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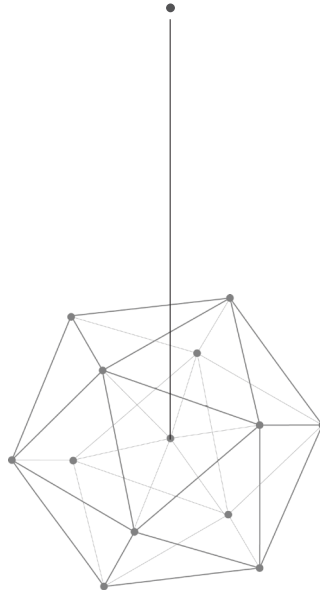
INTERCHANGING ANIMATION

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WILAN BURGER ROSSOUW

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INTERCHANGING ANIMATION



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INTERCHANGING ANIMATION

THE FOUNTAIN AND THE ENVIRONMENT

An Architectural Threshold Device

WILAN BURGER ROSSOUW

COURSE COORDINATOR: ARTHUR BARKER

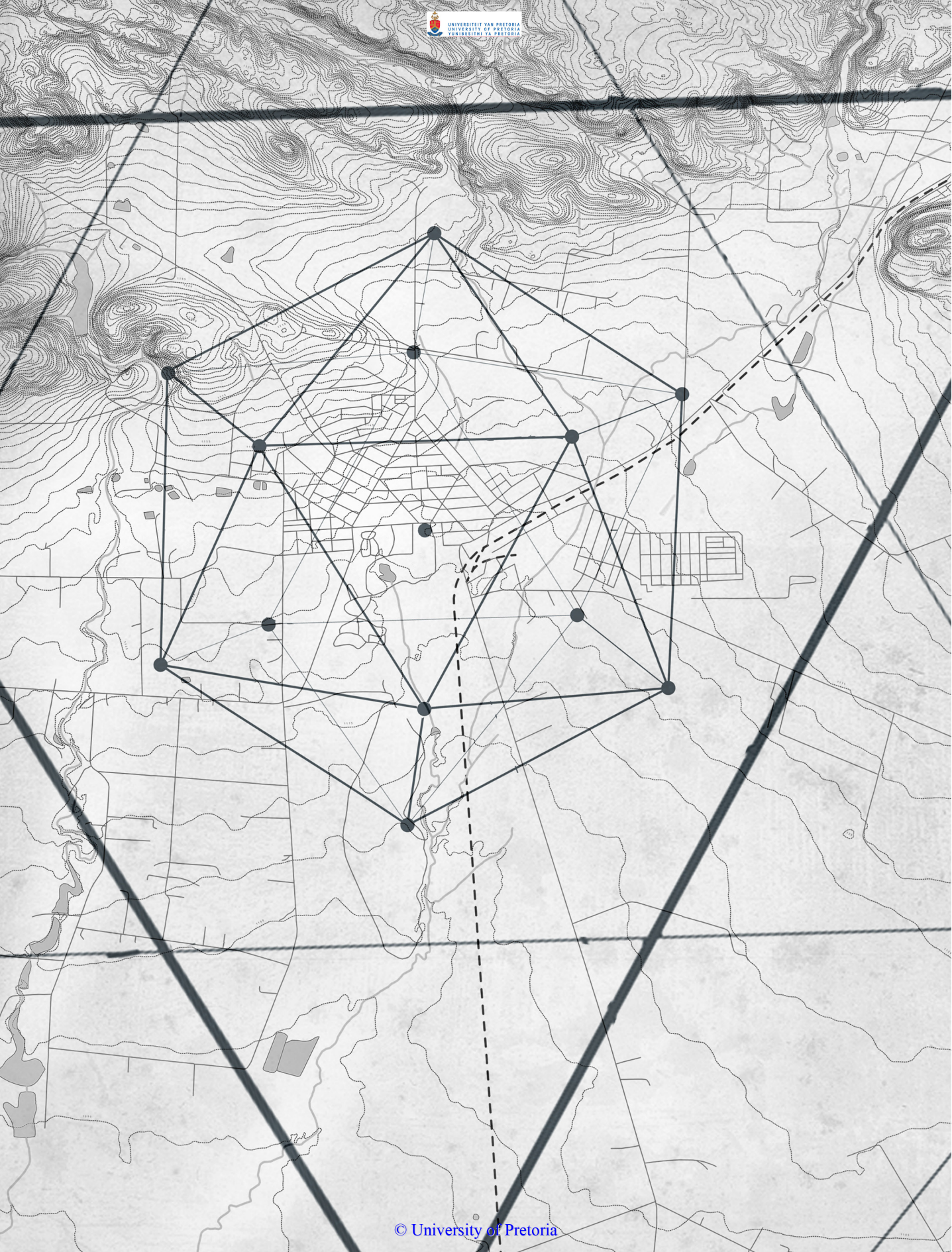
STUDY LEADER: ARTHUR BARKER

Submitted in fulfilment of part of the requirements for the degree of Magister of Architecture,
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Technology.

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ABSTRACT

This dissertation is rooted in the premise of stitching together and creating relationships between components and conditions that define a *place* and its essence. Through architecture, the project focuses on the creation of interconnections between these and subsequent reciprocal complementation and animation.

The town of Bela-Bela developed radially around the Warmbaths fountain, which served as the settlement genesis and origin. Due to the water's mystical, mythical and medicinal allure, favourable weather conditions and the serene natural environment, recreational facilities were envisaged and developed here to accommodate the intersection with the water and natural environment enveloping it. The recreational facilities and the town were conceived to be inseparable entities but have evolved to operate independently through privatisation and insulation of the physical and metaphysical nucleus to the *place*: The central gardens and fountain.

The site of investigation is the eastern boundary condition of the Warmbaths Forever Resort. The CBD and major transportation infrastructure ring this site and extend into the urban and rural environment. The urban intention is to create a condition that re-instils a public relationship between the nucleus and the urban context, while the programmatic intentions are to facilitate and reference the characteristics and conditions that define and make up the *place*, so as to interconnect and animate the town and the *everyday* with the *extraordinary* that presides. The architectural intentions are to enable an interchanging animation between architecture, the natural environment and the context, while creating a sensorial intersection with the inherent poetics of the water from the fountain and those from the natural landscape.

Keywords: Urban landscape. Natural landscape. Reciprocity. Responsive architecture. Recreation. Regeneration. Symbiosis. Threshold. Liminality

Programme: An integrational facility between the enveloping urban and rural environment of Bela-Bela, and the central gardens and recreational facilities at the nucleus.

Client: Warmbaths Forever Resort – Bela-Bela

Site: Erf 262 Warmbath

Site description: The north-eastern boundary condition between the resort and the town.

Coordinates: 24°53'9.15"S; 28°17'31.66"E

Address: 1 Chris Hani Way, Bela-Bela, 1240

Research fields: Environmental Potential, Heritage and Cultural Landscapes, Human Settlements & Urbanism

TO MY PARENTS

With gratitude and thanks to:

Dr. Arthur Barker

André Rossouw + Thonél Rossouw

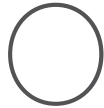
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In accordance with Regulation 4(e) of General Regulations (G. 57) for dissertations and theses, I declare that this thesis, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my thesis has already been or is currently being submitted for any such degree, diploma or other qualification. I further declare that this thesis is substantially my own work. Where reference is made to the work of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.

