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POETICS OF THE CHANGING DUNESCAPE

Turning Brownfield Terrain into Activity and Ecological Open Space

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"I confess I do not believe in time...
...and the highest enjoyment
of timelessness - in a landscape
selected at random - is when I stand
among rare butterflies and their food plants.
This is ecstasy, and behind the ecstasy
is something else, which is hard to explain.
It is like a momentary vacuum into
which rushes all that I love. A sense of
oneness with sun and stone."

Vladimir Nabokov
Speak, Memory (1966)



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Changing the landscape and its perceived value by both uncovering and creating Meaning, Sense of Place, Presence and Belonging to a large brownfield site within an existing urban fabric, using theories of Palimpsest, Place, and Experiential Landscape Architecture principles, as researched and defined by the author.

Our environment and our perception of it are continuously changing. This thesis objective is to change an existing site to become an experientially poetic landscape, imbued with meaning, a strong sense of place, presence and belonging. It explores the ideas of palimpsest, theory of place and experiential landscape architecture. The argument is that only through physical, bodily engagement with the landscape may it acquire meaning in the collective memory and significance as a place, especially when informed by the unique characteristics of the site itself.

The site is positioned in Wingfield/Maitland, an under-appreciated, derelict, forgotten and currently non-experiential large tract of land, lying in the Cape Flats area. The land is under a threat of re-development, with existing proposals intending to develop it to its maximum extent, not taking sufficient cognisance of its other values. This is a good case for when a landscape architectural approach may look at the site from a more holistic point of view, taking into account the various values, needs and claims of the site.

Landscape in this project is understood to be a cultural construct. The design takes inspiration from understanding the unique natural-cultural qualities of this land, which serve as a tool to create attachment to the place and to nature's rhythms.

The change is a poetic event. Compared to the extremes of climate of my childhood and adolescence homeland, I find the change in the Cape Flats landscape to be more subtle, and it takes time to grow to appreciate its poetry. The idea of change is a multi-layered one. It is about the poetical seasonal and other cyclical changes between the dry and wet seasons, wind strength, and flooding, changing colours and shapes, and the necessity of periodic fires. I believe, change is also imperative in our attitude towards our engagement with and appreciation of the landscape. Change is about the evolution of the landscape and its history, and about its continuous and necessary adaption to future conditions, in terms of both environmental and future human needs.

The site has undergone a lot of natural and anthropogenic alterations. The topic of poetic change is inspired by both the site's natural character and by its history. The change is explored in the design through the concepts of movement and participation in the landscape, allowing for experience of various conditions. It is also supported by the concept of connectivity, both natural and human; and the concepts of contrast and counterpoint; as well as the strategies of inclusion and absence.

Water, sand, vegetation, as well as some traces of human activity, are the main place-making elements in the design. The inland dunes with mosaic wetland habitat and their associated vegetation are some of the last traces of the typical Cape Flats landscape, that was/is not fully understood or appreciated. These natural elements are the best expressions of the landscape's ephemerality, changeability and the sense of time. It is the breathtaking potential abundance and variety of life on this site that is the inspiration for this design thesis.

Research Methodology

One of the aims of my thesis is the development of my own landscape language and my understanding of the position and contributions of Landscape Architecture to people/society and the built realm.

The practice of Landscape Architecture is multi-disciplinary and involves some knowledge and understanding of various other fields, like architecture, the fine arts, ecology, botany, horticulture, urban design, environmental sciences, geography and more. This complexity of the field guides my methodology/ or 'research through designing' strategy.

The diagram (refer Figure 1) shows my general methodology of 'research through designing.' The definition of 'research through designing' is understood in line with the definition given by Lenzholzer, Duchart and Koh (2004:121), where 'the designing activity is employed as a research method' to generate new knowledge.

Methodology is research that is conducted through a lens of a specific paradigm. Paradigm is "a basic set of beliefs that guides action." (Guba, 1990:17) In other words, paradigm shapes and prescribes researcher's ontological, epistemological and methodological attitudes.

For the purpose of my thesis, I'm engaging with the Pragmatist Paradigm, using Mixed-Methods Studies that combine the qualitative and quantitative approaches within different phases of/ or simultaneously throughout the research process. (Tashakkori & Teddlie, 2008:22) Mixed-Methods allow for a greater design choices involving a range of sequential and concurrent strategies. The pragmatic paradigm integrates positivist, post-positivist, constructivist, and advocacy/participatory knowledge claims. (Lenzholzer, S., et al., 2013:122) This approach allows for paradigm relativism, "the use of whatever philosophical and/or methodological approach (that) works for the particular research problem under

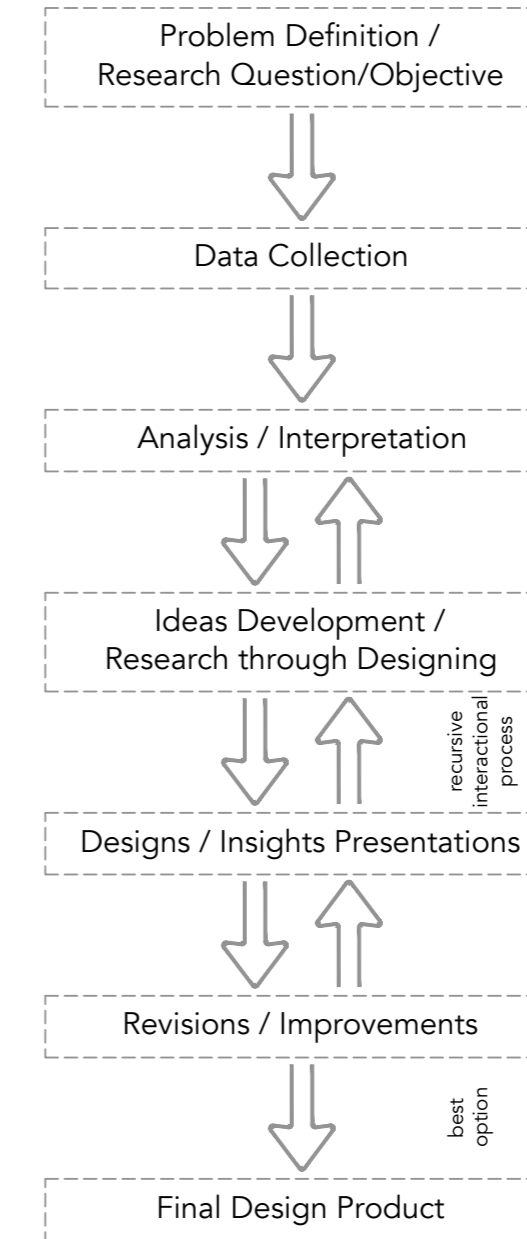
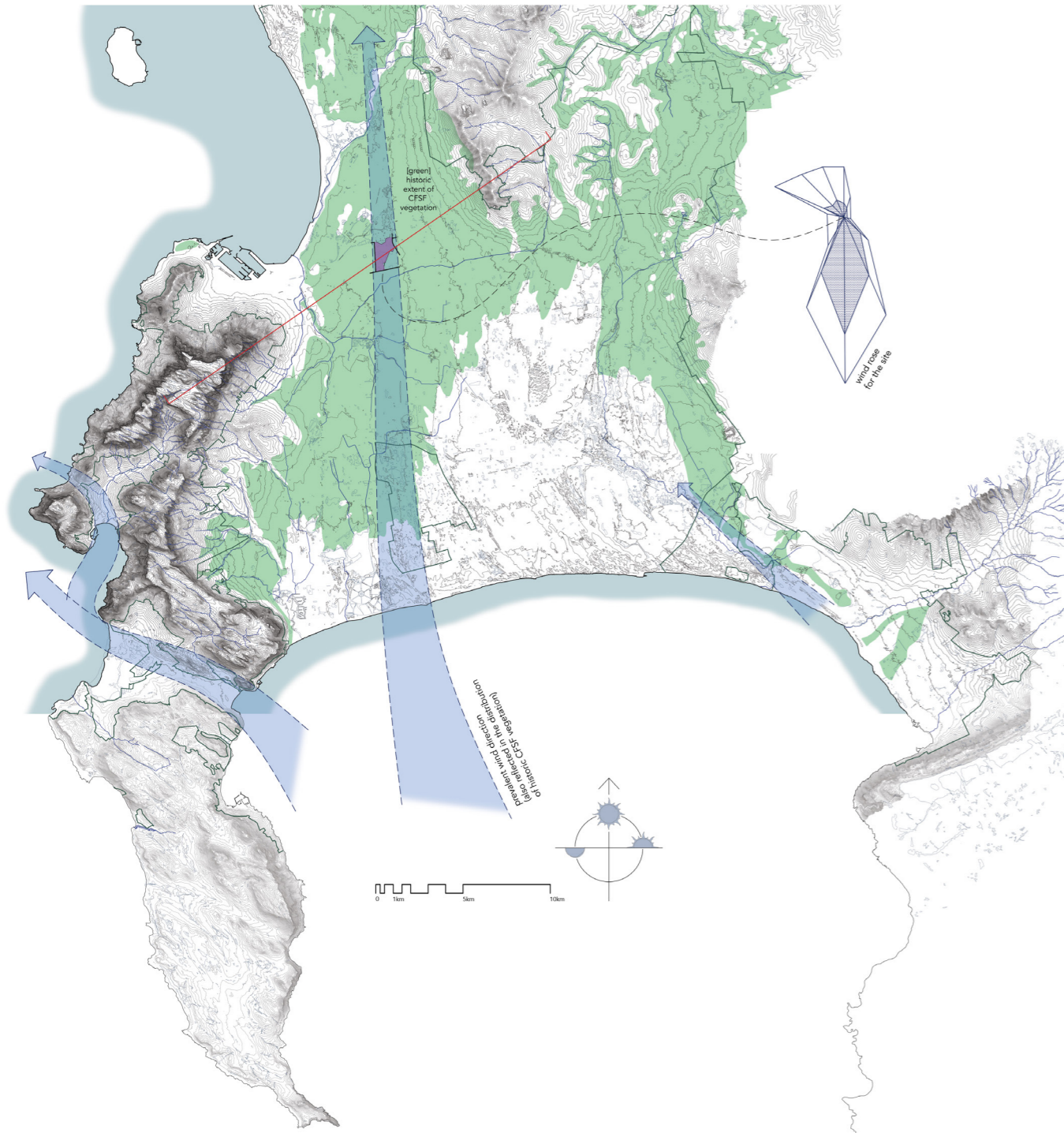


Image 3. General Methodology Diagram. By author.

study" (Tashakkori & Teddlie, 2008:9) For a pragmatist, the context is very important, and the paradigms amongst which to manoeuvre and the related methods depend on the research question and context. I will draw on post-positivist and constructivist/ or interpretivist paradigms' constructions in my research.

Post-positivist paradigm is necessary for 'empirical (scientific) research' through designing. (Lenzholzer, S., et al., 2013:122) Landscape is a complex, dynamic and adaptive natural environmental phenomenon, and specialists' scientific studies and reports (e.g. hydrology, climatology, landscape ecology, botany) have to be translated to inform design decisions. Some of the sub-questions important for my design are related to post-positivist knowledge claim, such as 'how my proposal could best function to fit and emphasise natural processes? what materials are best appropriate? what spatial configurations could have what effect on people's perception of the environment and induce what use?'

Qualitative research acknowledges possibility of multiple-constructed realities, time- and context-dependent research, that the knower and known are intertwined, and that the subjective knower is the source of reality. (Johnson and Onwuegbuzie, 2004:14) The sub-questions, that are in line with constructivist/ interpretivist paradigm, are: 'how can I create an experiential landscape? how this landscape would relate to other people's experience? can the design bring about a change in people's perception and experience of the landscape?' These questions involve ontological relativism and epistemological subjectivity. Methodologically, this paradigm also demands different type of research, thorough visual analysis, physical immersion in the site, 'thick description.' (Lenzholzer, S., et al., 2013:123)



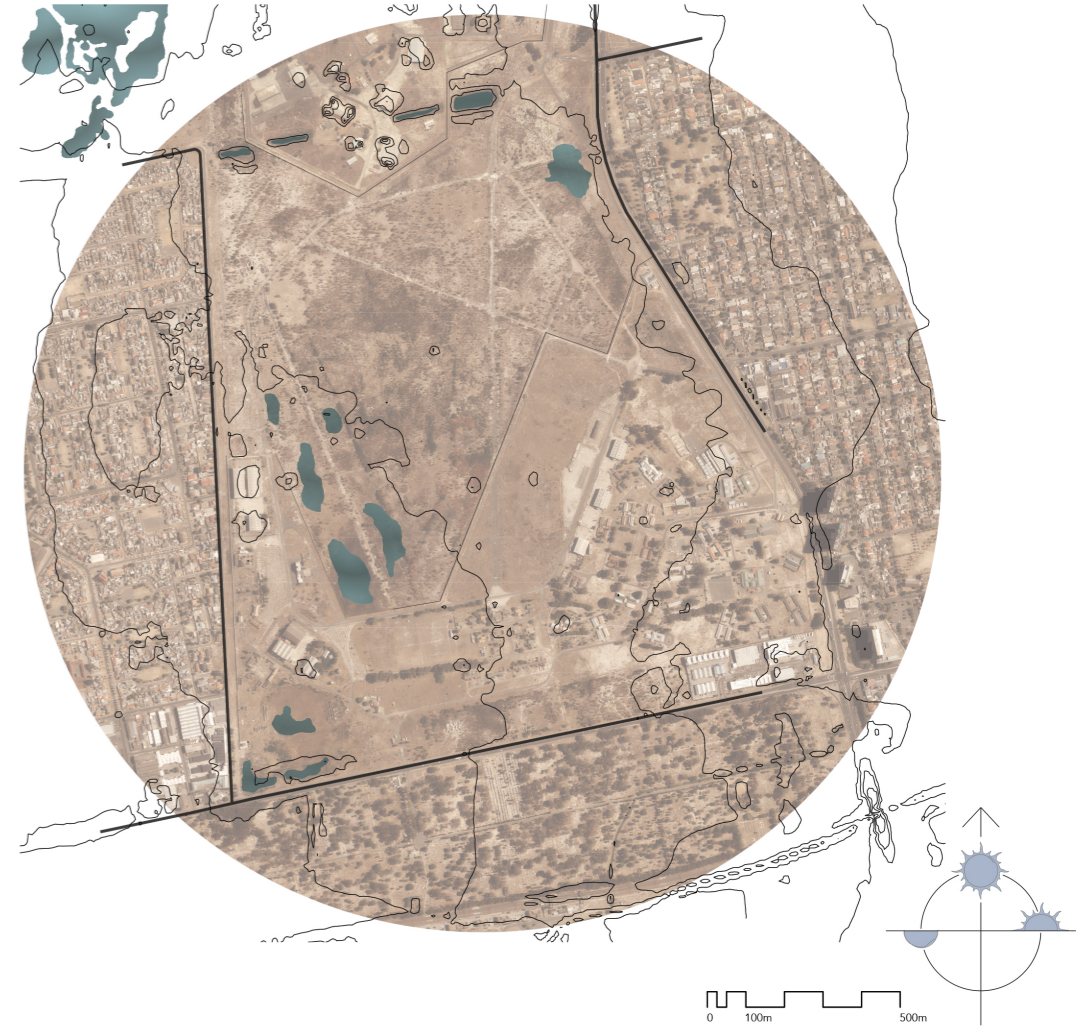
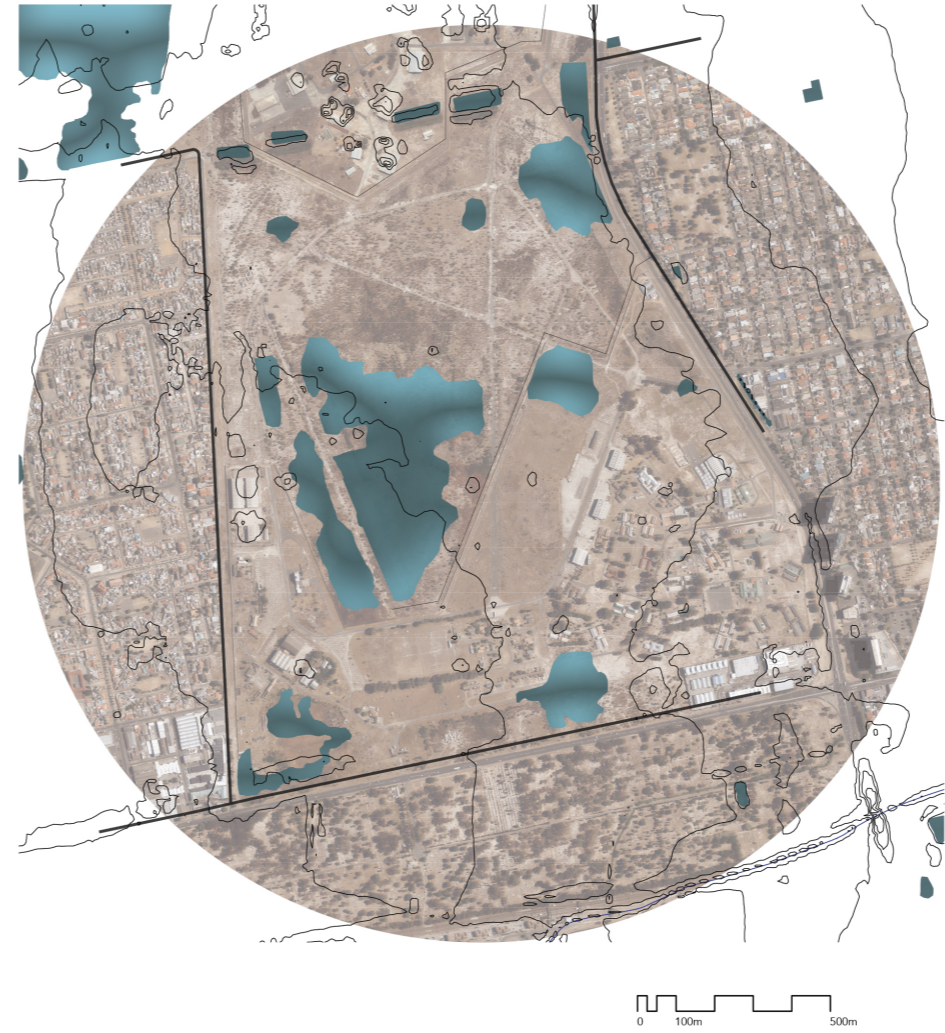
Site Positionality

The site is positioned in the Cape Flats area, off Voortrekker Road, which runs from Salt River Circle to Stikland Bridge, and connects Cape Town and Bellville. It goes through more disadvantaged areas.






Climate

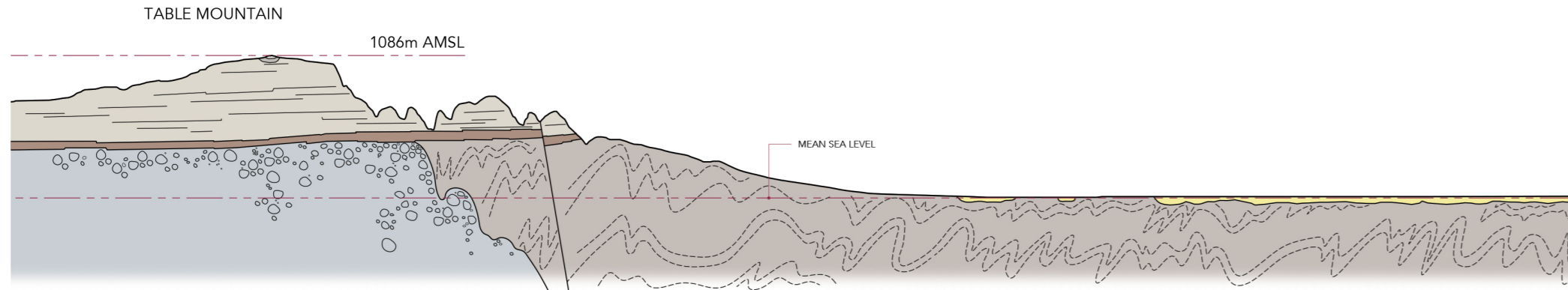
Hot and dry summers, and cold and wet winters. Annual precipitation of Cape Flats area = varies between 400 and 800mm. (Yearly precipitation data for a time period of 165 years, from 1841-2006, shows strong fluctuations between 229mm and 1 037mm; the mean annual precipitation over this period is 619mm. About 80% of the annual precipitation occurs in winter time.)
 Dry period - November to March: less than 20mm rainfall/month.
 Fluctuations in rainfall patterns.
 Strong winds.

Appearance and Disappearance of the wetland mosaic habitat as the major expression of seasonality and visible-invisible aspects of the landscape



SECTION (below) LEGEND:

-  Quaternary sediments: non-calcareous sands, clayey sand, sandy calcrete (40-50m deep)
-  Sedimentary quartzitic sandstones, of Peninsula Form. TMG
-  Sedimentary Graafwater Form. TMG
-  Igneous rocks of Cape Granite Suite
-  Metamorphic rocks of Malmesbury Group



Cape Flats is an area of lowland, low-lying sandy plains (with an average elevation of 30m AMSL / flat topography), in places up to 50m thick / sediments of Quaternary Age (= superficial deposits less than 2,6 million years old / usually unconsolidated deposits) / Sandveld Group.

Underlying geology: impervious Malmesbury Shale (low-grade metamorphic rocks such as phyllitic shale, quartz and schist, siltstone, sandstone and greywacke)

The sands are derived from 2 sources:

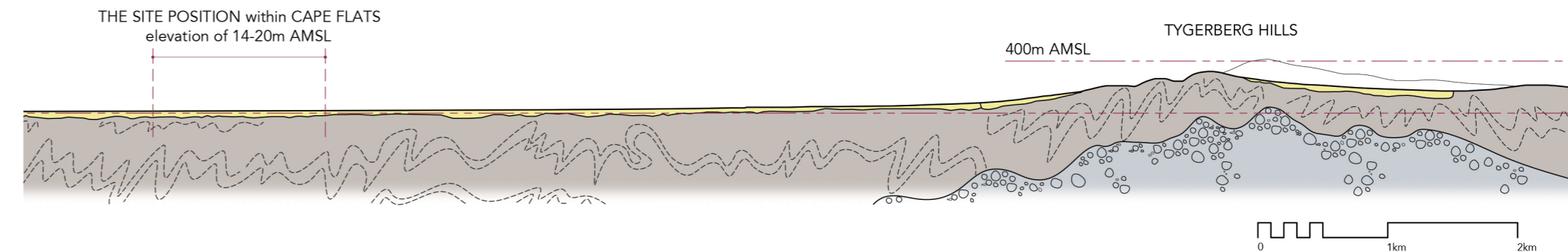
- Weathering followed by deposition, under marine conditions, of the quartzite and sandstones of the Malmesbury Formation and Table Mountain Group;
- The beaches in the areas, from where Aeolian sand was deposited as dunes on the top of the marine sands.

Sandveld Group / Quaternary / Milnerton Formation: Fluvial gravel, marine clay and littoral sand / Age: Pleistocene (from 2,6 million to approximately 11 700 years ago). (Adelana, Xu & Vrbka, 2010:462-463)

Cape Flats: thin layer of eolian and marine sands - most recent sediment (less than 50m thick) / "deposited within the last several million to several thousand years

...over the subsurface Malmesbury shale and Cape Granite bedrock." (Compton, 2004:73)
 "a 25m higher stand of sea level that occurred around 5 and 1,5 million years ago" - Cape Peninsula was an island and Cape Flats were covered by sea water
 "a 125m lower stand of sea level at the time of maximum ice buildup during cold periods - the most recent being 20 000 years ago." (Compton, 2004:77)
 Sea-levels fluctuated between -120 to +25 m from present mean sea level during the Pliocene and subsequent Pleistocene ice-age between 2.6 million and 18,000 years ago as a result of fluctuating global temperature and variable amounts of water accumulated in polar ice caps. At times the sea covered the Cape Flats and Noordhoek valley and the Cape Peninsula was then a group of islands. Beach sands with shell fragments and estuarine muds were deposited and later overlain by calcrete-cemented dune sands as the sea retreated. (<http://www.geology.uct.ac.za/cape/town/geology>)

Soils are bleached sandy soils, which are nutrient poor, deep, white, acidic, tertiary, grey regic sands, usually white, often Lamotte form.

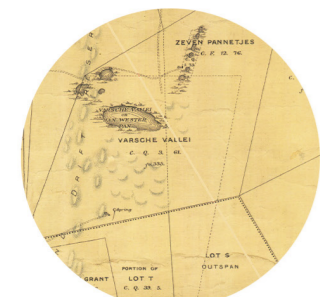


'The architectural work is about sensing the history of the place and trying to make things visible in a way that allows people to respond to them emotionally, rather than passively 'learning' about the site. ...I'm trying to open the window through which we can see things and lives that came before us, so that we can discover traces of the past. I'm offering a new framework for experience that stimulates an emotional awareness of the history of the place'.

