Courtney Jade Shaw 17043795
M(Prof) Arch 2023
Supervised by Dr Coralie van Reenen

only 27% of people receive adequate treatment

47.5%
South Africa's mental health quotient

mental health

1 in 6 suffer from anxiety, depression and/or substance abuse

<4%
of the national health budget is allocated to mental health services

passive healing

urban wellbeing

<10%
of the total urban area of most South African cities are dedicated to public parks

green space

urban heat mediation

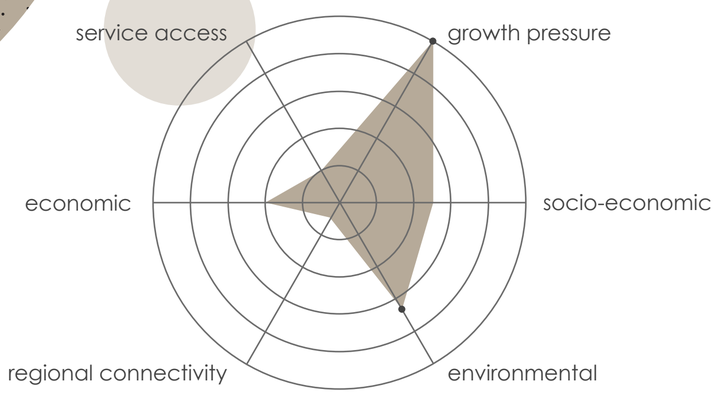
+3°C
urban heat island effect

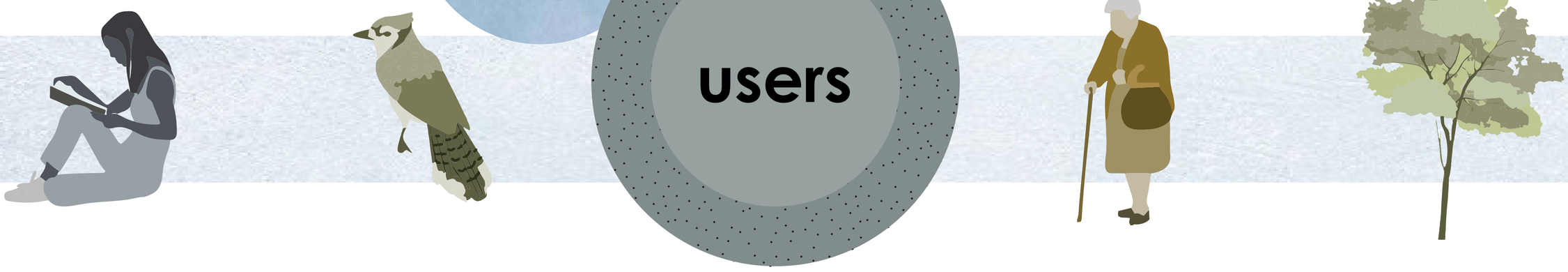
9m²
of green space per person recommended by WHO

urbanisation

high growth pressure

3.5m → **5.8m**
city of tshwane population 2018 → city of tshwane population 2050





users

c o n t e x t u a l g r o u n d i n g

mental health:
city dwellers

urbanisation:
the city

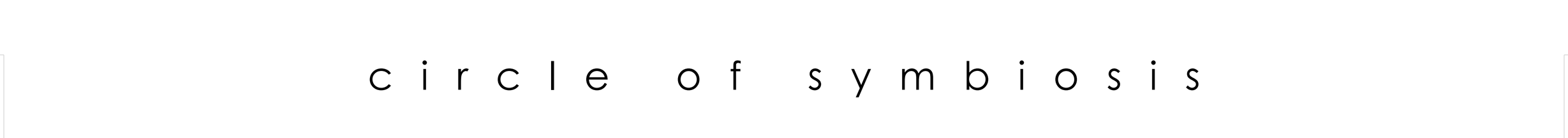
green space:
public parks

symbiosis

urban growth
lifestyle. vulnerability & opportunity

passive healing & relationship with nature
community & preservation

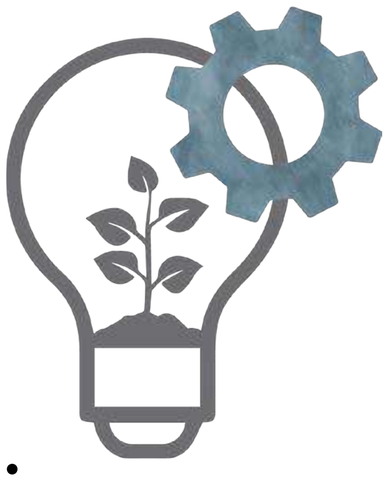
city identity & heat control
access & infrastructure



circle of symbiosis

1.

2.



3.

4.

5.

project outcomes

1. The rehabilitation & revitalisation of the existing site as a critical public green space in the city as it continues to densify.
2. Provide an enriched healing experience to users based on the principles of the 'Sense of Coherence' by sociologist Aaron Antonovsky.
3. The integration of IBTs, passive design strategies and energy-efficient buildings that promote environmentally sustainable and responsible architectural practices.
4. Reduce the pressure on existing mental healthcare services by providing a diverse range of opportunities for complementary treatment options that function alongside conventional interventions for outpatients and the general public.
5. Promote a healthier lifestyle for urban dwellers by reconnecting users back to nature and their community.

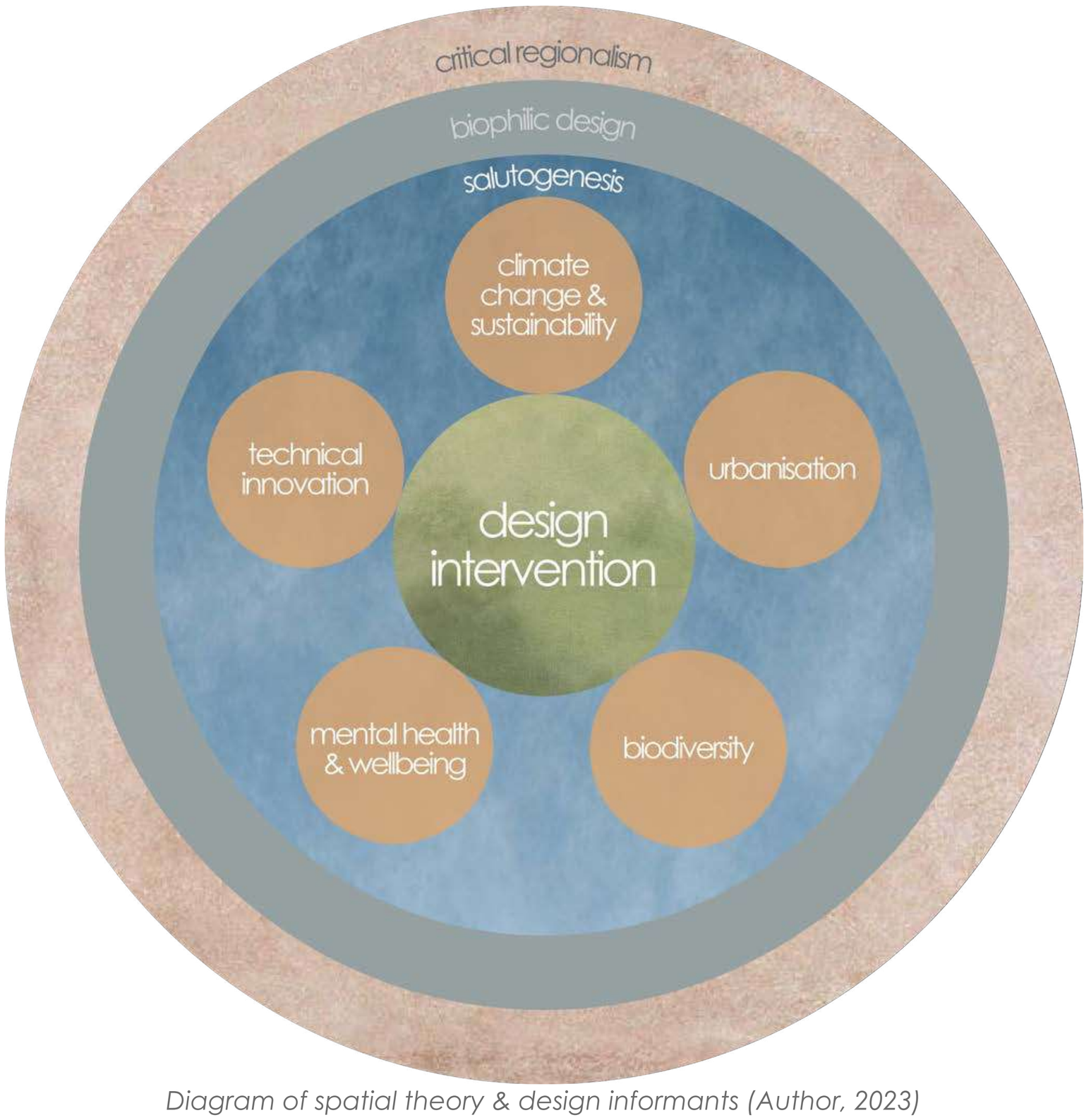
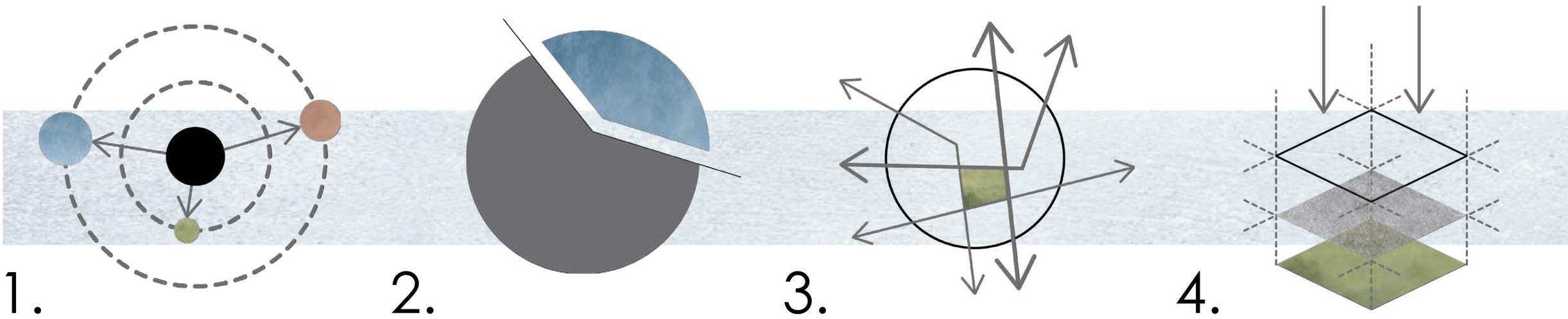


Diagram of spatial theory & design informants (Author, 2023)

site selection criteria

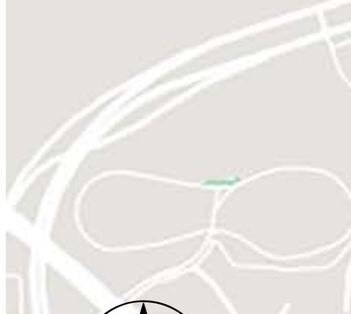
1. Proximity to a variety of potential user groups.
2. An underutilised public green space with critical environmental characteristics in need of rehabilitation.
3. Ease of access or the potential for improved accessibility into and across the site.
4. Has existing programmes that the intervention can tie into and extend upon.



1. 2. 3. 4.

t h e o r y & d e s i g n p r i n c i p l e s

reconnecting Pretoria’s public green space along river & open green space networks - introducing urban wellness infrastructure



Human Activity - Private vs Public

Interconnectedness

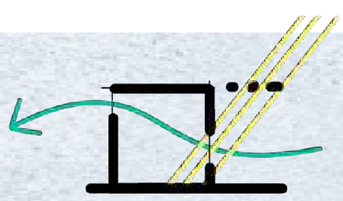
Public Open Space

Extension of Green Space

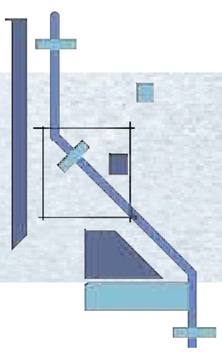
Scale, Barrier & Connectivity

Tectonics - Respect the Existing

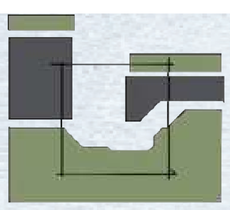
Regenerative Socio-economic Networks



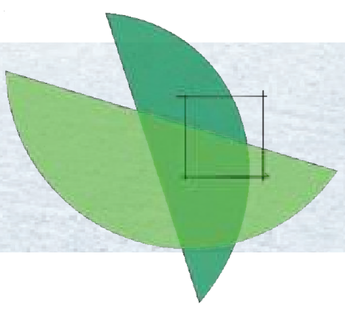
Passive Design Principles



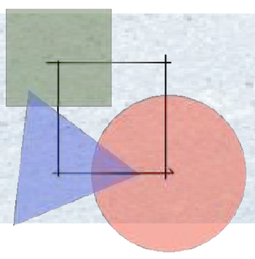
Rehabilitate Natural Water Systems



Sensitive Biodiversity Intervention



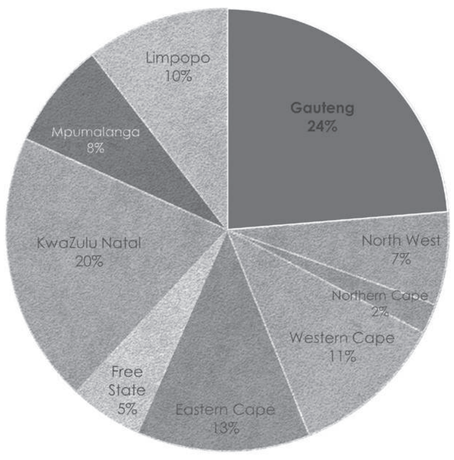
Symbiotic Healing



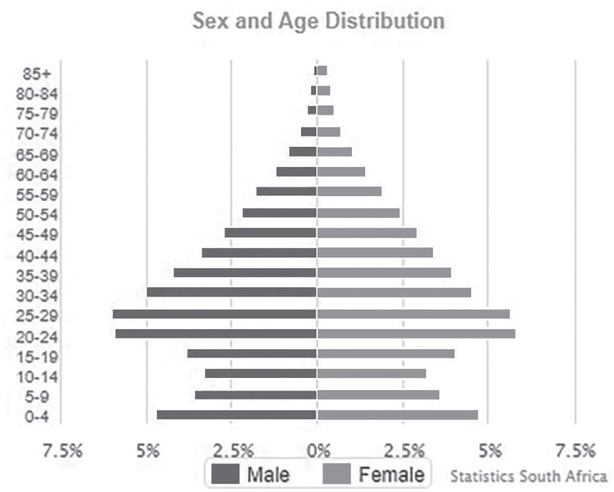
Multi-species Users

u r b a n v i s i o n

Provincial population
2011
12 130 000 people
(CSIR, 2019)

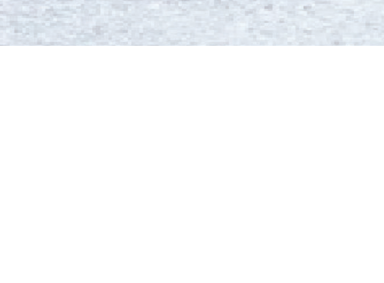


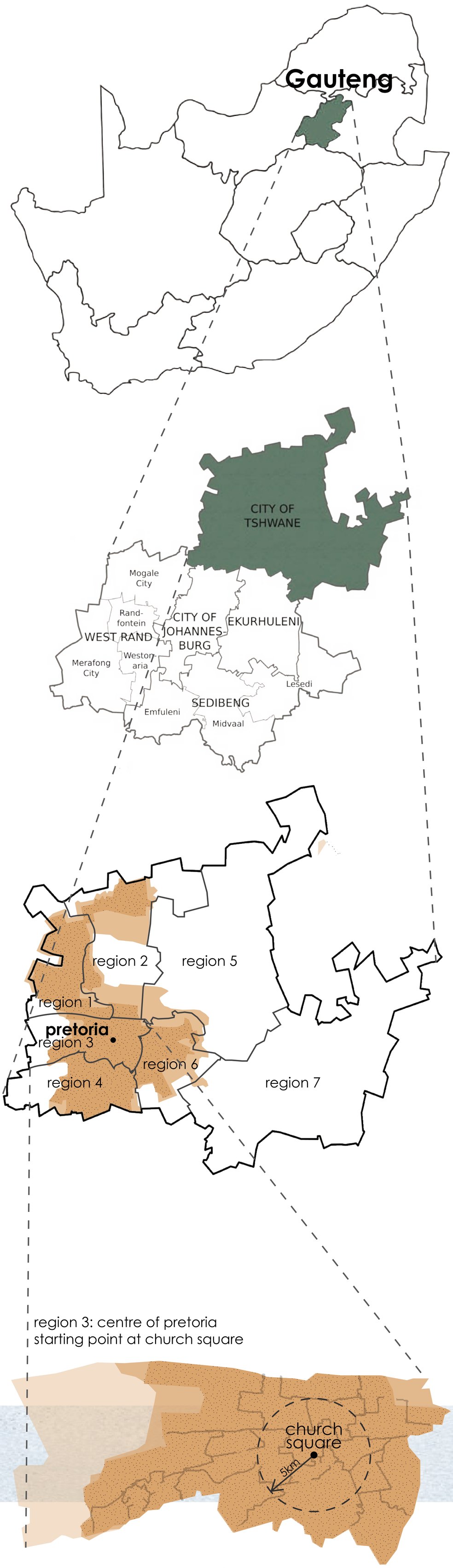
Municipal population
2011
2 921 291 people
(STATS SA, 2011)



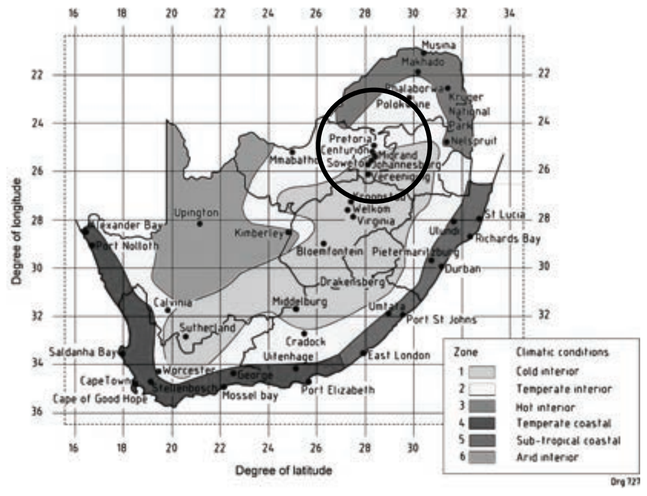
Sex & age distribution of Pretoria (STATS SA, 2011)

Marikana thornveld
bioregion





Provincial population
2050
20 290 000 people
(CSIR, 2019)



Climatic zones of South Africa (SANS 10400X & XA)

Municipal population
2050
± 5 469 766 people
(CSIR, 2019)

Ecosystem protection levels in CoT (BPCT, 2016)

2021 urban edge

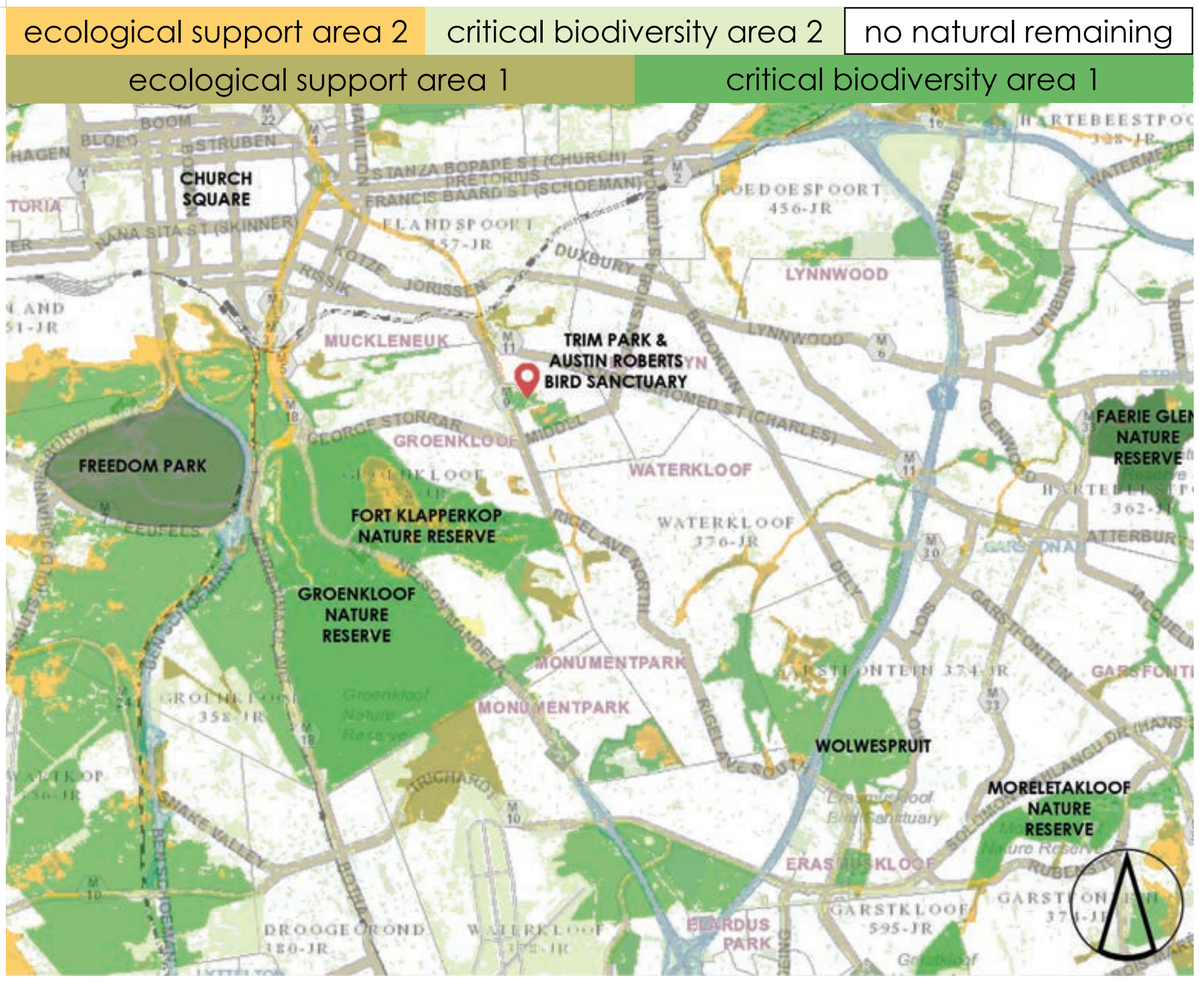
2010 urban edge

Region 3 population
2018
± 701 316 people
(CSIR, 2019)

