

A photograph of a lush, green public space. In the foreground, there are various plants, including tall grasses and broad-leafed shrubs. A metal railing runs across the middle ground. In the background, a modern building with a curved, metallic facade is visible. The scene is bathed in warm, golden light, suggesting late afternoon or early morning. The overall atmosphere is serene and inviting.

Transforming Unused Shaded Public Space for the Community at Villa Verde

Singapore

01 Project Statement

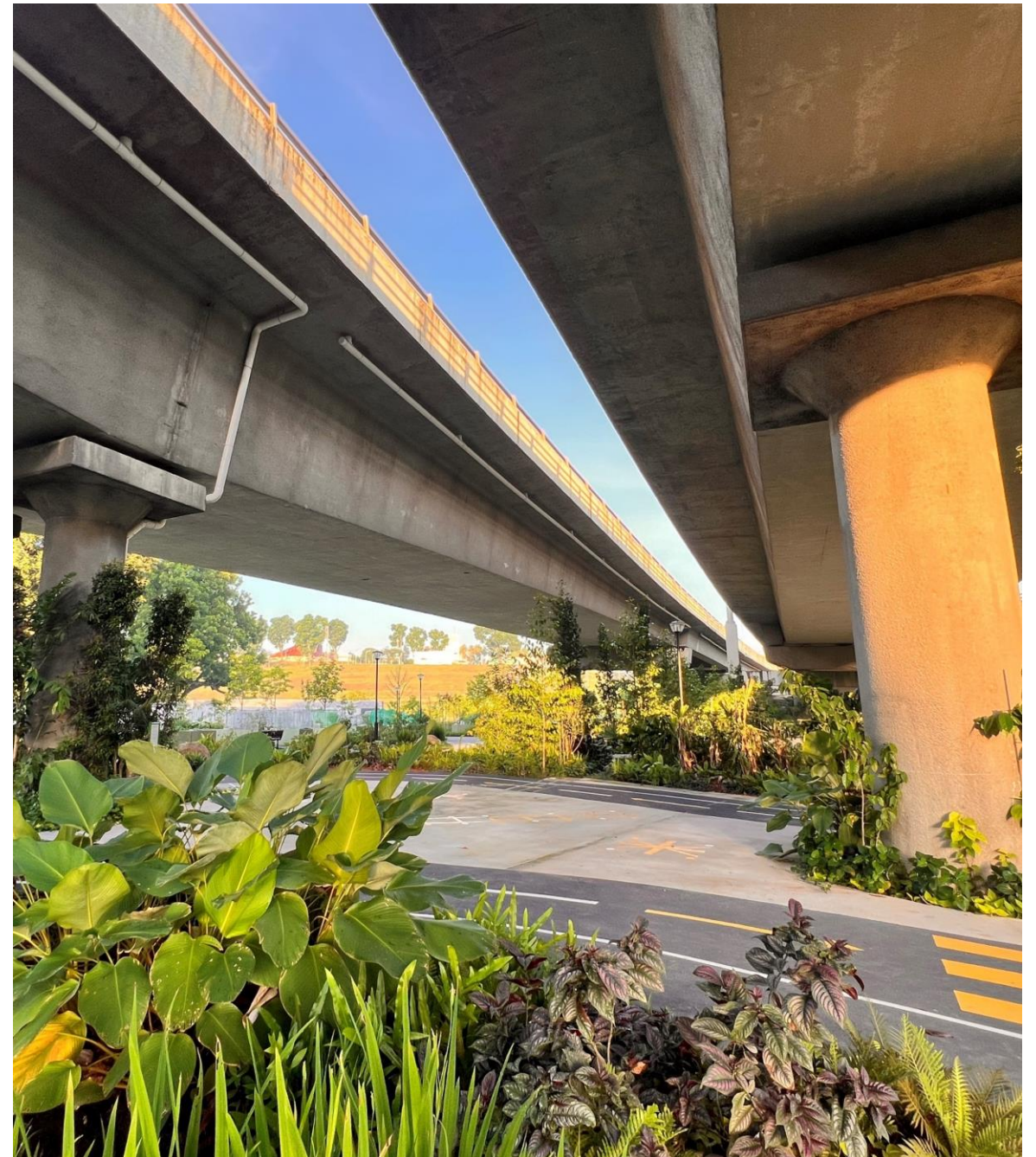
Transforming unused shaded public space for the community at Villa Verde

Singapore

Singapore, despite its limited size and high urbanisation, has consistently maintained a reputation for lush greenery. However, the looming challenges of climate change, particularly rising temperatures, threaten the city's liveability. In response, Singapore's City in Nature vision aims to fortify the green infrastructure to counteract the effects of escalating temperatures, with a strong emphasis on community involvement.

The Villa Verde Park exemplifies community-driven transformation, converting an unused shaded public space under a flyover into a thriving park. The community wanted to use the unused shaded areas under the flyover for social and recreational uses. The park's design strategically situates activity spaces in shaded areas, informed by comprehensive analysis of annual shade patterns. Plant selection is tailored to the specific sunlight conditions of each area, while the integration of bioswales and raingardens ensures sustainable water management, reducing reliance on artificial irrigation during dry periods. Notably, approximately 40% of the park's trees are mature transplants salvaged from ongoing development projects across Singapore, providing instant shade and enhancing thermal comfort in non-shaded areas.

The Villa Verde Park serves as a testament to cost-effective solutions for creating inviting outdoor spaces in high-temperature urban settings, offering opportunities for people to comfortably enjoy green environments.



02 Project Narrative and Contents

The concept of heat-resilient park design has gained significant traction in urban planning, particularly in response to the growing challenges posed by urban heat islands. In the context of Singapore, the need for such innovative designs is further underscored by the country's tropical climate and the increasing frequency of heatwaves.

The Villa Verde Park project was initiated as a ground-up effort, with residents near the site requesting government agencies to transform an unused space under a flyover into a park. The community observed the area to be consistently windy and shaded, envisioning its potential as a park that could serve as a respite from hot, dense urban areas.

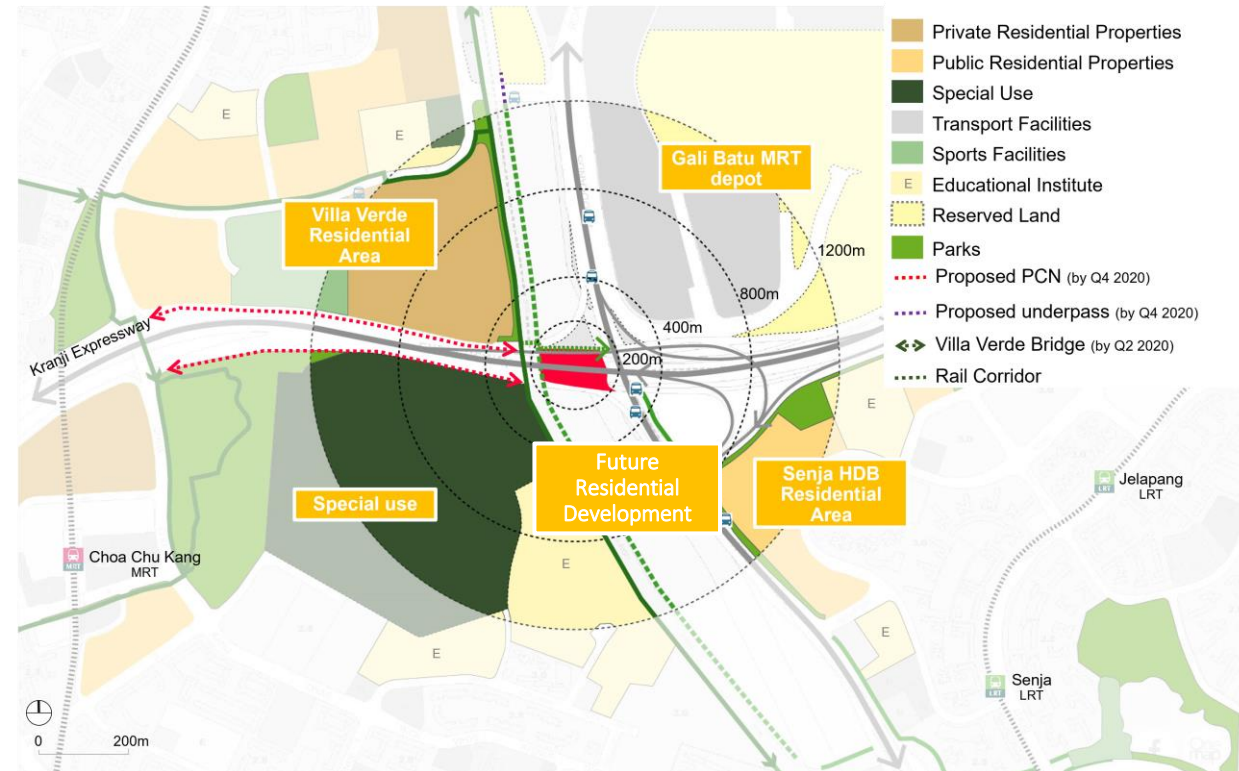
Project location:

The project is situated in the residential area of Choa Chu Kang in Singapore, in proximity to high-density private and public residential areas. Placing the park within a 10-minute walking distance of both private and public residential areas ensures that it is easily accessible to a wide range of residents, promoting inclusivity and encouraging diverse community participation.

The surrounding area is projected for significant development as a public residential estate. The park's strategic location fosters community engagement by providing a central gathering space for residents from both existing and future residential developments. This forward-looking approach ensures that the park will continue to serve as a valuable community asset as the surrounding area evolves.



Site Location in Singapore's context



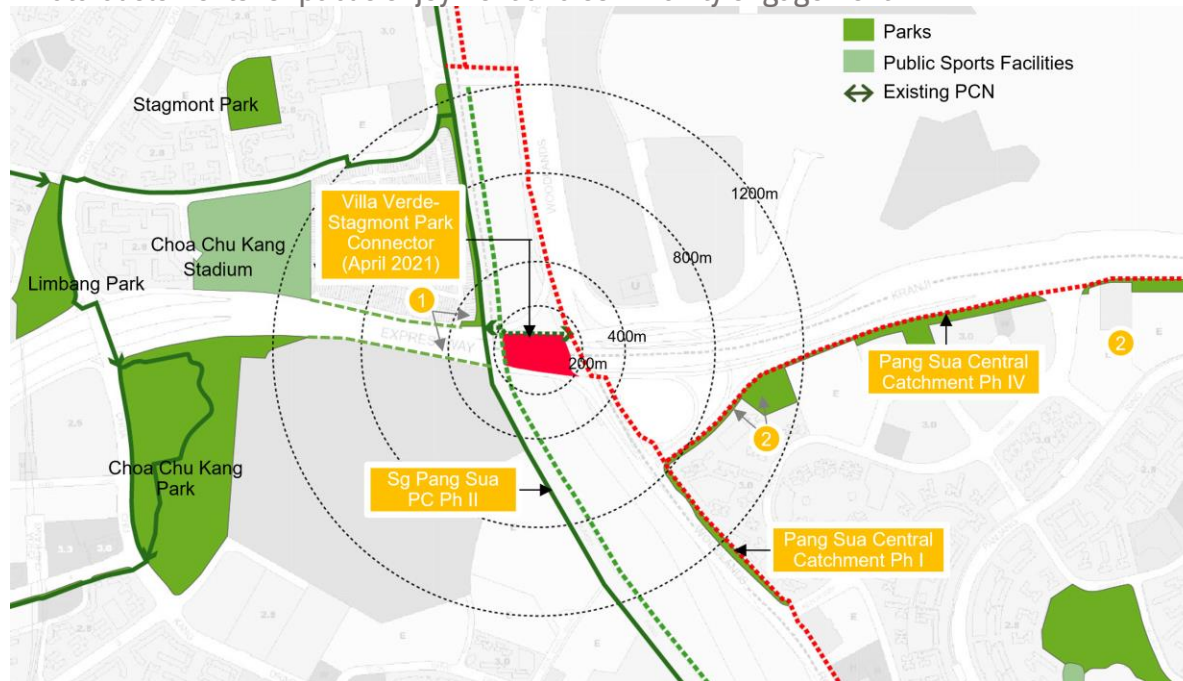
Surrounding Landuse (as of 2019)

02 Project Narrative and Contents

Context analysis:

The site is located between two canals on the East-West and future residential developments on the North-South. However, the park is well connected to surrounding private and public residential areas, as well as different parks within a 10-minute walking radius, via a network of Park Connectors. The adjacent Park Connector also creates an opportunity to establish this park as a shaded rest stop for cyclists and pedestrians using the Park Connector for commuting and recreational purposes.

Additionally, the site contains a stretch of the Rail Corridor, a former railway line transformed into an island-wide 24-kilometer green spine that integrates recreational, cultural, and natural elements for public enjoyment and community engagement.



Surrounding Parks and Park Connector Network (PCN) (as of 2019)

Furthermore, the designers have studied the ecological importance of the site, considering its proximity to freshwater marshes and a nature reserve. The linear Rail Corridor, Park Connectors, and adjacent canals also act as ecological links, connecting the site to nearby important habitats.



