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PROMOTING HEALTH THROUGH SUSTAINABLE LANDSCAPE DESIGN AT SENIOR CITIZEN COMPLEX SECTION 24, SHAH ALAM

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ABSTRACT

This project promotes healthy environments for the senior citizens through sustainable landscape design at the Senior Citizen Complex of Section 24, Shah Alam. Health is one of the prevailing issues faced by senior citizens that needs consideration. Therefore, this project proposed implementing a sustainable landscape design that will promote a healthy environment for senior citizens that can give long term impacts to their quality of life. This project is located in a residential area (Section 24) where senior citizens live. Section 24 Shah Alam has a theme of vegetation, and the name of each street with both Roman and Jawi symbolizes the identity of Shah Alam as “Bandaraya Melayu”. Therefore, observation, literature review and phone interview used to produce a comprehensive literature review on elderly and the benefits of sustainable landscape design to their health. The results obtained from the elderly needs and their preferences towards sustainable landscape designs.

Keywords: *Elderly, Aging, Sustainable landscape design, Sustainable development goals*
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INTRODUCTION

This project proposes a sustainable landscape design to promote a healthy environment for senior citizens or the elderly that will positively impact their quality of life. The issues of this project include road safety, environmental problems caused by parking lots, uncontrolled littering, pests and safety concerns from the nearby construction area. Therefore, the objectives of the projects are:

1. To identify the problems faced by the elderly according to their barrier and limitations;
2. To highlight elderly needs in the aspect of psychology, physical and social; and
3. To develop conducive outdoor spaces that give long term impacts to the quality of their life.

Historical background of Senior Citizen Complex

This complex is an old place for senior citizens. It is one of the old folk's homes with good facilities and located near 'Kolam Pancing' or a fishing pond which attracts tourists. Inside the complex, there is a hall mostly rented out during the weekend for wedding ceremonies since it has ample parking and comfortable space for the wedding.



Figure 2: Historical background and Demographic data



Figure 1: Key plan and location plan of selected site

LITERATURE REVIEW

AGEING POPULATION
Population ageing is poised to become one of the most significant social transformations of the twenty-first century with the implications for nearly all sectors of society including labour and financial markets, the demand for good and services as well as a family structures

AGEING in global context
The global population aged 65 years and above is growing faster than all other age of group

AGEING in Malaysia
"Malaysia need to prepare for ageing population"
Back in 1970, 3.3% of the population aged 65 years and above and it is projected to increase by 14.5% by 2040

SUSTAINABLE DESIGN
Are the responsive environment, re-generative, and actively contribute to the development of healthy communities. For examples, sequester carbon, clean the air and water, increase energy efficiency, restore habitats and create value through economic, social, and environmental benefits

Principles:
- Functional-environmental-ecological
- Environmental-ecological-landscape
- Visual-aesthetic value of the landscape
- Maintainable-Reduce maintenance

Categories:
- Senior's Playground
- Biowalls

Medicinal Plants:
- Carum longa
- Ficus deltoidea
- Eurycoma longifolia
- Andropogon paniculata
- Citrus aurantium
- Ocimum basilicum
- Ocimum oleraceum

SUSTAINABLE DESIGN FOR ELDERLY

Adopting universal design as an approach create safe, accessible and usable environments for the broadest spectrum of people. Seven principles of Universal design include the following:

1. **Equitable Use** – the design should be practical and marketable to people with diverse abilities;
2. **Flexibility in Use** – wide range of individual preferences and abilities;
3. **Simple and Intuitive Use** – a design that is easy to understand;
4. **Perceptible Information** – designs communication that meets user's sensory abilities;
5. **Tolerance for Error** – design minimizes hazards
6. **Low physical Effort** – Design can be used efficiently
7. **Size and Space for Approach & Use** – the appropriate size that follows the user's body size, posture or mobility

METHODOLOGY

Table 1: Method or procedures been used

A	B	C
Checklists and virtual observation	Review of previous studies (digital journals, e-books, online articles)	Interview through phone
To observe and produce analysis after site visit	To produce a comprehensive literature review on elderly and the benefits of sustainable landscape design to their health	To acknowledge on elderly needs and their preferences towards sustainable landscape design

SITE INVENTORY AND ANALYSIS

SPACE ZONING

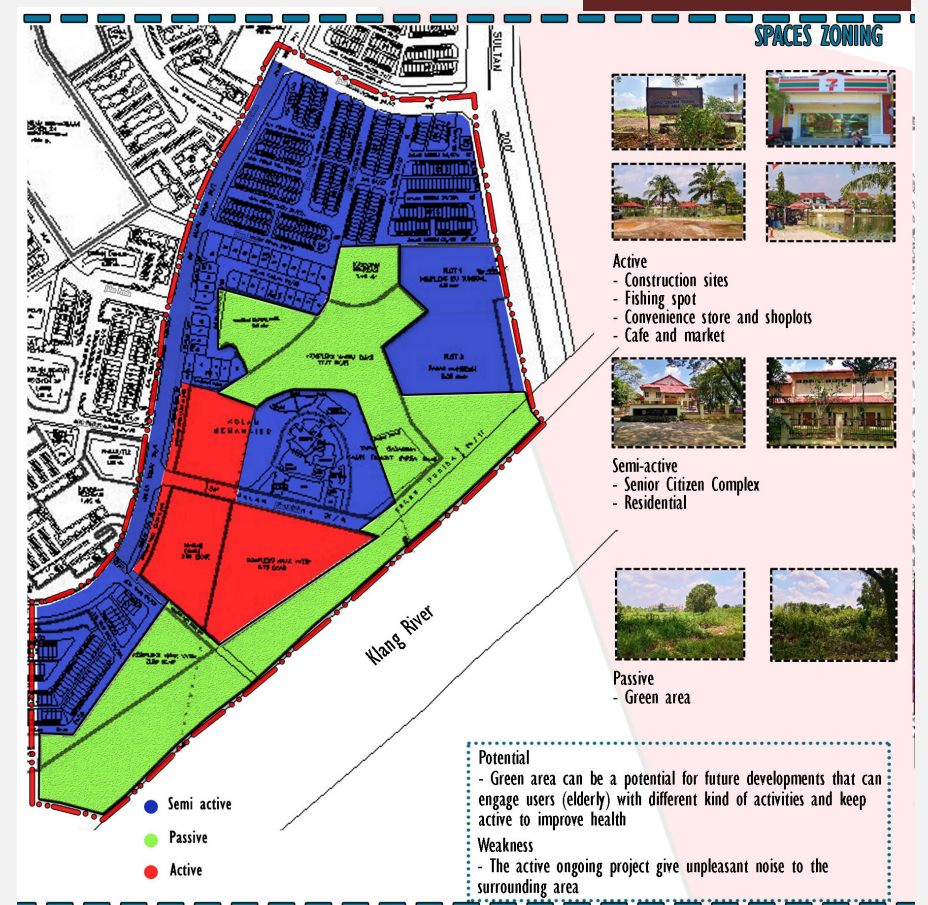


Figure 3: Map of Space zoning

Figure 3 shows there are three zoning of spaces: active, semi-active, and passive. The active area includes construction sites, a fishing pond, convenience store and shop lots, café and markets, while the semi-active area is in the senior citizen complex. However, the green or passive area can be a potential space for future developments to engage users with different activities and stay active to improve health.

