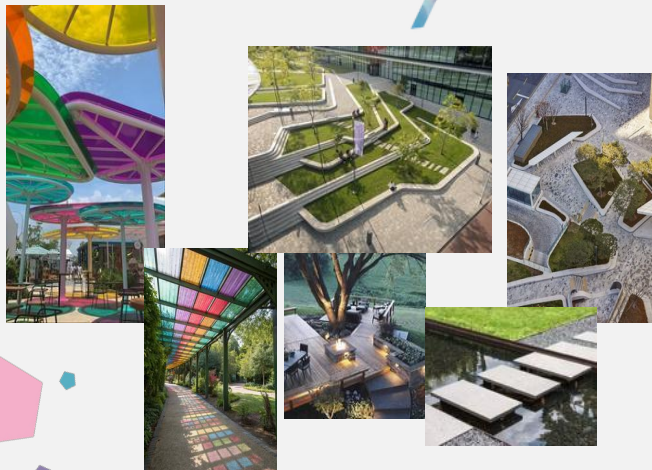


Figure 23. Initial design concept for Laman KAED. (Source: Author, 2025)

DESIGN DEVELOPMENT

The design development stage represents an ongoing process of testing, refining, and re-evaluating the initial ideas. At this point, various iterations of form, material, and spatial organisation are being explored to strike a balance between functionality, buildability, and aesthetic quality. Emphasis is placed on modular geometry, climate responsiveness, and user interaction, while alternative options are being studied to assess their feasibility and suitability for the site. This stage remains open-ended, allowing flexibility for adjustments and improvements before reaching the finalised design.

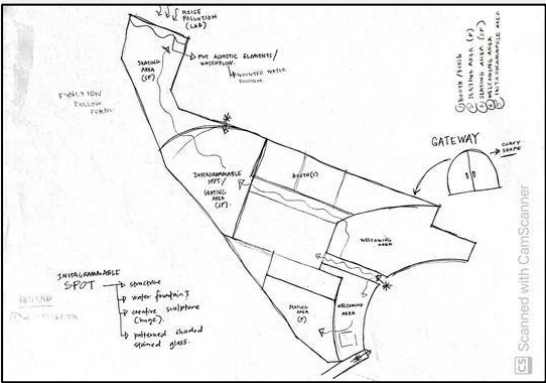


Figure 24. Space planning for Laman KAED. (Source: Author, 2025)

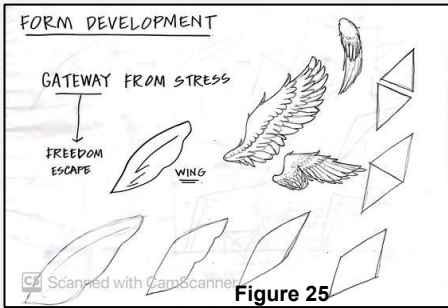


Figure 25

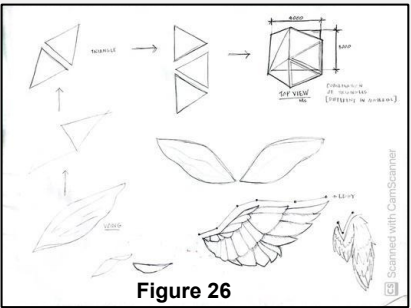


Figure 26

Figure 25 and 26. Form development for concept. (Source: Author, 2025)

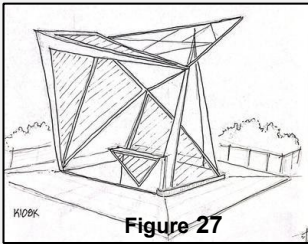


Figure 27

KIOSK DESIGN

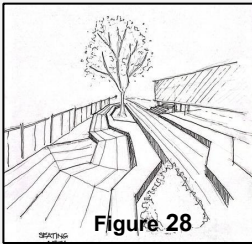


Figure 28

OPEN SEATINGS

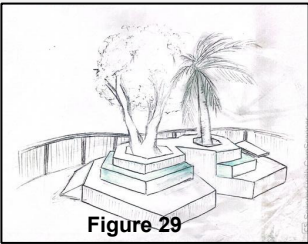


Figure 29

LEISURE AREA

Figure 27, 28 and 29. Sketches for design elements in proposal. (Source: Author, 2025)

Overall, this phase has proven useful in determining the project's design direction. The process has not only generated potential solutions but also revealed challenges that require further resolution. These findings will serve as a guide for the next stage, ensuring that the final plan is founded on both creative vision and practical considerations.

DESIGN FINALISATION

The design process resulted in a refined proposal that addressed both practical and aesthetic feedback. Improving buildability, assuring climate adaptability, and developing an inclusive user experience were all important factors to consider. The final outcome balances modular form and functionality with contextual sensitivity, resulting in a design that is distinctive, adaptable, and aligned with its intended purpose. Beyond functionality, the design emphasises sustainability by integrating passive climatic strategies and durable material choices, ensuring long-term usability and resilience. It also celebrates identity through colour, light, and spatial qualities that enhance user interaction and create memorable experiences. Ultimately, the proposal reflects a thoughtful synthesis of creativity and pragmatism, offering a solution that is not only visually engaging but also socially and environmentally responsive.

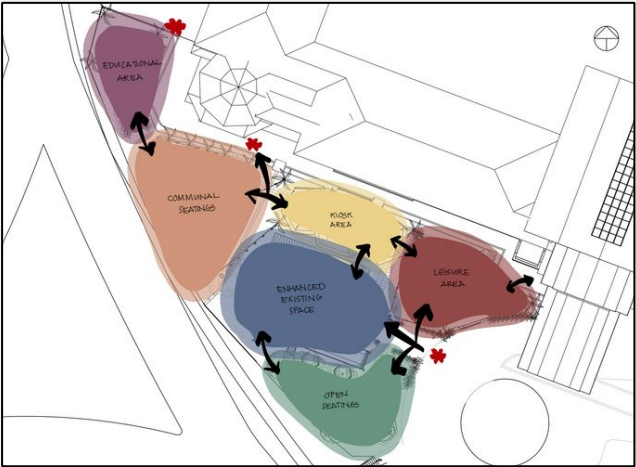


Figure 30. Space Planning.
(Source: Author, 2025)

Multipurpose Area - Kiosk Area

The space is designed to support flexibility of use, offering opportunities for both temporary and long-term functions. During events, it can be rented out for food stalls with foldable kiosks provided to accommodate vendors in an organised manner. Outside of event periods, the area remains available for rental to host a variety of activities, ensuring that the space continues to serve as a dynamic and versatile hub for the community.

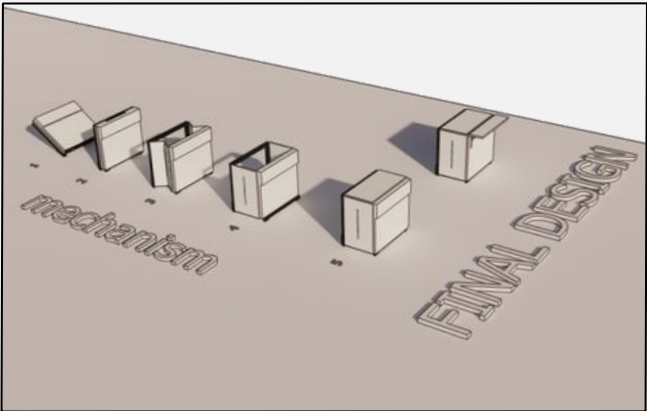


Figure 31. Foldable kiosk at Laman KAED.
(Source: Author, 2025)

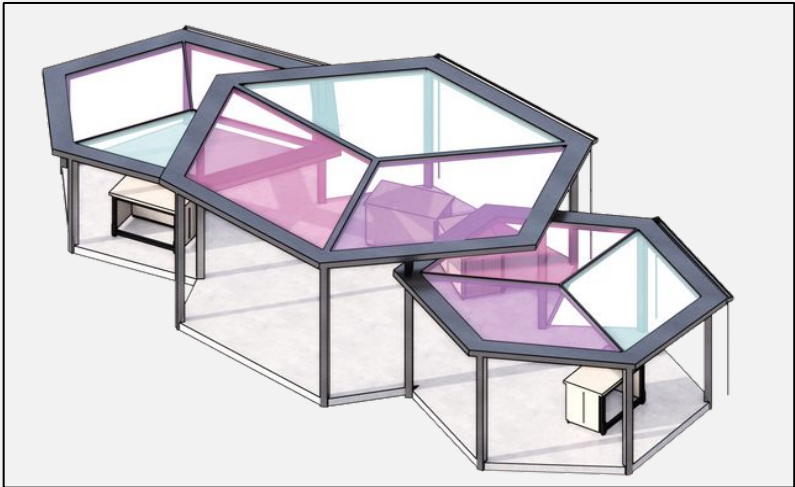


Figure 32. Hexagonal roofs for kiosk.
(Source: Author, 2025)

Leisure Area

A dual-purpose structure designed as both a projector screen and a photoshoot signage. It is cost-effective, requiring minimal budget, while remaining inclusive and user-friendly for all visitors.



Figure 33. Photospot can also serve as a flexible screen or backdrop.
(Source: Author, 2025)



Figure 34. Leisure area.
(Source: Author, 2025)

Pavement

The pavement width has been increased to 2000 mm to improve accessibility for persons with disabilities (PWD), ensuring smoother and more comfortable access to ILMSCAPE, Laman KAED. This adjustment not only complies with inclusive design standards but also enhances circulation by providing a clearer, safer, and more efficient accessway for all users.



Figure 35. Pavement.

(Source: Author, 2025)

Open Seating Area

The open seating area at Laman KAED is designed to provide a spacious setting with clear views towards the Rumah Kutai, serving as a visual attraction that encourages visitors to explore the site from outside. It offers students a comfortable and inviting place to sit, relax, and interact, strengthening its role as a social hub. Each seating area is complemented by natural shading, ensuring comfort and usability throughout the day while enhancing the overall environmental quality of the space.



Figure 36. Open seating area.

(Source: Author, 2025)

Communal Seating Area

The circular clustered seating fosters group interaction by bringing people together and providing an informal space for idea exchange, brainstorming, and discussions outside the classroom. Shaded by trees and supported with flexible seating, it creates a relaxed atmosphere that encourages longer conversations. The space can also be used at night, as hanging lights create an inviting ambience that encourages students to gather not only for academic purposes but also as a casual hangout spot.



Figure 37. Communal seating area.

(Source: Author, 2025)

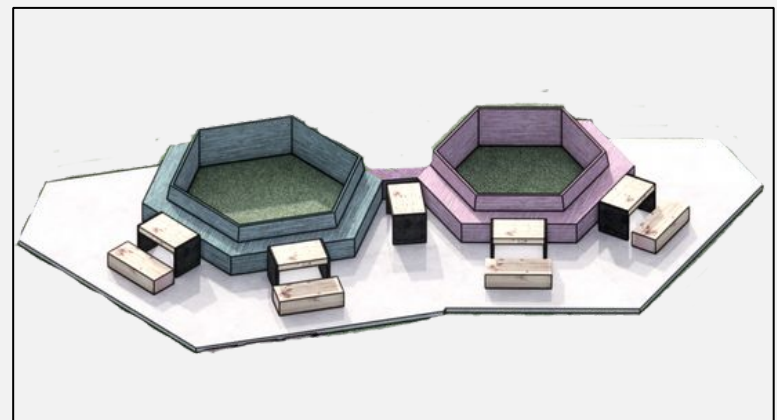


Figure 38. Communal seating.

(Source: Author, 2025)

Educational Area

The area is proposed as an educational space for KAED students, providing dedicated zones to support their creative works. For example, a mini garden could be introduced for Landscape Architecture students to experiment with and observe new plant species, fostering hands-on learning and innovation.



Figure 39. Educational area.

(Source: Author, 2025)

Enhanced Existing Space

The souvenir shop serves as a hybrid zone for quieter use, offering charging spots and new table sets for comfort. Designed by MeranT Studio with wood pallets, it maximises the under-stair space while also functioning as a storeroom for rental items like bean bags and foldable kiosks.



Figure 40. Souvenir shop at Laman KAED.
(Source: Author, 2025)



Figure 41. Souvenir shop at Laman KAED (Rendered).
(Source: Author, 2025)

MEASURED DRAWING

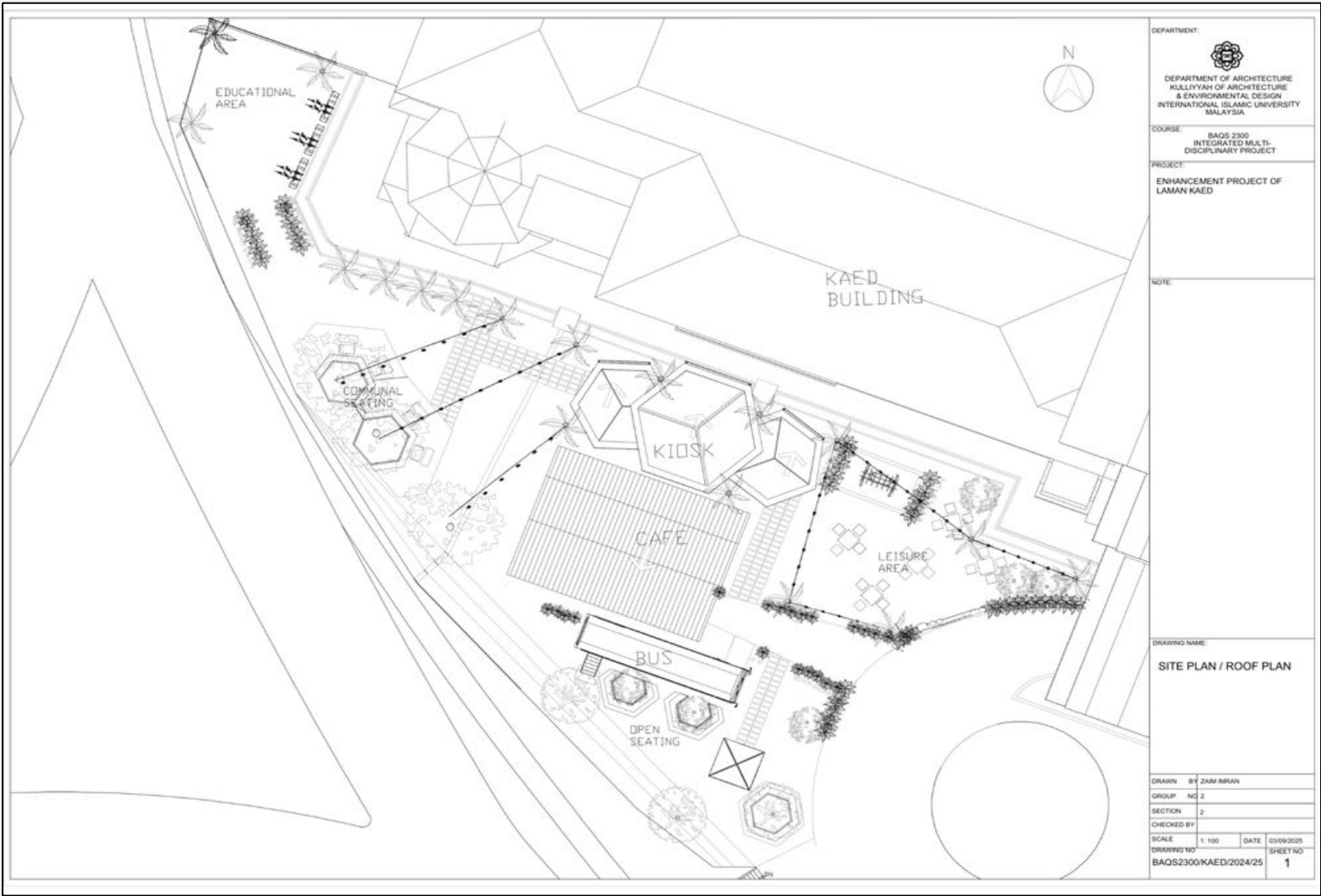


Figure 42. Site plan (not to scale).
(Source: Author, 2025)

RENDERED PICTURES



Figure 43. Ilmscape entrance.
(Source: Author, 2025)



Figure 44. View around communal seating area to kiosk.
(Source: Author, 2025)



Figure 45. View to Ilmscape educational area.
(Source: Author, 2025)

COST ESTIMATION AND SPECIFICATION

The cost estimation for the project amounts to RM50,000.00, covering key components such as preliminaries, kiosks, landscaping works, electrical services, and contingencies. The largest portion is allocated to landscaping works, followed by kiosks and WBLFF, reflecting the project's emphasis on creating a functional, sustainable, and engaging environment for students and visitors.

PRELIMINARIES	RM 1,500.00
WBLFF	RM 11,760.50
KIOSK	RM 13,718.00
LANDSCAPING WORKS	RM 19,566.50
ELECTRICAL SERVICES	RM 2,960.00
CONTINGENCIES	RM 585.00

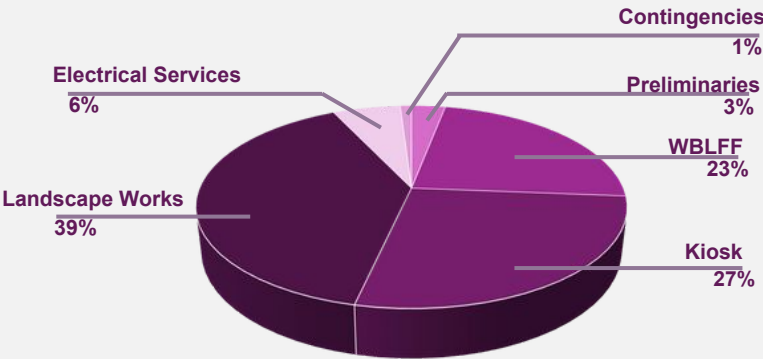


Figure 46. Cost estimation and specification.
(Source: Author, 2025)

CONCLUSION

The proposed redevelopment of Laman KAED by MeranT Studio highlights the importance of creating a multifunctional and inclusive outdoor space that reflects the values of stability, growth, and collaboration. Through the integration of academic, cultural, and social functions, the design transforms the underutilised site into a vibrant hub that supports student life both inside and outside the classroom. By addressing issues of accessibility, comfort, and engagement, while introducing flexible facilities such as kiosks, seating areas, and educational zones, the project provides long-term potential for sustainability and community-building. Ultimately, this initiative not only enhances the physical environment of KAED but also strengthens its role as a dynamic space for creativity, learning, and meaningful interaction.

ACKNOWLEDGEMENT

This project has been a valuable learning journey for the members of Group 2 MeranT Studio. In order to achieve outstanding results, the team is excited to use the knowledge acquired and the connections formed to future projects. The authors extend their sincere appreciation to the lecturers of BAQS 2300 Integrated Multi-Disciplinary Project, 2025, at the Kulliyyah of Architecture and Environmental Design (KAED), IIUM, as well as to all contributing parties and institutions for their invaluable role in making this project a success.

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3. Sr. Nur Ulfah Awatif Umairah Alias
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08

ENHANCEMENT PROJECT OF LAMAN KAED SPACE FUNCTIONALITY THROUGH THE CONCEPT OF ʔUMA'NĪNAH

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ABSTRACT

Laman KAED forms an integral part of the spatial identity and communal character of the Kulliyyah of Architecture and Environmental Design (KAED) at the International Islamic University Malaysia (IIUM). Nevertheless, several areas within the courtyard remain underutilised and lack functional integration within students' daily academic and social activities. This study therefore explores strategies to enhance the functionality and usability of Laman KAED in order to transform it into a vibrant, inclusive, and purposeful environment. Data collection methods included surveys, site observations, and questionnaires to examine user needs, spatial preferences, and patterns of space utilization. The findings are expected to inform design interventions that encourage a sense of ʔuma'nīnah tranquility, serenity, and emotional balance while simultaneously strengthening the role of the courtyard as an active communal hub within the campus environment. Ultimately, the project aspires to establish a multifunctional landscape that supports social interaction, well-being, entrepreneurship, and community engagement in alignment with the holistic educational values of IIUM.