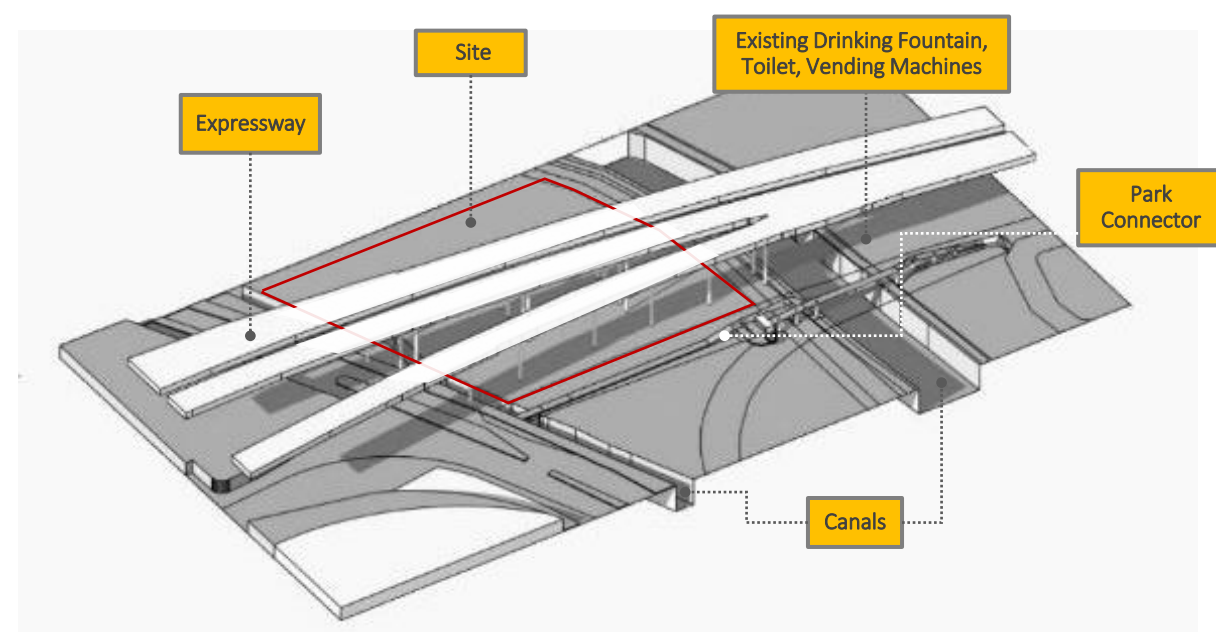
Ecological analysis

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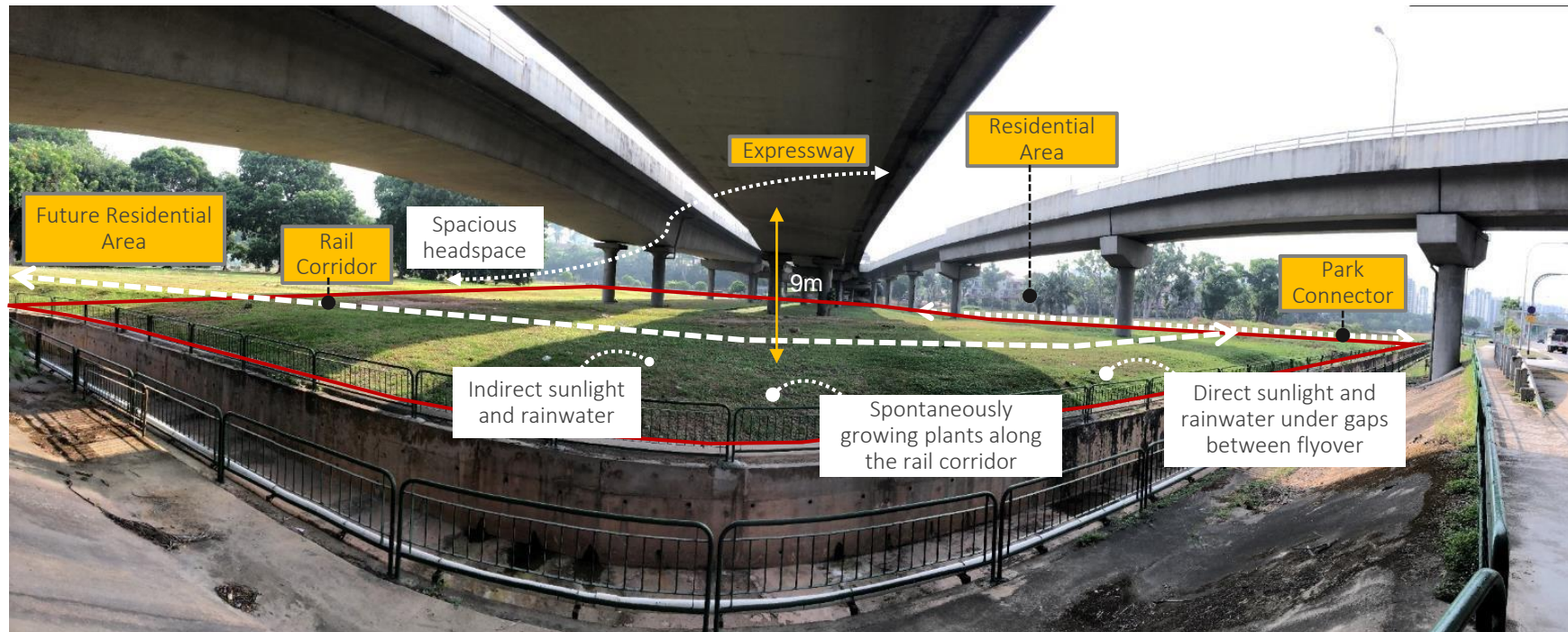
Site analysis:

The key physical feature of the site is the expressway flyover, which covers around 45% of the total 13000 Sq.m. of the site area. The positions and significant sizes of the flyover columns, and the limitation on planting due to limited sunlight, were significant constraints to creating a park nestled in a natural setting.

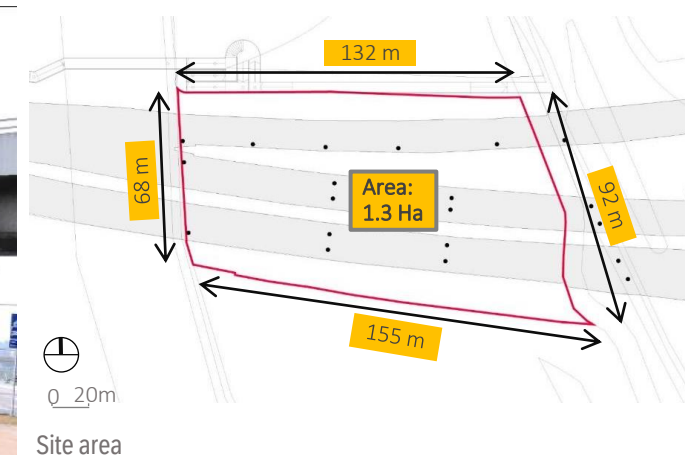
However, the expressway above the site created an opportunity to develop a park that could be utilised at any time of the day, especially considering that most outdoor spaces are often underutilised by the public due to high temperatures and the possibility of heat stress. The high height clearance of approximately 9m from the bottom of the flyover soffit and the park created a non-claustrophobic space under the flyover with comfortable wind flow.



Site perspective



Site photo, 2020



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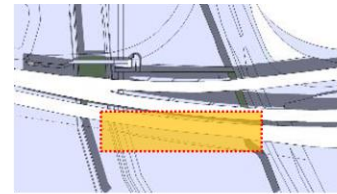
Site analysis:

The design of the park had to prioritise government regulations for building under the flyover, considering the structural and fire safety of the vehicles using the flyover as well as users using the park under the flyover.

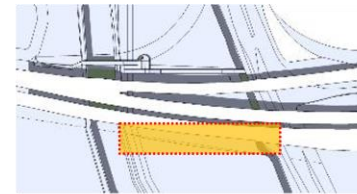
A thorough shade pattern analysis was conducted to understand the amount of sunlight received by different parts of the park. The shade analysis was done using a 3D model with the real location, and simulations were carried out for the entire year to analyse changes in the shade patterns.

The location of small hills on the North-East and South-West of the site also creates a wind flow through the space, providing a comfortable environment for afternoon use, considering the high humidity in Singapore.

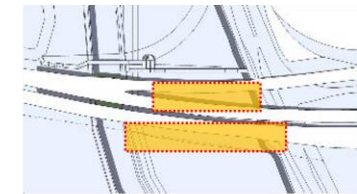
Regardless of low sunlight and limited access to rainwater, most of the site observed the growth of spontaneous plants on the unused site, assuring that even the shaded parts of the site are suitable for planting.