Peter Zumthor, interview with M. Lending, 2018



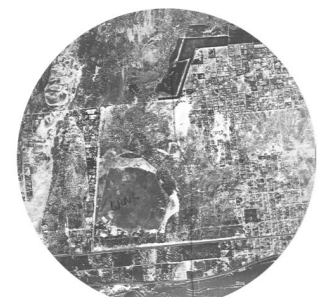
around 1690, portion of map



1898, portion of map



1953, orthophotograph



1938, orthophotograph



1998, orthophotograph



the unknown



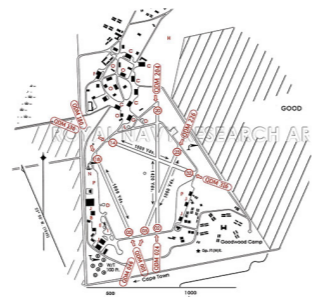
1941, portion of map



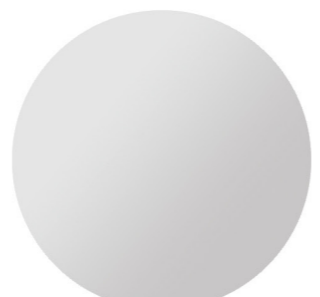
2018, orthophotograph



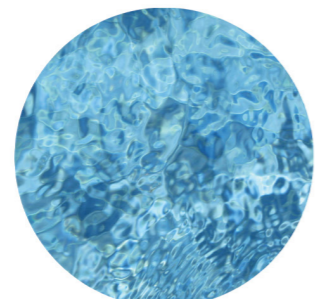
the hypothetical



1945, portion of map



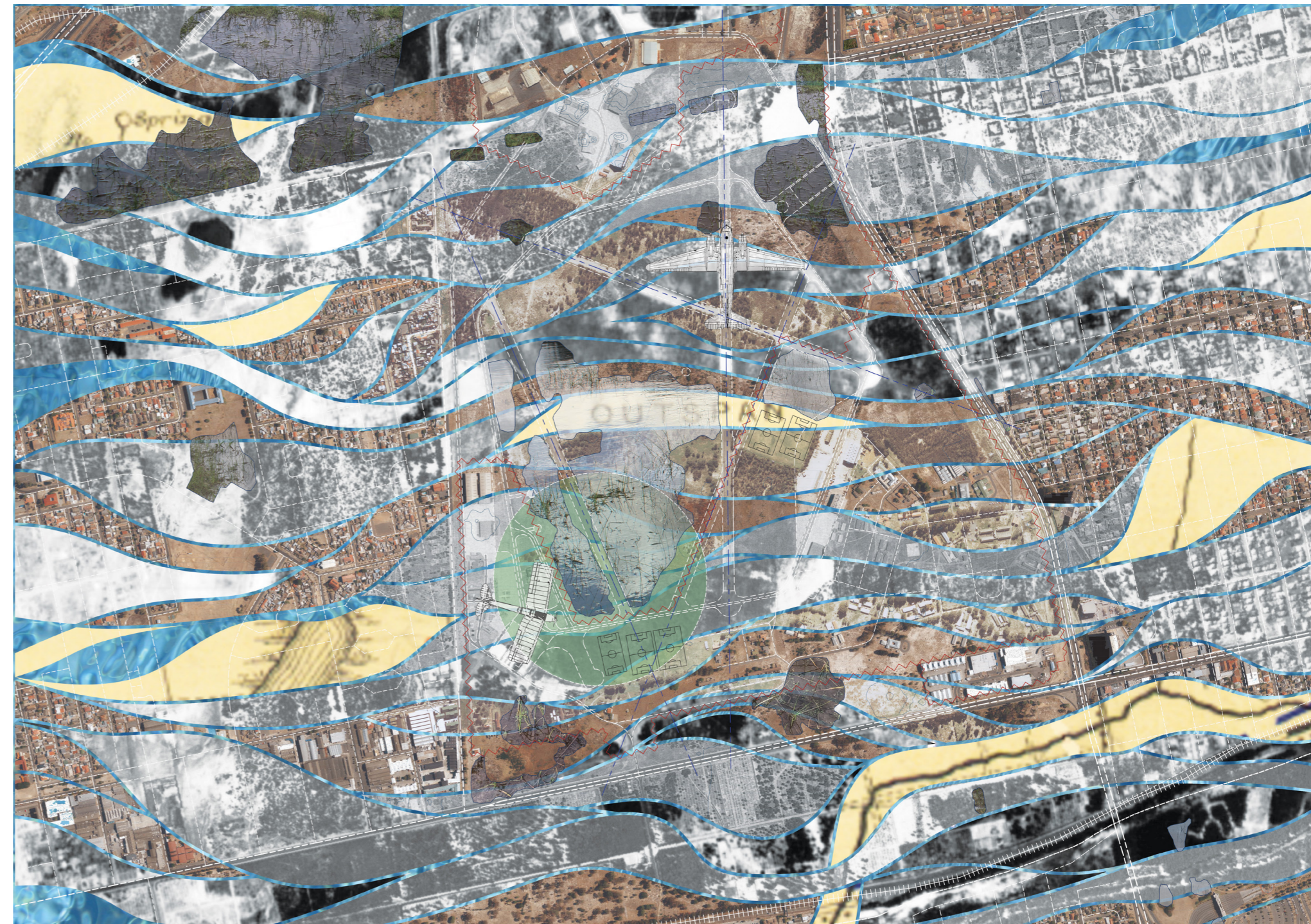
1952, orthophotograph



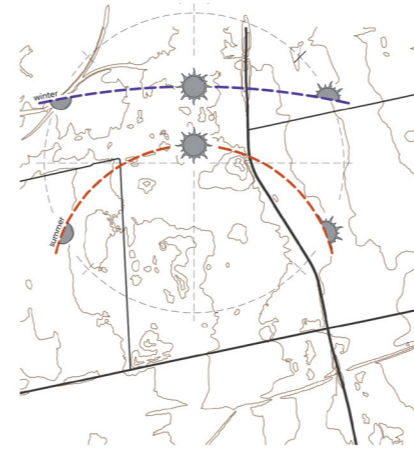
1,5 million years ago, approx 25m higher stand of sea level



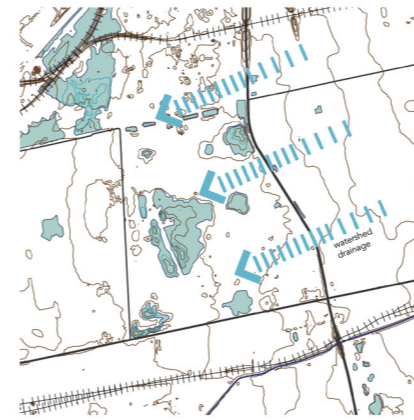
20 000 - 18 000 years ago, approx 125m lower stand of sea level, shoreline was 5 x further away



Understanding Existing Site



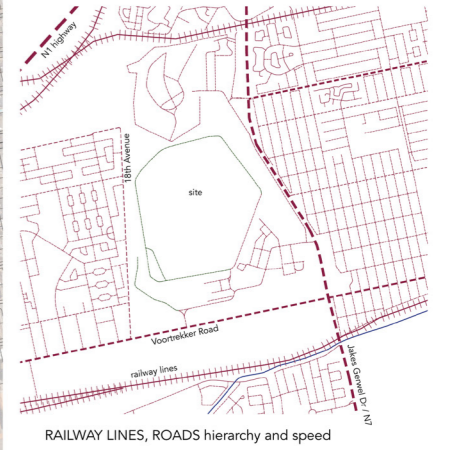
SOLAR CHART
seasonal sun path



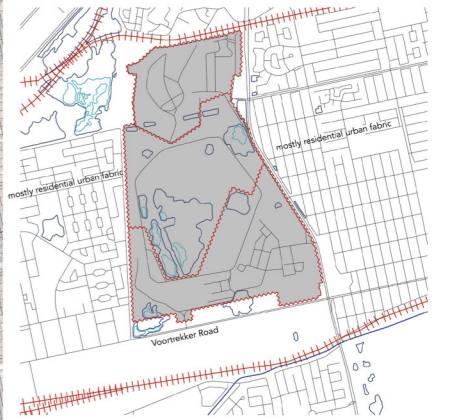
WATERSHED
site lies between approx. 14-15 & 19-20m AMSL, gentle fall mainly ENE to WSW, over approximately 1,5km, flat topography



VIEWS from the site



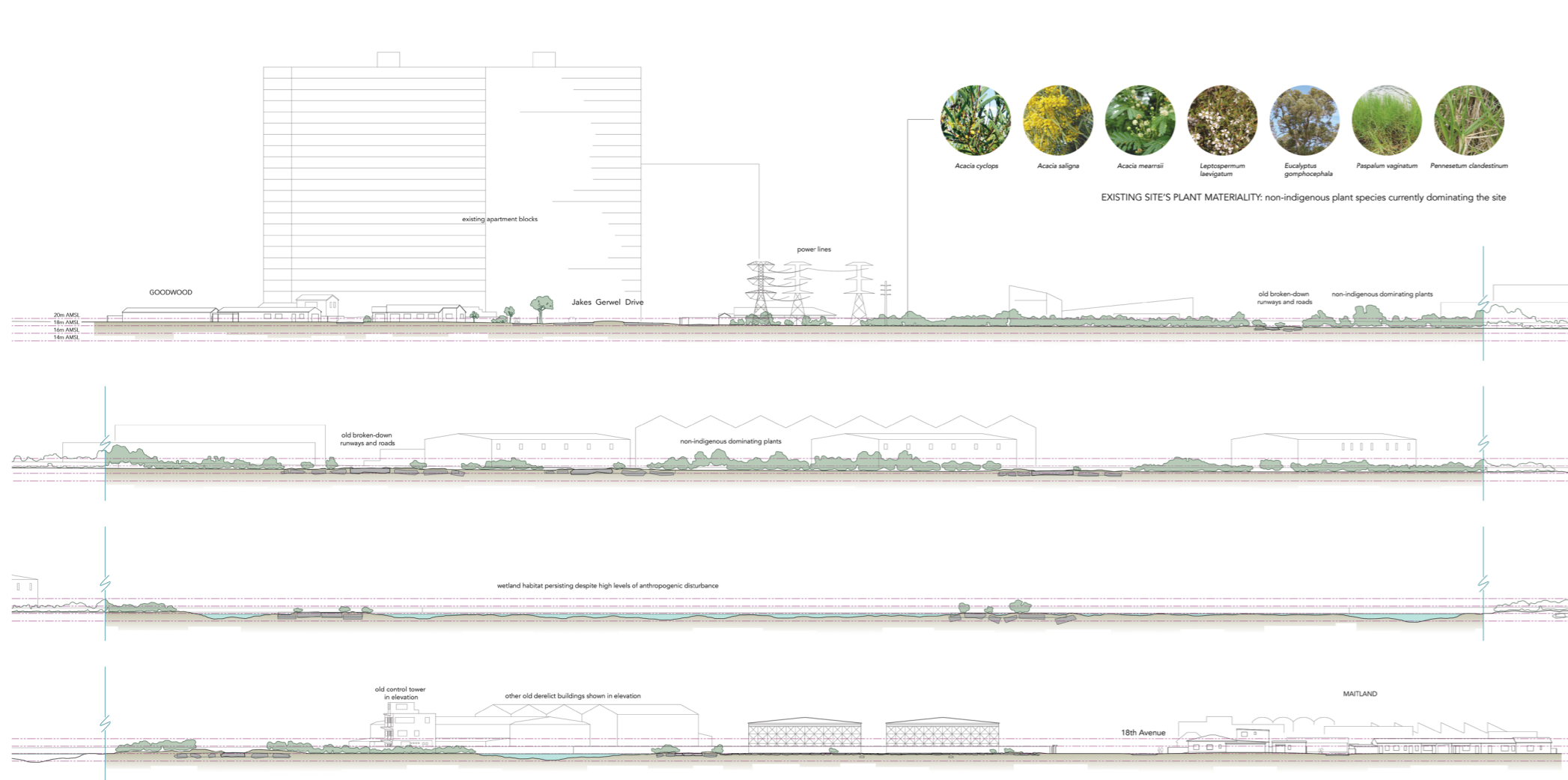
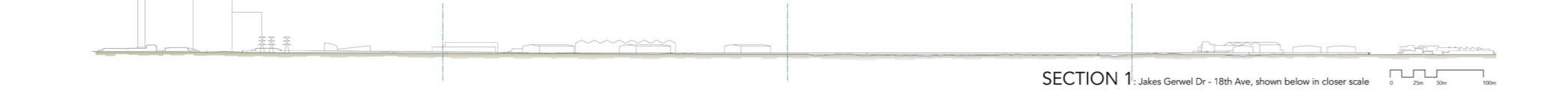
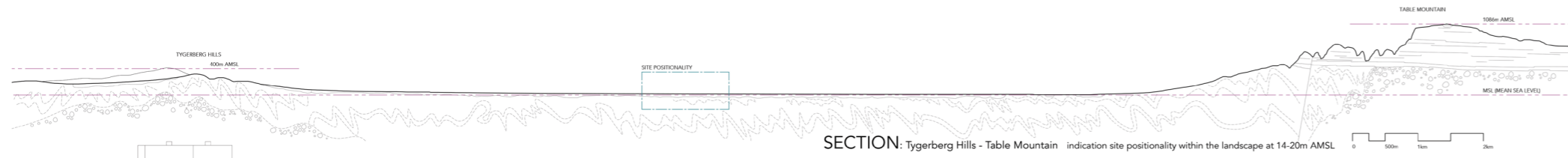
RAILWAY LINES, ROADS hierarchy and speed



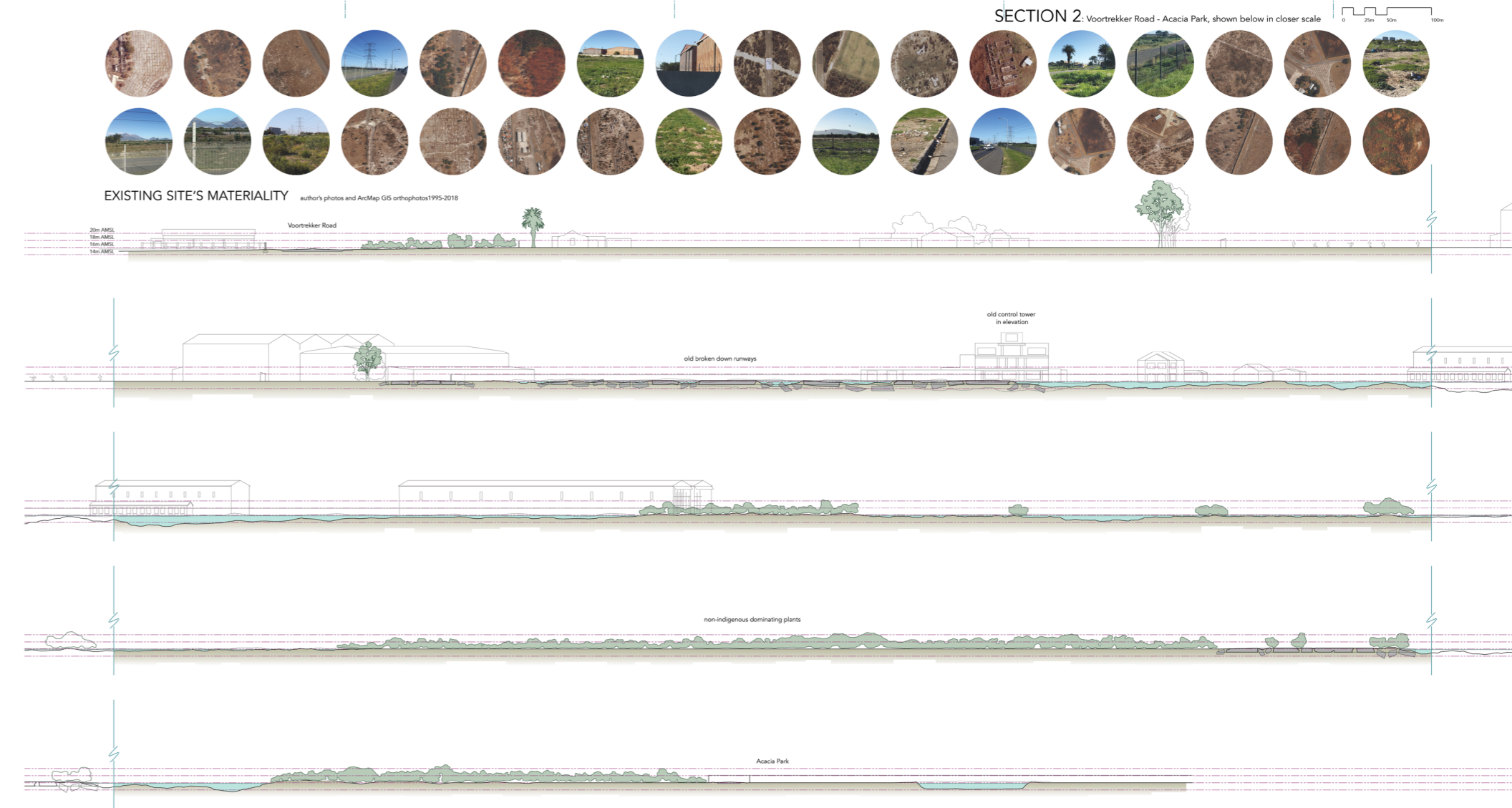
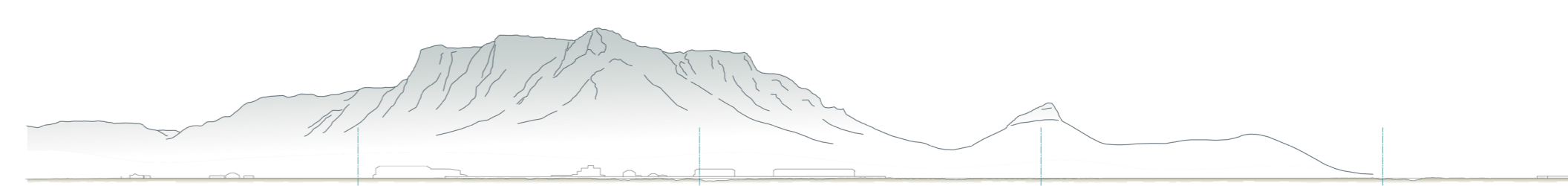
BREAK / non-space in the urban fabric
broken/non-existent connection between Maitland and Goodwood (apart from Voortrekker Road)

EXISTING SITE PLAN
and
ANALYSIS DIAGRAMS





SECTION 1 in four segments of closer scale



SECTION 2 in five segments of closer scale

PHENOMENOLOGY is a philosophical method that privileges experience as the source of subjectivity. (Herrington, 2017:86)

Phenomenological research aims to identify participant experiences concerning a phenomenon.

Following are some 'sketches', noted from various authors and some by the author of this dissertation.

The ideas on phenomenology are very diverse and complex. One needs to acknowledge such important thinkers as Edmund Husserl (1859-1938), Martin Heidegger (1889–1976), Jean-Paul Sartre (1905–1980), Maurice Merleau-Ponty (1908–1961), Paul Ricoeur (1913–2005), Tim Ingold (1948), James Corner (1961), and Hans-Georg Gadamer (1900-2002).

Bringing meaning to the landscape through revealing it as it is actually experienced directly, using Merleau-Ponty's existential phenomenological perspective that is grounded in the physicality and material existence of the human embodied consciousness in the world, is one of the main ideas for the dissertation work. "Producing human meaning in the world is all about establishing connections between ourselves and the disparate material phenomena with which and through which we live, the plants and animals, landscapes and artefacts that surround us..." (Tilley, 2004:31) The aim is to produce fresh understanding of the landscape, as describing such a landscape would always mean re-describing it and thus would lead onto new insights and knowledge creation. Phenomenology means to reveal the landscape as it is actually experienced directly by a human.

'[Phenomenology] is a philosophy for which the world is always 'already there' before reflection begins – as an inalienable presence; and all its efforts are concentrated upon re-achieving a direct and primitive contact with the world, and endowing that contact with a philosophical status... It also offers an account of space, time and the world as we 'live' them.' (Merleau-Ponty, Phenomenology of Perception, 1962: vii)

Merleau-Ponty's existential phenomenological perspective is grounded in the physicality and material existence of the human body in the world; perception constitutes the contact between consciousness and the world from which meanings arise; the lived body is both object and subject; consciousness is corporeal; the lived body is a way of viewing and feeling the world; 'At the basis of all knowledge is the sensuous, sensing and sensed body in which all experience is embodied: subjectivity is physical.' (Tilley, 2004:4)

LINKS between the body and the world:

Five Bodily Dyads: Elementary Structures of Embodied Experience

Six basic bodily dimensions (which link body to the world / relational coordinates of our body / asymmetrical axes of spatial orientation):

- 1 above / below or up / down (vertical axis is the most important as it represents earth - heavens cosmic axis)
 - 2 front / behind (horizontal axis)
 - 3 to the right / to the left (horizontal axis)
- horizontal dimensions (a sense of encirclement) are delimited by sensory visual, tactile, auditory and olfactory fields;

Fundamental experiential bodily terms:

- 4 here / there
- 5 near / far

Perceptual faith means an "animal" faith in the perceptual world as the basis for all our knowledge, prior to any abstract intellectual thought; sensation is coexistence between body and thing; (Tilley, 2004:10) Experience is deemed corporeal because perception is mediated through the body.

'The manner in which we sense the world remains forever incomplete and ambiguous because we always experience things from a particular point of view or relationship. The body is both open to the world yet things are always hidden from it. Therefore, perception always involves **a relationship between the visible and the invisible...**' (Tilley, 2004:10) (behind) There must exist an optimum distance for perceiving things.

Notion of temporality: 'Time is in a person, as it is in a thing and in a place. Thus things, persons and places are never static entities but constantly changing and altering their nature. Time is the fourth "hidden" dimension of being or existence, always part of places, landscapes and things. Our bodily existence and perception of the world always involves a stretching out of the present towards the past, which thus remains in contact with it and in relation to the future. Thus experience is temporally coloured and constituted.' (Tilley, 2004:12)

Synaesthesia,

or the overlapping of the senses, is an important concept that the author engages with. It is our primordial preconceptual experience of the world - part of our participatory relationship with the world. The human senses important for landscape architecture are:

Gustation - taste - has the most interior relation;

Tactility - touch - is bodily contact, primarily through the feet and hands;

Olfaction - smell of soil, of rain, of plants, of materials etc.

Audition - hearing - is the most social of all senses;

Vision - sight - is the most extended sense in relation to the body / and is the dominant in Western culture (due to the development of the written word, also Picturesque tradition)

Equilibrioception - vestibular sense, movement and balance sense; body in space;

Sense of Time (our brains have a system governing the perception of time) - expression of Change (<https://pathways.org/topics-of-development/sensory/>)

The above are the senses that I'm engaging with in the design. Recent research acknowledges that we have more senses than traditionally acknowledged.

Merleau-Ponty: the ontological primacy of the phenomena; the epistemological primacy of perception providing the foundation for rationality, value and existence; "The real world is the perceived world is the phenomenal world." Unity of the perceiver and the perceived in all acts of the perception transcending subject - object dualism; the sensible world is animate, alive, active.

Participation is a mode of "primitive" logic which creates correspondences and promotes resemblances. It links together culture and nature, the human and non-human world, subject and object, in a seamless web of connections. This is a system of knowledge of

the world embedded in embodied sensory experience. (as opposed to logical abstracted thought) ("I relate, therefore I am." against "I think, therefore I am.") (Tilley, 2004:20)

'In all indigenous world views the person is not individuated in the manner in which Western analytical philosophy might have us believe but diffused with other persons and things in a unitary sociomythic domain in which the most mundane of activities can be imbued with cosmic significance.' (Tilley, 2004:21) Perception = participation - only our interaction with the world brings it and us into being.

An embodied mind is a corporeal, bodily mind, part of culture and part of the world rather than something separate from it. human feeling, emotion, activity, movement link to landscapes; landscape experience through mobility and stasis - the manner and sequence in which they are explored and sensed, approached and left;

'...meaning is grounded in the sensuous embodied relationship between persons and the world, an invariant ontological ground for all feeling and all knowing taking place through persons with similar bodies.' 'Our primordial experience is inherently animistic, disclosing a field of phenomena that are all potentially animate and expressive because our perception involves the reversibility born out of our participation in the world.' (Ingold, 2006:67)

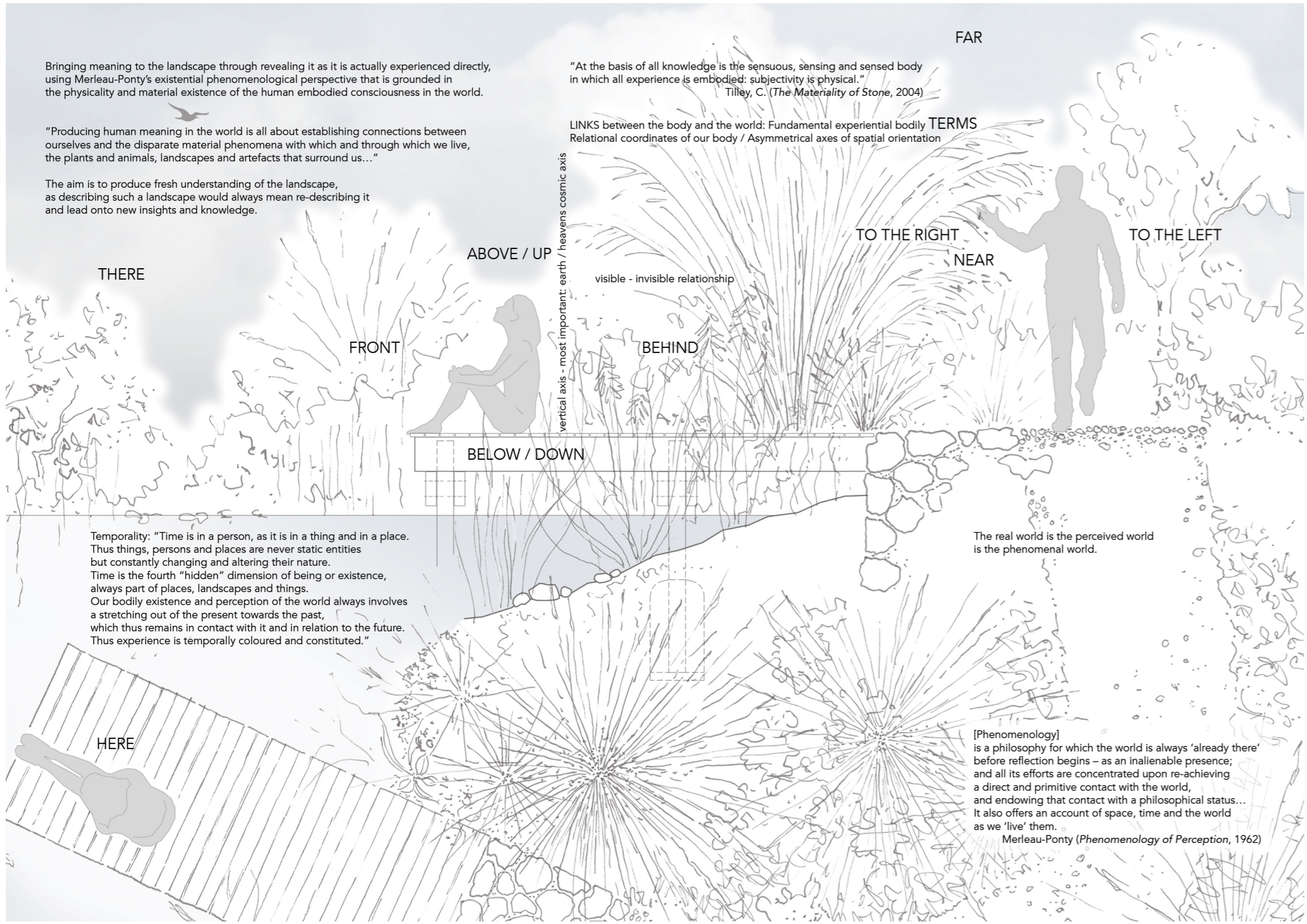
Aim of phenomenological analysis is to produce a fresh understanding of the landscape; A prereflective embodied consciousness that is anonymous and which all humans share prior to and irrespective of the distinctive cultural and linguistic worlds in which they are enmeshed; culture: knowledge, traditions, meanings, symbols; to be encultured is to be emplaced; places - specific cultural character;

"Producing human meaning in the world is all about establishing connections between ourselves and the disparate material phenomena with which and through which we live, the plants and animals, landscapes and artefacts that surround us..." (Tilley, 2004:31)

The intertwining of a "wild" embodied primal perception with "domesticated" cultural meaning.