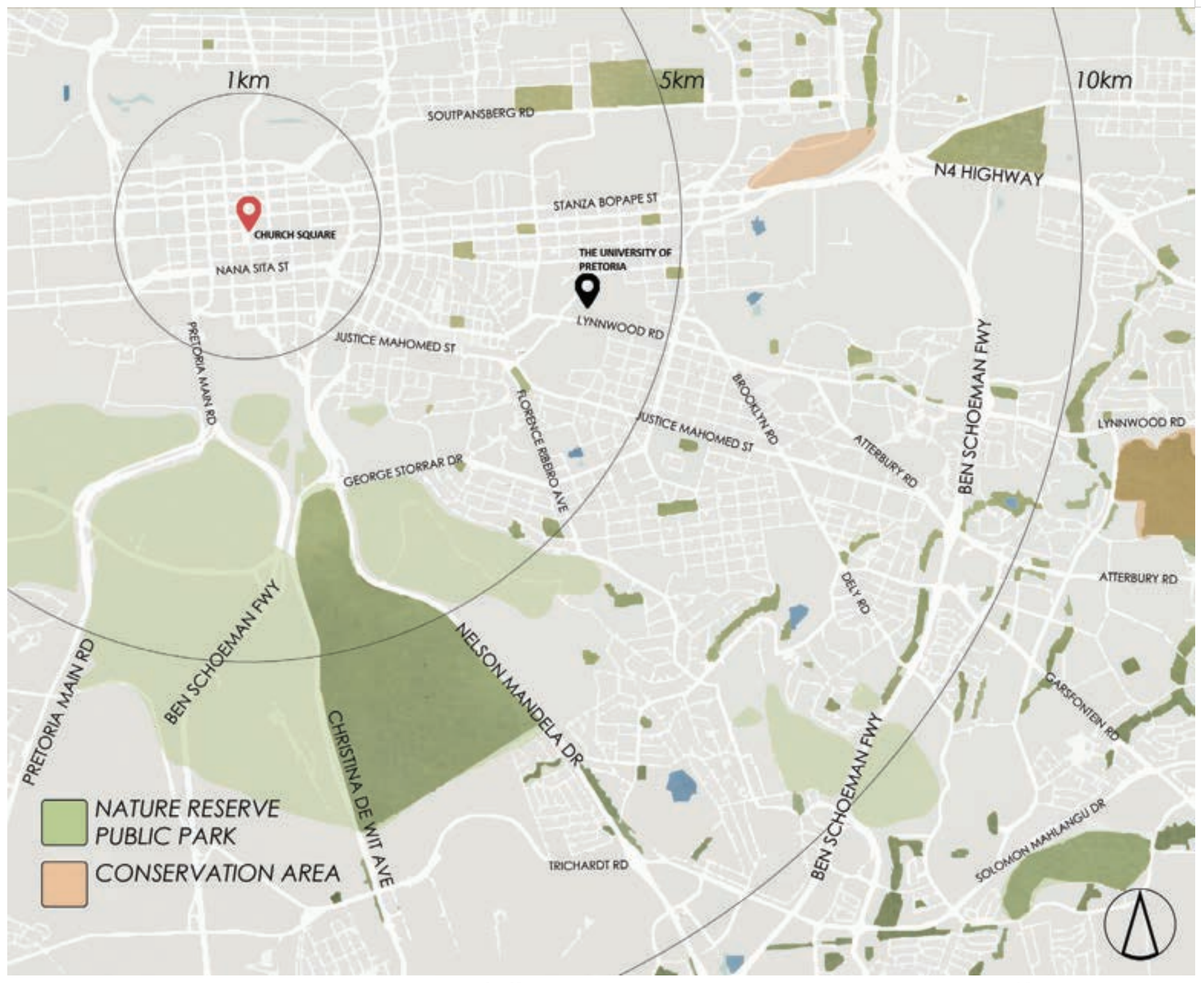
region 3: centre of pretoria
starting point at church square

Region 3 population
2050
± 1 028 396 people
(CSIR, 2019)

m a c r o - s c a l e m a p p i n g

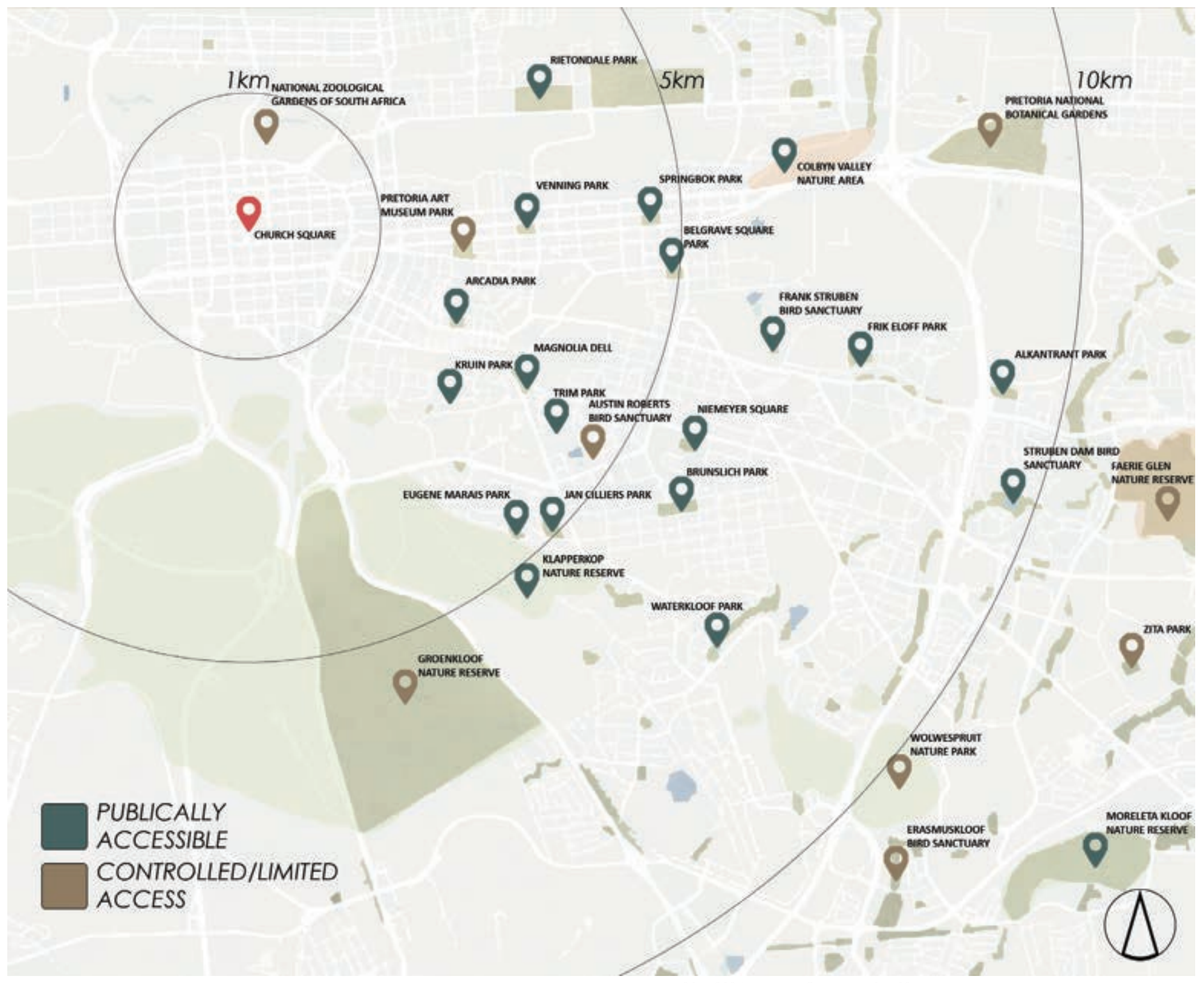


biodiversity analysis of Pretoria



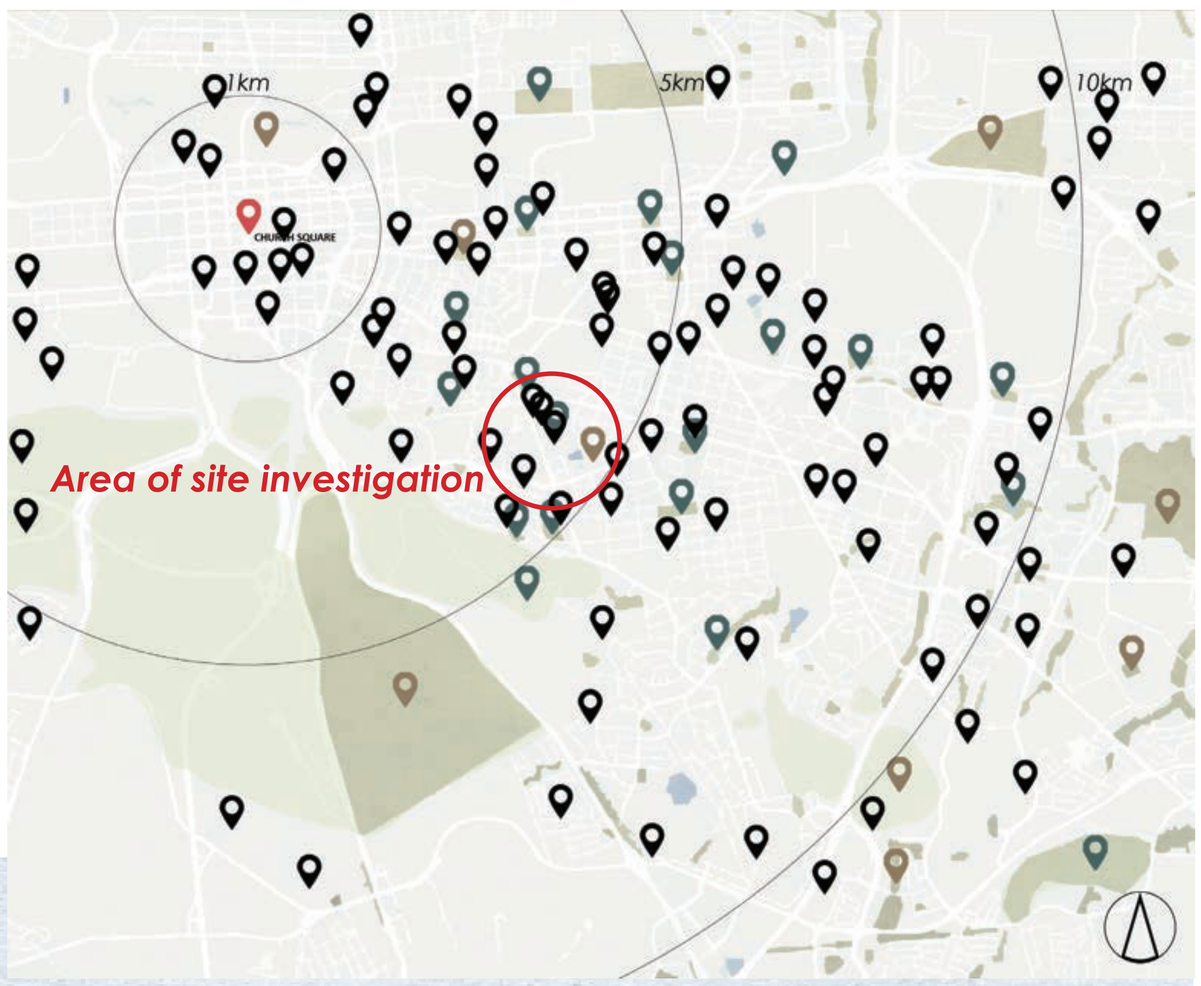
public green spaces & conservation areas

mental healthcare services



accessibility of public green spaces

educational facilities



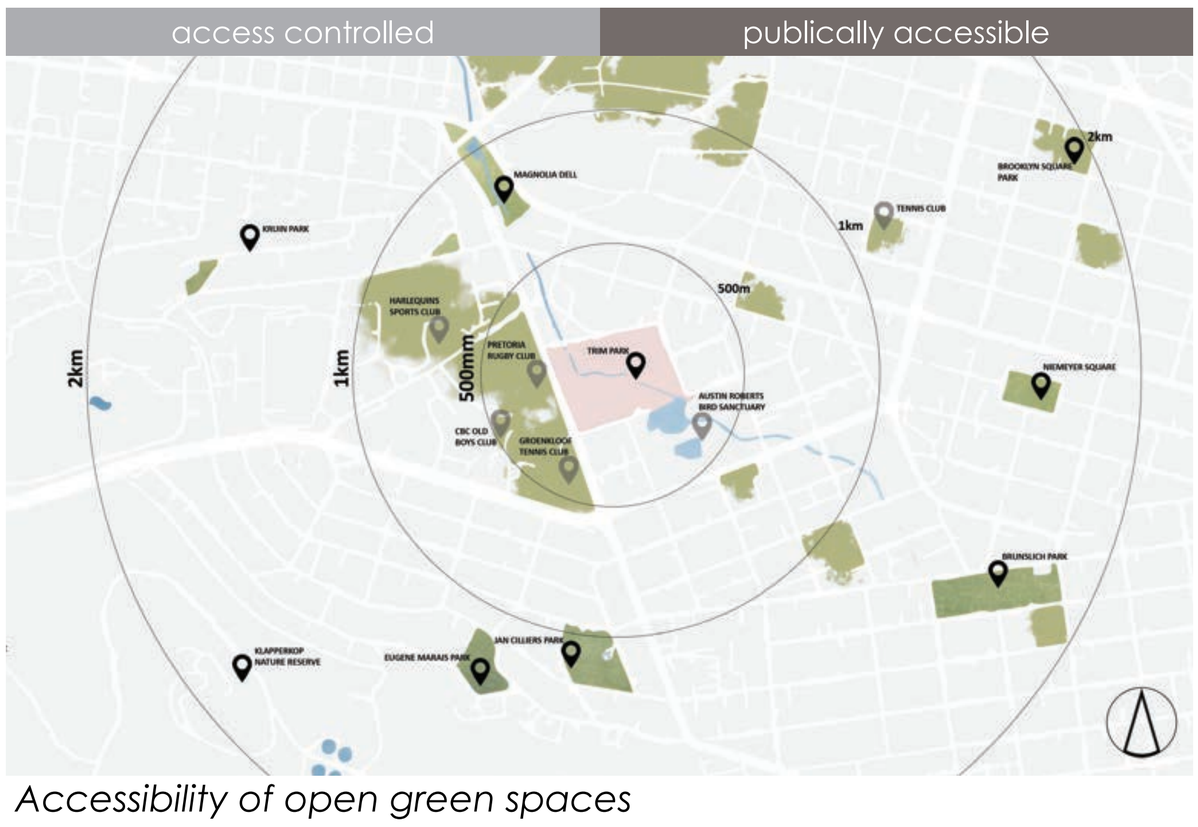
identification of potential site

the macroscale focused on the City of Tshwane, identified areas undergoing urban growth and potential loss of open space to densification as well as the bioclimatic and biodiversity characteristics of the region. Mesoscale mapping highlighted the critical state of biodiversity due to urbanisation, and the challenge of balancing the city's development with the increasing need for open space.

m a c r o - s c a l e m a p p i n g

Clay quarry, Nieuw Muckleneuk,1948 (University of Pretoria, 1948)

Trim Park, Nieuw Muckleneuk, 2022 (Google Maps, 2023)

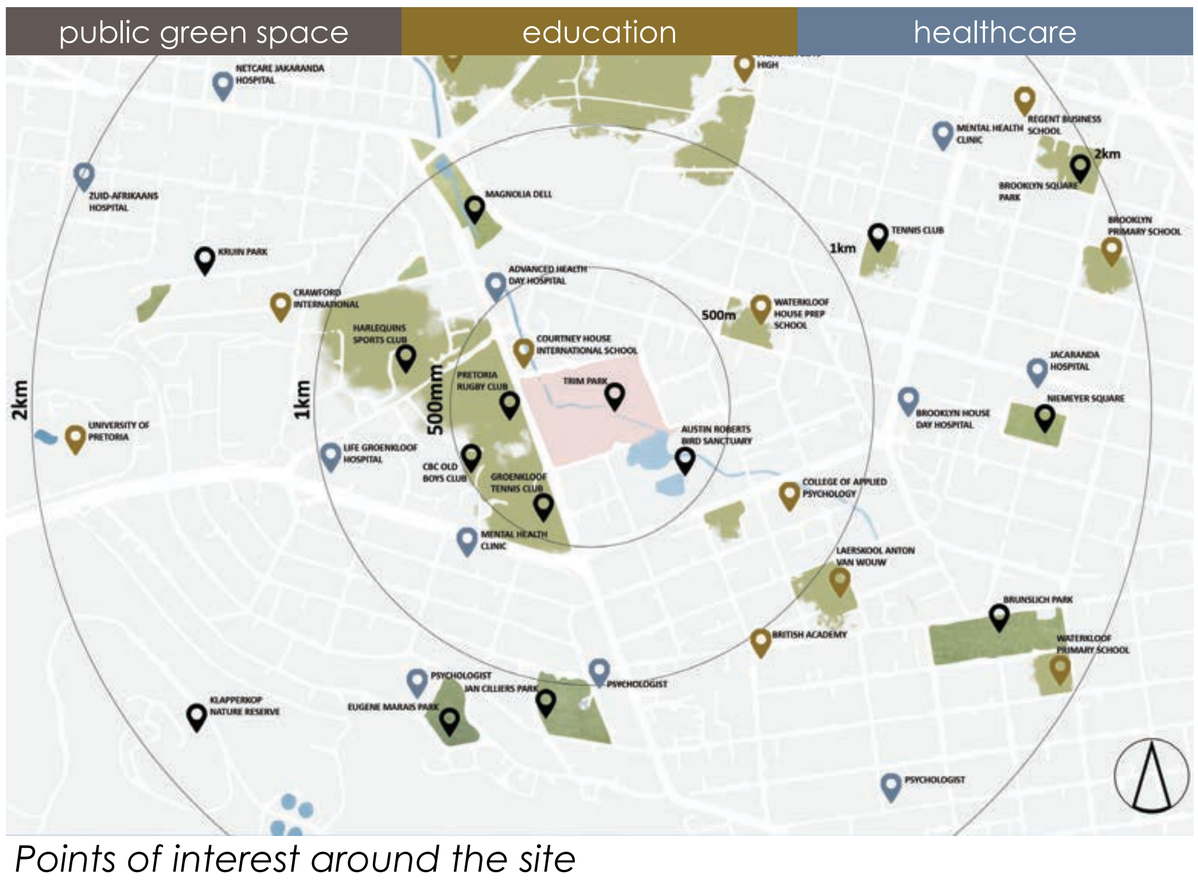


Accessibility of open green spaces

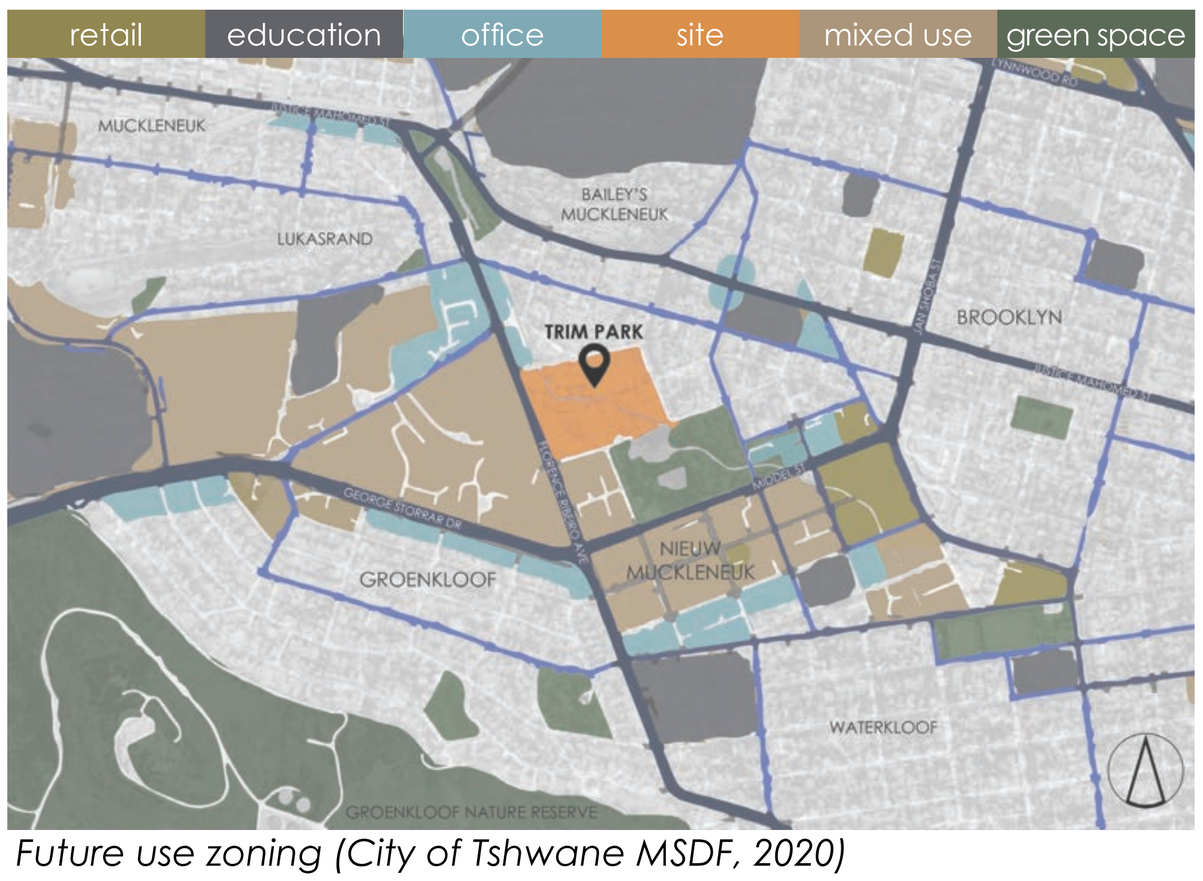
As already illustrated, over the past 75 years the region of Nieuw Muckleneuk has undergone intensive densification and will continue to experience exponential growth over the next 50 to 100 years.

The site identified, Trim Park, is one of the few remaining large publically-accessible green spaces in the area with a unique natural fabric and a complex set of ecological systems.

Presently, the park is surrounded by a wide range of different users, programmes and critical access routes in and out of the city, with the potential to improve the lifestyle of urban dwellers in proximity to its location.

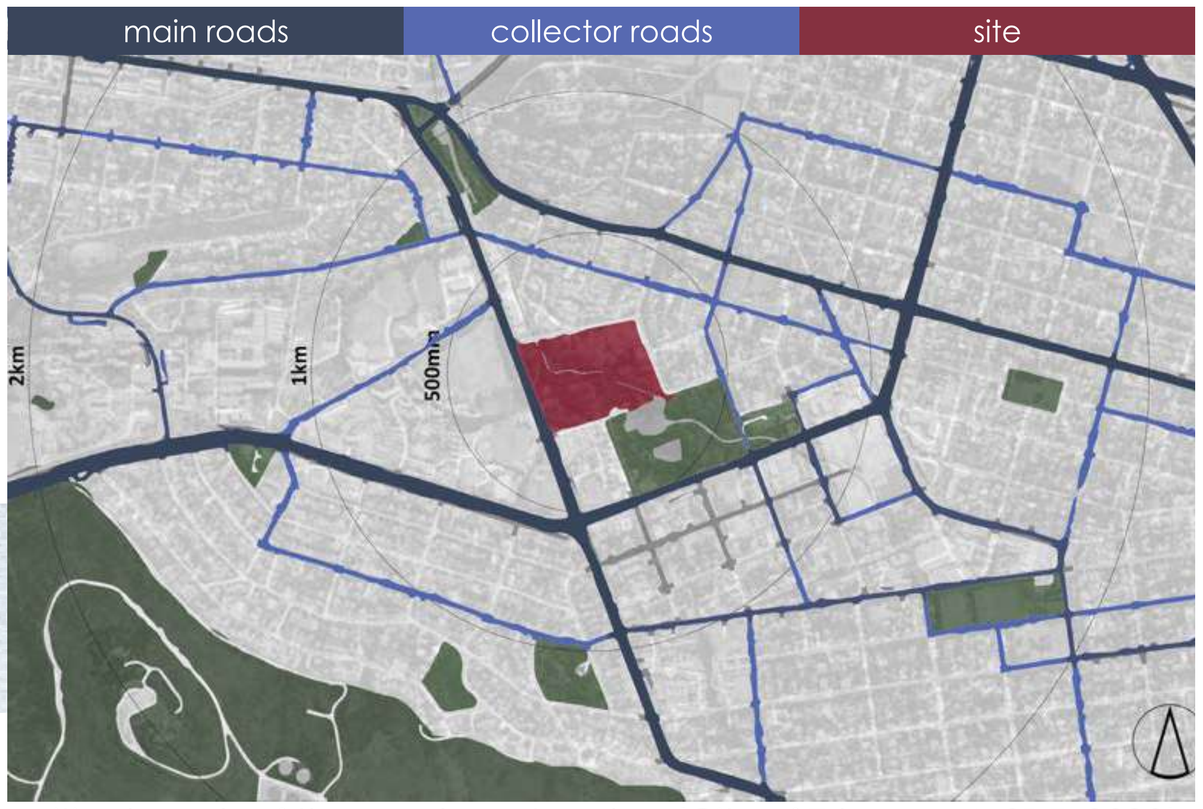


Points of interest around the site



Future use zoning (City of Tshwane MSDF, 2020)

future points of densification (City of Tshwane MSDF, 2020)