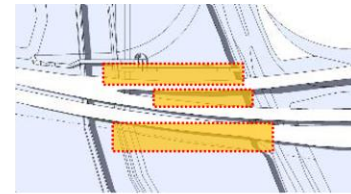
January 3pm



February 3pm



March 3pm



April 3pm



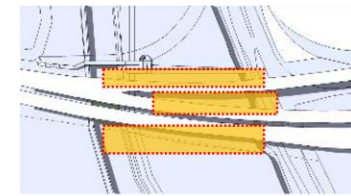
May 3pm



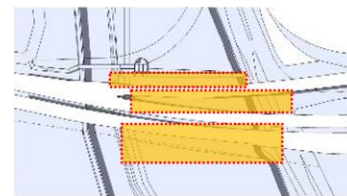
June 3pm



July 3pm



August 3pm



September 3pm



October 3pm



November 3pm



December 3pm

Area with direct sunlight
Shade analysis of the site



Site photos of the unused space, 2019/2020

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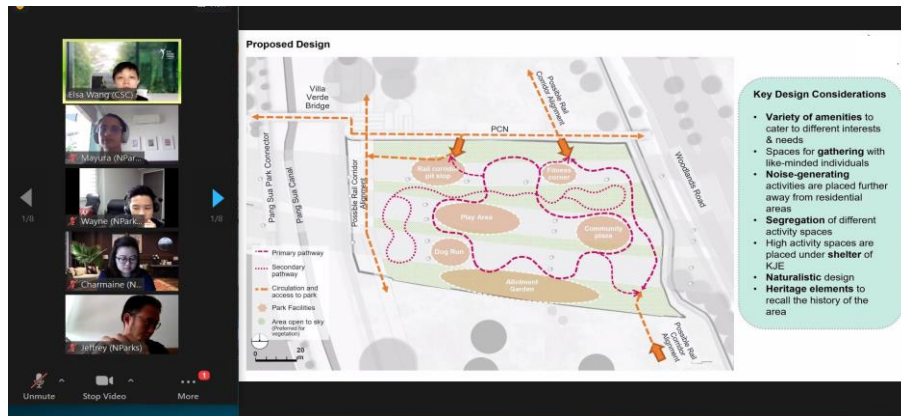
Community Engagement:

Another strength of the project lies in the surrounding community's enthusiasm for participating in co-creating this park with the landscape architects and park managers. Despite the site's constraints being situated under a significant flyover, the community and the government agencies recognised a great opportunity in activating the unused shaded space to develop an active park for nearby residents and diverse users utilising the Rail Corridor and Park Connector.

A team of experts closely collaborated with the local community, including residents, a park advocacy group, and an interest group of the Rail Corridor, to design the park's features. The community engagement sessions enabled the Landscape Architects to incorporate user needs and community stewardship in the park design process. The community suggested a variety of shaded spaces for community activities such as group exercises, performances, and gardening workshops. Additionally, the team worked with young participants from the Youth Stewards for Nature Programme who provided inputs for the design of the Nature Playgarden.

Furthermore, the team collaborated with a resident, who is a doctor at one of the local hospitals, to study and select suitable equipment for the fitness corner and to add ground markings for self-directed physiotherapy exercises within shaded areas.

The community also emphasised the creation of naturalistic spaces that would provide them with a respite from dense, hot urban areas. Members also requested the park to be a gathering space for the community to actively participate in various group social events as well as individual gardening activities.



02 Project Narrative and Contents

Concept Design:

Taking inputs from the community and after detailed site analysis, the park was designed along three key concepts:



1

To create a heat-resilient park for various community bonding activities.



2

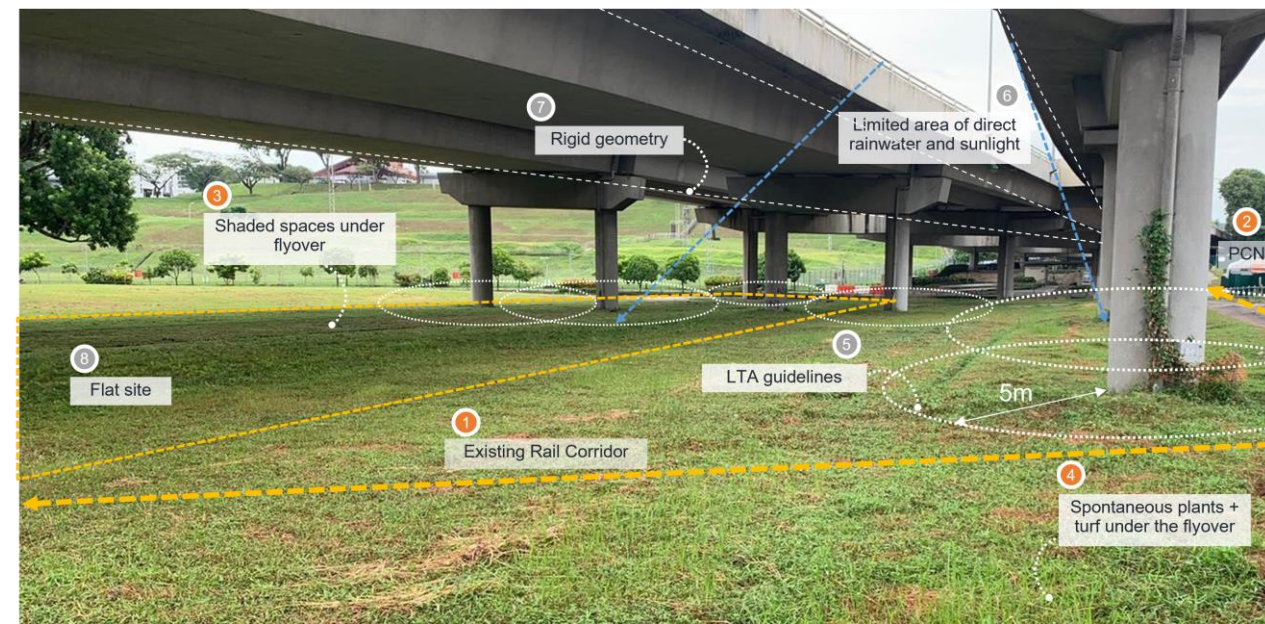
To optimise the open-to-sky spaces to create cooling, naturalistic, and vibrant park spaces to revive the unused land under the flyover.



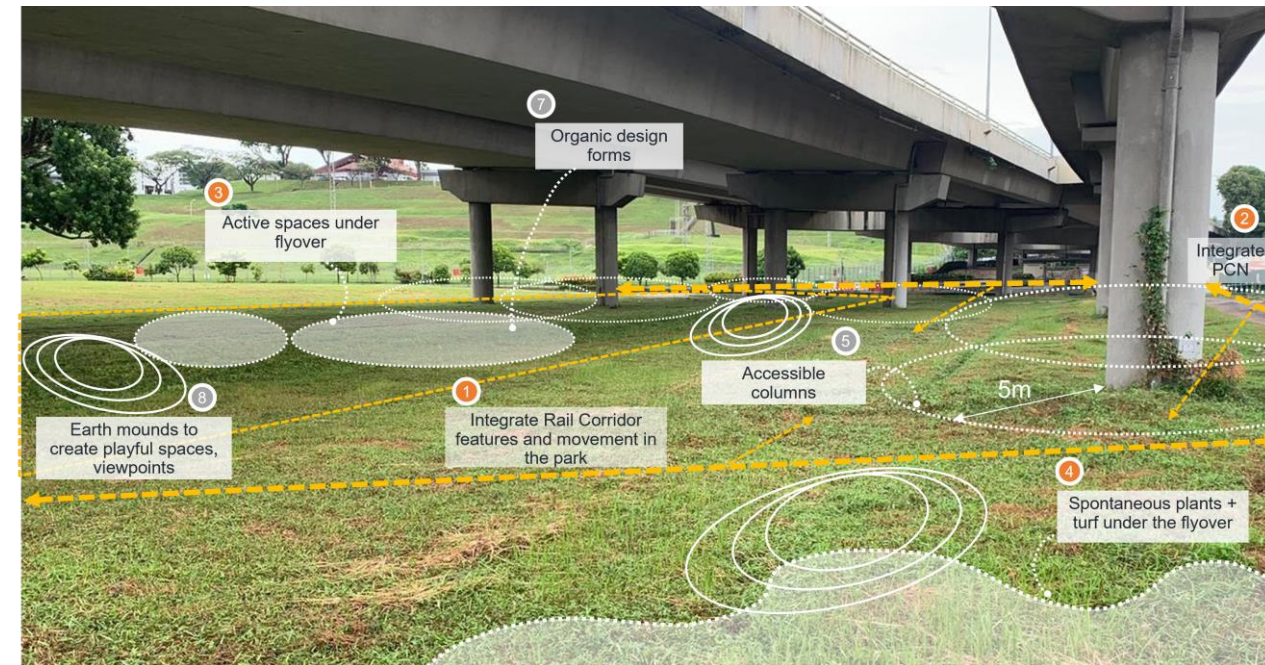
3

To create a shaded resting node integrated into the cultural heritage of the site for cyclists and pedestrians using the adjacent Park Connector and Rail Corridor.