For me, designing phenomenologically is really engaging with the site, understanding it as fully as possible in its historic and current states. The theories of Place and Palimpsest are closely intertwined with the landscape practice of phenomenology. It is designing meaningfully, and designing experientially, where design is rooted in the understanding of the landscape and strives to create a strong sense of place. I believe it is also a design approach to landscape architecture practice for better experience in a space.

'It is always and only now, in the moment, that architecture can create a feeling for history and the absent. Everything happens in the present. ... architecture is about history precisely then when it ties in with the world of the here and now.' (Zumthor, 2018:34)



Bringing meaning to the landscape through revealing it as it is actually experienced directly, using Merleau-Ponty's existential phenomenological perspective that is grounded in the physicality and material existence of the human embodied consciousness in the world.

"Producing human meaning in the world is all about establishing connections between ourselves and the disparate material phenomena with which and through which we live, the plants and animals, landscapes and artefacts that surround us..."

The aim is to produce fresh understanding of the landscape, as describing such a landscape would always mean re-describing it and lead onto new insights and knowledge.

"At the basis of all knowledge is the sensuous, sensing and sensed body in which all experience is embodied: subjectivity is physical."
Tilley, C. (*The Materiality of Stone*, 2004)

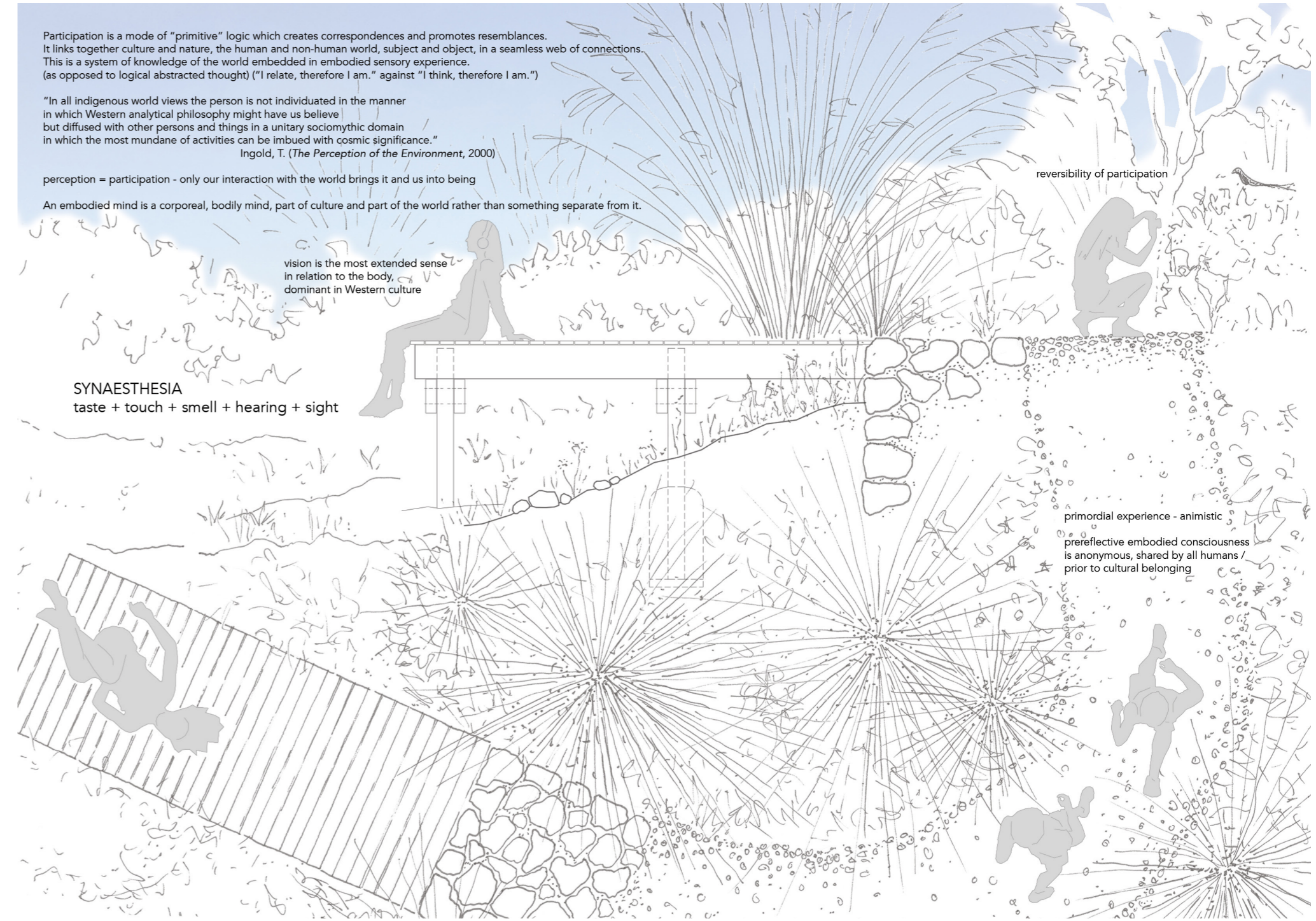
LINKS between the body and the world: Fundamental experiential bodily TERMS
Relational coordinates of our body / Asymmetrical axes of spatial orientation

vertical axis - most important: earth / heavens cosmic axis

visible - invisible relationship

The real world is the perceived world is the phenomenal world.

[Phenomenology] is a philosophy for which the world is always 'already there' before reflection begins – as an inalienable presence; and all its efforts are concentrated upon re-achieving a direct and primitive contact with the world, and endowing that contact with a philosophical status... It also offers an account of space, time and the world as we 'live' them.
Merleau-Ponty (*Phenomenology of Perception*, 1962)



Participation is a mode of "primitive" logic which creates correspondences and promotes resemblances. It links together culture and nature, the human and non-human world, subject and object, in a seamless web of connections. This is a system of knowledge of the world embedded in embodied sensory experience. (as opposed to logical abstracted thought) ("I relate, therefore I am." against "I think, therefore I am.")

"In all indigenous world views the person is not individuated in the manner in which Western analytical philosophy might have us believe but diffused with other persons and things in a unitary sociomythic domain in which the most mundane of activities can be imbued with cosmic significance."
Ingold, T. (*The Perception of the Environment*, 2000)

perception = participation - only our interaction with the world brings it and us into being

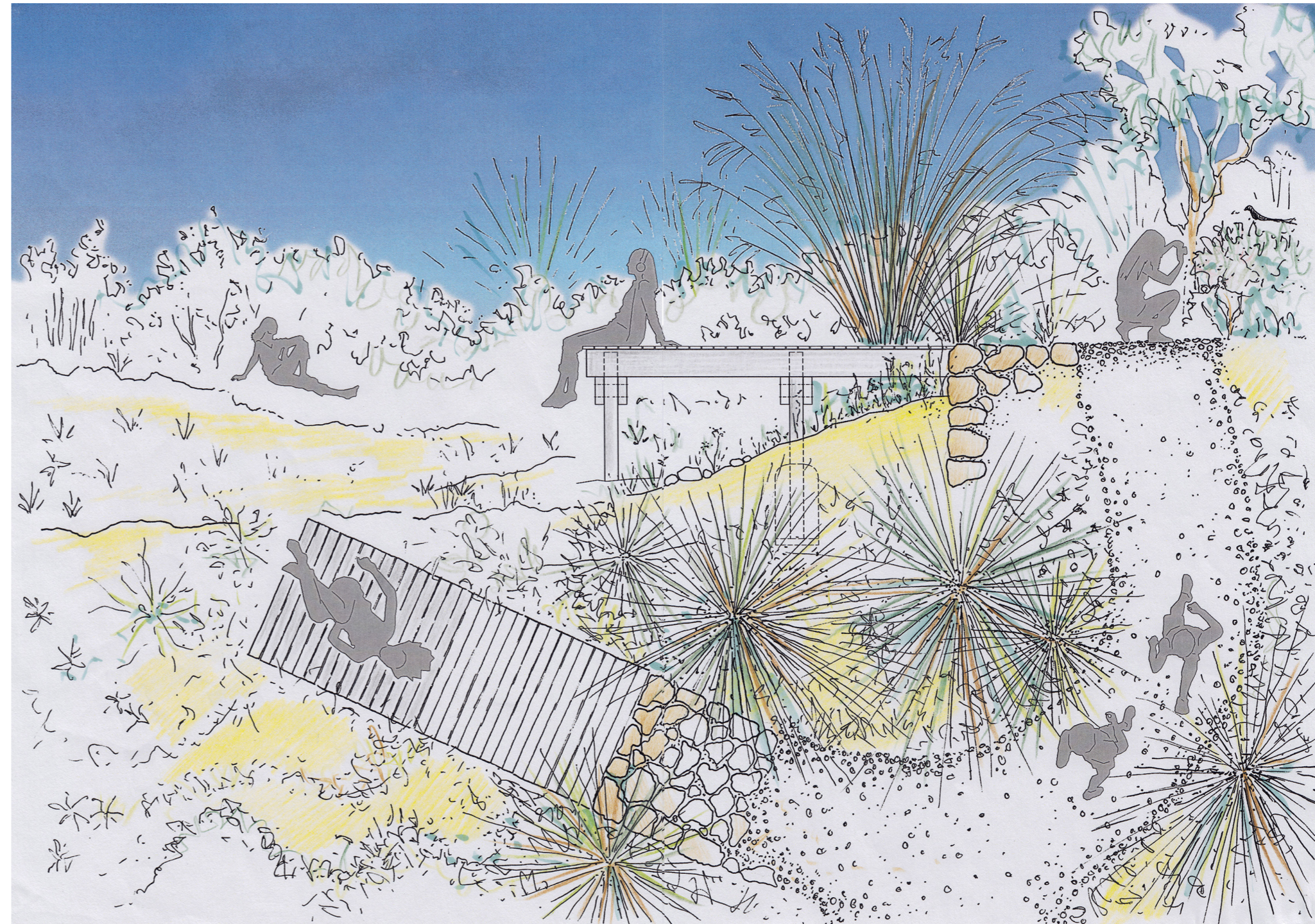
An embodied mind is a corporeal, bodily mind, part of culture and part of the world rather than something separate from it.

vision is the most extended sense in relation to the body, dominant in Western culture

SYNAESTHESIA
taste + touch + smell + hearing + sight

reversibility of participation

primordial experience - animistic pre-reflective embodied consciousness is anonymous, shared by all humans / prior to cultural belonging



- Chenopodiaceae / *Atriplex* sp. 1
- Crassulaceae / *Crassula* sp. 1
- Cyperaceae / *Cyperus* sp. 1
- Ebenaceae / *Euclea racemosa*
- Ericaceae / *Erica mammosa*
- Ericaceae / *Erica subdivaricata*
- Ericaceae / *Erica ferrea*
- Fabaceae / *Aspalathus* sp. 1
- Fabaceae / *Lebeckia* sp. 1
- Gentianaceae / *Orphium frutescens*
- Geraniaceae / *Geranium incanum*
- Geraniaceae / *Pelargonium capitatum*
- Geraniaceae / *Pelargonium multicaule*
- Geraniaceae / *Pelargonium triste*
- Haemodoraceae / *Wachendorfia paniculata*
- Iridaceae / *Aristea africana*
- Iridaceae / *Gladiolus carinatus*
- Iridaceae / *Gladiolus quadrangulus*
- Iridaceae / *Moraea tripelata*
- Mesembryanthemaceae / *Carpobrotus acinaciformis*
- Mesembryanthemaceae / *Carpobrotus edulis*
- Mesembryanthemaceae / *Conicosia puglioniformis*
- Mesembryanthemaceae / *Lampranthus aureus*
- Mesembryanthemaceae / *Lampranthus* sp. 1
- Myricaceae / *Myrica quercifolia*
- Orchidaceae / *Pterygodium catholicum*
- Orchidaceae / *Satyrium coriifolium*
- Oxalidaceae / *Oxalis caprina*
- Oxalidaceae / *Oxalis luteola*
- Oxalidaceae / *Oxalis pes-caprae*
- Oxalidaceae / *Oxalis versicolor*
- Poaceae / *Cynodon dactylon*
- Poaceae / *Ehrharta calycina*
- Poaceae / *Ehrharta villosa*
- Poaceae / *Plagiochloa uniolae*
- Polygalaceae / *Muraltia* sp. 1
- Polygalaceae / *Nylandtia spinosa*
- Proteaceae / *Diastella proteoides*
- Proteaceae / (*Leucadendron?*) *Leucospermum hypophyllocarpodendron*
- Proteaceae / *Leucadendron levisanus*

- Proteaceae / *Leucadendron* sp. 1
- Proteaceae / *Serruria aemula*
- Proteaceae / *Serruria fasciflora*
- Restionaceae / *Chondropetalum tectorum*
- Restionaceae / *Thamnochortus dichotomus*
- Restionaceae / *Thamnochortus fruticosus*
- Restionaceae / *Thamnochortus spicigerus*
- Rhamnaceae / *Phyllica cephalantha*
- Rosaceae / *Cliffortia juniperina*
- Rubiaceae / *Anthospermum aethiopicum*
- Scrophulariaceae / *Manulea tomentosa*
- Solanaceae / *Lycium afrum*
- Solanaceae / *Lycium ferocissimum*
- Thymelaeaceae / *Gnidia subulata*
- Thymelaeaceae / *Passerina vulgaris*
- Zygophyllaceae / *Zygophyllum* sp. 1

In total, about 70 indigenous species were found at Wingfield, and more than a 100 species are at the adjacent interchange between the N1 and N7 freeways. Furtheron, Eskom line on eastern side could provide a biological corridor-link to Six Battalion Ordinance Depot, 50 Ha (Fort Ikapa Military Base), which is under conservation (status: Natural Heritage Site) to Eskom Power-line Reserve (while Wingfield site has zero conservation status). (Low & McDowell, 1990:39-40)

	Plant Name	Flowering Season & Main Colour												h x w	Experience - Senses	
		Autumn			Winter			Spring			Summer					
		M	A	M	J	J	A	S	O	N	D	J	F			
TREES	<i>Brachylaena discolor</i>														4-10m	Visual, Audition (nectrar-rich flowers - insects & birds),
	<i>Buddleja saligna</i>														4-10m	Olfaction (honey-scented flowers), Audition (insects & birds)
	<i>Ekebergia capensis</i>														15m	Audition (birds), Visual, Olfaction (sweetly scented flowers)
	<i>Gymnosporia heterophylla</i>														5m	Olfaction (fetid-smelling flowers)
	<i>Nuxia oppositifolia</i>														2-5m	Visual, Audition (insects & birds)
	<i>Psoralea pinnata</i>														up to 4m	Olfaction (strong scent), Touch (leaflets are aromatic - crushed), Audition (insects & birds)
	<i>Searsia laevigata</i>														4 x 4m	Visual (barrier), Thermoception (wind break), Audition (birds)
	<i>Searsia lancea</i>														7 x 7m	Gustation (edible fruits)
	<i>Syzygium guineense</i>	f	f												15-20m	Gustation (edible fruits), Thermoception (deep shade)
	<i>Tarchonanthus camphoratus</i>														2-9m	Olfaction (camphor-smelling leaves), Vision
TALL SHRUBS	<i>Athanasia dentata</i>														1,5 x 1,5m	Audition (butterflies, insects, birds), Olfaction (honey-scented flowers)
	<i>Euclea racemosa</i>															Visual (screening, framing; new spring growth colour: pale, gold-tinged, velvety hairy foliage out of dark green crown), Gustation (edible fruit), Audition (birds)
	<i>Leucadendron floridum</i>														2m	Sense of Time (seasonal colour), Visual (silver foliage)
	<i>Leucadendron levisanus</i>														2m	Visual (flowers), Olfaction
	<i>Leucadendron salignum</i>														0,75-2m	Visual (colourful leaves, long flowering season)
	<i>Lycium afrum</i>														2-3m	Visual (showy), Audition (birds)
	<i>Lycium ferocissimum</i>														2-3 x 3m	Audition (birds), Visual, Olfaction (sweetly scented flowers)
	<i>Metalasia densa</i>														1,5m	Visual
	<i>Metalasia muricata</i>														2-4m	Olfaction (honey-scented flowers), Visual (greyish interest)
	<i>Morella cordifolia</i>														1,5 x 1,5m	Gustation (berry wax eaten as food), Visual (interesting structure), Touch
	<i>Morella serrata</i>														2m	Olfaction (aromatic)
	<i>Osteospermum moniliferum</i>														2-2,5 x 3m	Gustation (edible berries), Visual
	<i>Passerina corymbosa</i>														1-3m	Touch (fibrous stems), Visual (showy in flower)
	<i>Protea burchellii</i>														1-2 x 3m	Visual (specimen), Audition
	<i>Protea repens</i>														1-4m	Audition (large amount of nectar - insects, birds)
<i>Pterocelastrus tricuspidatus</i>	f	f	f											shrub/tree	Visual (variable; brilliant orange fruit), Audition	
<i>Searsia lucida</i>	f	f	f	f										2-3-5 x 4m	Audition (birds), Gustation (edible fruits), Visual (barrier - dense)	
<i>Wiborgia obcordata</i>															Visual (gentle yellow lion head flowers and grey foliage)	

	Plant Name	Flowering Season & Main Colour												h x w	Experience - Senses			
		Autumn			Winter			Spring			Summer							
		M	A	M	J	J	A	S	O	N	D	J	F					
LOW SHRUBS	<i>Anthospermum aethiopicum</i>																	
	<i>Athanasia capitata</i>																	Visual
	<i>Aspalathus</i> spp.																	Visual
	<i>Aspalathus callosa</i>																0,15-0,40m	Visual, Olfaction
	<i>Aspalathus hispida</i>																	Olfaction (honey-scented flowers)
	<i>Aspalathus quinquefolia</i> subsp. <i>quinquefolia</i>																0,2-1,5m	
	<i>Aspalathus sericea</i>																	
	<i>Aspalathus spinosa</i> subsp. <i>spinosa</i>																	Sense of Time (seasonal interest)
	<i>Aspalathus ternata</i>																	
	<i>Aspalathus tyloides</i>																	extinct
	<i>Aspalathus variegata</i>																	extinct
	<i>Berkheya rigida</i>																0,80m	
	<i>Berzelia abrotanoides</i>																1,5m	Touch (fluffy ball-like white flowerheads), Visual, Audition
	<i>Chrysocoma coma-aurea</i>																0,50m	Touch (textural contrast)
	<i>Cliffortia ericifolia</i>																	
	<i>Cliffortia eriocephalina</i>																	
	<i>Cliffortia juniperina</i>																	
<i>Cliffortia polygonifolia</i>																		
<i>Diastella proteoides</i>																0,50m	Visual, Touch (dainty delicate protea)	
<i>Diosma hirsuta</i>																0,15-0,60m	Olfaction (wild buchu), Touch, Audition, Visual (accent)	

	Plant Name	Flowering Season & Main Colour												h x w	Experience - Senses		
		Autumn			Winter			Spring			Summer						
		M	A	M	J	J	A	S	O	N	D	J	F				
LOW SHRUBS	<i>Erica articularis</i>																Visual
	<i>Erica axillaris</i>																Visual
	<i>Erica capitata</i>																Visual
	<i>Erica corifolia</i>															1m	Visual
	<i>Erica ferrea</i>																Visual
	<i>Erica imbricata</i>															0,60m	Visual
	<i>Erica lasciva</i>																Visual
	<i>Erica mammosa</i>															0,5-1-1,8m	Visual (variable flower colour)
	<i>Erica margaritacea</i>															0,50m	Visual
	<i>Erica muscosa</i>															1m	Visual, Touch (sticky)
	<i>Erica plumosa</i>																
	<i>Erica pulchella</i>															0,60m	Visual (beautiful)
	<i>Erica pyramidalis</i>																extinct
	<i>Erica subdivaricata</i>															0,40m x spr.	
	<i>Erica turgida</i>															0,30-0,40m	
	<i>Erica verticillata</i>															1,5-2-3m	Visual (accent)
	<i>Eriocephalus africanus</i> var. <i>africanus</i>															1m	Olfaction (wild rosemary), Visual (grey)
	<i>Galenia africana</i>															1m	
	<i>Gnidia spicata</i>																
	<i>Gnidia subulata</i>															0,30m	
	<i>Helichrysum cymosum</i>																
	<i>Helichrysum cymosum</i> subsp. <i>cymosum</i>															0,5-1m	Visual (silver grey foliage & yellow flowers), Olfaction (aromatic leaves)
	<i>Helichrysum petiolare</i>															0,5-1 x 1m	Visual (striking), Olfaction (dense aromatic foliage, honey-scented flowers)
	<i>Leucospermum hypophyllocarpodendron</i> subsp. <i>canaliculatum</i>															0,20m	Visual
<i>Lebekia</i> spp.															1m		
<i>Leysera gnaphalodes</i>															1m		
<i>Liparia graminifolia</i>																extinct	
<i>Metalasia adunca</i>																	
<i>Metalasia pulchella</i>																	
<i>Morella quercifolia</i>															0,60m x spr.	Visual (interesting oak-like leaves)	
<i>Muraltia spinosa</i> (<i>Nylandtia</i>)															1 x 1m		

	Plant Name	Flowering Season & Main Colour												h x w	Experience - Senses		
		Autumn			Winter			Spring			Summer						
		M	A	M	J	J	A	S	O	N	D	J	F				
LOW SHRUBS	<i>Orphium frutescens</i>															0,60 x 0,30m	Visual (glossy pink stars), Touch (sticky petals)
	<i>Osteospermum incanum</i>															1,5 x 1m	Visual (butterflies; grey leaves and yellow daisies), Gustation (edible berries)
	<i>Passerina ericoides</i>															0,3-1,2m	
	<i>Passerina vulgaris</i>																
	<i>Pharnaceum lanatum</i>																Visual (dainty flowers)
	<i>Phylica cephalantha</i>																
	<i>Phylica parviflora</i>																
	<i>Plecostachys polifolia</i>															1m	Visual (thinly white-wooly shrublet)
	<i>Plecostachys serpyllifolia</i>															1m x sprawl.	Visual (grey foliage)
	<i>Polpoda capensis</i>																
	<i>Protea scolymocephala</i>															0,5-1,5m	
	<i>Senecio halimifolius</i>															1,5m	Visual
	<i>Seriphium cinereum</i>															1,5m	Visual (grey foliage, strange flowers)
	<i>Seriphium plumosa</i>															1 x 1m	Visual (grey shrublet, striking colour)
	<i>Serruria aemula</i>															0,50m x sprawl.	Olfaction (sweetly-scented flowers)
	<i>Serruria fasciflora</i>															0,4-1 x 0,5m	Olfaction (sweetly-scented flowers)
	<i>Serruria foeniculacea</i>																
	<i>Serruria furcellata</i>															0,50m	Audition (insects, birds)
	<i>Serruria glomerata</i>															0,2-0,50 x 0,50m	
	<i>Serruria trilopha</i>															0,3-0,80 x 0,80m	Olfaction (coconut-scented flowerheads), Visual
<i>Staavia radiata</i>															0,90m		
<i>Stilbe albiflora</i>															1,2m	Touch (velvety branches)	
<i>Syncarpha vestita</i>															1m	Visual (branches covered thickly in grey wooly hair; unusual and beautiful)	
<i>Trichocephalus stipularis</i>															0,90m	Olfaction (honey-scented), Visual (and densely white-hairy on the outside flowers)	
<i>Zygophyllum sp.</i>																Visual (dwarf)	