Wilan Burger Rossouw



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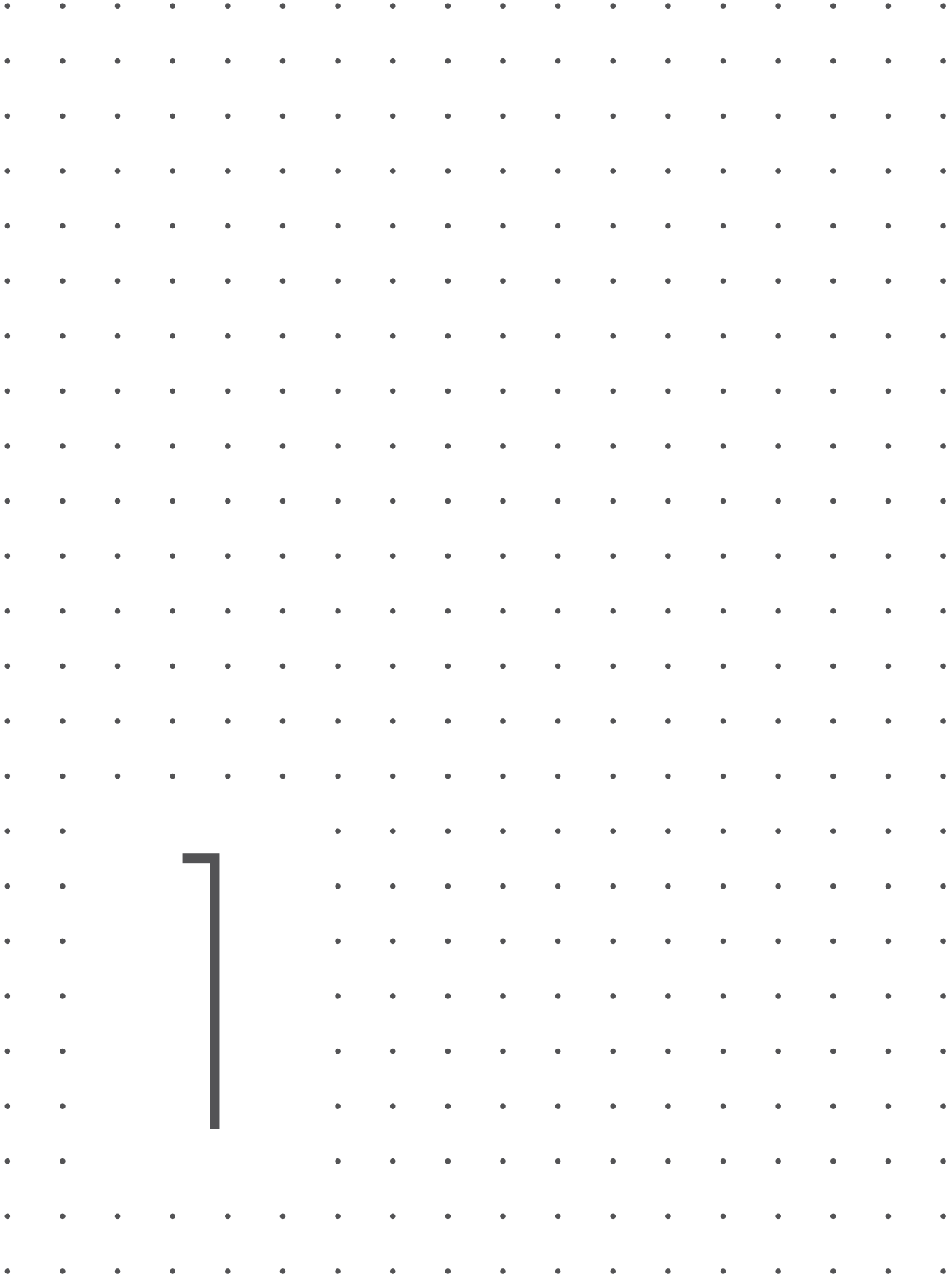
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INTRODUCTION

INTERCHANGING ANIMATION

The Fountain and the Environment



CONTEXT

THE WARBATHS FOUNTAIN

Where the Springbok flats meet the Waterberg mountain range, a fountain is located in a fault within the substrata of the earth, which allows mineral-rich hot water to surface from a deep-lying aquifer. Due to the water's mystical, mythical and medicinal allure, favourable weather conditions, and the serene environment recreational facilities were envisaged and developed here to govern the water "that flows out of the Earth at a rate of 22 000 litres per hour, with a temperature of 52°C" (Accommodation-warmbaths.co.za, 2015).

Bela-Bela, the town formerly known as Het Bad, Hartingsburg and Warmbaths, was conceived around, and developed radially from, the recreational facilities that are located at the physical and metaphysical epicentre of the town. The subsequent formalisation of the town was conceived in the fashion of Ebenezer's *Garden City* due to its close proximity to the major metropolises (107km from Pretoria CBD,) and the presence of the mineral spring that could uniquely animate the central garden. The town, however, developed as a synthesis between Ebenezer's *Garden City* model and the segregating spatial planning models of the Apartheid regime.

The town forms part of the Waterberg district, which is the only Savanna Biosphere Reserve in Southern Africa, and "features a mix of rock formations formed over millions of years, significant San (Bushmen) rock art sites, and abundant bushveld plains that support a diverse array of fauna and flora" (Southafrica.net, 2015). The resort, along with the Waterberg district and rural Bela-Bela, serve as an important tourist destination. Rural Bela-Bela furthermore produces agriculture on a national level and houses the Toowoomba Agricultural Research Centre of the Limpopo Department of Agriculture. Along with this facility, urban and rural Bela-Bela hosts a multitude of other academic institutions and almost all of the medical and medicinal facilities of the region.

Figure 1.1
The township of Bela-Bela
and the fountain
(Author, 2015)



PROBLEM STATEMENT

GENERAL PROBLEM

IN THE SHADOW OF SILENT MAJORITIES

The recreational facilities and the town were conceived to be inseparable, but have evolved into individual entities and continue to operate as such. The fountain and central gardens, due to appropriation by individual interests, have become insular and thus the nucleus of the town evades an internalised dialect and relations with the urban environment as well as with the extended rural environment of Bela-Bela. The resort, the major economic stimuli to Bela-Bela's economy, currently offers the oar of the spring and the gardens primarily to paying recreation seekers, while depriving the local population of an existential foothold within the centre of their environment and an association with the essence of their environment.

URBAN PROBLEM

VIOLENT COLLISIONS

The resort and its facilities are orientated 'inward' and towards the southern natural environment, while all access routes ring the facilities or radiate from the fountain. The resort's premises are demarcated by a wall and fence where it abruptly meets the urban parameters of the town. The rigid and static boundary-condition perpetuates Apartheid planning ideals and its subsequent manifestation in Bela-Bela, represented by the radial of social hierarchies and sectorial and transportation buffer zones around the fountain and resort that limit access to opportunities and amenities.

This condition yields autonomous development and a dilapidating public environment at the core of the town while discouraging a cultural and physical diversity. It limits connections between conditions and components of the *place* and serves as deterrence to the positive progression of each through its fragmented operation. In the absence of any urban 'condenser', the grain of the town remains of low density and fragmented at the nucleus while residential development sprawls over productive land. Tourism initiatives associated with the Warmbaths fountain are starved due to the facilities encouraging the visitor to not even leave the resort and that the fountain, and with the central gardens being walled off.

ARCHITECTURAL PROBLEM

How can architecture re-instil a dialectical condition between the physical and metaphysical nucleus of a *place* and its essentials?

How can architecture illuminate and enhance the unique and tourist-attractive qualities of a *place*, while allowing the urban and rural environment to have an existential relationship with the same qualities (such as those of the central gardens and fountain)?

Figure 1.2

The boundary of the
Warmbaths Forever resort

(Author, 2015)



URBAN POTENTIAL

The town has developed a spatial liminality in that it serves as seat to the municipal government, and that major vehicular routes diverge from the nucleus into the rural environment that is rich with agricultural produce, natural splendour, conservation and game farms, and other recreational facilities. The project's mapping concludes Bela-Bela to be a tourist destination; an agricultural-, rural-, and eco-tourism centre; an urban residence; a learning centre as well as a health centre.

SITE

The site of investigation is the eastern boundary condition of the Warmbaths Forever Resort. The CBD and major transportation infrastructure ring this site and extend into the urban and rural environment. The intervention is proposed on the northern end of this site where the urban framework and urban design extend towards the south. North of the site is the municipality and beyond, and to the west a higher-income residential suburb with tourist accommodation integral to it. It thus intersects with traversing tourism, the resident population in and around their *place*, and the lingering recreation seekers within the resort.

CONCEPTUAL APPROACH

INTERCHANGING ANIMATION

An interchanging animation is where conditions or components of a *place* are allowed, through architecture, to animate and complement one another. These become interlinked and serve as a reference to one another within a larger framework. Like the fountain, the urban settlement and the natural environment are the essentials to the *place*; the project proposes a re-stitching of these essentials through an interchanging animation between architecture and the natural environment, the *everyday* and the extraordinary, and the urbanity and the rural or natural environment.

URBAN VISION

A NEW URBAN CONDITION

The central core is envisioned to become a transactional zone and threshold between local and global conditions, cultures and components. The central gardens are proposed to become publically accessible and that a spatial dialect with the extended rural environment and its natural splendour transverses the urban fabric. The project proposes the insertion of a responsive public condition through a framework that stitches together, facilitates, and creates new relations, connections, and associations within the nucleus of the town. The condition is proposed to serve as catalyst to an urban renewal and condensation towards a compact form around the nucleus with creates a shared investment in public space around the fountain and central gardens.

Figure 1.3

The site of investigation

(Author, 2015)

DESIGN INFORMANTS

CONCEPT

An interchanging animation is proposed a central concept that influences the site location, programmatic requirements, design and technological investigations and decisions, as well as a contextual response. The design and urban design is proposed to become the 'threshold device' that allows for this reciprocal complementation.

CONTEXT

The site forms the intersection between the urban grain and the central gardens. The distinct spatial and architectural themes of the resort influence the design vernacular as the intervention is envisioned to become an extension of the resort's facilities but also of the central gardens. A spatial dialogue between the proposed urban form towards the town, and the integration of the building with the gardens, is envisioned.

CLIMATE

The arid climate of Bela-Bela, a distinct diurnal variation in wind, and the ample amounts of water (hot and cold) available, all influence the design and technology of the device - it is proposed to integrate the presiding natural environment and water from the fountain with the architecture. Passive cooling and ventilation of spaces are proposed through adapting the design towards a symbiosis with the climate and environment.

URBAN VISION

The urban framework, to which the intervention is integral, proposes a spatial layer over the violent collisions where the various land usages meet the unresponsive wall of the resort. The new condition, the 'urban commons', is zoned for proposed public and tourism facilities, urban landscaping and infrastructure that extend from this core into the environment along transportation linkages. The intervention becomes an extension and integral component to the framework.