Keywords: Laman Functionality, KAED, IIUM, Space Enhancement, Tuma'nīnah, Campus Design

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INTRODUCTION

Laman KAED, located within the International Islamic University Malaysia (IIUM), occupies a central position within the Kulliyyah of Architecture and Environmental Design (KAED). Despite its strategic location and strong potential as a communal hub, the courtyard remains underutilized and lacks functions that effectively support student interaction, social activities, and entrepreneurial engagement.

At present, the space functions primarily as a transitional area rather than an active social and academic environment. Consequently, opportunities for informal learning, cultural exchange, relaxation, and income-generating activities remain limited. In response to these issues, this study aims to enhance the functionality of Laman KAED by identifying existing shortcomings and proposing design strategies capable of transforming the courtyard into a vibrant, inclusive, and economically sustainable environment.

Central to the proposal is the concept of ʔuma'nīnah, which embodies tranquility, harmony, and emotional serenity. Through the integration of therapeutic landscapes, multifunctional spaces, and inclusive design principles, the project seeks to establish a courtyard environment that supports both psychological well-being and meaningful community interaction.

METHOD / PROCEDURE

This study employed site visits, direct observations, and spatial analysis to evaluate the existing condition and future potential of Laman KAED. Figure 1 and 2 displayed the field studies were conducted at Taman Tasik Titiwangsa, TRX City Park, and Laman KAED in order to compare the ways in which public and semi-public spaces are designed, utilized, and activated.

At KAED, detailed documentation was undertaken through photographs, sketches, and site measurements to record circulation patterns, existing facilities, spatial organization, and user behavior as shown in Figure 3. Furthermore, indoor, semi-indoor, and outdoor spatial references were analyzed comparatively to evaluate functionality, usability, and user engagement across different environmental settings.

The insights derived from these studies informed the development of strategies aimed at improving Laman KAED as a multifunctional space that supports social interaction, entrepreneurship, cultural engagement, and sustainable income-generating activities.

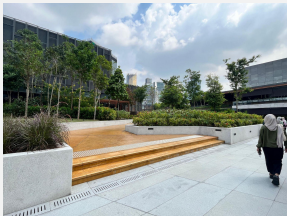


Figure 1: Walking at TRX City Park (Source: Author)



Figure 2: Site Observation at Taman Tasik Titiwangsa (Source: Author)



Figure 3: Laman KAED (Source: Author)

KEY PLAN, LOCATION PLAN AND SITE PLAN



Figure 4: Key Plan, Not to Scale (Source: Authors)



Figure 5: Location Plan, Not to Scale (Source: Authors)



Figure 6: Site Plan, Not to Scale (Source: Authors)

LITERATURE REVIEW

Outdoor spaces within educational and communal settings are increasingly recognized as essential extensions of academic and social life. As illustrated in Figure 4,5, and 6 showing the underutilized outdoor spaces that have potential. When thoughtfully designed, courtyards and open landscapes encourage interaction, cultural exchange, reflection, and a stronger sense of identity and belonging (Wang, Ismail, & Bin, 2024).

Recent studies further emphasize sustainability and multifunctionality as fundamental principles in contemporary landscape design. Outdoor environments that integrate ecological strategies such as shading systems, vegetation, and material reuse, while simultaneously accommodating flexible spatial functions, are better able to respond to evolving community needs and environmental challenges (Ak, 2024; Wang, Ismail, & Bin, 2024). Consequently, landscapes should no longer be perceived merely as ornamental additions, but rather as dynamic systems that actively contribute to social, environmental, and economic well-being.

In addition, contemporary landscape design increasingly incorporates therapeutic, inclusive, and entrepreneurial dimensions. Multisensory environments have been shown to enhance psychological well-being, while universal design principles ensure accessibility and inclusivity for diverse user groups. Simultaneously, entrepreneurial landscapes provide opportunities for economic activity and community engagement. Collectively, these approaches redefine courtyards and open spaces as socially cohesive, self-sustaining, and multifunctional environments (Wang, Ismail, & Bin, 2024; Ak, 2024).

- **THERAPEUTIC GARDENS & SENSORY DESIGN**

Therapeutic gardens contribute significantly to stress reduction and psychological well-being through sensory engagement involving planting, aromatic herbs, textured surfaces, and natural soundscapes. As illustrated in Figure 5, the design engages the five human senses sight, sound, smell, touch, and taste in order to create a more immersive and restorative environmental experience. Previous studies demonstrate that sensory gardens stimulate the senses of smell, sight, sound, and touch, thereby encouraging relaxation, resilience, and social inclusion (Zhou & Zeng, 2023; Wajchman-Świtalska et al., 2020; Porada, 2022).

Furthermore, these multisensory interactions reinforce the role of therapeutic landscapes in creating restorative and inclusive environments that support both emotional and physical well-being. As such, sensory design becomes an essential strategy in developing outdoor spaces that foster tranquility and meaningful user experiences.

- **MULTI-FUNCTIONAL YARDS FOR EDUCATION, CULTURE, & COMMUNITY**

Courtyards and open yards increasingly function as social and academic environments that extend learning beyond traditional classroom boundaries. Their multifunctional nature enables activities such as reflection, discussion, collaboration, and cultural exchange, while simultaneously contributing to health and well-being through accessible outdoor environments (Juba & Bogenç, 2024; Alnusairat et al., 2022).

When carefully designed, such spaces become integral components of campus identity and significantly enhance the quality of students' daily experiences. Therefore, multifunctional courtyards should not merely accommodate movement and circulation, but should also support meaningful social and educational engagement.

- **ENTREPRENEURIAL LANDSCAPE & SELF-SUSTAINING CAMPUSES**

Landscape design can also support entrepreneurship through the integration of spaces for markets, pop-up stalls, exhibitions, and community-based activities. Such strategies contribute positively to local economic development while simultaneously creating opportunities for students to engage in entrepreneurial initiatives and practical learning experiences (Herlina & Wahira, 2024; Sălăgean Şoldan & Bejinaru, 2023).

Moreover, entrepreneurial landscapes ensure that open spaces remain active and socially engaging throughout the day. As illustrated in Figure 9, This approach aligns closely with sustainable campus models that emphasise financial self-reliance, social vitality, and long-term community sustainability.

- **INCLUSIVE & ACCESSIBLE LANDSCAPE DESIGN**

Inclusive landscapes incorporate universal design principles such as ramps, barrier-free circulation routes, tactile surfaces, and clear wayfinding systems in order to ensure accessibility for all users, including persons with disabilities.

Rather than being regarded solely as a regulatory requirement, accessibility is increasingly understood as an essential component of sustainable and human-centred design that promotes social equity, inclusivity, and community cohesion (Gramkow, Merit, & Stigsdotter, 2022). Consequently, accessible outdoor environments contribute not only to physical mobility but also to broader social participation and inclusiveness.

INTEGRATED RELATIONSHIP BETWEEN THERAPEUTIC, MULTIFUNCTIONAL, ENTREPRENEURIAL, AND INCLUSIVE LANDSCAPE DESIGN THROUGH THE CONCEPT OF ʔUMA'NĪNAH

The enhancement of Laman KAED through the concept of *ʔuma'nīnah* integrates therapeutic gardens and sensory design, multifunctional community spaces, entrepreneurial landscapes, and inclusive accessibility into a cohesive and holistic courtyard environment. The need for this concept arises from the current underutilisation of the courtyard, limited user engagement, lack of functional diversity, and insufficient environmental comfort within the space. In response, the proposed design seeks to transform Laman KAED into a more meaningful, restorative, and people-centred environment that supports the academic, social, emotional, and cultural needs of the IIUM community.

Therapeutic landscape elements such as greenery, shaded pathways, and sensory experiences promote tranquility, emotional well-being, and relaxation, while multifunctional spaces support learning, cultural interaction, recreation, and community engagement. Simultaneously, entrepreneurial features such as kiosks and event spaces contribute towards a self-sustaining campus environment by encouraging student participation and economic activities. These strategies are further strengthened through inclusive and accessible landscape design that ensures comfort, safety, and equal usability for diverse user groups. Collectively, the integration of these interconnected themes transforms Laman KAED into a restorative, socially vibrant, and sustainable communal space that reflects the values of harmony, inclusivity, and holistic well-being within the IIUM community.

CASE STUDIES

Several precedent studies as listed in Table 1,2,3, and 4 were analyzed to identify suitable design strategies relevant to the enhancement of Laman KAED through the concept of ṭuma'nīnah. The selected case studies demonstrate how courtyards, urban parks, and multifunctional public spaces can successfully integrate social interaction, therapeutic landscapes, inclusivity, sustainability, and entrepreneurial activities. Furthermore, these precedents provide valuable insights into circulation planning, environmental comfort, accessibility, and spatial activation, which collectively inform the proposed design interventions for Laman KAED.

Case Study 1: Sheikh Nahyan Centre for Arabic Studies



Figure 7: Sheikh Nahyan Centre for Arabic Studies
(Source: ArchDaily, 2017)

Table 1: President Study at Sheikh Nahyan Centre

Aspect	Description
Case Study	Sheikh Nahyan Centre for Arabic Studies
Location & Typology	Located at the University of Balamand, Lebanon, the Sheikh Nahyan Centre is designed around a central courtyard that functions as both an academic and social hub.
Users	Primarily utilized by students, educators, and visiting researchers for academic, social, and cultural activities.
Key Features	• The courtyard supports informal learning, cultural exchange, and reflective activities. • Passive ventilation strategies, local stone materials, and shaded seating enhance environmental comfort and sustainability. • The building design responds sensitively to the site's natural slope, thereby reducing earthwork and environmental disturbance.
Design Significance	The Sheikh Nahyan Centre for Arabic Studies demonstrates how courtyards can function as multifunctional, sustainable, and inclusive gathering spaces that encourage interaction, well-being, and environmental responsiveness.

Case Study 2: Taman Kuliner Condong Catur



Figure 8:Taman Kuliner Condong Catur
(Source: NativeIndonesia, 2020)

Table 2: President Study at Taman Kuliner Condong Catur

Aspect	Description
Case Study	Taman Kuliner Condong Catur
Location & Typology	Located in Yogyakarta, Indonesia, Taman Kuliner Condong Catur is an entrepreneurial courtyard that integrates commercial activities with leisure and community gathering spaces.
Users	Primarily utilized by food vendors, families, youth, tourists, and local communities for dining, social interaction, and recreational activities.
Key Features	• A central open courtyard integrated with food stalls and shaded seating creates a cohesive and welcoming environment. • The spatial arrangement encourages communal dining, social interaction, and engagement among diverse user groups. • The space provides opportunities for small businesses, temporary vendors, and student entrepreneurship activities.
Design Significance	Taman Kuliner Condong Catur demonstrates how open public spaces can function as entrepreneurial landscapes that support income generation while simultaneously fostering social interaction, community vibrancy, and cultural engagement.

Case Study 3: Taman Tasik Titiwangsa



Figure 9: Aerial View of Taman Tasik Titiwangsa
(Source: Shutterstock, 2022)

Table 3: President Study at Taman Tasik Titiwangsa

Aspect	Description
Case Study	Taman Tasik Titiwangsa
Location & Typology	Located in Kuala Lumpur, Malaysia, Taman Tasik Titiwangsa is a major urban recreational park redesigned to emphasize inclusivity, accessibility, and diverse recreational activities.
Users	Primarily utilized by families, joggers, cyclists, elderly visitors, differently-abled users, and tourists for recreation, leisure, exercise, and social interaction.
Key Features	• The park incorporates playgrounds, splash parks, cycling and jogging tracks, as well as lakeside decks that support recreational and community activities. • Shaded rest areas and extensive tree canopies improve thermal comfort, environmental quality, and biodiversity. • Inclusive design elements such as ramps, tactile paving, and accessible playgrounds enhance usability for diverse user groups, including persons with disabilities.
Design Significance	Taman Tasik Titiwangsa demonstrates how urban parks can successfully balance recreation, accessibility, and therapeutic landscape design, making it a valuable precedent for the development of inclusive and multifunctional courtyard environments.

Case Study 4: TRX City Park

Table 4: President Study at TRX City Park

Aspect	Description
Case Study	TRX City Park
Location & Typology	Located within Kuala Lumpur’s Tun Razak Exchange (TRX) financial district, TRX City Park is a 10-acre elevated urban park that integrates leisure, ecology, and urban connectivity.
Users	Primarily utilized by office workers, residents, families, children, tourists, and differently-abled users for recreation, relaxation, social interaction, and community activities.
Key Features	• The park includes various recreational and social spaces such as Play City, Play Cave, splash areas, amphitheaters, and forest walk pathways. • Sustainable landscape strategies, including native planting, rain gardens, and bioswales, are incorporated to improve ecological performance and environmental resilience. • Universal accessibility is enhanced through clear wayfinding systems, barrier-free circulation, and strategically placed rest nodes that improve user comfort and inclusivity.
Design Significance	TRX City Park demonstrates how contemporary urban parks can successfully integrate multifunctionality, inclusivity, and ecological landscape design within dense urban environments, making it a relevant precedent for the enhancement of flexible and sustainable communal spaces.



Figure 10: Aerial View of TRX City Park
(Source: Oculus Landscape, 2024)

SITE ANALYSIS AND SYNTHESIS

• Circulation and Accessibility

The analysis revealed that the courtyard is located away from the primary circulation route, resulting in limited visibility and reduced user engagement. Existing pathways are relatively uninviting and lack ramps or barrier-free access for elderly users and persons with disabilities (OKU). Therefore, the introduction of clearer circulation systems, accessible pathways, and inclusive design interventions would significantly improve accessibility and encourage more frequent daily use.

• Zoning and Space Utilization

Large portions of the courtyard currently remain underutilized due to the absence of clearly defined spatial zoning and activity areas. As a result, the courtyard lacks spatial identity and functional diversity. Establishing designated zones for cultural, educational, entrepreneurial, and recreational activities would therefore contribute towards activating the space and improving overall user engagement.

• Entrepreneurial and Cultural Opportunities

At present, the site lacks facilities that support student entrepreneurship or cultural activities. Consequently, opportunities for economic engagement and cultural interaction remain limited. The incorporation of kiosks, exhibition spaces, and cultural display areas could create income-generating opportunities while simultaneously strengthening KAED’s institutional identity and community presence.

• Comfort & Microclimate

At present, the site lacks facilities that support student entrepreneurship or cultural activities. Consequently, opportunities for economic engagement and cultural interaction remain limited. The incorporation of kiosks, exhibition spaces, and cultural display areas could create income-generating opportunities while simultaneously strengthening KAED’s institutional identity and community presence.

DESIGN CONCEPT

TUMA'NINAH (PAUSE)

The concept of Tuma'ninah, rooted in the notion of serenity and inner peace, responds directly to the need for therapeutic and restorative spaces within the intensity of campus life. Similar to a sensory garden that engages multiple human senses, the proposed design offers a retreat where students and staff may experience relief, reflection, and emotional rejuvenation.

Natural elements such as trees, greenery, water features, and shaded walkways are carefully integrated to create an environment that calms both the body and mind, thereby extending the courtyard's role beyond purely functional use. By stimulating the senses of sight, sound, smell, touch, and taste, the space encourages mindfulness and a deeper connection with nature.

Furthermore, the organic spatial arrangement, inclusive pathways, and multifunctional landscape elements embody harmony, balance, and tranquility, transforming the courtyard into a meaningful environment for learning, interaction, healing, and reflection.

Inspired by Surah Ar-Ra'd (13:28), which reminds believers that hearts find peace through the remembrance of Allah, the proposal aspires to establish a sanctuary where knowledge, culture, spirituality, and community coexist harmoniously in continuity and peace.

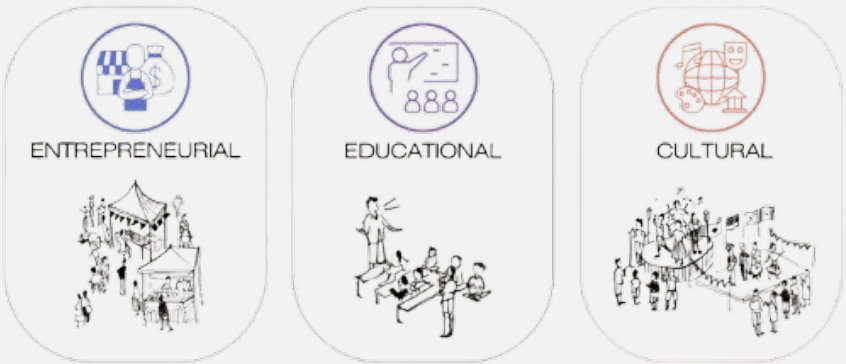


Figure 11: The Design Strategies For Landscape Design of Laman KAED.
(Source: Authors)

Additionally, as illustrated in Figure 12 and 13 the ideation and design development of the design concept emphasizes the integration of nature, movement, and human interaction through shaded pathways, sensory planting, water elements, and flexible communal spaces that encourage relaxation, reflection, and social engagement. At the same time, as illustrated in Figure 11, the proposal supports multifunctionality by incorporating areas for academic, cultural, recreational, and entrepreneurial activities, thereby transforming Laman KAED into a dynamic and restorative environment that balances tranquility, functionality, and community interaction.

DESIGN DEVELOPMENT



Figure 12: Design Ideation
(Source: Authors)

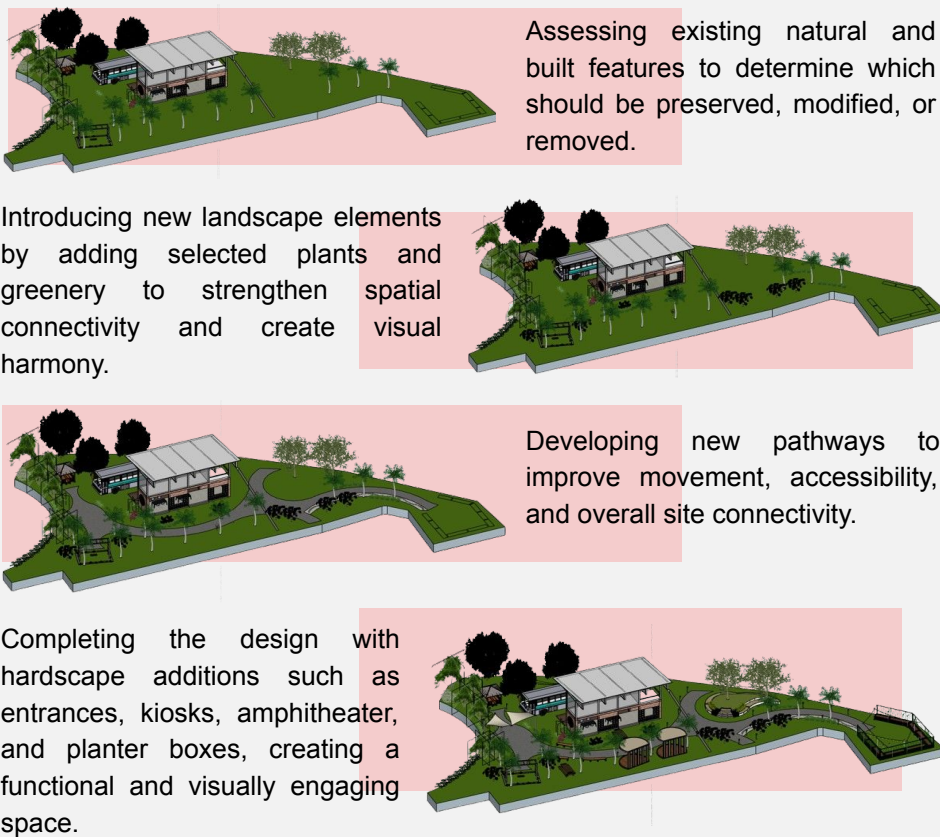


Figure 13: Design Development
(Source: Authors)

DESIGN FINALISATION

The final design proposal for Laman KAED revolves around the concept of “A Pause Beyond the Expected: A Therapeutic Garden Experience”, symbolizing seamless access to spaces of rest, reflection, and social interaction that are open and welcoming to all users. The courtyard functions as a restorative hub that supports well-being, creativity, and knowledge-sharing while bringing the IIUM community together within a calming and inclusive environment as illustrated in Figure 14 until 29. The essence of peace and therapeutic healing is expressed through the integration of landscape elements, sensory experiences, and architectural structures that collectively create a tangible atmosphere of tranquility.