	Plant Name	Flowering Season & Main Colour												h x w	Experience - Senses		
		Autumn			Winter			Spring			Summer						
		M	A	M	J	J	A	S	O	N	D	J	F				
GEOPHYTES	<i>Arctopus echinatus</i>															0,060 x 0,60m	Visual (unusual, ground-bound)
	<i>Aristea africana</i>															0,1-0,5m	Visual/Sense of Time
	<i>Aristea dichotoma</i>																Visual/Sense of Time
	<i>Geissorhiza tenella</i>															0,1-0,30m	Visual/Sense of Time
	<i>Gladiolus carinatus</i>																Visual/Sense of Time
	<i>Gladiolus quadrangularis</i>																Visual/Sense of Time
	<i>Ixia versicolor</i>																Visual/Sense of Time
	<i>Moraea tripelata</i>																Visual/Sense of Time
	<i>Othonna heterophylla</i>																Visual/Sense of Time
	<i>Oxalis spp.</i>															0,05-0,3m	Visual/Sense of Time
	<i>Oxalis caprina</i>																Visual/Sense of Time
	<i>Oxalis luteola</i>																Visual/Sense of Time
	<i>Oxalis pes-caprae</i>															0,20 x 0,150m	Visual/Sense of Time
	<i>Oxalis purpurea</i>																Visual/Sense of Time
	<i>Oxalis versicolor</i>																Visual/Sense of Time
	<i>Pelargonium longifolium</i>																Visual/Sense of Time
	<i>Pelargonium triste</i>																Visual/Sense of Time
	<i>Pterygodium catholicum</i>																Visual/Sense of Time
	<i>Satyrium coriifolium</i>																Visual/Sense of Time
	<i>Wachendorfia paniculata</i>																Visual/Sense of Time
<i>Wachendorfia thyrsiflora</i>															1 x 1m	Visual/Sense of Time	
<i>Watsonia meriana</i>																Visual/Sense of Time	
<i>Zantedeschia aethiopica</i>																Visual/Sense of Time	

	Plant Name	Flowering Season & Main Colour												h x w	Experience - Senses			
		Autumn			Winter			Spring			Summer							
		M	A	M	J	J	A	S	O	N	D	J	F					
	<i>Calopsis impolite</i>																	
	<i>Cynodon dactylon</i>																	
	<i>Cyperus textilis</i>																	
	<i>Elegia juncea</i>																	
	<i>Elegia microcarpa</i>																	
	<i>Elegia nuda</i>																	
	<i>Elegia tectorum</i>																0,6-1,6 x 2-3m	Touch, Visual
	<i>Ehrharta calycina</i>																	
	<i>Ehrharta villosa</i>					0												
	<i>Ehrharta villosa</i> var. <i>villosa</i>																	
	<i>Hordeum capense</i>																	
	<i>Hypodiscus aristatus</i>																	
	<i>Imperator cylindrica</i>																1-1,2m	
	<i>Ischyrolepis capensis</i>																	
	<i>Ischyrolepis paludosa</i>																	
	<i>Juncus capensis</i>																0,30 x 0,20m	
	<i>Juncus kraussii</i>																1,2 x 1m	
	<i>Restio bifurcus</i>																	
	<i>Restio micans</i>																	
	<i>Restio quadratus</i>																	
	<i>Restio quinquefarius</i>																	
	<i>Sporobolus virginicus</i>																	
	<i>Tetraria variabilis</i>																	
	<i>Thamnochortus dichotomus</i>																	
	<i>Thamnochortus erectus</i>																	
	<i>Thamnochortus fruticosus</i>																	
	<i>Thamnochortus insignis</i>																2,5 x 3m	Visual, Touch
	<i>Thamnochortus spicigerus</i>																1,5 x 2m	Visual (feature)
	<i>Trianoptiles solitaria</i>																0,30m	
	<i>Typha capensis</i>																	Audition (birds)
	<i>Willdenowia incurvata</i>																0,5-1,5 x 3m	Visual (curved, feature plant)
	<i>Willdenowia sulcata</i>																	
	<i>Willdenowia teres</i>																0,3-1m	

GRAMINOIDS / GRASSES

	Plant Name	Flowering Season & Main Colour												h x w	Experience - Senses			
		Autumn			Winter			Spring			Summer							
		M	A	M	J	J	A	S	O	N	D	J	F					
	<i>Carpobrotus acinaciformis</i>																	Guastation (edible fruits), Visual
	<i>Carpobrotus edulis</i>																	Guastation (edible fruits), Visual
	<i>Cliffortia ferruginea</i>																0,30-0,50m	Visual (trailing)
	<i>Conicosia puglioniformis</i>																0,12-0,40m	Visual, Gustation (edible)
	<i>Crassula flava</i>																0,40m	Visual
	<i>Crassula multicava</i>																0,20 x 0,30m	Visual (white flowers on pink stems)
	<i>Edmondia sesamoides</i>																0,350m	Visual, Touch (white-wooly shrublet)
	<i>Geranium incanum</i>																0,30 x 0,60m	Visual
	<i>Helichrysum tinctorum</i>																0,150m	Visual (grey-wooly shrublet)
	<i>Indigofera procumbens</i>																trailing	Visual
	<i>Knowltonia vesicatoria</i>																0,3-1,2m x 1,5m	Audition (birds), Visual (under trees shade, berries)
	<i>Lampranthus aureus</i>																0,40 x 0,50m	Visual (showy)
	<i>Lampranthus stenus</i>																0,50m	Visual (gentle pink)
	<i>Manulea tomentosa</i>																0,60-0,80m	Visual
	<i>Monopsis lutea</i>																0,1-0,30 x 0,50m	Visual
	<i>Monopsis unidentata</i>																0,20 x 0,50m	Visual
	<i>Pelargonium capitatum</i>																0,30 x 1,5m	Touch & Olfaction (sweetly scented stems and leaves), Visual (pink colour)
	<i>Pelargonium multicaule</i>																0,30 x 1m	Olfaction, Visual
	<i>Zygophyllum</i> sp.																	Visual (unusual)

GROUNDCOVERS

Hydrology

The site's hydrology is represented by the wetlands, the ground water and high water table, and by seasonal stormwater. The site is not directly connected to any flowing/river network.

Wetlands are generally characterised by:

1. soil type
2. biota (fauna/flora)
3. hydrology:

Water sources are high water table (groundwater) and surface stormwater runoff.

The wetlands represent **mosaic habitats**: perennial + seasonal + ephemeral, which is often not recognised and overlooked.

Other characteristics of the site's wetlands:

- freshwater
- nutrient enriched / polluted / linked system - upstream pollutants
- acid / on acidic sands (not calcareous, which are alkaline)
- natural + artificial
- static / not flowing
- function in landscape:
- local stormwater attenuation services
- serve as habitats for fauna (birds) and flora
- water quality amelioration

Salt River Stormwater Catchment (into Elsieskraal - Vygekraal Canal - Black - Salt River) / Diep River SC

Wingfield wetlands' description:

"land which is transitional between terrestrial and aquatic systems, where the water table is usually at/ top 0,5m, or near the surface, or the land is periodically covered with shallow water and which under normal circumstances supports, or would support, vegetation adapted to life in saturated soil." (NWA 36 of 1998) (Day, 2011:5)

Various identified site wetlands:

JES2356, JES2362 - artificial stormwater attenuation wetlands

WING1 - an artificial wetland, excavated

WING2 - a largely natural depressionnal wetland, excavated in places

JES2353, JES2354, JES2358 - largely natural depressionnal wetlands

Natural wetlands persisted despite significant levels of site alterations. The natural wetlands comprise mosaic expanses of perennially, seasonally and ephemerally inundated to saturated wetland habitat.

Current status: significantly disturbed by:

infilling
dumping of solid waste
pollution
invasion of non-indigenous vegetation: drying out wetland areas, shading out and out-competing indigenous species
fragmentation / severed natural connectivity with upstream wetlands by roads, buildings and other infrastructure

Dominant indigenous plant species:

Typha capensis
Juncus kraussii
Juncus capensis
Imperator cylindrica
Cynodon dactylon

Other non-indigenous species:

Acacia cyclops (to control drifting sands + act as water pumps)
Acacia saligna
Leptospermum laevigatum
Paspalum vaginatum
Pennesetum clandestinum (kikuyu grass)

Any development on the site should take into the consideration the following:

The site includes substantial areas of wetland habitat of high conservation importance. However, the long-term sustainability might be enhanced through appropriate incorporation into a more formal development layout. (Day, 2011:22)

The large areas of the mosaic habitats of seasonal and perennial wetland fauna and flora would be MORE SUSTAINABLE than smaller, more isolated systems within the urban network.

Conserve the MOSAIC nature. (Day, 2011:18)

Future removal of alien vegetation and the expansion of hardened areas upstream of the wetlands are likely to contribute to long-term wetland EXPANSION, rather than shrinkage. (Day, 2011:20)

Groundwater over-abstraction (even being far from the wetland itself can impact negatively), and climate change / drought will impact the wetlands.

Ecosystem services & functions:

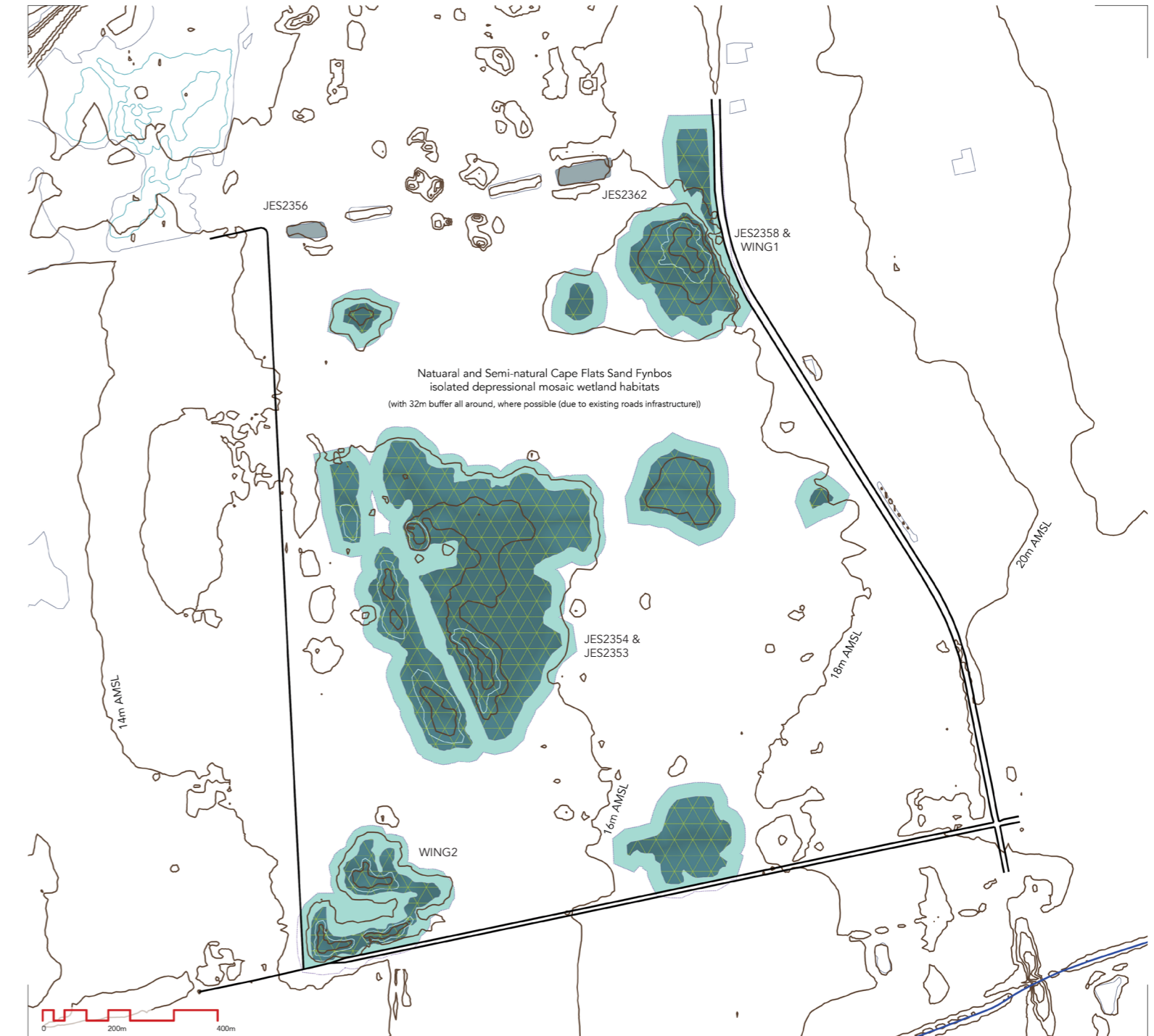
Regulating (floods & drought attenuation; important functions of endemic hydrophilic vegetation and animal life, forming interwoven mesh together; biogeochemical cycling on greater scale)

Habitat

Information Ecosystem Services (experiential, recreational, aesthetic, educational, cultural).

Wetland mosaic habitats within sand dunes and the associated vegetation type are taken by the author as the major place-making elements and design inspiration. Their seasonal change is a great tool to engage with through design to express the sense of time, temporality and ephemerality.

One of the major experiential values highlighted is **the value of landscape for deep-rooted, primordial, human need to return to nature.**



Terrestrial Critical Biodiversity Areas

The diagram map demonstrates various value of Critical Biodiversity Areas (CBA1b, 1d, 2)

Important point to mention: this map is based on a map study and is not ground-truthed; fragmentation of the areas is obvious, where various area are rather 'island' than a connected network.



Ecological Connectivity

attempting to create a connected network



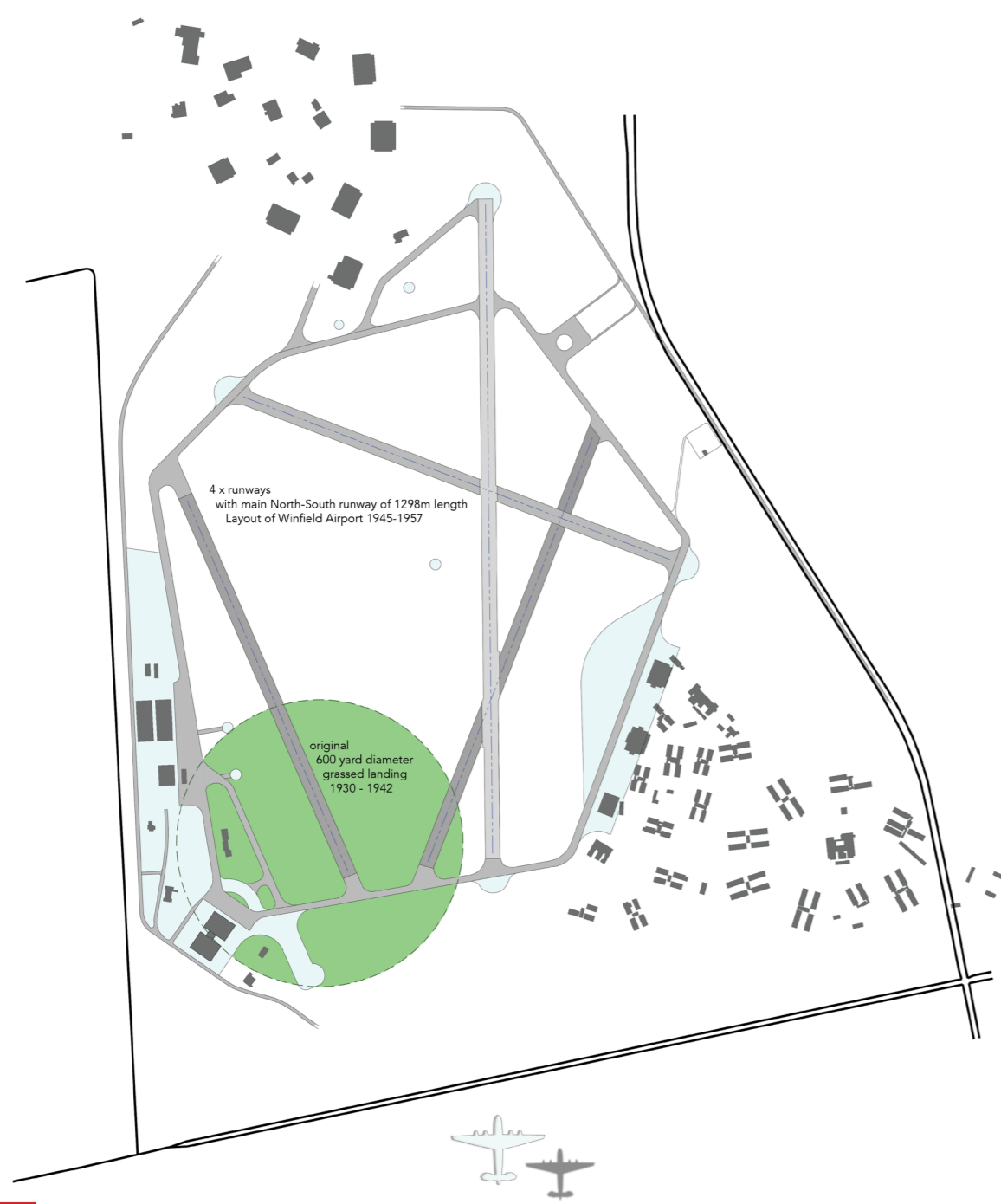
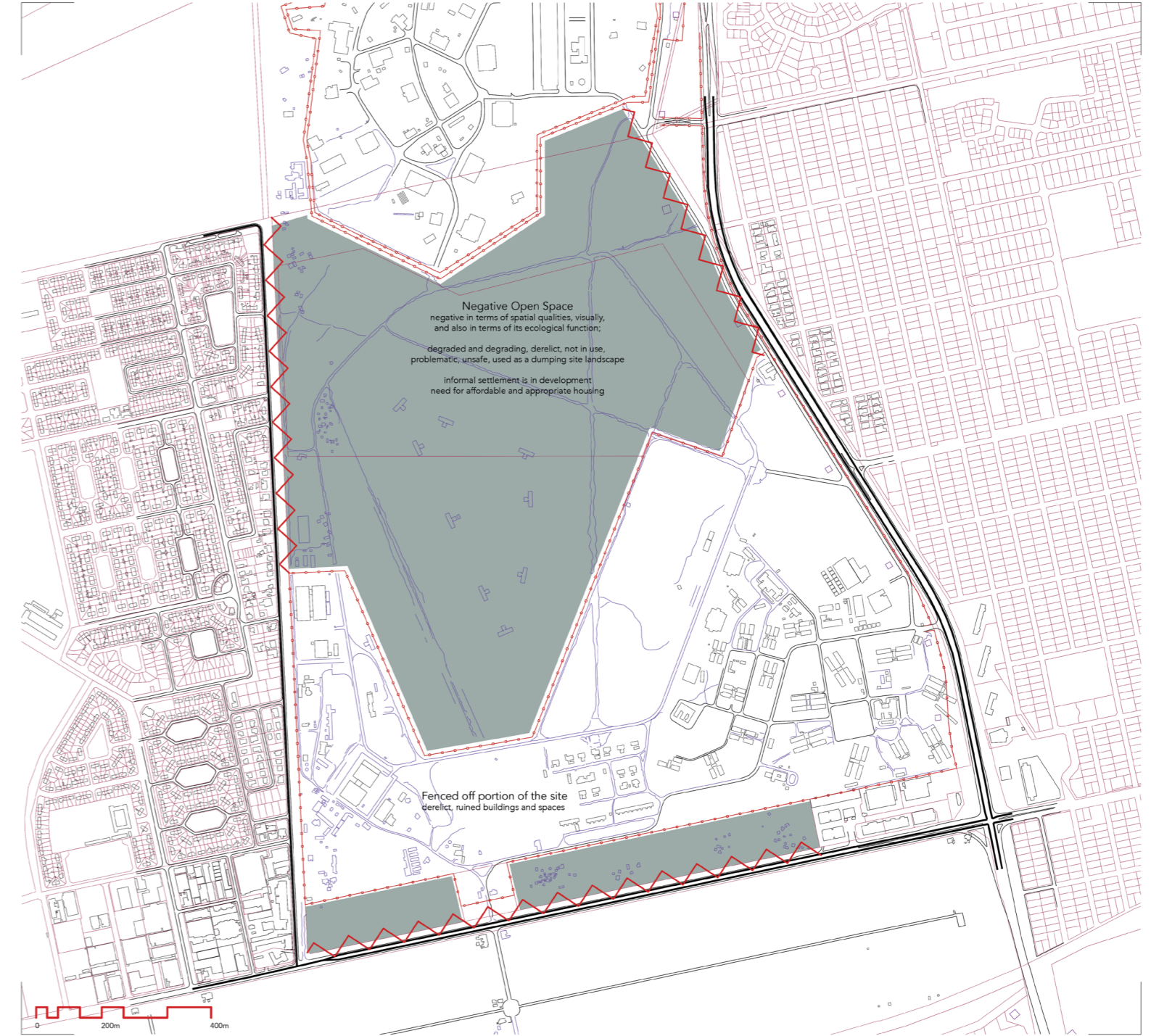


Photo: Wingfield Aerodrome c1950.
Available: <http://www.cape-town.photos/userImages/b3/2063-b3aa9830.jpg>



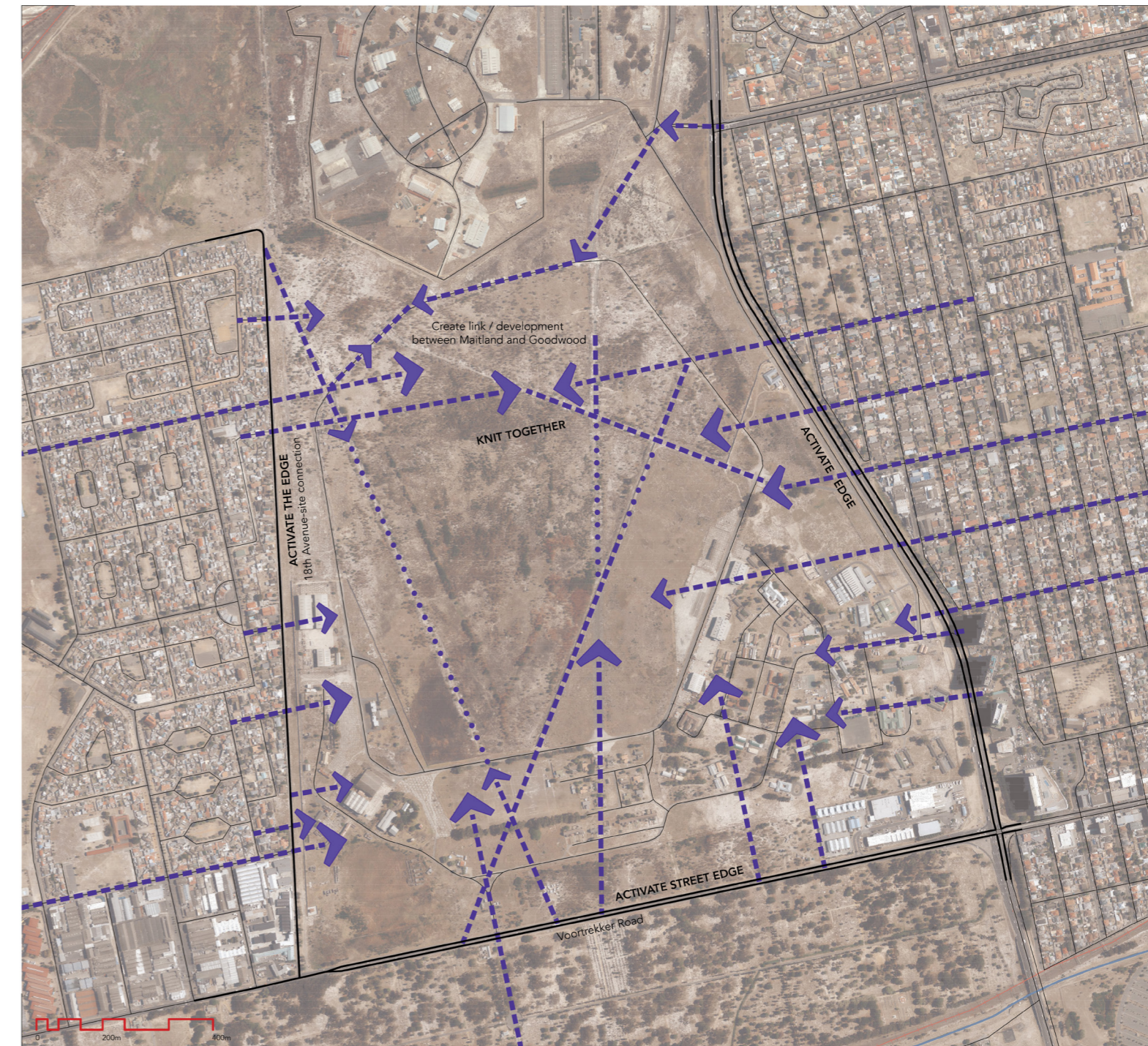
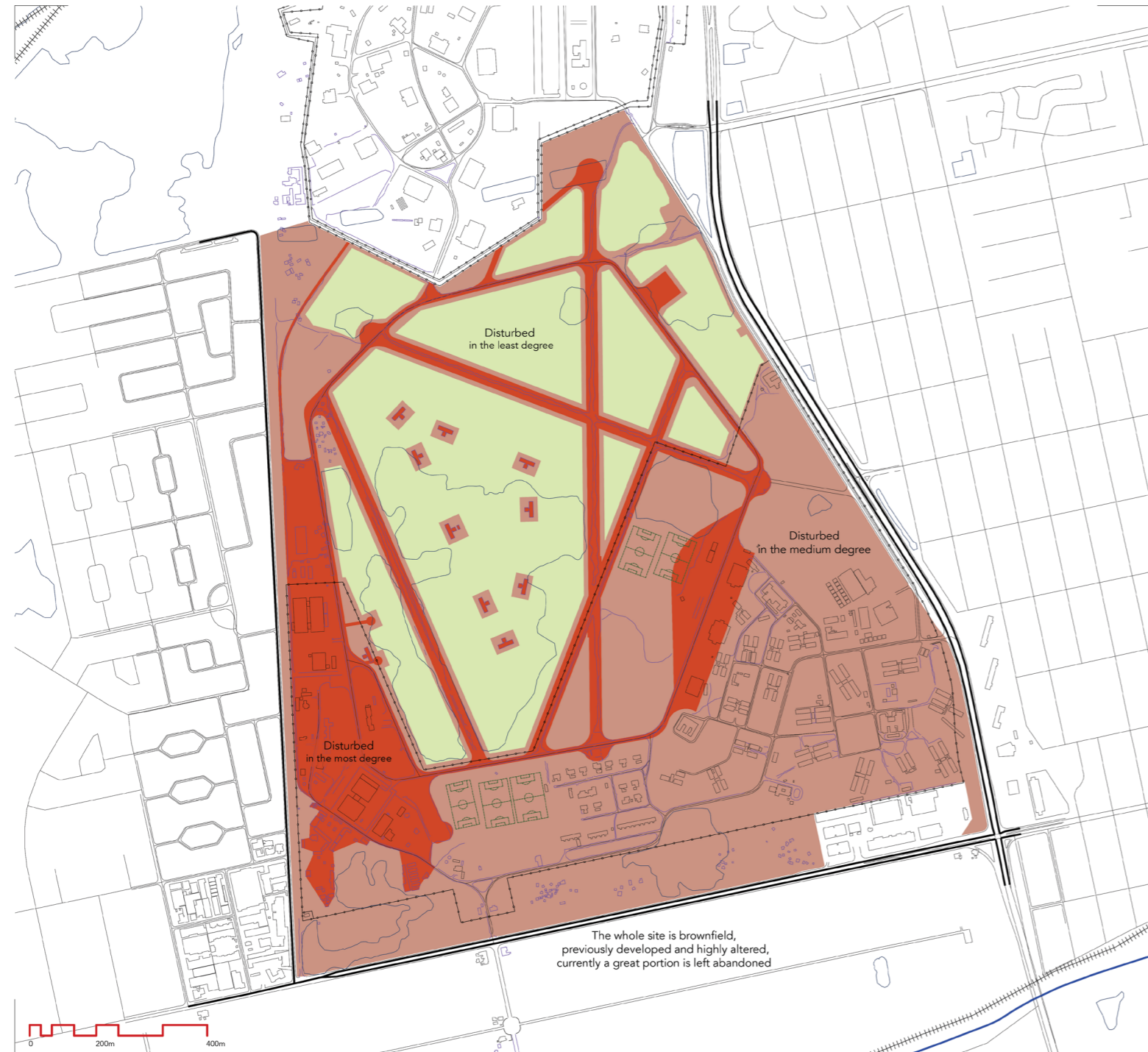
Photo: Plane Taking Off. SAA Skymaster Leaving Wingfield Airport, Cape Town (1950).
Available: https://c1.staticflickr.com/4/3449/3835353402_69047ed4c8_b.jpg



Analysis of Disturbed Landscape

Most disturbed areas are shown in red; Least disturbed in light yellow.