MAN AND BIOSPHERE PROGRAMME

The Waterberg region was the first region in the northern part of South Africa to be named as a Biosphere Reserve by UNESCO. A biosphere is an area designated by UNESCO'S Man and Biosphere (MAB) programme that "aims to establish a scientific basis for the improvement of relationships between people and their environments" (Unesco.org, 2015). This framework proposes the initiative to investigate human settlements, to foster their cultural values, and to promote their harmonious integration with the remarkable natural environment as to conserve the biological diversity (Ibid).

URBAN INTENTION

The project proposes the insertion of a new dialectical condition instead of the irresponsible “wall” or boundary that encloses the fountain and the central gardens. It proposes new public and tourism amenities within a newly established framework. It furthermore proposes the re-introduction of the recreational heart as integral and active part of the *everyday* of urban Bela-Bela. It also aims to reference the extended enveloping natural splendour that presides through integrating it with the design.

PROGRAMMATIC INTENTIONS

The intervention facilitates recreation programmes that interlink and merge with the facilities of the resort and the fountain in the central public gardens. It hosts commercial spaces that animate and interlink with tourism and recreation to animate the urban edge. The device hosts a public floral greenhouse and a multi-purpose hall that support the lack of civic facilities in the town and diversifies tourist attractions. The building becomes an extension of the public gardens and the recreational facilities, as well as the urban and rural environment of Bela-Bela.

ARCHITECTURAL INTENTIONS

The project is aimed towards the creation of an interchanging animation between architectural spaces, the water from the fountain, and the natural landscape that, through architecture, becomes ‘visible’ and animates the architectural space. It proposes a design of a threshold device, which becomes the spatial, referential, and programmatic linkage between urban and rural components and conditions of Bela-Bela, and which allows synergies to exist in-between these. The design is aimed towards intertwining the *everyday* of Bela-Bela with the fountain, the central gardens, and recreation hosted at the nucleus of the *place* and towards the creation of a device that engages sensibly with the natural environment to evoke its inherent poetics and potential.

INVESTIGATION STRUCTURE

The dissertation's investigation aligns with the chapter progression:

Chapter 1 Introduction:

Chapter 2 Aquapoetics: This chapter outlines a study into the poetic reality of water and existence's intersection therewith. It describes the qualities of the water from the Warmbaths fountain and portrays the author's mapping of the intersection at the Forever Resort. It concludes with a spatial synopsis and response to the existing spatial fabric and architectural theme of the resort.

Chapter 3 Context: Portrays the Author's analysis of the Warmbaths fountain and the natural environment as settlement genesis to Bela-Bela. A study of the historical development of the town is undergone which is followed by a study into the historical development of the resort. The problem statement is derived from the condition arising from the historical and urban landscape and concludes the chapter.

Chapter 4 L'Esprit Nouveau: A conceptual premise is developed from theoretical discourse. The premise draws from a discourse that proposes the integration of dualistic conceptions between a "cultural realm" and a "natural realm", architecture and environment, self and other, and between difference and monotony.

Chapter 5 Bela-Bela: This chapter outlines the author's mapping of the urban environment around the nucleus by analysing the liminality of the location, and introducing the site on the north-eastern boundary of the resort. An urban vision is proposed concluding the mapping that intersects with this liminality. An urban framework for development in and around the nucleus of Bela-Bela concludes the chapter.

Chapter 6 Interchanging Animation: Introduces the concept of the intervention as 'threshold device', which allows an interchanging animation between components and conditions of the *place* and environment. Prec-edent studies and their respective influences are described where after 'Sensory Architecture' is presented as the spatial theme and narrative to the intervention. The author draws from concept and the liminality of the location to produce a programmatic response to the site.

Chapter 8 Design: This chapter introduces the main design generators, where after the design of the 'threshold device' and the 'sensorial promenade' is expressed through its narrative, site intentions and the creation of an 'interchanging animation'.

Chapter 9 Techne: Chapter nine introduces the major influences to the structural and other systems, and technology of the building. The technological concept is introduced, which is followed by the structural concept. The technology and materiality of the device is described through its spatial, programmatic and functional arrangements. The water and ventilation systems of the building are presented along with a planting palette of floral species.

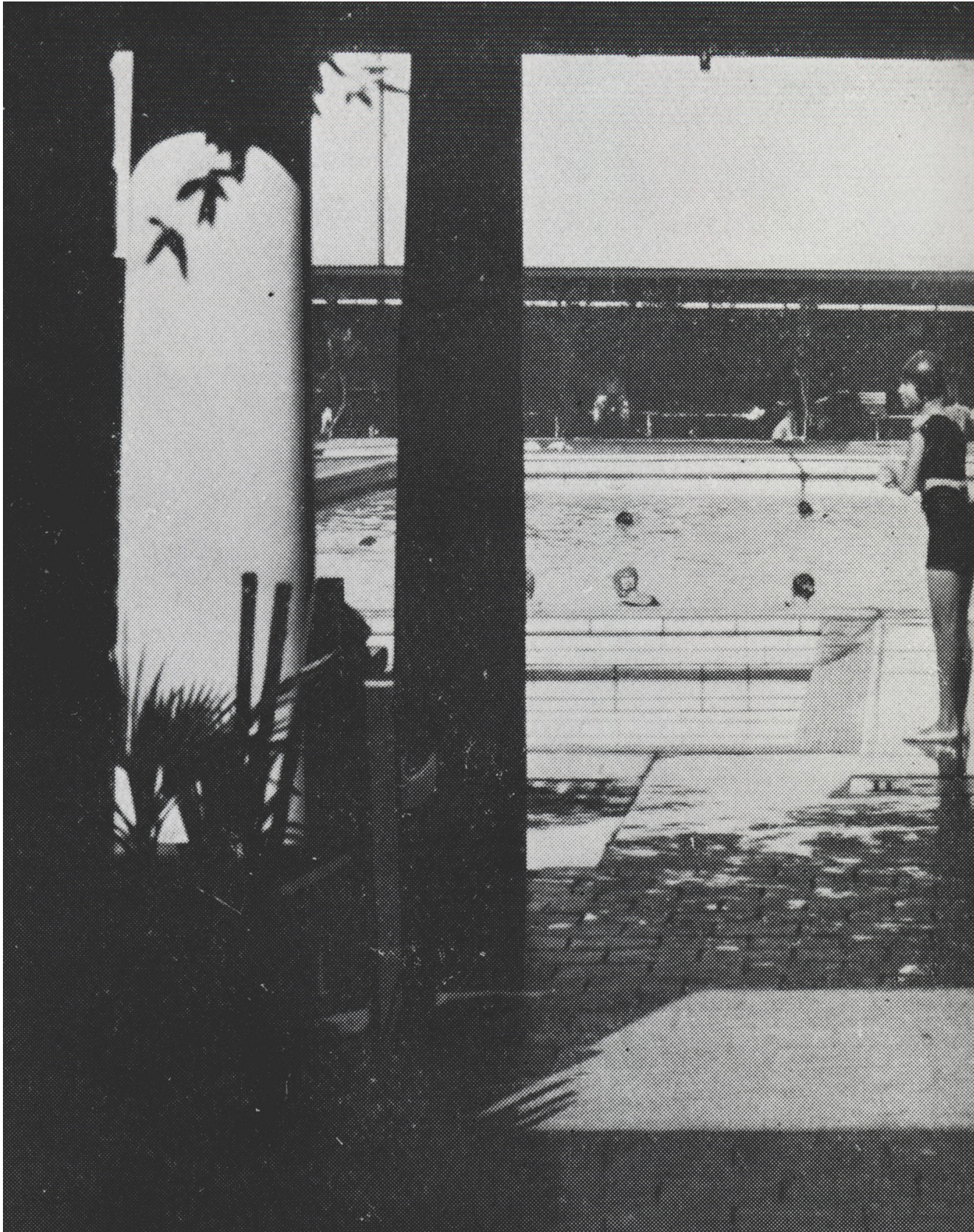
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AQUAPOETICS

WATER AND EXISTENCE

Intersecting the “Poetic Reality” of Water

This chapter outlines a study into the poetic reality of water and existence’s intersection with it. It describes the qualities of the water from the Warmbaths fountain and portrays the author’s mapping of the intersection at the Warmbaths Forever Resort in Bela-Bela. It concludes with a spatial synopsis and response to the existing spatial fabric and architectural theme of the resort.