Furthermore, the design successfully fosters meaningful social interaction, strengthens community belonging, and enhances emotional well-being through inclusive and multifunctional spaces. Ultimately, the proposal transforms the courtyard into an engaging and restorative environment that responds to the evolving social, cultural, and psychological needs of the university community.



Figure 14: Entrance of Laman KAED (Source: Authors)



Figure 15: Kiosk (Source: Authors)

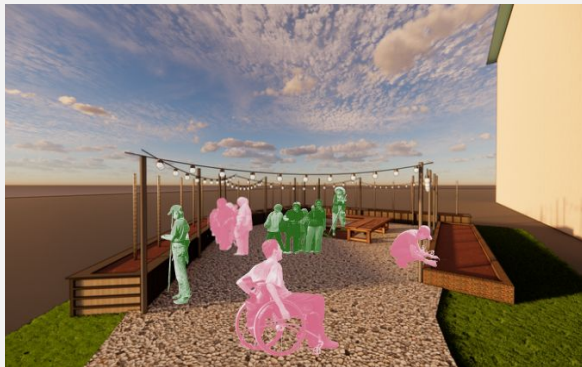


Figure 16: Horticultural Area (Source: Authors)



Figure 17: Swing (Source: Authors)

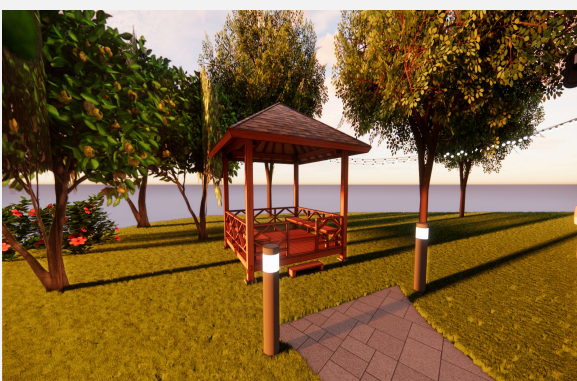


Figure 18: Gazebo (Source: Authors)



Figure 19: Open Lawn (Source: Authors)



Figure 20: Reflexology Path (Source: Authors)



Figure 21: Tensile Structure (Source: Authors)



Figure 22: The Perspective View of The Laman KAED (Source: Authors)

ELEVATION AND SECTION DRAWINGS



Figure 23: Masterplan (Source: Authors)



Figure 24: Front Elevation (Source: Authors)



Figure 25: Rear Elevation (Source: Authors)



Figure 26: Left Elevation (Source: Authors)



Figure 27: Right Elevation (Source: Authors)



Figure 28: Section X-X' (Source: Authors)



Figure 29: Section Y-Y' (Source: Authors)

COST ESTIMATION

DETAILED COST BREAKDOWN

Listed in Table 5 is the detailed cost breakdown demonstrates a balanced allocation of the project budget across key components such as landscape enhancement, functional facilities, accessibility improvements, infrastructure, and supporting amenities. A significant portion of the budget is dedicated to landscape and environmental works, reflecting the project’s emphasis on creating a therapeutic and environmentally responsive courtyard that aligns with the concept of *ṭuma’nīnah*. At the same time, allocations for kiosks, seating areas, pathways, lighting, and communal spaces highlight the project’s commitment to improving functionality, inclusivity, and social interaction. Overall, the cost distribution indicates a strategic financial approach that prioritizes user comfort, sustainability, and long-term usability while supporting the transformation of Laman KAED into a vibrant and multifunctional campus environment.

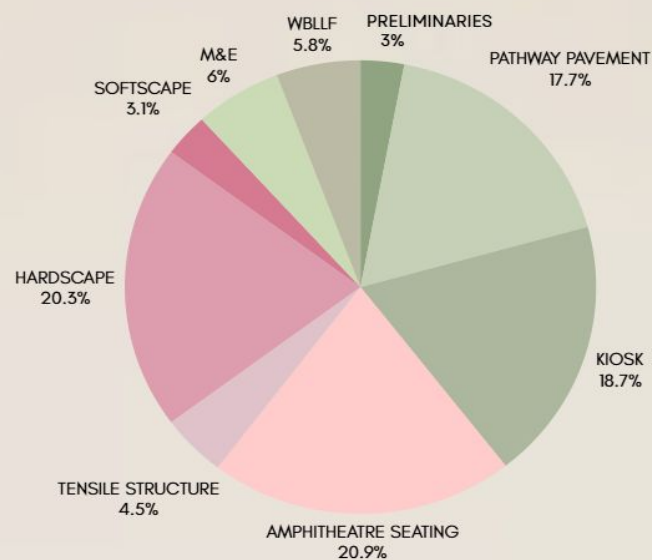
As illustrated in Figure 34 the pie chart of the cost breakdown provides a clear visual representation of the distribution of the total project expenditure across the major work categories. The largest percentage is allocated to landscape and environmental enhancement works, highlighting the project’s strong emphasis on creating a therapeutic, comfortable, and sustainable outdoor environment. Meanwhile, other allocations towards functional facilities, accessibility improvements, infrastructure, and supporting amenities demonstrate the project’s balanced approach in addressing both aesthetic and practical needs. Overall, the chart reflects a well-planned financial strategy that supports the development of an inclusive, multifunctional, and environmentally responsive courtyard for the KAED community.

To summarize, the detailed cost breakdown table and pie chart collectively illustrate the allocation of the overall project budget across major components such as landscape enhancement, functional facilities, accessibility improvements, infrastructure, and supporting amenities. A substantial portion of the expenditure is dedicated to landscape and environmental works, reflecting the project’s strong focus on creating a therapeutic, sustainable, and comfortable outdoor environment aligned with the concept of *ṭuma’nīnah*. At the same time, the allocation for kiosks, communal spaces, pathways, lighting, and accessibility features demonstrates a balanced approach towards improving functionality, inclusivity, and user experience. Overall, both the table and pie chart indicate a strategic and well-distributed financial planning approach that supports the transformation of Laman KAED into a multifunctional, engaging, and environmentally responsive campus space.

Table 5: Detailed Cost Breakdown

ITEM	DESCRIPTION	UNIT	QUANTITY	RATE (RM)	AMOUNT
A1	PRELIMINARIES				
A2	TURFING/ GRASS AREA/ FLOWER				
A3	CLEARING/ CLEANING/ TIDYING AREA (GOOD)				
A4	RUBBISH AND DISPOSAL				
A5	EXISTING UTILITIES & METERING				
B	WORK BELOW SUNKET FLOOR/ FLOOR			SUBTOTAL	RM 2,982.00
B1	BROKEN TERAZO	M2	20	RM 5.15	103.20
B2	GRANITE (T)	M2	31	RM 6.25	193.75
B3	DRAIN TECH COVER (B.M)	M2	14	RM 6.60	92.40
B4	SANDA FACE (RUBBER BAR)	M2	202	RM 6.60	1,333.20
B5	CONCRETE KERB (150X150MM)	M	8	RM 45.00	360.00
B6	CONCRETE KERB AND ROAD KERBING	M2	11	RM 20.00	220.00
B7	ROAD SUBBASE AND HARD BASE	M3	111	RM 8.25	915.75
B8	CONCRETE	M3	23	RM 78.00	1,794.70
C	PATHWAY/ PAVEMENT			SUBTOTAL	RM 1,298.50
C1	EXPOSED	M2	1	RM 302.00	302.00
C2	EXPOSED CONCRETE AGGREGATE	M2	35	RM 45.18	1,581.30
C3	INTERLOCKING CYME	M2	20	RM 64.17	1,283.40
C4	KERBING	M	342	RM 5.50	1,881.00
D	WORK			SUBTOTAL	RM 5,662.00
D1	CONCRETE SEAT (E) COLOUR	M2	1	RM 180.00	180.00
D2	STAIR (TERRACE) AND HAND RAIL	KG	283	RM 2.60	735.80
D3	RAIN BAR	M2	12	RM 22.00	264.00
D4	GABION WALL	M3	9	RM 22.00	298.00
D5	BOULDER	M3	12	RM 61.00	732.00
D6	WATER	M	26	RM 11.00	286.00
D7	LOG	M3	15	RM 32.64	489.60
D8	ROCK CLADDING	M2	18	RM 24.50	441.00
D9	WALL	M2	10	RM 81.13	811.30
D10	TASCA BOND	M2	2	RM 81.13	162.26
D11	WOVEN BAMBOO	M2	5	RM 11.33	56.65
D12	PLATED PARK BOARD	M2	21	RM 31.76	667.00
D13	TIMBER DECK	M2	14	RM 70.11	981.54
E	AMPHITHEATRE SEATING			SUBTOTAL	RM 4,521.32
E1	GEOTEXTILE	M2	4	RM 15.33	61.32
E2	GEOMEMBRANE	No.	26	RM 102.31	2,661.96
E3	GABION MATTRESS	M2	21	RM 183.15	3,844.15
E4	CONC. WALL AND GABION (M3)	M2	11	RM 123.45	1,357.95
E5	CONC. PLANTER BOX CACING AND MEITEEL	M	7	RM 24.76	173.32
E6	BOTTING 19 VOLUME TIMBER CAP	M2	44	RM 2.04	89.76
E7	RAISED PLANTER AND BAMBOO	M2	9	RM 22.54	202.86
E8	ARTIFICIAL TURFING	M2	8	RM 21.50	172.00
E9	TIMBER SEATING/CAP	M2	2	RM 251.66	503.32
E10	WOVEN BAMBOO	M2	5	RM 11.33	56.65
F	TIMBER STRUCTURE			SUBTOTAL	RM 2,189.96
F1	SHS GALVANISED STEEL PIPE	No.	12	RM 124.13	1,489.56
F2	SPANDEK STEEL DECKING WITH CONNECTION	No.	12	RM 32.83	393.96
F3	BAMBOO CLUMP AND CEILING	No.	5	RM 61.33	306.44
G	HARDSCAPE			SUBTOTAL	RM 2,584.94
G1	DRAIN COVER 1.8M	No.	26	RM 13.33	346.58
G2	CAMPER BENCH	No.	24	RM 1,472.25	4,046.00
G3	SIGNAGE	No.	1	RM 561.33	561.33
G4	PICNIC KET BAMBOO TABLE		LUMP SUM	RM	3,354.00
G5	MOTORISED SWING CHAIR		LUMP SUM	RM	2,100.00
G6	ILLUMINATEH 200W			RM	207.03
H	SOFTSCAPE			SUBTOTAL	RM 6,219.28
I	TREES				
H1A	PTEROCARPA CHINOPHORA	No.	21	RM 11.00	231.00
H1B	CHOISIA/ HONGKONG	No.	24	RM 9.00	216.00
H1C	DELIMA/ MAKETAN	No.	24	RM 12.10	290.40
H1D	MURRAY P	No.	4	RM 21.00	84.00
H2	PALMS				
H2A	LICUALA GRANDIS	No.	8	RM 14.50	116.00
H3	SHRUBS				
H3A	PLUMBAGO ZINGRAPH	No.	6	RM 17.32	103.92
H3B	ROSA ROXBURGH	No.	11	RM 13.79	151.69
H3C	JASMINE	No.	27	RM 7.20	194.40
H3D	TUMBUH LAMPUCOLA	No.	6	RM 9.89	59.34
H4	GROUND COVER	No.	8	RM 3.14	25.12
I	MECHANICAL AND ELECTRICAL			SUBTOTAL	RM 1,624.57
I1	LIGHTING				
I1A	STRING LIGHT WITH SOLAR	No.	8	RM 63.50	508.00
I1B	SIMPLE LIGHT WITH SOLAR	No.	81	RM 18.50	1,498.50
I1C	STRIP LIGHT WITH SOLAR 3BH	No.	62	RM 18.70	1,159.40
I1D	STRIP LIGHT WITH SOLAR 5BM	No.	1	RM 134.13	134.13
				TOTAL	RM 29,613.27
				TECH.	RM 296.13
				BALANCE	RM 0.00

COST BREAKDOWN



RM 50 000.00

PRELIMINARIES	RM 1 500.00
WBLFF	RM 2 914.01
PATHWAY PAVEMENT	RM 8 906.75
KIOSK	RM 9 422.04
AMPHITHEATRE SEATING	RM 10 484.23
TENSILE STRUCTURE	RM 2 269.38
HARDSCAPE	RM 10 179.24
SOFTSCAPE	RM 1 561.19
M & E	RM 2 763.16

Figure 30: Cost Breakdown
(Source: Authors)

CONCLUSION

This paper has presented the findings and design outcomes related to the enhancement of Laman KAED through the concept of *tuma'ninah*. By addressing the courtyard's existing shortcomings, the proposal transforms a previously neglected and underutilized space into an environment that promotes tranquility, therapeutic value, and meaningful social interaction.

The redesign introduces open, inclusive, and multifunctional spaces that encourage participation, collaboration, and community engagement. Simultaneously, the incorporation of improved materials, landscaping strategies, and environmentally responsive design interventions enhances both the aesthetic quality and functional performance of the courtyard.

Moreover, the revitalization not only reactivates the physical environment of Laman KAED but also strengthens its role as a practical, engaging, and restorative setting for the IIUM community. Ultimately, the enhanced courtyard stands as a welcoming and therapeutic environment capable of supporting the evolving needs of students and staff while fostering well-being, inclusivity, and social cohesion.

ACKNOWLEDGEMENT

This project has been a valuable and transformative journey for Group 3, Arqan Cooperation. The experiences gained and connections formed throughout the process will serve as a foundation for future work, driving the team towards excellence. The authors wish to express heartfelt gratitude to the lecturers of BAQS 2300 Integrated Multi-Disciplinary Project, 2025, at the Kulliyyah of Architecture and Environmental Design (KAED), IIUM, as well as to all individuals and institutions whose contributions were instrumental in the success of this project.

Lecturers

1. Asst. Prof. Dr. Siti Noorfairus Che Abdullah (Department of Applied Arts and Design)
2. Asst. Prof. Sr. Dr. Masidah Abdul Majid (Department of Quantity Surveyor)
3. Asst. Prof. Sr. Roziha Che Haron (Department of Quantity Surveyor)
4. Asst. Porf. Raja Intan Suhaylah Raja Abdul Rahman (Department of Applied Arts and Design)
5. Nur Ulfah Awatif Umairah Alias (Department of Architecture)

Table 6: List of Students

No.	Students Name	Matric
1	AHMAD HADI HADRI BIN ZAINUDDIN	2310583
2	IRDHINA ZAHIRA BINTI FAHMI	2310772
3	FARAH DIYANA BINTI RAJMAN	2310966
4	NAJLA IRDINA AL-FAHMI BINTI KHAIRIL AMRAN	2311224
5	NURUL IMAN NAFISAH BINTI SUHAIMI	2311390
6	MUHAMAD HAFIZAN BIN MAT HASAN	2311507
7	HAJAR ARIFAH BINTI ROSDI	2224400
8	NUR ANIS NADHIRAH BINTI AMIR RAMADZAN	2226598
9	NADHIRAH AFIFAH BINTI MUHAMAD	2229088
10	MUHAMMAD AIMAN BIN NASRUDDIN	2310091
11	FARAH NUR ILHAMI BINTI EKHSAN	2310262
12	RAJA NAILY QISTINA BINTI RAJA ISKANDAR SHAH	2310478
13	FAIQ DANISH BIN FADZIL	2211349
14	NURUL ATIQA AH AYUNI BINTI AHMAD FAIZOL	2211510
15	NUR FATIN ZAFIRAH BINTI MOHAMAD NISFU	2212322
16	ZAHLIA MAETHILDA BINTI ZULKARNAIN	2212636
17	NUR ADRIANA ALYA BINTI RUSMAN @ MAN	2212842
18	NUR ANNISSA BALQIS BINTI AZIZ	2212538

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09

REVIVING SOULS: ENHANCING LAMAN KAED AS COMMUNAL PUBLIC SPACES IN UNIVERSITY

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ABSTRACT

The project aims to revive and revitalize Laman KAED at the Kulliyyah of Architecture and Environmental Design (KAED), International Islamic University Malaysia (IIUM), transforming it into a vibrant hub that promotes interaction, creativity, and spiritual grounding. Bayu Bentala Corporation envisions this space as a reflection of KAED's identity, embodying the harmony between nature, humanity, and divine principles while supporting academic and social development. The design emphasizes inclusivity, sustainability, and Shariah compliance. Proposed innovations include paved walkways for improved circulation, kiosks as income generating elements for KAED, and a stage to foster engagement between lecturers and students. Together, these interventions seek to create a multifunctional, aesthetically pleasing, and meaningful environment. Finally, this initiative aspires to establish Laman KAED as an iconic landmark that represents the Kulliyyah's architectural excellence while nurturing a sense of belonging and community.

Keywords: Laman KAED, Social Development, Interaction, Sustainability, Shariah Compliance

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INTRODUCTION

Aesthetic and vibrant gathering spaces are vital for students as they foster interaction, creativity, and a sense of belonging while supporting mental well-being and academic engagement. Efficient use of space ensures inclusivity and sustainability, with multi-purpose areas accommodating diverse activities in line with Shariah compliance. In this context, KAED aims to transform the existing Laman KAED into a sustainable landscape that reflects its architectural identity and values by harmonising nature, humanity, and divine principles. As illustrated in Figure 1 the proposed interventions such as paved walkways, kiosks as income-generating elements, and a stage for lecturer-student interaction will enhance circulation, encourage community participation, and establish the courtyard as a multifunctional hub that supports both academic excellence and social development.

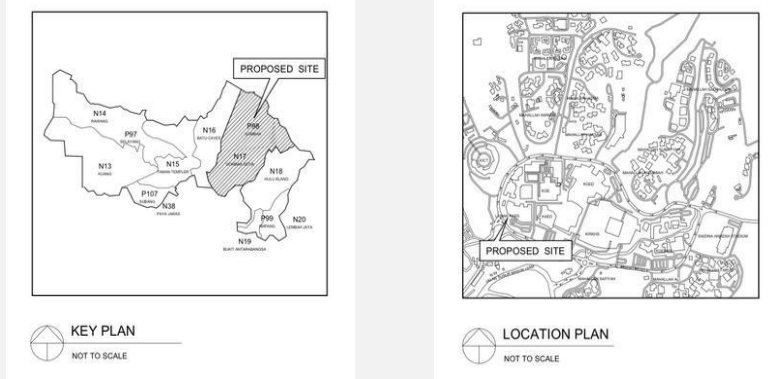


Figure 1: Key and Location Plan
(Source: Authors, 2025)

METHODOLOGY

Figure 2 shows the process undertaken to achieve the design project's objectives. The process began with a thorough literature review, followed by site analysis, precedent study and design concept. Followed by consultation sessions with the supervisor, the design was finalised. Finally, documented all processes and design in E-magazine and the multimedia presentation.