However, the whole site is a brownfield site and none of it can be considered pristine.



Proposed Knitting of the existing urban fabric, Maitland and Goodwood areas together to activate the area

Ecological Connectivity - Biological Corridor Link

The mapping shows the site in the context of the City of Cape Town's Terrestrial Biodiversity network, parks network (which includes community parks, other various parks, cemeteries, road reserves, river corridors), existing protected by legislation conservation areas, and natural areas (beyond urban edge, ocean).

The chosen features represent current best scenario of potential ecological connectivity, creating a network of nodes and corridors, linking the site to the north-east.

Other potential avian connectivity is also illustrated.

These are author's inferences, based on various literature and works, most of which is listed in the Bibliography and References.



POTENTIAL ECOLOGICAL CONNECTIVITY NETWORK: TERRESTRIAL & AVIAN
 Green Terrestrial Network includes: CBAs (WCBS/CapeNature), City Parks (parks, road reserves, cemeteries, river corridors)
 Aquatic Network includes: various wetland habitats (perennial, seasonal, ephemeral) & rivers

Framework Design Principles - Vision for the Site

Designing for landscape sustainability and human well-being

Gateways with sense of transition / transformation in mood, atmosphere, function

Nodes or activity centres of various nature

Linear elements: walkways, running tracks

Connecting residential fabric to mainly new residential development (18th Avenue)

Commercially activating Voortrekker Road strong edge definition

Hierarchy of movement and streets

Interconnected system of public spaces

Designing to allow options/diversity

Interconnected green structure - supporting potential ecological connectivity

Inner wetlands' core area serves to attenuate flood during wet season, to recharge aquifer, to provide habitat, biodiversity, and other various ecosystem services (regulating, providing, producing, informing)

Wetland habitat of high conservation importance (Day, Liz), where the long-term sustainability might be enhanced through appropriate incorporation into a more formal development layout

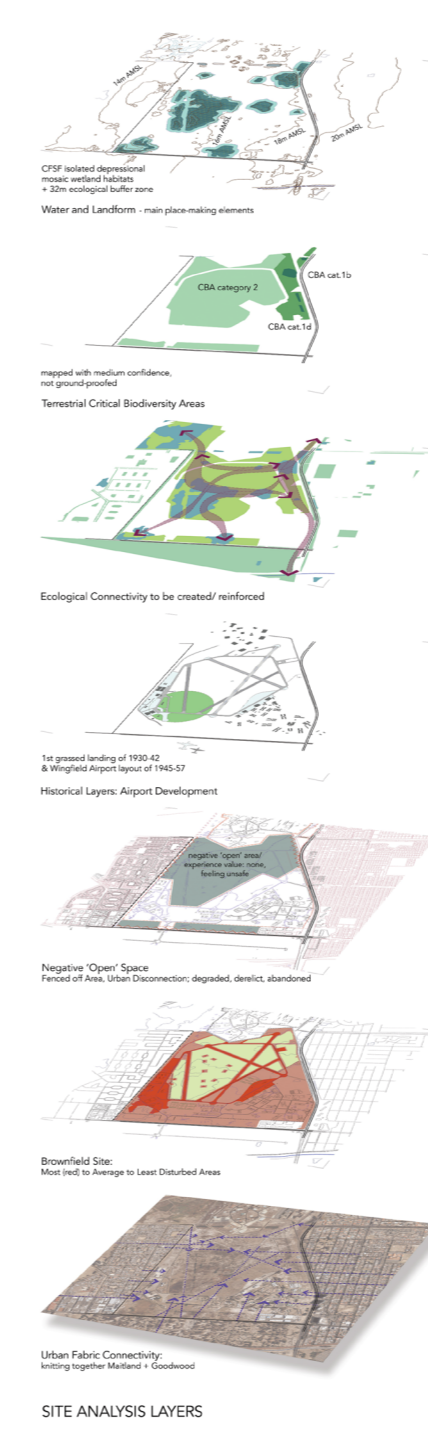
Experience of nature - large enough area - to really offset the negative effects of the built environment and create a feeling of wild dunescape

Taking into consideration seasonal water table fluctuations

Strategies of INCLUSION and ABSENCE (humans)

Value: valuable/ endangered habitat - central to a sense of place

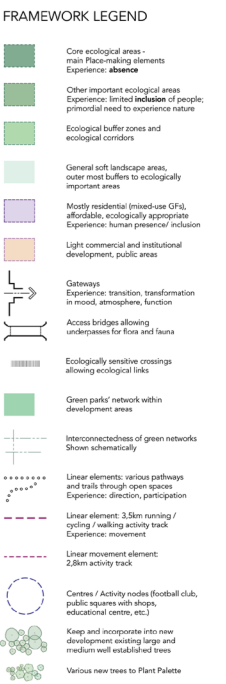
Experience: deep-rooted, primordial, human need to return to nature.



SITE ANALYSIS LAYERS



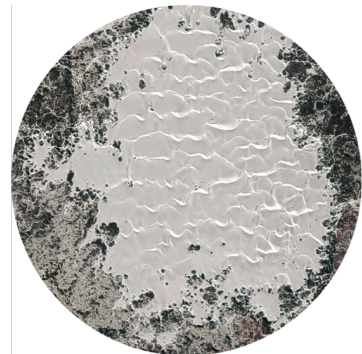
FRAMEWORK PLAN



Inland Dunes versus Coastal Dunes



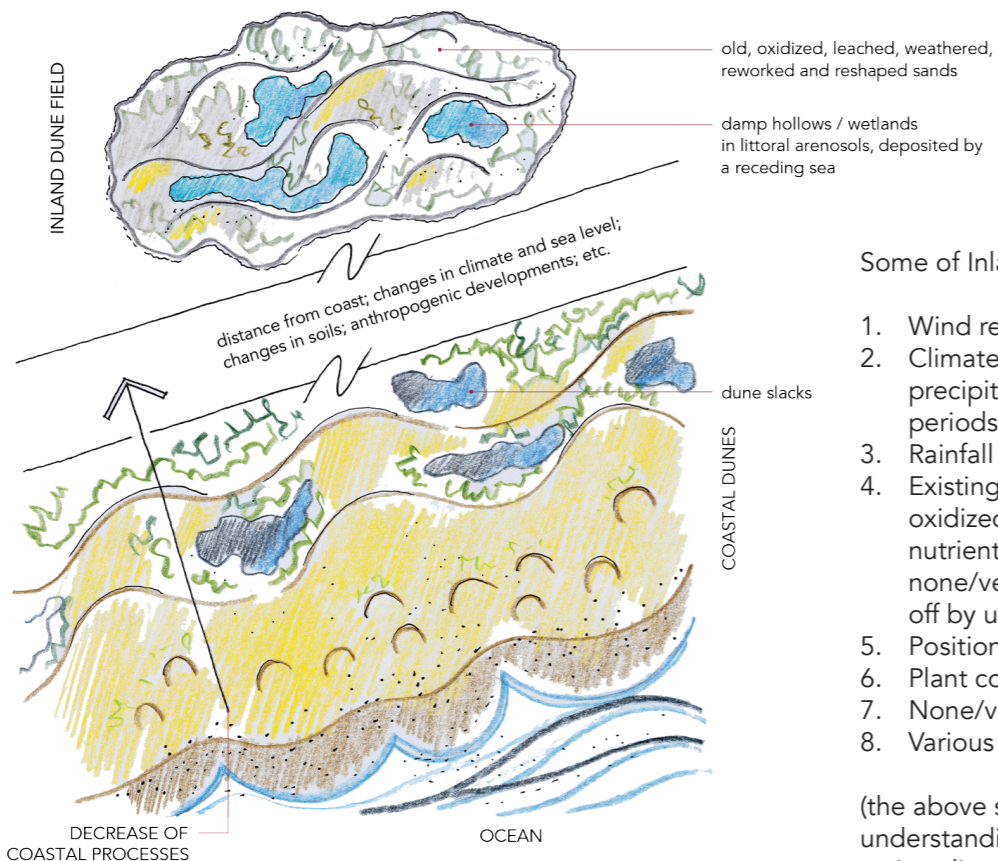
Inland dunes, at Matroosfontein, next to Cape Town International Airport, right above N2, about 12-14km away from False Bay coast



Inland dunes, at Witvands Aquifer Nature Reserve, close to Atlantis; about 8-10km away from the coast



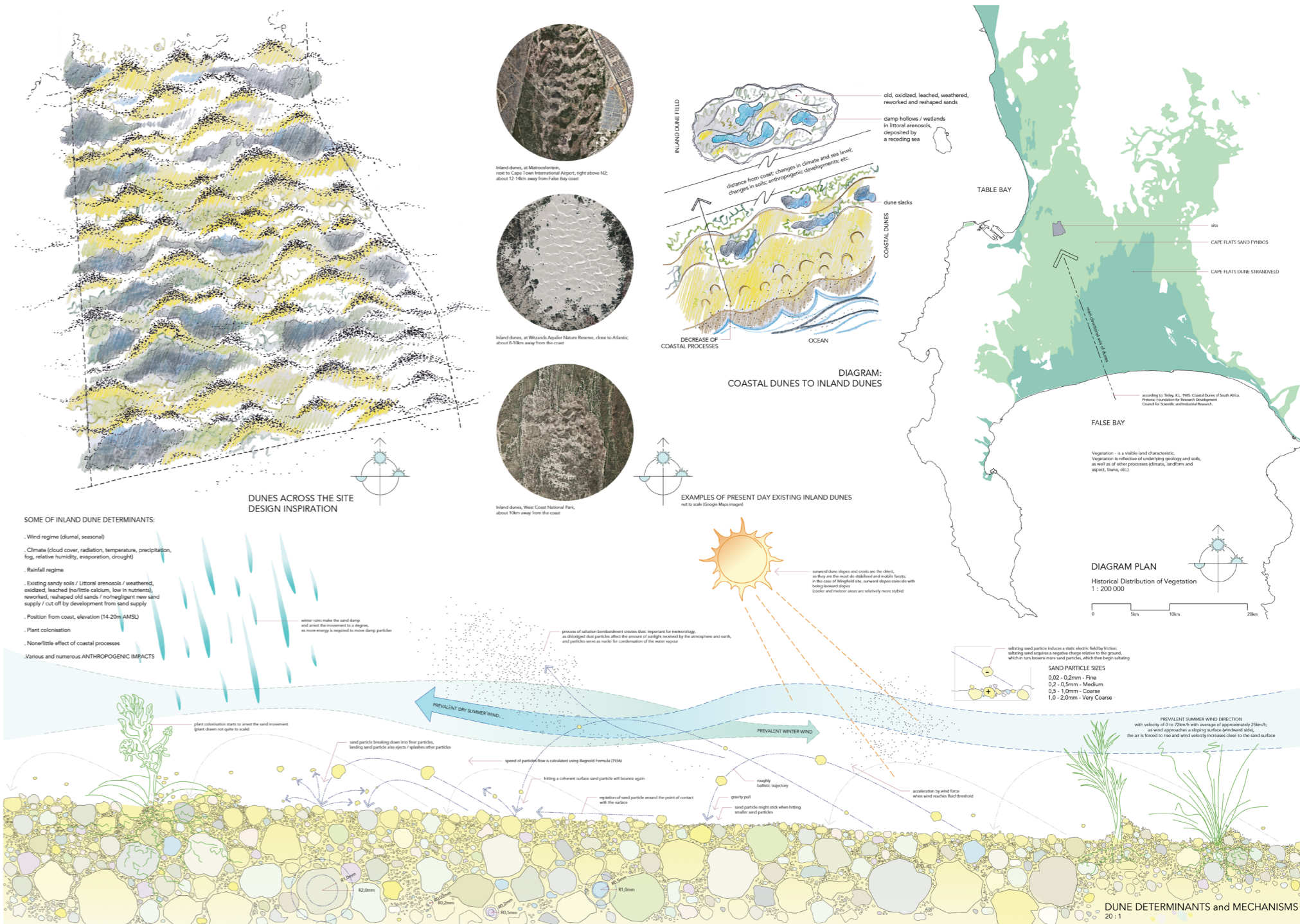
Inland dunes, West Coast National Park, about 10km away from the coast



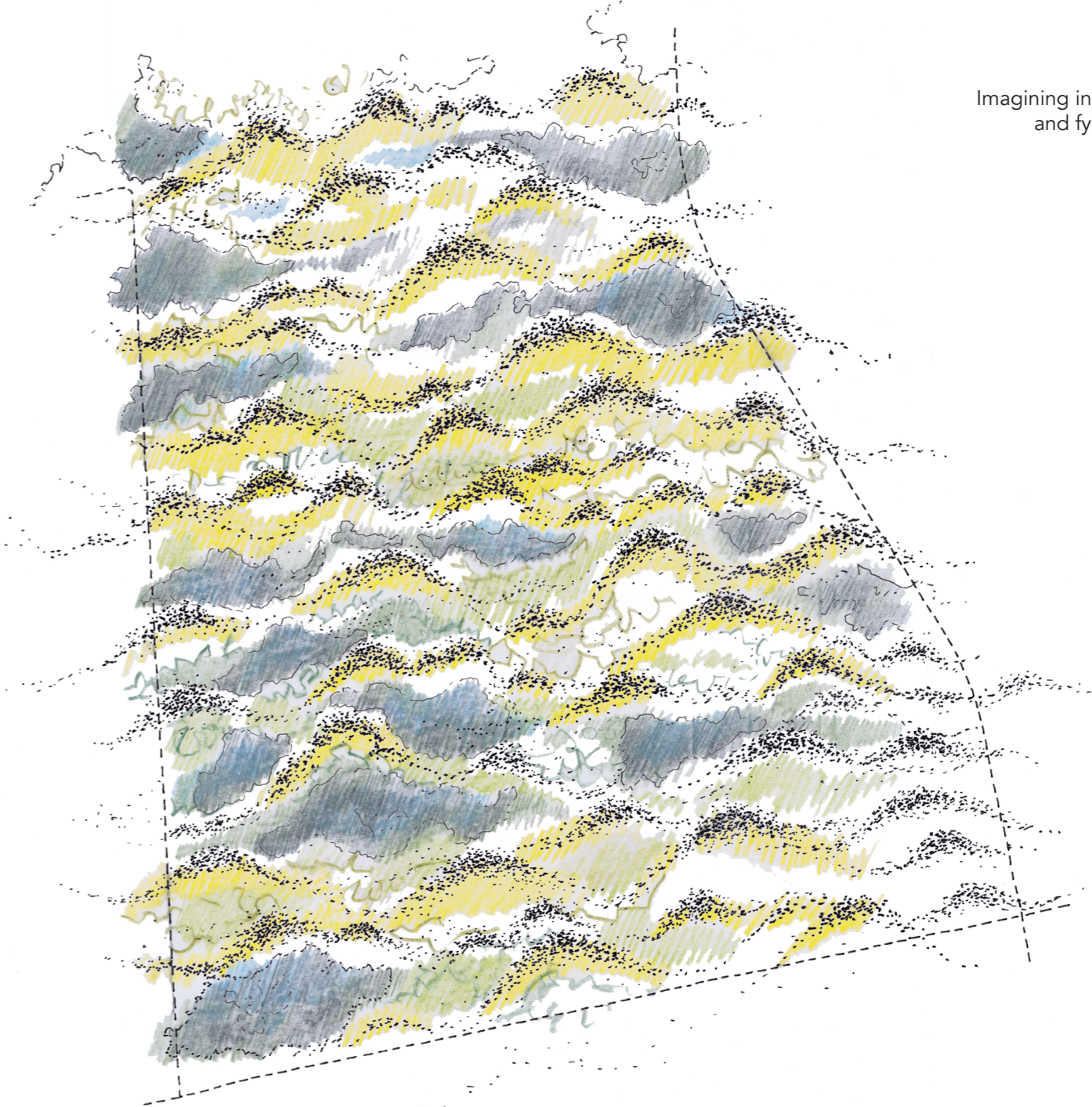
Some of Inland Dunes Determinants

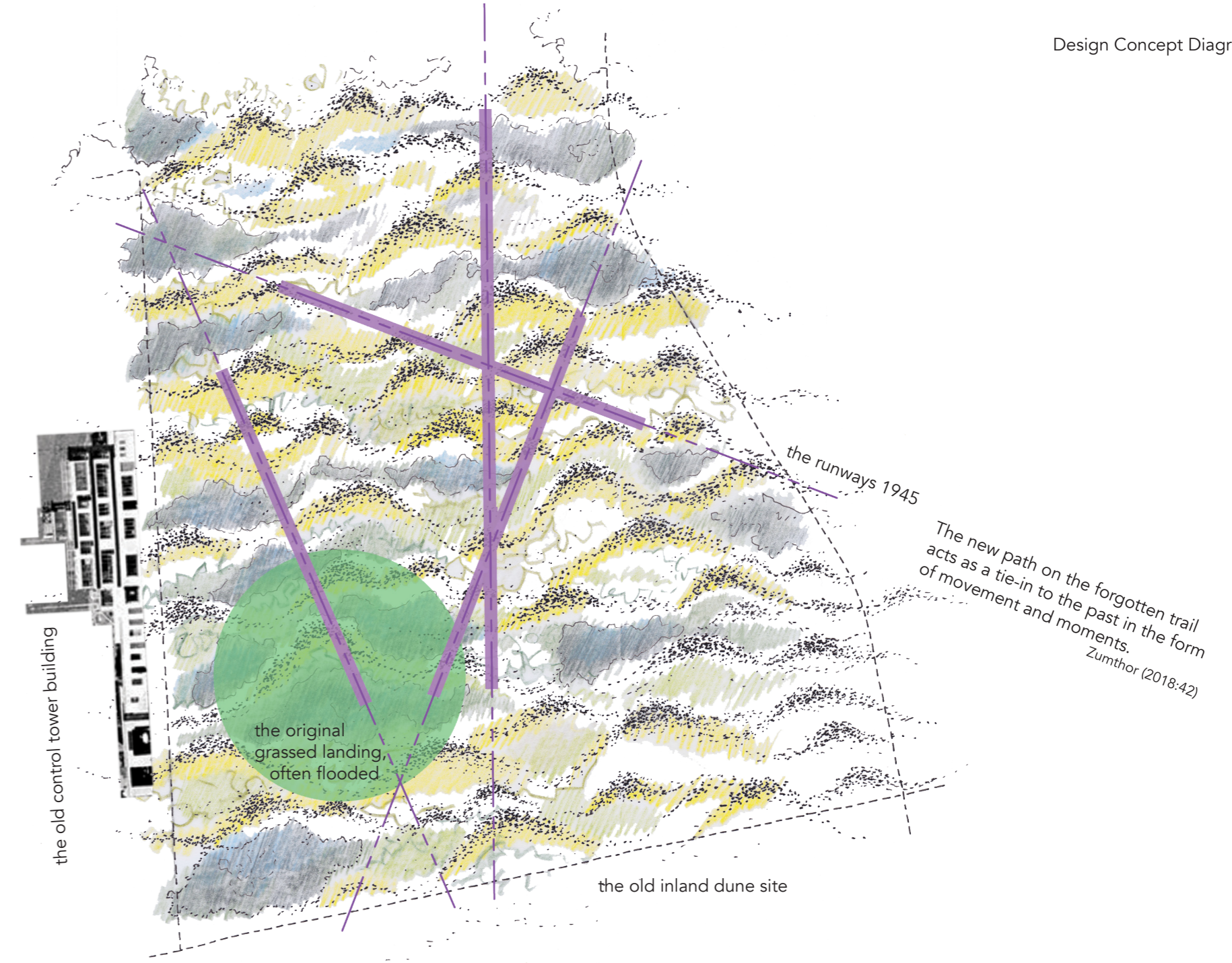
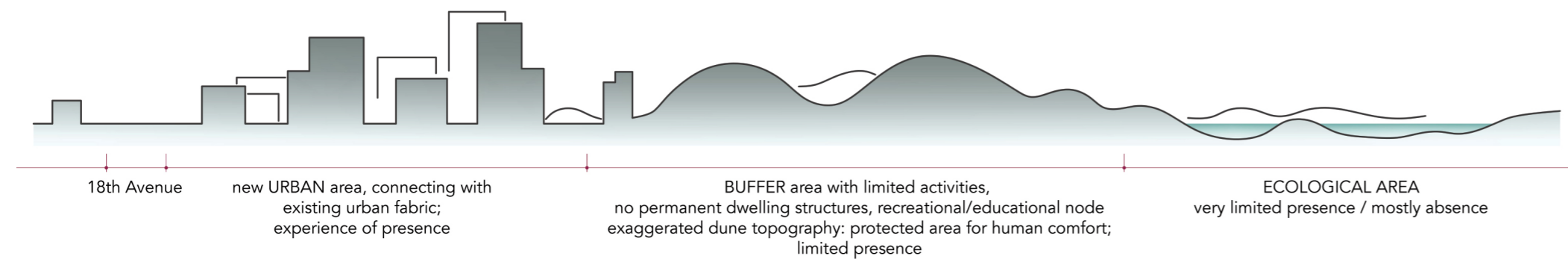
1. Wind regime (diurnal, seasonal)
2. Climate (cloud cover, radiation, temperature, precipitation, fog, relative humidity, evaporation, periods of drought and flooding, etc.)
3. Rainfall regime
4. Existing sandy soils / littoral arenosols / weathered, oxidized, leached / no/little calcium, very low in nutrients, reworked and reshaped old sands with none/very little new sand supply / mainly being cut off by urban development and stabilised by plants
5. Position: distance from the coast, elevation
6. Plant colonisation and succession
7. None/very little effect of coastal processes
8. Various and numerous anthropogenic impacts

