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NATURAL RESTORATION OF GEO URBAN FOREST SETTING AT KL EAST PARK

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ABSTRACT

This project is about integrating the geological character of the site into the park at KL East, Kuala Lumpur. The KL East Park faces urban security issues from environmental, social and natural heritage aspects. Therefore, the proposed project is to develop a forest park which will serve various activities that associate the natural and geological values of the site for local communities as integration between human activities and the natural environment. KL East Park is at Bukit Tabur foothill and comprises of 53 acres vacant forest land.

Keyword: Nature park, Geopark, urban forest, natural environment, restoration
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INTRODUCTION

KL East Park is one of the destinations in KL East Tourism Master Plan 2015-25. According to Sime Darby Property (the developer of KL East), the park's future development project is part of the KL East mixed development proposed to create a sustainable and low-density living. Set across the world's most-extended quartz ridge, KL East celebrates nature with a proposed 53-acre park, providing natural greeneries to escape the city's hustle and bustle. The site is a pressured landscape currently facing high demand due to its strategic location near Gombak Integrated Terminal. The KL East Park is accessible from six major highways- Middle Ring Road 2, Damansara - Ulu Klang Expressway (DUKE), Ampang-Kuala Lumpur Elevated Highway(AKLEH), Sungai Besi -Ulu Kelang Elevated Highway (SUKE) and upcoming Setiawangsa -Pantai Expressway (SPE). Figure 1 shows the key plan and location plan of the selected site. The area is part of the KL East development developed by the Sime Darby Property, consisting of a high-rise residential and retail mall.

The project aims to develop a forest park which will serve various activities associated with the natural and geological values of the site for local communities as the integration between human activities and the natural environment. The design will focus on creating balanced, holistic well-being between society and the environment. This project highlights the issue of rapid development, biodiversity and disturbance faced by the study area, lack of attention to the site's natural beauty by local communities and densely populated surrounding areas. The objectives of the project are:

1. To create an eco-park with the environment for play, learning, relaxation, and adventure integrated into its natural setting

2. To conserve the topography and geological condition of the site for the protection of natural resources that has potential for the development of research-related activities.

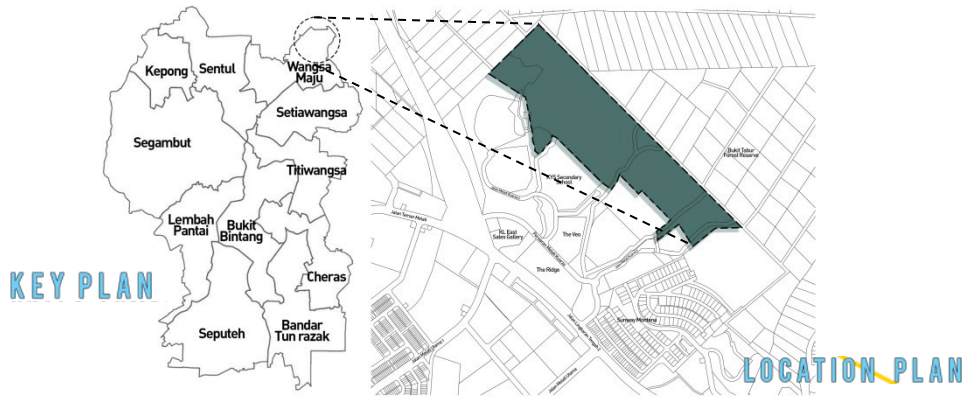


Figure 1: Key and location plan of the selected site

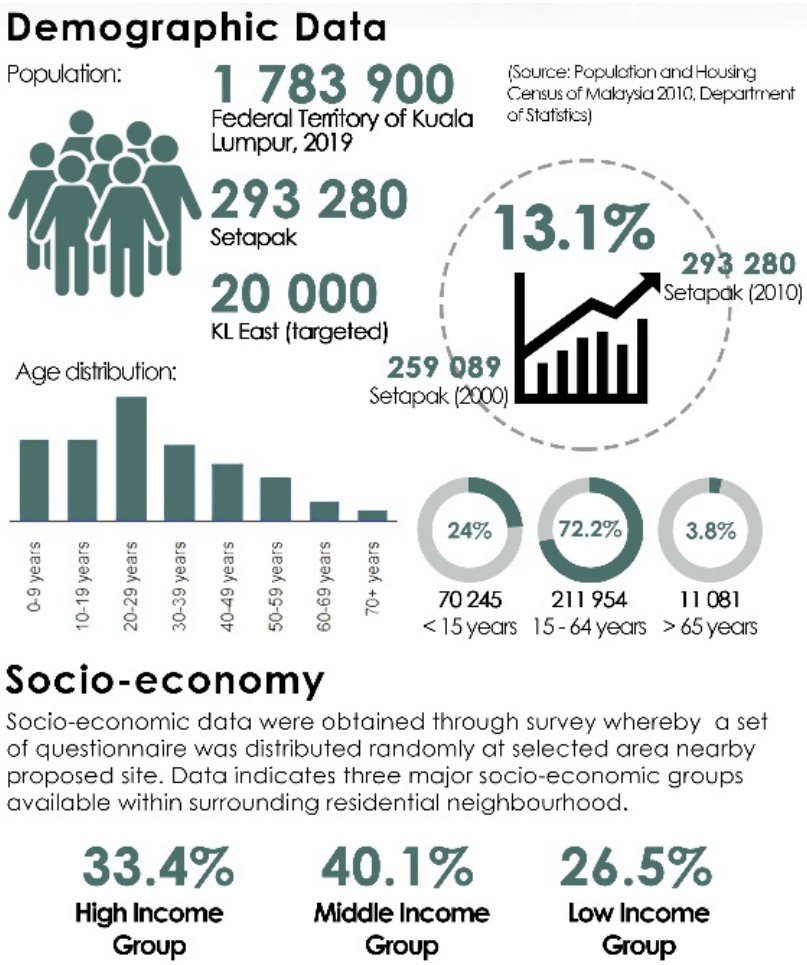


Figure 2: Zoning area and demographic data of the selected site

LITERATURE REVIEW

Nature Park

According to Gül et al. (2006), nature parks are *" a protected natural area, which has unique natural and geo-morphological elements, scenic beauty, special floristic features and wildlife, various outdoor recreational resources at (the) regional and national level"*. Nature parks protect the site's valuable natural and cultural environments, such as streams, valleys, wetlands, buffers, un-fragmented forest land and significant trees, wildlife habitat, open fields, scenic views, trails and archaeological sites. Development at Nature Park shall avoid hazardous areas such as flood plains and steep slopes. Maximised advantage of the natural topography of nature parks whilst minimising 'cuts and fill'. The topography and natural features of the site may require at least 10% of the open space or two acres shall be of a shape, slope location and condition to provide an informal field for group recreation or community space for users. Nature parks are for recreation other than for conservation, agriculture or forestry purposes.

Urban Forest

Urban forests are defined by their proximity to human populations. The criteria include numerous physical elements that constitute urban development. The forests' characteristics are determined by their natural components and the anthropogenic elements in the landscapes in which they occur (Nowak, 2008). The urban forest can be found in either a gazetted forest or urban areas. Conventionally, the area is usually designated for conserving local flora and fauna. However, the purpose of the urban forest has expanded with the incorporation of environmental education and recreation for people to gain positive physiological and psychological energy and solve urban climates.