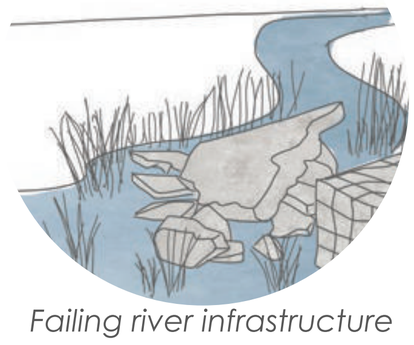
critical roads of the road master plan (City of Tshwane MSDF, 2020)

m e s o - s c a l e m a p p i n g

Damaged outdoor lighting network

Dilapidated park bridges

Partial inaccessibility



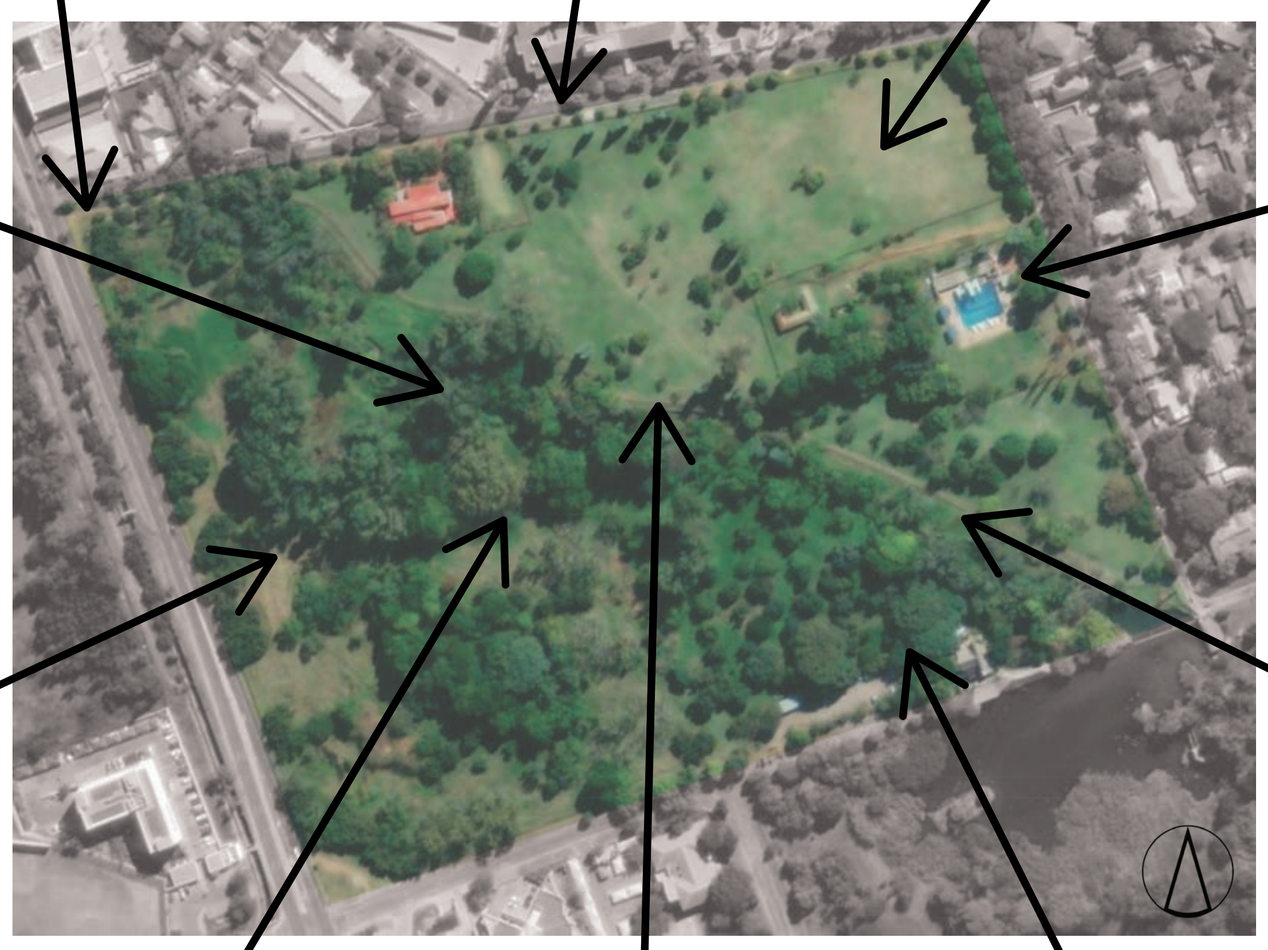
Failing river infrastructure

Pretoria Arts Association - landmark

View of Mackie street

Informal soccer field on north-east corner of the park

River condition



De Jong Diving Centre - temporarily closed

Dense vegetation

Pedestrian bridges

Street light network throughout park

Fence along north-east side of river

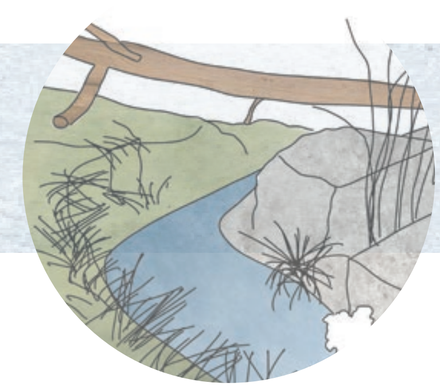
Single public access point

Presence of a variety of animal species

Immersive experience with nature

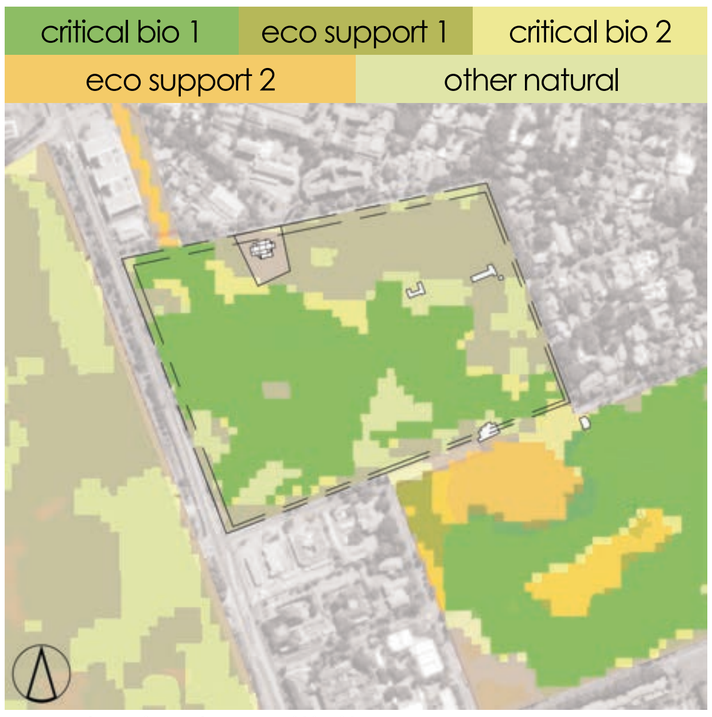
invasive species present

walkerspruit river



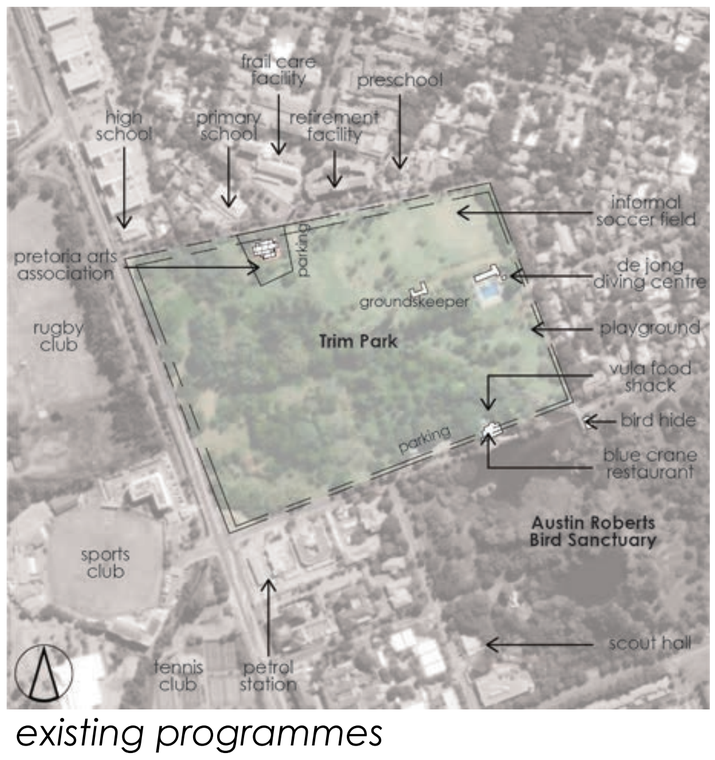
micro-scale mapping

trim park, nieuw muckleneuk, pretoria



ecological sensitivity

stormwater & sewer lines



existing programmes

public accessibility

Average Rainfall

732mm

Average Temperature

5°C - 29°C

Prominent Wind Direction

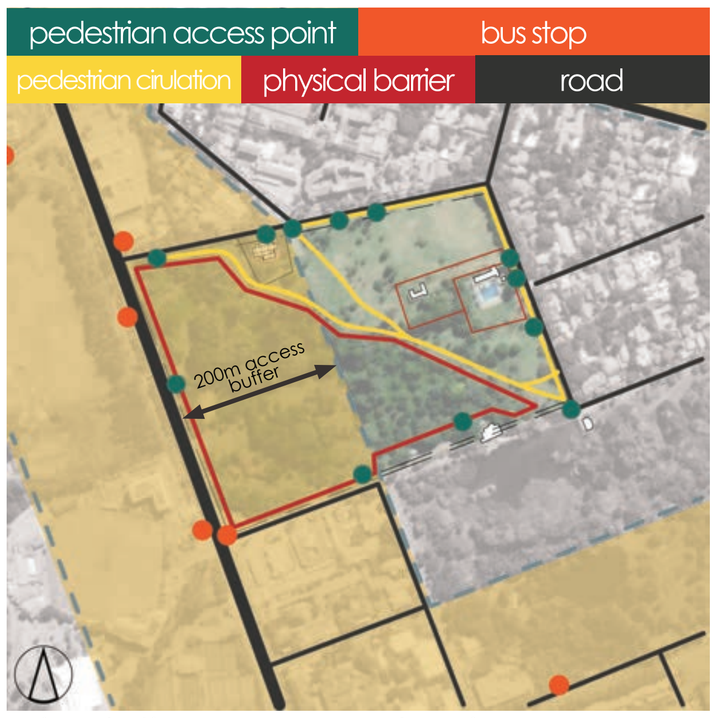
North-East

Biome Class

Temperate Grassland

Site Elevation

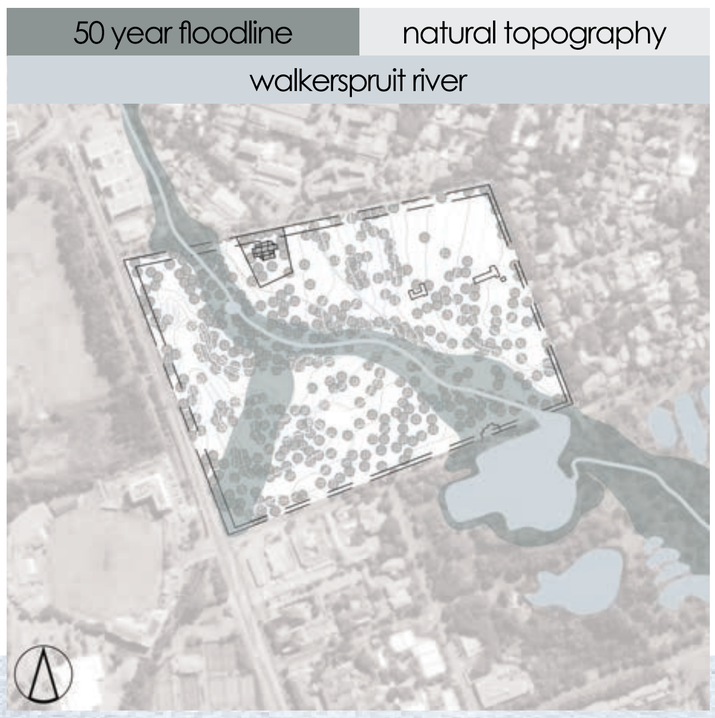
1364-1373m ASL



circulation, access & barriers

sensory features

future density growth



topography & hydrology

future use zoning

vegetation classification

Critical biodiversity area 1 *- A natural/near-natural area required for ecological processes and/or biodiversity patterns. These areas are required to be maintained and rehabilitated to prevent harm to natural systems. Conservation orientated activities are permitted with strict control on the overall environmental impacts.*

Critical biodiversity area 2 *- Intensive agricultural landscapes required for ecological processes and/or biodiversity patterns. Land is to be cultivated to retain support to threatened species.*

Ecological support area 1 *- A natural/near-natural area required for ecological processes and/or biodiversity patterns such as floodplains, corridors, catchment areas and/or wetlands. These are focused as rehabilitation zones. Intensive land-use should be avoided and natural systems are to be maintained. Compatible land-uses include low-density developments, eco-tourism and conservation activities.*

Ecological support area 2 *- Areas with no natural habitat which provide critical support to ecological processes such as buffer zones around wetlands, corridors and/or floodplains. Existing activities to be retained and/or downscaled to less intensive uses where possible.*

Other natural areas *- Natural areas not included in the aforementioned categories.*

(Bioregional Plan for th City of Tshwane, 2016)

s i t e a n a l y s i s

informal circulation | formal circulation
access point | fence/barrier
vehicle circulation | public transport node

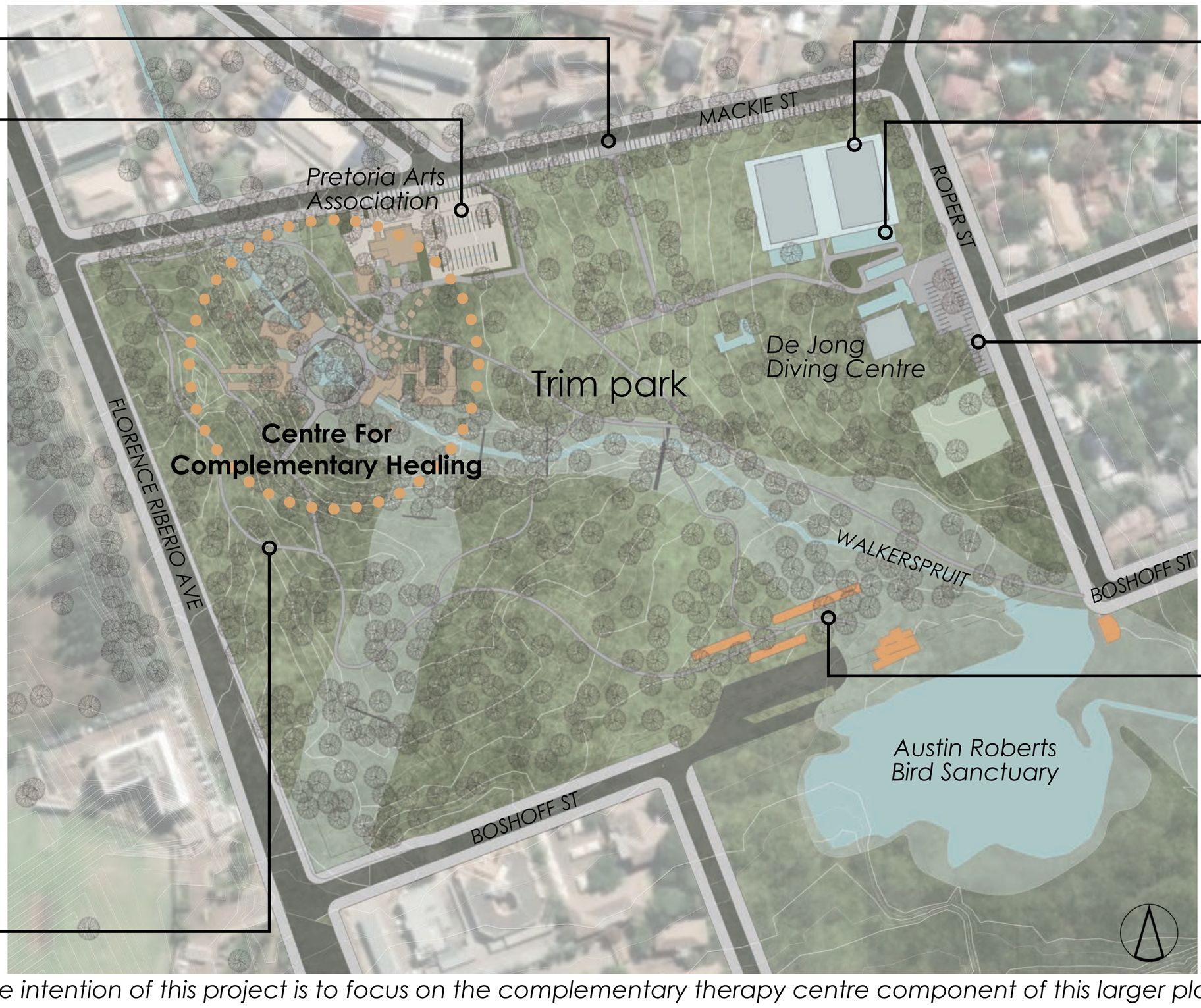
existing circulation & access

activity/user | informal circulation
vehicle circulation | formal circulation

existing activities

critical bio area 1 | 50-year floodline
vehicle circulation | river/water system
natural feature | critical bio area 2

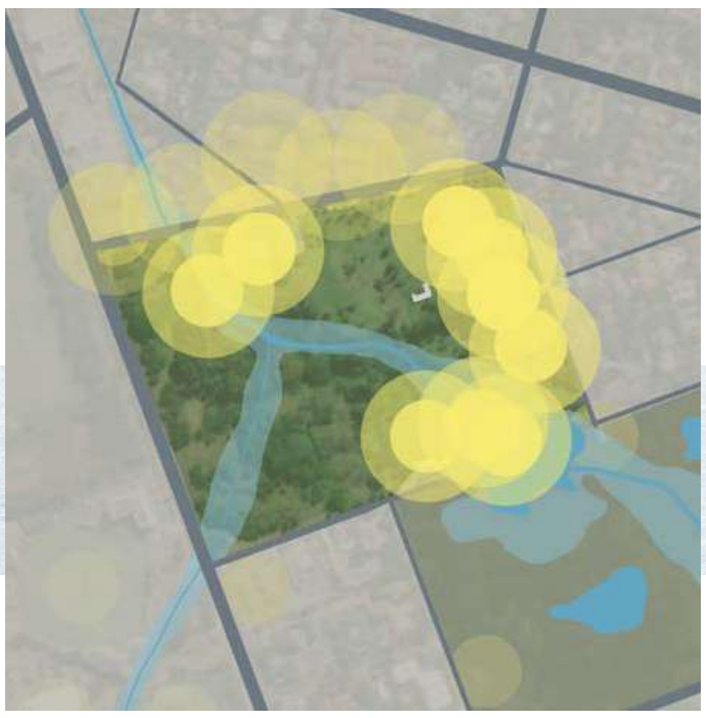
existing vegetation & environment



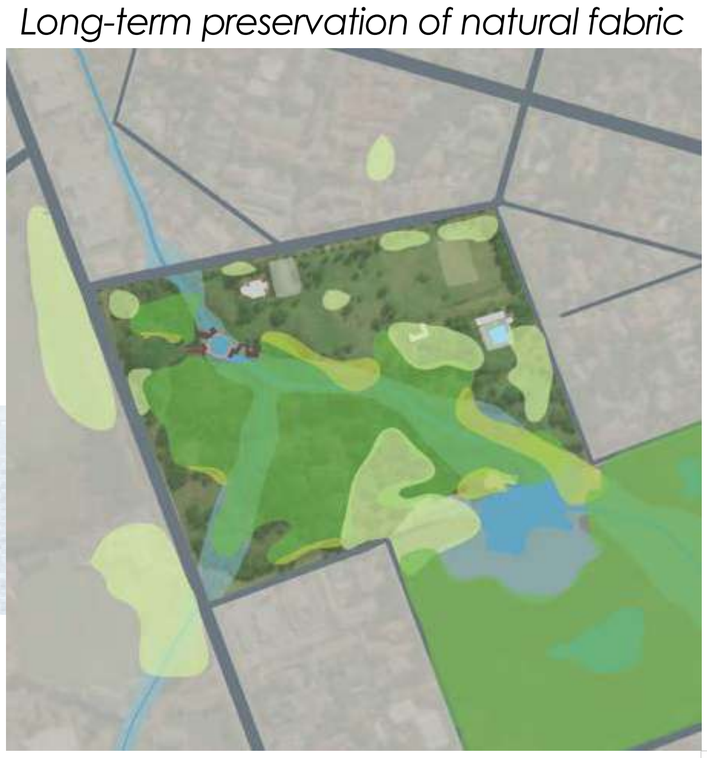
The intention of this project is to focus on the complementary therapy centre component of this larger plan.

New and improved circulation & access

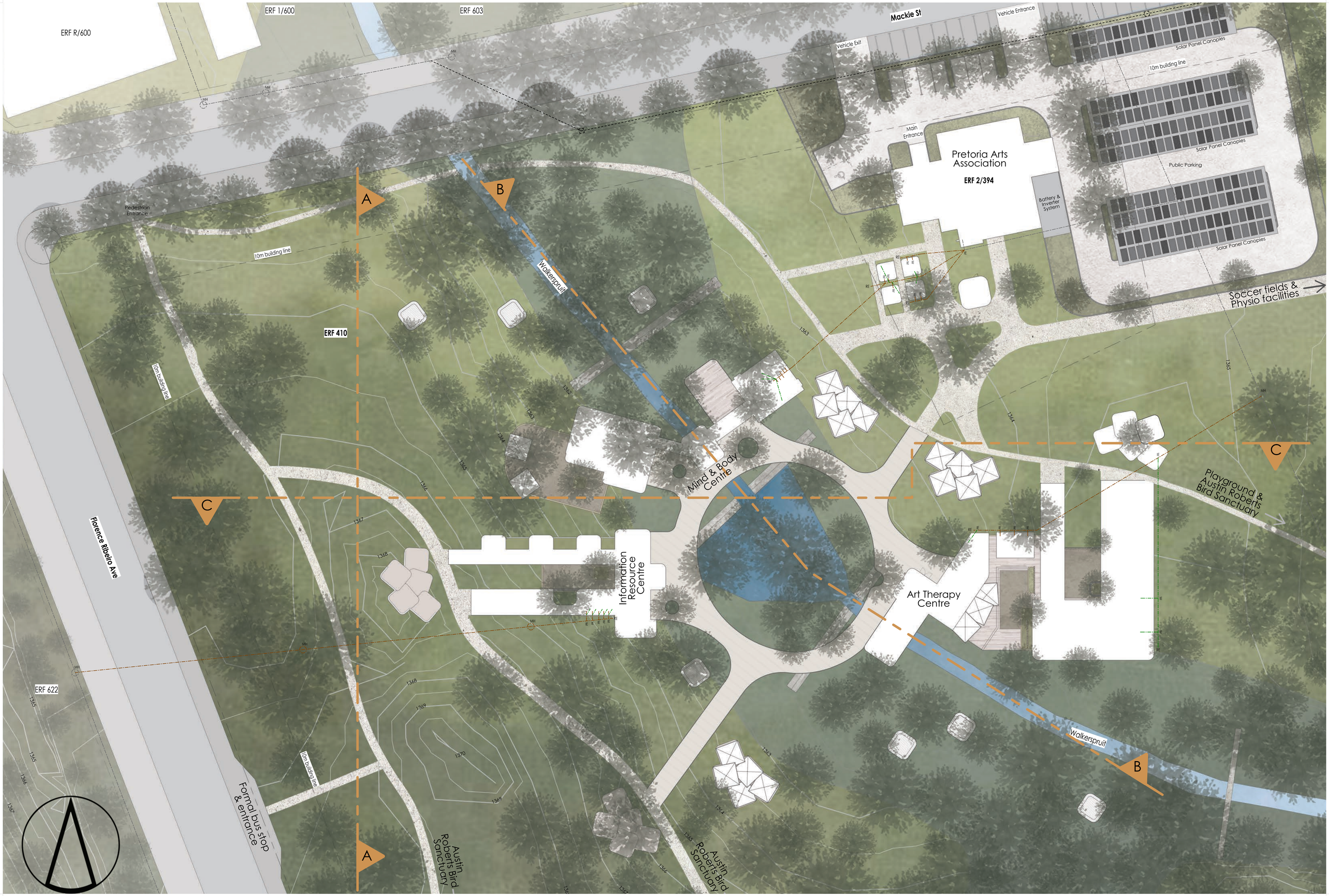
Further site activation



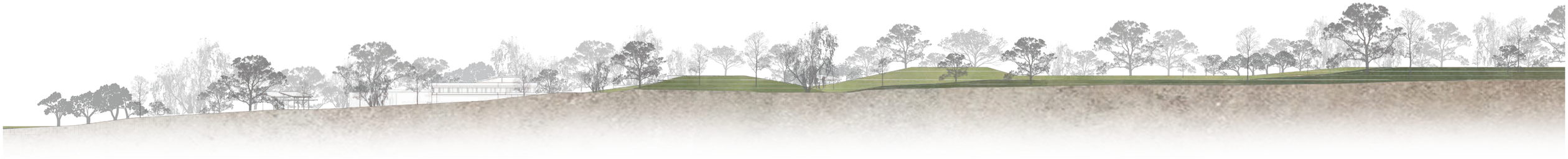
Long-term preservation of natural fabric