SPACE WITHIN SPACES



Figure 4: Map of Space within spaces

Figure 4 shows space within spaces. For example, there are nine spaces in the senior citizen complex, including entrance, hall, parking, clinic, surau, senior citizen house, lawn, playground, and green area. The site can be used as a commercial area that will help create job opportunities. However, the weakness in the area has limited parking spaces

ACTIVITIES AND ACCESS AUDIT

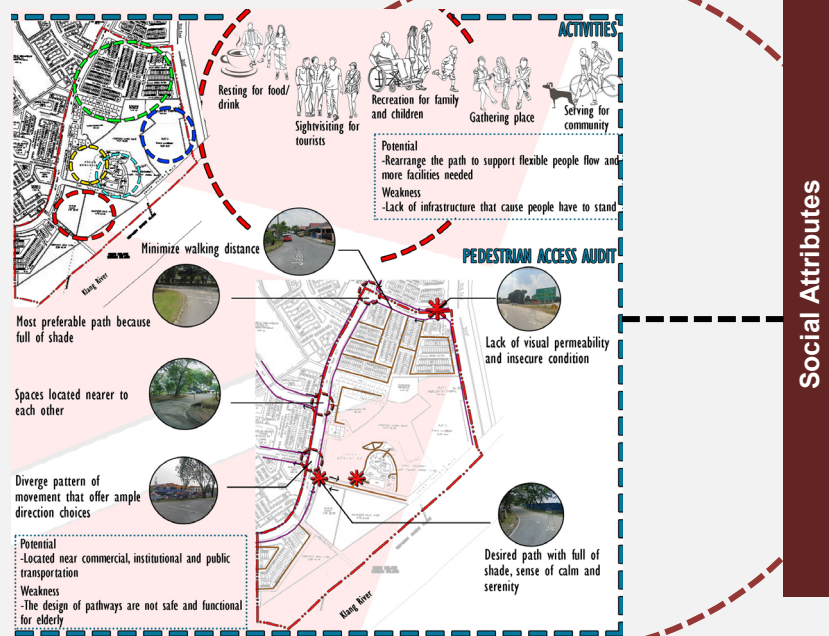


Figure 5: Map of Activities and access audit

Figure 5 shows the potential activities like sightseeing, recreation, resting, gathering and serving the community. However, the lack of infrastructure caused people to stand. Therefore, the existing spaces need to be rearranged and must incorporate the path to support the flexibility of people's flow and the provision of more facilities needed.

LANDUSE AND SITE CONTEXT

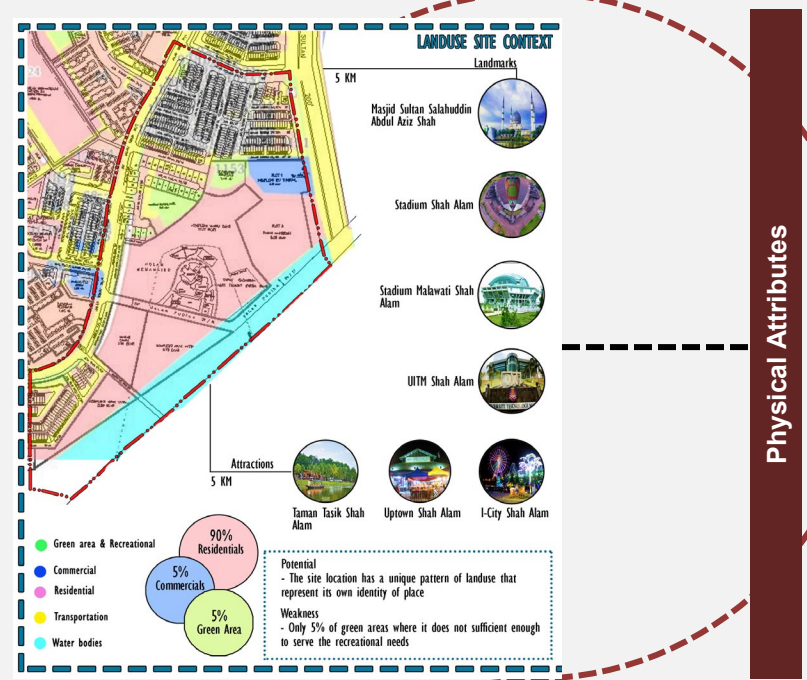


Figure 6: Map of Land use and site context

Figure 6 shows a landuse map and site context. The residential area occupies about 90% of the site, while the commercial and green areas share 5%. Within a 5 km radius from the site, the existing landmark includes Masjid Sultan Salahuddin Abdul Aziz Shah, Stadium Shah Alam and UiTM Shah Alam, while the attractions that exist within a 5 km radius are Taman Tasik Shah Alam and I-City.

SOLID VOID

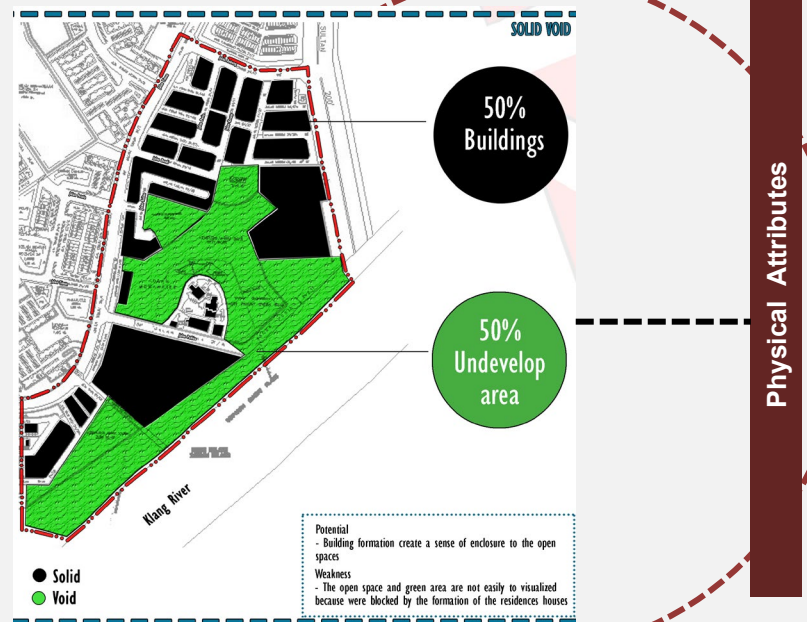


Figure 7: Map of Solid void

Figure 7 shows 50% of developed (with buildings) area, and another 50% is undeveloped. The physical building formation creates a sense of enclosure to the open spaces. However, the green area is not visible as more and more residential houses built blocked it.

CIRCULATION

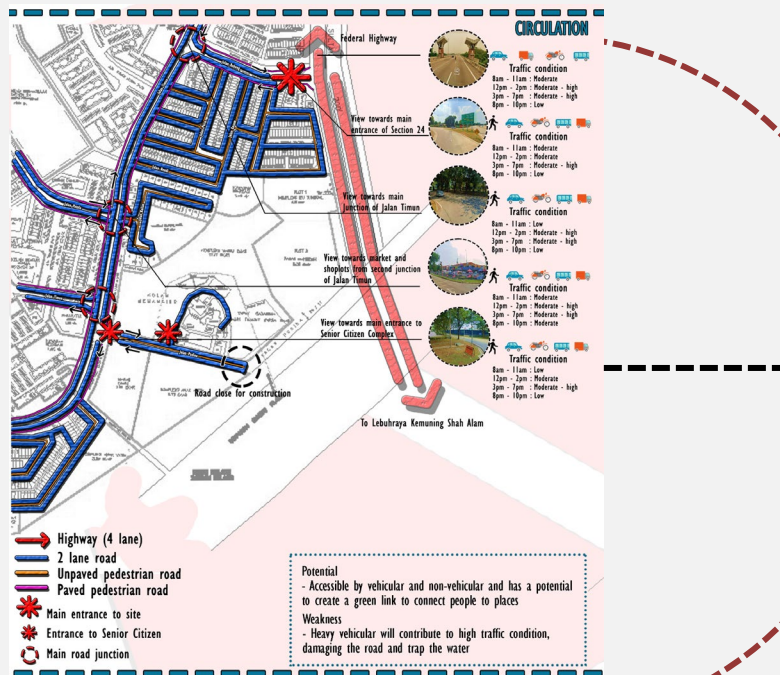


Figure 8: Map of Circulation

Figure 8 shows the circulation map. In the morning, the traffic conditions are primarily low, while in the evening, the traffic conditions are high because people go back home upon completing their shift. The location of the site is easily accessible by vehicular and non-vehicular. However, the ongoing construction project can lead to road damage and water trap.