Geo Park

Geo Park is a territory with a particular geological heritage of international significance, rarity or aesthetic appeal, which is developed as part of an integrated concept of conservation, education, and local economic development (UNESCO). As stated by Global Geopark Network, a geopark is selected according to six main criteria, namely; i) Size and setting, ii) Management and local involvement, iii) Economic development, iv) Education, v) Conservation and preservation, and vi) Global geopark networking

METHOD

Checklist and Observation

Geopark is a territory with a particular geological heritage of international significance, rarity or aesthetic appeal, developed as part of an integrated concept of conservation, education, and local economic development (UNESCO). As stated by Global Geopark Network, a geopark is selected according to six main criteria, namely; i) Size and setting, ii) Management and local involvement, iii) Economic development, iv) Education, v) Conservation and preservation, and vi) Global geopark networking.

Site Inventory and Analysis

PHYSICAL ATTRIBUTES

1. Land use

Figure 3 shows the percentages of land use maps as well as the analysis of the cross-relation of each attribute. The highest percentage of land use is in the undeveloped area, which is 33.1 per cent of the selected area, followed by the residential area with 29.7 per cent. The residential area is the direct user-client of this project and having a large percentage of the target user is one of the factors why this area needs to be proposed as an integrated recreational area for local community wellbeing and to prevent further development near the forest area.

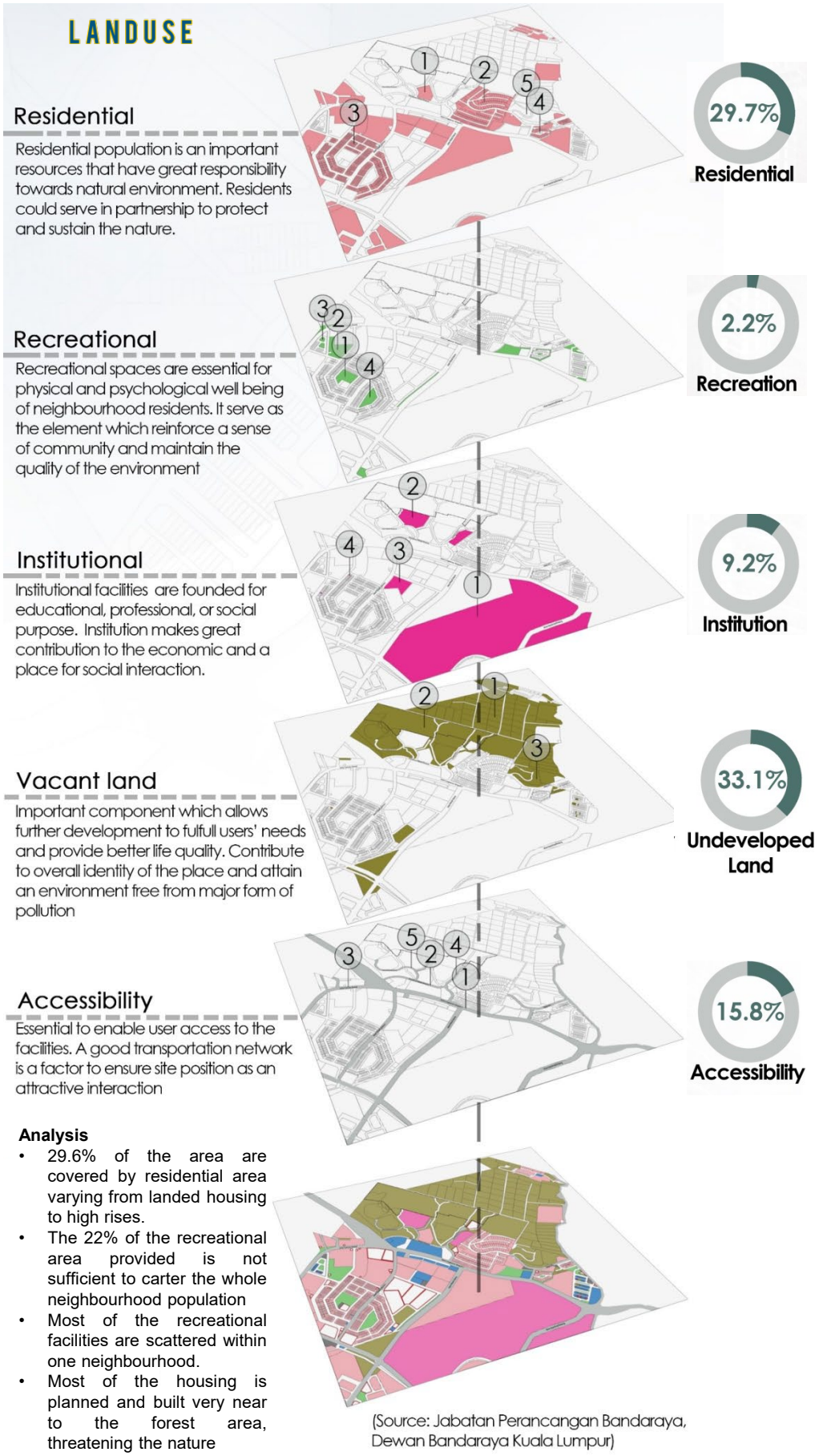


Figure 3: Analysis map for land use

2. Site Context

Figure 4 shows the location of the KL East Park site and its site context, nodes and landmarks. The site's context is vital in considering the circulation and accessibility of the visitor to the site. KL East is known as a transit-adjacent development due to its proximity to the Gombak Integrated Transport Terminal (GITT), which is under construction.

KL East Park is in the eastern corridor of Kuala Lumpur City Centre. The corridor encompass the Wangsa Maju, Setiawangsa, Ampang and Ulu Klang suburbs. The KL Middle Ring Road 2 (MRR2) serves as the central artery road of the area, connecting the areas as mentioned earlier to other towns like Cheras to the south as well as Kepong and Genting Highlands in the north. The site is also accessible via the Duta-Ulu Klang Expressway (DUKE) and the Ampang-KL Elevated Highway (AKLEH).

The relatively established eastern corridor also houses the National Zoo, Columbia Asia Hospital, Gleneagles Kuala Lumpur and Ampang Puteri Specialist Hospital. Education institutions like Fairview International School, Tunku Abdul Rahman University College (UTAR) and International Islamic University Malaysia (IIUM) have also attracted a large student population to the area. Thus, this park has the potential to benefit community wellbeing and is highly accessible to various user groups within Kuala Lumpur city.