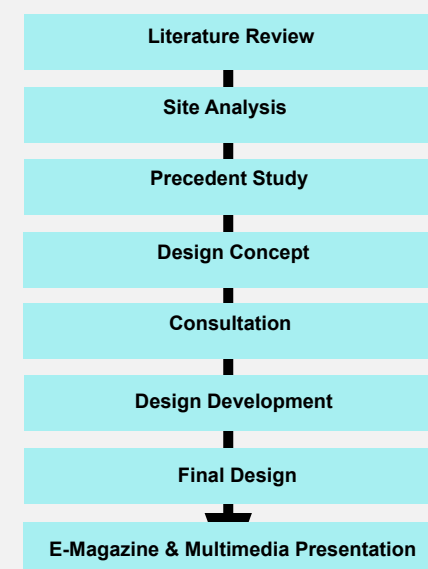


Figure 2: Research Methodology Chart
(Source: Authors, 2025)

LITERATURE REVIEW

PLACEMAKING AND THE ROLE OF COMMUNAL SPACES IN MALAYSIA

Recent studies show that well-designed communal spaces in Malaysia provide social, environmental, and psychological benefits when supported by sustainable planning. Tharim et al. (2023) highlight how biophilic strategies implemented in Malaysian green-rated office buildings improved user comfort and enhanced environmental resilience. Similarly, Manan, Artha, and Putri (2025) examined public perception of biophilic design in Kuala Lumpur high-rise buildings, finding that natural integration positively shaped how users engaged with urban communal environments. These findings reinforce that communal spaces, when embedded with ecological and cultural sensitivity, can foster vibrant interactions and long-term usability.



Figure 3: Dataran Merdeka's New Pedestrian Upgrades
(Source: My Kuala Lumpur Pass, 2024)

WELLBEING AND COGNITIVE BENEFITS OF BIOPHILIC CAMPUS SPACES

Recent research underscores how biophilic and restorative environments on campuses can significantly enhance wellbeing and cognitive function. Thani (2024) demonstrated that student engagement in biophilic landscapes fostered restorative experiences that improved focus and prolonged interaction with communal spaces. Similarly, Sakip (2024) highlighted that biophilic elements in university libraries not only enhanced cognitive performance but also contributed to stress reduction and greater academic productivity. Zamri (2025) further noted that such design interventions directly alleviate stress, depression, and anxiety, reinforcing the mental health value of natural integration in campus settings. Collectively, these findings suggest that embedding restorative and biophilic qualities into campus communal areas transforms them into living laboratories that support both academic excellence and holistic student wellbeing.



Figure 4: University of Malaya Rimba Ilmu Biophilic Communal Space
(Source: Hati NGO, 2025)

BIOPHILIC DESIGN AND STRATEGIES FOR REVIVING CONNECTION WITH NATURE

Biophilic design has gained momentum globally and locally as a way to strengthen user connection with nature while improving mental and physical health. Tekin et al. (2025) identified key gaps and emerging trends in biophilic design research, noting its capacity to restore psychological wellbeing and enhance built environment sustainability. Khan (2025) further emphasized that integrating elements such as greenery, daylight, and natural ventilation fosters human sensory comfort and reduces stress. In the Malaysian context, Zahir (2024) explored how biophilic architectural features in Geoffrey Bawa's works reshaped spatial perception, reinforcing the relevance of culturally rooted nature–architecture integration. Together, these studies show that reconnecting architecture with nature enhances healing, restoration, and environmental performance.



Figure 5: Biophilic Design Integration
(Source: Bonaiuto et al., 2025)

MANAGEMENT CHALLENGES IN REVITALISING PUBLIC COMMUNAL SPACE

While communal spaces offer multiple benefits, their quality is often undermined by governance and maintenance gaps. Zamri (2025) emphasizes that under-maintained environments exacerbate stress, anxiety, and reduced wellbeing, particularly in dense urban settings. Likewise, Syafinaz and Md Sidik (2025) argue that Malaysian urban public spaces need structured biophilic interventions and stronger community involvement to overcome issues such as poor upkeep, limited coordination, and declining user participation. Collectively, these findings suggest that addressing management challenges through co-management and nature-based strategies can ensure sustained engagement.



Figure 6: Abandoned Skatepark in a Malaysian Forest
(Source: Publicly documented, Selangor, 2025)

PRECEDENT STUDIES AND CASE STUDIES

CROSSRAIL PLACE ROOF GARDEN, CANARY WHARF, LONDON, UNITED KINGDOM



Figure 7: Crossrail Place Roof Garden
(Source: Google)



Figure 8: Crossrail Place Roof Garden's
Multifunctional Green Roof Strategy
(Source: Google)

Located above the Crossrail station in Canary Wharf, the Crossrail Place Roof Garden is an innovative green space that fuses nature and architecture. Designed by Foster + Partners and Gillespies, the garden is enclosed in a striking timber lattice roof, creating a sheltered environment that supports a unique blend of Eastern and Western plant species, which reflect the site's location on the Prime Meridian line. The space is more than just a garden, it includes seating areas, performance spaces, and winding walkways that invite exploration. It's a peaceful sanctuary in one of London's busiest financial districts, offering both commuters and visitors a refreshing pause amidst the urban rush.

GARDEN OF COSMIC SPECULATION, DUMFRIESSHIRE, SCOTLAND



Figure 9: Garden of Cosmic Speculation's
Landscape
(Source: Google)



Figure 10: Garden of Cosmic
Speculation's Curves Design
(Source: Google)

The Garden of Cosmic Speculation, created by landscape architect and theorist Charles Jencks, is a remarkable private garden that integrates science, philosophy, and art into its landscape design. Spanning over 30 acres, it features a range of imaginative sculptures, geometrically designed earthworks, fractals, black holes, and DNA-inspired elements, that each representing concepts from the universe and human understanding of space and time. The garden's flowing curves and mathematical symmetry are not only visually stunning but also intellectually stimulating. Though only open to the public one day a year, it has become globally renowned as one of the most thought-provoking gardens in the world.

TRX CITYPARK, KUALA LUMPUR, MALAYSIA



Figure 11: TRX Citypark Garden
(Source: Google)



Figure 12: TRX Citypark – Birdview
(Source: Google)

TRX City Park is a landmark public park located at the heart of Kuala Lumpur's new international financial district, the Tun Razak Exchange. Spanning 10 acres, the elevated park was designed to seamlessly integrate green spaces with the urban skyline. It offers wide open lawns, tree-lined promenades, shaded rest areas, and sustainable rainwater management systems. The landscape incorporates local flora and eco-friendly materials, creating an inviting space for both leisure and community activities. Surrounded by iconic skyscrapers, the park functions as the "green lung" of the city, enhancing the quality of life and urban biodiversity while promoting healthy, outdoor living in the city center.

TAMAN TASIK TITIWANGSA, SELANGOR, MALAYSIA



Figure 13: Taman Tasik Titwangsa's
Reflective Water
(Source: Authors, 2025)



Figure 14: Taman Tasik Titwangsa's
Jogging Paths
(Source: Authors, 2025)

Taman Tasik Titiwangsa is one of Kuala Lumpur's most iconic recreational parks, offering a serene escape in the middle of the bustling capital. Centered around a scenic lake with views of the KL skyline, the park covers over 95 hectares and features lush green landscapes, cycling and jogging paths, water activity zones, children's playgrounds, and reflective water bodies. A recent revitalization project introduced modern features such as interactive water fountains, dedicated sports areas, and improved accessibility, making it even more family-friendly and inclusive. The park is a cherished green space where residents and tourists alike gather for exercise, picnics, or simply to enjoy nature within the urban environment.

SITE ANALYSIS

Laman KAED is an open communal courtyard located within the Kulliyyah of Architecture and Environmental Design (KAED) at the International Islamic University Malaysia, Gombak Campus. Its strategic location positions it as a key transitional node for students and staff. Pedestrian movement remains constant throughout the day. The physical characteristics of the site reveal a gently sloping terrain with a mix of hardscaped walkways and soft landscape elements such as lawns and scattered trees. While this open layout allows for flexibility of use, the space currently lacks defined programmatic functions that would strengthen its role as an active communal hub within the kulliyyah.



Figure 15: Laman KAED's Entrance



Figure 16: Students Activity at Pavillion at Laman Kaed

In terms of climate, the location is representative of the usual tropical climate of Malaysia, where high temperatures, high humidity, and a lot of rain affect outdoor comfort. Laman KAED's openness permits a certain amount of natural ventilation, but the lack of flora and shade structures leads to extended exposure to sunshine and precipitation, discouraging extended occupation. Although they partially shade the adjacent buildings, some of them also block cross-ventilation. These environmental considerations emphasize how crucial it is to incorporate sustainable design elements, such tree planting, water-sensitive landscaping, and covered pavilions, to enhance the site's microclimatic resilience and comfort.

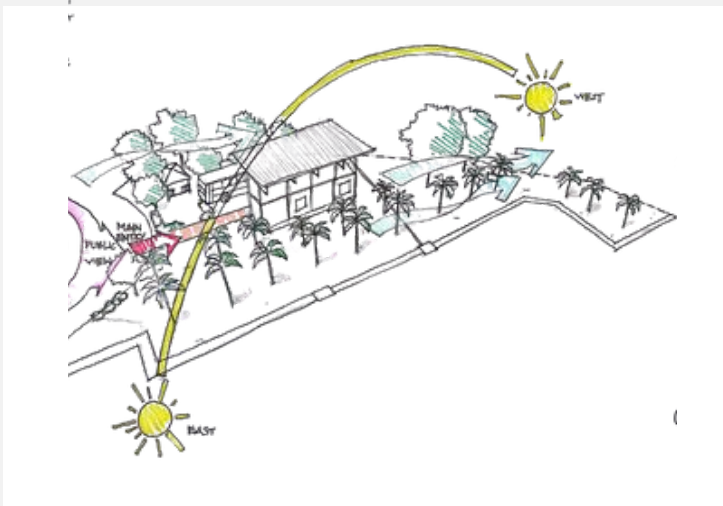


Figure 17: Sun Path Study of Laman KAED
(Source: Authors, 2025)

In terms of usage and potential, Laman KAED is primarily employed as a spillover area for informal discussions, student activities, and circulation, yet its spatial and environmental qualities suggest broader opportunities. A comprehensive site analysis indicates that the space could be transformed into a dynamic micro-community hub by addressing current weaknesses, such as limited seating, shading, and functional diversity. Through careful planning and design, the site may evolve into a living laboratory for sustainability and creativity, aligning with KAED's academic vision while enhancing the overall student experience. This positions Laman KAED not only as a transitional courtyard but as an integral element of the Kulliyyah's identity, contributing to IIUM's aspiration of holistic, sustainable, and experiential learning environments.



Figure 18: Laman KAED's Seatings
(Source: Authors, 2025)



Figure 19: Laman KAED's Decking
(Source: Authors, 2025)

SWOT ANALYSIS

Table 1: SWOT Analysis

Categories	Description
Strength	The site has a natural gradient terrain suitable for landscaping, allowing ease of pedestrian movement.
Weakness	Current cultural uses are scattered with no structured events to consistently highlight KAED culture.
Opportunity	The site's rich plant biodiversity and calming environment can create an educational nature park.
Threat	The nearby drainage, while currently not a problem, could produce odours if maintenance declines during certain weather conditions.

DESIGN CONCEPT

REVIVING SOULS

The concept of Reviving Souls reimagines Laman KAED as a lively and sustainable space that transforms an underutilized site into a hub for learning, creativity, and community engagement. Rooted in the idea of renewal, this concept emphasizes reinstating the space's fundamental functions such as facilitating interaction, nurturing creativity, and supporting academic and social learning. It seeks to reconnect people with the site, restore its memory and social value, and harmonize the presence of nature within the KAED environment.

The design objectives highlight reconnecting users through layered spatial experiences, generating a sustainable source of income for KAED, and restoring the space's functionality for daily usability. To achieve this, the spatial strategy focuses on revival through temporal adaptability, where multifunctional structures cater to diverse activities; regenerative elements, such as a rainwater-fed greenhouse, ensure ecological resilience; and material transformation turns raw, unused surfaces into inviting and functional platforms.

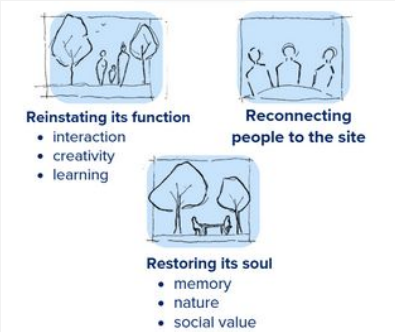


Figure 20: Core Ideas
(Source: Authors, 2025)

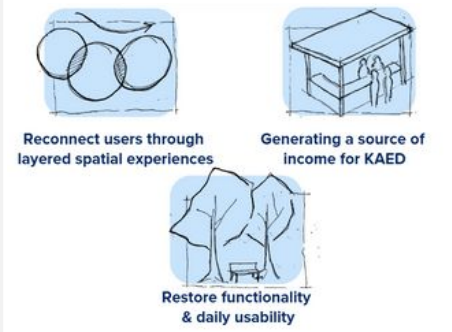


Figure 21: Design Objectives
(Source: Authors, 2025)

Stylistically, the project adopts an industrial-biophilic approach, integrating exposed structural elements with natural features. Passive water systems, strategic planting, and structural integration embody a design language that bridges human activity and environmental awareness. These interventions allow the site to evolve as both a practical and symbolic place of gathering, grounded in Islamic values. The essence of Revive resonates with the verse from Surah Al-Baqarah (2:261) emphasizes the concept's spirit of growth, generosity, and multiplication of benefits, where a modest intervention blossoms into manifold outcomes that is academic excellence, community strength, and spiritual enrichment.

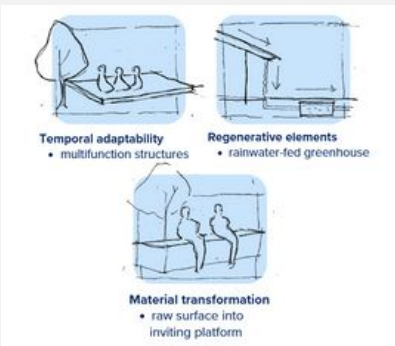


Figure 22: Spatial Strategy as Revival
(Source: Authors, 2025)

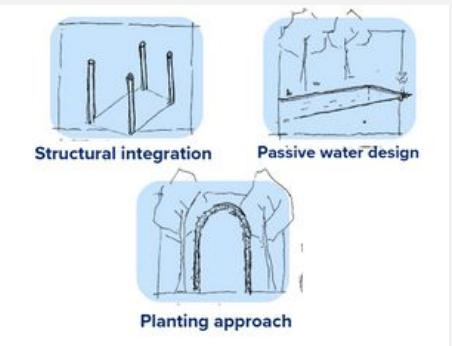


Figure 23: Industrial Biophilic Styling
(Source: Authors, 2025)

DESIGN DEVELOPMENT

1) ZONING AND BUBBLE DIAGRAM

The zoning divides the site into the pocket garden, multipurpose area, commercial zone, and parking for clear functional separation. Each zone is placed to maximize accessibility and minimize conflict between uses. The bubble diagram develops this further by adding activity nodes such as seating, kiosks, bicycle parking, and water features. All nodes are connected with clear circulation routes to create a smooth and engaging user flow.

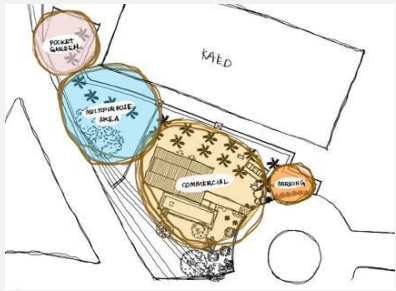


Figure 24: Laman KAED's Zoning
(Source: Authors, 2025)

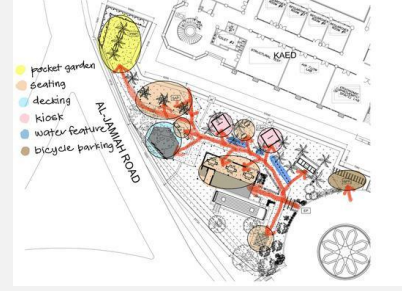


Figure 25: Laman KAED's Bubble Diagram
(Source: Authors, 2025)

2) GRIDLINE AND SPACE PLANNING

A gridline system is introduced to provide structure and proportion to the layout. It organizes pathways, seating, and kiosks into a balanced rhythm across the site. Space planning ensures the multipurpose area remains central with other functions arranged around it. This stage creates a practical and flexible plan that can adapt to different activities.

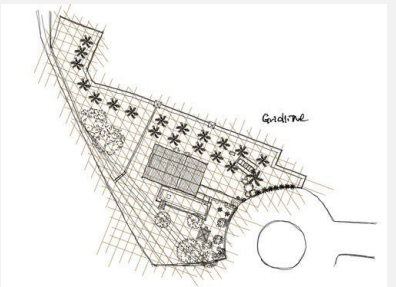


Figure 26: Laman KAED's Gridline
(Source: Authors, 2025)

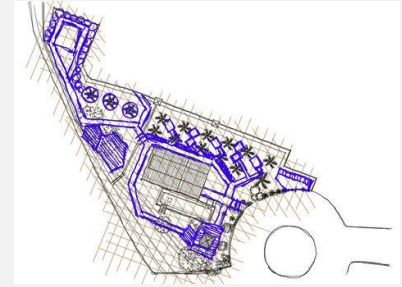


Figure 27: Laman KAED's Space Planning
(Source: Authors, 2025)

3) FINAL DESIGN

The final design combines zoning, bubble diagrams, and gridlines into a cohesive layout. Circulation is clear and connects the entrance, commercial spaces, multipurpose hub, and pocket garden seamlessly. Landscape and water features are distributed to create comfort, harmony, and visual interest. The result is a sustainable and inclusive design that supports both daily use and community events.



Figure 28: Laman KAED's Final Design
(Source: Authors, 2025)

8.0 DESIGN FINALISATION

This concept of Reviving Souls in these student spaces revolves around fostering a collaborative and inspiring environment where ideas can thrive. These spaces are intentionally designed to cater to various activities that support idea generation, such as self-study, group discussions, and moments of rest. Additionally, they allow students to engage with and appreciate the work of others, further fueling creativity. By accommodating diverse interests and needs, the spaces create a dynamic ecosystem that encourages students to connect with ideas and each other, ultimately enhancing their academic and personal growth.