s i t e v i s i o n : m a s t e r p l a n 1 / 1 5 0 0

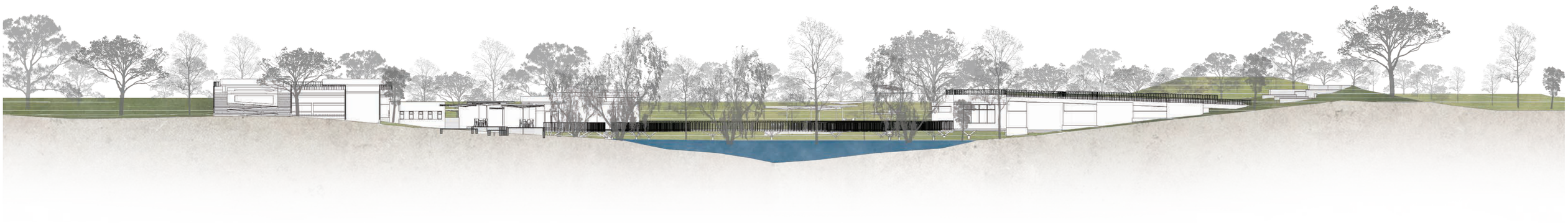


site plan 1:200



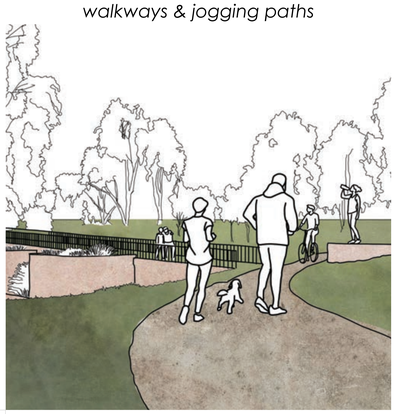
A: West site elevation

B: Site sectional elevation through river



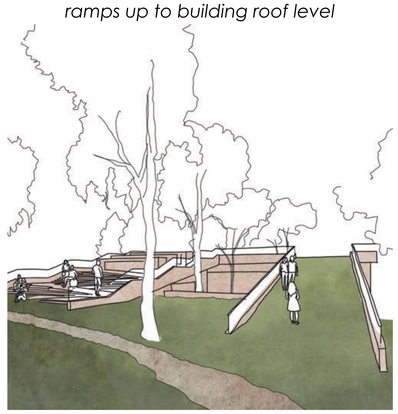
C: North site elevation

walkways & jogging paths



outdoor pavilion seating

ramps up to building roof level



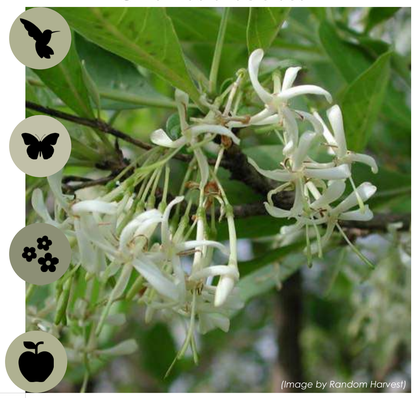
outdoor therapy sessions

s i t e s e c t i o n s 1 : 2 5 0

walkerspruit river
walkway through site
private pavilion
private pavilion
private pavilion
walkway through site
walkway through site
gradual-sloped green roof
walkway through site
Gabion system failure over time
New gabion wall system and water retention dam
walkway through site
new indigenous gardens
New gabion wall system and water retention dam
gradual-sloped green roof
new indigenous gardens
elevated bridge & walkway
private pavilion
walkway through site
private pavilion
private pavilion
walkerspruit river
private pavilion
private pavilion variations

select plant palette

Pavetta gardeniifolia
Christmas bride's bush



Ehretia rigida
puzzle bush

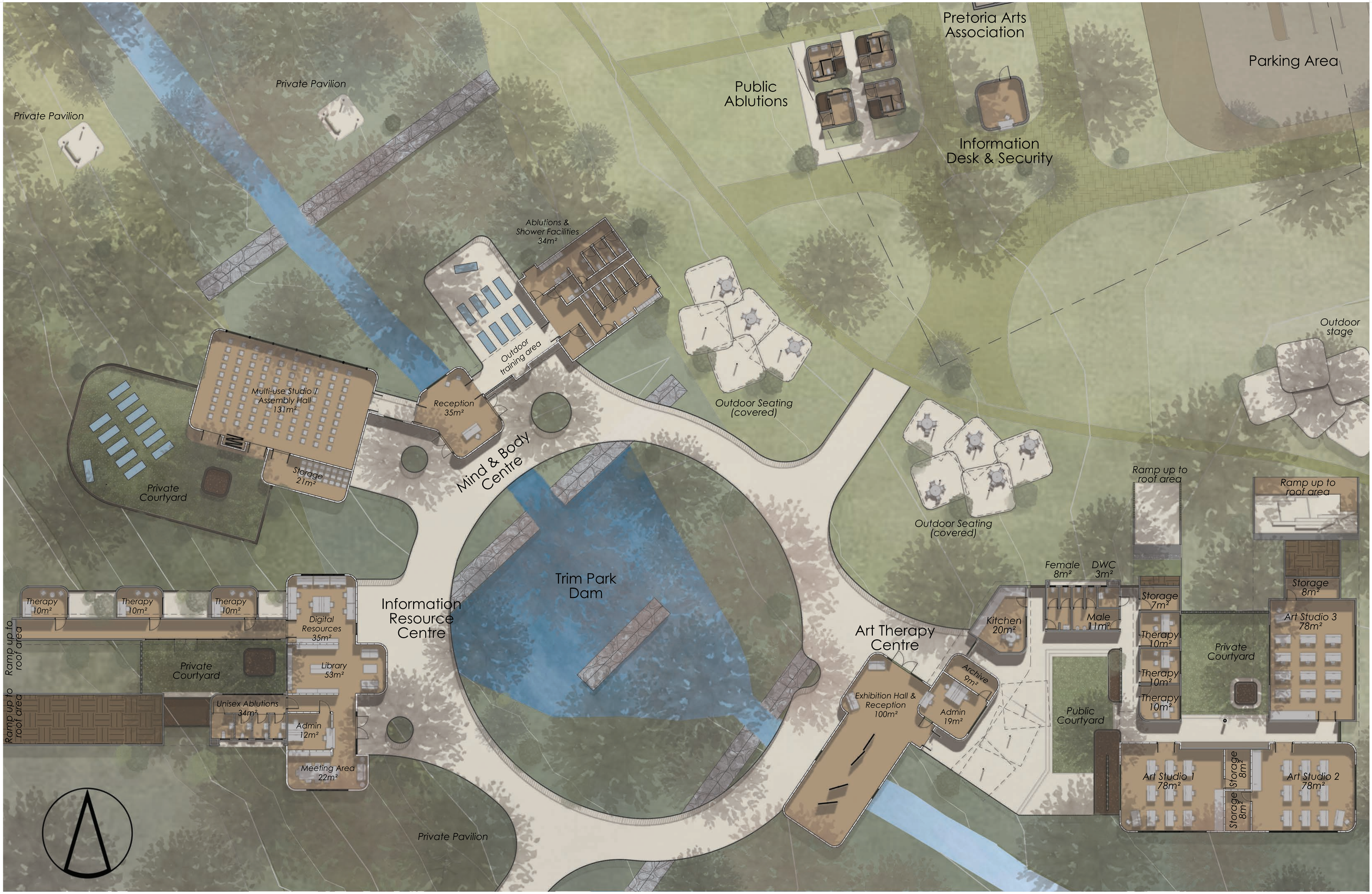
Hilliardiella oligocephala
bicoloured-leaved vernonia

Elionurus muticus (Spreng.) Kuntze
wire lemon grass

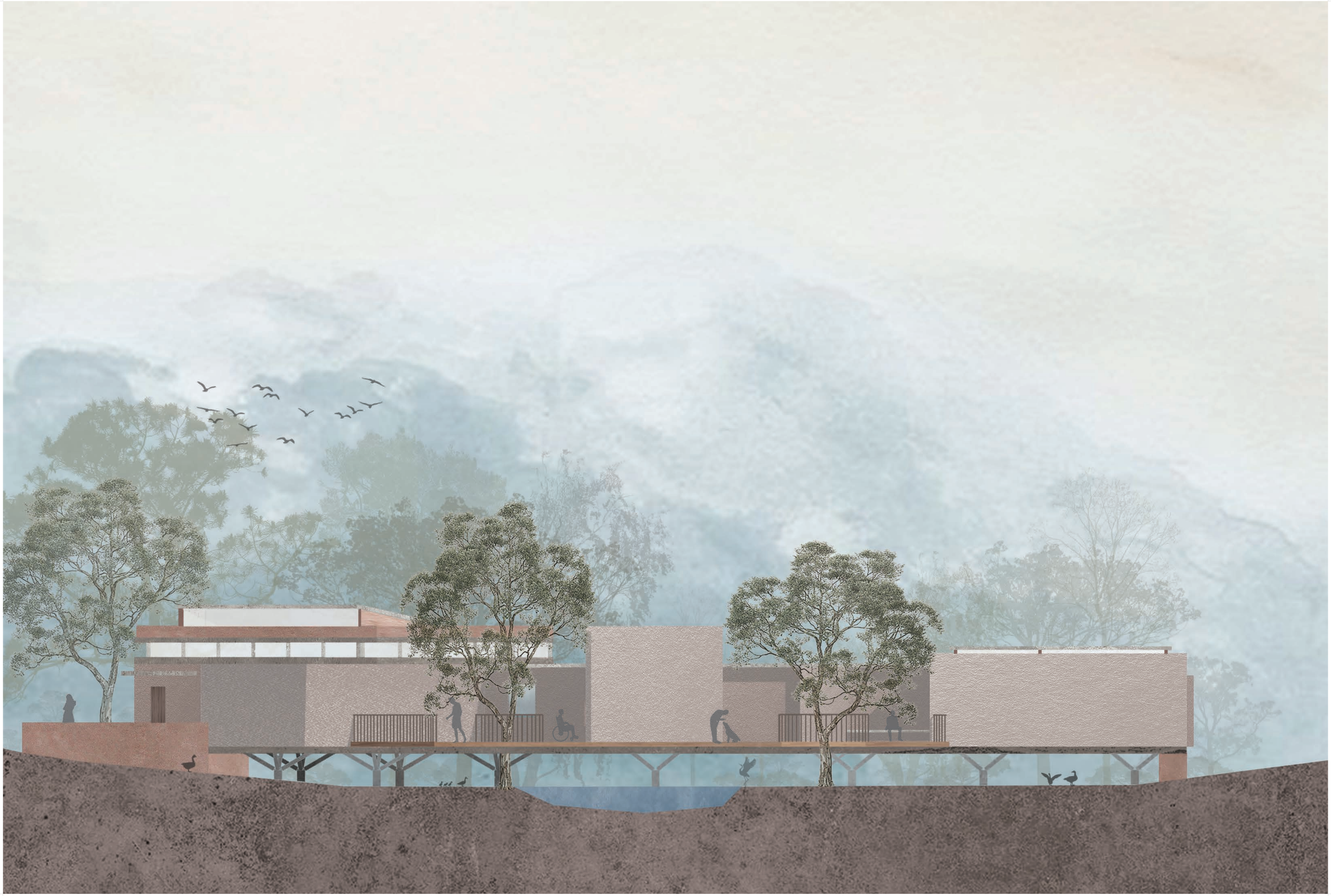
Melinis nerviglumis (Franch.) Zizka
bristle-leaved red-top grass

Setaria sphacelata
Golden bristle grass

r o o f & l a n d s c a p e p l a n 1 : 2 0 0



ground floor plan 1:100



mind & body centre front elevation 1:50

CJ SHAW 17043795
CPD 810 UNIT 4 ASSIGNMENT

PASSIVE BUILDINGS

DEFINITIONS

EMBODIED ENERGY

Milne & Reardon define embodied energy as: "a consolidation of all the energy consumed during the production of a building". It is the energy used during the extraction, processing and transportation of a product (Milne & Reardon, n.d). In the context of this investigation, the embodied energy of the selected material and structural system is considered for comparison.

MATERIALITY & STRUCTURAL SELECTION

A building's envelope can account for between 26-30% of it's total Life-cycle Assessment (LCA) energy contribution (Ampofo-Anti, 2010). Therefore, the walling and structure system chosen can greatly affect a development's embodied energy and thus, its overall environmental impact. It becomes the responsibility of the architect to investigate the most sustainable technologies in order to ensure a successful project without adding additional pressure to resources and the environment.

OPERATIONAL ENERGY

Operational energy refers to the consumption of energy within a building to adequately function during its time of occupation (GBCSA, 2023). It can be further defined as the amount of energy required to safely heat, cool, ventilate and power a space based on its occupational requirements (Metcalf, 2020). Passive design strategies assist designers in lowering the amount of energy used during occupation and ensure efficient energy solutions. For the purpose of this study, no artificial ventilation will be used.

LIGHTING

Globally, artificial lighting contributes approximately 20% of the total energy consumption. (Brown, 2010). Optimal daylighting as a passive design strategy, can assist in reducing a building's electricity demand as well as the ambient heat generated by lighting fixtures inside a building.

TEMPERATURE CONTROL

Many artificial means of controlling temperature (ie. HVAC) inside a building have large energy and thermal implications. Therefore, alternative methods of heading and cooling can largely improve a building's energy efficiency.

Passive Heating Strategies:
- Orientation
- Spatial planning & building shape
- **Thermal mass**
- **Solar heating**

Passive Cooling Strategies:
- Natural ventilation
- **Shading devices**
- **Thermal mass**
- Exterior planes' colour and finish
- **Stacked windows**

BASE CASE

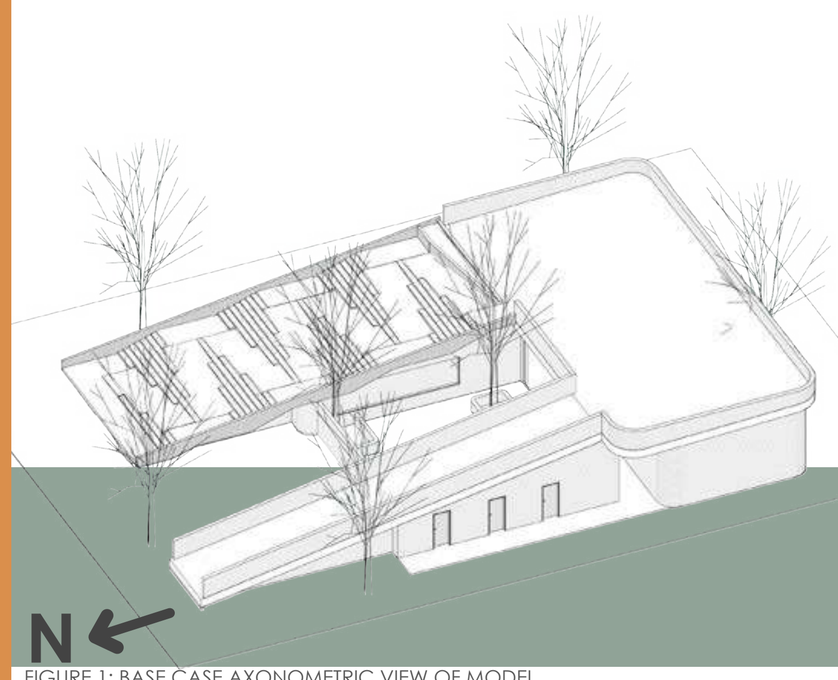


FIGURE 1: BASE CASE AXONOMETRIC VIEW OF MODEL

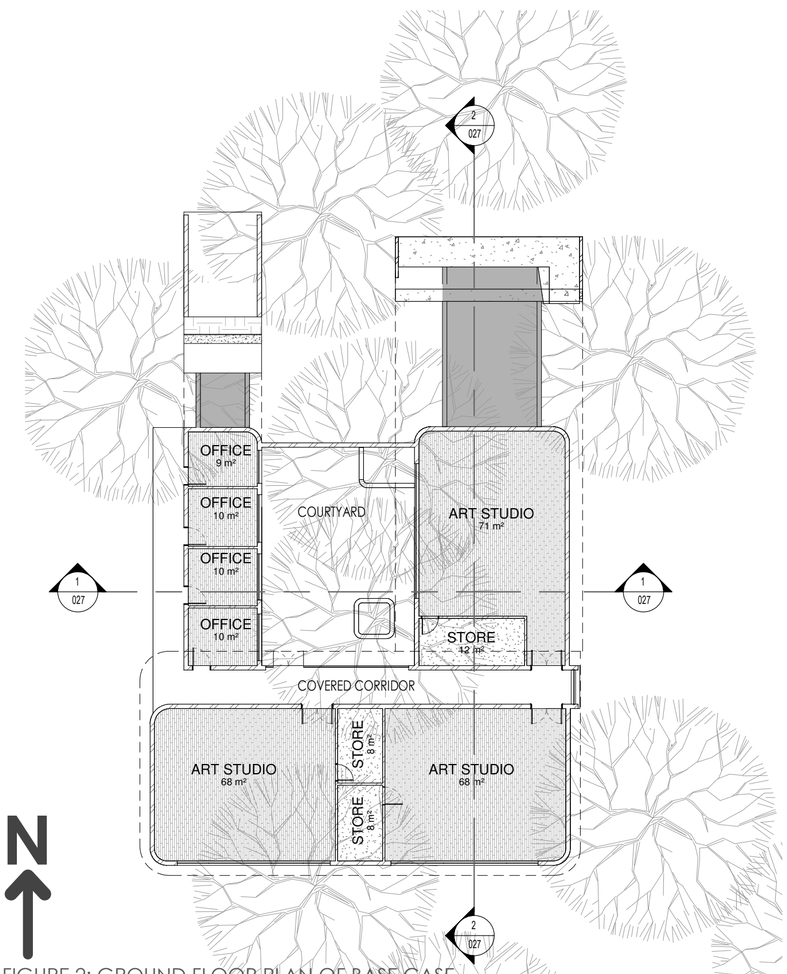


FIGURE 2: GROUND FLOOR PLAN OF BASE CASE

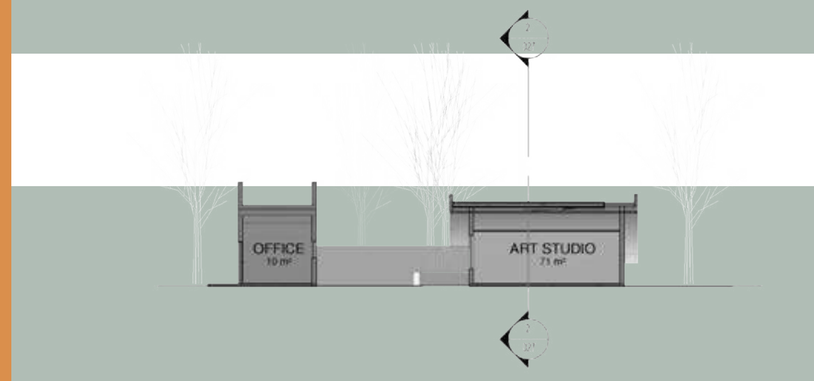


FIGURE 3: WEST/EAST SECTION OF BASE CASE

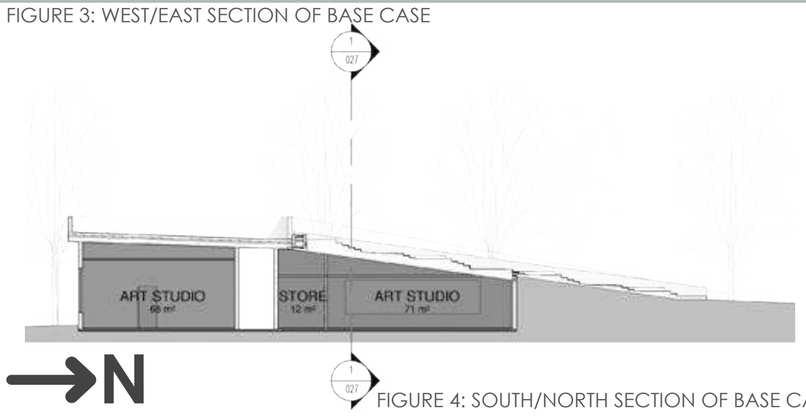
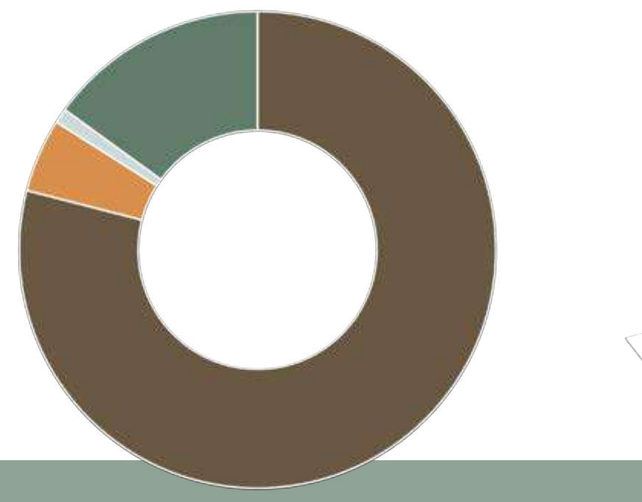


FIGURE 4: SOUTH/NORTH SECTION OF BASE CASE

RESULT

BASE CASE EMBODIED ENERGY COMPOSITION



Ground Slab: 150 mm conventional reinforced concrete slab
Roof System: 170 mm conventional reinforced concrete slab
Exterior Walls: 220 mm clay brick wall, plastered interior only
Interior Walls: 120 mm clay brick wall, plastered both sides

OBSERVATIONS

Materiality & Structural Selection:

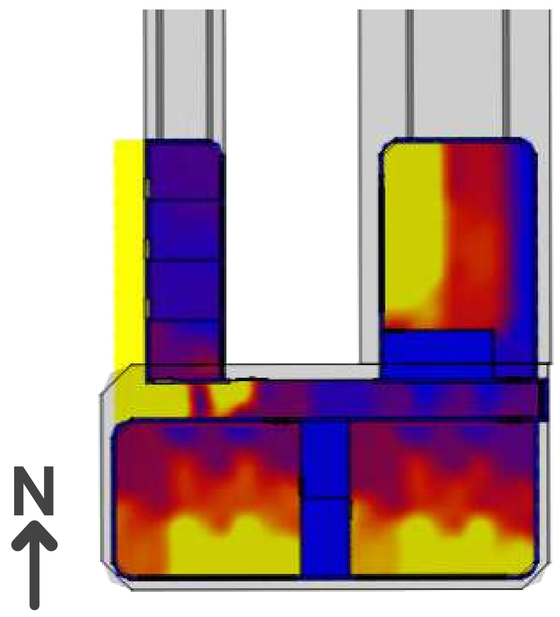
Conventional building materials in a standard brick and concrete slab construction contain a high amount of embodied energy.

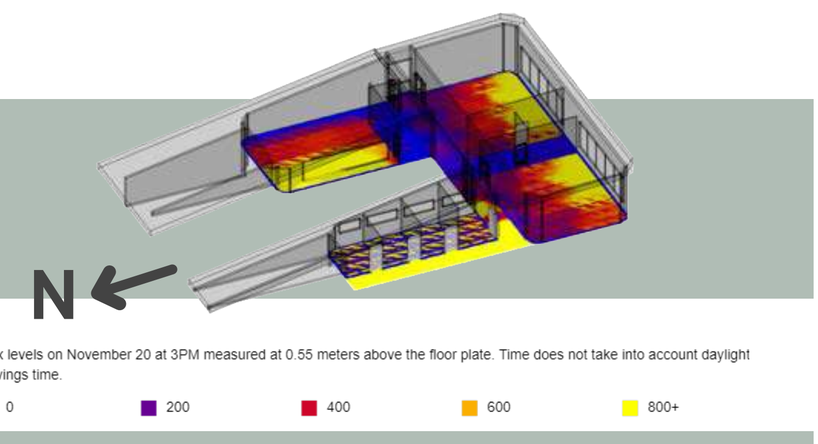
Lighting:

Lux levels are extremely low (approx 0-200lx) throughout interior spaces, with areas adjacent to windows and openings experiencing a high percentage of over-lighting.