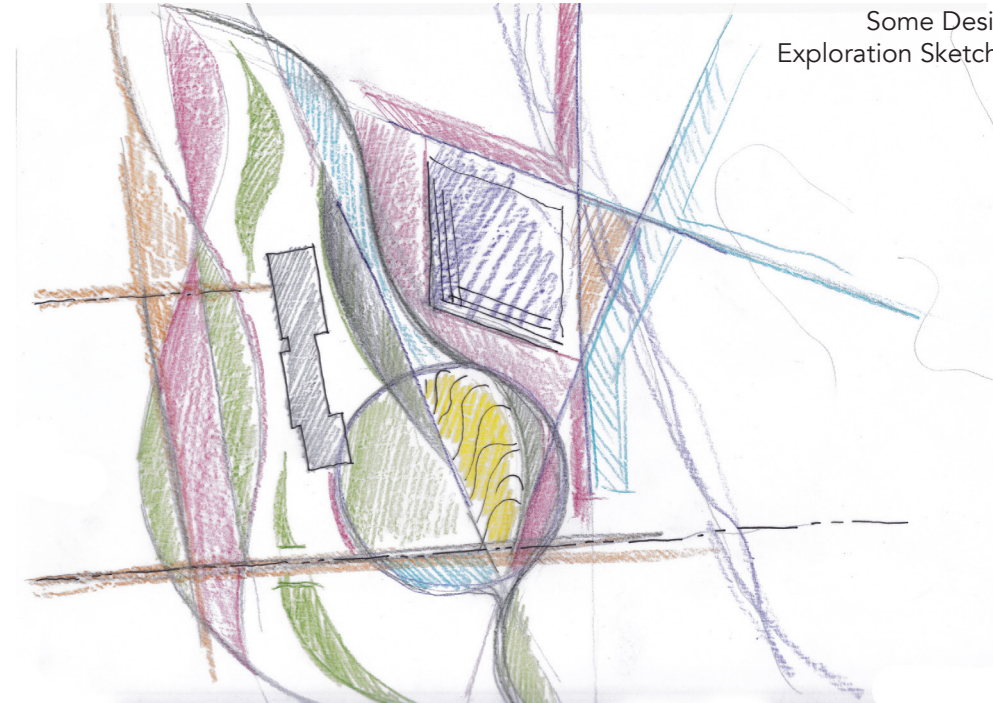
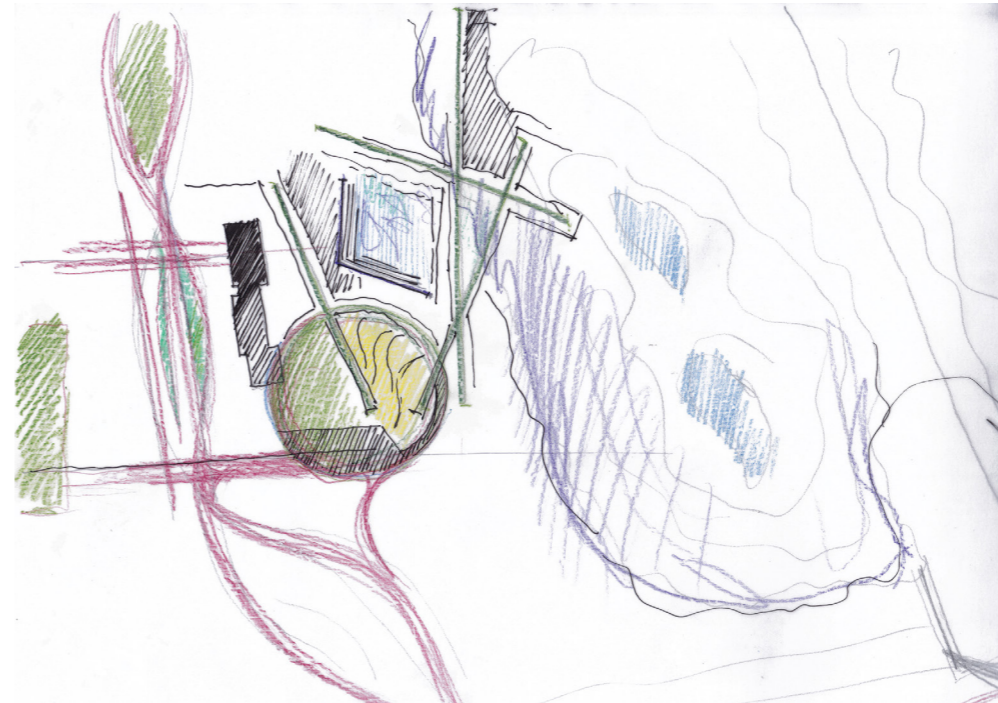
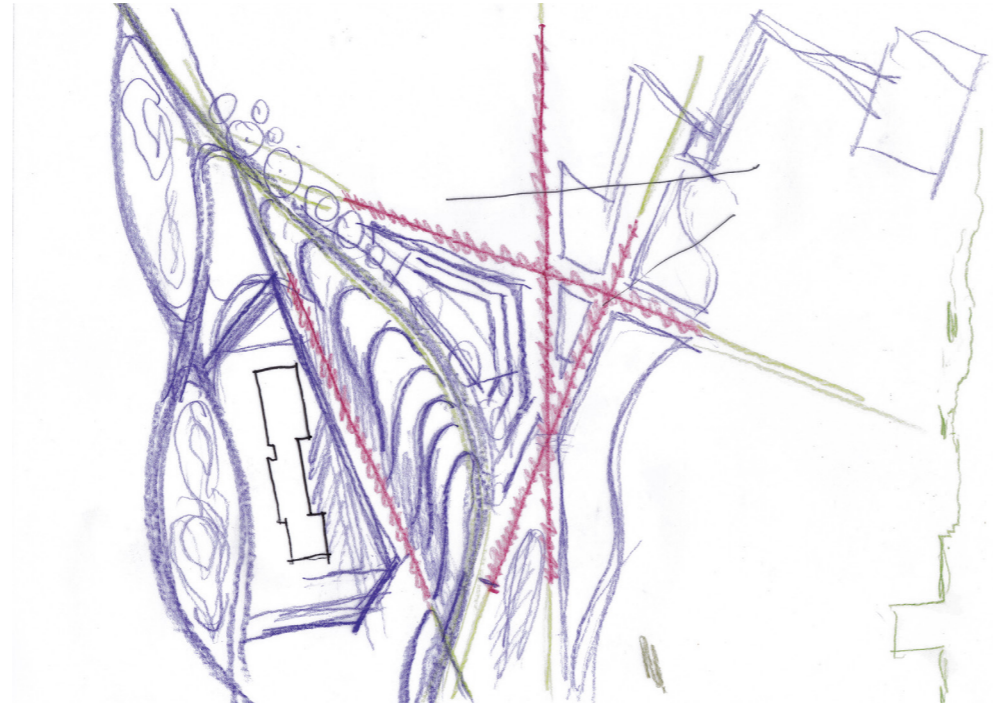
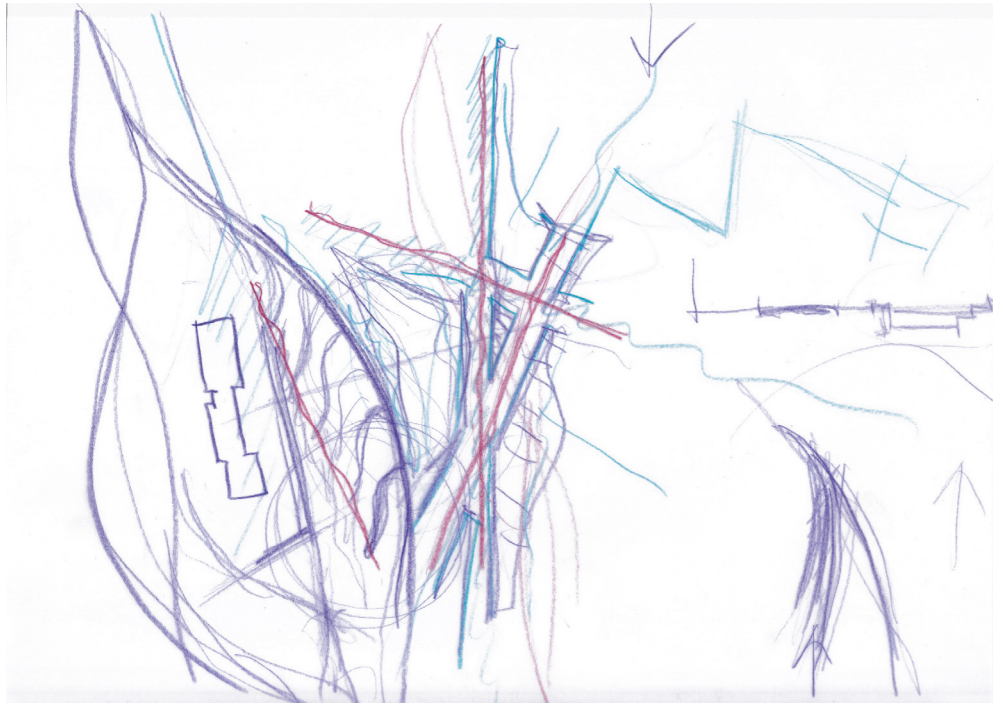
(the above summary is my gained personal understanding, based on teaching by Barry Low, and various literature, including Tinley, K.L. (1985))



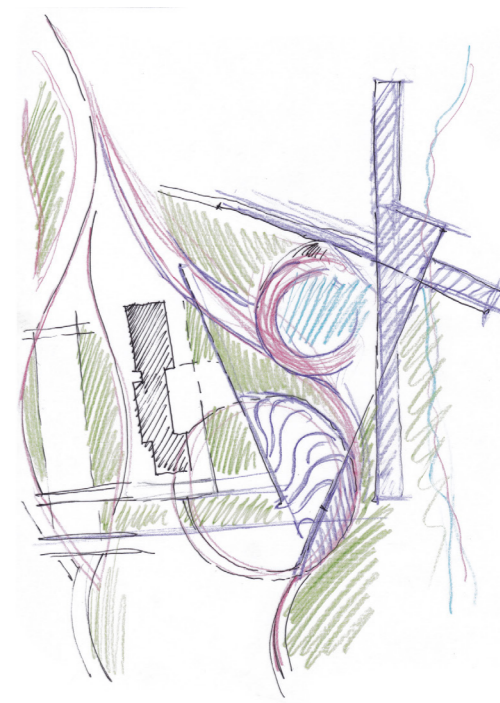
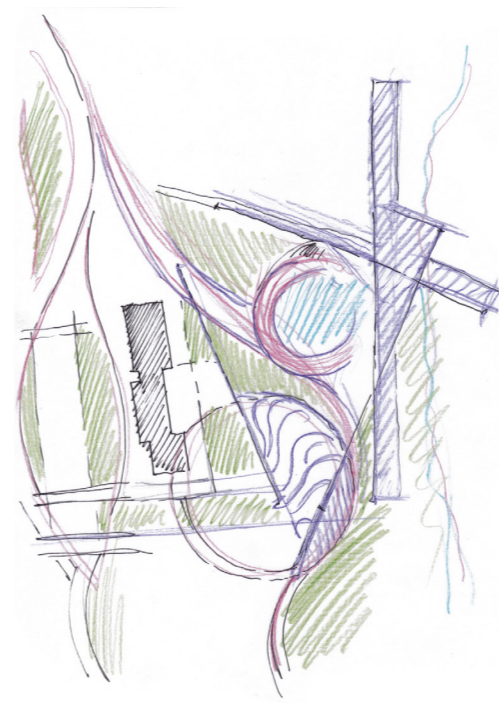
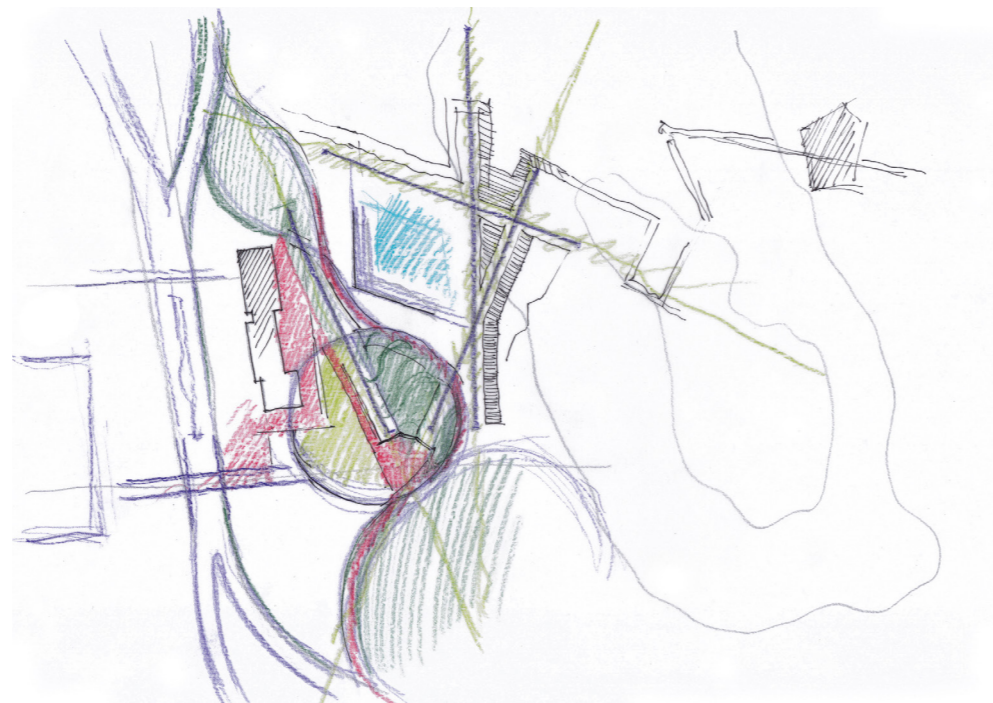
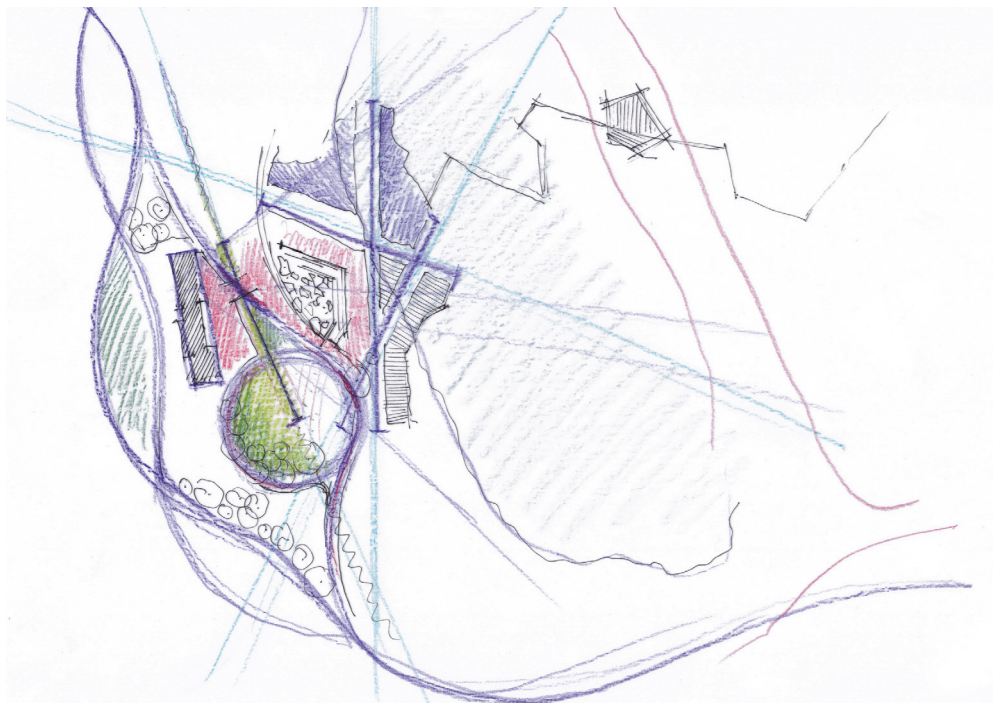
Imagining inland dunes and depressional wetlands and fynbos vegetation across the whole site.

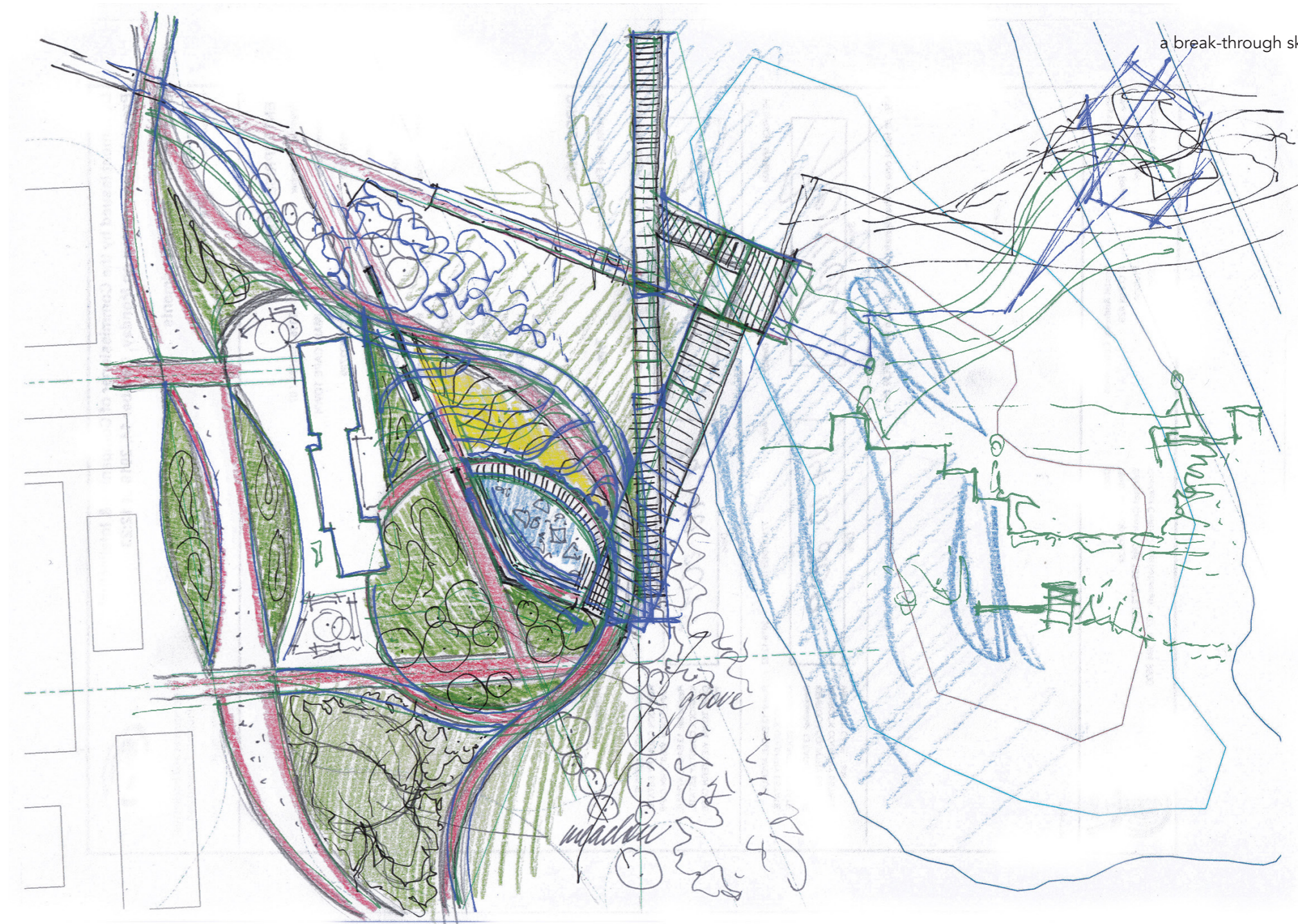
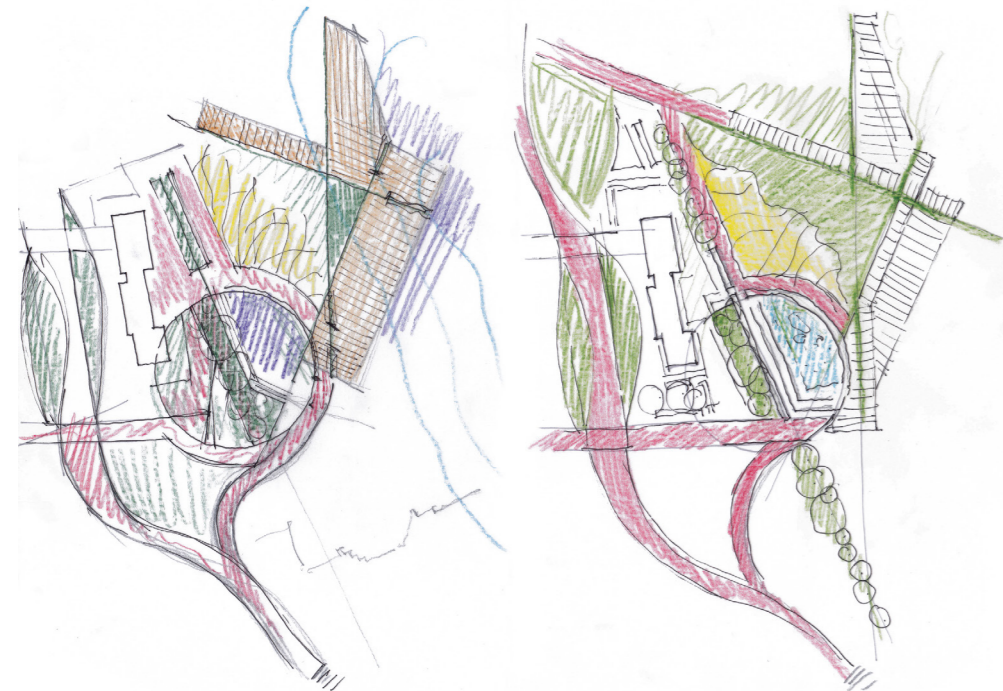
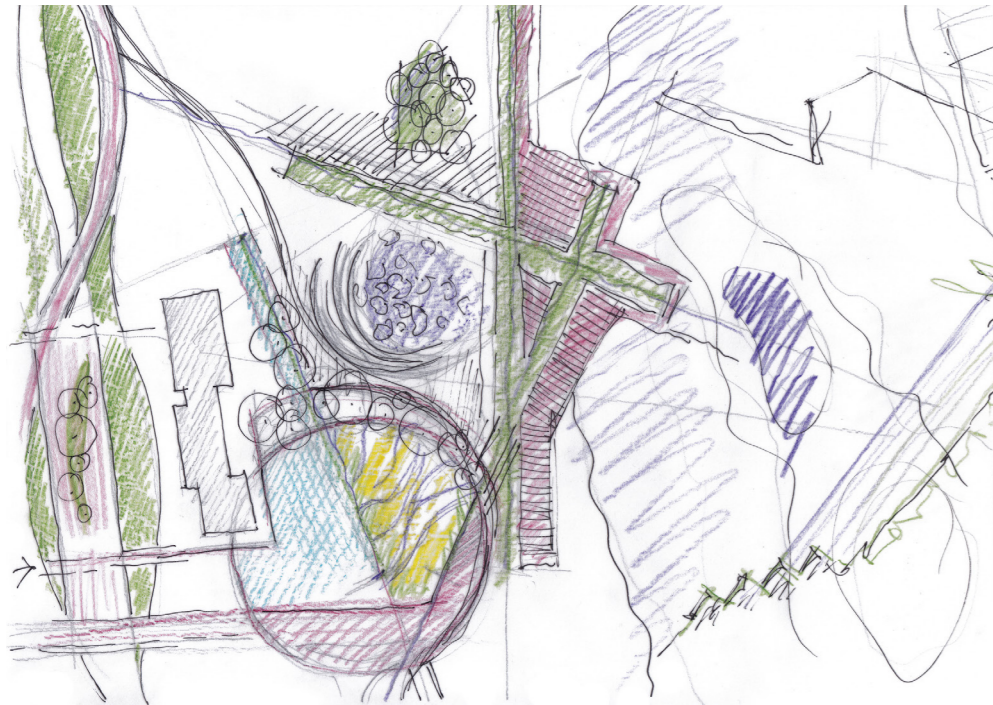






Some Design Exploration Sketches





a break-through sketch

Materiality of the Proposed Design

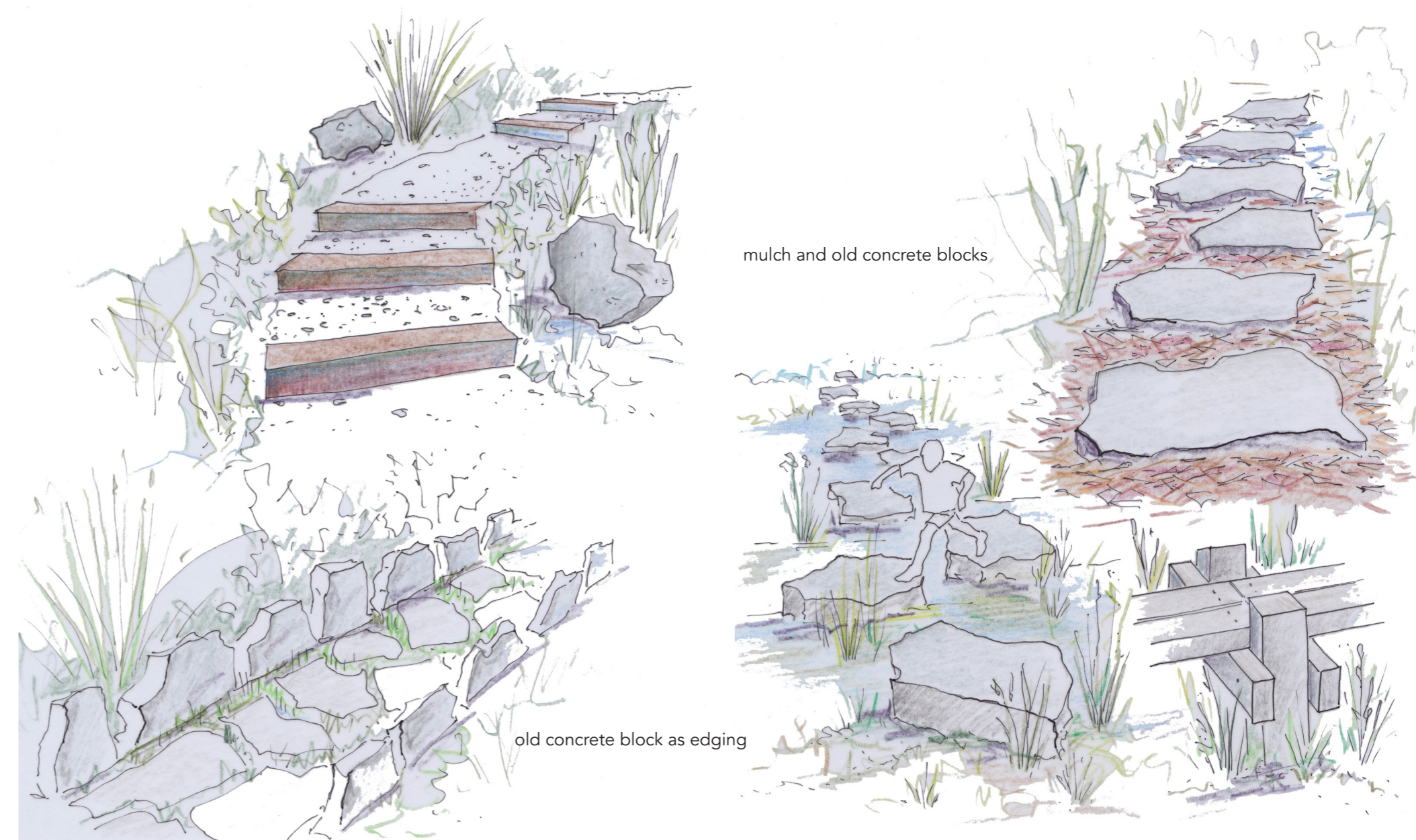
Indigenous fynbos plants (professional botanist to assist with rehabilitation, and new methods of re-establishment of fynbos)

Plus other indigenous species (trees), that are not usually present in this type of fynbos but are important for the design of human comfort (provision of shade, wind breaker function, attracting birds, insects, etc.)