The park design also took into consideration the adjacent future developments, ensuring that the design of the park seamlessly merges with the future public spaces.



Site SWOT analysis



Proposed Concept Design

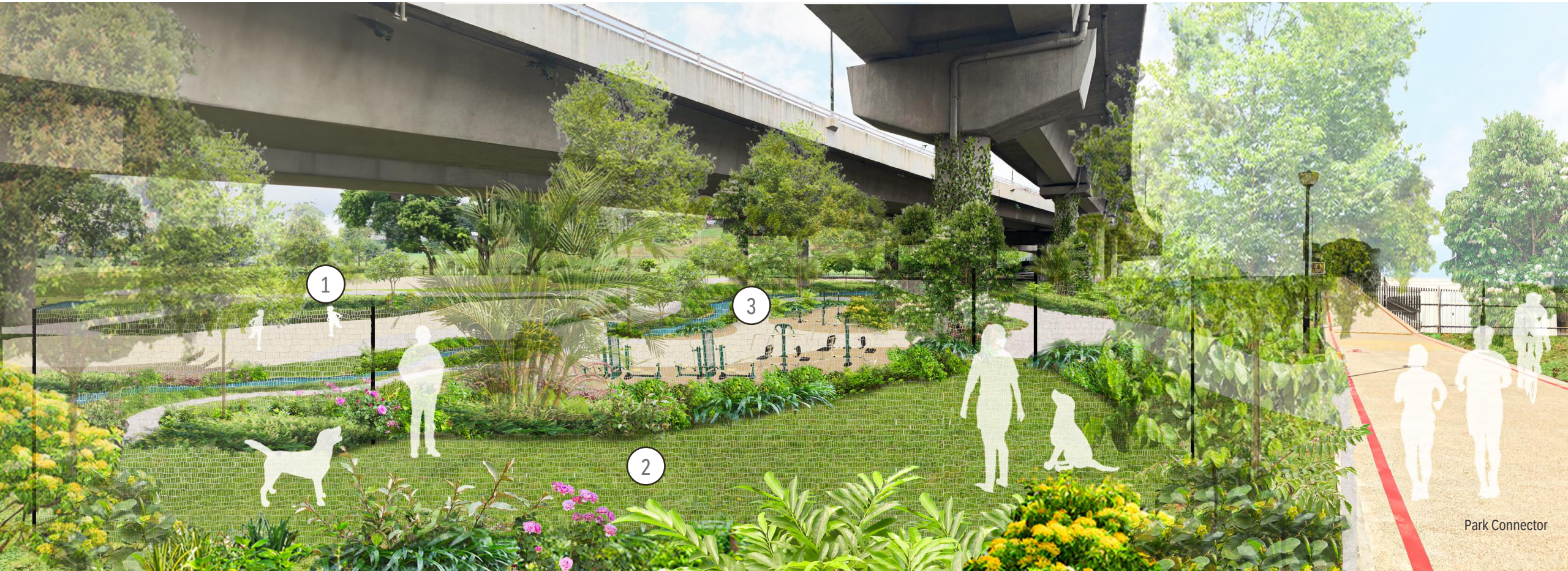
02 Project Narrative and Contents

Concept Design Layout



02 Project Narrative and Contents

Concept Design – Artist's Impression



① Multipurpose Plaza Sheltered

② Dog Run Unsheltered + Seating area for dog owners Sheltered + Water point for dogs

③ Fitness Corner Sheltered

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Concept Design – Artist's Impression



① Allotment Garden Lots (plots of land available for rent by community members) Unsheltered

② Community Plaza for gardening workshops Sheltered

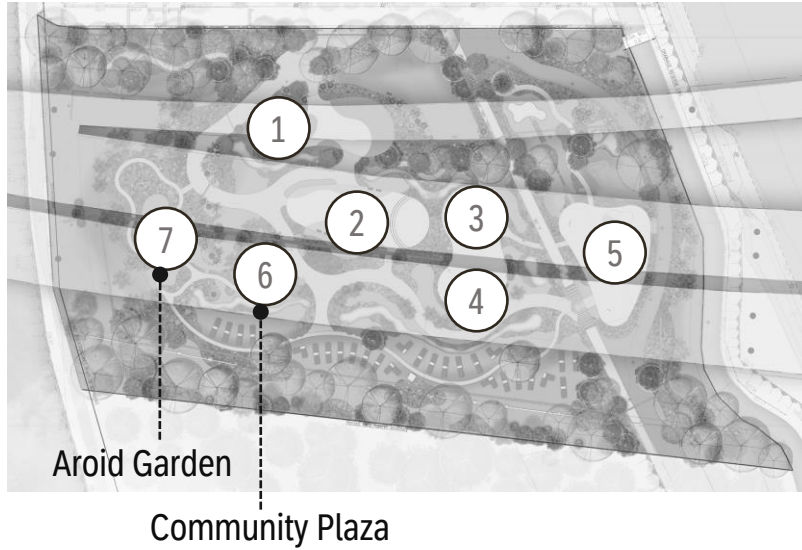
③ Multipurpose Plaza Sheltered

④ Bioswale

02 Project Narrative and Contents

Concept Design 1 To create a heat-resilient park for various community bonding activities.