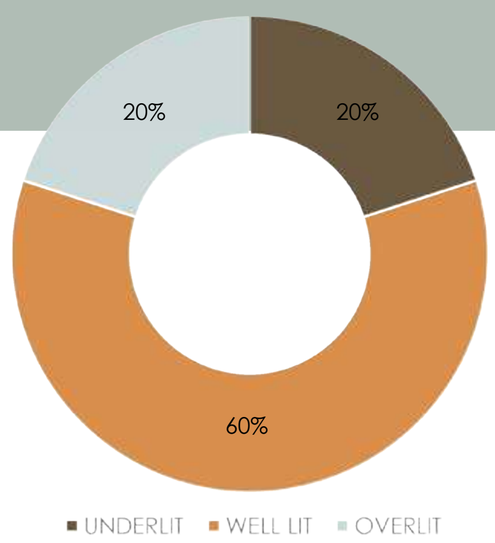
Temperature Control:

The lack of shading devices over large apertures provides too much solar heat gain to internal spaces. There are no additional passive cooling or ventilation strategies implemented.





BASE CASE DAYLIGHTING



ENVIRONMENTAL SUSTAINABILITY

VERSION 5

FIGURE 4: VERSION 5 AXONOMETRIC VIEW OF MODEL

Ground Slab: 150 mm conventional reinforced concrete slab
Roof System: 200 mm conventional reinforced concrete slab cast on corrugated steel deck over steel beams
Exterior Walls: 150mm dry-stack interlocking insitu-cast compressed earth blocks
Interior Walls: 120mm dry-stack interlocking in-situ-cast compressed earth blocks, plastered both sides

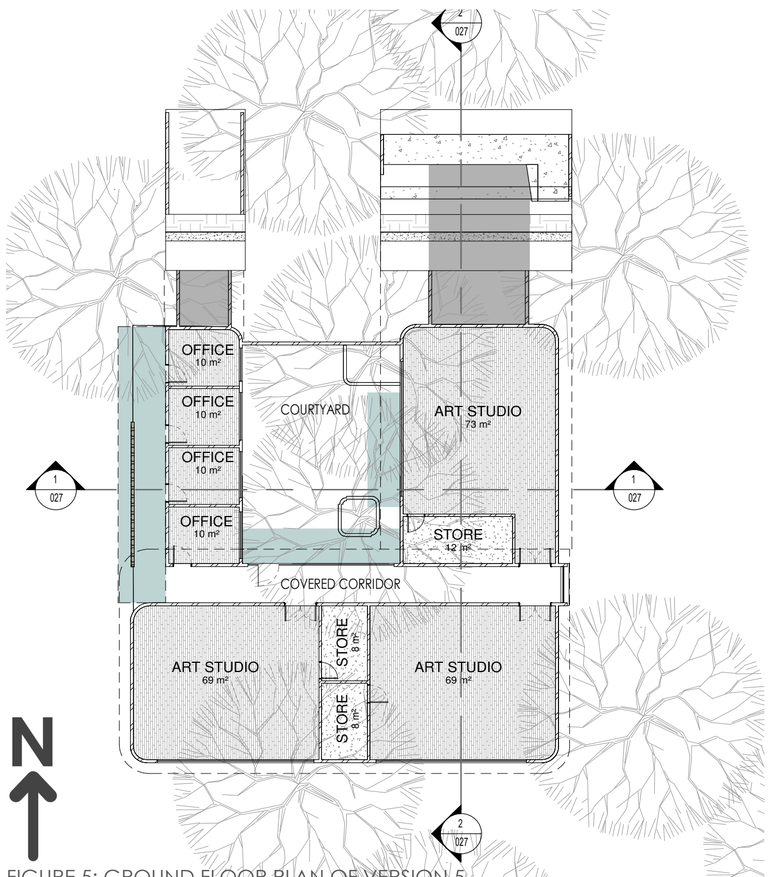


FIGURE 5: GROUND FLOOR PLAN OF VERSION 5

Updates to Version 5:

- Shading device over western facade to reduce heat gain on office walls.
-Shading devices over east-wing art studio to reduce excess direct sunlight that could lead to an internal temperature increase and uncomfortable working conditions.
- Walling system updated to IBT alternative system
- Conventional concrete slab roof updated to composite envirocrete concrete and steel decking slab with extensive green roof finish.

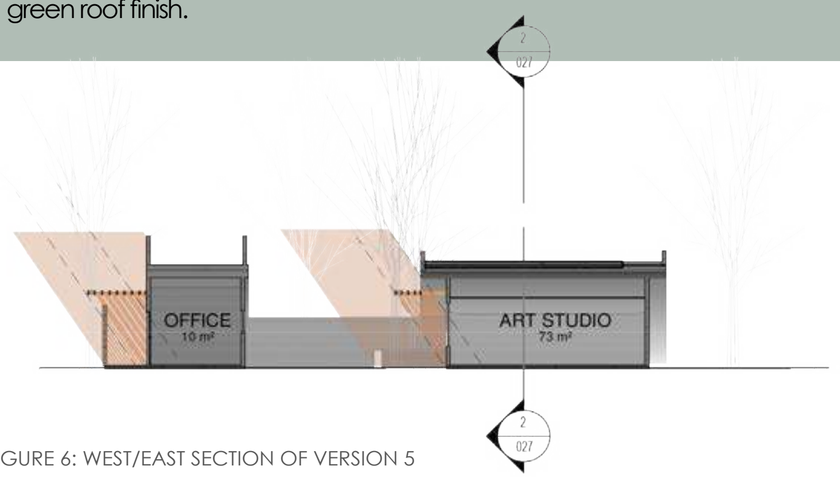
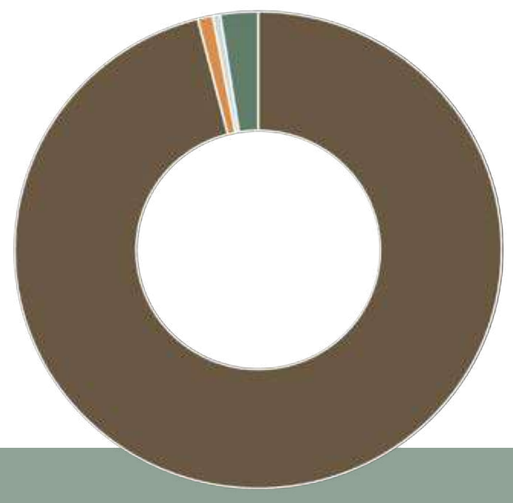


FIGURE 6: WEST/EAST SECTION OF VERSION 5

RESULT

SOIL BLOCK EMBODIED ENERGY COMPOSITION



OBSERVATIONS

Materiality & Structural Selection:

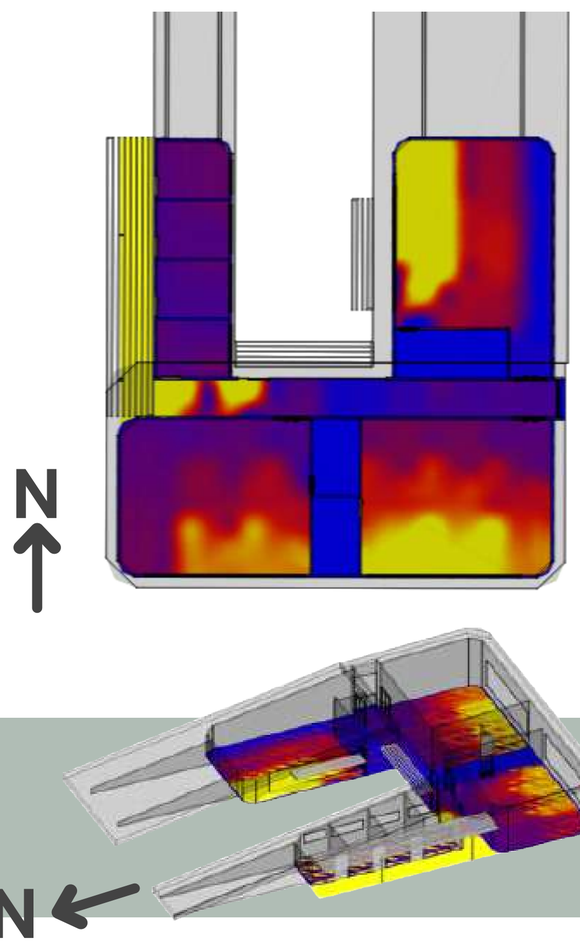
There is a large reduction in the ratio of embodied energy contained in the walling system and roof system in comparison to that of a conventional brick wall and concrete roof scenario. The floor slab remained unchanged and retains a high composition of the building's total embodied energy. A change in walling systems also increased the available internal floor area of rooms.

Lighting:

Main art studio spaces are deep, resulting in natural lighting depleting further into the space (average lux level of 200 lx), making it unsuitable for a classroom typology as the lighting change is too drastic.

Temperature Control:

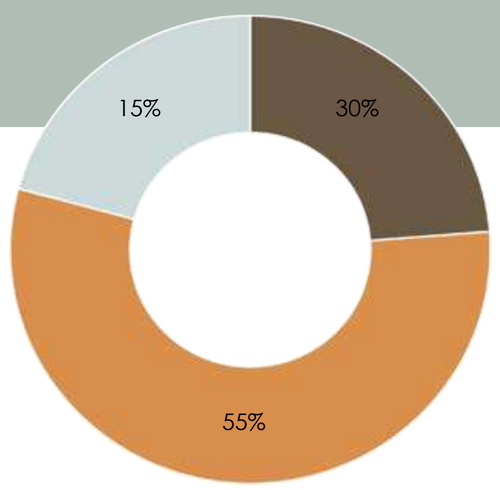
Simple shading devices along west-facing walls are not sufficient to reduce solar heat gain experienced at large glazing areas.



Lux levels on November 20 at 3PM measured at 0.55 meters above the floor plate. Time does not take into account daylight savings time.

0 200 400 600 800+

VERSION 5 DAYLIGHTING



VERSION 6

Ground Slab: 150 mm conventional reinforced concrete slab
Roof System: 200 mm conventional reinforced concrete slab cast on corrugated steel deck over steel beams
Exterior Walls: 150mm light steel frame with fiber-cement infill panels, plastered both sides
Interior Walls: 150mm light steel frame with fiber-cement infill panels, plastered both sides

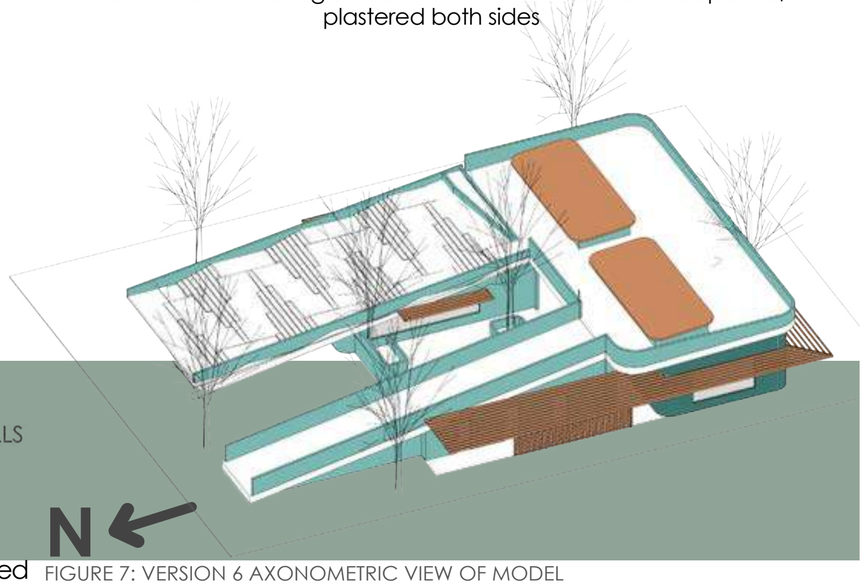


FIGURE 7: VERSION 6 AXONOMETRIC VIEW OF MODEL

Updates to Version 6:

- Extended shading device over western facade & introduction of perforated brick screen.
-Shading devices over southern art studios.
- Additional window on west and east wall of art studios.
- Increased size of glazing areas.
- Walling system updated to LSF IBT system.
- Removal of shopfront along north elevation of covered corridor to improve cross ventilation.
- Clerestory windows added to southern studios' roof.

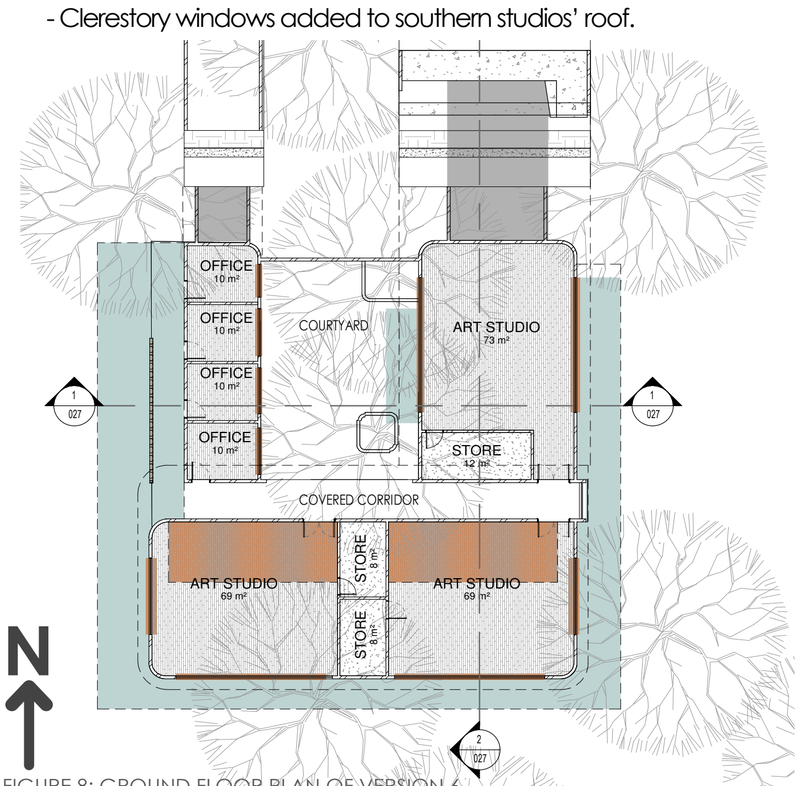


FIGURE 8: GROUND FLOOR PLAN OF VERSION 6

FIGURE 6: WEST/EAST SECTION OF VERSION 6

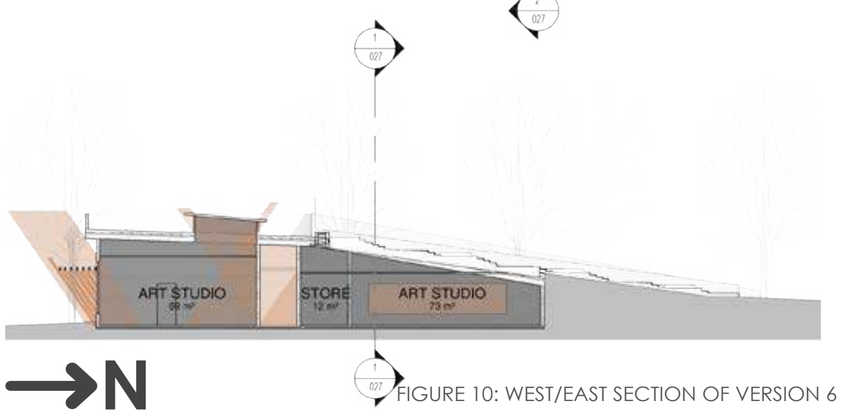
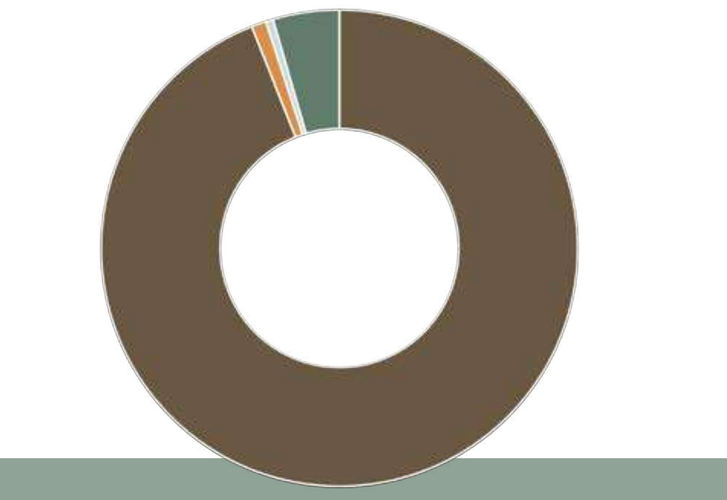


FIGURE 10: WEST/EAST SECTION OF VERSION 6

ENERGY EFFICIENCY

RESULT

LSFC EMBODIED ENERGY COMPOSITION



OBSERVATIONS

Materiality & Structural Selection:

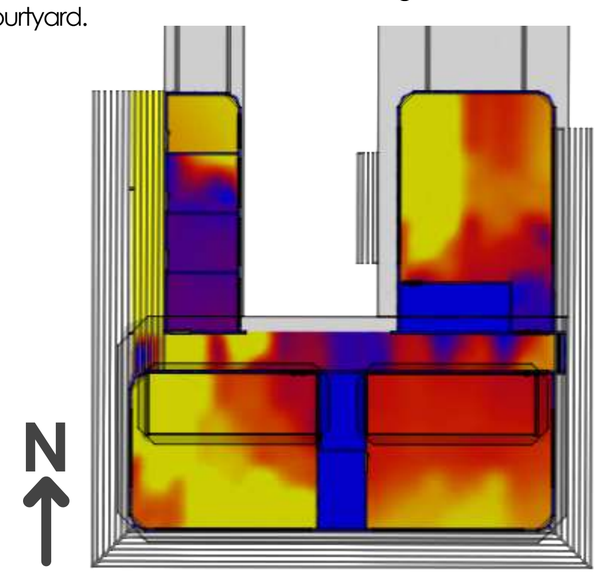
The second alternative building technology (IBT) identified also resulted in a reduction of embodied energy contained in the walling system and roof system compared to the conventional base case scenario. The floor slab remained unchanged and retains a high composition of the total embodied energy in the building system.

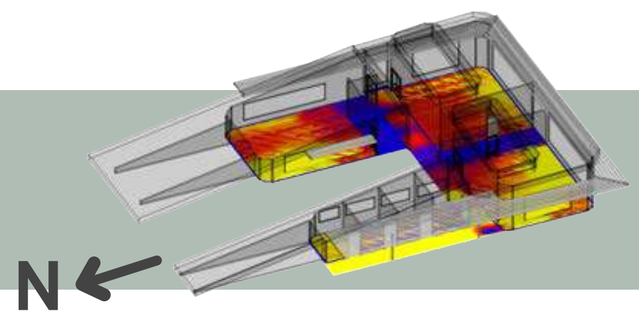
Lighting:

Introduction of more windows along east and west facades improves overall lux levels in studio spaces (approx 400lx). Offices still require supplementary lighting as it is still too dark. Storerooms will need to be artificially illuminated. New clerestory windows address the large deep spaces of studios, resulting in a better light diffusion.

Temperature Control:

Wrap-around shading devices have mitigated excess solar heat gain and over-lighting in spaces adjacent to glazing panels. Natural cross ventilation can now occur along the covered corridor and courtyard.

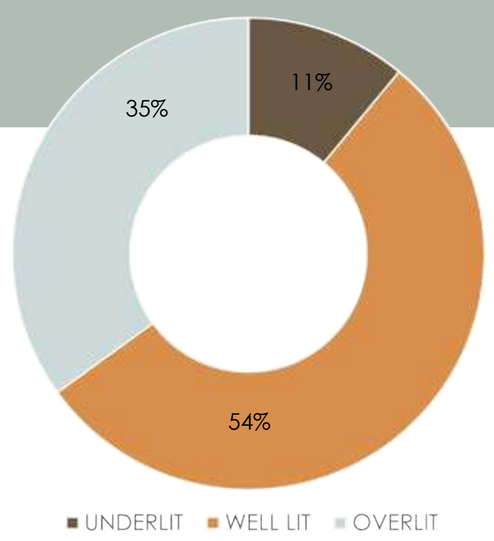




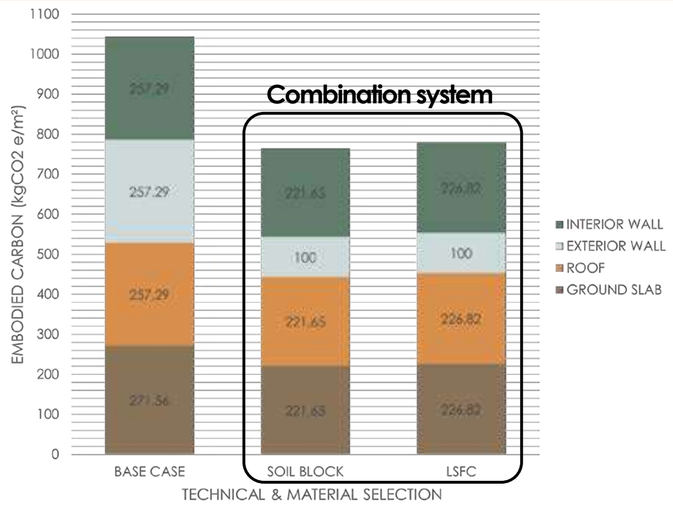
Lux levels on November 20 at 3PM measured at 0.55 meters above the floor plate. Time does not take into account daylight savings time.

0 200 400 600 800+

VERSION 6 DAYLIGHTING



FINAL



Updates to Final:

- Solid courtyard wall replaced by a perforated brick facade
- Reduced glazing size along west facade of east-wing studio.
- A combination of both IBT systems are used in place of conventional building methods.
- Clerestory window height and roof incline increased.

FIGURE 11: NORTH/WEST AXONOMETRIC

FIGURE 12: SOUTH/WEST AXONOMETRIC

FIGURE 13: SOUTH/EAST AXONOMETRIC

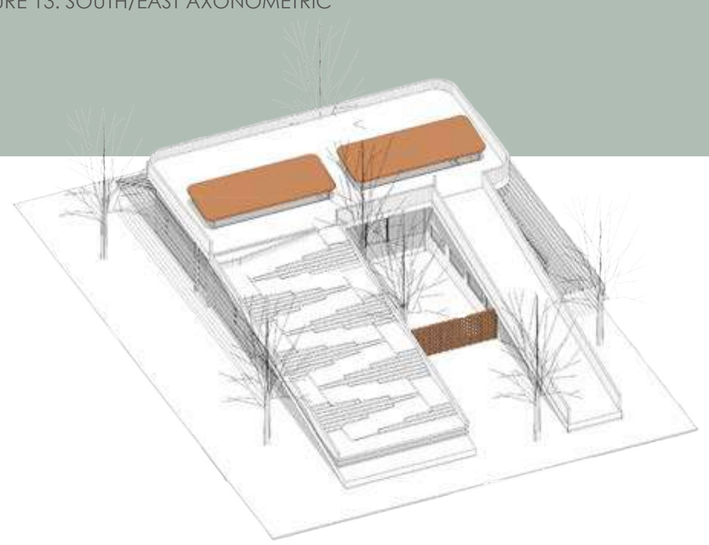


FIGURE 14: NORTH/EAST AXONOMETRIC

CONCLUSION

EMBODIED ENERGY

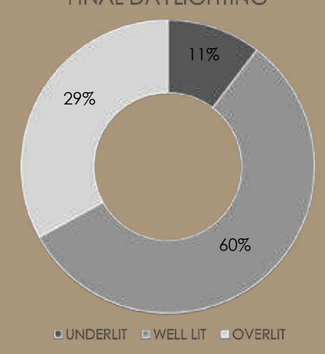
By altering the material system of the envelope and interior walls, using a combination of both the alternative building technologies (dry-stack in-situ - cast compressed soil blocks and light steel frame with fiber cement infill panels), there is an average embodied carbon value of 224,24 kgCO2 e/m². This is a 12,8% reduction from the initial base case scenario of 257,29 kgCO2 e/m² which utilities conventional masonry construction methods.

MATERIALITY & STRUCTURAL SELECTION

Lux levels on November 20 at 3PM measured at 0.55 meters above the floor plate. Time does not take into account daylight savings time.