Figure 29: Exterior perspective of Laman Kaed



Figure 30: Exterior perspective of Laman Kaed



Figure 31: Exterior perspective of Laman Kaed



Figure 32: View of Kiosks at Commercial Area



Figure 33: View of Stage at Multipurpose Area



Figure 34: View of Seating at Multipurpose Area



Figure 35: View of Pocket Garden



Figure 36: View of Arches at Entrance



Figure 37: Bird's-eye perspective view

Figure 29 to 37 shows the perspective views of the Laman KAED
(Source: Author)

TECHNICAL DRAWINGS

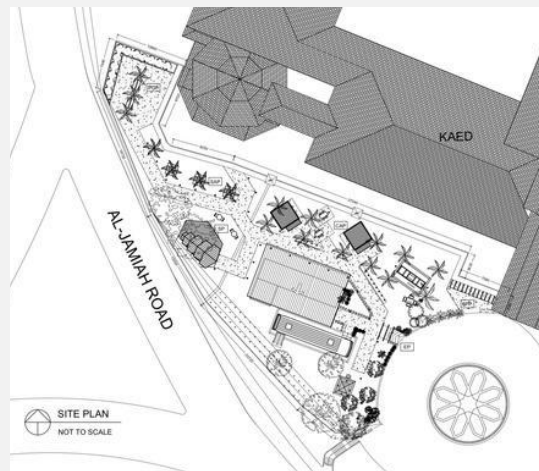


Figure 38 : Site Plan

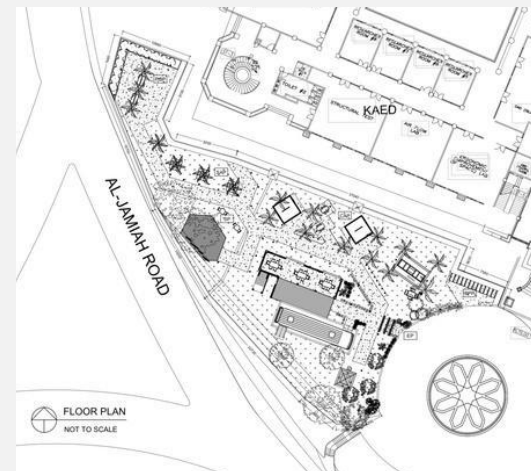


Figure 39 : Floor Plan



Figure 40 : Front Elevation

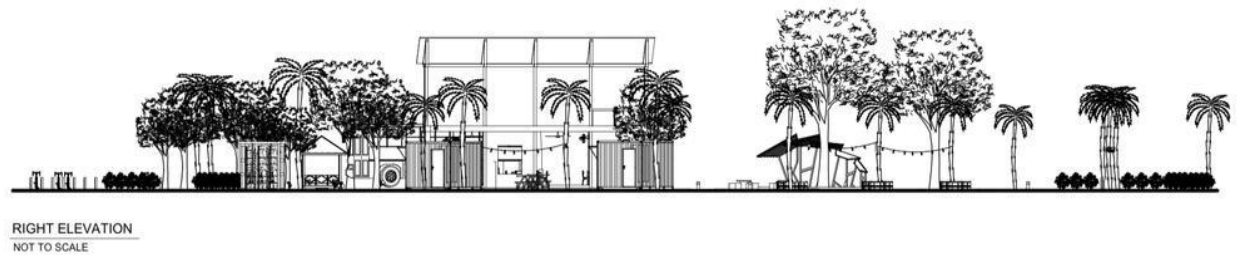


Figure 41 : Right Elevation



Figure 42 : Rear Elevation



Figure 43 : Left Elevation

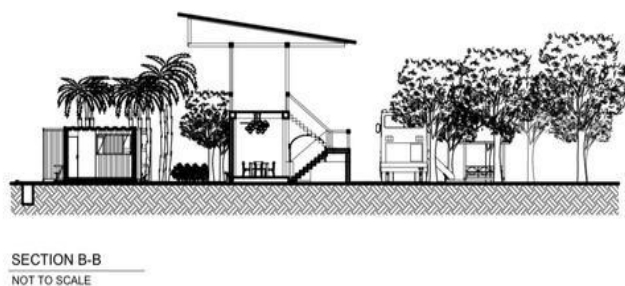


Figure 44 : Section B-B

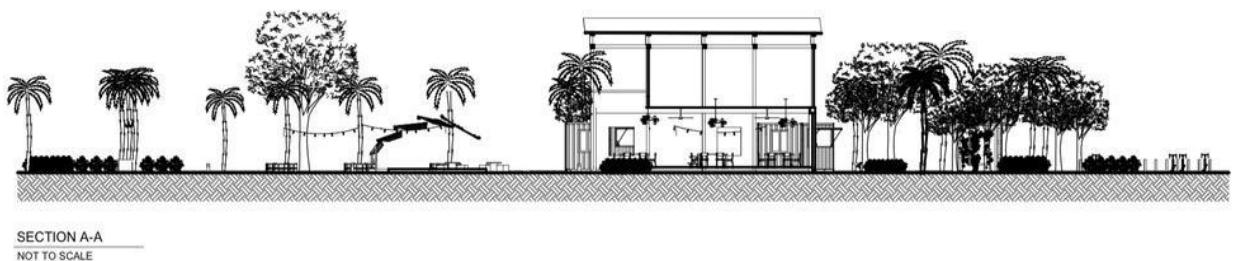


Figure 45 : Section A-A

Figure 38 to 45: The Rendered Drawings for Laman Kaed
 (Source: Authors)

CONCLUSION

Revive redefines Laman KAED as a purposeful, dynamic, and sustainable space that restores both the physical and symbolic value of the site. Rooted in principles of renewal and community, it harmonizes ecological resilience with academic and social engagement. By integrating passive systems, multifunctional structures, and biophilic design, the space evolves into a living environment that adapts to changing needs while nurturing creativity, interaction, and well-being. Anchored in Islamic values and inspired by the spirit of growth from Surah Al-Baqarah (2:261), Revive aspires to multiply its benefits academically, socially, and spiritually, creating a long-lasting impact on the KAED community and beyond.

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This project has been a transformative experience for the members of Group 5, Bayu Bentala Corp. We are eager to apply the insights we’ve gained and the relationships we’ve built in future projects, aiming to achieve outstanding results. We extend our sincere appreciation to the lecturers of BAQS 2300 Integrated Multi-Disciplinary Project, 2025, at the Kulliyyah of Architecture and Environmental Design (KAED), IIUM, for their continuous guidance, constructive feedback, and encouragement throughout the process, and to all other contributing parties and institutions for their significant role in making this project a success.

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	ASSOCIATE PROFESSOR IR. DR. MOHD. FAIRULLAZI AYOB
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ARCHITECTURE	PROFESSOR DATO' SRI AR. DR. ASIAH ABDUL RAHIM
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APPLIED ART & DESIGN	ASSISTANT PROFESSOR DR. RAJA INTAN SUHAYLAH RAJA ABDUL RAHMAN
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4	MUHAMMAD ALIF BIN MOHD HISHAM	2313569	ARCH
5	NURUL AINA BINTI ABDULLAH	2313608	ARCH
6	NIK RUWAIDAH BINTI NIK MOHD NIZAM	2313640	ARCH
7	AMIR FAIZ BIN AHMAD FADZIL SUMBANDY	2311765	AQS
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9	WAN ALIYA NADZIFAH BINTI WAN KAMARUZAMAN	2311984	AQS
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11	AYSHA BINTI MUSTAFA	2312092	AQS
12	HASYA DINA BINTI NUZRA EFENDI	2312146	AQS
13	SITI HAJAR IRIS BINTI SAHID	2312602	AQS
14	ILHAM TSAQIEF BIN SANUSI	2214801	AAD
15	DAMIA BATRISYIA BINTI MOHD RAFI	2215098	AAD
16	MUHAMMAD AMIR NASRULLAH BIN ZABIDI	2215407	AAD
17	MUHAMMAD AMMAR BIN MOHD NOR HIDAYAT	2215593	AAD
18	MISHA WARDINA BINTI MAIZAMSHAH	2214174	AAD

Table 3: Students’ list

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10

A SPACE OF ENGAGEMENT: PROPOSING ENHANCEMENT OF COURTYARDS IN KULLIYYAH OF ARCHITECTURE AND ENVIRONMENTAL DESIGN, IIUM

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Kulliyyah of Architecture and Environmental Design, International Islamic University Malaysia

ABSTRACT

The proposed enhancement of the KAED Courtyards at the Kulliyyah of Architecture and Environmental Design (IIUM) focuses on transforming underutilized outdoor areas into meaningful and engaging spaces for the campus community. The objectives are to strengthen the identity of KAED, create inclusive gathering spaces, maximize the use of open areas, and promote environmentally responsive design. The proposal emphasizes multifunctionality, sustainability, and community engagement, envisioning the courtyards as vibrant and adaptable hubs that support academic, social, and cultural activities while contributing to the long-term sustainability of the faculty.

Keywords: Courtyard Design, Community Engagement, Landscape Design, Sustainability

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INTRODUCTION

The Kulliyyah of Architecture and Environmental Design (KAED) at the International Islamic University Malaysia (IIUM), established in June 1996, was founded with the aim of advancing education and professional training in the built environment disciplines. Its academic philosophy is uniquely shaped by the Tawhidic approach, which integrates Islamic principles into teaching, research, and practice across architecture, planning, and design. This pedagogical orientation positions KAED as a pioneer in holistic education, dedicated to producing graduates who are not only technically proficient but also guided by ethical and spiritual values that contribute meaningfully to society.

Within this context, the courtyards at KAED represent significant yet underutilised assets that hold potential to support academic, social, and cultural life within the faculty. Their current lack of vibrancy and limited functionality restricts their capacity to foster engagement and strengthen KAED's identity. This study therefore seeks to revitalise these outdoor spaces, transforming them into inclusive hubs that facilitate interaction, learning, and relaxation. By adopting strategies that promote multifunctional use, sustainable landscaping, and community-oriented design, the project aims to align the courtyards with broader institutional aspirations, particularly the IIUM Sejahtera Framework, which emphasises spiritual, intellectual, emotional, and physical well-being. Furthermore, the proposed interventions are envisioned to contribute to global sustainability efforts, specifically Sustainable Development Goals (SDGs) 3 (Good Health and Well-Being), 4 (Quality Education), 11 (Sustainable Cities and Communities), and 13 (Climate Action).

This project is undertaken in conjunction with BAQS 2300 (Integrated Multi-Disciplinary Project) involving students from the departments of Architecture, Applied Arts & Design, and Quantity Surveying. Over a duration of 5 weeks, each team developed design solutions that enhance the KAED Courtyards, with the aim of creating spaces that strengthen campus life and reflect KAED's architectural and environmental values.



Figure 1. Site Plan - KAED Courtyard A (right) & Courtyard B (left)

(Source: Google Earth, 2025)

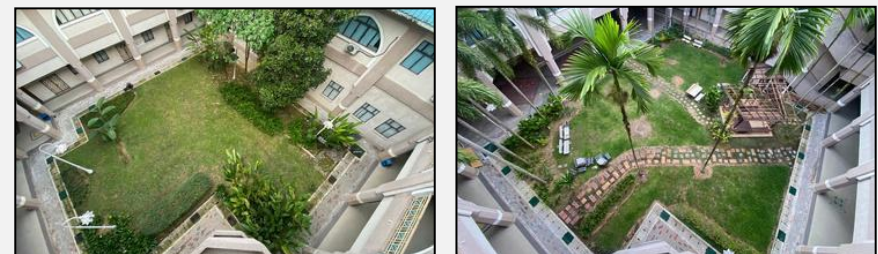


Figure 2. Top View of Courtyard A (right) & Courtyard B (left)(Source: Authors, 2025)

METHODOLOGY



Figure 3. Methodology used in the study
(Source: Authors, 2025)

LITERATURE REVIEW

This project explores the transformation of underutilised campus spaces into inclusive and engaging areas that support interaction, learning, and well-being. Previous studies highlight the importance of inclusive design, creating environments that encourage community participation. The literature reviewed provides a foundation for understanding how design principles and planning strategies can be applied to enhance campus environments in meaningful and functional ways.

COURTYARD DESIGN

Courtyard spaces have long been recognized as essential architectural features that contribute to social, cultural, and environmental functions within the built environment. They serve as transitional zones that balance openness with enclosure, allowing for natural ventilation, daylight penetration, and opportunities for human interaction. Recent scholarship highlights their continuing relevance in contemporary design, particularly in addressing sustainability and inclusivity concerns in urban settings.

Gupta and Joshi (2021) emphasize that courtyards are not merely residual spaces but integral design elements that foster community engagement and adaptability. Their study underscores how courtyards can be strategically planned to enhance circulation, accommodate vegetation, and mediate between shaded and sunlit areas. This aligns with current efforts in sustainable landscaping and campus planning, where multifunctional outdoor spaces are increasingly prioritized.

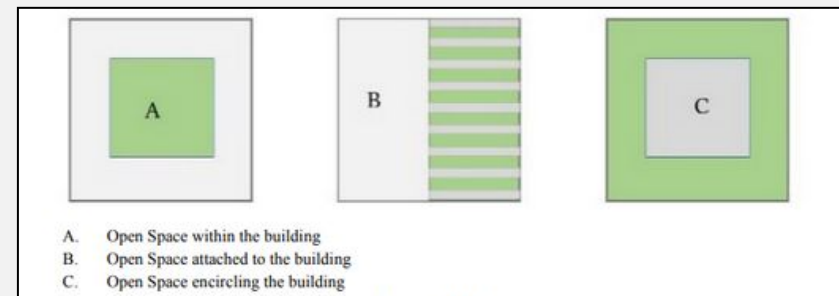


Figure 4. Different categories of transitional spaces
(Source: Gupta and Joshi, 2021)

OUTDOOR GYM

Outdoor gyms (OGs) are increasingly recognised as environmental infrastructure that supports health, fitness, and social well-being. Zhang (2020) explored outdoor gym design as a medium for stimulating social interaction, proposing cooperative play, competition, and conversational opportunities as strategies to strengthen engagement and community ties

COMMUNITY ENGAGEMENT

Community engagement is a critical element of efforts to improve the built environment because it ensures that concerns of local residents are considered in partnerships and planning, while also building social capital. Improvements to the built environment can facilitate social connections and increase opportunities for interaction, leading to greater community ownership, deepening opportunities for engagement, and instilling a sense of pride in physical improvements. Salameh et al. (2020) emphasize that inclusive design practices—especially in educational settings—can elevate user satisfaction by aligning architectural features with community aspirations.

PRECEDENT & CASE STUDIES

TAMAN TASIK TITIWANGSA



Figure 5. Aerial view of Taman Tasik Titiwangsa
(Source: Google)

Taman Tasik Titiwangsa is a prominent urban park in Kuala Lumpur, occupying approximately 46 hectares and featuring a large lake formed from a former tin mining pond. It was redeveloped and opened in February 1980 to serve surrounding communities with green recreational space. Designed to support fitness, leisure, family outings, and cultural functions, the park meets diverse user needs. Inclusivity: The park is accessible and welcoming, drawing users from various age.

TRX CITY PARK



Figure 6. The playground area inside the TRX city park (Source: Google)

TRX City Park is a groundbreaking 10-acre rooftop park atop The Exchange TRX mall within Kuala Lumpur's Tun Razak Exchange district. It is the city's first major public park in over two decades and the largest elevated park in Southeast Asia. Circulation & Microclimate: A gracefully curving central promenade is shaded by high canopy trees with layered planting, water features, and steel shade structures enhancing thermal comfort

COURTYARD @ UITM PUNCAK ALAM



Figure 7. Courtyard at UiTM Puncak Alam (Source: Google)

The symmetrical layout, structured with pathways, greenery, and raised planters, emphasizes circulation and relaxation. Greenery and axial views frame a calming atmosphere, while planter edges, textured paving, and natural surfaces introduce tactile variation. Natural sounds, wind, and fragrant planting enhance the sensory palette, resulting in a multi-sensory environment suitable for study, relaxation, and light physical activity.

TAYLOR'S LAKESIDE CAMPUS



Figure 8. Taylor's Lakeside Campus (Source: Google)

Taylor's Lakeside, the waterside setting provides a dynamic spatial experience. Waterside seating and breeze-oriented design foster comfort, while reflective water surfaces and expansive views evoke openness. The sounds of water splashing, rustling leaves, and the earthy, slightly swampy scent further enrich the sensory environment. The campus' design promotes a spacious, event-ready setting, offering flexibility for both casual gatherings and large-scale activities.

USM SCHOOL OF THE ARTS



Figure 9. Courtyard at USM School of the Arts (Source: Google)

The open sculpture garden and grass amphitheater at USM exemplify an integration of art, landscape, and social interaction. With dappled shade, green scenery, and vibrant sensory inputs such as rustling leaves, birdsong, and human activity, the space creates an engaging atmosphere. Textures from paved walkways, shrubs, and sculptural features complement floral scents and earthy tones. This design encourages curiosity and reflection while maintaining a calming and inspiring setting.

SITE ANALYSIS

Located at the heart of the KAED building, the two internal courtyards are surrounded by studios, lecture room, gallery and corridors. Courtyard A, near the main lobby, is larger and more open but remains underused due to direct sun exposure and lack of shade or seating. Courtyard B, closer to academic spaces, workshop and cafe is more enclosed with partial tree cover and occasional student use but lacks identity and function.

SITE ZONING & CIRCULATION

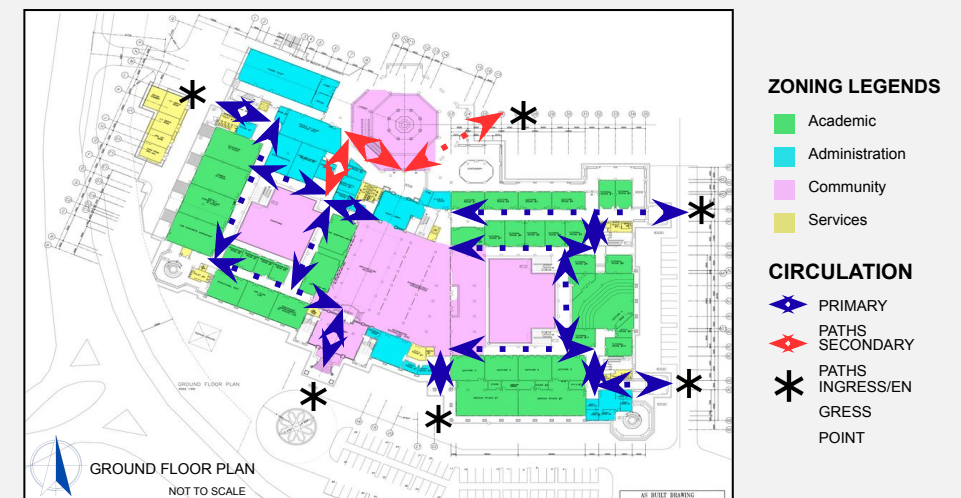


Figure 10. Circulation & Zoning of Courtyard A & Courtyard B. (Source: Author, 2025)

The site is surrounded by three main neighborhood contexts: social, educational, and service/utilities. Access is primarily shaped by the educational zone, as most users, students, staff, and visitors approach from nearby lecture theatres, laboratories, and tutorial rooms.

EXISTING UTILITIES & MAN MADE FEATURE



Figure 11. Figure 12. Figure 13.
Figure 11,12, and 13 Existing utilities at Courtyard A



Figure 14. Figure 15. Figure 16.
Figure 14,15, and 16 Existing utilities at Courtyard B

Both courtyards are equipped with basic utilities such as water supply systems, drainage, and lamp poles to support functionality and user comfort. Courtyard A (482 m²) includes water bibs, a basin, and downpipes, while Courtyard B (349 m²) features a water dispenser and underground pipe supply. Despite these provisions, several lamp poles in both courtyards are not functioning, limiting visibility and reducing safety at night. This highlights the need for proper maintenance to ensure that the courtyards can serve as sustainable and inclusive spaces for the KAED community.