Shaded Areas



Fitness Corner



Multipurpose Plaza



Physiotherapy Markers



Toddler's Cycling Track

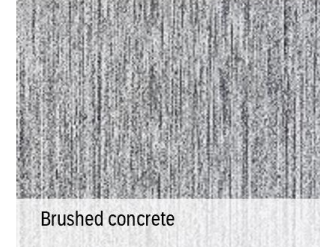
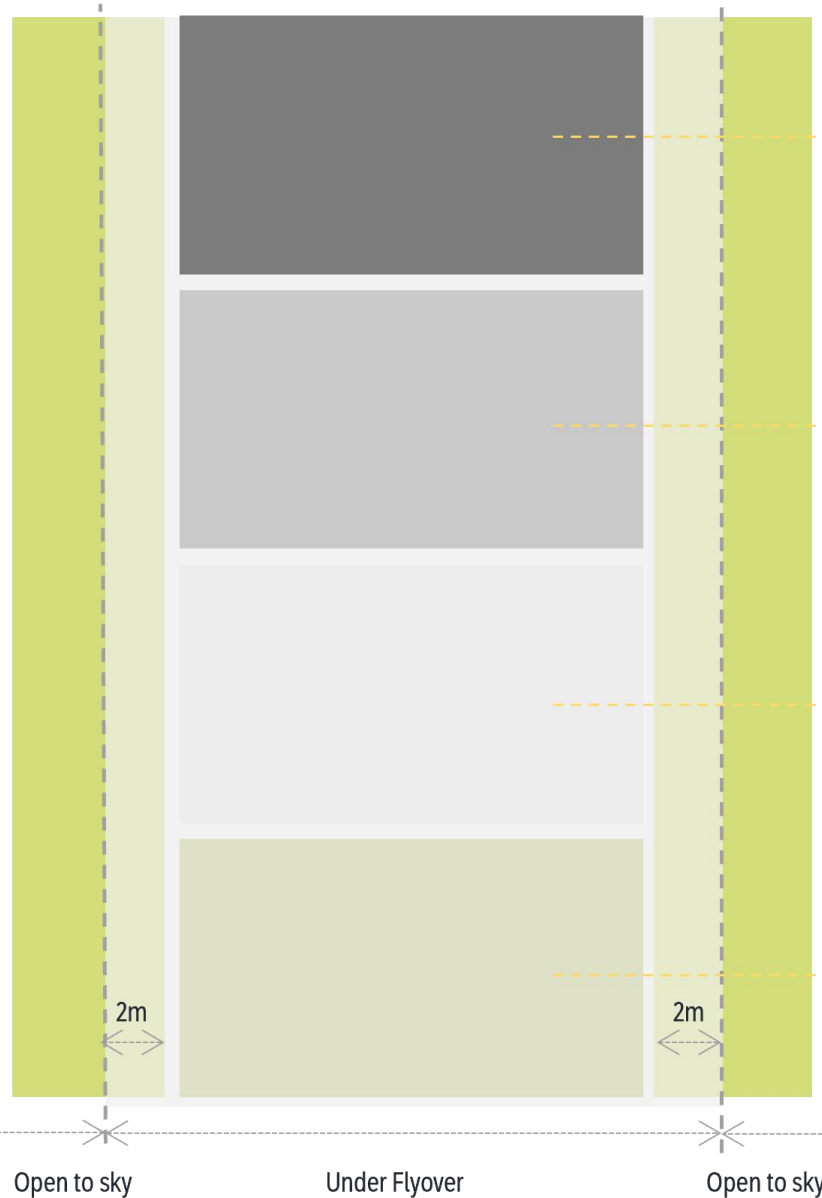


Playground

02 Project Narrative and Contents

Concept Design 1 To create a heat-resilient park for various community bonding activities.

Cool Pavement Materials



Using materials for walkways and pavements that have high solar reflectance and low heat absorption to minimize the heat island effect and reduce surface temperatures.

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Concept Design 1 To create a heat-resilient park for various community bonding activities.

Cool pavement materials



Materials used for walkways have high solar reflectance, permeability and low heat absorption to minimise the heat island effect and reduce surface temperatures.

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Concept Design 1 To create a heat-resilient park for various community bonding activities.

Cool pavement materials



Materials used for walkways have high solar reflectance and low heat absorption to minimise the heat island effect and reduce surface temperatures.

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Concept Design 1 To create a heat-resilient park for various community bonding activities. Improve Ground Water Level



Features such as Bioswales and Rain Garden, and permeable materials help improve ground water level, reducing reliance on artificial irrigation during dry periods

02 Project Narrative and Contents

Concept Design 1 To create a heat-resilient park for various community bonding activities.

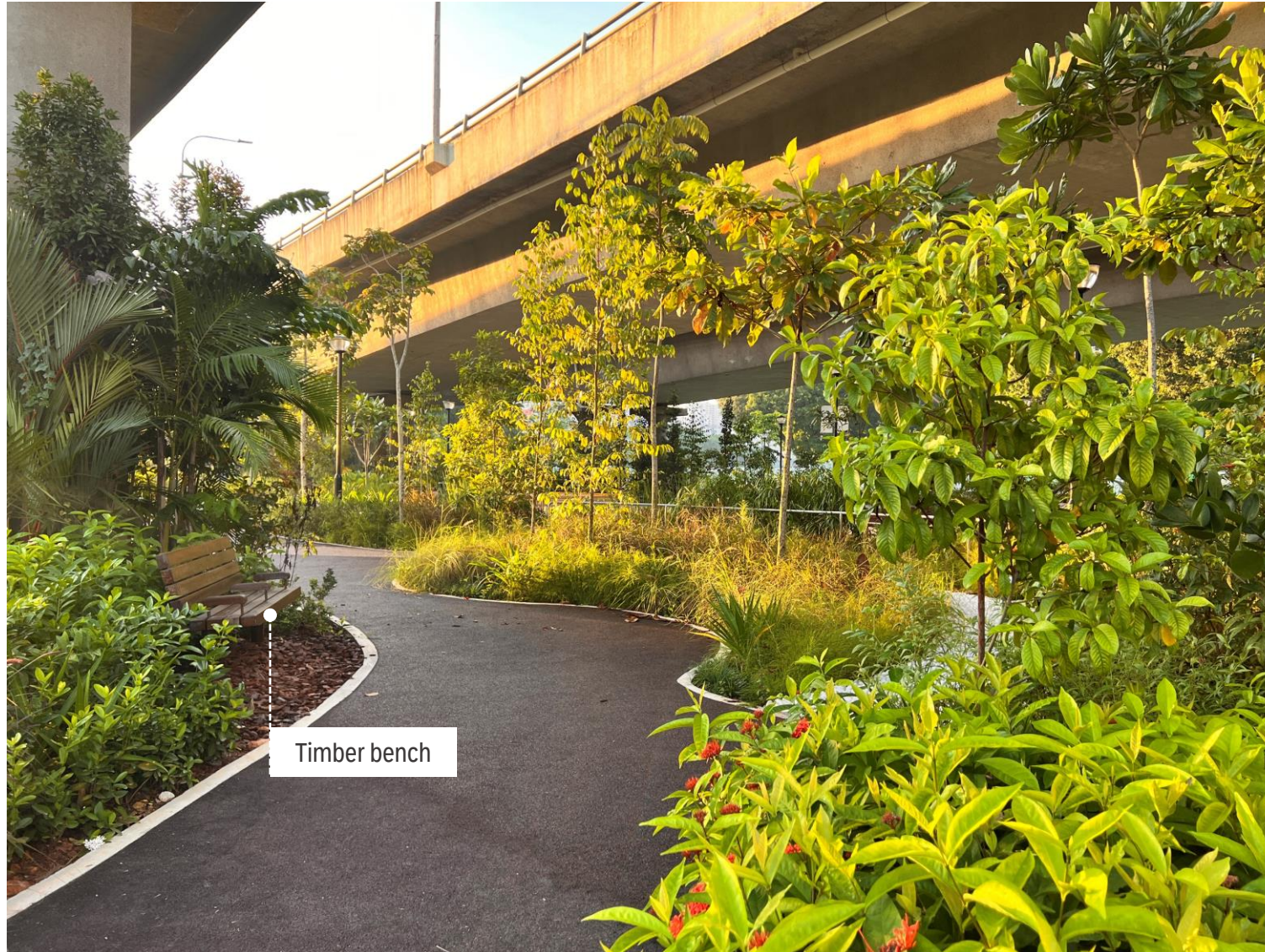
Ventilation and Airflow



The park layout optimises natural ventilation and airflow, taking advantage of the wind patterns and the open space under the flyover to create a comfortable environment

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Concept Design 1 To create a heat-resilient park for various community bonding activities. Heat-resilient landscape furniture