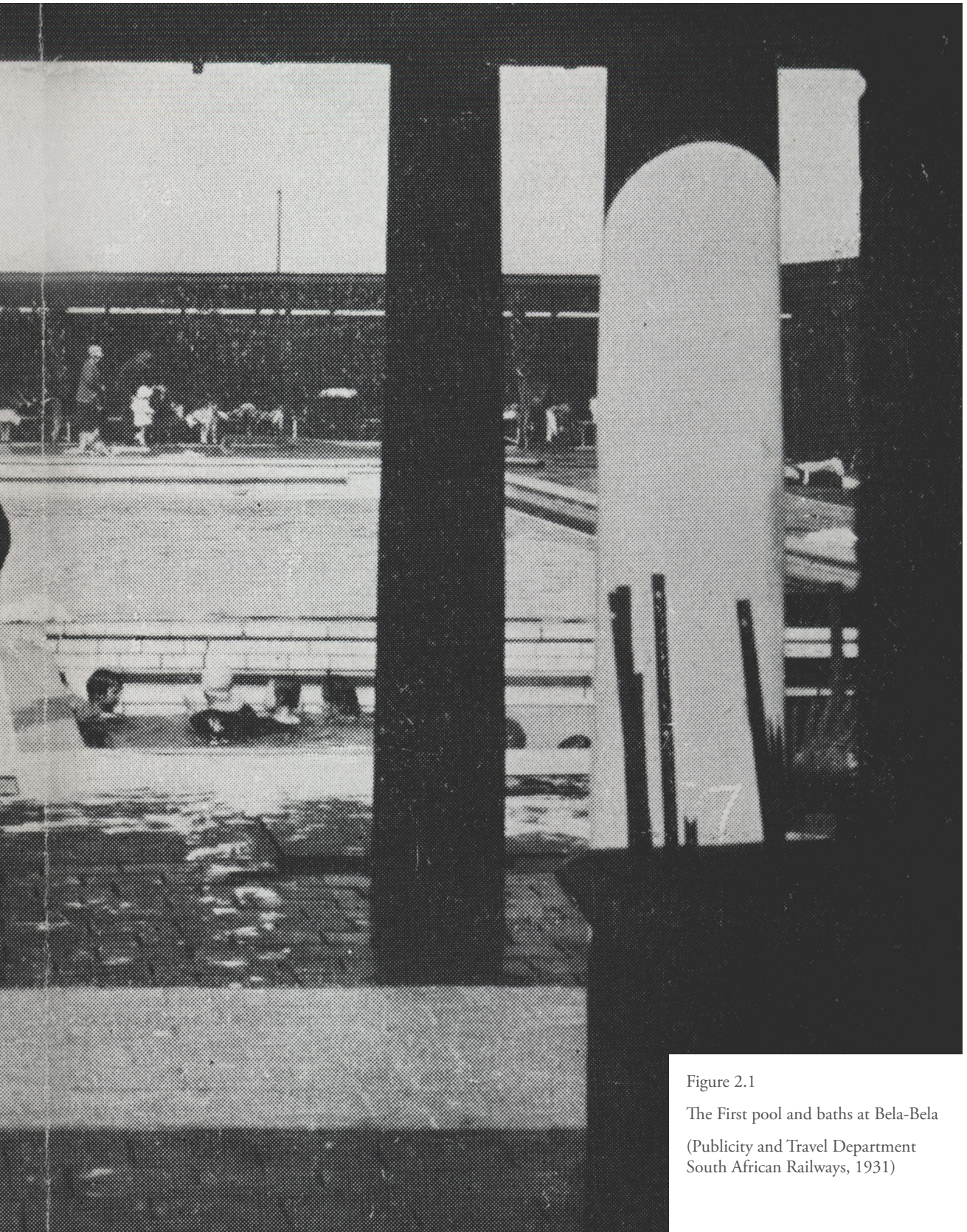


Figure 2.1

The First pool and baths at Bela-Bela

(Publicity and Travel Department
South African Railways, 1931)



EXISTENCE

The fact or state of living or having objective reality (Oxforddictionaries.com, 2015).

THE POETIC REALITY OF WATER

Bodies of water and their enveloping fertile soil have been the settlement genesis to many an urban settlements. They serve not only as physical sustenance to life, but also as metaphysical and emotional sustenance to *place*, referring to home or origin. “When an environment is meaningful, man feels at home” (Ibid: 23). Subterranean and terranean water bodies and water conduits, such as rivers and streams, embed an integral emotive image into Existence by its physical manifestation. The presence of water gives identity to the land (ibid: 35). Its presence is made visible through an absence of the ground that man resides on – a “world not world, but that which is not world” (Eliot, 1944: 6)

Water is an essential part of the earth and the planets’ biosphere. It gathers on the surface of the earth and below in bodies that are naturally filtered by the transversal of earth surfaces driven by cyclic condensation and percolation. This continual process sustains existence and water thus becomes an inseparable part thereto.

Water concretises as “phenomena” in the world of our everyday life (Norberg-Schulz, 1980: 6). It is meaningless to conceive of any event without reference to the locality of the happening, as it is common usage to say that act and happenings *take place* (Ibid: 6). H₂O manifests in solid (frost), liquid (water) or gaseous (steam, mist) form. The form it takes is interdependent on its environment and the presence of an external stimulus. It becomes an integral and interdependent part of a landscape and a metaphorical part of the phenomena of *place*.

Suggesting that water is a being that possesses a body, a soul and a voice, Gaston Bachelard postulates that “more than any other element, water is the complete poetic reality” (Bachelard, 1983: 15) (Tymieniecka, 1985). Water is an emotive being with which humankind intersects evocatively (Bachelard, 1983: 15). Water has a voice that animates its surroundings, and is mirrored by human languages’ liquid quality, emulating the “flow in its overall effect, water in its consonants” (ibid: 15).) (Brereton , n.d.). The liquidity, he notes, causes a distinctive psychic excitement that, in itself, evokes images of water.

Figure 2.2

A waterfall in the Waterberg region

(Publicity and Travel Department South African Railways, 1931)

INTERSECTING A POETIC REALITY

THE SENSES

“My body is truly the navel of my world, not in the sense of the viewing point of the central perspective, but as the very locus of reference, memory, imagination and integration” (Pallasmaa, 2005: 11). It is through architecture that we articulate a sensory experience of space. “Architecture is essentially an extension of nature into the man-made realm” (Ibid: 41). Through the senses, the interplay of space and the elements evoke an emotive response in the being and guides a sensorial exchange. (Fig.)

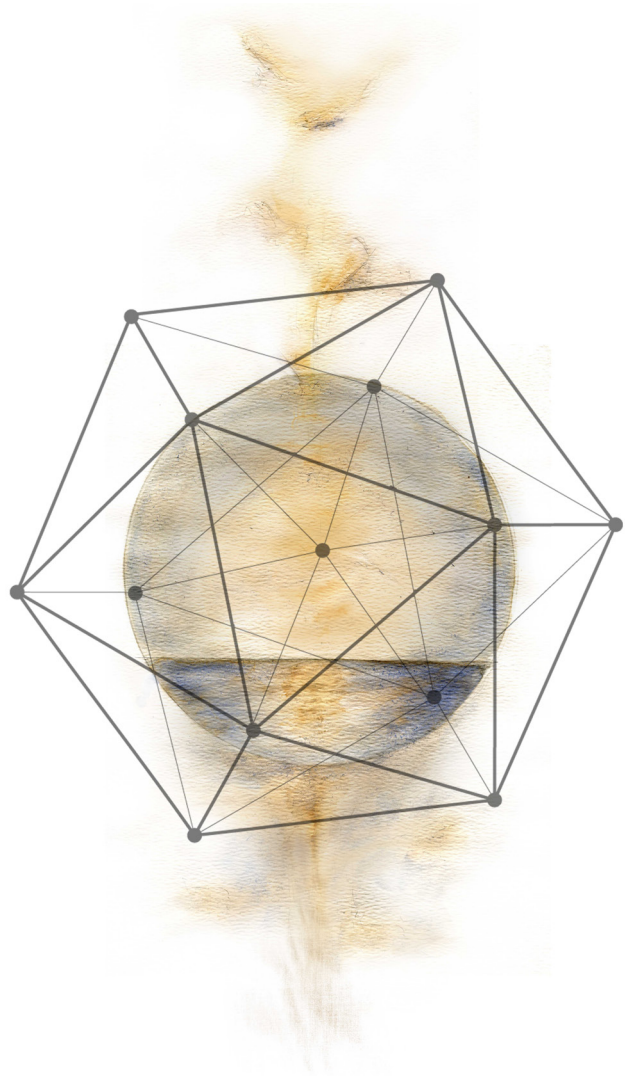


Figure 2.3

The interconnection between water and the being through the senses

(Author, 2015)

THE RITUAL

“Architecture is defined by the actions it witnesses as much as by the enclosure of its walls” (Tschumi, 1996: 100). (Fig.) Human existence has developed rituals since the beginning of time that relate to their individual and collective identity. Architecture concretises the rituals and habits of societies in relation to their environment as ritual implies a “near frozen relationship between space and event.” (Ibid: 163). Architecture, and sequentially, urban environments, inherit and incorporate these rituals into their structure and articulate the sensorial engagement.