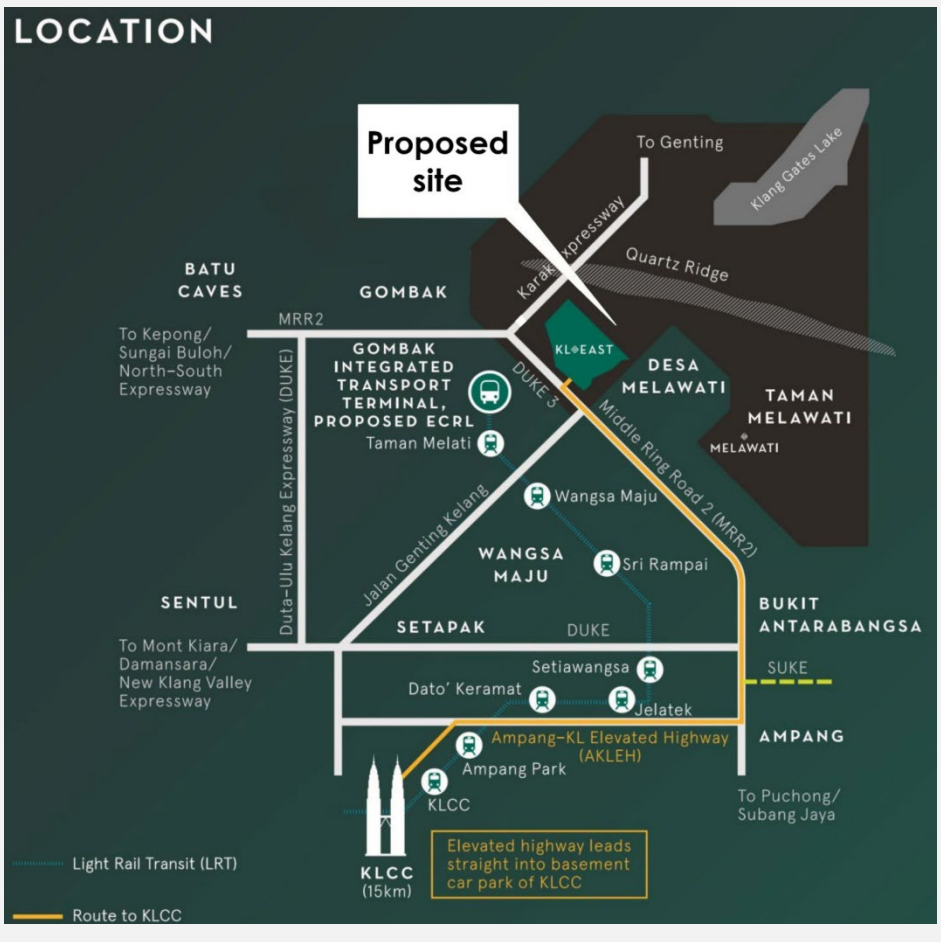


Figure 4: Map for site context
https://araexclusive.wordpress.com/the-veo-kl-east/

3. Circulation and Accessibility

On a micro-scale, the circulation and accessibility of the site are not developed as the site is still essentially forest land. The only existing trail is a hiking trail due to the site's hilly topography. However, the site is highly accessibly on the macro scale as it is linked to many major highways, allowing access from all over the Kuala Lumpur district (Figure 5). The primary threat of road development to the study area are landslides and soil erosion due to slope alteration, and the amount of gas emitted from the vehicles may cause a rise in the micro temperature of the site.

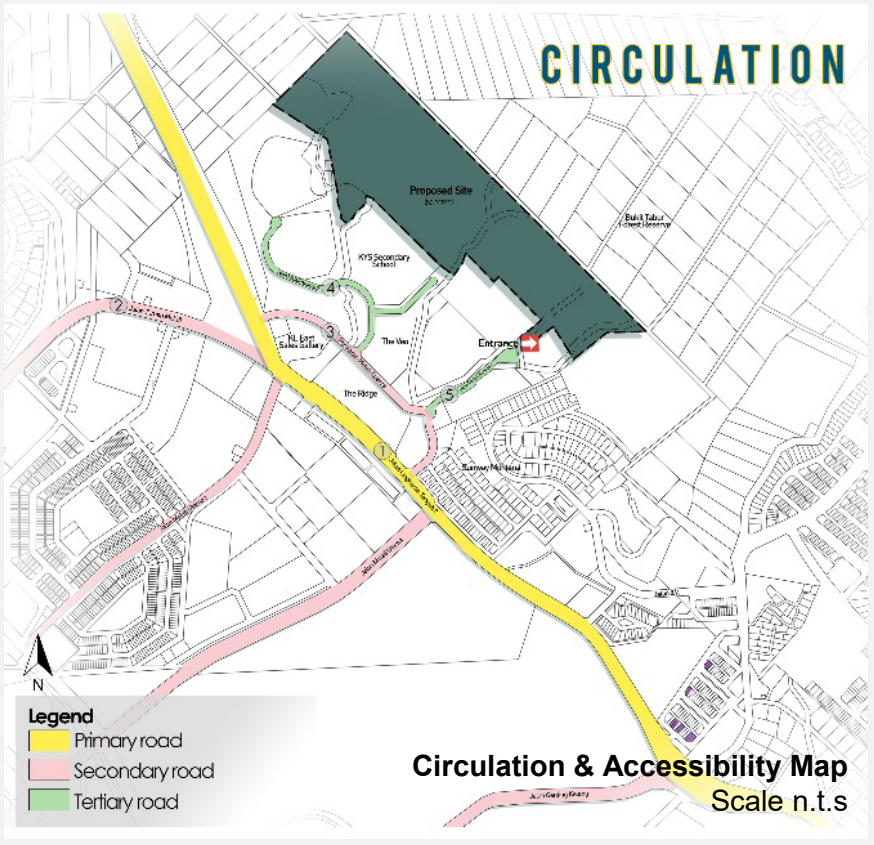


Figure 5: Map for circulation

1. Middle Ring Road 2 (MRR2)
- Located at the southwest of the proposed site.
- Six lanes dual carriageways road
- Link to major highways

2. Jalan Taman Melati
- Located west of the proposed site
- Six lanes dual carriageways road
- Link to LRT Gombak Station and Taman Melati

3. Persiaran Melati Kuarza
- Located West of the proposed site
- Dual lanes road (divided by four lanes)
- One-way road exits to MRR2
- Two-way road on the other exit to MRR2

4. Jalan Melati kuarza 1
- Two ways two lanes road
- Partially closed due to ongoing construction towards Yayasan Saad College Secondary School

5. Jalan Melati Kuarza 2
- Two ways two lanes cul-de-sac road

Connectors
- DUKE
- Jalan Genting Kelang
- SUKE
- AKLEH

- Middle Ring Road 2
- Persiaran Melati Kuarza
- Jalan Terminal Putra

- Middle Ring Road 2
- Jalan Taman Melati
- Jalan Melati Kuarza 1
- Jalan Melati Kuarza 2

- Persiaran melati Kuarza
- Road reserve

NATURAL ATTRIBUTES

1. Topography

Figure 6 shows the topography layers according to the data gathered using the Topographic Map website. The lowest topography is located at 175m above sea level, and the highest point is 305m above sea level. The hilly area comprises a valley, two peaks and a ridge.