Figure 17. Figure 18. Figure 19.
Figure 17,18, and 19 Existing man made features at Courtyard A

The site shows several maintenance issues, including damaged benches and tables, a deteriorated gazebo under renovation, and uneven pavement caused by soil deposits and tree root intrusion. The land condition leads to water stagnation and surface cracks during rain, while one lamp post is non-functional, creating dim areas at night. Despite these challenges, the site hosts 16 types of trees including palms, shrubs, and groundcover, and is equipped with a sink and water tap for practical use. The drainage system remains in good condition, effectively managing water overflow.

MICROCLIMATE & SENSORY

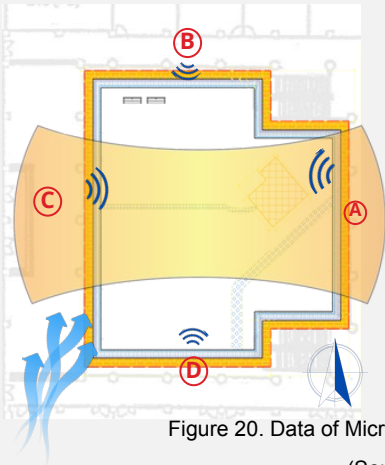


Figure 20. Data of Microclimate and Sensory for Courtyard A
(Source: Author, 2025)

DATA COLLECTION	10 A.M	4 P.M
Tempreature	27 °C	27.6 °C
Wind	1.6 m/s	1.03 m/s
Sound	55db	50.46db



Figure 21. Data of Microclimate and Sensory for Courtyard B
(Source: Author, 2025)

DATA COLLECTION	10 A.M	4 P.M
Tempreature	28.1°C	29.5 °C
Wind	0.9m/s	0.6m/s
Sound	52db	49.2db

SWOT ANALYSIS

S	• Strong architectural identity with Islamic elements. • Passive design supports ventilation and daylight. • Clear spatial zoning with courtyards as breathing spaces. • Integration with natural terrain and scenic views.
W	• Unpleasant odors from poor hygiene. • Excessive heat from lack of shading. • Limited attraction and student engagement. • Poor management and maintenance. • Poor soil causes waterlogging and safety risks.
O	• Design courtyards with shaded, multifunctional spaces. • Improve wayfinding with clear visual cues. • Use climate-friendly, cultural materials. • Provide openings, shading, and greenery.
T	• Climatic extremes reduce usability. • Increasing student intake risks overcrowding • Without maintenance, cladding, roof, and drainage may deteriorate • Inflexible design limits adaptation.

Figure 22. SWOT Analysis table (Source: Author, 2025)

DESIGN CONCEPT
ENGAGEMENT

The proposed courtyard design is guided by the principles of movement, memory, and meaning, framing the courtyard as an interactive and inclusive space of engagement. The concept seeks to balance physical, social, and mental well-being through spaces that are both functional and culturally resonant.

MOVEMENT, MEMORY & MEANING;
A SPACE OF ENGAGEMENT

To create a space that actively draws in students through functionality, interaction, visual appeal, cultural resonance, and physical activity.

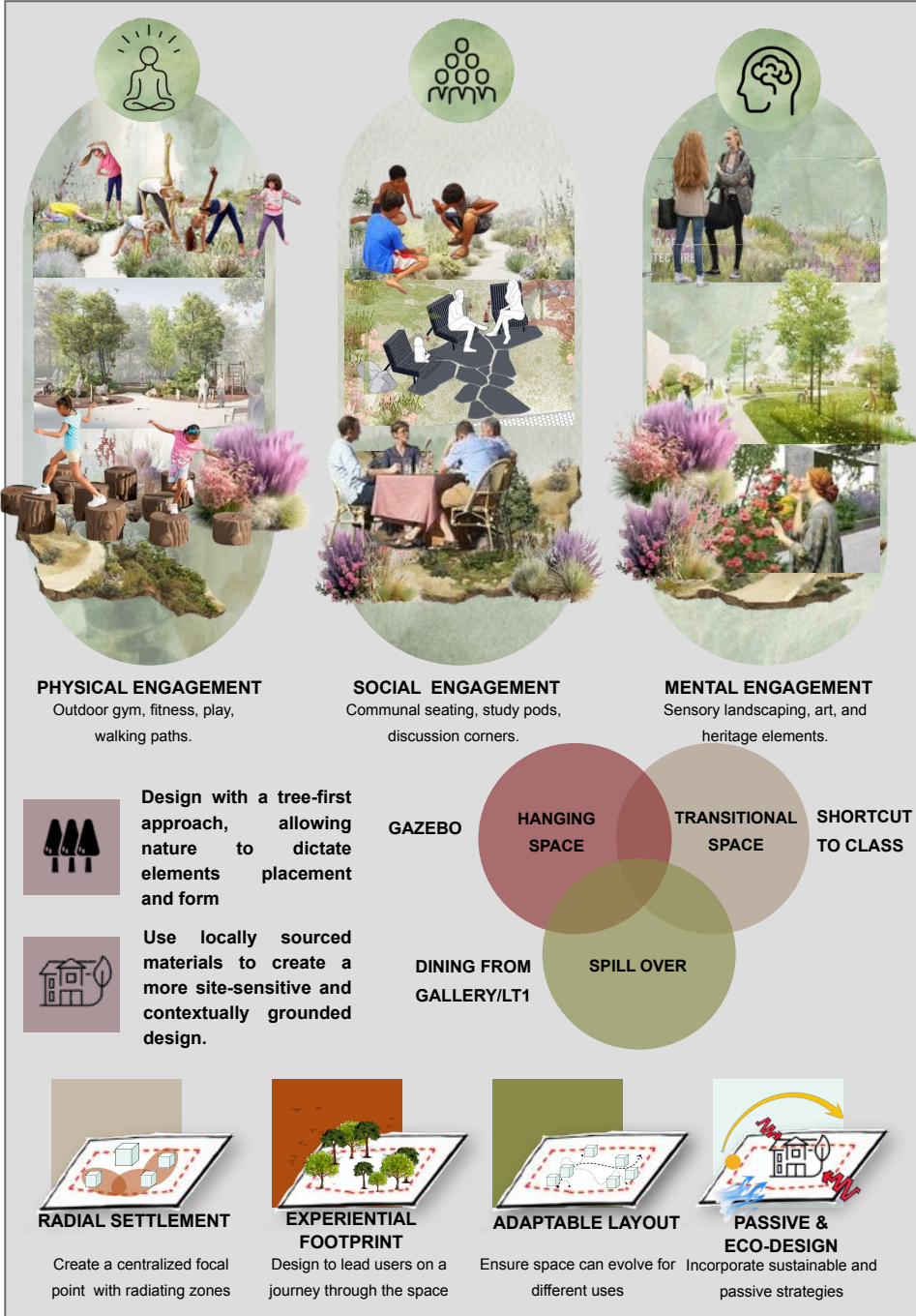


Figure 23. Design Concept & Theme (Source: Author, 2025)

DESIGN DEVELOPMENT

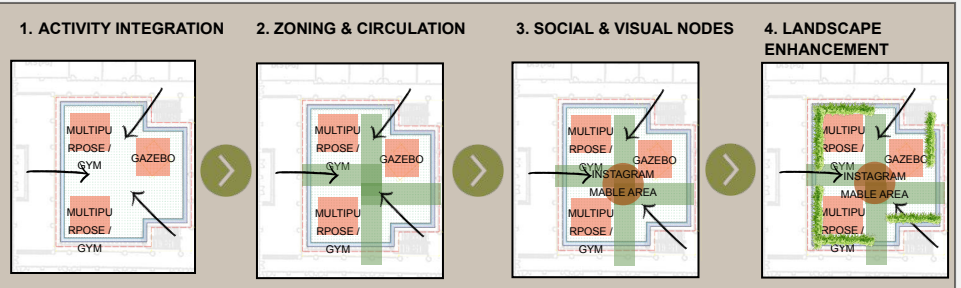


Figure 24. Design Development of Courtyard A (Source: Author, 2025)

The concept integrates four key strategies: activity integration, zoning and circulation, social and visual nodes, and landscape enhancement. The first step involved activity integration, positioning the courtyard as an active hub equipped with outdoor gym facilities, multipurpose areas, and gazebos. To organize these functions effectively, zoning and circulation were carefully developed. The design also emphasizes social and visual nodes, which act as focal points within the courtyard. Finally, landscape enhancement was incorporated to elevate environmental comfort and visual appeal.

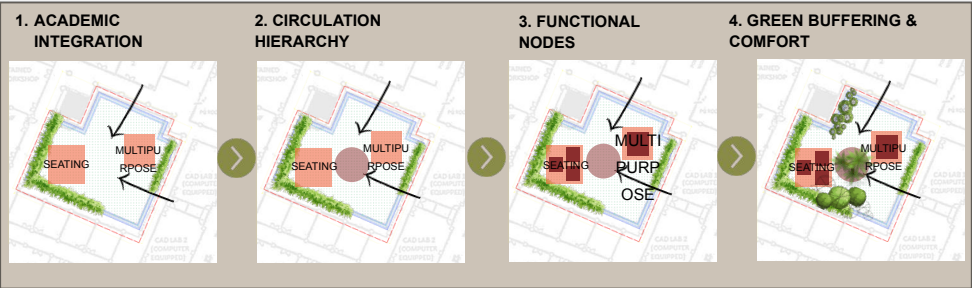


Figure 25. Design Development of Courtyard B (Source: Author, 2025)

The design development of Courtyard B begins with academic integration, framing the courtyard as a study and relaxation garden where nature blends with learning spaces to support informal discussions and research activities. Building on this, a radial circulation hierarchy is introduced to ensure smooth and direct access from all surrounding rooms, reinforcing its role as a central connector. Next, functional nodes are established to provide flexible zones for group work, individual study, or casual rest, ensuring the space adapts to different academic and social needs. Finally, green buffering and comfort strategies enhance the microclimate, reduce heat, and soften the courtyard visually, while incorporating varied seating and multipurpose areas that allow the courtyard to operate as both a contemplative retreat and a collaborative hub.

DESIGN FINALIZATION



Figure 26. The Bench



Figure 27. The Multipurpose Area



Figure 28. The Instagrammable Spot

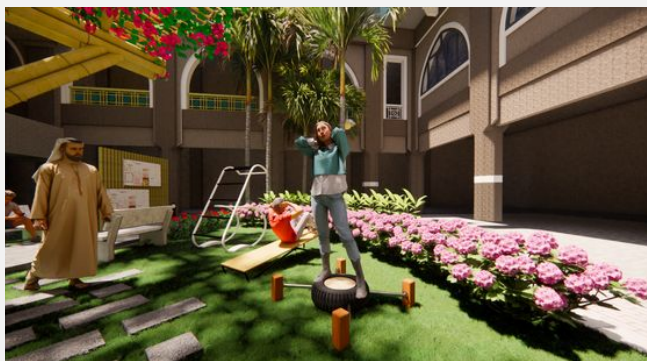


Figure 27. The Outdoor Gym



Figure 28. The Timber Entrance



Figure 29. The Bamboo Partition



Figure 30. The Aerial View of Courtyard A



Figure 31. The Floor Plan of Courtyard A

Key features of Courtyard A include an outdoor gym for fitness and wellness, a multipurpose area that supports studying, mini-games, or small events, and resting/seating spaces designed for relaxation, sketching, or social interaction. To enhance identity and user experience, an Instagramable area and interactive information boards are placed strategically as visual anchors and communication tools. A gazebo offers shaded seating for group discussions, while sanitation facilities ensure practicality with handwashing, water supply, and drainage.



Figure 32. The Bamboo Wall



Figure 33. The Pergola



Figure 34. The Centre



Figure 35. The Pavement



Figure 36. The Entrance



Figure 37. The Seating Area



Figure 38. The Aerial View of Courtyard B



Figure 39. The Floor Plan of Courtyard B

The design of Courtyard B highlights flexibility, comfort, and visual identity, offering a more intimate yet multifunctional outdoor environment. Organized through public, semi-private, and private zoning, the courtyard balances spaces for both active use and quiet retreat. The multipurpose area serves as the core activity hub, accommodating studying, casual discussions, mini-games, or small-scale events. Surrounding this, resting and seating areas provide opportunities for reading, sketching, or socializing in a relaxed atmosphere. An Instagrammable area strengthens the courtyard's visual appeal, inviting photography and videography to enhance its role as a vibrant engagement spot.

PRESENTATION DRAWING



Figure 40. North and South Elevation of Courtyard A (Source: Author, 2025)



Figure 41. East and West Elevation of Courtyard A (Source: Author, 2025)

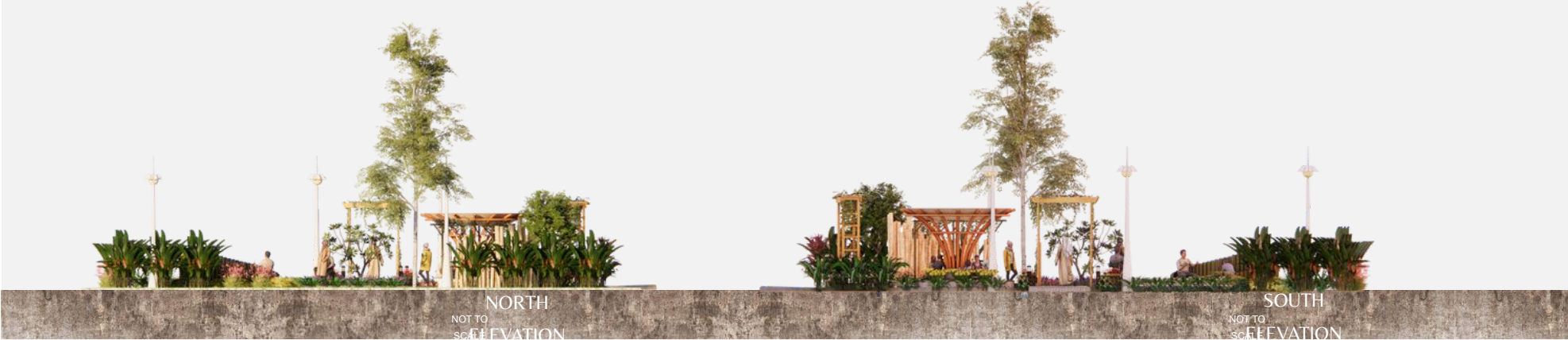


Figure 42. North and South Elevation of Courtyard B (Source: Author, 2025)



Figure 43. East and West Elevation of Courtyard B (Source: Author, 2025)

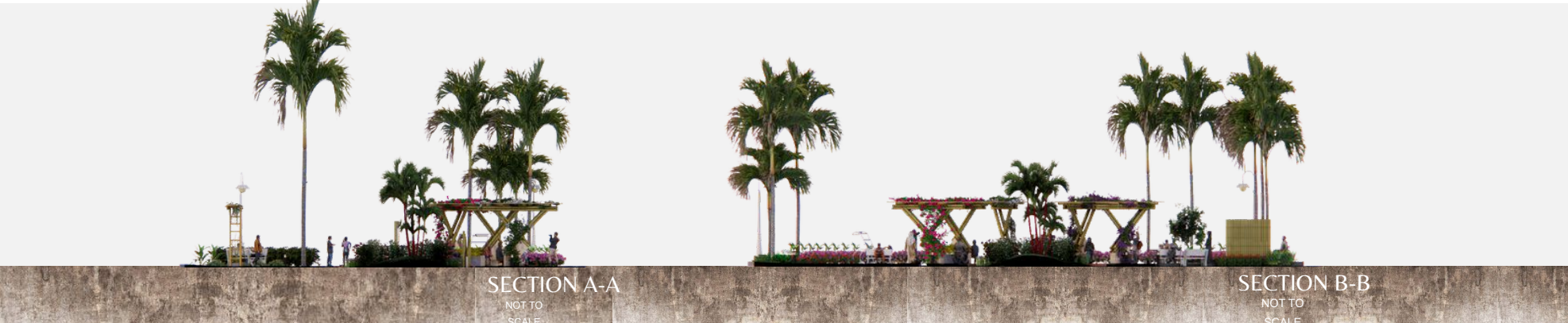


Figure 44. Section A-A' and B-B' of Courtyard A (Source: Author, 2025)

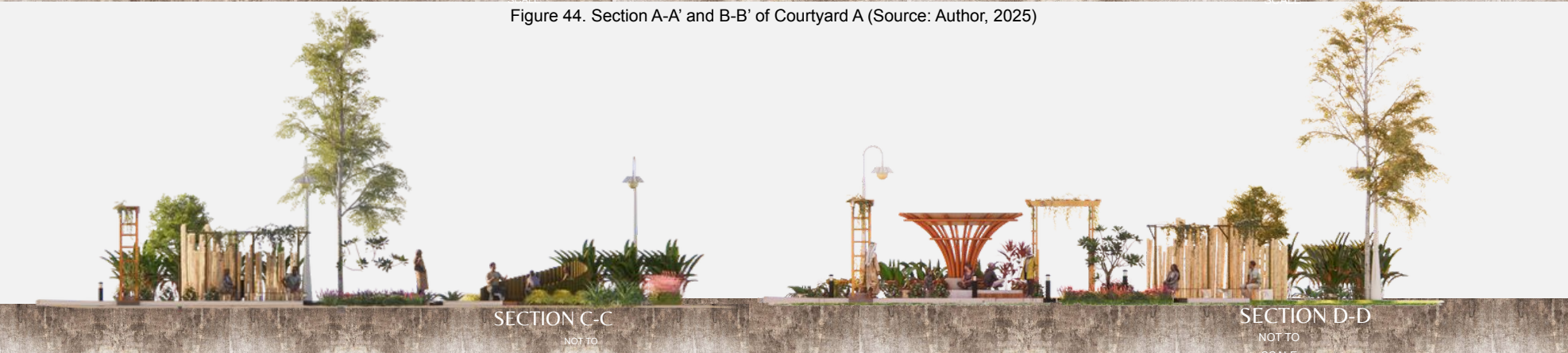


Figure 45. Section C-C' and D-D' of Courtyard B (Source: Author, 2025)

The section and elevation of the KAED Courtyard are included in the journal to provide a clearer understanding of its vertical proportions, spatial layering, and relationship between built and open elements, while also highlighting aspects such as natural ventilation, daylight penetration, and human-scale interactions, thereby complementing the plan view and offering a more holistic perspective of the overall design.