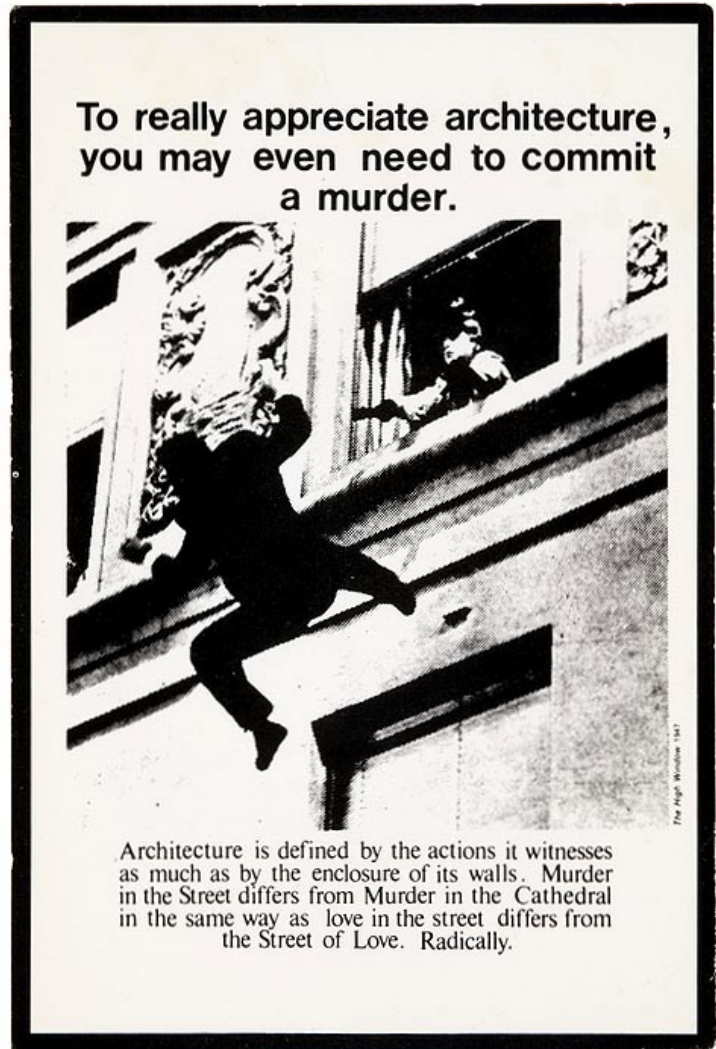


Figure 2.4

“Architecture is defined by the
actions it witnesses”

(Tschumi, 1996)

TO CLEANSE

To Cleanse and to purify synonymous. There is a ritualistic association that human existence makes towards water's purity and fluidity. Early African cultures believed in the ceremonial cleansing of the soul through bathing (Bachelard, 1983: 140), as others believed in the renovation of the soul, as suggested by Bachelard (Ibid: 144), when "one dives into water in order to be reborn and changed". Apart from only physical cleansing, i.e. to cleanse the body, humankind makes a metaphysical connotation with bathing, and intersects with water as a method to purify and cleanse the soul.

TO BATHE

Intersecting with water rejuvenates the mind and the body and brings about a state of relaxation. Physiological changes in the body are triggered initially by the body's buoyancy in the water and the transference of heat to the body (bodymindandsoul.com.au, 2015). Through intervention these effects are heightened – water of higher temperatures have a seductive effect on nerve endings, while the buoyancy reduces gravitation to ease the joints and create freedom of movement (Ibid, 2015). Circulating the water breaks the 'wetsuit' effect to stimulate heat transference and blood flow, which allow tense muscles to relax (Ibid, 2015). Jet pressure enhances one's ability to release endorphins (Ibid, 2015), stimulating the body and mind.

Figure 2.5

The first outdoor pool at Bela-Bela
(Publicity and Travel Department
South African Railways, 1931)



TO SWIM

Swimming is practiced either for fitness or relaxation. It is an essential part of being, as it relates to a primitive survival instinct. The art of swimming envelops many ritualistic practices in itself and is a universal dialect.

TO DREAM

“The ebb and flow of my soul are in perfect harmony with the absolute reality of my mind.” Liquidity is felt, not as metaphor, but as lived experience (Artaud, 1983) (Brereton, n.d.). The fluidity of water mirrors a fluidity of thoughts. The emotive state of the being that results from their intersection with water and its presence is a transcendental state. It reflects that of the foetus in the amniotic fluid and thus speaks a universal dialect of calmness that does not pertain to time. Reverie in and around water becomes part of this universal dialect - the subjective being interacts with water as with art to produce an internalised response.

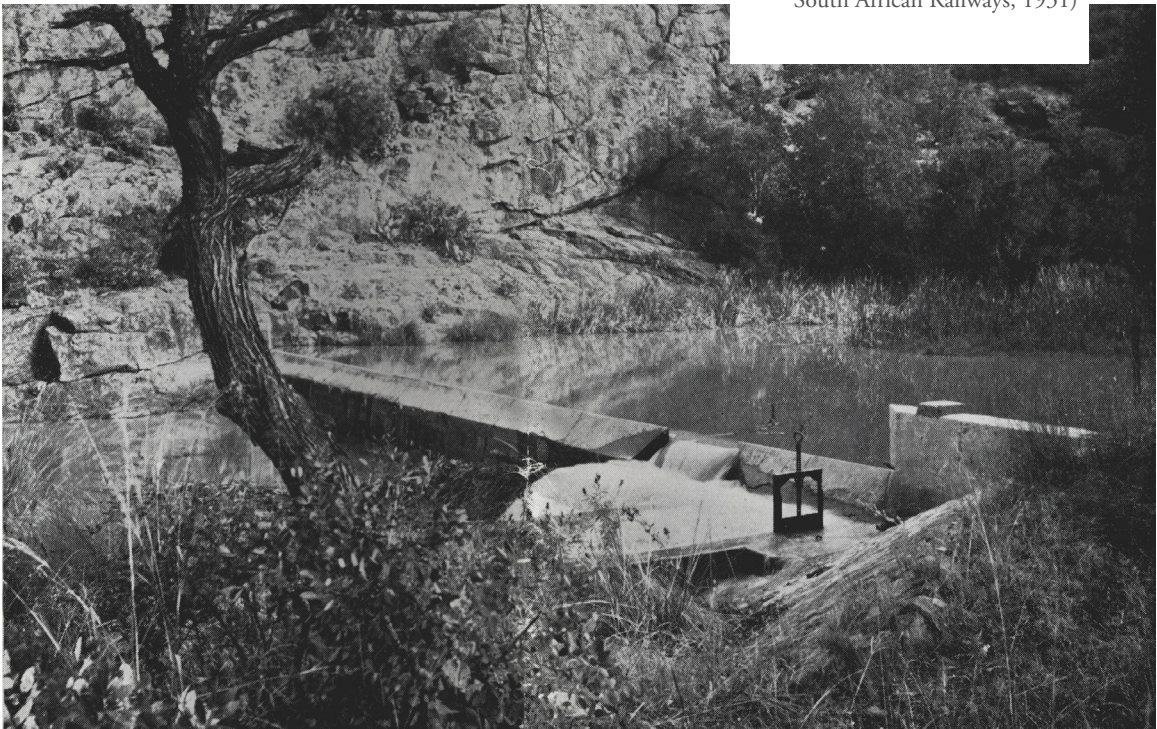
A FORCE

The fluidity and heat of water are means for humanity to sustainably provide an alternative to our fossil fuel-dependent needs. The heat can be used to generate electricity whereas the mineral solvents can be treated to foresee potable water. Water is a life force that is inseparable from human existence.

Figure 2.6

A detention dam in the
Bela-Bela region

(Publicity and Travel Department
South African Railways, 1931)



THE WARBATHS FOUNTAIN

THE FOUNTAIN

Thermal groundwater surfaces at the Warmbaths fountain at 52°C, at a rate of 22 000 litres per hour (accommodation-warmbaths.co.za, 2015) and owes its mineral rich chemical composition to water-rock interaction, crystallisation, and isotope exchanges between the soil's CO₂ and the aquafer matrix (Olivier and Jonker, 2013: ii). The state in which it surfaces promotes bathing and swimming in the spring for its medicinal and recreational qualities (Appendix A), but it is also currently successfully employed for irrigational purposes from a runoff dam that is host to biological habitats (Basson, Personal communication. 2015). Intersection with the spring's water soothes arthritic and muscular conditions and aids in the relaxation of joints. The fluidity and buoyancy allow the being to transcend to a state of relaxation.

Supportive to the thermal spring, another large local borehole extends into a natural aquafer that services the resort and the facilities with fresh potable water. The current demand leaves an excess capacity of 20 000 l/h that can be used (Basson, 2015 Pers comm.).

Figure 2.7

The Warmbaths fountain, 1888

Booyens, B. 1981

Figure 2.8

The Warmbaths fountain

(Author, 2015)





INTERSECTION

PRE-MODERNITY

The fountain was known to the indigenous Tswana people of the area as “Bela Bela” which translates to “Hy wat vanself kook” (Booyens, 1981: 86) or in English, ‘He who boils automatically’. They associated the smoking waters with the “spirits of the great chiefs of the past” (Northern Transvaal: 15), and the fountain was internalised as integral to their place. By 1850, the Waterberg region had attracted the Trekboere, who intersected with the water from the fountain for its health-restoring and recreational benefits (cited elsewhere). Visitors readily tapped water from the eye down large drainage channels from which smaller channels led the water to private hand-dug pools enclosed by thatch screens wherein bathers bathed (Ibid: 86). Even after the formalisation of facilities for a body’s intersection with this water, the Boers preferred to dig their own holes in the ground where they would bath for hours on end (Ibid: 87) as preferred method of intersecting these waters.