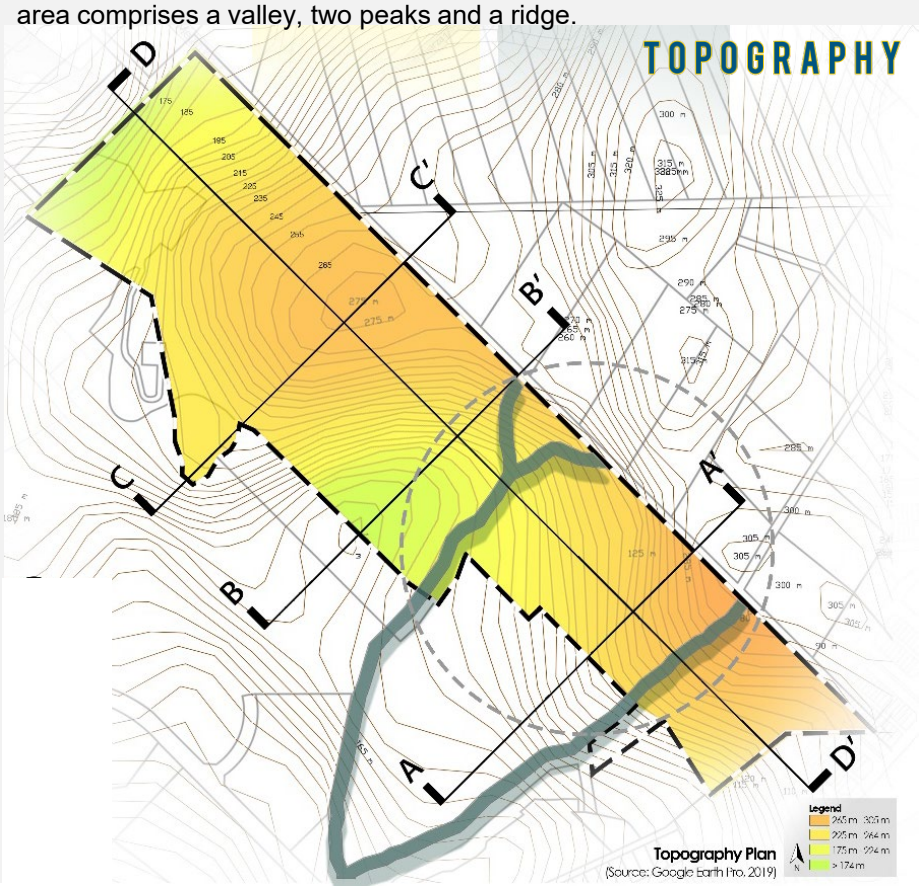


Figure 6: Map for topography
http://en-gb.topographic-map.com/places/Malaysia-275484/

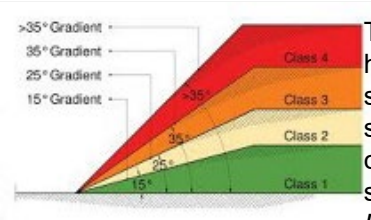


Figure 7: Classification of slope gradient in Malaysia

The general topography of the study area is hilly. The topographic survey data is shown in several sectional diagrams to summarise the slope gradient and the site geotechnical constrain. Figure 7 shows four classification of slope gradient in Malaysia according to *Garis Panduan Perancangan Pembangunan di Kawasan Bukit dan Cerun bagi Wilayah Persekutuan Kuala Lumpur* (2010).

Slope Angle (Degree)	Description
< 15	*Class I* - Low geotechnical constrain
16 – 25	*Class II* - Moderate geotechnical constrain
26 – 35	*Class III* - High geotechnical constrain
> 35	*Class IV* – Very high geotechnical constrain

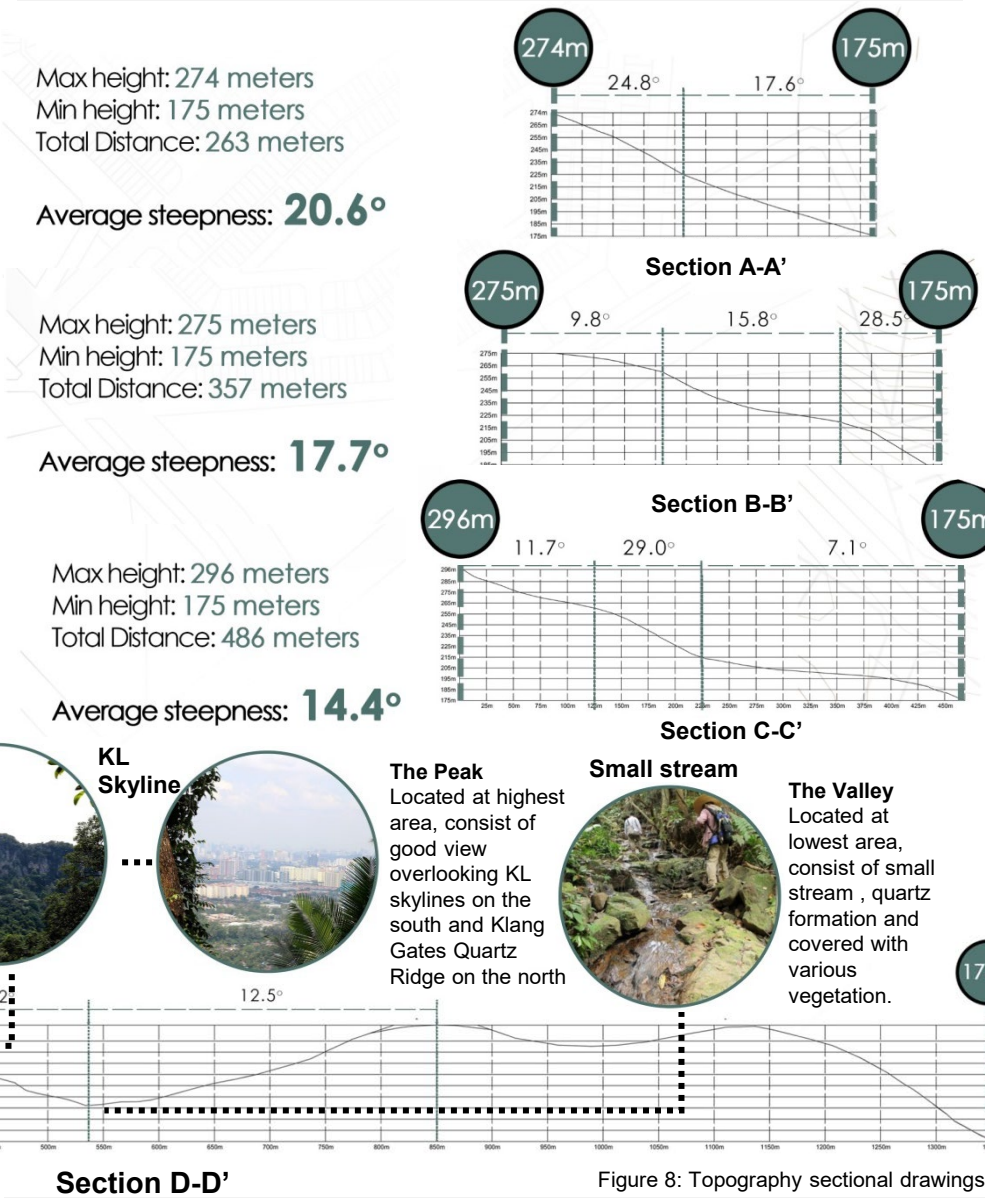
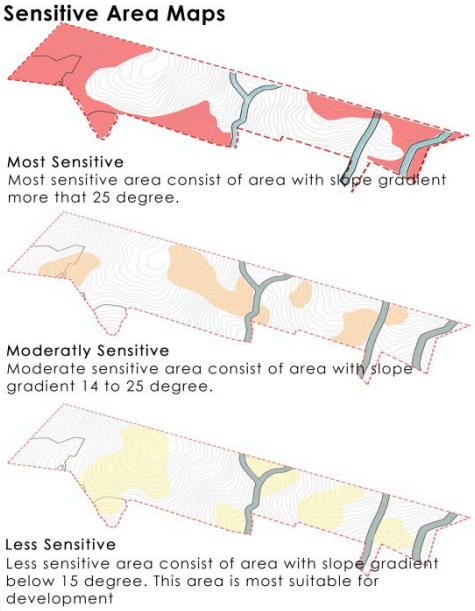


Figure 8: Topography sectional drawings

Sensitive Area Maps



Based on the cross-section analysis conducted, the general slope gradient of the proposed site is classified under low to moderate geotechnical constrain.