COST ESTIMATION & SPECIFICATIONS

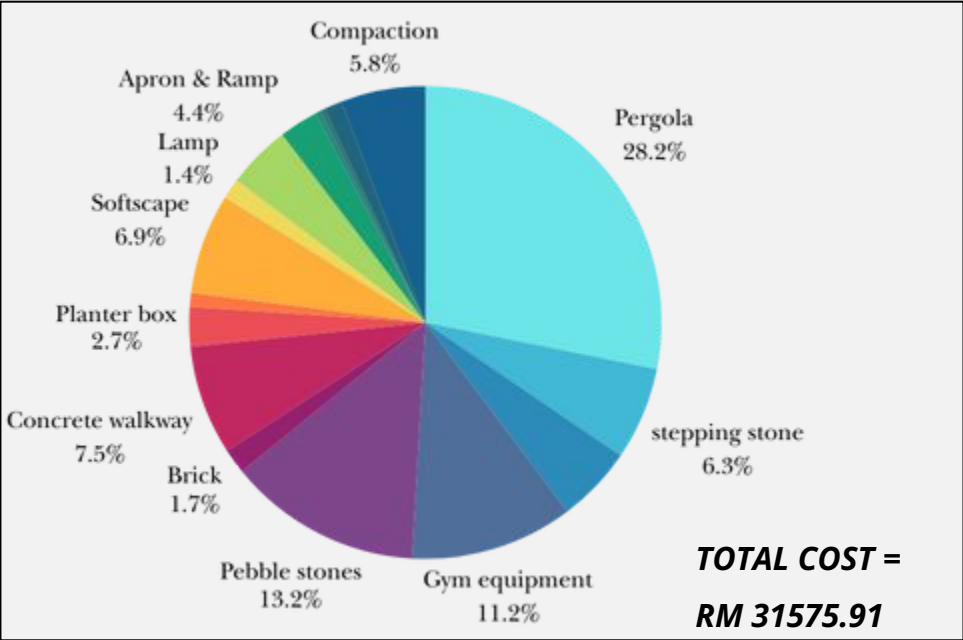


Figure 46. Cost Data for Courtyard A (Source: Author, 2025)

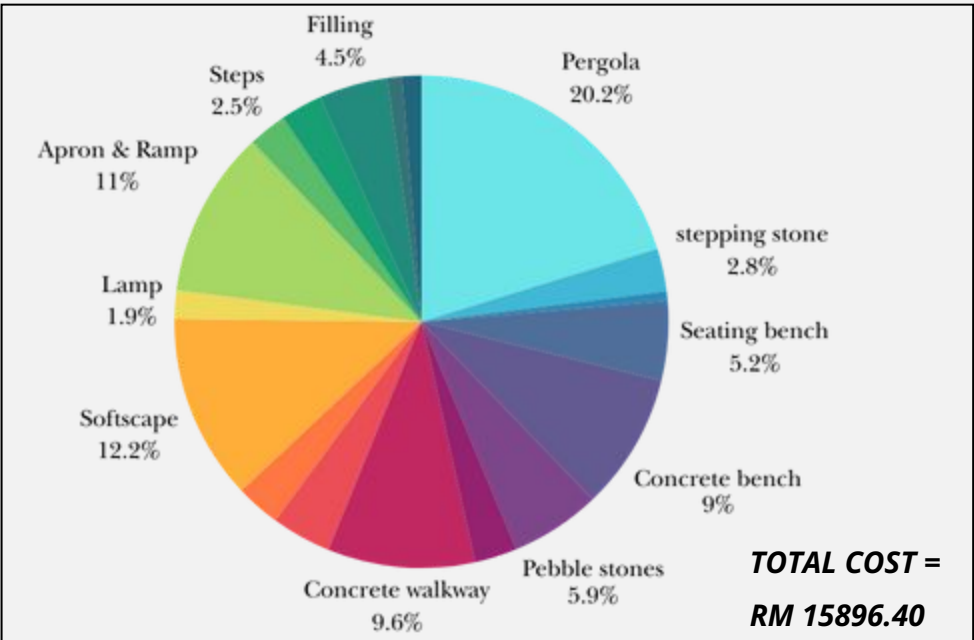


Figure 47. Cost Data for Courtyard B (Source: Author, 2025)

The cost analysis shows that Courtyard B costs RM 15,896.40, with spending focused on seating, softscape, and modest landscape features, making it a budget-friendly design for relaxation and social use. Courtyard A, at RM 31,575.91, is costlier due to the pergola, gym equipment, and extensive landscape works, emphasizing active and multifunctional engagement.

CONCLUSION

In conclusion, the Courtyard Enhancement project envisions the transformation of Courtyard A and Courtyard B into vibrant, multifunctional spaces that balance relaxation, interaction, and activity. Through careful zoning, sustainable design strategies, and integration of academic and cultural values, the courtyards will evolve into inclusive hubs that support student well-being, engagement, and learning. This initiative not only revitalizes underutilized spaces but also sets a precedent for thoughtful campus landscape development.

ACKNOWLEDGEMENT

Group 6, Lakar, wishes to express sincere gratitude for the opportunities and lessons gained throughout the course of this project. The process has not only deepened our understanding of multidisciplinary collaboration but also strengthened our skills in research, design, and practical application. We are especially thankful to the lecturers and coordinators of BAQS2300 Multi-Disciplinary Project, Semester 3, 2024/2025, at the Kulliyah of Architecture and Environmental Design (KAED), IIUM, for their continuous guidance, encouragement, and constructive feedback.

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11

THE OVERFLOW: REVITALIZATION OF COURTYARDS IN KAED, IIUM THROUGH THE CONCEPT OF OASIS

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ABSTRACT

The courtyards within the Kulliyyah of Architecture and Environmental Design (KAED), IIUM, have strong potential to enhance campus life but remain underutilised due to thermal discomfort, limited shading, and poor functionality. The Overflow: Oasis project aims to transform these spaces into comfortable and vibrant environments that support wellness, social interaction, and the identity of KAED. The study employs site analysis, literature review, precedent studies, and design development to formulate suitable design strategies. The proposal introduces two courtyard concepts: the Tranquility Oasis, a pocket garden for rest and reflection, and the Wellness Oasis, an outdoor activity and community space. Overall, the project demonstrates how neglected courtyards can be revitalised into sustainable, inclusive, and meaningful environments that promote well-being within the academic setting.

Keywords: Courtyards, Oasis Concept, Revitalization, Sustainability, Well-being
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INTRODUCTION

The Kulliyyah of Architecture and Environmental Design (KAED), International Islamic University Malaysia (IIUM) centers the courtyards as important community spaces that sustain social, academic and recreational interactions. They create in between spaces that connect circulation routes and they offer chances of relaxation, informal meetings and outdoor activities. Nonetheless, the factors which hinder their efficiency and make them less comfortable by the users include the lack of enough seats, poor shading, unutilised spaces and visual identity. The proposed research work will restore vitality to courtyards by dealing with such problems and changing them into dynamic multifunctional spaces incorporated with KAED architectural values. With the due incorporation of strategies of inclusivity, sustainable landscaping, and climate responsiveness, the courtyards can also be more aligned with the goals of SDG No. 3, No. 4, No. 11 and No. 13 and IIUM Sejahtera Framework, which underlines all-round well-being.



Figure 1: Site - Courtyard A
(Source: Author, 2025)



Figure 2: Site - Courtyard B
(Source: Author, 2025)

METHODOLOGY

Figure 5 illustrates the process undertaken to achieve the design project's objectives.

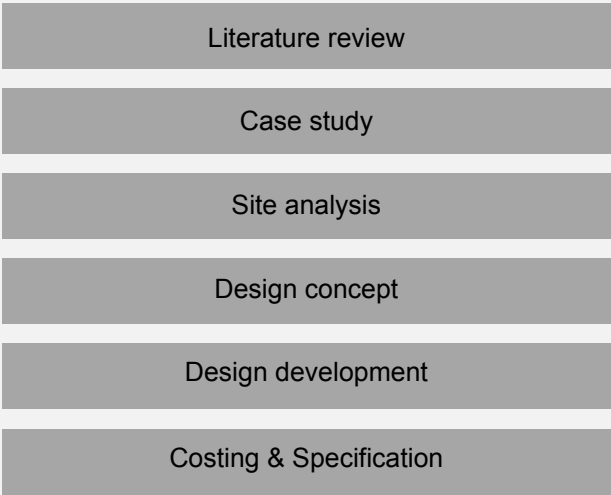


Figure 5: Research Methodology Chart
(Source: Authors, 2025)

LITERATURE REVIEW

Educational and urban settings on a larger scale require the mandatory use of courtyards and pocket gardens that have numerous multifunctional advantages in a variety of ways to a global sustainable end. IIUM-KAED has two interior courtyards that serve as pocket gardens, which are both environmentally and socially valuable.

ROLE OF COURTYARDS AND POCKET GARDENS

Courtyards are open areas of the buildings that maximize natural light and ventilation and expose them to nature. They create a healthier learning environment in educational institutions, promote well-being, and academic/social participation (Kordi et al., 2025). Pocket gardens (or pocket parks) are greatly scaled green spaces usually not larger than an acre and are usually intended to enhance urban quality, strength and the tightness of green to urban populations particularly in intricate or busy urban areas (Dong et al., 2023). They are both an essential infrastructure in terms of recreation, rest, and socialisation with the community (Kordi et al., 2025; Dong et al., 2023).



Figure 6: An example of pocket garden
(Source: landud.co.uk, 2018)

ENVIRONMENTAL AND SOCIAL BENEFITS

Courtyards and pocket gardens are significant in the control of microclimates of the surrounding areas. They alleviate the hot and humid climates where heat stress is a factor due to their ability to improve natural ventilation, create thermal comfort, and use lower energy amounts (Zamani et al., 2018). These spaces, as well as stormwater management, can also be coupled with sustainable drainage systems, which will assist in reducing the urban heat island effect (Zamani et al., 2018; Bagiouk et al., 2024). Besides, they sustain biodiversity through provision of flora and fauna habitat in such dense built areas. Such ecological role provides a number of valuable ecosystem services, including air purification and absorption of rainwater, to improve the performance of the environment and the comfort of the user (Dong et al., 2023; Bagiouk et al., 2024).

Beyond environmental benefits, courtyards and pocket gardens also serve vital social functions. Green spaces within educational institutions contribute to user satisfaction, improve motivation, and foster a positive learning environment. They provide restorative settings that support mental health, social cohesion, and informal academic engagement among students and staff (Kordi et al., 2025; Dong et al., 2023). Furthermore, pocket gardens promote equity by ensuring that green spaces are accessible to diverse populations, including communities in high-density or lower-income areas that may otherwise lack access to quality outdoor environments (Dong et al., 2023).

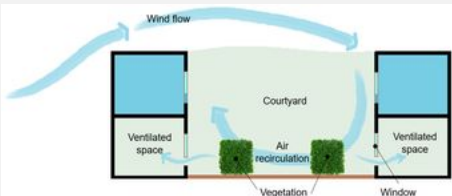


Figure 7: The courtyard model with natural ventilation and vegetation.
(Source: Sun et al. 2021)

CONNECTION TO SDGS AND KAED’S CONTEXT
(SDGS 3, 4, 11, 13)

Courtyards can play an important role when it comes to the Sustainable Development Goals (SDGs) in both environmental and social terms. SDG 3, Good Health and Well-being, can be achieved by lowering stress, enhancing mental health, and increasing physical activity and a sense of belongingness (Kordi et al., 2025; Dong et al., 2023). The Quality Education SDG 4 is promoted by the means of improving the learning environment and offering inclusive spaces to collaborate outside of the classroom (Kordi et al., 2025). The SDG 11 on Sustainable Cities and Communities is mitigated by provision of resilient and accessible green infrastructure that improves sustainable cities (Kordi et al., 2025; Dong et al., 2023; Bagiouk et al., 2024). Lastly, SDG 13, Climate Action, is achieved through the capacity of courtyards to mitigate the effects of climate by regulating microclimates, conserving energy and managing floods in the areas (Zamani et al., 2018; Bagiouk et al., 2024).

The two courtyards at KAED, IIUM are pocket gardens that duplicate these principles. With such a twinning of environmental responsiveness and social inclusivity, they reinforce the sustainability of our campuses and have a direct impact on the goals of health, education, urban resilience, and climate action aligned with the SDGs.

SDG	Key Contributions at KAED	Citations
SDG 3	Health, well-being, stress reduction	(Kordi et al., 2025; Dong et al., 2023)
SDG 4	Quality education, student engagement, inclusive learning	(Kordi et al., 2025)
SDG 11	Urban resilience, accessible green infrastructure	(Kordi et al., 2025; Dong et al., 2023; Bagiouk et al., 2024)
SDG 13	Climate mitigation, energy savings, stormwater management	(Zamani et al., 2018; Bagiouk et al., 2024)

Figure 8: How KAED’s courtyards support SDGs 3, 4, 11, and 13.
(Source: Authors, 2025)



Figure 9: Highlighting where improvements can link to SDGs
(Source: Authors, 2025)

CASE STUDIES

Taman Tasik Titiwangsa

One of the oldest urban parks in Kuala Lumpur, Taman Tasik Titiwangsa that is constructed along a big lake and centred around the established green environment. The park features various facilities like jogging lines, bicycle lanes and canopies, and kiosks, seating provisions, also includes family-based spaces like picnic lawns and built-in benches. It has natural elements, such as appropriate tree row positions and shelter near the lake, that provide a comfortable microclimate that adds to the user experience. Passive and interactive zones are also introduced to the park, and both silence and physical activity can be chosen. This case study teaches how natural shading, site-permeable green areas, and community-friendly amenities can turn a public courtyard or park into an inclusive, thriving environment.



Figure 10



Figure 11

Figure 10 and Figure 11 show Taman Tasik Titiwangsa

(Source: ecentral.my , 2024)

TRX City Park

TRX City Park is a modern urban green space which can be found in Tun Razak Exchange development. It is a modern lifestyle park, designed as gazes of open event lawns with self-shaded promenades, kids play areas, fitness stations, water amenities. To add to the lack in shade created by newly planted trees, architectural canopies and reflective pools are used to provide shade and beauty to an urban atmosphere. Barrier-free circulation and way finding is also a priority of the park. It has photogenic landscape items and multi-utility spaces that promote sharing in social media and has wide usage by multiple users, including office employees and families. This case study can be used to show the importance of contemporary measures of design, being relevant to modernity, accessibility and flexibility of space to activate a public arena in a crowded city setting.



Figure 12



Figure 13

Figure 12 and Figure 13 show TRX City Park

(Source: pentago.com.my, 2024)

Synthesis

Both case studies reveal the importance of comfort, accessibility, and multifunctionality in public outdoor spaces. Taman Tasik Titiwangsa prioritises natural cooling, cultural identity, and community ownership, while TRX City Park focuses on urban lifestyle appeal, modern facilities, and flexible open spaces. Together, they provide valuable insights for enhancing the KAED courtyards: integrating natural and built shading, ensuring barrier-free circulation, and offering multifunctional areas that support both academic and recreational activities.

SITE ANALYSIS

The KAED Courtyards serve as essential community spaces within the Kulliyyah of Architecture and Environmental Design (KAED), International Islamic University Malaysia (IIUM). Designed to sustain social, academic, and recreational interactions, they act as in-between spaces that connect circulation routes while offering opportunities for relaxation, informal meetings, and outdoor activities. However, challenges such as limited seating, poor shading, unutilized areas, and lack of strong visual identity reduce their comfort and efficiency for users. The proposed project seeks to restore vitality to these courtyards by transforming them into dynamic, multifunctional spaces that reflect KAED's architectural values.

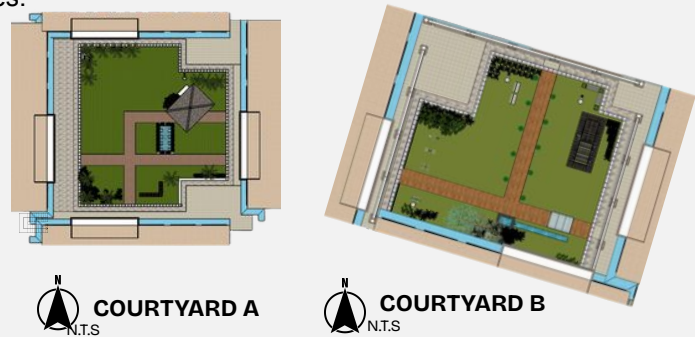


Figure 14: Site analysis diagrams

(Source: Authors, 2025)

The courtyard provides basic seating areas with simple concrete benches and a straightforward stone-paved walkway connecting different sections of the space. While these features are functional, they appear underutilised and lack comfort, shading, and aesthetic appeal, making them less inviting for prolonged use. The benches show signs of wear, and the walkway is uneven and blends into the ground, reducing accessibility and visual clarity. To enhance usability, improvements in design, materials, and landscaping are needed so that the seating and pathways can better support relaxation, circulation, and social interaction in the courtyard.



Figure 15



Figure 16

Figure 15 and Figure 16 :Existing conditions in Courtyard A, including worn benches and uneven stone-paved walkways.

(Source: Authors, 2025)

The courtyard infrastructure includes a drainage cover and outdoor lighting to support functionality and safety within the space. However, the drainage cover shows signs of deterioration, with visible damage and uneven edges that may pose hazards to users. Similarly, the lamp post, though intended to provide adequate lighting for nighttime use, appears outdated and lacks integration with the overall courtyard design. These conditions reduce both the safety and aesthetic quality of the space. Upgrading the drainage system and modernising the lighting would improve usability, safety, and visual coherence, making the courtyard more functional and inviting.



Figure 17: Existing conditions in Courtyard A
(Source: Authors, 2025)

Overall, while the KAED courtyards provide essential open spaces for circulation and gathering, issues such as inadequate seating, poor shading, worn pathways, deteriorating infrastructure, and outdated amenities limit their functionality and comfort, highlighting the need for revitalisation to create safer, more inviting, and sustainable community spaces.

SWOT Analysis

Table 1 shows the SWOT Analysis table for the site. (Source: Authors, 2025)

CATEGORIES	DESCRIPTION
Strength (S)	• Open Layout Enhances Accessibility - It allows easy movement and flexibility in usage. • Abundant Seating Areas Encourage Rest and Social Interaction - Allows for users to pause, relax, or engage in social activities.
Weakness (W)	• Maintenance Concerns - uneven grass growth and overgrown plants hint at inconsistent landscaping and debris. • Limited Accessibility Features - no visible ramps or accessible routes at both courtyard.
Opportunity (O)	• Outdoor Gym and Interactive Elements - Courtyard B suits compact gym stations or sensory furniture. • Outdoor Exhibition Space - Courtyard A suits showcases, pop up events, and displays.
Threats (T)	• Weather Exposure or weather impact - Open courtyard vulnerable to heavy rain or strong sunlight, limiting usability. • Pest and Maintenance Issues - Dense plants and poor drainage.

Site Zoning

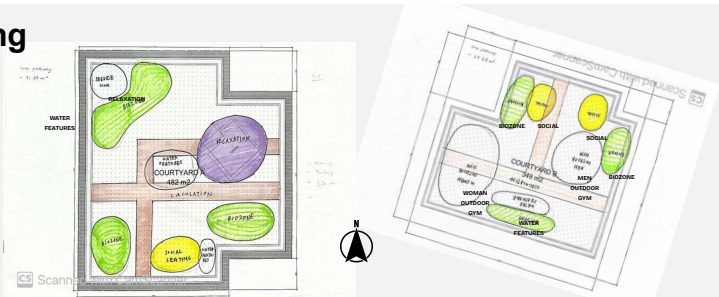


Figure 21: Site - Courtyard A Figure 22 : Site - Courtyard B



Courtyard A balances ecology, relaxation, and social interaction. Three corner biozones act as natural buffers, improving environmental quality. A relaxation zone on the east provides a quiet retreat, while the southwest social zone encourages gatherings with water features enhancing both areas. A small service zone in the northwest ensures functionality, and central circulation connects all spaces while separating active and passive areas.

Courtyard B emphasizes social engagement and physical activity. Outdoor gyms for women (southwest) and men (east) promote inclusivity, supported by northern social zones for interaction. Corner biozones soften the environment, while a central water feature anchors the layout and supports ecology. Circulation divides the courtyard into functional sections, linking gym, social, and ecological spaces seamlessly.

DESIGN CONCEPT : OASIS

The design concept of Oasis draws inspiration from the idea of creating serene, nature-filled spaces that serve as a peaceful refuge within or around buildings. Rooted in the vision of transforming chaos into calm and stress into strength, the oasis approach in architecture seeks to integrate greenery, water features, and natural light into built environments, providing relief from the harshness of urban or challenging settings. This concept emphasizes enhancing well-being by establishing spaces that are not only visually soothing but also refreshing and life-enhancing. Addressing site pain points such as excessive heat, stress, and lifeless courtyards, the Oasis concept introduces qualities associated with comfort and rejuvenation—cool, alive, refreshing, and layered. Ultimately, it aims to elevate the user experience by merging natural elements with architectural design, resulting in environments that foster calm, vitality, and resilience.