LANDSCAPE VISUAL CHARACTER



Figure 10: Map of Landscape visual character

Figure 10 shows the landscape visual character where the existing tree, *Samanea saman*, gives the place a sense of calmness and serenity. The area has the potential to propose new planting to create the identity of the place. However, if the maintenance does not take care of the root of the tree, it could damage the road and harm the people, especially the elderly

FACILITIES AND AMENITIES

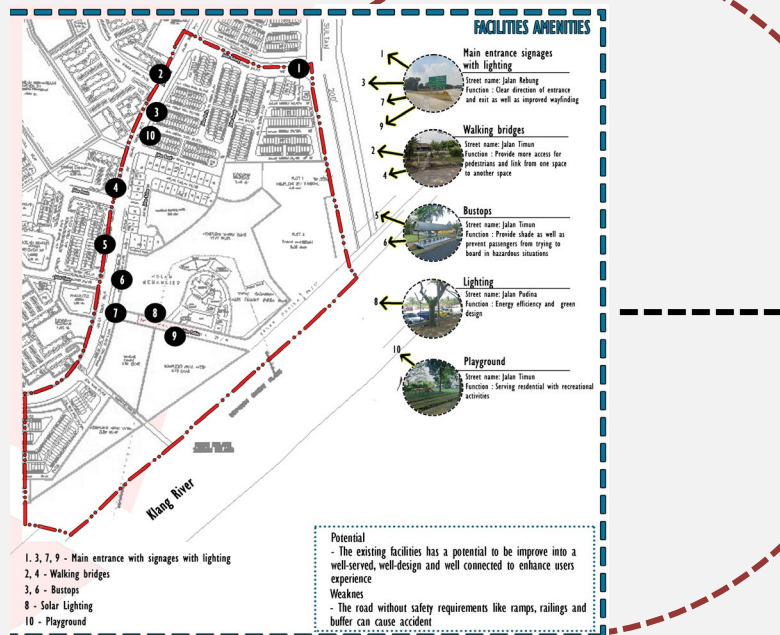


Figure 9: Map of Activities and access audit

Figure 9 shows the existing facilities that can improve into well serviced, well designed, and well connected to relevant spaces that enhance users experience. However, the road without safety requirements without ramps, railings or buffers, can cause accidents, especially for the elderly.

HYDROLOGY

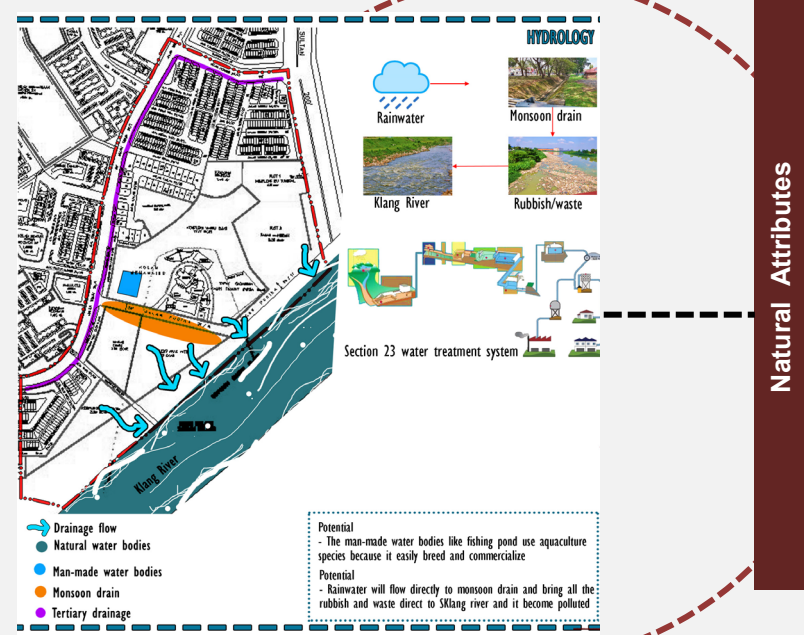


Figure 11: Map of Hydrology

Figure 11 shows a man-made water body like a freshwater fishing pond. The pond can easily be used for aquaculture species to breed and commercialize the fish. It also can be the source of food to generate income.

SITE SYNTHESIS

The synthesis map (Figure 12) categorised the landscape into three areas - social, physical and natural. However, site constraints and their potential values have led to proposing a design recommendation in the future