Figure 2.7 & 2.8
Mud bath therapy ca. 1888
Booyens, B. 1981



The “warmmodderkuur” or mud bath therapy became a popular attraction in the town of Bela Bela (Previously Warmbaths) and later on facilities were erected and developed for a more formalised use of hot mud and the bathing therein. In 1895 there were forty-eight baths, of which twelve were reserved, and the rest were “Vrije baden” or free baths that could be used free of charge on certain conditions. (Ibid: 88). These baths were accessible to the public who could, at certain times of the day, make use of them for one hour per person per turn, and after each turn the custodian would be granted half an hour to clean the baths. (Ibid: 88) The “Badopsigter” or Bath-Custodian was bestowed with the care over the water from the fountain by the Volksraad in 1895 (Ibid: 88). His duties included ensuring that the water for use was clean and pure, and managing the facilities at the “Bronhuis” (House at the Oar) and the “badhuisjes” (personal bathhouses). When visitors preferred to dig their own “badkuilen” or bathing holes, the custodian was to show them a spot from where the drainage of the hole would not make an impact on load-bearing structures downstream. The Bath-Custodian had to be on duty during the bathing season, from 1 May until 1 September.

The Boers extensively patronised the baths and visited them often for the health restoring and medicinal properties of the waters (Ibid: 87). Old President Paul Kruger and his wife, Siena Kruger frequently visited the warm baths and after his induction as President, new bath stalls were erected at the fountain at his wishes.



MODERNITY

The early developments around the spring were formalised into the first resort in 1921, and planning of the new swimming baths and a great hall (Lacovig, 2003: 174) clustered in the central gardens, started. The servient facilities to the baths unfolded symmetrically along an axis and promenade, extending from the gardens to the north to the centre of the main loggia overlooking the baths. The servient spaces flank the baths and loggia by shaping an internal courtyard to provide a sense of privacy.

Figure 2.9 & 2.10

The first public pool at Bela-Bela
(Publicity and Travel Department
South African Railways, 1931)

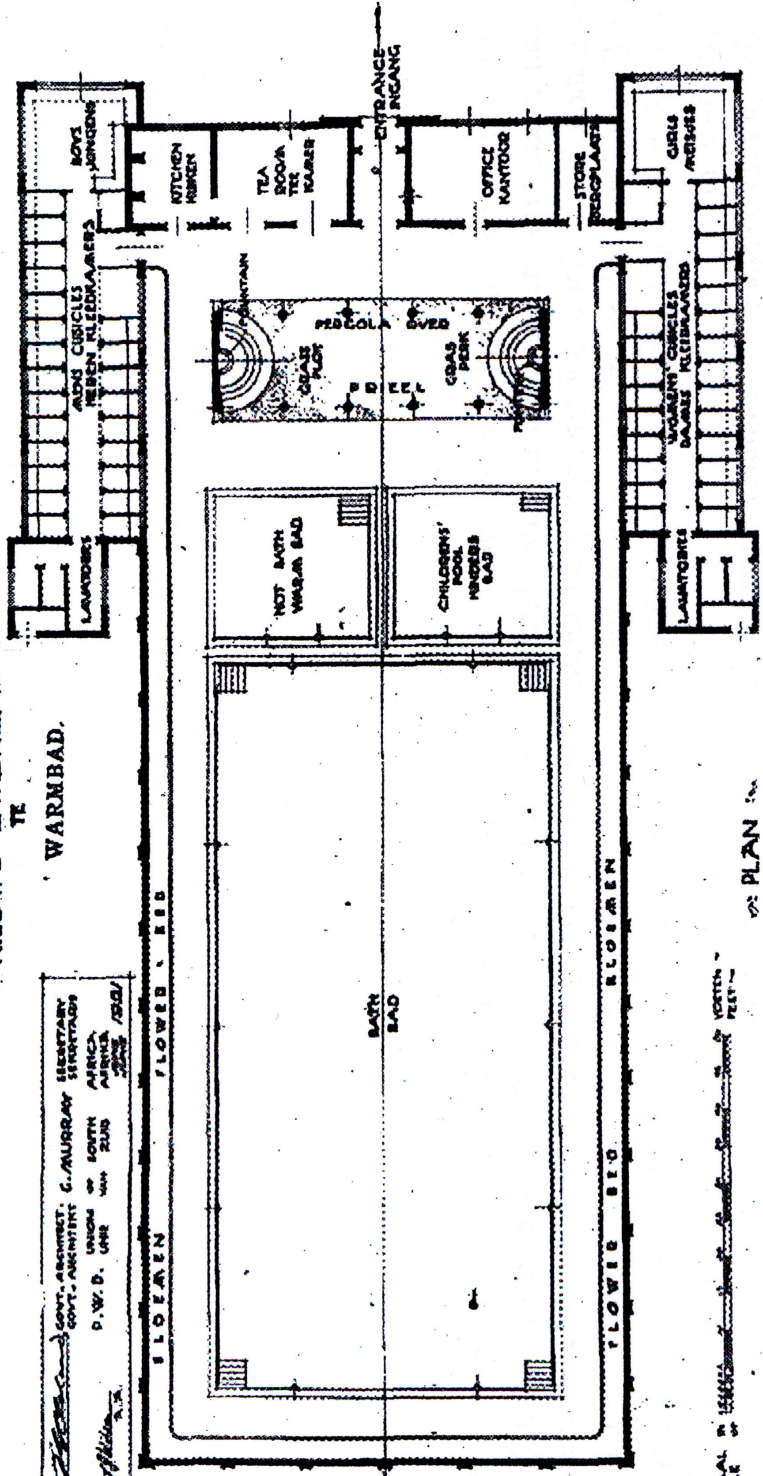


THE NEW SWIMMING BATH AT WARMBATHS IN
TRANSVAAL PROVINCE

DE-1914-13 4083

DE NIEUWE ZWEMBAD IN
TE WARMBAD.

GOVT. ARCHITECT: G. MURRAY
GOVT. ARCHITECT: G. MURRAY
UNION OF SOUTH AFRICA
D. W. D. ONE 1914-2013 (S.A.)



SCHAAL 1:1000
SCALE 1:1000
PLAN

An interplay between private and public bathing promoted a reciprocity between outside and inside and between water and landscape. Private bathing enclosed landscaped courtyards where public bathing was enclosed by servient spaces and porticos. The formal bathing facilities intercepted the route from the fountain to a garden setting, and to the south you could find a diving pool, a cold pool and “spelekamer” or playroom. Beyond this setting a road divided the landscape to the south where servient spaces to the resort and baths for “non-whites” were located. The gardens extended into the town grain and facilities, inextricably connecting it to the town.

Planning commenced to upgrade the scale of the resort when above-mentioned expansions proved insufficient for its popularity by the mid 60’s (ibid: 174). Through an adaptation of European models to local context, a master plan was developed which entailed an outdoor pool area in a garden setting, as well as the Hydro Complex containing indoor and outdoor pools (Ibid: 176) that resembled European models. The planning and construction of this master plan saw its major contribution, the Hydro Spa, opening to the public in 1978 (ibid: 176). This facility adopted a symmetrical approach of unfolding servient spaces which the visitor descends lightly past to the main pool. The pool is enclosed by a double volume coffered slab with skylights and serves as an oculus. A mezzanine lives out onto this space that serves as a loggia and is connected to the first floor of the building, which hosts water and mud therapy rooms and its servient spaces. This first floor again retracts from a double volume shaft to an oculus in the foyer. The pool extends outwards into a garden setting where porticos ring the garden. From the fountain, the more public gardens are banked up against these porticos to become walkways with which to cross the enclosures.