Section D-D shows the cross-section of the site. It shows that the slope within these classes is suitable for various activities such as cycling, relaxation and leisure. The highland topography allows a different kind of experiences within nature for the visitor

2. Vegetation

The site is categorised as a lowland with hill dipterocarp forest located around 300m – 750m above sea level. Based on the interview with Richard Ng (Sime Darby Property interim chief operating officer), KL East Park is considered a natural heritage with flora and fauna (Wong et al., 2010). Therefore, the project aspires to promote healthy living via nature-oriented activities at KL East by leveraging the park's offerings, which are part of the Bukit Tabur and Klang Gates Quartz Ridge network that extends into the Gombak Forest Reserve and beyond, including the Titiwangsa mountain range. According to Wong et al. (2010), the vegetation in the proposed site can be broadly divided into four categories; i) Emergent species, ii) Canopy species, iii) Understory species and
iv) Forest floor. *Aleisanthia rupestris*, *Eulalia milsumii* and *Ilex praetermissa* have been considered endemic to the Klang Gates quartz ridge north-east of Kuala Lumpur, Malaysia

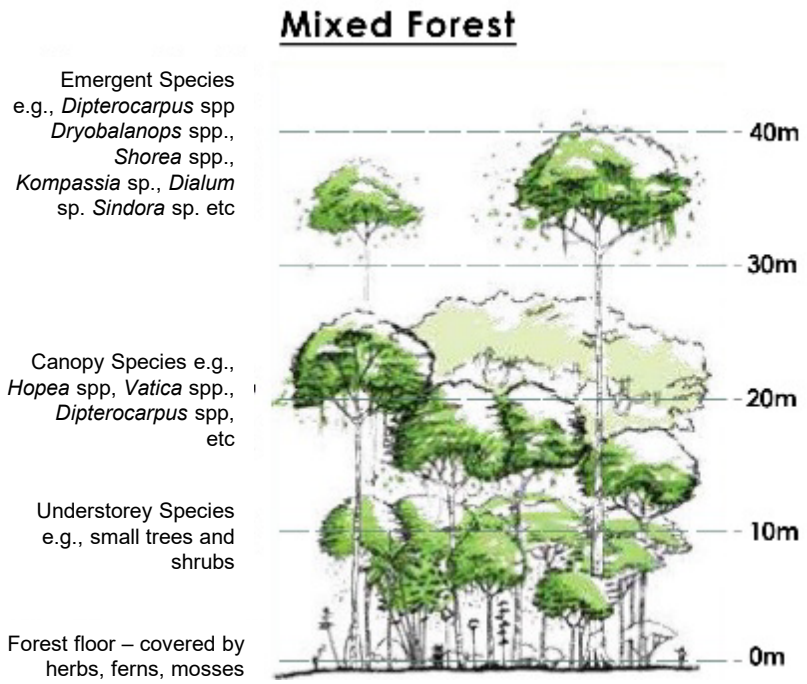


Figure 9: Profile of mixed Dipterocarp Forest

3. Geology

The proposed site is in the metamorphic rock formation area comprising phyllite and schist belonging to the Hawthorden formation. According to Umor et al. (2018), the Klang Gates Quartz Ridge areas were built entirely of quartz veins formed when residual magma crystallised and consolidated within the vertical slab of dyke through large linear fissures within massive granitic rock known as Kuala Lumpur Granite. The intruded rock is about 15 km long by medium to coarse-grained granite from the late intrusion of prominent Northwest to Southeast direction of Klang Gates Quartz Ridge. Based on the observation, the site contains various types of quartz rock crystals and a unique formation of small waterfalls and ponds, suitable to be developed as part of an educational trail (Figure 10). However, due to the location being very near the existing river/ stream, specific measures must be taken to prevent disturbance to the river ecosystem.