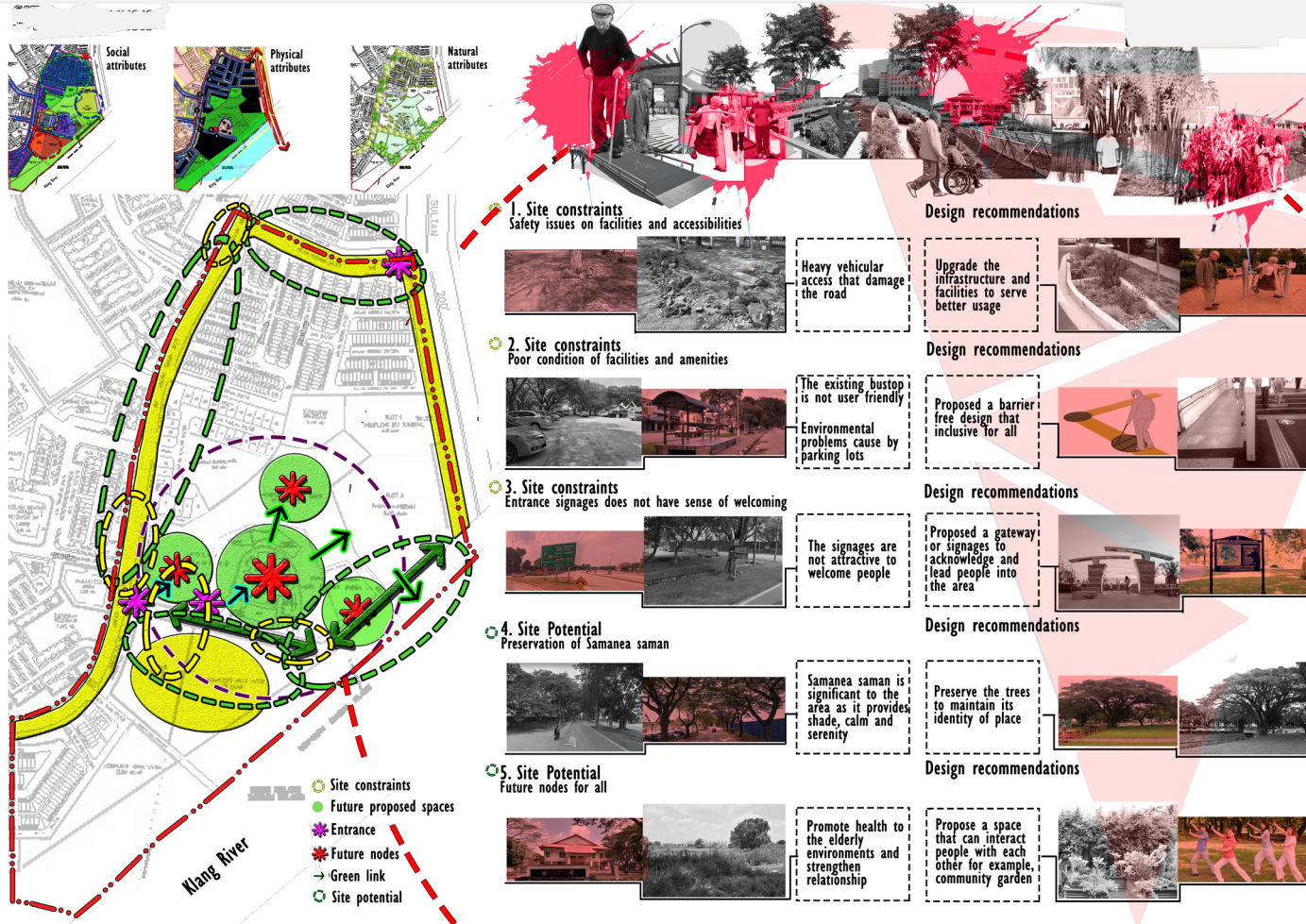


Figure 12 : Synthesis Map

DESIGN STRATEGIES

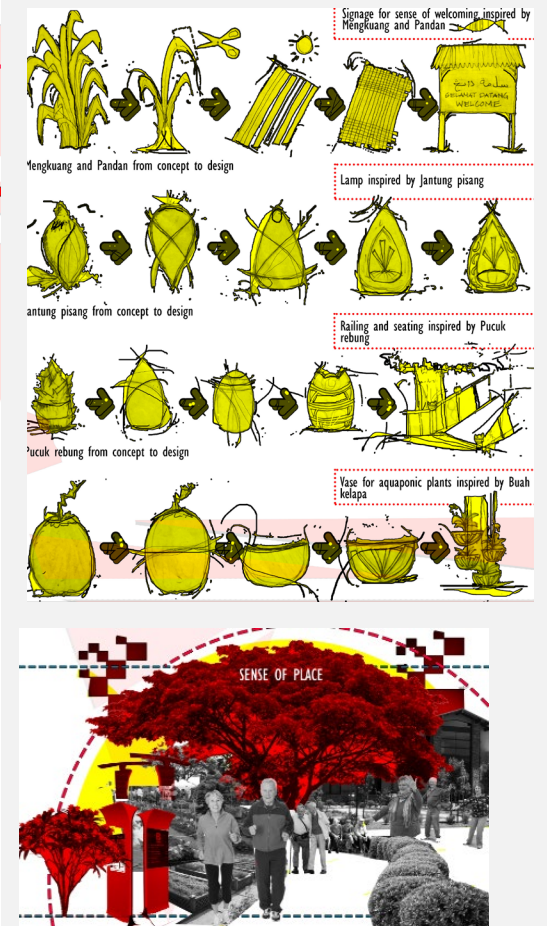


Figure 13 : Design strategies and ideas

DESIGN PROCESS



Figure 14 : Design process

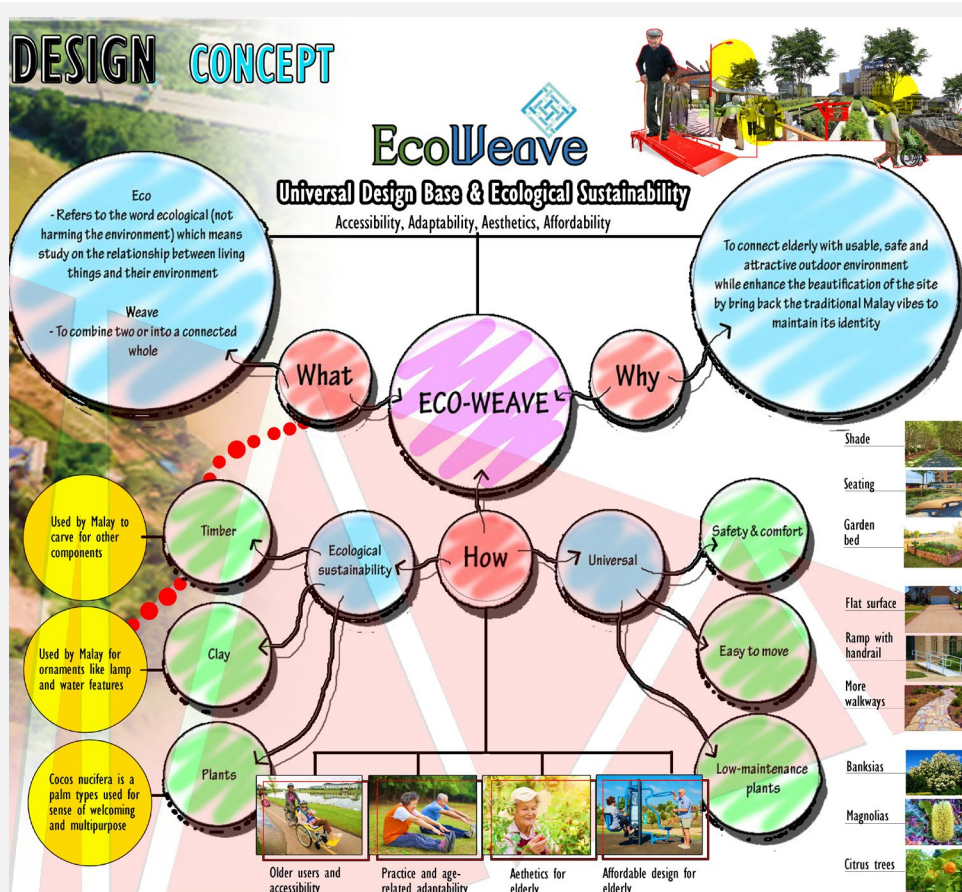


Figure 15 : Design concept

DESCRIPTION OF SPACES

Healing garden serve as a passive area where people can relax and practice yoga.

Outdoor gym, outdoor learning centre and recreational area combined together and serve as a semi-active area where people can do workout, training, mural painting, etc. it will use a barrier free design with low impact facility

Aquaponic and urban farming area connected and combined to ensure food security, space saving and energy efficiency

Market and café will boost economy where the crop production from urban farming area will be the source of supply.

DESIGN CONCEPT

Eco refers to the ecological or the study between living things and their environments. This concept of universal design based on ecological values combines or weave the two essences into a connected whole. Thus, provide the basis for sustainability that emphasise *Accessibility, Adaptability, Aesthetics, Affordability*.

DISTRIBUTION OF SPACES

	<p>Healing Garden (Passive area)</p> <p>List of space</p> <ol style="list-style-type: none"> 1. Reflexology garden 2. Water feature (hearing) 3. Scent walk (smell) 4. Cascading plants <p>List of programme</p> <ol style="list-style-type: none"> 1. Yoga practice and reflexology walking 2. Hear the sound of water flow as mind therapy 3. Smell fragrance flower 4. Touch texture of plants 	
	<p>Outdoor Gym (Semi-active area)</p> <p>List of space</p> <ol style="list-style-type: none"> 1. Fitness area 2. Trails <p>List of programme</p> <ol style="list-style-type: none"> 1. Workout and training 2. Walking in trails 	
	<p>Outdoor Learning centre (Semi-active area)</p> <p>List of space</p> <ol style="list-style-type: none"> 1. Workshop for disable 2. Transitional area 3. Un-paved area 4. Bio-pond <p>List of programme</p> <ol style="list-style-type: none"> 1. Mural painting 2. Walking and nature appreciation 3. Gardening 4. Feeding fish 	
	<p>Aquaponics (Active area)</p> <p>List of space</p> <ol style="list-style-type: none"> 1. Aquaculture 2. Aquaponic plants 3. Connecting path <p>List of programme</p> <ol style="list-style-type: none"> 1. Food harvesting, cleaning 2. Filtration, fertilizing, watering 3. Walking through natural path 	
	<p>Urban Farming (Active area)</p> <p>List of space</p> <ol style="list-style-type: none"> 1. Hydroponic vertical farming 2. Herbs garden 3. Urban farming kiosk 4. Compost area 5. Edible garden <p>List of programme</p> <ol style="list-style-type: none"> 1. Fertilizing, gardening 2. Sitting, smell medicinal plants 3. Selling and supply crops 4. Cleaning, composting 5. Pluck and eat 	
	<p>Market and Cafe (Active area)</p> <p>List of space</p> <ol style="list-style-type: none"> 1. Dining cafe 2. Stalls <p>List of programme</p> <ol style="list-style-type: none"> 1. Eating, resting, enjoy the view 2. Selling, buying, eating 	
	<p>Recreational (Semi-active area)</p> <p>List of space</p> <ol style="list-style-type: none"> 1. Playground 2. Plaza <p>List of programme</p> <ol style="list-style-type: none"> 1. Playing 2. Resting and watching activities, walking, reading 	