Core Elements of Oasis Architecture

Integration with Nature:

- Architecture incorporates plants, water features (ponds, fountains, etc.), and natural light to blur the lines between indoor and outdoor spaces

Tranquility and Calm:

- The goal is to create spaces that offer respite from stress and bustle, promoting relaxation and well-being.

Community Focus:

- Oasis designs can foster social interaction and a sense of community through shared gardens, gathering spaces, and communal amenities.

Sustainability:

- Many oasis concepts incorporate sustainable design principles, such as green roofs, natural ventilation, and efficient water management.



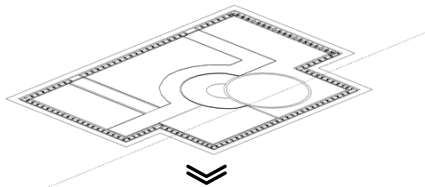
The Oasis Concept is developed as a dual spatial typology that transforms the two existing courtyards into complementary spaces, each addressing a distinct aspect of human well-being. The first courtyard becomes a Tranquility Oasis, functioning as a passive zone dedicated to contemplation, rest, and sensory pause. The second transforms into a Wellness Oasis, serving as an active outdoor gym that integrates nature, shade, and revitalizing elements to support physical activity and movement. Together, these spaces maintain conceptual unity while also responding to the client's request for a gym, expanding its role beyond exercise equipment into a holistic environment for body and mind. The theme and concept connection is rooted in the idea that a gym is not just about physical strain, but about creating an intentional environment that motivates people to stay active and feel good. By balancing the body and mind, the Oasis design transforms the gym into an inviting rather than intimidating place. Natural materials, calming colors, and climate-sensitive design reinforce this sense of harmony, making the courtyards into serene yet energizing spaces.

DESIGN DEVELOPMENT

Courtyard A

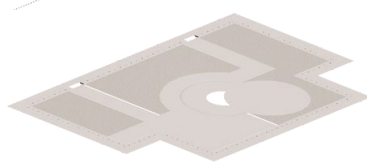
Linework Plan

- The process begins with outlining the courtyard layout, defining circulation routes and central gathering points.



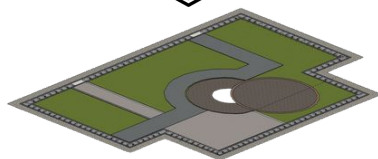
Base Forming

- Basic ground surfaces and levels are introduced to shape the foundation of pathways and activity zones.



Landscape Zoning

- Landscaping is added by dividing the courtyard into softscape and hardscape areas, creating balance between green zones and functional spaces.



Final Design Integration

- Finalisation of the design integrates greenery, shading structures, seating, and water elements to transform the courtyard into a comfortable and engaging oasis.

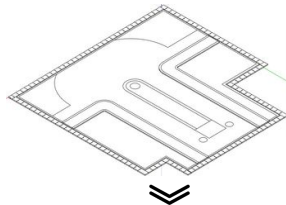


Figure 23: Design development sequence of Courtyard A
(Source: Authors, 2025)

Courtyard B

Linework Plan

- The process starts with mapping the courtyard outline and identifying areas for circulation, open use, and potential activity spots.



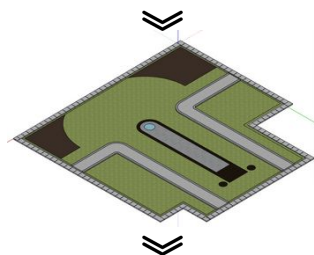
Base Forming

- Ground surfaces and levels are applied, forming the base structure for pathways and designated zones.



Landscape Zoning

- Zoning is developed by allocating green areas and open platforms to support an active outdoor environment.



Final Design Integration

- Finalisation of the design includes the integration of exercise equipment, greenery, and seating, shaping the courtyard into a wellness-focused oasis.



Figure 24: Design Development Sequence of Courtyard B
(Source: Authors, 2025)

COSTING AND SPECIFICATION

		Courtyard A		Courtyard B	
No.	Elements	%	RM	%	RM
1	Hardscape	35.11	RM17,553.00	45.58	RM22,789.00
2	Softscape	6.24	RM3,118.00	8.71	RM4,356.00
3	M&E	0.62	RM308.00	0.46	RM231.00
4	Preliminaries		RM840.00		
5	Provisional sum (1.62%)		RM809.00		
			RM50,000.00		

Figure 25: shows a table of total cost estimation
(Source : Authors, 2025)

DESIGN FINALISATION

Courtyard A

The redesign of Courtyard A that is proposed and discussed focuses on the establishment of the restorative and contemplative atmosphere in the KAED context. The design aims to alleviate thermal discomfort and increase spatial quality through the use of shading devices, stratification of greenery and an element of water. The seating is strategically arranged to allow single and small group use, provide spaces of reflection, rest and minimal interaction. The sense of the courtyard is established as a pocket garden that provides user well-being and strengthening the identity of KAED as a climate-responsive and student-centred environment.



Figure 26



Figure 27



Figure 28



Figure 29



Figure 30



Figure 31



Figure 32



Figure 33

Figures 26 to 33 show perspective views of Courtyard A showing various angles of seating, greenery, and water integration.(Source: Authors: 2025)

Courtyard B

The Courtyard B redesign aims to transform a poorly used space into a dynamic wellness-based space. The design will include outdoor gym equipment, natural shading, and soft landscaping to allow physical activity and promote social interaction between students and staff. The spatial organisation will be designed so that it is accessible, usable and comfortable, especially in response to the climatic conditions of the site. The result is a multi purpose courtyard which promotes healthy living, improves community participation and adds to the peaceful nature of the neighboring courtyard.



Figure 34



Figure 35

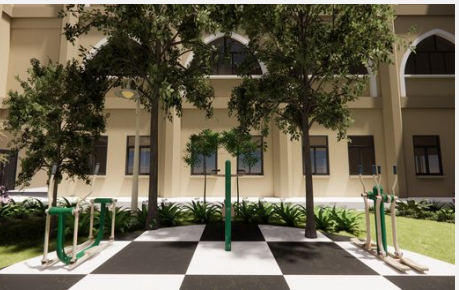


Figure 36



Figure 37



Figure 38



Figure 39



Figure 40



Figure 41

Figures 34 to 41 show perspective views of Courtyard B, featuring outdoor gym facilities, shading elements, and landscaped seating (Source: Authors, 2025)

ELEVATIONS AND SECTION DRAWINGS
Courtyard A



Figure 42: Floor plan design



Figure 43: Axonometric view

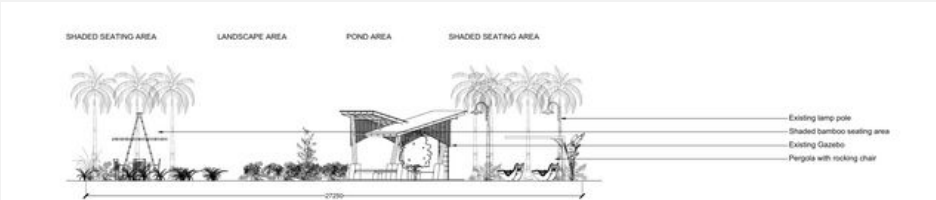


Figure 44: East elevation

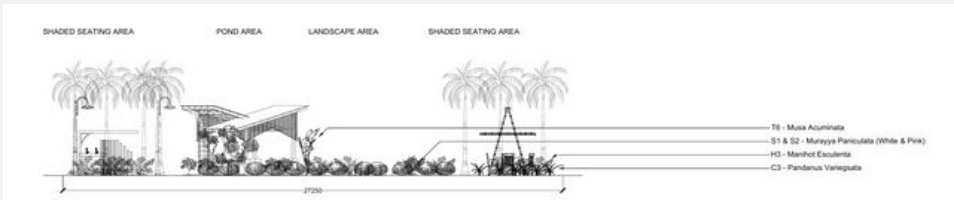


Figure 45: West elevation

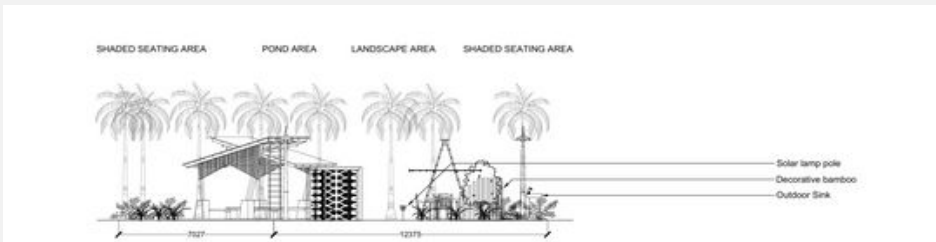


Figure 46: North elevation

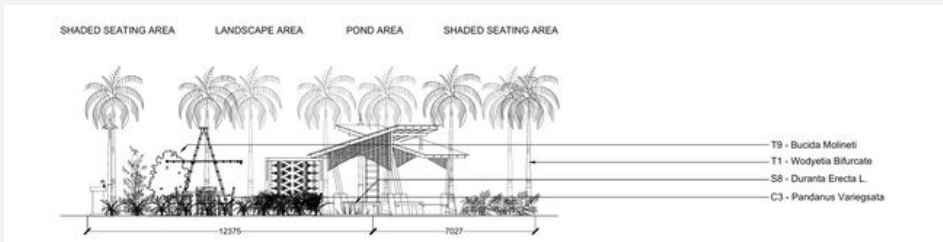


Figure 47: South elevation

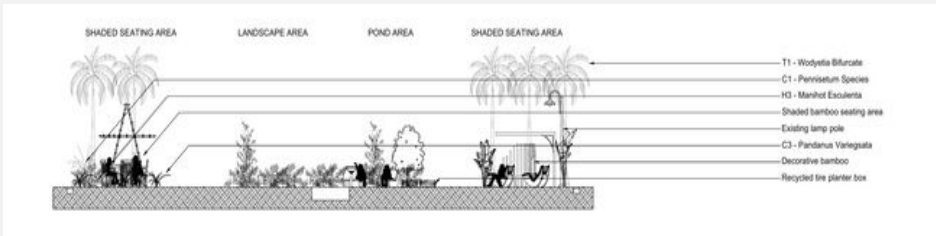


Figure 48: Section A-A

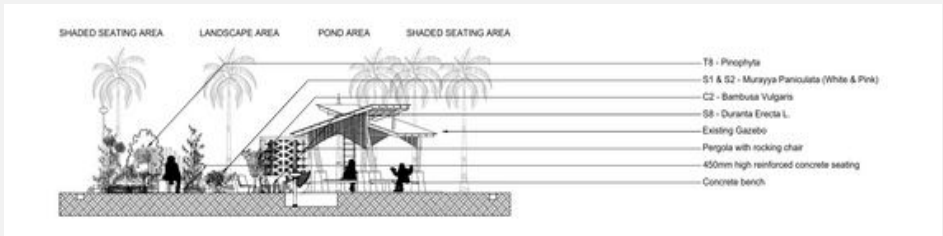


Figure 49: Section B-B

Figures 42 to 49 show the perspective views of the courtyard A
(Source: Authors, 2025)

Courtyard B

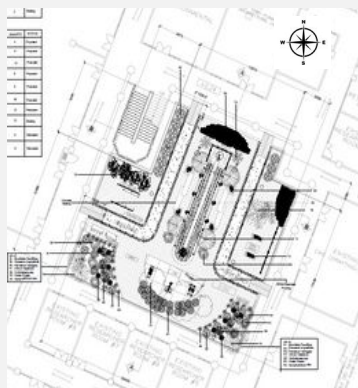


Figure 50: Floor plan design



Figure 51: Axonometric view

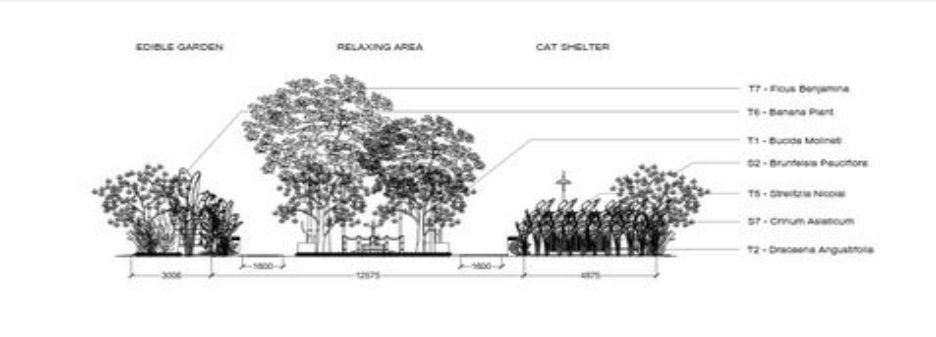


Figure 52: East elevation

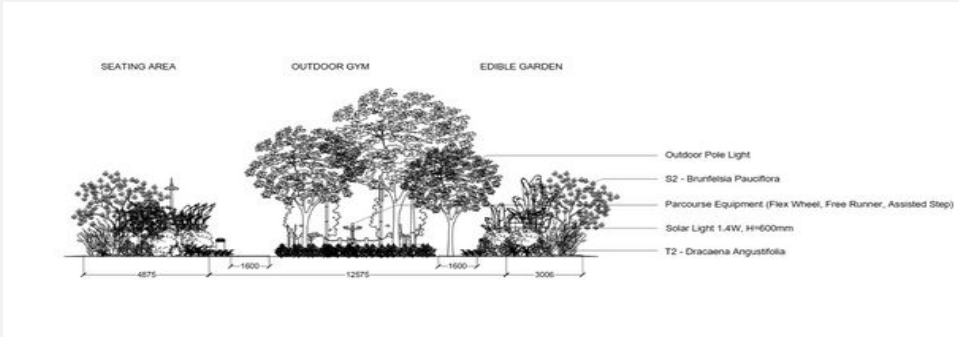


Figure 53: West elevation

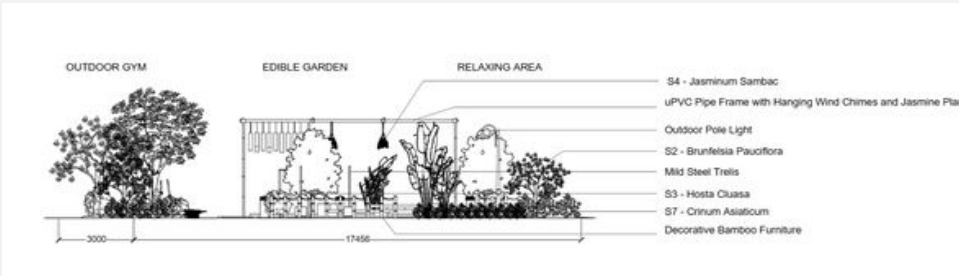


Figure 54: North elevation

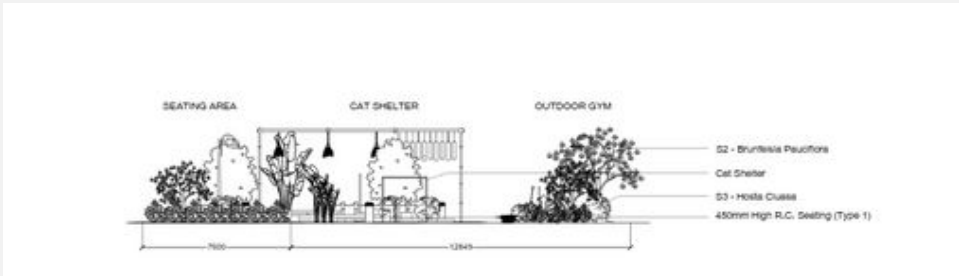


Figure 55: North elevation

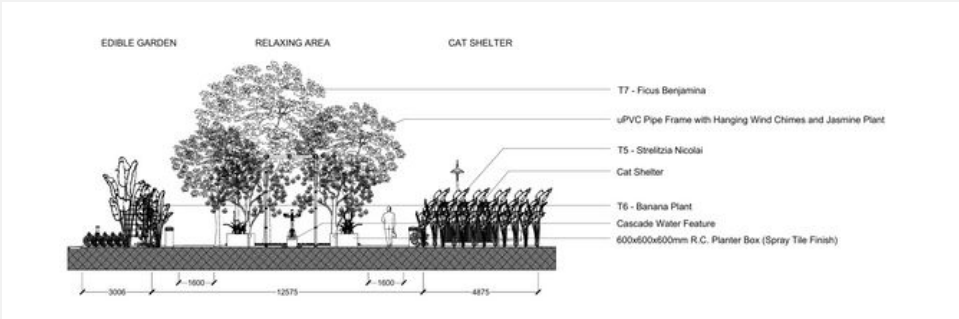


Figure 56: Section A-A

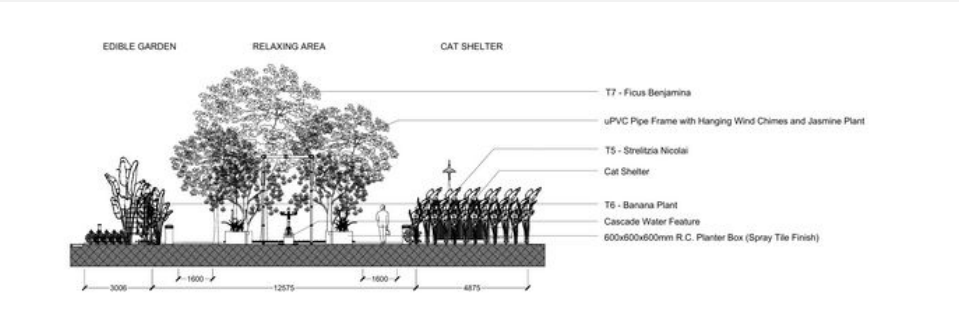


Figure 57: Section B-B

Figures 50 to 57 show the perspective views of the courtyard A
(Source: Authors, 2025)

CONCLUSION

The Overflow: Oasis transforms the KAED courtyards into places that will enrich both academic and social life in the faculty. The project addresses questions of underutilisation, thermal discomfort, and non-functionality to show how strategy-based design interventions can turn neglected spaces into meaningful places of rest, wellness, and interaction. Courtyard A For Courtyard B The suggested design of the Tranquility Oasis (Courtyard A) and Wellness Oasis (Courtyard B) will assure the equilibrium between space serenity and energy, providing the user with various opportunities to experience the areas.

The solutions are both viable and sustainable and are guided by the design process which is aided by site analysis, literature review, case studies, design development and costing. In conclusion, The Overflow: Oasis also recognizes the importance of courtyards as essential elements of campus life-places which reflect not only comfort, inclusivity, and resilience but also the values of sustainable design and user-centered design.

ACKNOWLEDGEMENT

The completion of The Overflow: Oasis has been a meaningful and rewarding experience for the members of Ruang Teroka Studio, providing us with the opportunity to explore multidisciplinary collaboration while applying our skills in a real project context. This journey has strengthened our creativity, teamwork, and problem-solving abilities, leaving us with valuable lessons to carry into future work.

The team extends sincere gratitude to the lecturers of BAQS 2300 Integrated Multi-Disciplinary Project, 2025, at the Kulliyyah of Architecture and Environmental Design (KAED), IIUM, for their continuous guidance and support. Appreciation is also expressed to all contributing parties and peers whose encouragement and contributions have played an essential role in the success of The Overflow: Oasis.

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