0 200 400 600 800+

FINAL DAYLIGHTING



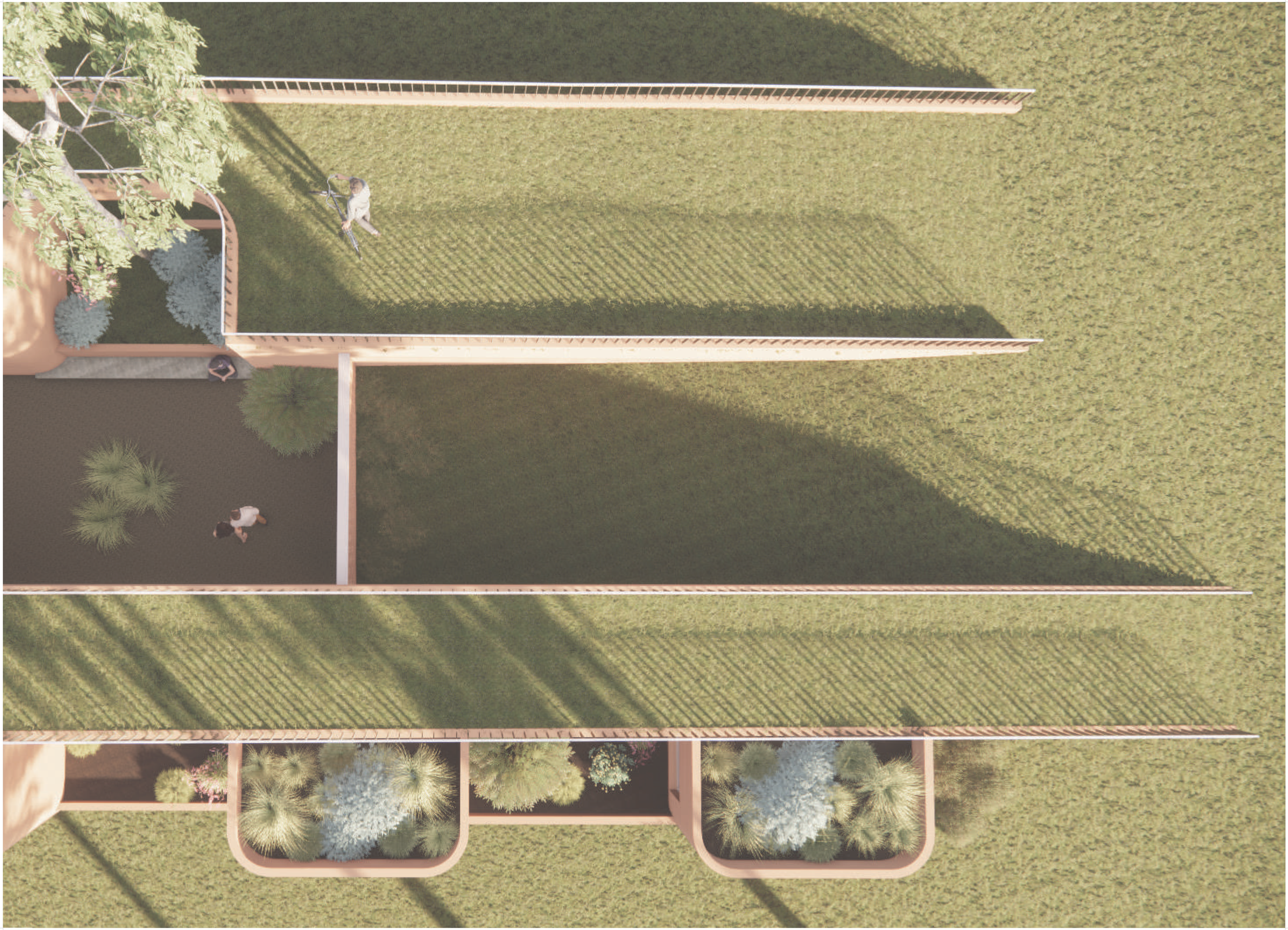
OPERATIONAL ENERGY

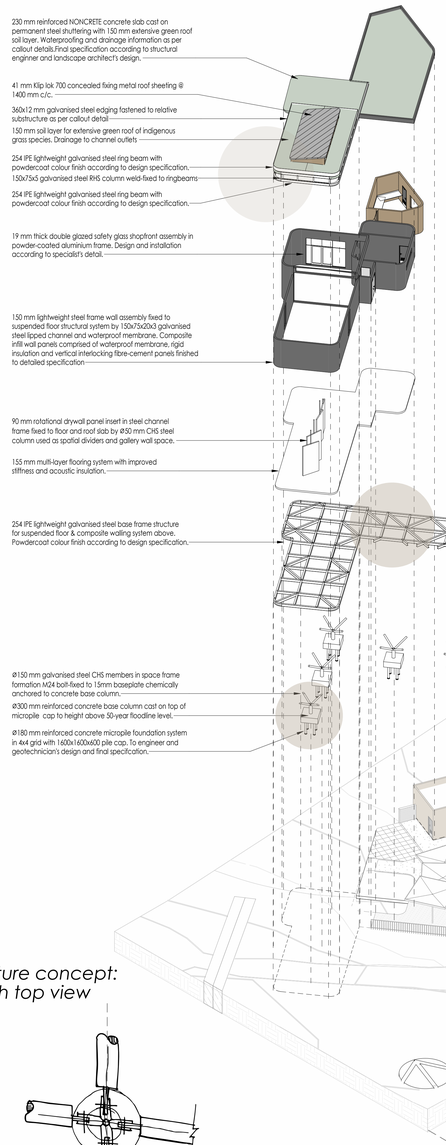
LIGHTING

- Artificial lighting sensors & controls - Occupation sensors to limit artificial lighting usage during operational hours as well as day/ night switches for automated exterior lighting in the evening.
- Clerestory windows break the depth of large open-plan spaces, improving the overall ambient daylighting.

TEMPERATURE CONTROL

- Natural cross ventilation throughout composition of building's spaces as well as breaking up solid walls into perforated facades to allow for cooling breezes.
- Stacked (clerestory) windows that open and close automatically to control ambient internal temperatures throughout the year as needed.
- The innovative materials selected provide lower embodied energy solutions but also act as thermal massing, allowing the building to mediate large temperature fluctuations as the day progresses, improving the thermal comfort inside.





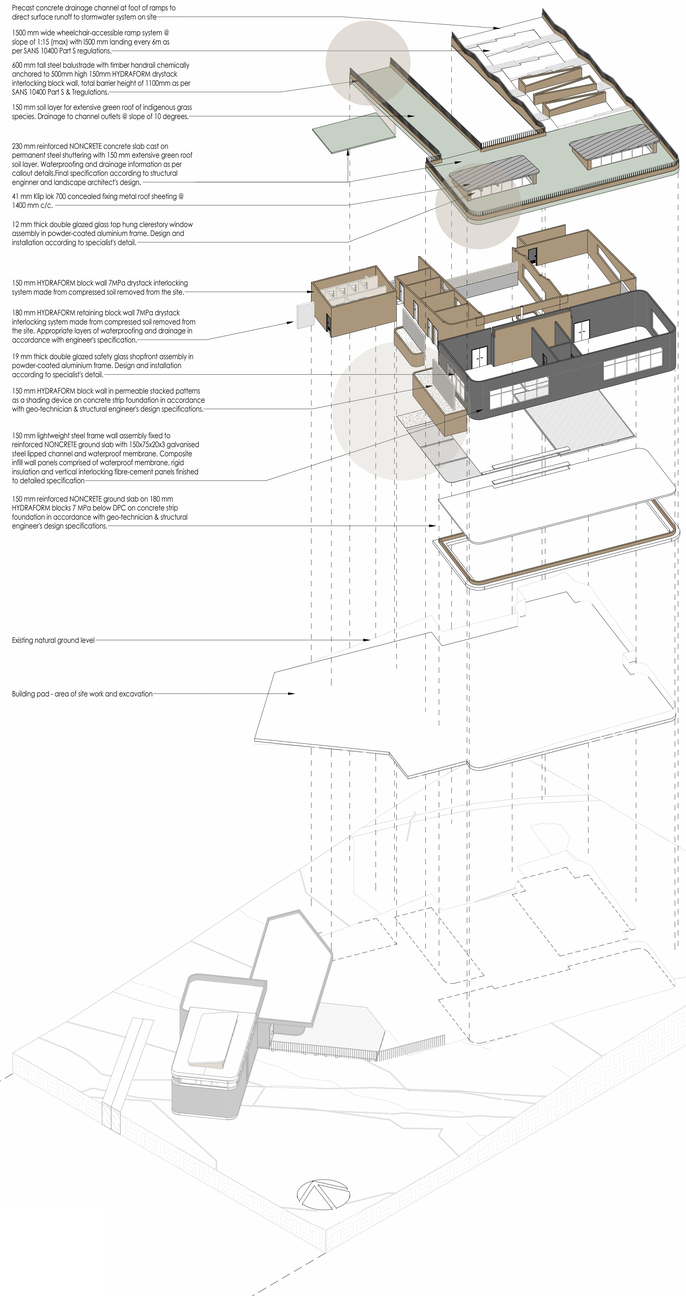
Mimicking the nature systems on site

Vertical fibre-cement interlocking shiplaop boards
(image by James Hardie)

Integrated native grass cover on green roofs
(image by Lynn Greyling)

Lightweight tectonic language

Heavy stereotomic language

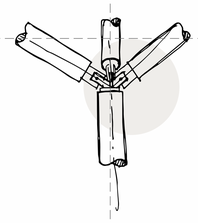


HYDRAFORM permeable wall

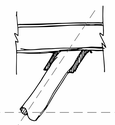
HYDRAFORM feature wall detail

Unique earth identity of the site

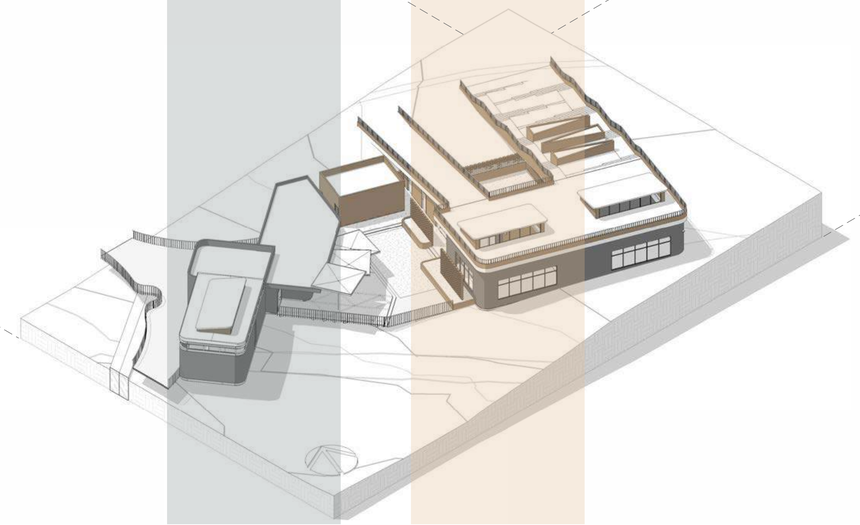
Structure concept: sketch top view

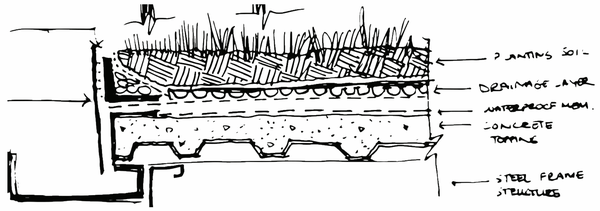


Structure concept: space frame sketch elevation



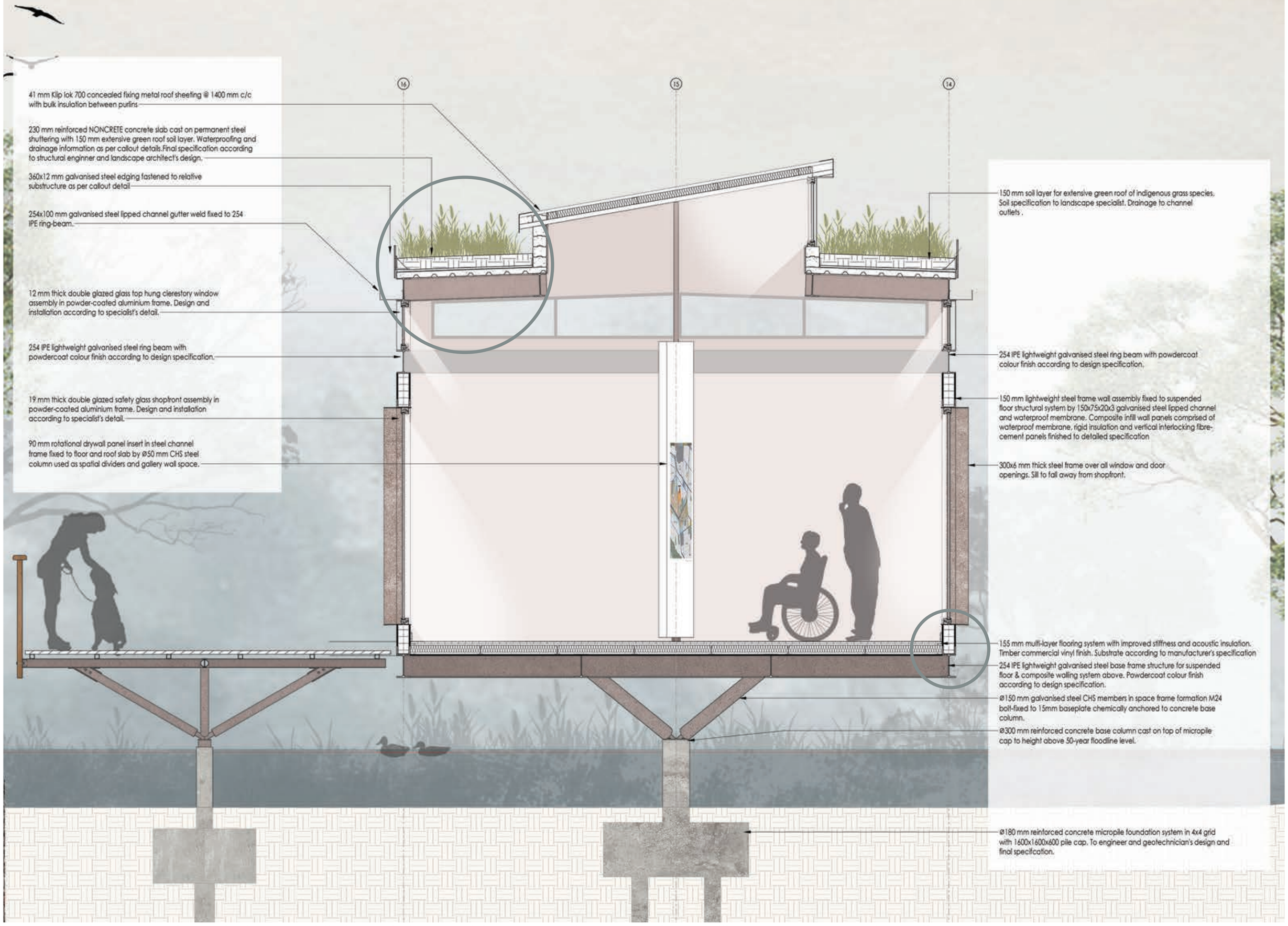
Structure concept: junction detail elevation



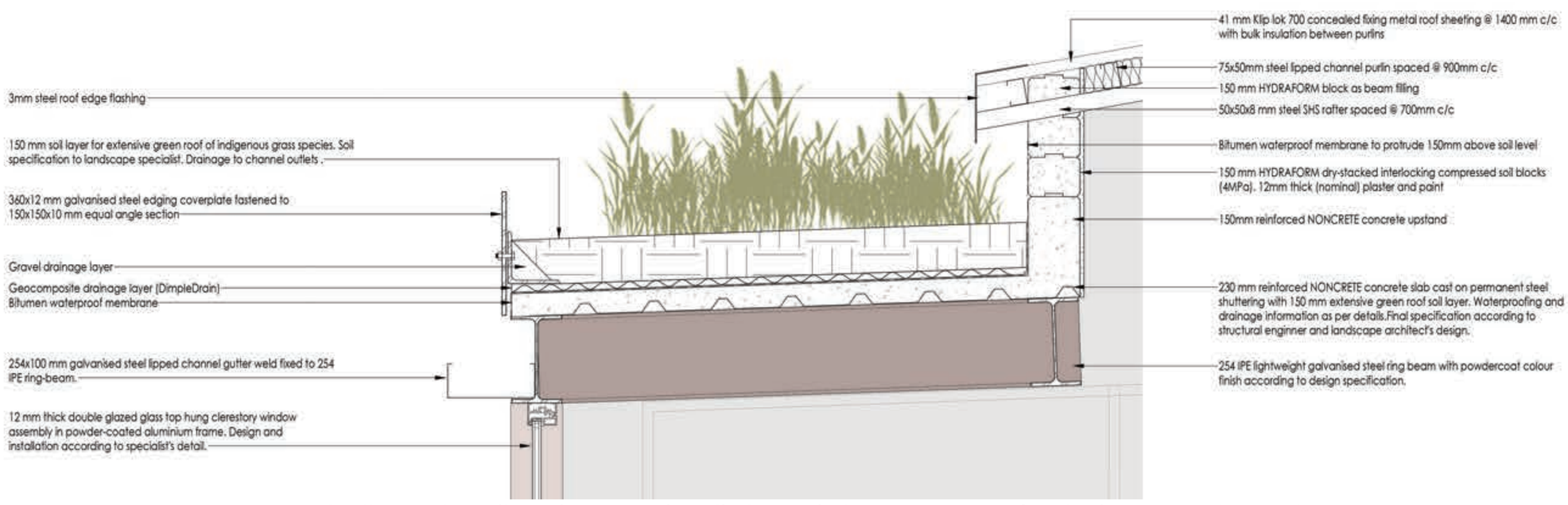


Structure concept: green roof made of NONCRETE concrete slab cast into permanent steel shuttering

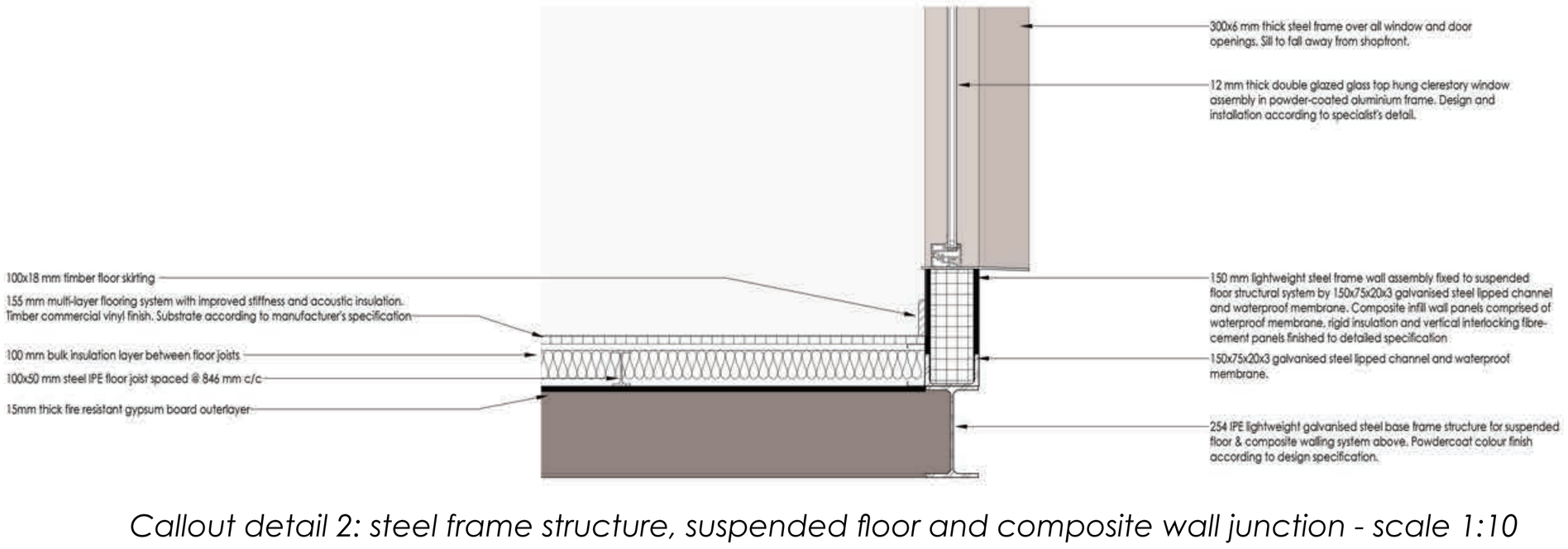
t e c h n i c a l r e s o l u t i o n a x o n o m e t r i c s



Cross section of elevated lightweight steel frame and composite walling system on micropiles above the river - scale 1:25

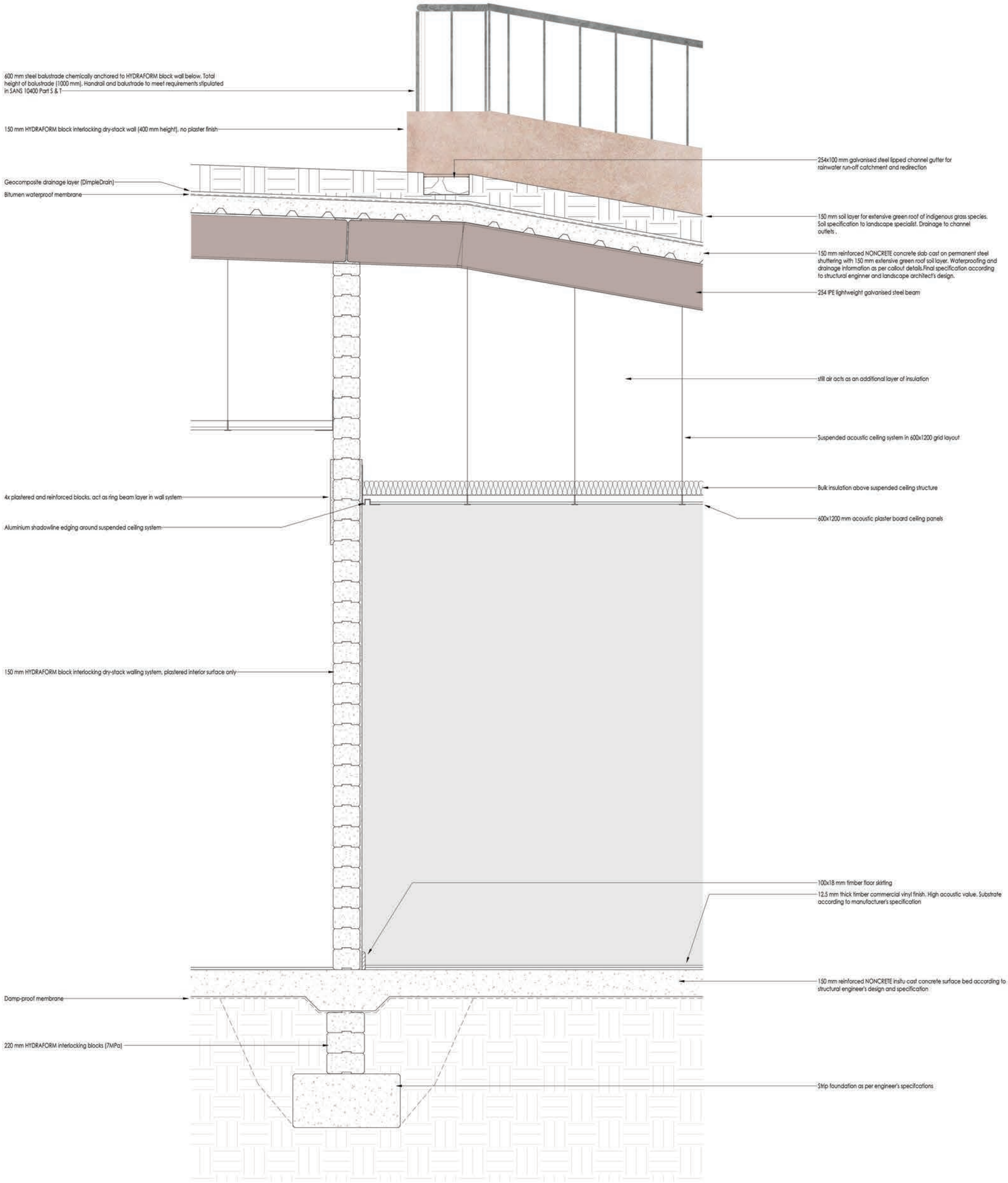


Callout detail 1 - innovative lightweight green roof solution - scale 1:10



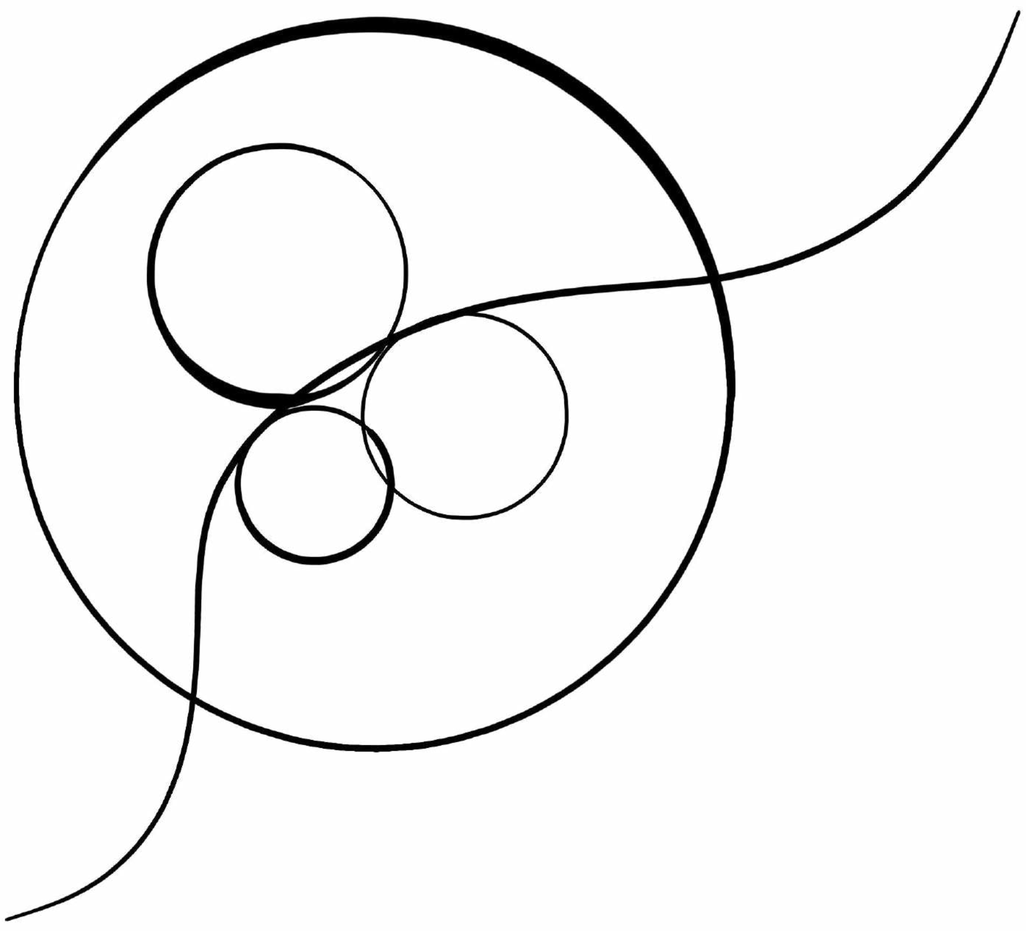
Callout detail 2: steel frame structure, suspended floor and composite wall junction - scale 1:10