Timber bench



Recycled log play



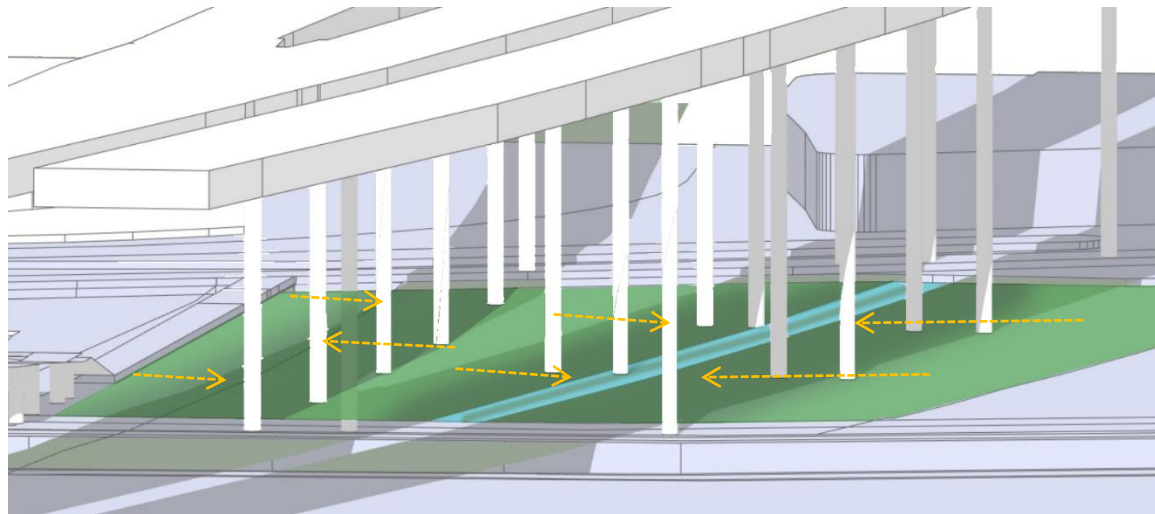
Recycled log seats

The park furniture and play equipment are selected to minimise heat retention, ensuring user comfort during hot weather.

02 Project Narrative and Contents

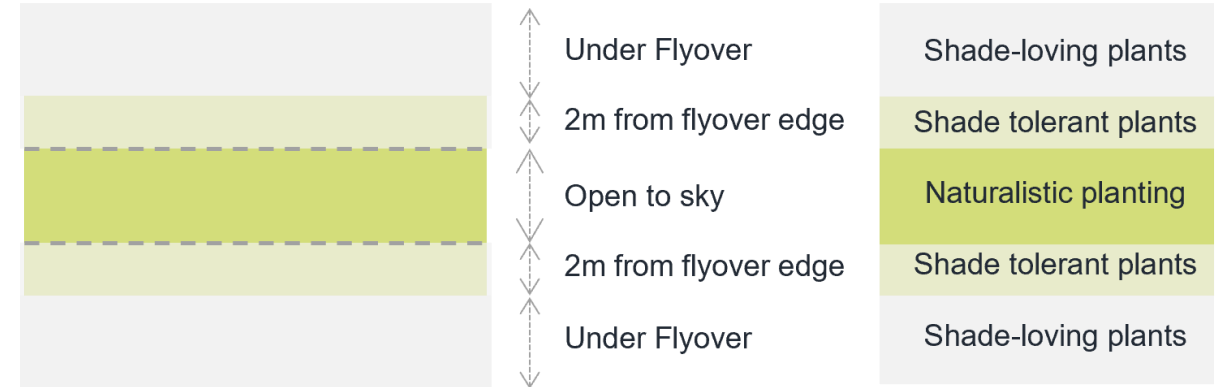
Concept Design 2 To optimise the open-to-sky spaces to create cooling, naturalistic, and vibrant park spaces to revive the unused land under the flyover.

The planting is selected after studying the shade patterns to ensure that the plants thrive without the need for artificial irrigation. Within the open-to-sky area, plants are chosen to create multi-tiered planting, incorporating mature trees transplanted from ongoing development areas in other parts of Singapore. This approach has facilitated the creation of instant shade in sun-exposed areas and the development of diverse habitats. Additionally, the planting is strategically located to avoid obstructing comfortable wind flow.

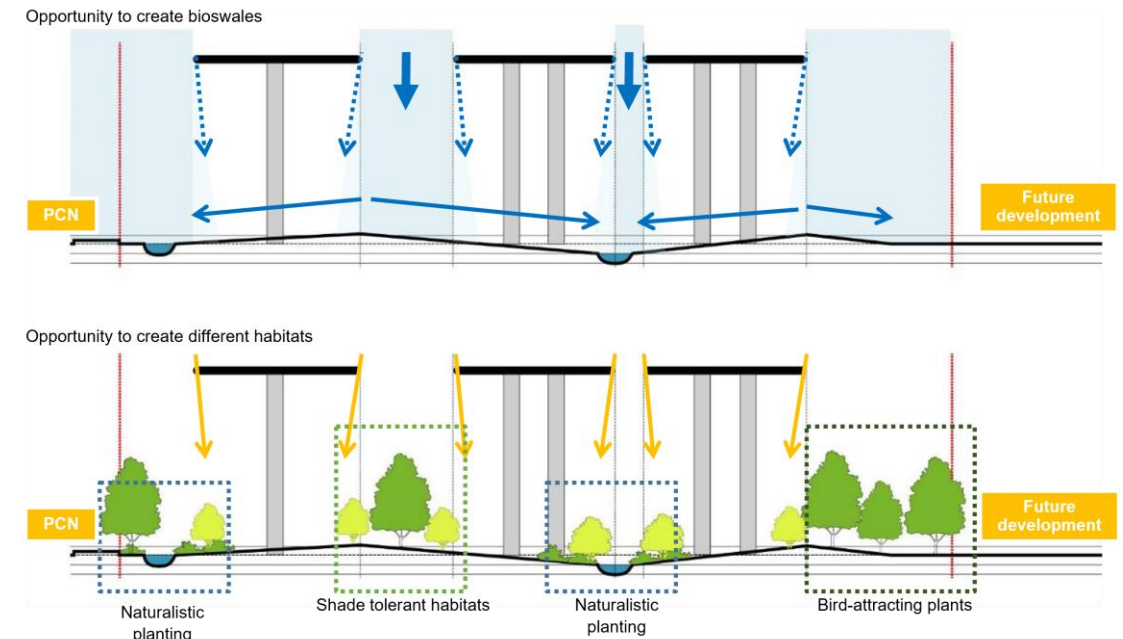


Gentle slopes that will naturally water the areas covered by flyover, reducing need of manual watering / irrigation needs during the dry and hot periods

Drought-resistant planting design



Planting design zones



Planting design concept depending on shade intensity

02 Project Narrative and Contents

Concept Design 2 To optimise the open-to-sky spaces to create cooling, naturalistic, and vibrant park spaces to revive the unused land under the flyover.