Re-use of existing old concrete, making it more neutral for the environment via special application (as concrete is poisonous for the landscape, and fynbos plants, changing chemical composition of soils, raising pH, etc.)

Use of mulch, made on site from existing non-indigenous trees (a certain level of management of existing non-indigenous seedbank and species re-growth to be done by the adjacent community assisted by professional botanist)

Jarrah untreated timber decks and boardwalks



Some Design Ideas

Contrast and counterpoint as design strategies:

Shapes of dunescape - linearity of human traces

Sand (dune sand 'play' undulating areas) - Water elements (sunken area) brought in close proximity

Areas for humans / presence versus areas for natural habitat / absence

Existing old concrete blocks 'encased' 'old non-indigenous grove'/almost monoplanting versus surrounding indigenous diverse fynbos display

Connectivity and options - knitting together

Diversity in the landscape and diversity of human experience - variations

Structures, landform, vegetations, and water interplay

Materiality appropriate or appropriated (concrete and mulch from existing non-indigenous trees) from the site

Changes and variations in materiality of the pathways finishes to bring attention to the sense of touch as experienced through movement/feet

Comfortable and protected areas for human experience versus areas where humans are exposed to harsh landscape elements

Planting principles:

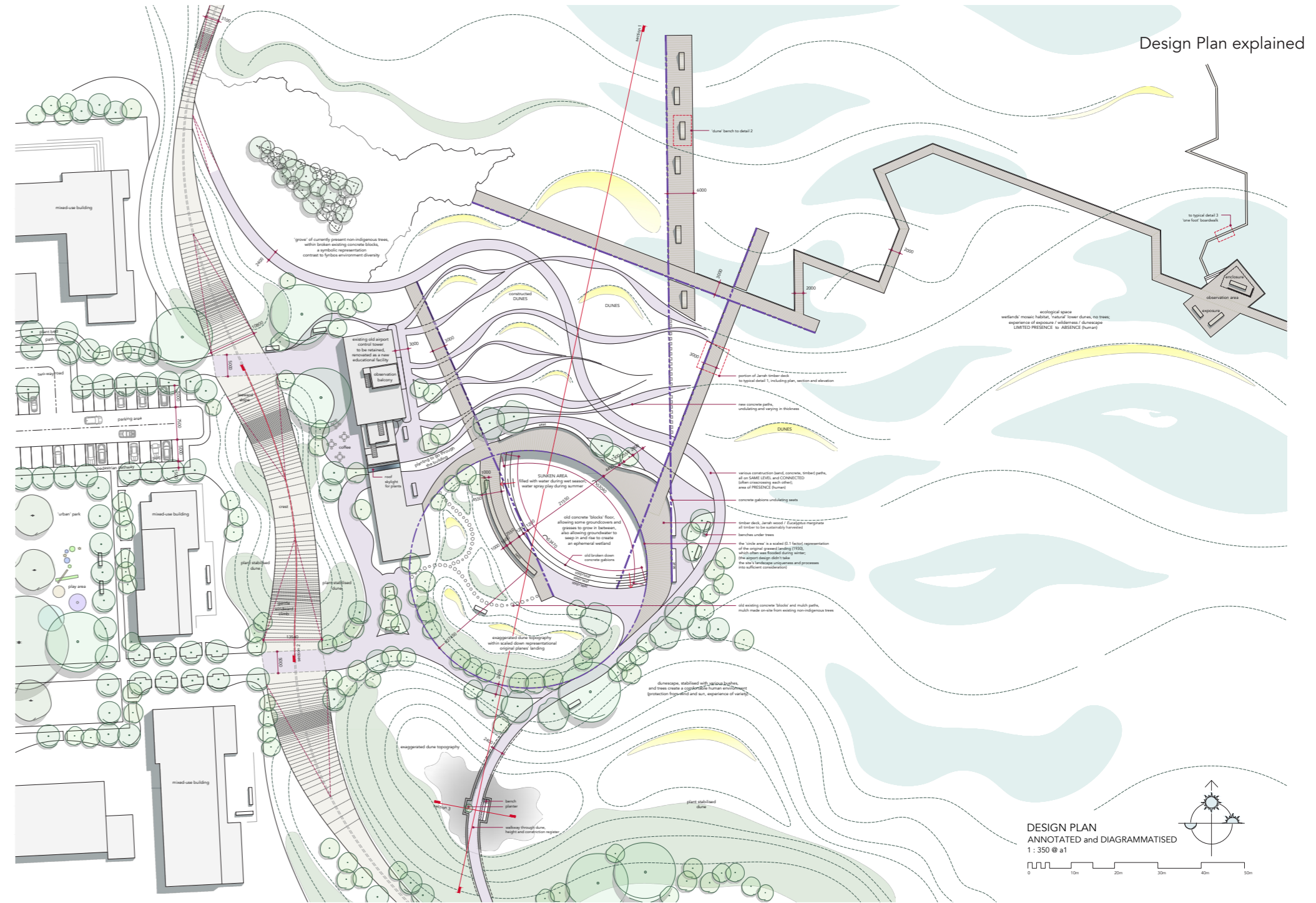
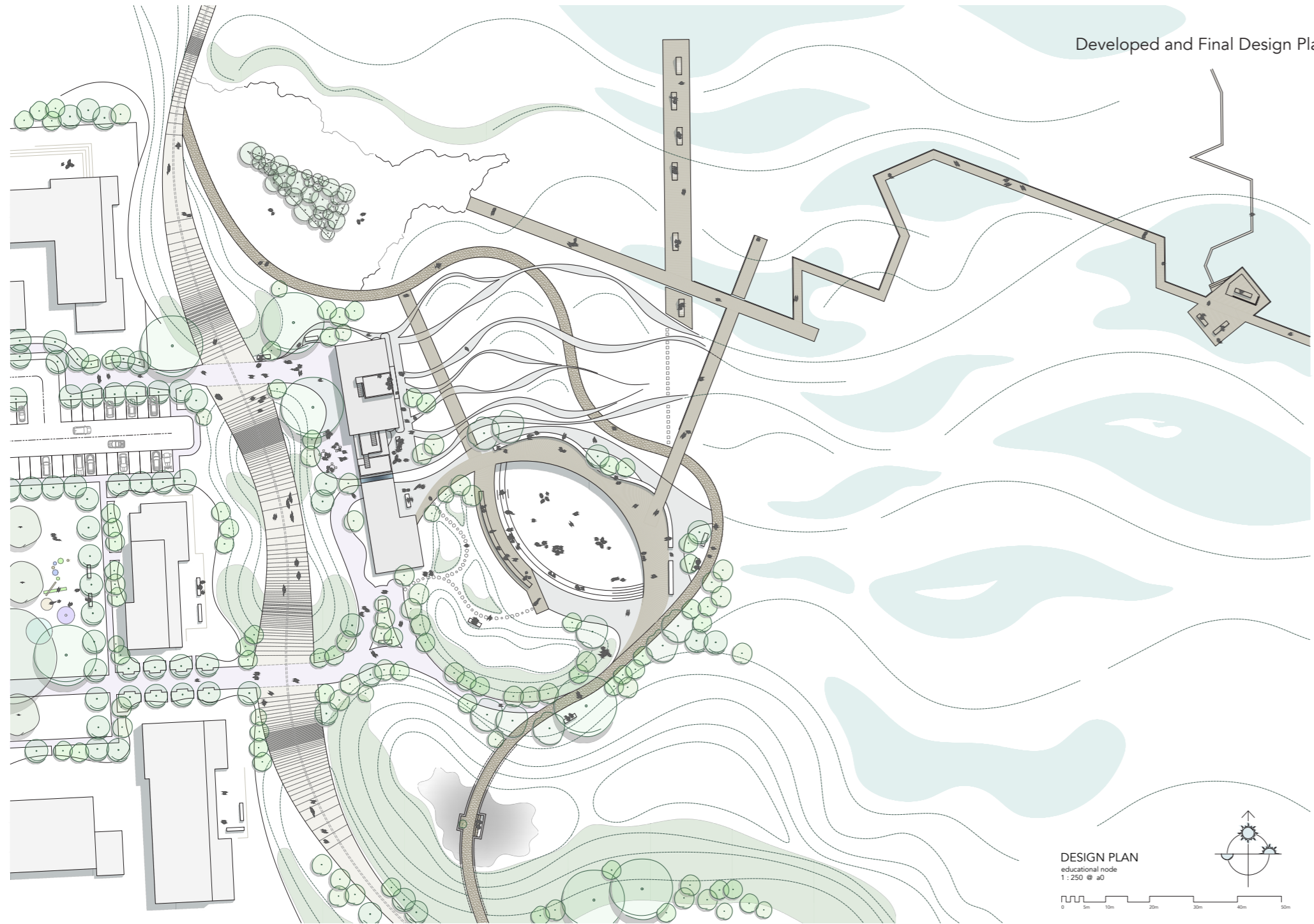
- providing for biodiversity of flora and fauna, taking inspiration from indigenous plant palette of site-type of vegetation, Cape Flats Sand Fynbos
- creating seasonal interest through the use of planting material
- low management approach
- ecosystem design, where planting mixes incorporate a community of plants, each playing various roles: pioneer/filler plants, structural plants (backbones of the planting mix), accent plants, seasonal plants
- plant selection is inspired by naturally occurring plant communities of the site, and it also includes other plant species into the mix in response to the specific site conditions and human needs - so, it is about relating plants to the site, relating plants to plants, and relating plants to people's needs
- planting is a mix of compatible species that interact with each other and the site, and provide for human experiential dimensions
- planting is done densely, including vertical layering of the plants; however, seasonal dying off of some plant species (geophytes) and other seasonal changes are taken into account; at times bare sand will be exposed, which is a part of designed experience
- planting to simulate natural landscape, certain plants need more sun, sunward slopes, others require a position close to wetland edge, etc.
- designing for a water wise landscape, not requiring irrigation once established.

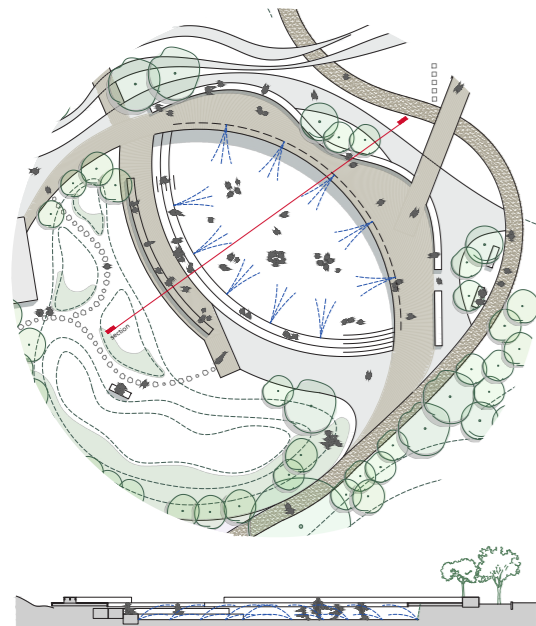
'There is nothing natural about landscape: even though landscape evokes nature and engages natural processes over time, it is first a cultural construct, a product of the imagination. ...the fact that designed and constructed landscapes inevitably signify the natural world - and ultimately succumb to the naturalisation over time - is the primary source of the delight and pleasure they provide and the source of what makes the medium so difficult.'

Corner, James (2014:8)

A Preliminary Design Plan

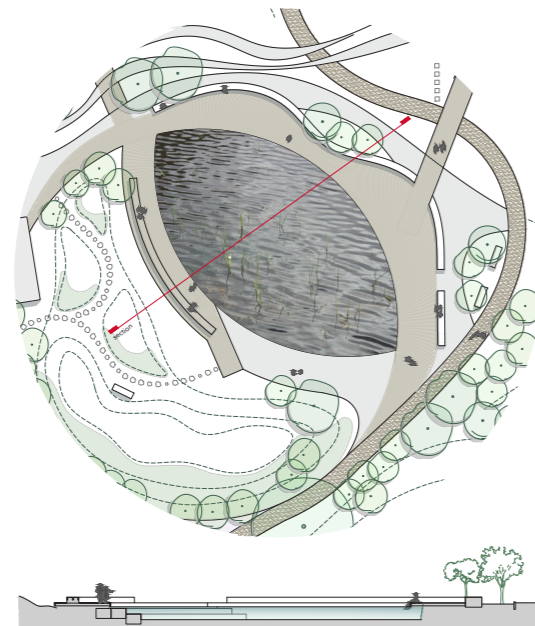






SUNKEN AREA DURING DRY SUMMER SEASON

PLAN 1:350 & SECTION 1:200 @ a1



SUNKEN AREA DURING WET WINTER SEASON

PLAN 1:350 & SECTION 1:200 @ a1

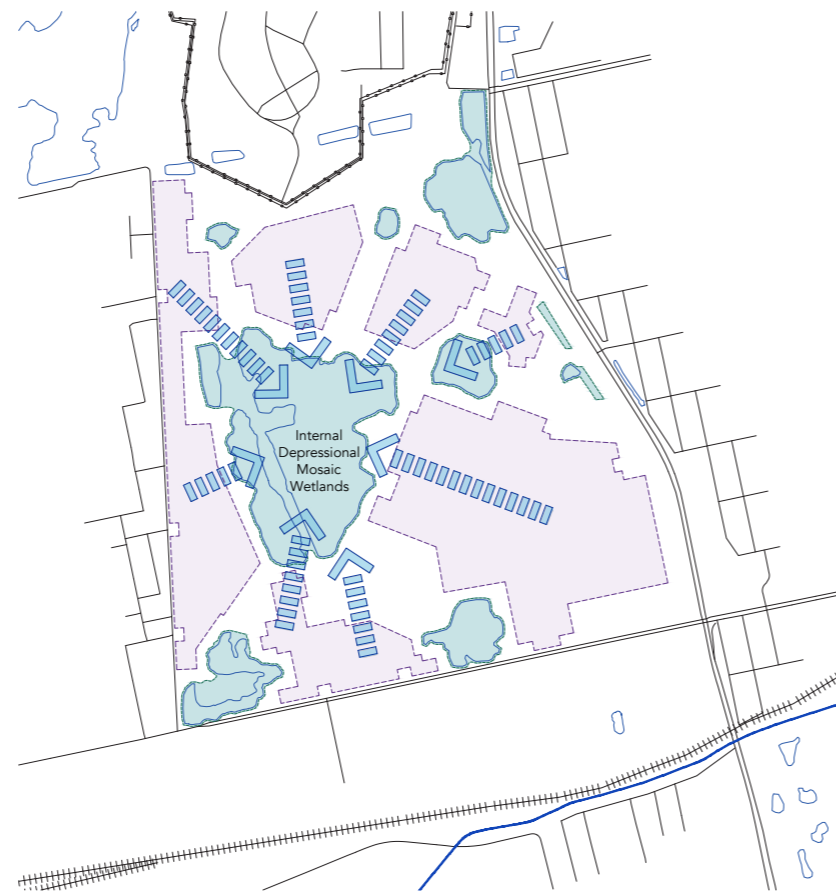
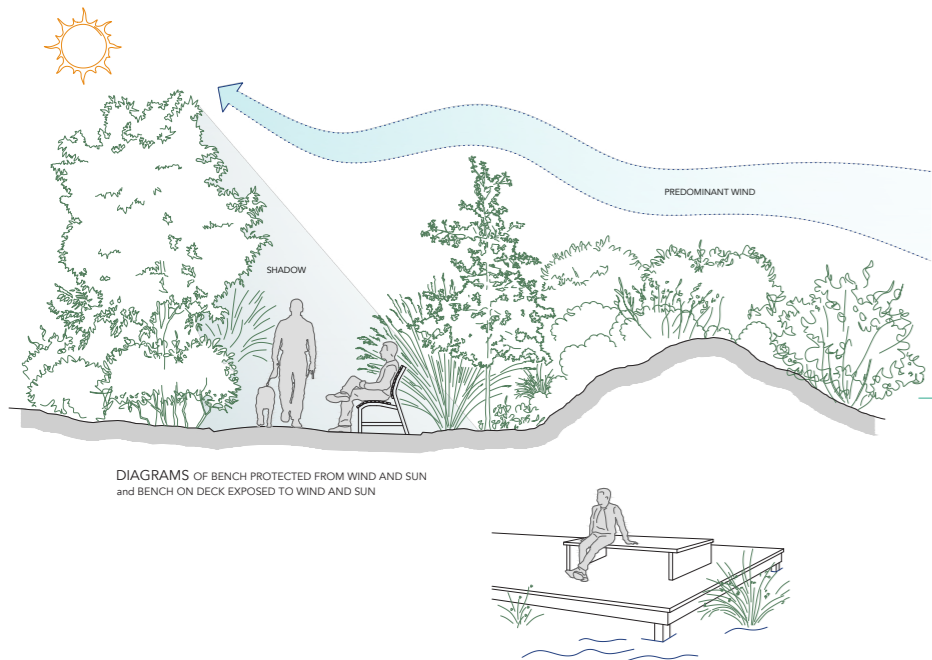
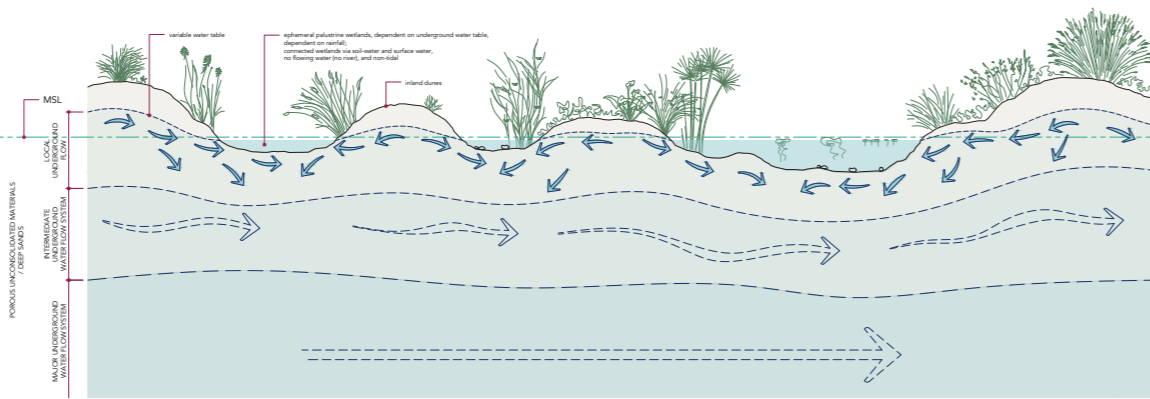