lightweight system section 1:25 & callout details 1:10



Section of Hydraform block walling system and sloping green roof

stereotomic system section 1:20



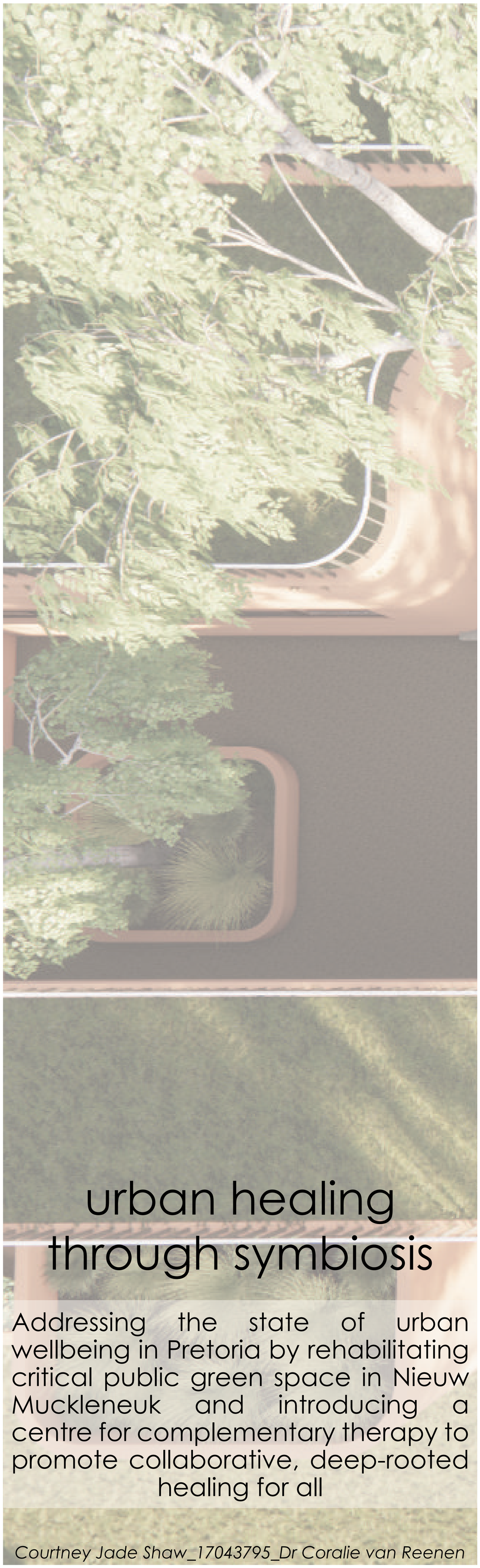
ABSTRACT

The City of Tshwane municipality's population will almost double from 3.5 million to 5.8 million by 2050 (Green Book, 2023). Pretoria, as a city within this municipality, is set to experience urban growth pressure. With this expansion comes several critical issues hindering the city's ability to adapt and develop, such as: access to adequate resources and services, the reduced quality of life of its residents and associated potential mental health issues, as well as the loss of critical biodiversity.

The intervention addresses the pressing need for improved access to mental healthcare resources in a city where a notable portion of the population suffers from mental health issues. Thus, it proposes a facility that provides complementary therapy interventions in combination with conventional therapy, and presents how access to public green space can play a vital role in healing. In an effort to improve Pretoria's environmental vulnerability, this renewed purpose aims to preserve and regenerate green sites across the city as it continues to densify. Salutogenic and biophilic design strategies are used to provide a comprehensive solution using natural systems to address human wellbeing and the state of nature in the city.

The design resolution, located in Nieuw Muckleneuk, is a series of spaces bridging the Walkerspruit river and nesting into the ground at either end, anchoring and reconnecting each side of Trim Park into a newly activated urban green site. It illustrates how innovative building technologies (IBTs) can reduce a project's carbon footprint and energy demands. Moreover, contextually-specific passive design principles and the curated introduction of indigenous plant species at a site level, exemplify how architecture is enriched when the context and site are allowed to shape the buildings. This presents a new typology in which architecture serves as a facilitator between critical urban stakeholders to ensure symbiotic collaborations that produce environmentally-responsible building practices and an improved sense of urban wellbeing for the city, its residents and nature.

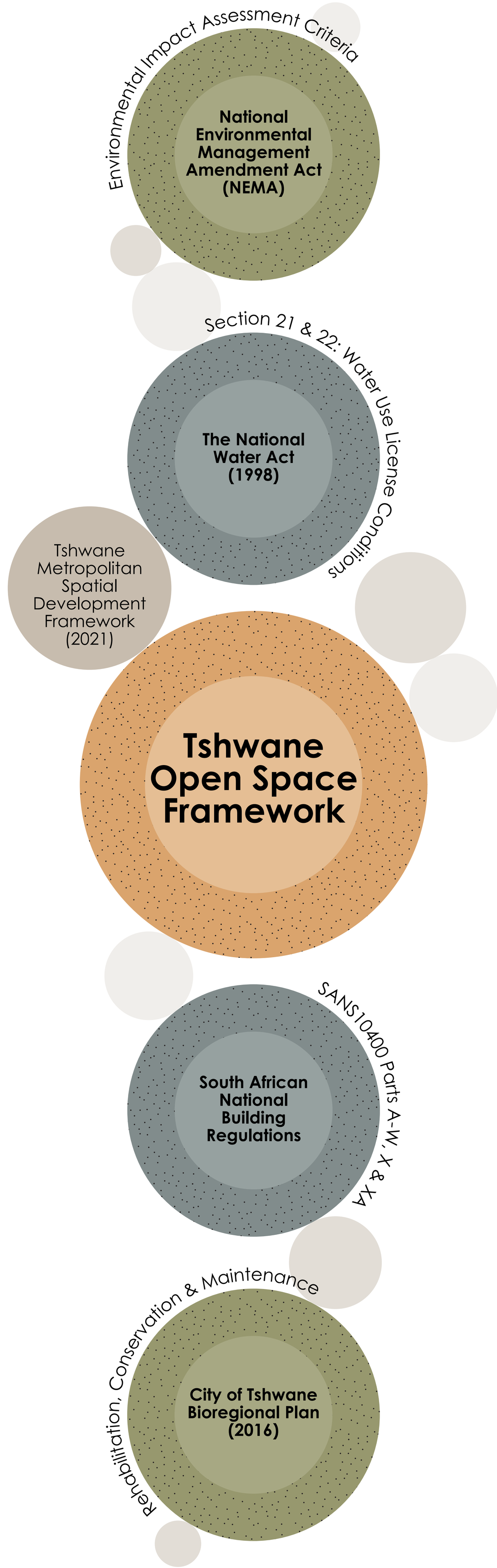
Keywords: Salutogenesis, biophilia, passive design, integrative, mental health, innovative building technologies, environmental sustainability, urban wellbeing, symbiotic relationships.



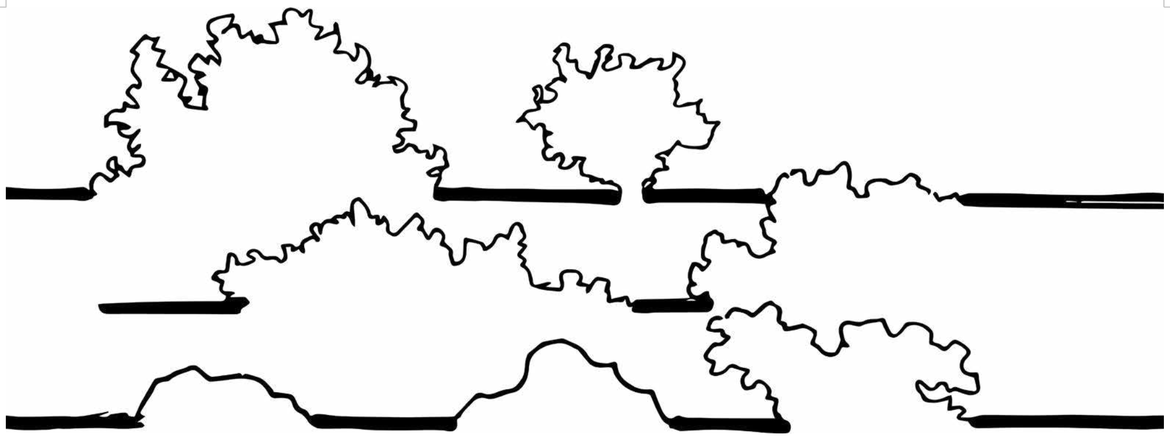
urban healing through symbiosis

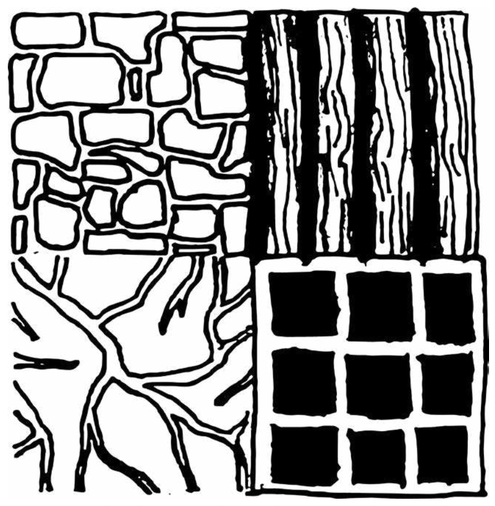
Addressing the state of urban wellbeing in Pretoria by rehabilitating critical public green space in Nieuw Muckleneuk and introducing a centre for complementary therapy to promote collaborative, deep-rooted healing for all

Courtney Jade Shaw_17043795_Dr Coralie van Reenen

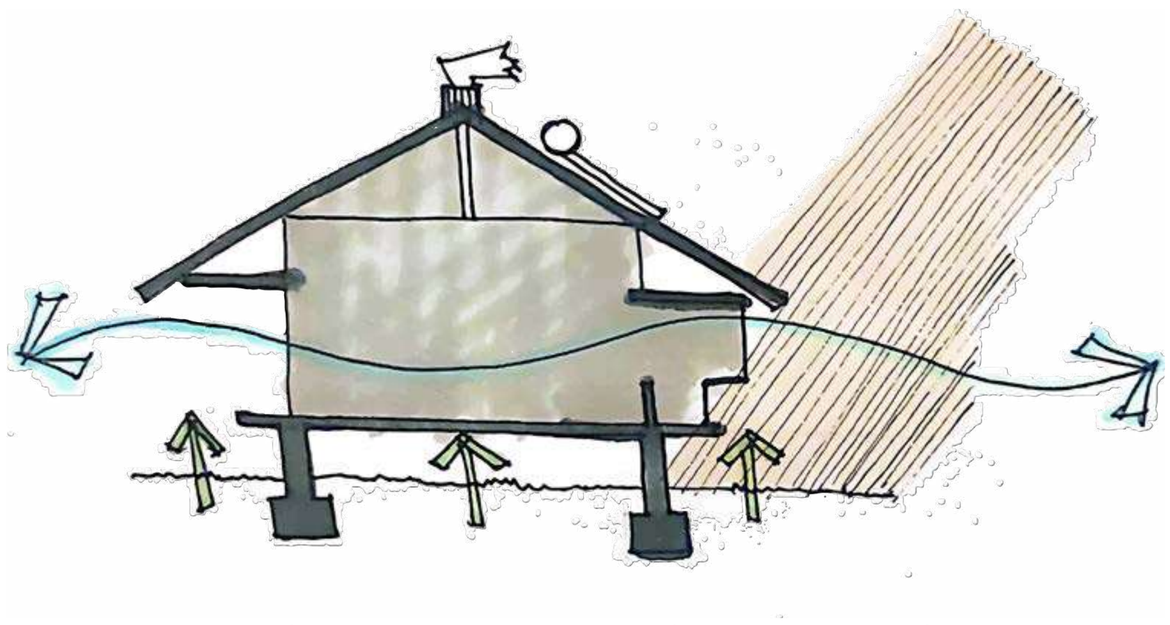


legislation & regulations

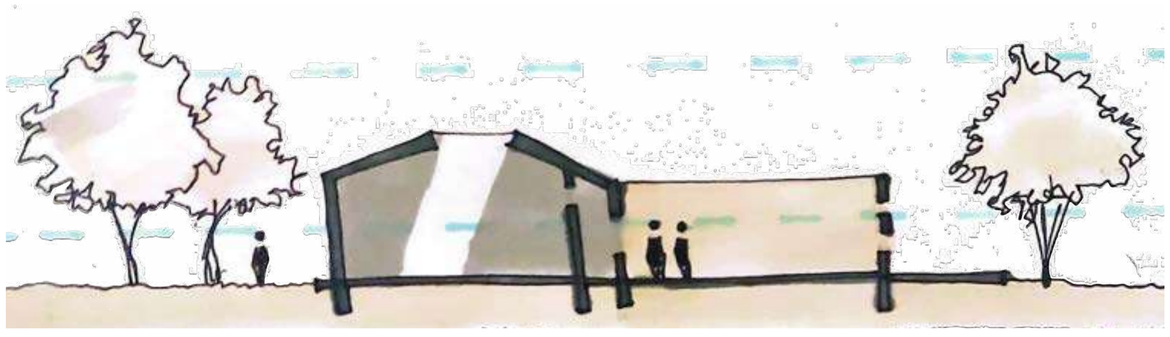




Coromandel, Lydenburg South Africa
Marco Zanuso
materiality and merging of building and site



Marika-Alderton house, Yirrkala, Australia
Glenn Murcutt
contextual climatic response

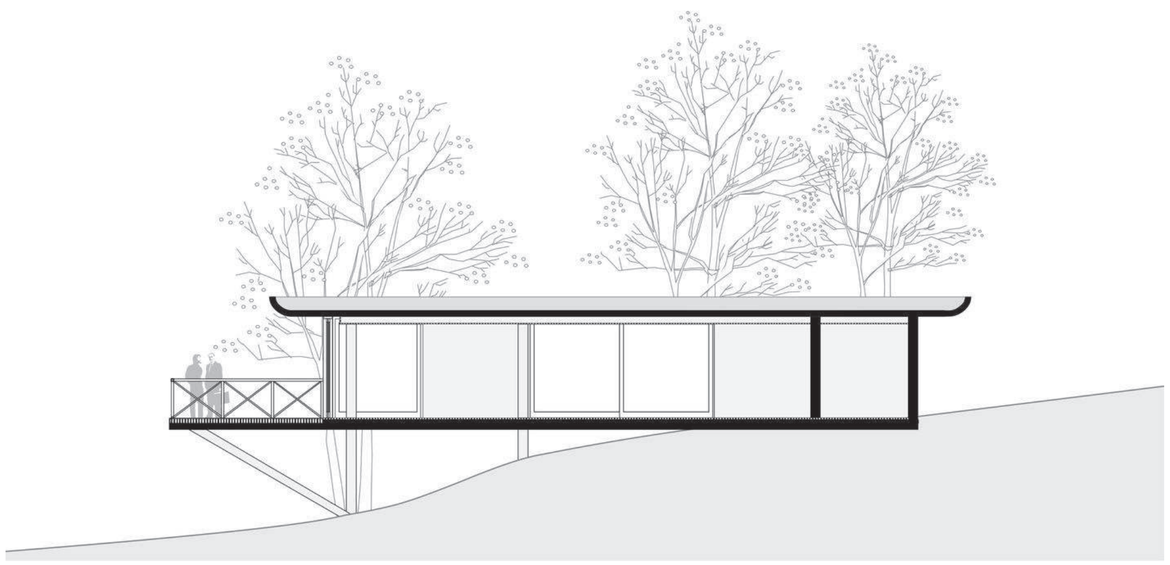


Centre for health & social welfare, Laongo, Burkina Faso
Kere Architecture
privacy and spatial planning for healthcare design

conceptual precedents

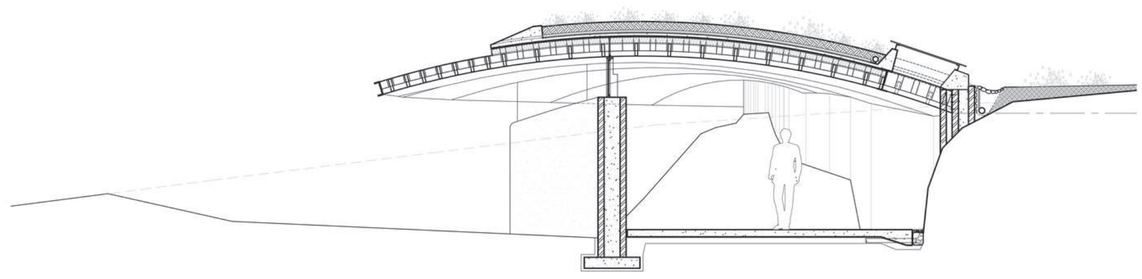
(Image by GLH Architects)

Witklipfontein Eco Lodge, Vredefort, South Africa
GLH Architects
roof and landscape



(Image by GLH Architects)

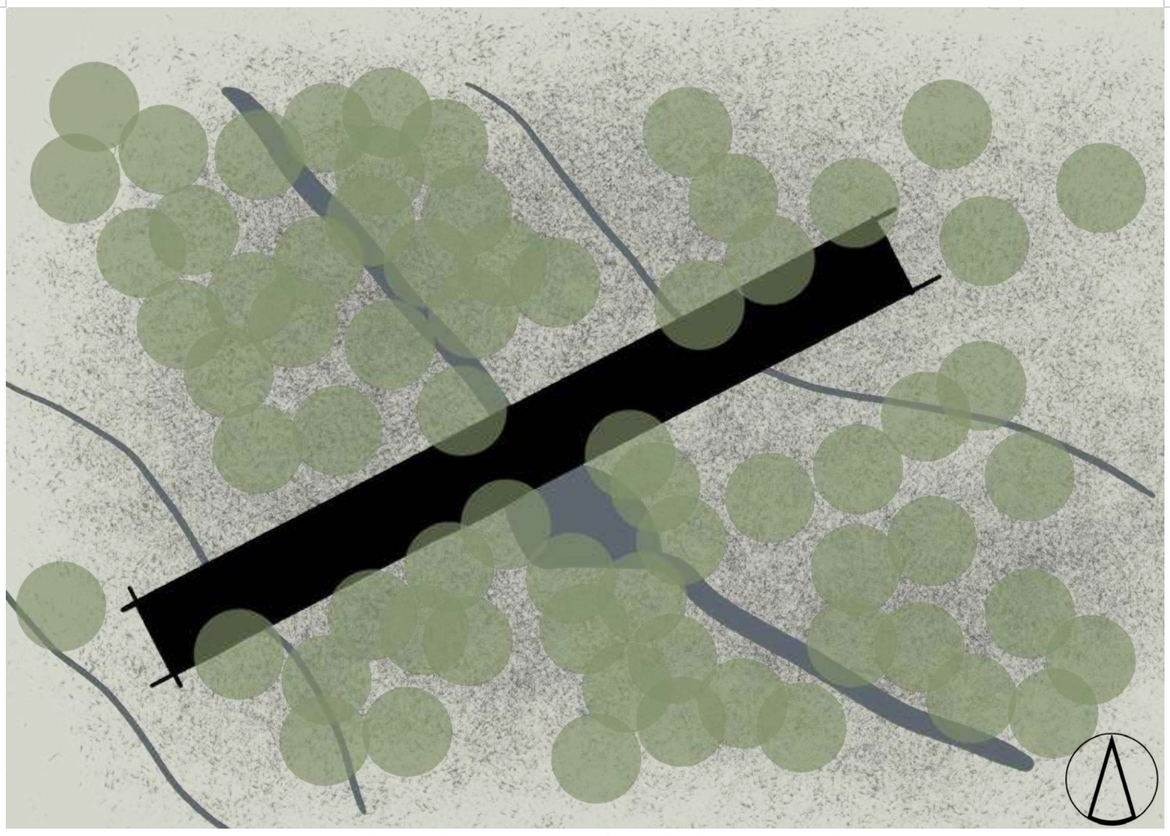
GN Residence, Itaipava, Brazil
Miguel Pinto Guimarães Arquitetos Associados
elevating the ground plane



(Image by KLG Architects)