Heat-tolerant and Shade-tolerant plants



Groundcover

Butterfly and bee-attracting

Shade loving

Fragrant plants

Edging plants

Trees

Bioswale

Shade loving purples

Palms

Selection of heat-tolerant and shade-tolerant plants

Aroid garden- Small shrubs

Butterfly and bee-attracting

Aroid garden- Flower columns

Aroid garden- Groundcover

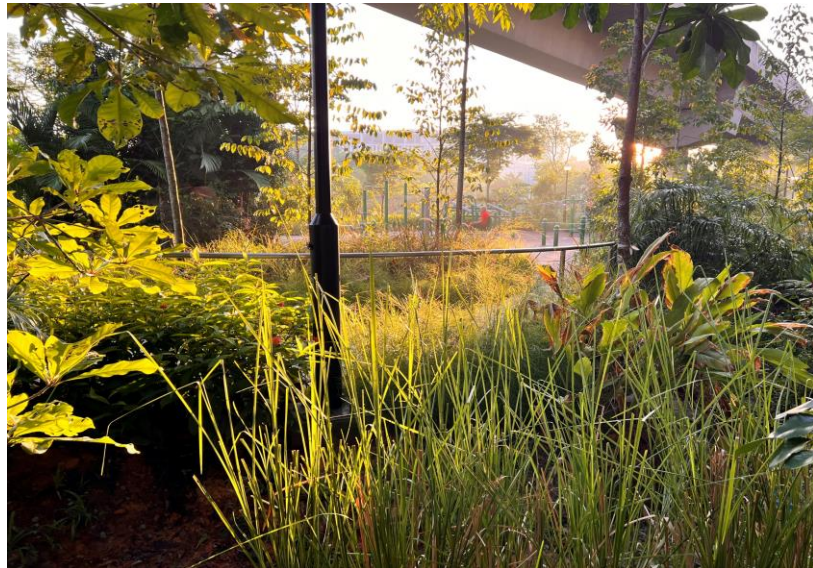
Aroid garden- Signature shrubs

Spider like plants

02 Project Narrative and Contents

Concept Design 2 To optimise the open-to-sky spaces to create cooling, naturalistic, and vibrant park spaces to revive the unused land under the flyover.

Heat-tolerant plants



02 Project Narrative and Contents

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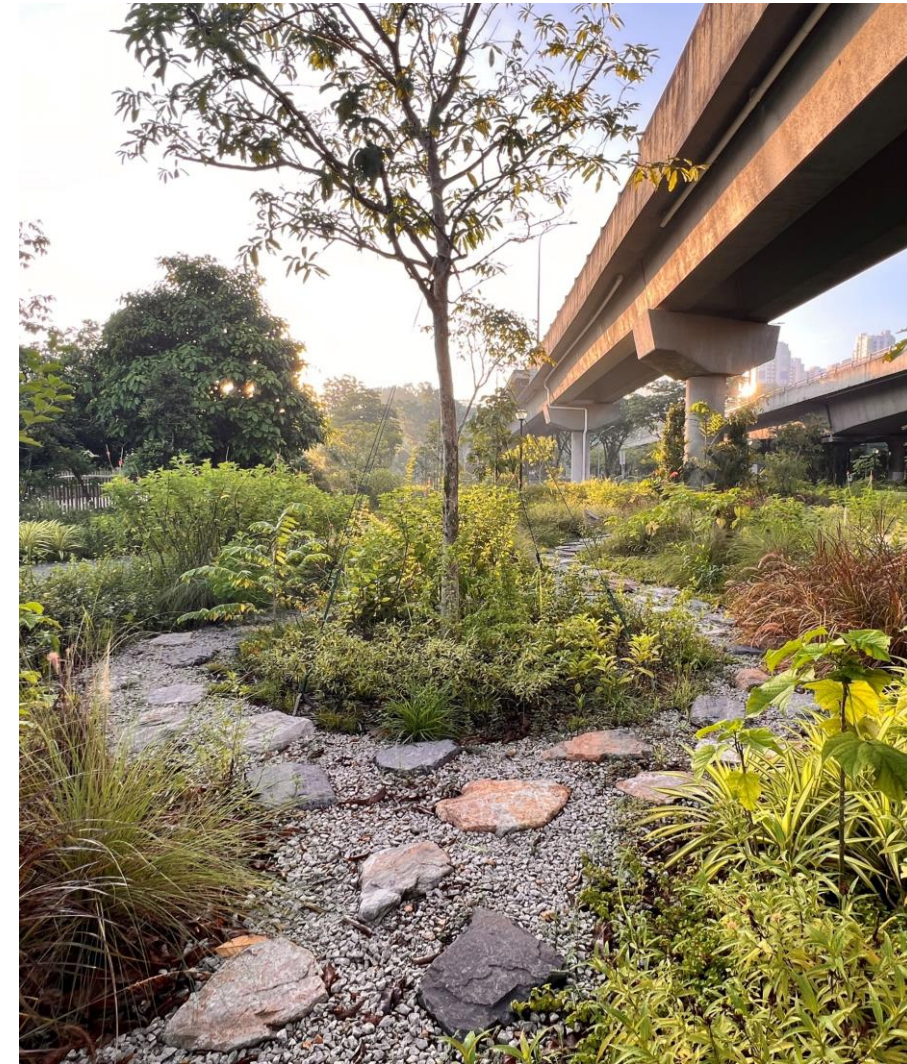
Shade-tolerant plants



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Concept Design 2 To optimise the open-to-sky spaces to create cooling, naturalistic, and vibrant park spaces to revive the unused land under the flyover.

Instant shade creation



Approximately 40% of the park's trees are mature transplants salvaged from ongoing development projects across Singapore, providing instant shade and enhancing thermal comfort in non-shaded areas.

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Concept Design 3 To create a shaded resting node integrated into the cultural heritage of the site for cyclists and pedestrians using the adjacent Park Connector and Rail Corridor.

Resting Node



02 Project Narrative and Contents

Post-implementation impact:

In conclusion, the revamped site has become actively utilised by individuals of all age groups, even during relatively hot days, showcasing its effectiveness as a truly heat-resilient park. The project represents a cost-effective solution to address urban heat challenges and create thermally comfortable outdoor spaces in hot and humid cities without relying on expensive mechanical or infrastructural solutions.

By leveraging existing shade patterns, strategic landscaping, and community-centric design, the park effectively mitigates the impact of high temperatures, providing a welcoming environment for outdoor enjoyment. This approach not only reduces the reliance on costly mechanical cooling systems but also promotes sustainable and environmentally friendly practices in urban planning. As a result, the project serves as a model for creating heat-resilient and inclusive public spaces that enhance the well-being of communities while minimising the financial burden associated with traditional cooling solutions.

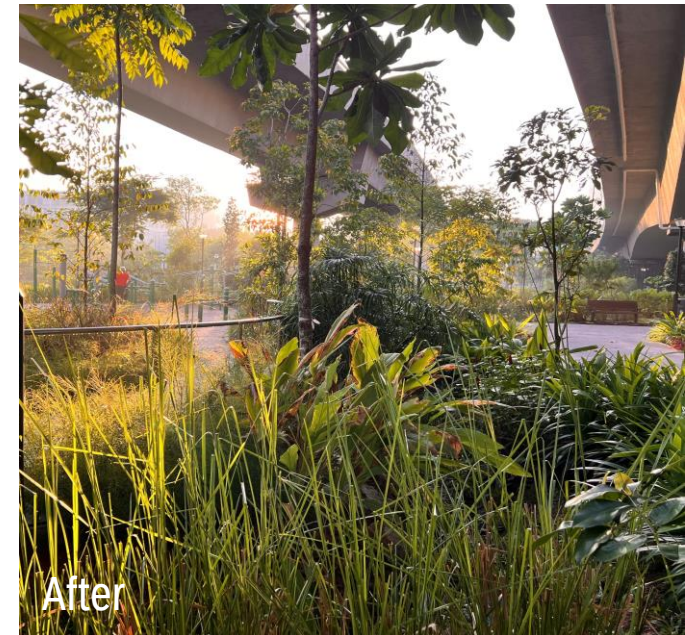
“The Villa Verde Park has some unique features that sets it apart such as a toddler’s cycling track and unusual physiotherapy floor markings, and.. without the community’s inputs this space would have been left empty” – Channel News Asia, Jan 2024

“After work, we can go for a walk at nearby green park, relax, and refresh ourselves after a day at the workplace ...”- resident of Villa Verde, Nov 2023

“Would love to see more such spaces underneath MRT/LRT lines being transformed into useful and purposeful spaces for all...”- member of public, Jan 2024



Before



After