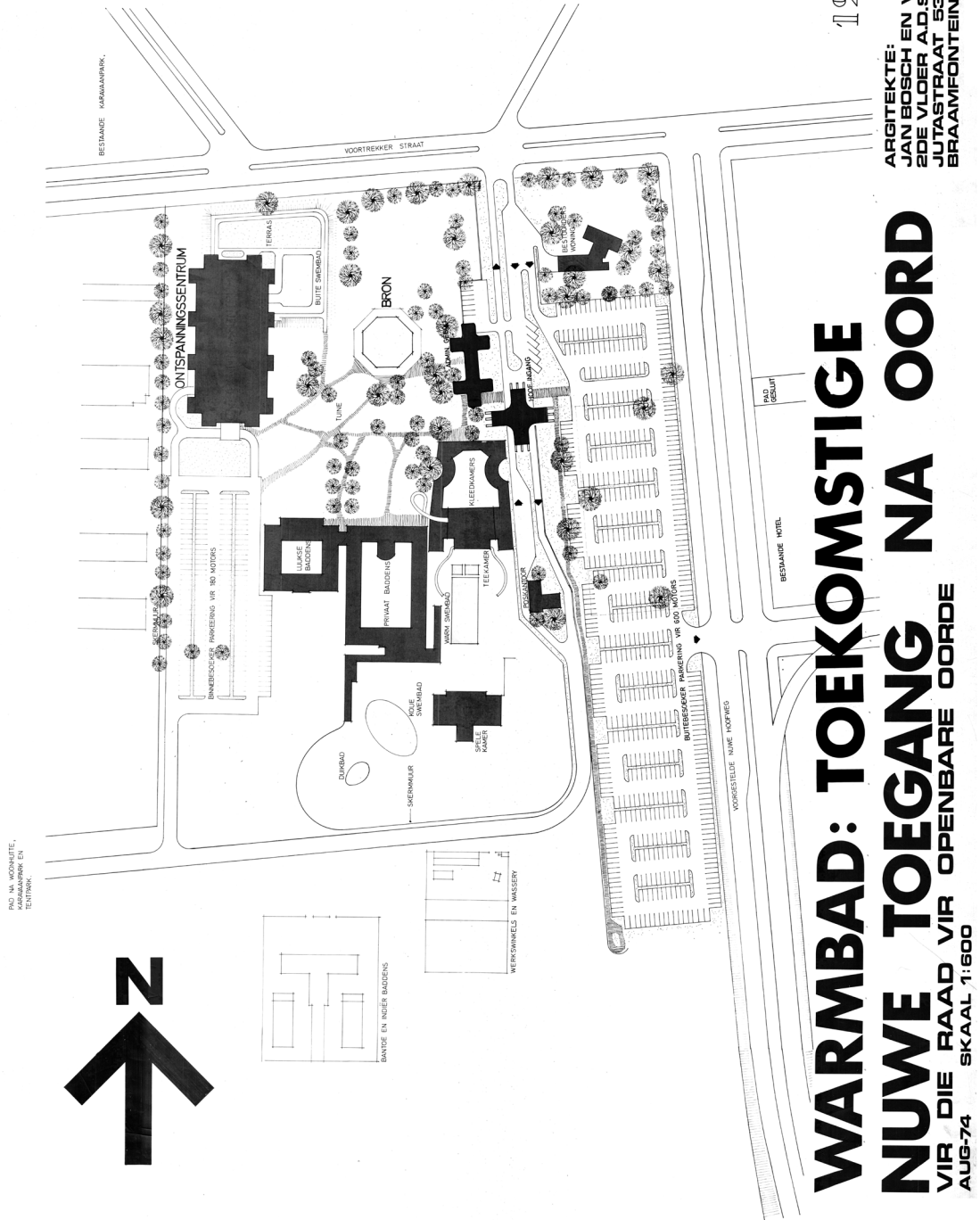
Figure 2.11
The Hydro Pool
(Author, 2015)



Figure 2.12

The 1974 resort plan with new access facilities proposed

Jan Bosch and Partners, 1974



The early 80's saw the development of a master plan for the outdoor pool area in the garden setting that opened to the public in 1986 (ibid: 184). The garden setting hosts a hot outside pool with a central Jacuzzi and oculus within the semi-enclosed space. A cold wave pool resides to the south that morphs into the embanked landscape that provides privacy from the town. This embankment subsequently morphs into channel waterslides going down to the garden, but retracts to allow for a towering waterslide that coils a central structure. Water spouts and fountains invigorate the garden along with netted shading canopies and piping that run to and from heat exchangers within the facilities' individual service rooms, and to the boiler and service yard hidden beyond the public interface of the hotel. The gardens descend to the south with many recreational facilities amongst the water dams. These dams fill with runoff water from the baths, supply irrigation to the gardens, while excess water is released into secondary bodies of water and subsequently into the nature reserve (Wimpie Basson, Personal communication). It becomes a natural filtration system of retention dams and wetlands. Beyond the gardens to the southeast, is the ski-dam that hosts water-skiing by utilising the fountain's runoff water (Ibid). A local borehole services all the servient facilities to the baths and accommodation with potable water replenished by the natural rain cycle (Ibid).

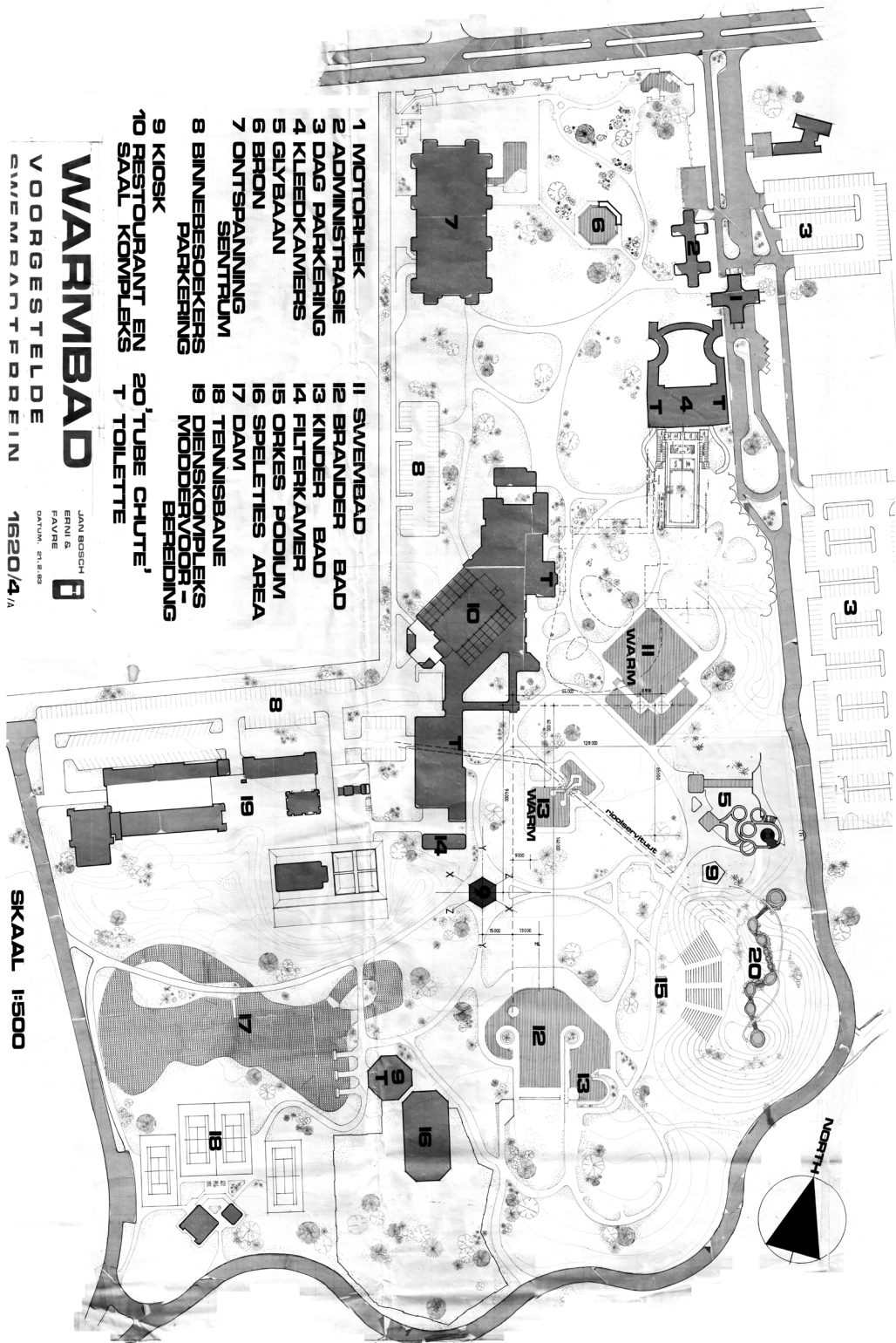
Figure 2.13

The Garden pool
(Author, 2015)

Figure 2.14

The 1983 Resort plan
Jan Bosch and Partners, 1983





- 1 MOTORHEK
- 2 ADMINISTRASIE
- 3 DAG PARKERING
- 4 KLEEDKAMERS
- 5 GLYBAAN
- 6 BRON
- 7 ONTSPANNING SENTRUM
- 8 BINNEBEOEKERS PARKERING
- 9 KIOSK
- 10 RESTOURANT EN SAAL KOMPLEKS
- 11 SWEMBAD
- 12 BRANDER BAD
- 13 KINDER BAD
- 14 FILTERKAMER
- 15 ORKES PODIUM
- 16 SPELETIES AREA
- 17 DAVI
- 18 TENNISBANE
- 19 DIENSKOVLOER - BEREDING
- 20 'TUBE CHUTE' TOILETTE