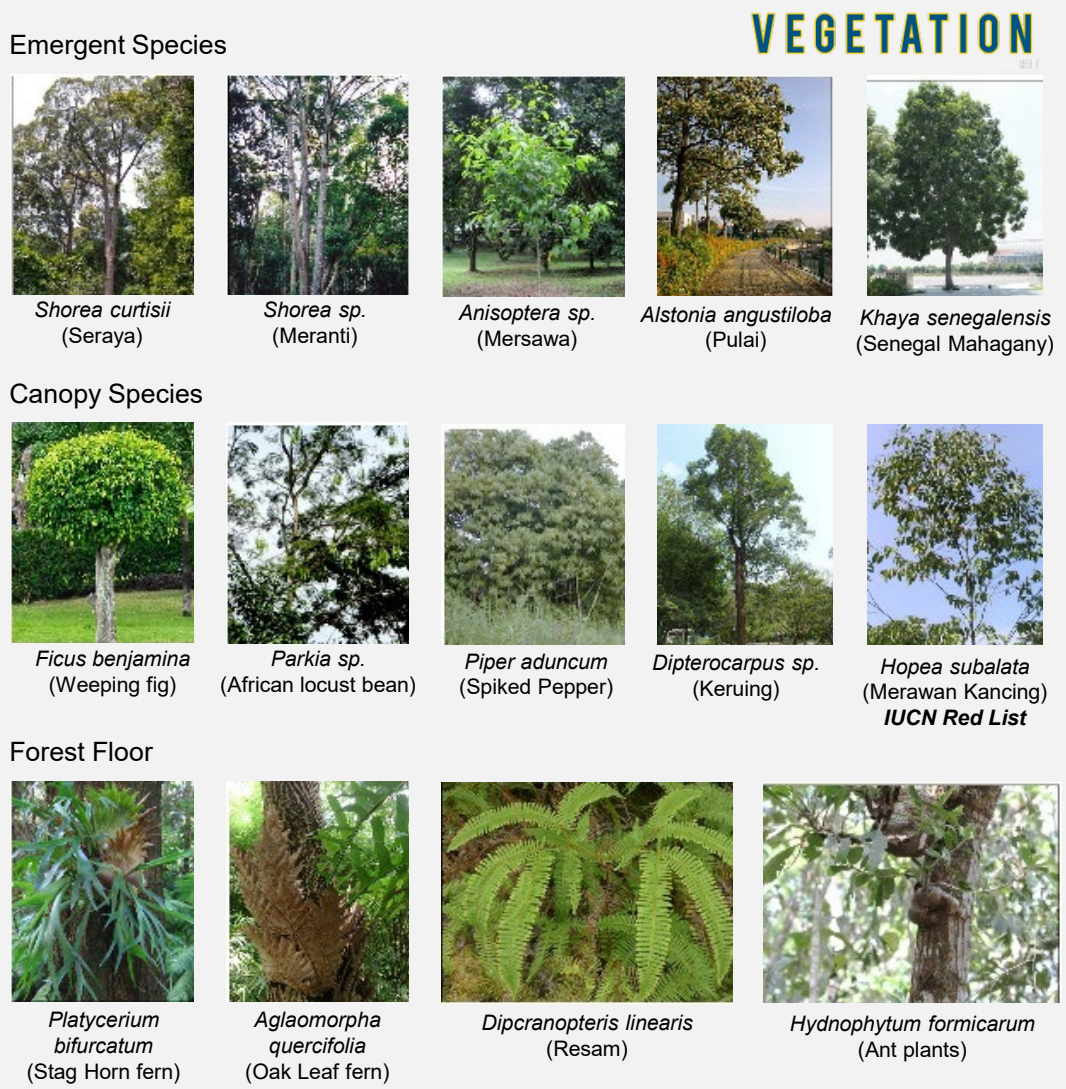


Figure 10: List of existing vegetation

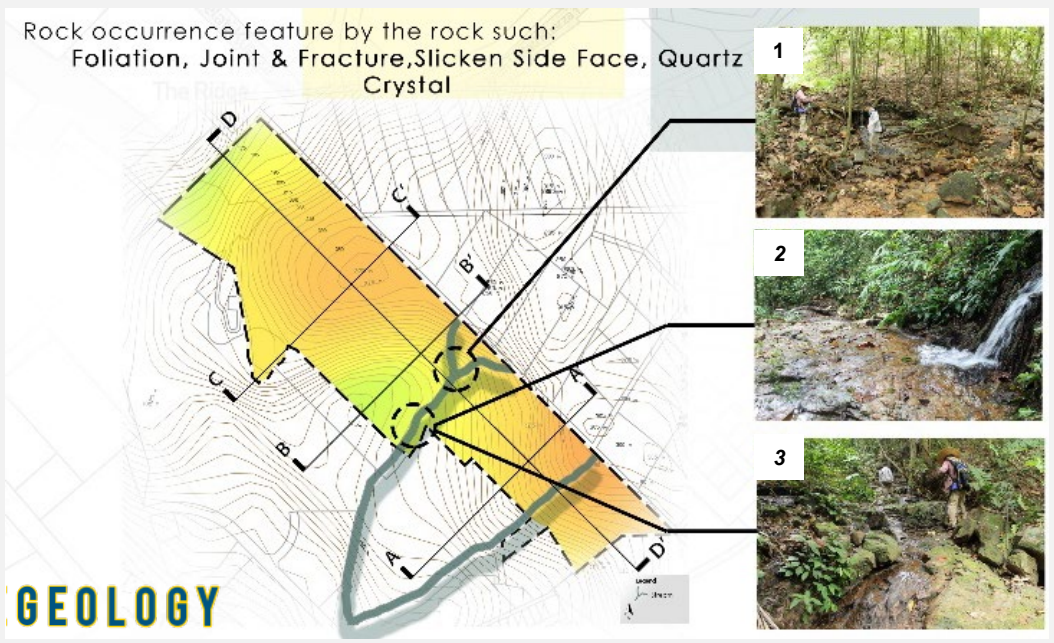


Figure 10: Map of geological occurrence on the site

DESIGN DEVELOPMENT

Design Strategies

The design strategies are developed according to the Sustainable Development Goals (SDG) from three aspects: environment, social and economy. Figure 11 shows the highlighted SDG goals related to the proposed design. The selected areas of concern are to propose a design that will promote health and wellbeing (SDG3), considering the natural environment and life on land (SDG 13 and 15) and promoting sustainable cities and communities (SDG 11).

Figure 11: Related Sustainable Development Goals.

Figure 12 (right) shows the development of the design strategies derived from the data gathered from site inventory and analysis. Based on the physical and natural attributes analysed, the development strategies focused on the areas located according to the most suitable potential for community wellbeing, education and physical attributes. The upper part of the proposed site is considered a potential area for community wellbeing, followed by the educational area in the middle. The lowest part of the site will be provided with facilities for users.