Figure 16 : Space distribution

DESIGN ALTERNATIVES

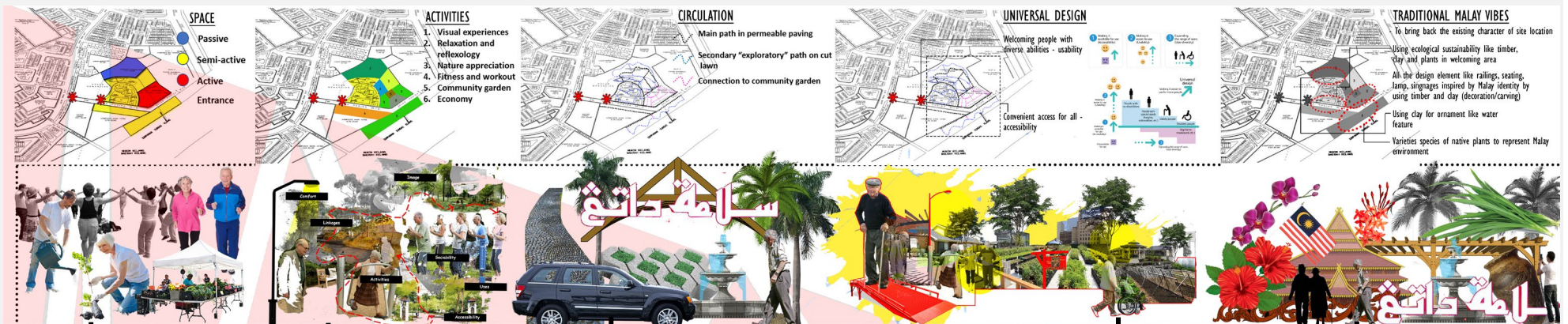


Figure 17: Design Alternatives

There will be three proposed spaces which are passive, semi-active and active to balance the needs

Passive area focus on relaxation and reflexology; semi-active area provide fitness and active area focuses more on economy purposes

There will be three access to the site – the main path in permeable paving, secondary is exploratory path and third is connection to the community garden to increase users' activity

It will use universal design approach to welcome people with diverse abilities; and convenient access to all. It will emphasize on barrier free design to ensure users safety, and economically with low maintenance

This design will inject traditional Malay vibes using timber, clay and native plants to represent the Malay identity. For example, *hibiscus rosa sinensis*, *ixora*, *orchid*, *bougainvillea*

FUNCTIONAL DIAGRAM

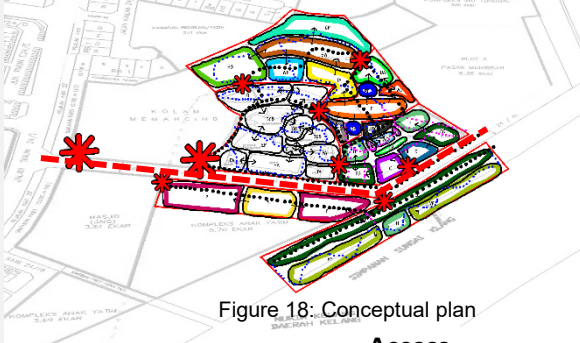


Figure 18: Conceptual plan

Legend

Existing space

- PA – parking
- HA – hall
- TA – tank
- EP – existing playground
- C – clinic
- SU – surau
- SCB – senior citizen building
- EL – existing lawn

Functional areas

- HG – Reflexology garden
- WF – water feature
- TRA – transitional area
- SW – scent walk
- CP – cascading plants
- UA – unpaved area
- BP – bio-pond
- T – trails
- WD – workshop for disable
- PL – playground

Access

- Main path in permeable paving
- Secondary "exploratory" path on cut lawn
- Connection to community garden
- Vehicular access
- Pedestrians access
- OG – outdoor gym
- UFK – urban farming kiosk
- H – herb garden
- AQ – aquaponic
- EG – edible garden
- C – café
- S – stalls
- VF – vertical farming
- P – plazas

SCHEMATIC PLAN

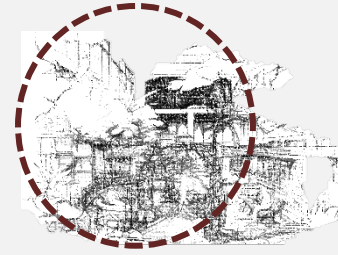


Figure 19: Schematic plan

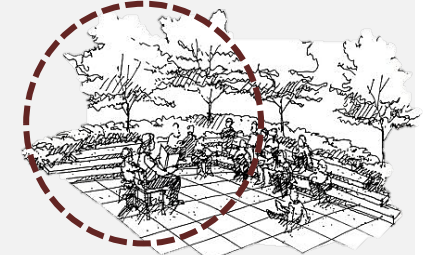
The schematic plan resulting from the merging of functional diagrams, proposed spaces and planting concept to show its functionality and comprehensiveness