DIAGRAM OF STORMWATER FLOW FROM NEW DEVELOPMENT

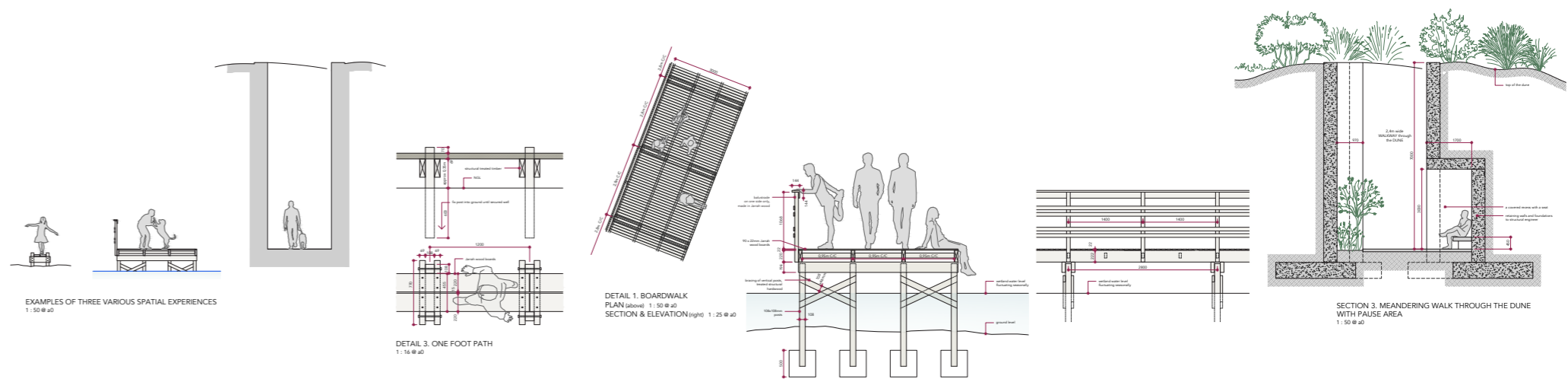
1:7 500 @ a1



DIAGRAMS OF BENCH PROTECTED FROM WIND AND SUN and BENCH ON DECK EXPOSED TO WIND AND SUN



INLAND WETLANDS and UNDERGROUND WATER FLOW DIAGRAM



EXAMPLES OF THREE VARIOUS SPATIAL EXPERIENCES

1:50 @ a0

DETAIL 1. BOARDWALK

DETAIL 3. ONE FOOT PATH

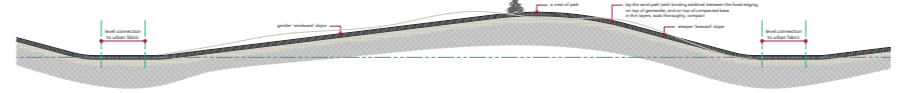
1:16 @ a0

DETAIL 1. BOARDWALK

PLAN (width) 1:50 @ a0 SECTION & ELEVATION (height) 1:25 @ a0

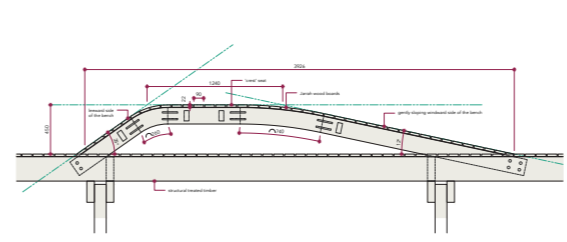
SECTION 3. MEANDERING WALK THROUGH THE DUNE WITH PAUSE AREA

1:50 @ a0



SECTION 2

1:200 @ a0



DETAIL 2. 'DUNE' BENCH

1:16 @ a0



EXPERIENTIAL LANDSCAPE IMPRESSION

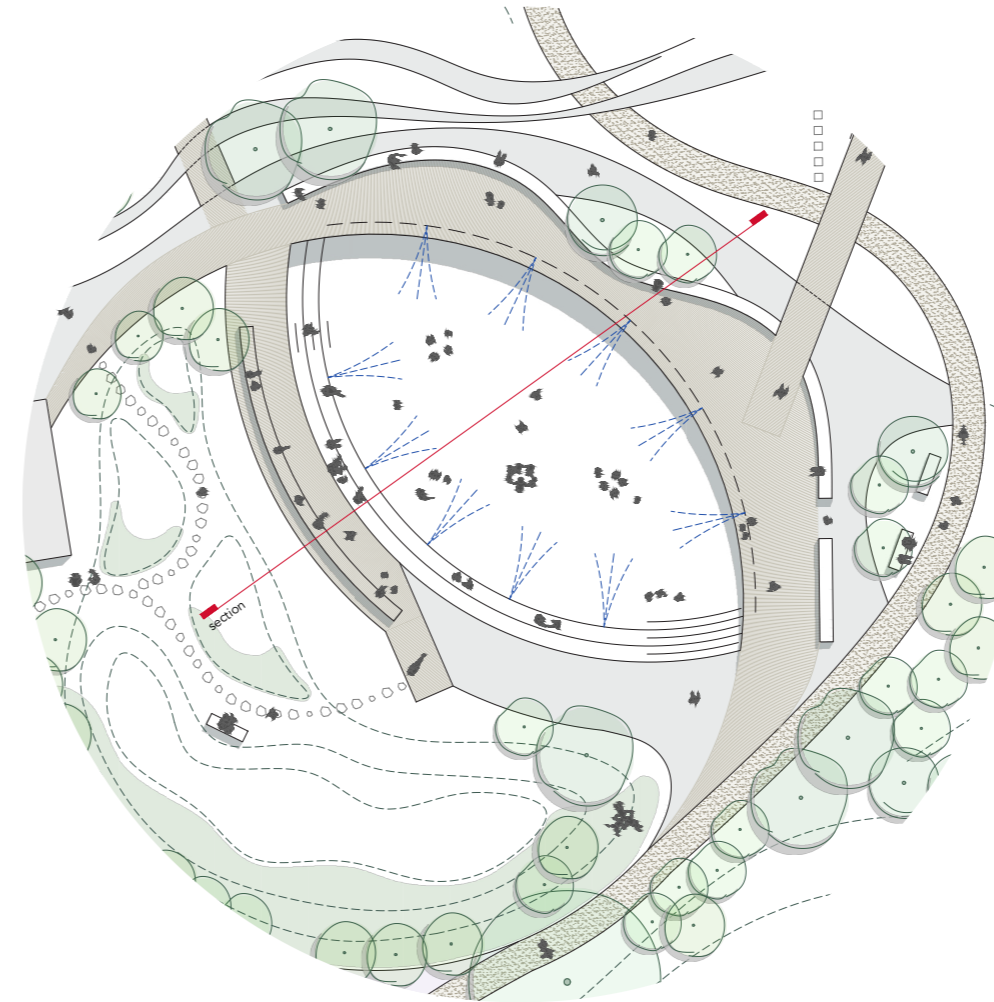
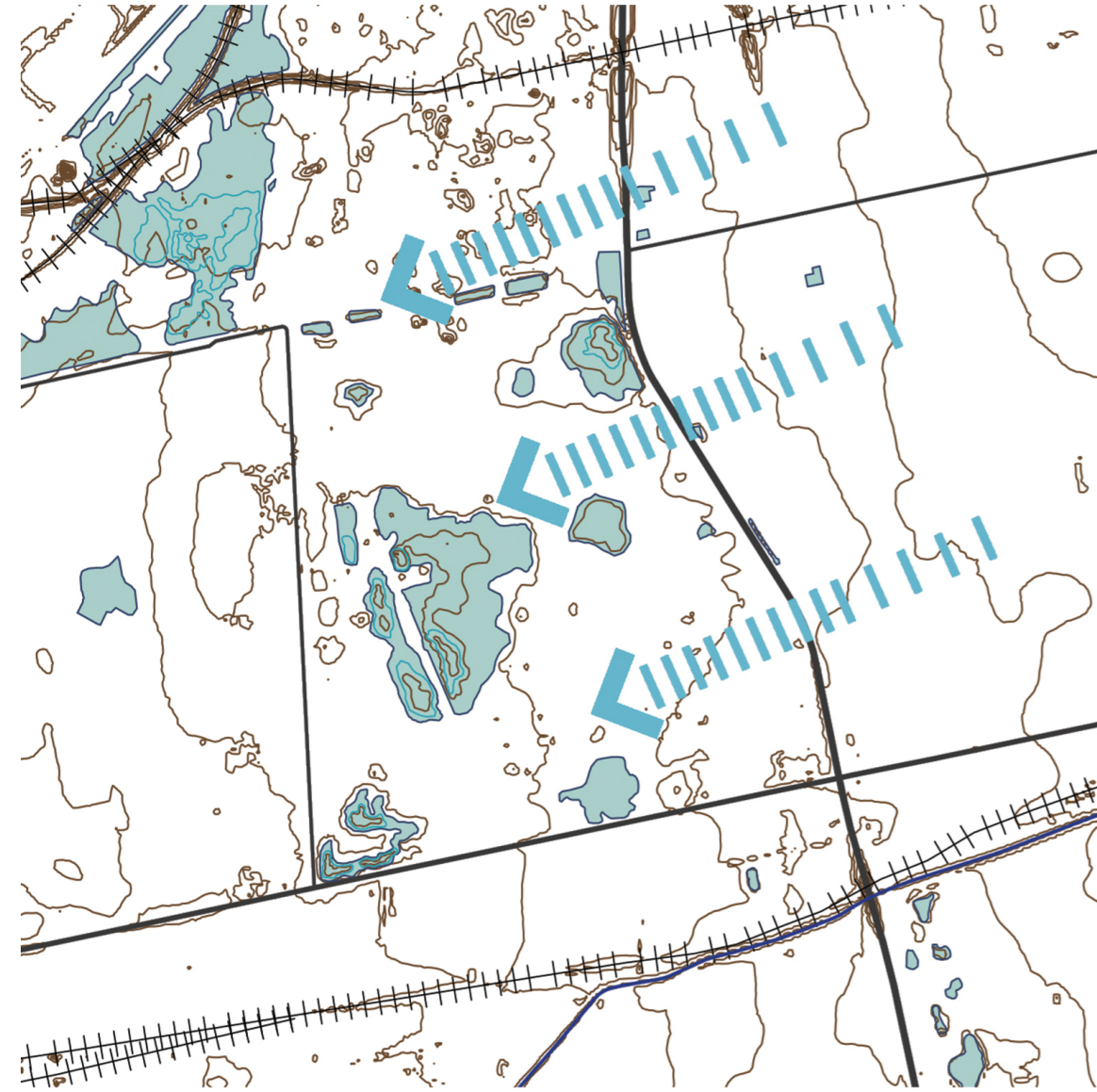
EXPLORATION OF FUTURE LANDSCAPE'S MATERIALITY

Source for all the images and photographs used for this impression are listed under Bibliography and References in the Book. The specific photographs used for this impression are listed in the book.

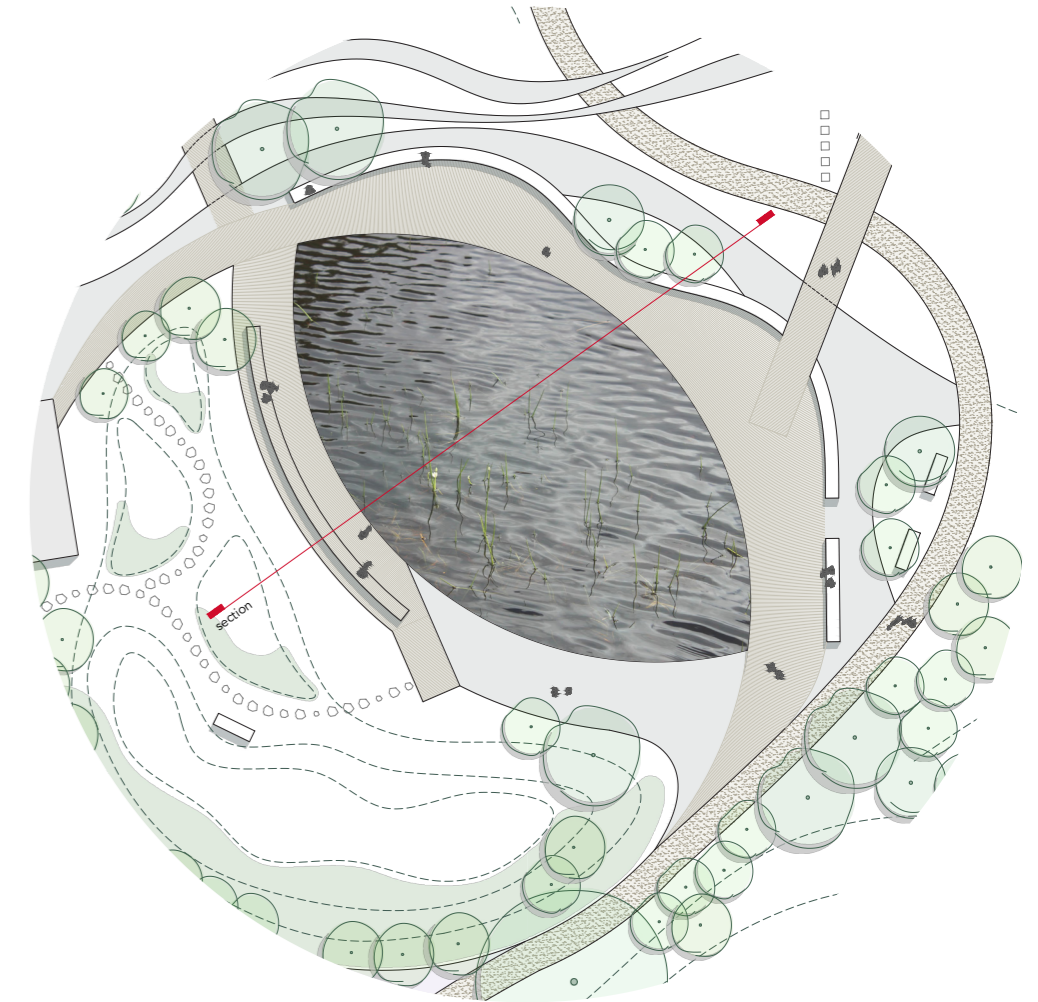
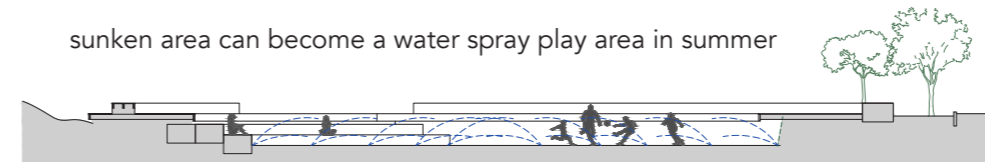


SECTION 1

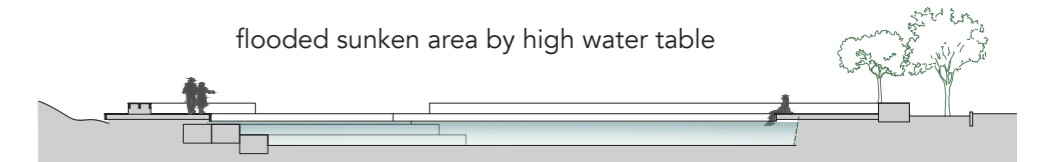
1:200 @ a0

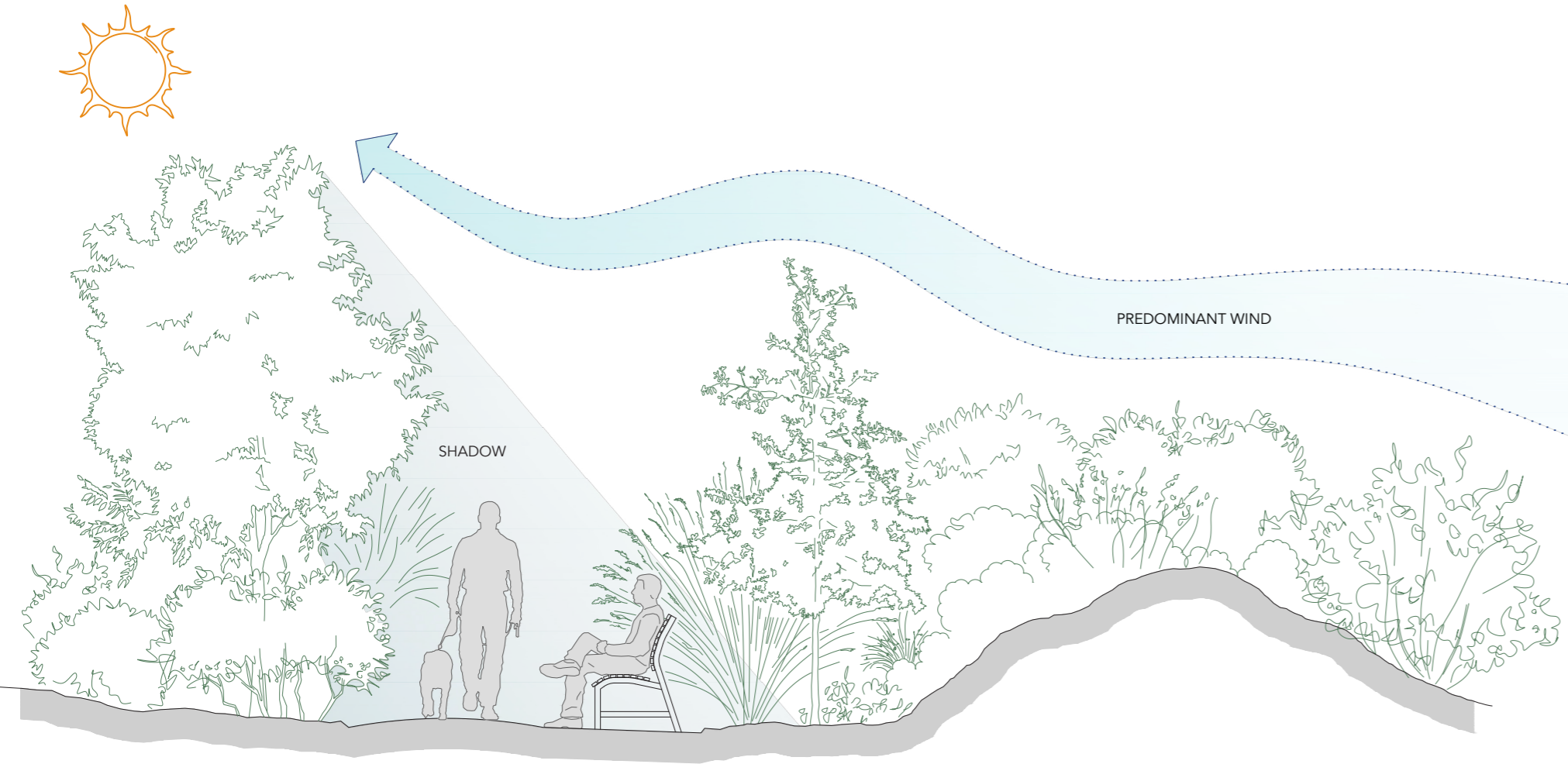


sunken area can become a water spray play area in summer

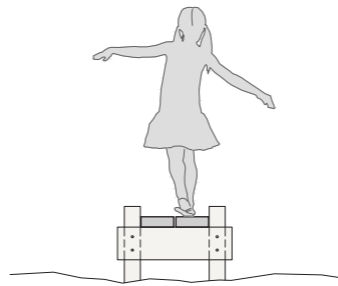
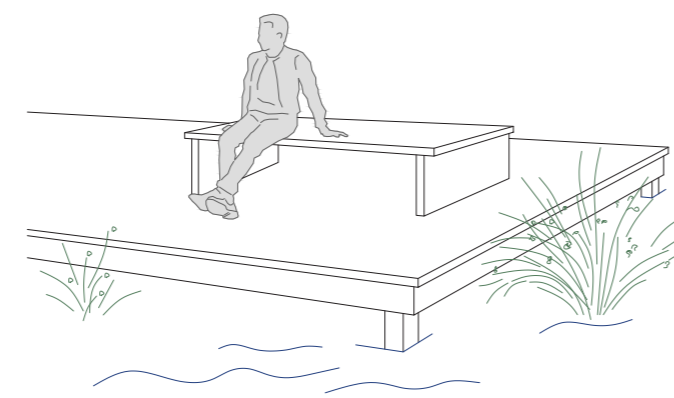


flooded sunken area by high water table

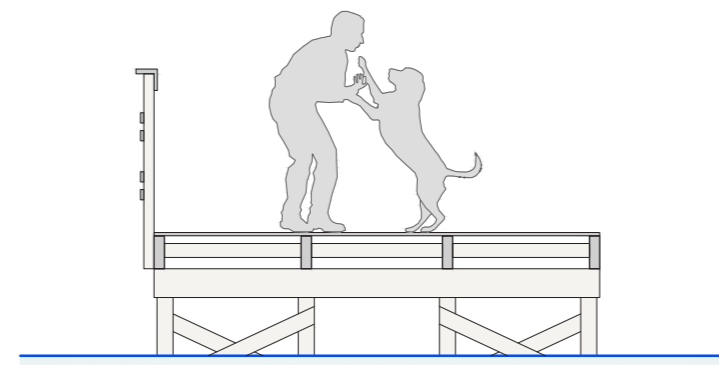




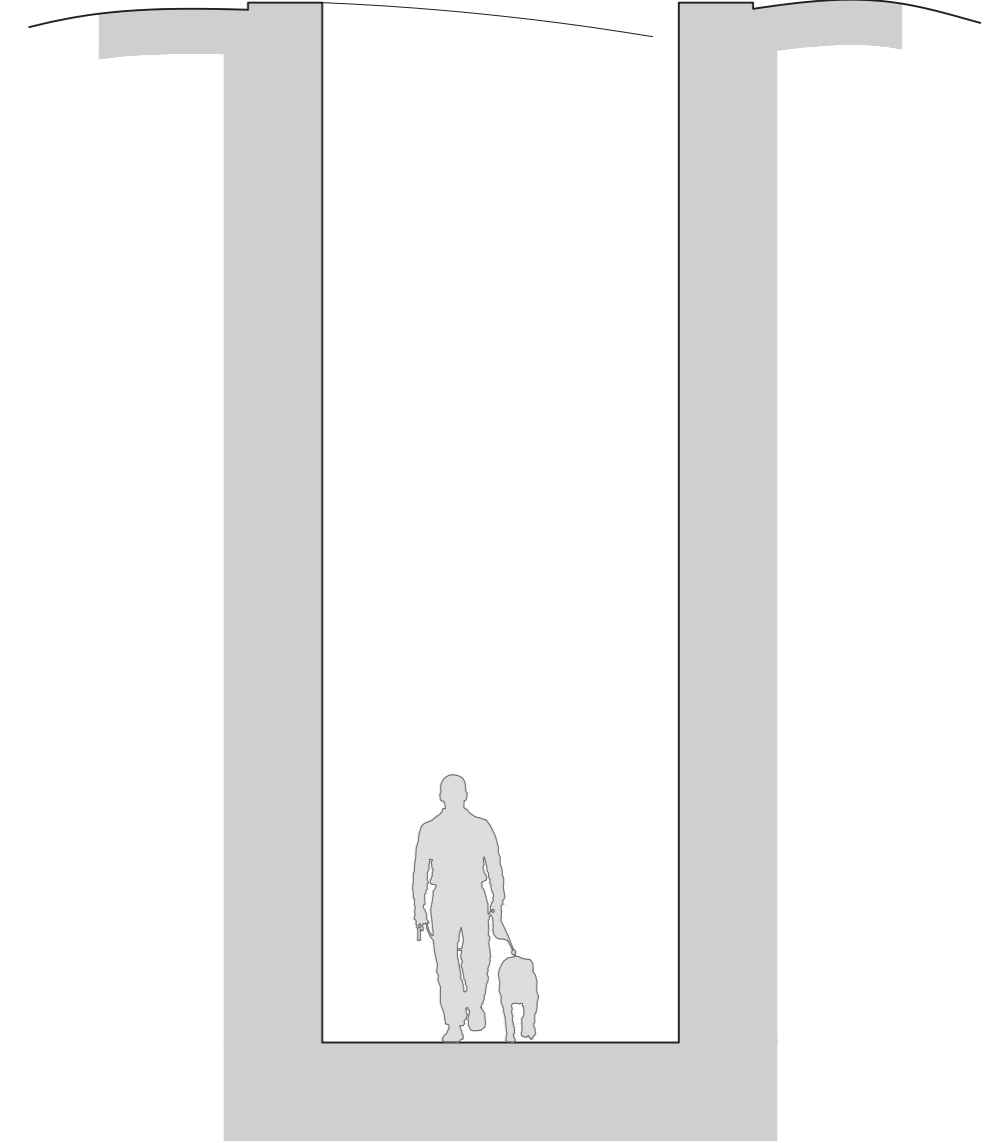
Human Comfort, created by planting (protecting from wind and sun) and landforms (dunes) versus Human Exposure to the element (sun, wind, views etc.)



Sense of equilibrioception



Walk on the comfortable wide boardwalk



Walk through the dune - height register, lack of vision



Image 1, outer front cover. *Arctopus echinatus* photos, 'cut by design concept diagram', 6 x photos are taken by Kulikovskaya, Maria/further referred to as author, at Rondebosch Common, during July, September, October, November 2019.

Image 2, page 5. Experiential Immediacy. Collage and photos by author.

Image 3, page 11. General Methodology Diagram, by author.

Image 4, page 13. Mixed-Methods Methodology-Process Diagram. After after Johnson and Onwuegbuzie (2004:23) and adapted by author.

Image 5, page 14. Metro Site Positionality and Some Important Natural Factors. Information sources: Map done by author using ArcMap software, most recent GIS information obtained from Geomatics Department, UCT, June 2019; information from maps done by Gasson, Barrie, stored at Centlivres Building, UCT.

Image 6, page 15. Seasonal wetlands on the site. GIS information, Geomatics Department, UCT, and author's assumptions based on literature review regarding the site.

Image 7, pages 16-17. Geological Section: Site Positionality. Information from various sources, literature as per Bibliography and References, page 77, and Landscape Systems and Terrain Analysis courses lectures, 2017-2018.

Image 8, page 18. Circular crops of various images and historical maps, relating to the site. Photographs by author. Orthographs 1953, 1998, 2018 are obtained using ArcMap software, GIS data from the Geomatics Department, UCT. Maps 1690, 1898, 1941, 1945 and orthographs 1938 & 1952 are obtained digitally from the Department of Rural Development - National Geo-Spatial Information, 19 Rhodes Avenue, Mowbray, Cape Town, 7925 [2018, June 21].

Image 9, page 19. Palimpsest Collage: Rediscovering the Site-In-Time. Information/images used as per Image 8.

Image 10, page 20. Four photographs of the site, taken by the author, July 2019.

Image 11, page 21. Existing Site Plan Analysis, by author. Information layers are obtained using ArcMap software with information obtained from Geomatics Department, UCT, June 2019, plus from: Open Data Portal - City of Cape Town, <https://web1.capetown.gov.za/web1/OpenDataPortal/AllDatasets> [2019, July 21].

Image 12, page 22. Existing Site Section 1 Analysis. All photographs are by author.

Image 13, page 23. Existing Site Section 2 Analysis. All photographs used in the layout are by author, plus GIS orthograph, 2018, Geomatics Department, UCT.

Images 14 - 17, pages 26-29. Images of Human Experiences in Landscape, as elaborated in 'Understanding Phenomenology for Landscape Architecture' on pages 24-25.

Image 15, page 31. Plant Palette for the Changing Dunescape, photos by author plus other images from <http://pza.sanbi.org> [2019, June-October].

Image 16, page 41. Water and Landform. By author.

Image 17, page 42. Terrestrial Critical Biodiversity Areas, information from: South African National Biodiversity Institute. BGIS Map Viewer (see Bibliography and References for the link).

Image 18, page 43. Ecological Connectivity at the site's scale, by author. Author's research representation.

Image 19, page 44. Old Land Uses (airport) diagrams, and photographs, annotated with sources below.

Image 20, page 45. Negative Open Space diagram, by author.

Image 21, page 46. Analysis of Disturbed Landscape areas diagram, by author.

Image 22, page 47. Proposed Knitting of the existing urban fabric, Maitland and Goodwood areas together to activate the area, diagram, by author.

Image 23, page 49. Ecological Connectivity. Large scale diagram, by author, own design based on research, layers of contours, roads, rivers, wetlands, etc. are taken from GIS information, Geomatics Department, UCT.

Image 24, page 51. Design Framework for the Wingfield Site Portion, by author.

Image 25, page 52. Precedents of Currently Existing Inland Dunes, Google Earth images [2019, October 23], and an Inland Dunes and Wetlands Diagram, by author.

Image 26, page 53. Examination layout, relating to design inspiration regarding natural inland dunes and wetlands, including research on the inland dunes and some design ideas.

Image 27, page 55. Imagining Dunes and Wetlands Across the Whole Site, by author.

Image 28, page 56. Sectional Design Diagram, by author.

Image 29, page 57. Concept Design Diagram, by author. A photo of the existing control tower building available at: <http://www.famgus.se/Postcards/Aviation/Airlines/SA%20South%20African/APC-Airlines-SA-FleetList.html> [2019, September, 11].

Images 30-42, pages 58-61. Design sketches, by author.

Image 43, page 62. *Arctopus echinatus* photo, by author.

Images 44-47, page 63. Design sketches, by author.

Image 48, page 65. Preliminary Design Plan, by author.

Image 49, page 66. Final Design Plan, examination layout, by author.

Image 50, page 67. Annotated and Dimensioned Design Plan, examination layout, by author.

Image 51, page 68. Various Design Diagrams, examination layout, by author.

Image 52, page 69. Various Sections, Details and Experiential Impression of the Design, examination layout, by author.

Image 53, page 70. Stormwater Scenarios: current and proposed, by author.

Image 54, page 71. Seasonal Experience of the Sunken Area, by author. Water photograph by author.

Image 55, page 72. Human comfort versus Human Exposure diagrams, by author.

Image 56, page 73. Some Designed Experiences, by author.

Image 57, pages 74-75. Experiential Impression of the Final Design and its Materiality. People are drawn by author. Photographs of plants, soil, concrete, water are by author. Photographs of birds, butterflies and, mouse, and a gekko are obtained from free Internet resources.

Methodology Related:

Bourke, B. 2014. "Positionality: Reflecting on the research process." The qualitative report. 19(33): 1-9.

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Terrell, S. 2011. Mixed-methods research methodologies. *The Qualitative Report*, 17(1), 254-280. Retrieved from <http://www.nova.edu/ssss/QR/QR17-1/terrell.pdf>.

Topic Related:

Abram, David. 1997. *The Spell of the Sensuous. Perception and Language in a More-Than-Human World*. New York: Vintage Books, A Division of Random House, Inc.

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Czerniak, J. and Hargreaves, G. Eds. 2007. *Large Parks*. Harvard University: Graduate School of Design.

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Isikhungusethu Environmental Services In Association with Louw and Dewar: Architects - Urban Designers - City Planners. Louw, P. and Dewar, D. 2017, April. *Guidelines for the Provision of Open Space in South Africa*. Prepared for the National Department of Rural Development and Land Reform, Republic of South Africa.

Marris, Emma. 2011. *Rambunctious Garden*. Bloomsbury Publishing. Kindle Edition.

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Meyer, Elizabeth K. 2000. "The Post-Earth Day Conundrum: Translating Environmental Values into Landscape Design." In *Environmentalism in Landscape Architecture*, edited by Michel Conan, 187-244. Washington, D.C. : Dumbarton Oaks Research Library and Collection.

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