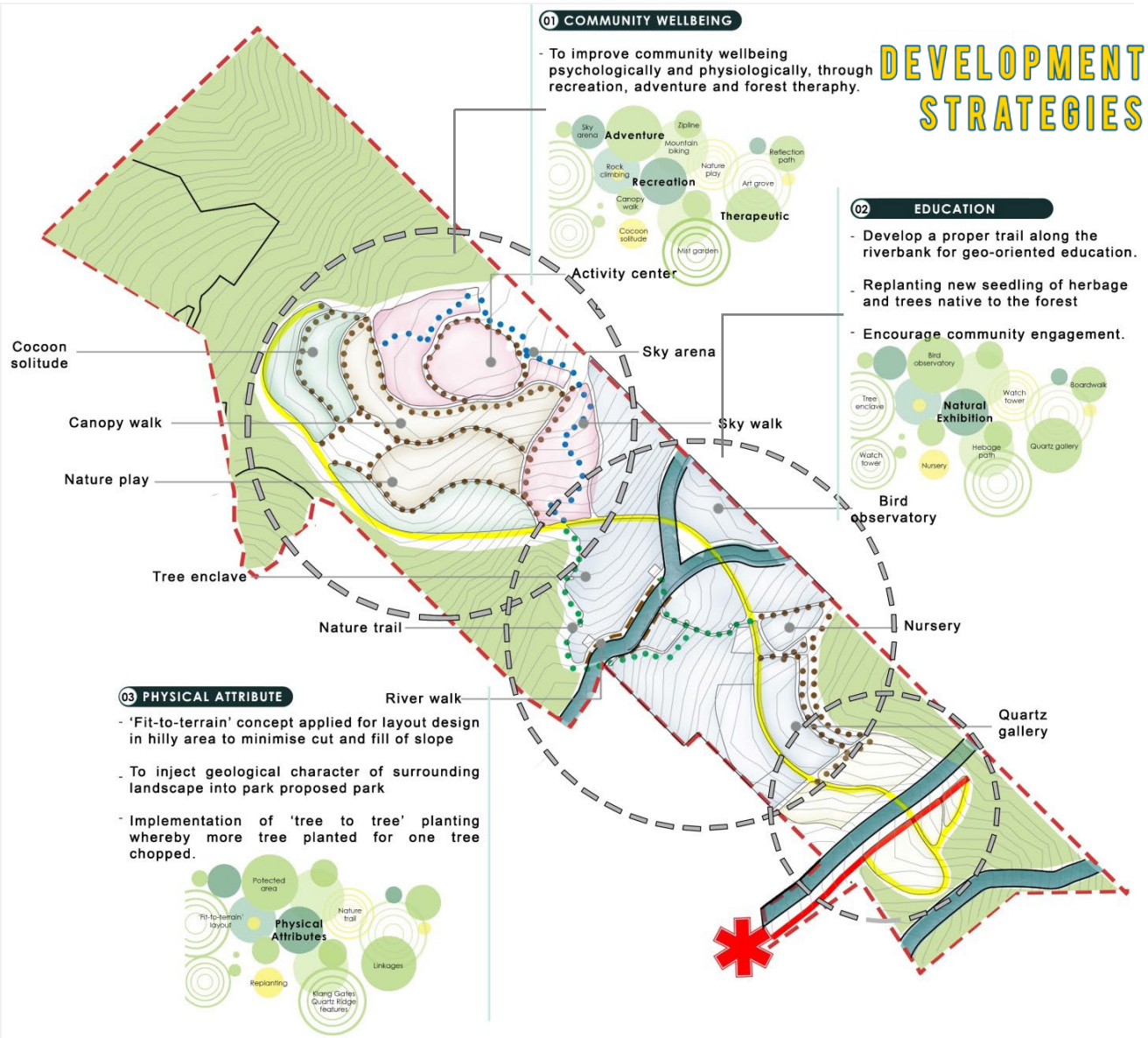


Figure 12: Development strategies map

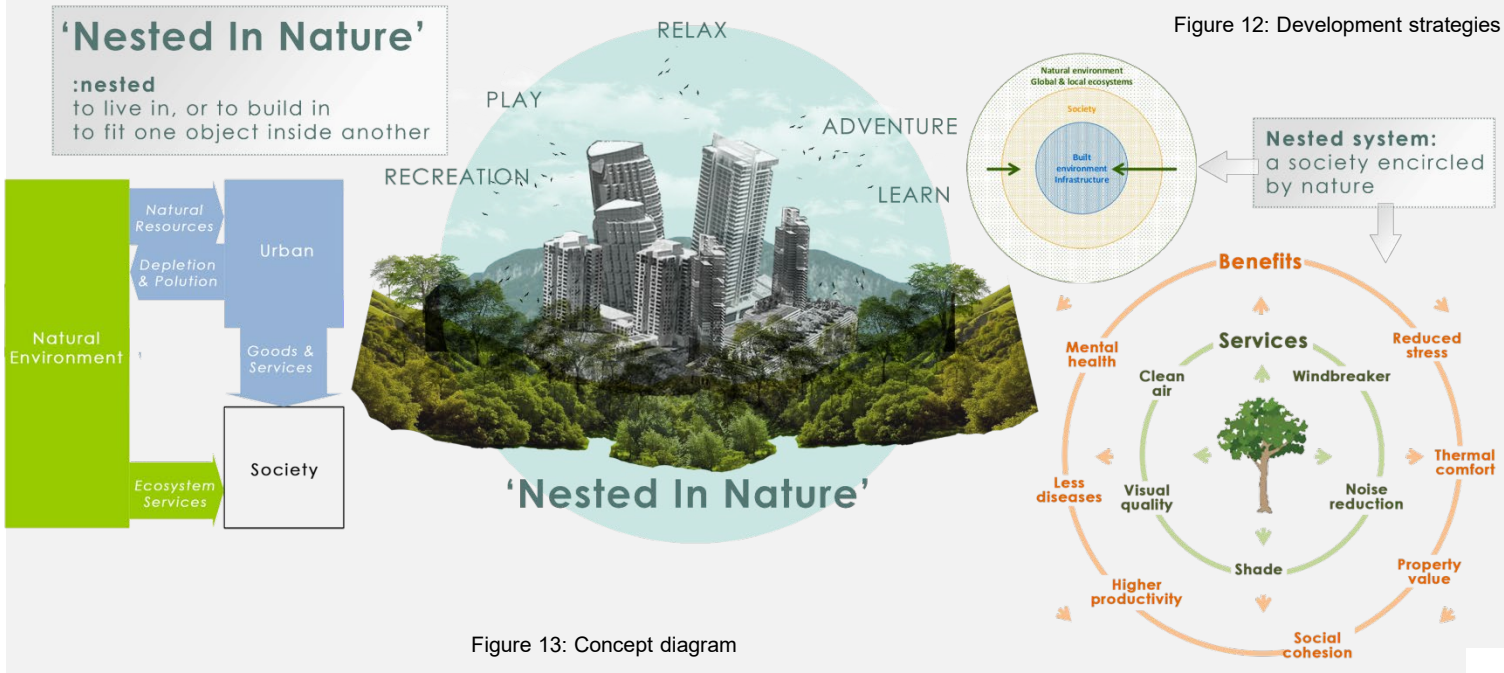


Figure 13: Concept diagram

Design Concept

The site is regarded as a gem to the area and helps to counter urban stress (refer to Figure 13).
'Nested in Nature' is the selected concept for this project. The concept was inspired by the site's strategic location – a lush green hillside surrounded by an urbanised area. The site provides enormous potential for urban dwellers to engage in activities in integrated green areas surrounded by the natural forest.

Schematic Plan

Figure 14 shows the schematic plan, detailed explanations of the elements proposed for the site, and the functional and conceptual plan results.

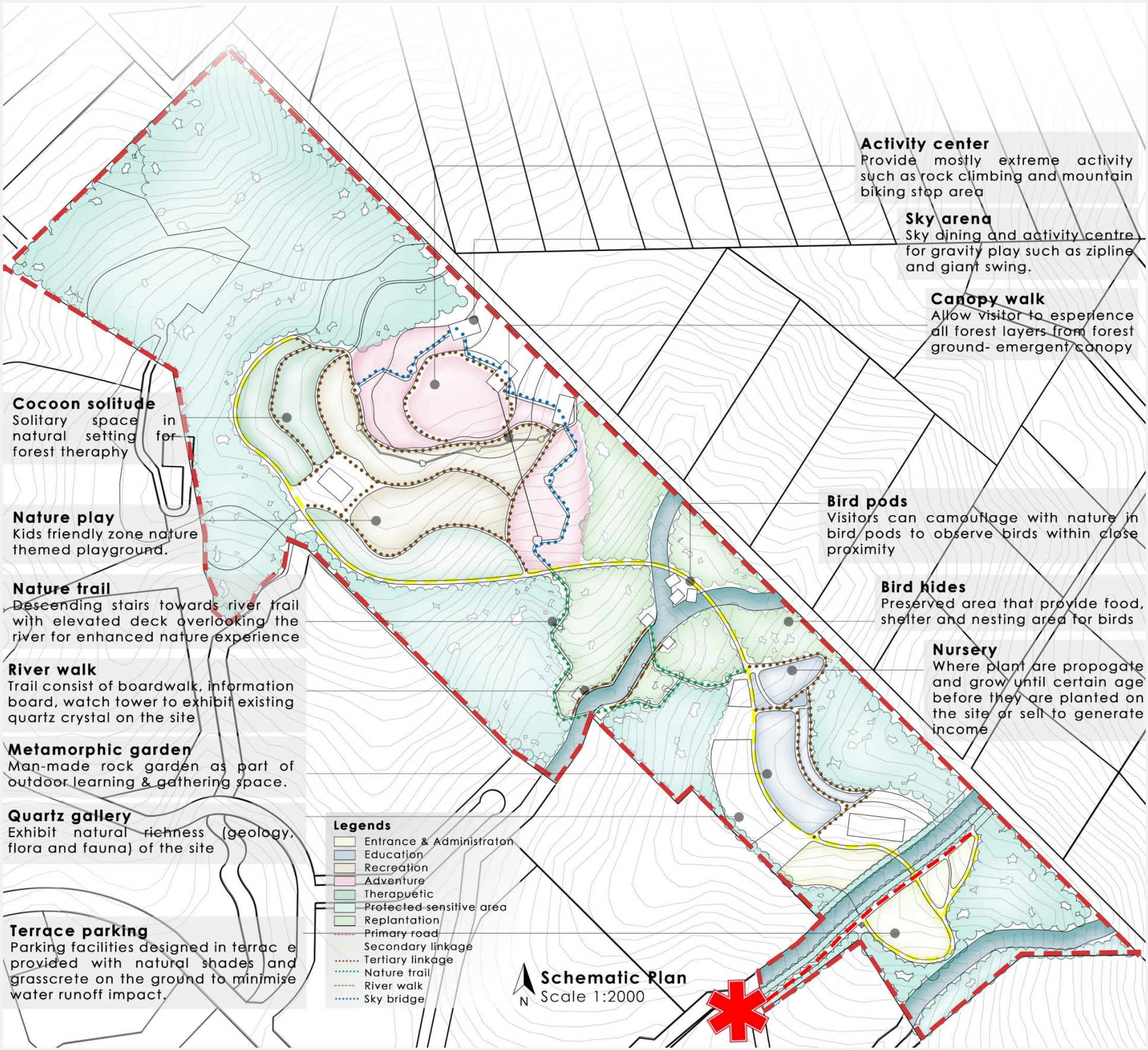


Figure 14: Conceptual Plan

KL EAST GEO-URBAN FOREST PARK

Proposed KL East Geo-Urban Forest Park lies on the foothill of Klang Gates Quartz Ridge, northeast of Kuala Lumpur, where locals can experience immediate natural richness nearby the city. The ecological regeneration project is designed as a recreational space integrated into its natural, geological and topographical setting to cultivate environmental awareness and educate visitors about local forest ecology. The project, on an abandoned secondary forest, aimed to reclaim 21.4-hectares (53 acres) of valuable land and reverse the trends of suburban sprawl and urban heat island by incorporating local-native and introduced-lowland tropical tree species.