Exploratory path to community garden



Healing garden



Outdoor learning centre

SECTION AND ELEVATION

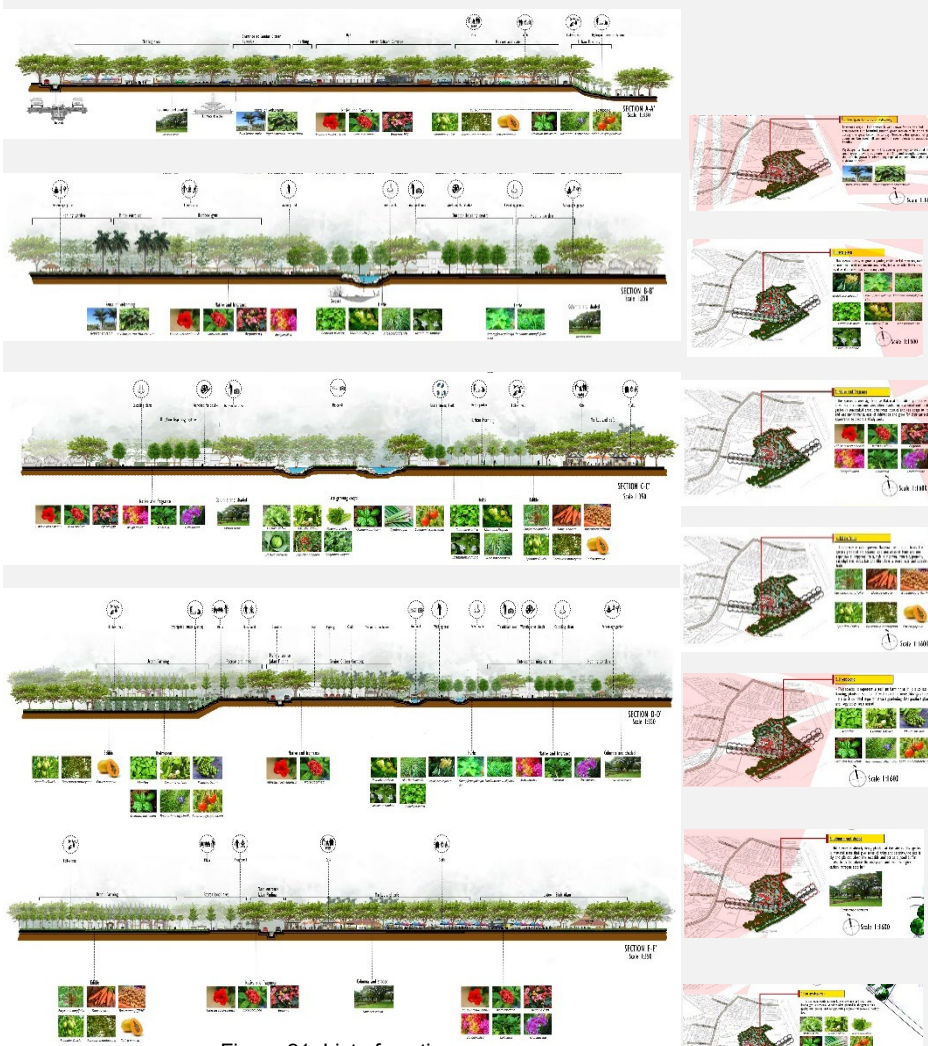


Figure 21: List of sections



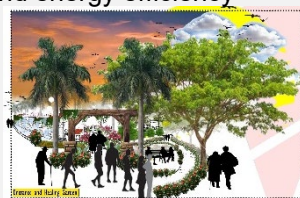
Users can socialize more and keep active



The crop production of urban farming to generate income



Terrace planting to ensure food security, space saving and energy efficiency



Healing garden to help improve the immune system, gives relaxation and opportunity to appreciate nature

Figure 22: Perspectives

MASTERPLAN



Figure 20: Masterplan

DETAIL DEVELOPMENT PLAN (DESIGN PROCESS)

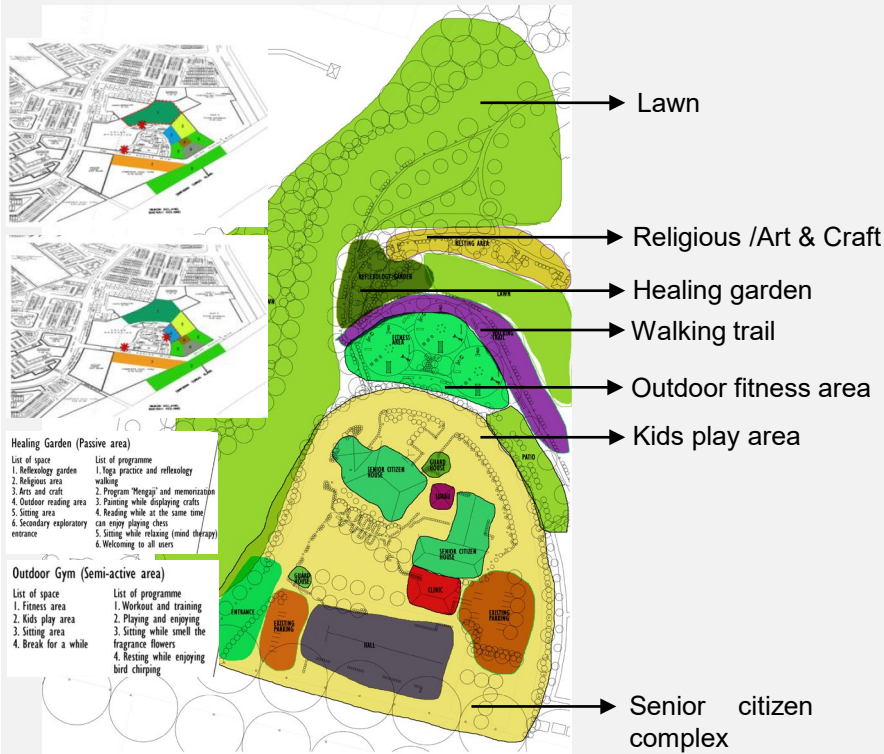


Figure 23: Development of spaces

The design aim of this project is to create a usable, safe and attractive built environment in improving the elderly quality of life. The issues of this project are safety from facilities and amenities that do not have a sense of welcome. However, this area has the potential to develop a sustainable landscape design that can promote various activities to the elderly. Therefore, the objectives of the design projects are:

1. To introduce a healthy social environment that can attract public attention
2. To provide opportunities for the elderly to experience the different activities
3. To enhance the beautification of the site by bringing back the traditional Malay vibes to maintain its local identity

OUTDOOR GYM

The outdoor gym is open, and users can enter freely. For example, they can enter from various entrances to ease their movement. The fitness equipment such as the balance stool, balance beam, push and pull, and step-ups can help the elderly active while boosting their health. This outdoor gym area will be planted with native fragrance, herbs, and medium-sized trees to stimulate their five senses and shade. As for the landscape, this area will use slip-resistant pavers to ensure stable walkways

HEALING GARDEN

The healing garden addressed the five human senses. The four spaces proposed are reflexology garden, religious area, art and craft, and outdoor reading area. Some of the activities the elderly could perform are yoga, tai chi, and aerobic. At the same time, they can also sit and enjoy the bright colours of the flowers and hear the birds chirping. Moreover, there will be a program like memorisation (Religious class) and arts and crafts to attract the attention of the elderly and other users. These areas will be equipped with reflexology stones as therapy, herbs and fragrance to enhance smell and sight. Furthermore, the water feature enhances hearing and protects them from the sun's heat and rain.