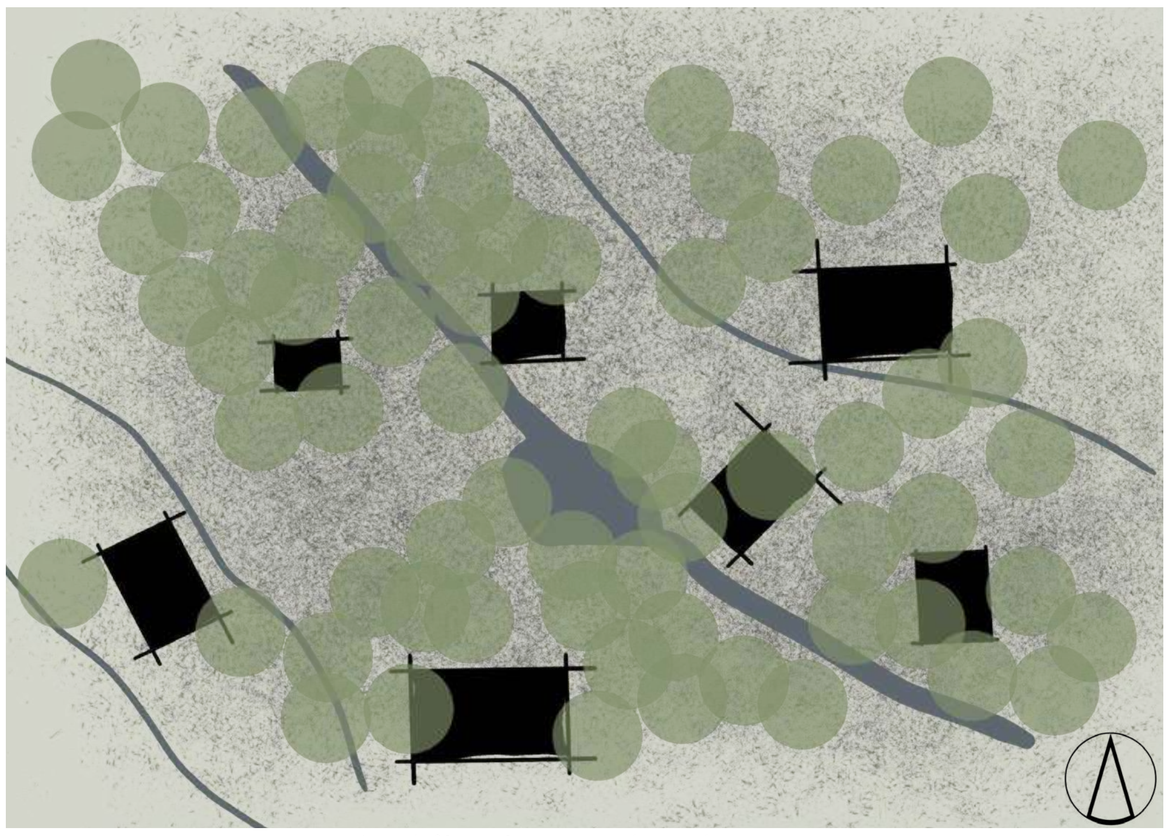
Yzerfontein, South Africa
KLG Architects
materiality and merging of building and site

technical precedents



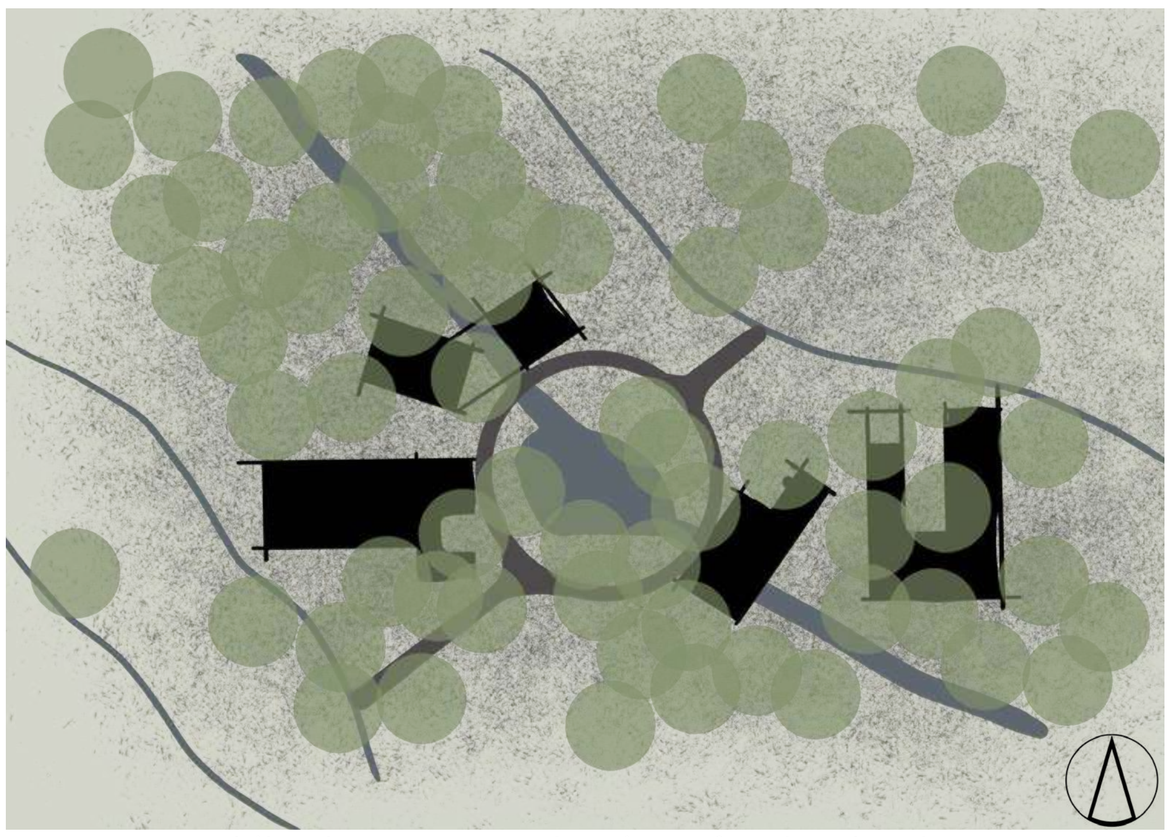
Architecture as a bridging device

The idea of a physical space that connected each side of the site over the river was strong and accessible. However, the architecture became a superficial object in the landscape, void of any deep-seated engagements with nature and too closely resembled the sterile, corridor typology of most institutional healthcare centres.



Architecture as landscape

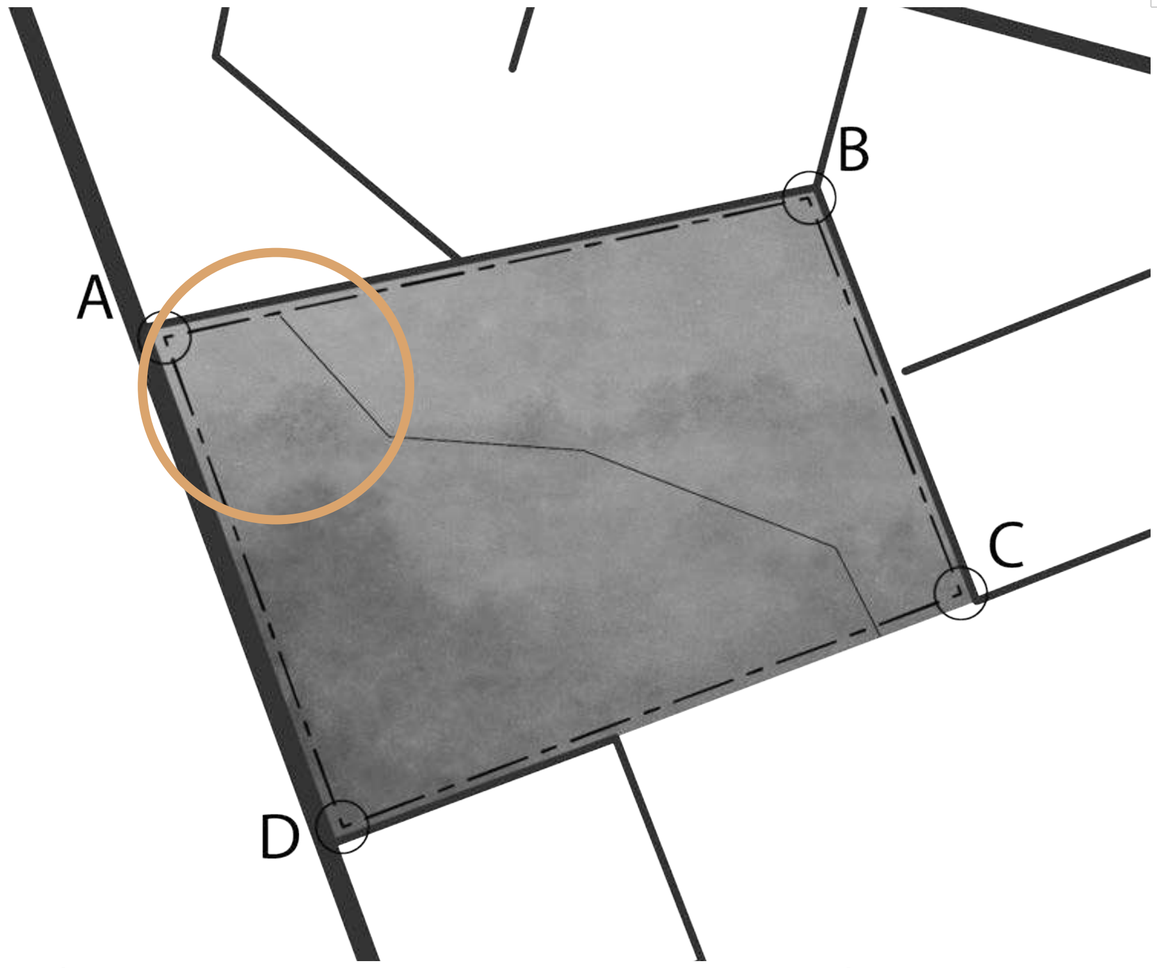
Breaking up the building into programmes spread across the river and site spoke to an organic spatial solution embedded in the landscape. However, navigation between spaces became disjointed and inaccessible which contradicted the characteristics of salutogenic design - innate healing spaces that are legible, well connected and lend themselves to an intuitive journey.



Architecture as an extension of natural systems

By combining the findings of previous milestones and with further responses to specific climatic characteristics, a comprehensive solution was refined. The result is an architectural intervention that stitches the site back together whilst respectfully engaging with the existing natural systems. The building therefore becomes an extension of the landscape.

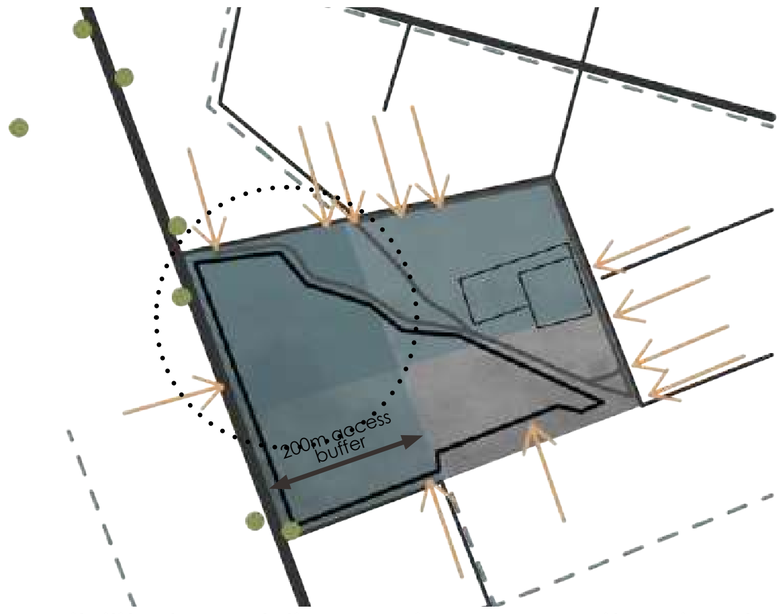
design development



Trim Park Complementary Healing Centre

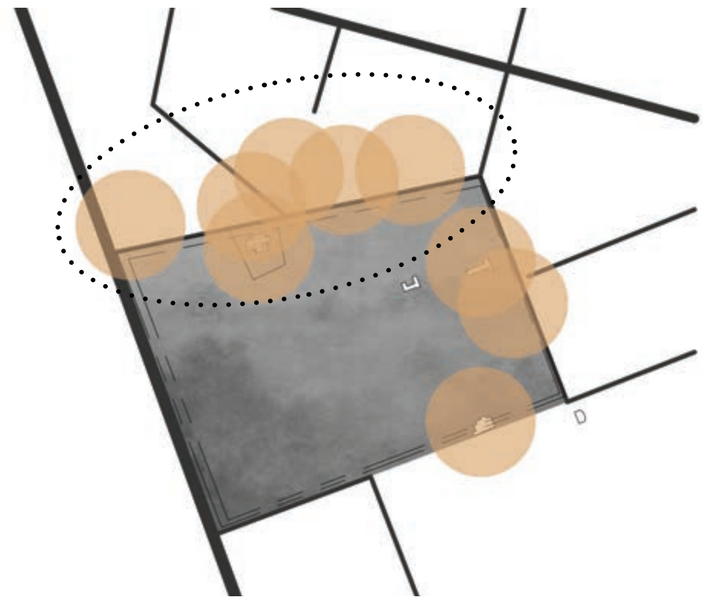
Erf number & site address	Erf 410, Erf 2/394 & Erf R1/1/394 Trim Park,173 Mackie street, Nieuw Muckleneuk, Pretoria
Zoning classification (City of Tshwane)	Public open space
SANS10400 occupation class	Entertainment & assembly (A1), indoor sports (A2), outdoor sports (A5), place of instruction (A3), exhibition hall (C1), library (C2), & offices (G1)
Total site area (m²)	129 071,517 m²
Existing building area (m²)	336 m²
New building area (m²)	1082 m²
Total building area (m²)	1418 m²
Property boundary lines (metres)	AB 429,58 m BC 270,19 m CD 424,11 m DA 338,51 m
Permissible site floor area ratio (FAR)	1,5
Permissible site coverage	Not applicable
Total estimated population	255 - 500 people
Parking requirements	62 parking bays & 2 disabled parking bays (Required: 60 bays & 2 disabled bays)
Ablution requirements (summary)	Male: 5 toilets, 6 urinals, 6 basins & 2 showers Female: 9 toilets, 6 basins & 2 showers
SANS10400 XA climate zone class	Temperate interior (2)
Hydrology sensitivity rating	Walkerspruit river - low threat level
Biodiversity sensitivity rating	Crtical biodiversity area 1
Total energy demand inside buildings (W)	18 029 W
Total energy produced by solar panels (W)	400W x 5,42 peak sun hours per day (average) = 42 192 W

site information

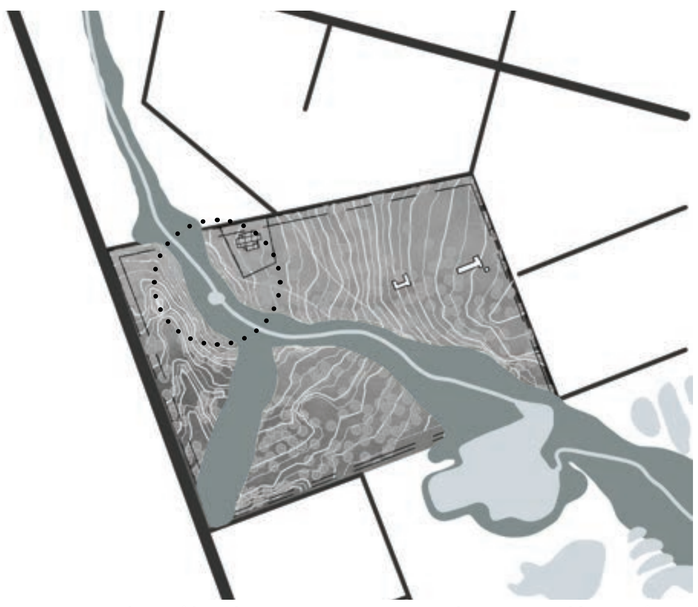


accessibility to public, services & on site circulation

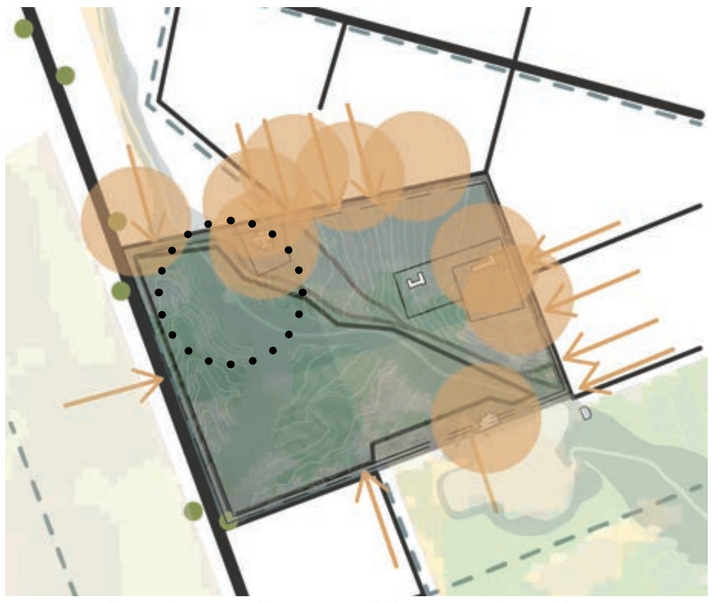
environmental characteristics



proximity to existing programmes



opportunity to reconnect over the river



final on-site position selection

l o c a t i o n s e l e c t i o n

- Acessibility

Controlled Entrance fees, dogs allowed

- Zoning Use

Mixed use, nature reserve

- Amenities & Activities

Pltfrm restaurant, Clay Cafe, Swift Physio Centre, Salomon store, Love of Dance Academy, TWS Trainers, PSG, bike, hiking and running trails, playground

- Quality of Infrastructure

Clean, functional & well maintained

Wolwespruit Bike and Trail Park

Magnolia Dell Park

- Acessibility

Publically Accessible, no entrance fee

- Zoning Use

Natural conservation, public open space

- Amenities & Activities

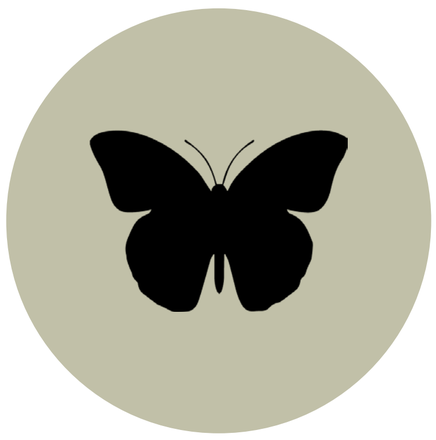
Huckleberry restaurant, flee market, intiem love bridge, soccer, skateboarding, playground

- Quality of Infrastructure

Clean, functional & well maintained

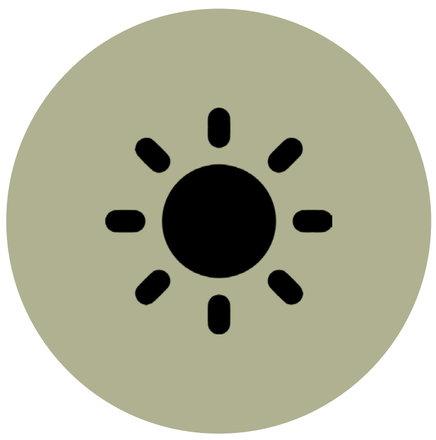
l o c a l p r e c e d e n t s

attracts birds



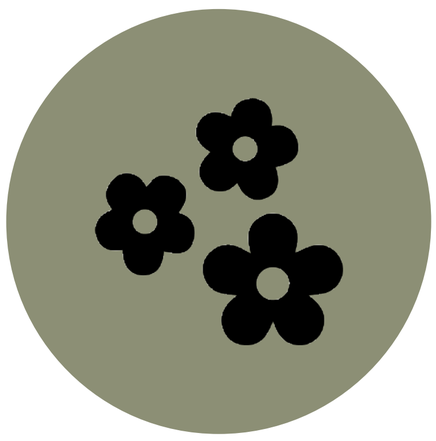
attracts butterflies

attracts bees



drought resistant

medical plant

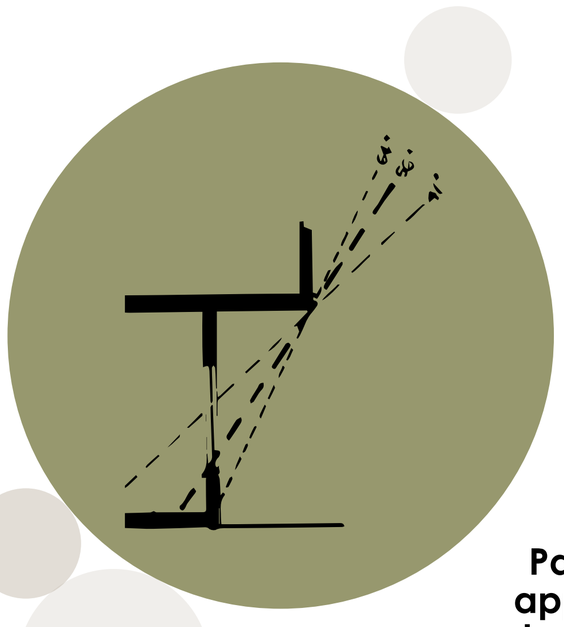


fragrant

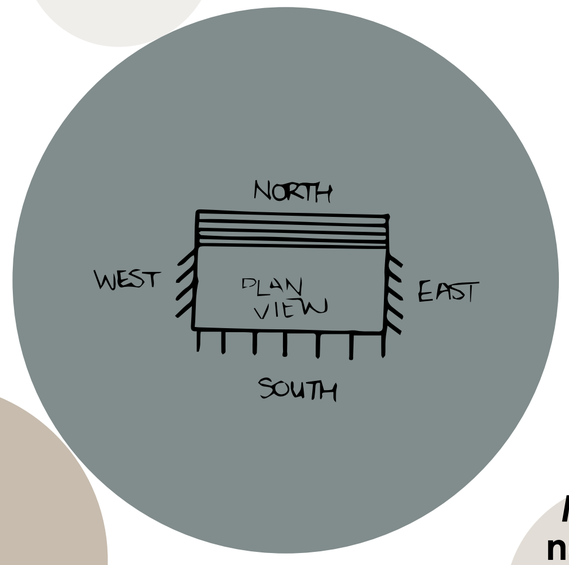
edible

useful plant

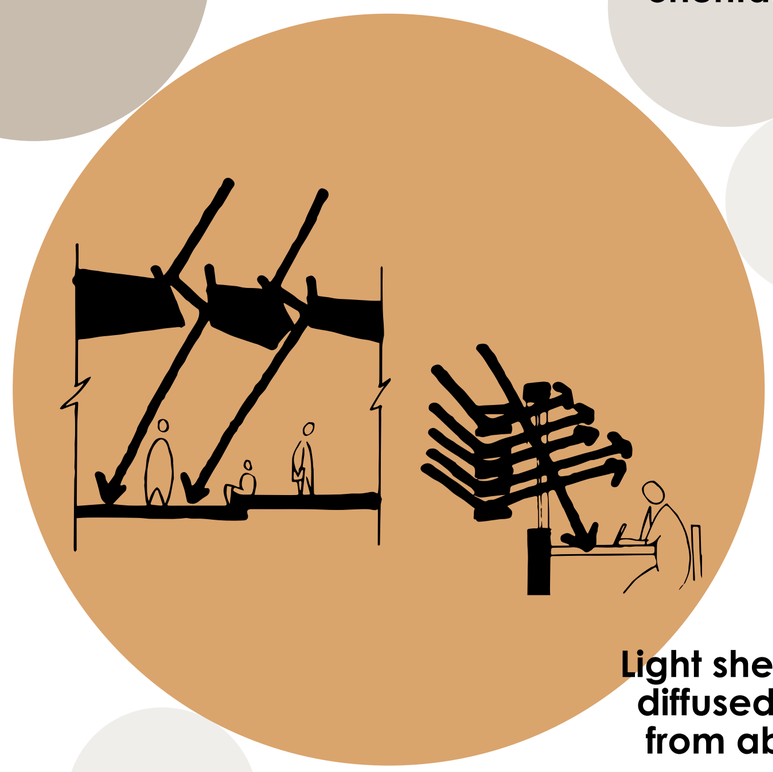
plant legend



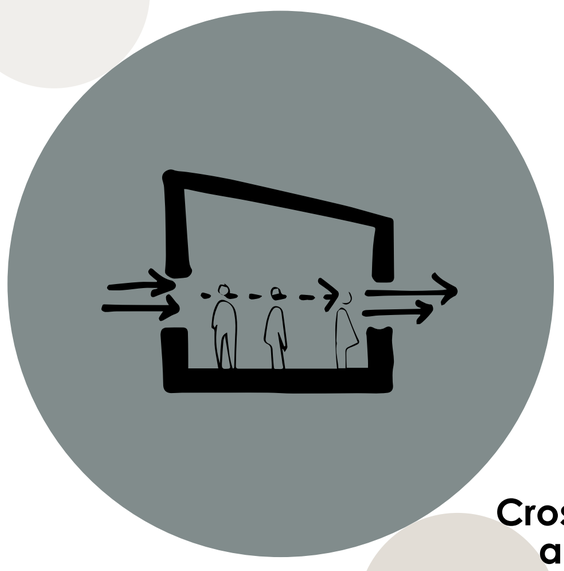
Passive solar applications & double glazing



Maximise north-south orientations



Light shelves & diffused light from above



Cross ventilation and natural cooling

Dense thermal mass & insulation systems

passive design strategies