The design is intended to be more than a static landscape sculpted by man but is more of a dynamic progression formed from ecosystem processes. The proposed geo-urban forest park is divided into three main areas: i) Gateway (entrance), ii) Educational zone and iii) Activities Centre, taking into consideration the highest and lowest point of site condition.

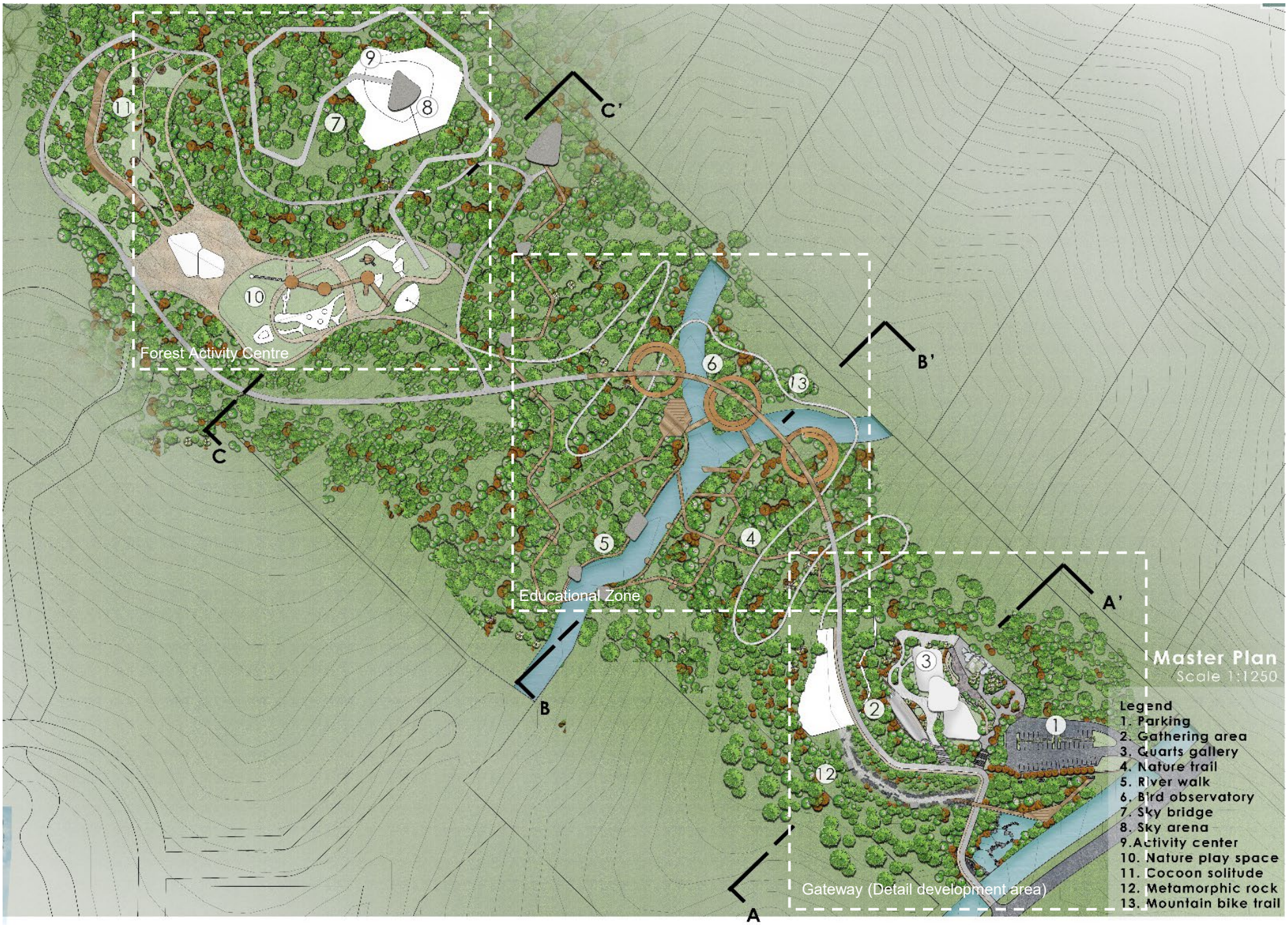


Figure 15: Master Plan

Detail Development Area

The Gateway is the detailed development area of the proposed three main areas. The site is introductory to a geo-urban forest park and is categorised as a public space. The space consists of an entrance, a briefing point, a tree-top walk at The Canopy, a metamorphic walk and accommodations such as visitors' parking. The park, located in the lower area of the overall master plan, the development maximises the existing slope with optimal slope alteration to allow some open area for the visitors. The development site is covered with native trees and some new ornamental plantings in a semi-formal setting.

Figure 16: Aerial View of Forest Activity Centre

Figure 17: Sectional-Elevation A-A’ shows the front yard of Quartz gallery, transition area and Metamorphic walk

Schematic Plan

Figure 18 shows the schematic plan and detail explanations on the element proposed to the site, results of the functional and conceptual plan.

Figure 18: Detail Development plan

Figure 19: Sectional-Elevation B-B'.

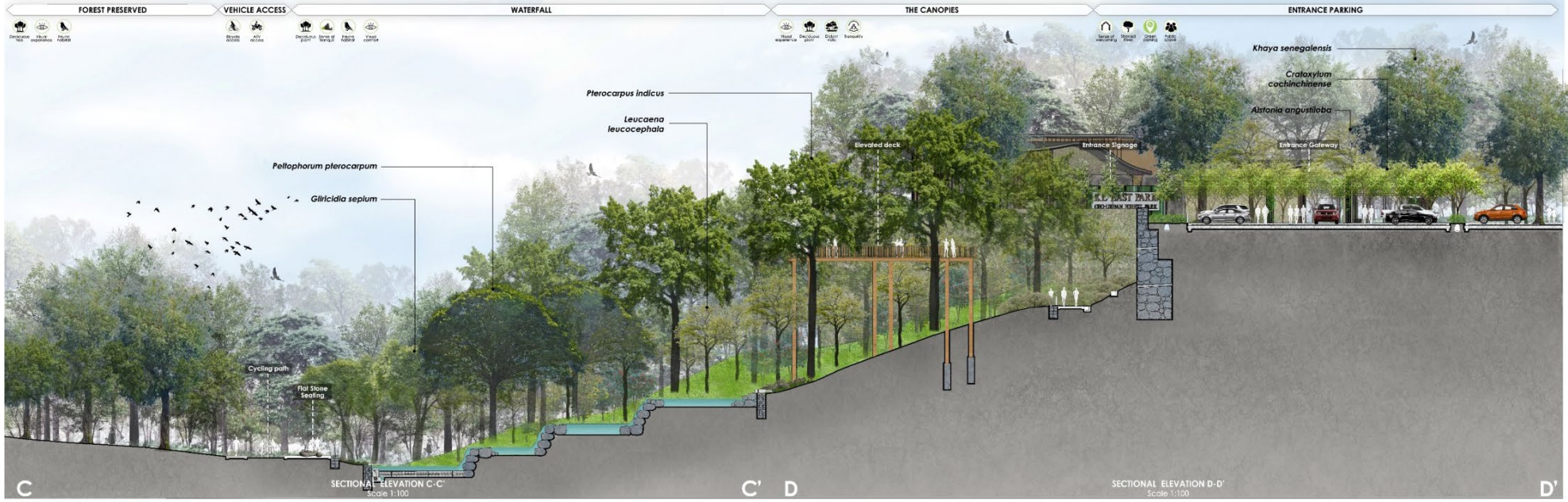


Figure 20: Sectional-Elevation C-C' and Sectional-Elevation D-D'

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