DETAIL DEVELOPMENT PLAN



Figure 24: Detail development plan

SECTION /ELEVATION & PERSPECTIVES

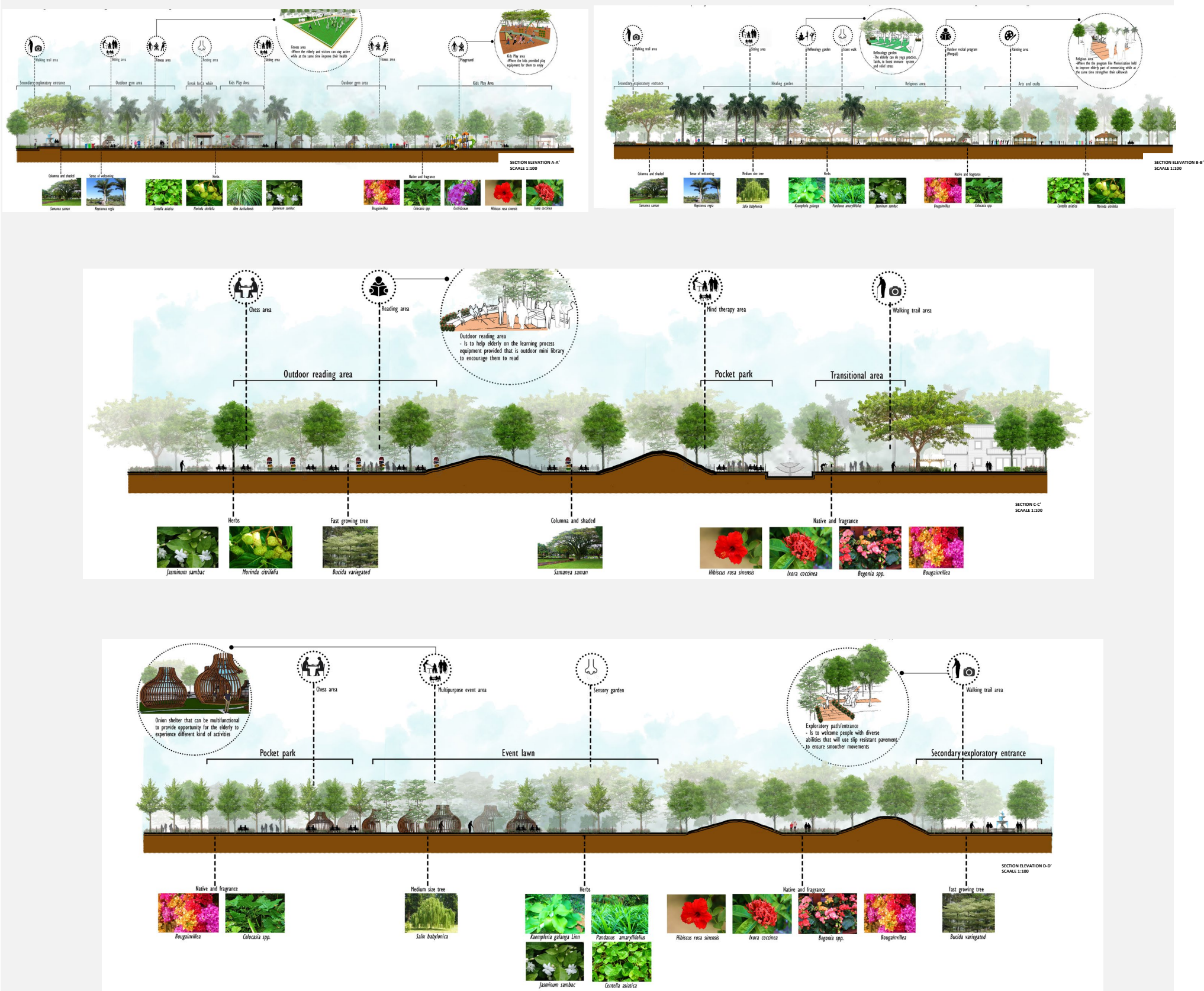


Figure 25: Section elevations, perspectives and plant materials

INNOVATIVE DESIGN ELEMENT

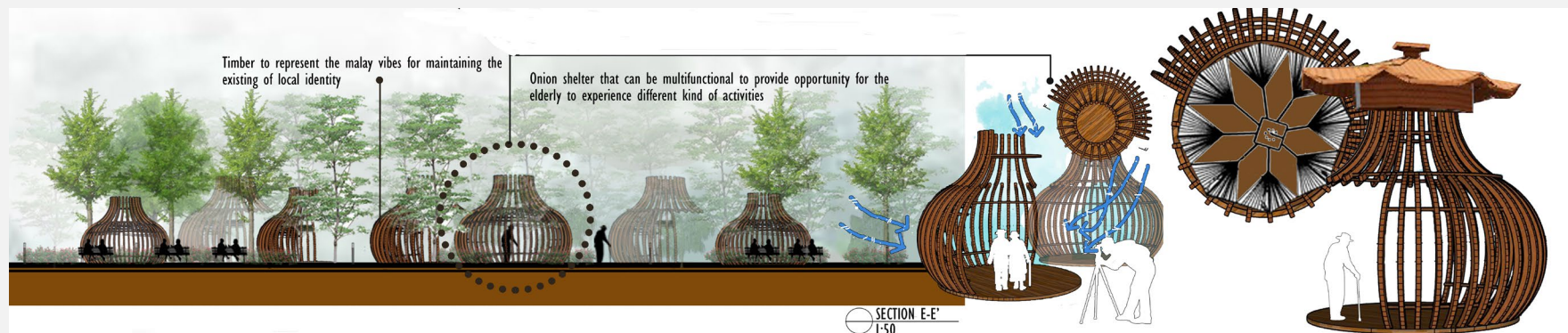
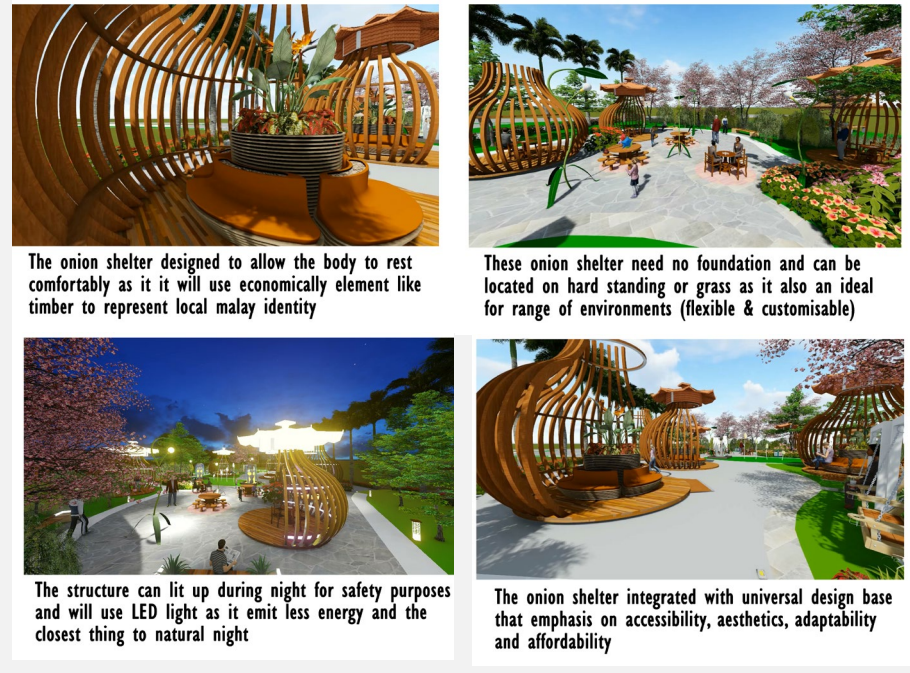
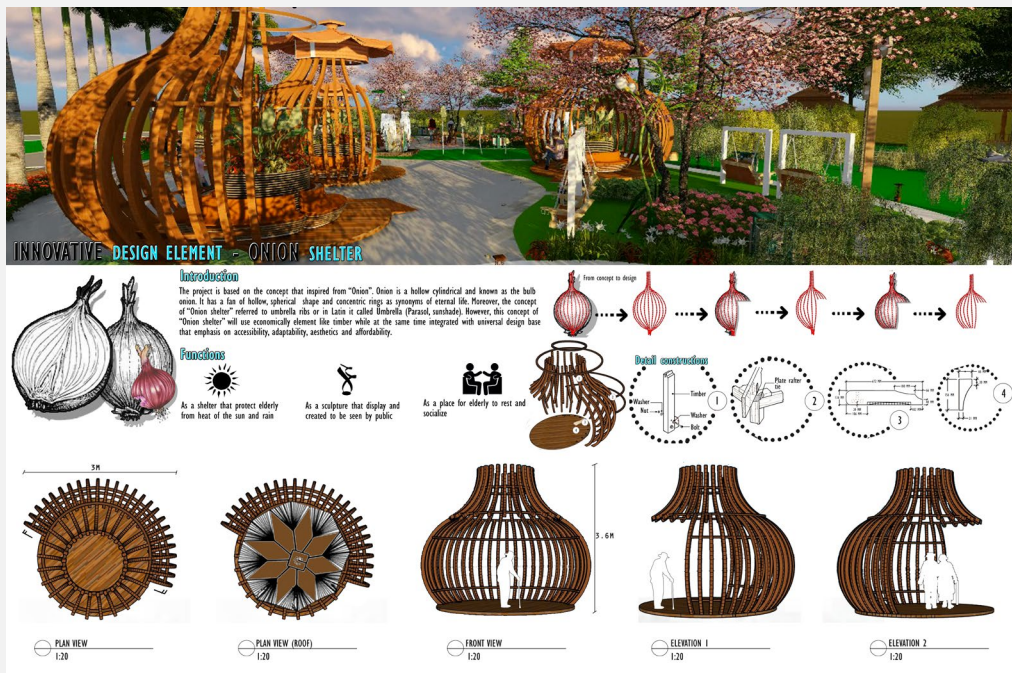


Figure 28: Morning view of onion shelter area

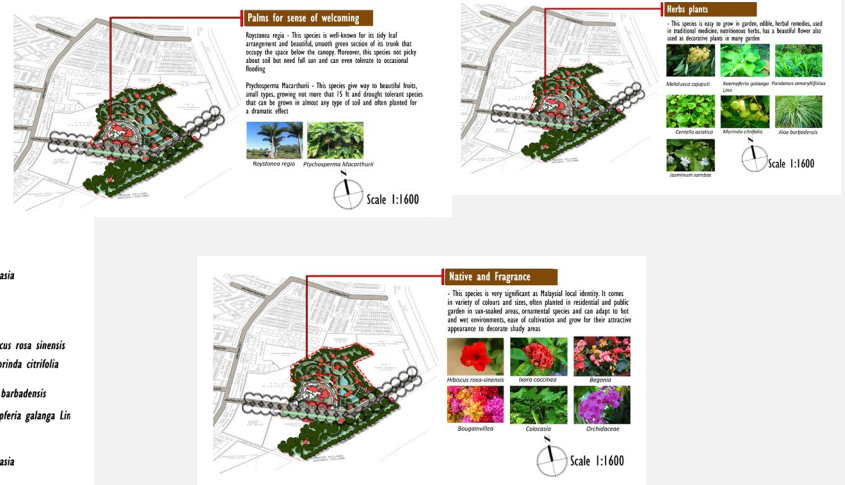
Figure 29: Night view of onion shelter area

SOFTSCAPE PLAN



Figure 30: Softscape plan

PLANTING CONCEPT



SOFTSCAPE SCHEDULE

Table 2: Softscape schedule

CATEGORY	SYMBOL	SCIENTIFIC NAME	COMMON NAME	HEIGHT	CANOPY	QUANTITY
TREE		Samanea saman	Rain tree	15-25m	30m	-
		Tabebuia rosea	Pink poui	8-15m	100cm	15 nos
		Buchida moliniei	Dwarf geometry tree	10-20m	10-15m	14 nos
		Salix babylonica	Weeping willow	9-15m	-	41 nos
		Morinda citrifolia	Indian mulberry	10m	15cm	6 nos
PALM		Roystonea regia	Royal palm	20-30m	3-5m	29 nos
SHRUBS/VINES		Hibiscus rosa sinensis	Shoeblack plant	2.5-5m	1.5-3m	22m ²
		Izora chinensis	Jajaram	1.5-3m	-	10m ²
		Bougainvillea	Paper flower	1-12m	2-6cm	15m ²
		Begonia spp.	Wax begonia	20-60cm	-	9m ²
		Colocasia esculenta	Elephant's ear	1.5m	-	13m ²
		Orchidaceae	Orchid	60cm	40cm	10m ²
		Jasminum sambac	Jasmine	0.5-3m	1.5-3m	23 nos
HERBS		Centella asiatica	Indian pennywort	15cm	-	10m ²
		Aloe barbadensis	Aloe vera	60-100cm	-	8m ²
		Kaempferia galanga Linn	Kencur/aromatic ginger	45cm	-	16m ²
		Pandanus amaryllifolius	Pandan	1-1.5m	15cm	11m ²
GROUNDCOVERS		Axonopus compressus	Carpet-grass	-	-	-
		Artificial grass	-	-	-	-

SOFTSCAPE PALETTE



Figure 31: Softscape palette

HARDSCAPE PLAN



Figure 32: Hardscape plan

HARDSCAPE SCHEDULE

ELEMENTS	MATERIALS	COLORS	SYMBOLS	QUANTITY
Lighting bollard	WPA steel	Grey and black		200 nos
Yellowish concrete pavers	Concrete	Yellowish		6 nos
Information board	Wood and steel	Brown and grey		8 nos
Recycled plastic swing	Plastic	White		8 nos
Water fountain	Stainless steel and ceramic	Grey and reddish		3 nos
Brick pavers	Brick	Red		18 nos
Marble pavers	Fluorite	Multi color		18 nos
Painting canvas	Wood and canvas	Brown and whiteish		5 nos
Gazebo	Wood	Brown		4 nos
Interlocking concrete pavers	Concrete	Multi color		1 nos
Reflexology stone	Public wash	White and black		1 nos
Synthetic wood bench	Synthetic wood	Brown and whiteish		24 nos
Wavy balance beam	Wood	Brown and whiteish		8 nos
Signage	Wood and steel	Brown and grey		6 nos
Sandbox	Hardwood	Whiteish peachish		1 nos
Tube slide	Wood and galvanized steel	Multi color		1 nos
Taps on platform	Wood	Brown		3 nos
Push and pull ups	Wood and galvanized steel	Multi color		13 nos
Calf raises	Wood and galvanized steel	Multi color		5 nos
Double cross-country skier	Wood	Brown		1 nos
Cardio combi	Solid steel	Multi color		4 nos
Airwalker	Solid steel	Multi color		3 nos
See saw	Wood and galvanized steel	Multi color		4 nos
Slides	Wood and galvanized steel	Multi color		2 nos
Spring rider	Wood and galvanized steel	Multi color		6 nos
Wooden bench	Wood	Brown		24 nos
Swing	Solid steel	Multi color		1 nos
Onion shelter	Wood	Brown		2 nos

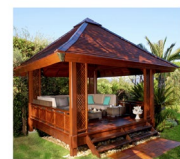
- 200 Nos Lighting Bollard
- Yellowish Concrete Pavers
- 8 Nos Information Board
- 8 Nos Recycled Plastic Swing
- 3 Nos Water Fountain
- Brick Pavers
- 18 Nos Dustbin
- Marble Pavers
- 5 Nos Painting Canvas
- 6 Nos Gazebo
- Interlocking Concrete Pavers
- Reflexology Stone
- 24 Nos Synthetic Wood Bench
- 8 Nos Wavy Balance Beam
- 6 Nos Signage
- 1 Nos Sandbox
- 1 Nos Tube Slide
- 3 Nos Taps on Platform
- 13 Nos Push and Pull Ups
- 5 Nos Calf Raises
- 1 Nos Taps on Platform with rounded snake pipe
- 9 Nos Arches
- Concrete Pavers
- 2 Nos Double Cross-Country Skier
- 4 Nos Cardio Combi
- 3 Nos Airwalker
- 4 Nos See Saw
- 2 Nos Slides
- 6 Nos Spring Rider
- 24 Nos Wooden Bench
- 1 Nos Swing
- Concrete Pavers
- 7 Nos Onion Shelter



Double cross-country skier



Onion shelter



Gazebo



Calf raises



Taps on platform with rounded snake pipe



Taps on platform



Push and pull ups



Arches

CONCLUSION

Designing a sustainable landscape is to promote a healthy environment for senior citizens. The many impacts are their psychological, physical and social aspects. The primary approach was using passive space (healing garden) to promote relaxation and reflexology. The second is a semi-active area (outdoor gym, outdoor learning centre and recreational area) to increase user activities and stay active. Lastly, is the active area (urban farming, market and café) to develop conducive outdoor spaces in long term impacts.

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