WARMBAD
VOORGESTELDE
GEMEENTEPREIN

JAN BOSCH
ERNI &
FAVRE

DATUM: 31.8.89
1620/4/1

SKAAL 1:500

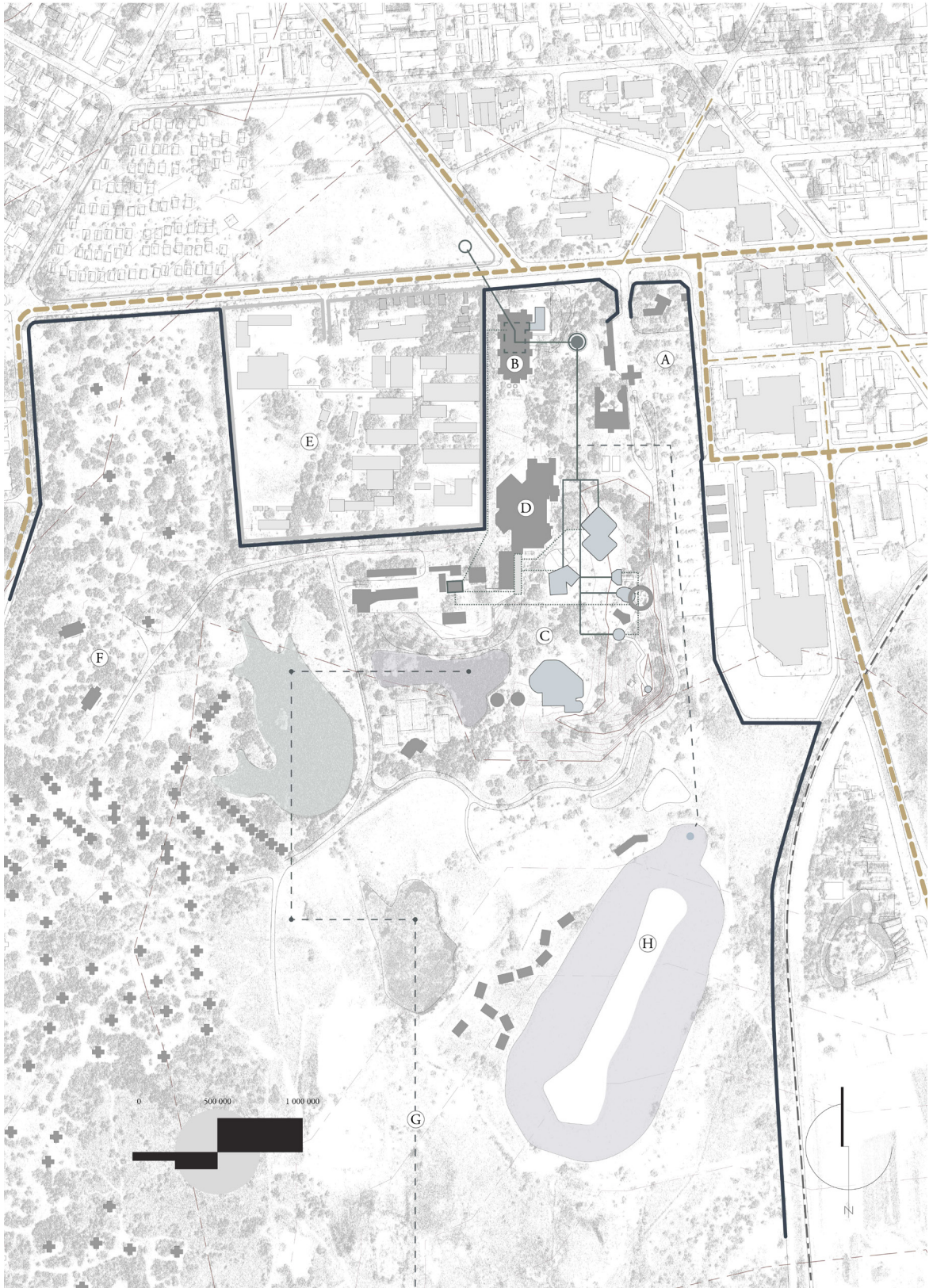


Figure 2.15 & 2.16

The Resort plan

(Author, 2015)

A: Resort Parking

B: The Hydro Spa

C: Garden Pools and Water Facilities

D: The Forever Hotel

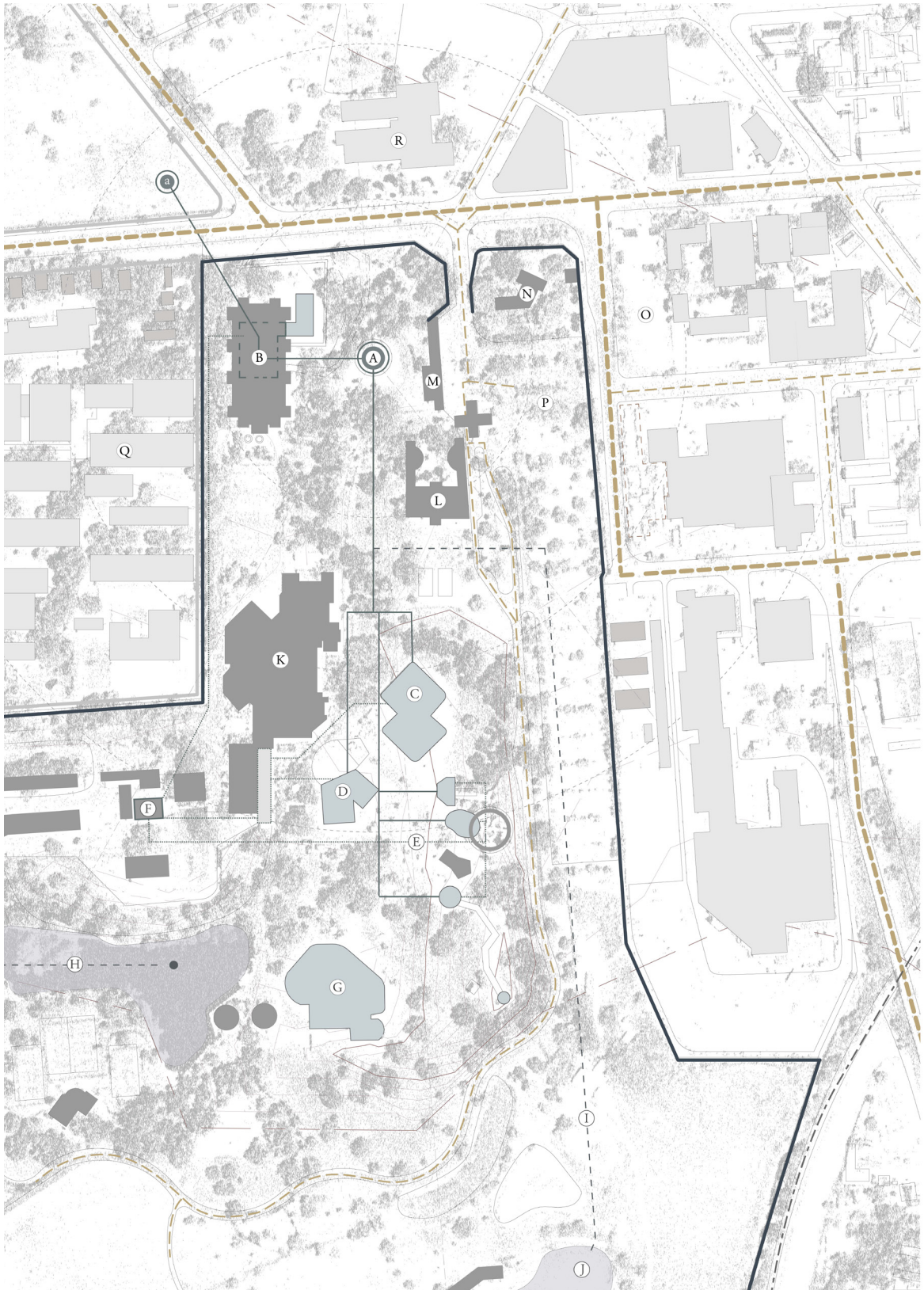
E: Bela- Bela Public Hospital and township

F: Chalette and Camping Accomodation

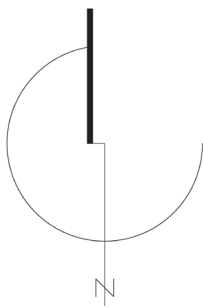
G: Water filtration and irrigation system

into the nature reserve to the south

H: Ski-boat dam and challette accomodation



- A: The fountain
- B: The Hydro Spa
- C: Hot Water Garden Pool
- D: Kids Splash Grounds
- E: Water Slides
- F: Boiler and service yard
- G: Wave Pool
- H: Paddleboat dam
- I: Fountain overflow
- J: Ski-boat dam
- K: The Forever Hotel
- L: Ablutions and admission
- M: Resort administration, reception
and vehicular access control
- N: Managerial residence
- O: Town of Bela-Bela
- P: Parking
- Q: Bela-Bela public hospital
- R: Bela-Bela Municipality



0 500 000 1 000 000

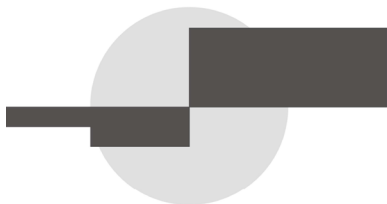




Figure 2.17
Light shaft in the foyer
of the Hydro
(Author, 2015)

THE LOGGIA AND THE OCULUS

THE LOGGIA AND THE OCULUS

All the facilities express a reciprocal relationship between the water and the sky through oculi whilst privacy and engagement is separated by loggias which become large pieces of lawn under trees or netted canopies at the pools in the garden setting. The structures are modern in character with dramatic classical spatial unfolding through rhythm between volumes and symmetrical approach. Though relationships occur between outside and inside, one is predominantly outside or inside of enclosure.

A Loggia is an open-sided, roofed or vaulted gallery, either free-standing or along the front or side of a building, often at an upper level. (Oxforddictionaries.com, 2015). It provides, through an interplay on levels, a spatial continue to overlap a boundary, where the boundary animates both spaces. Through an articulation and animation of this boundary, the condition becomes to animate both spaces whilst differentiating between engagement and privacy. The oculus provides the same condition, but along the axis-mundi between earth and sky.



Figure 2.18

Breakfast In The Loggia
- John Singer Sargent

(Sargent, 1910)

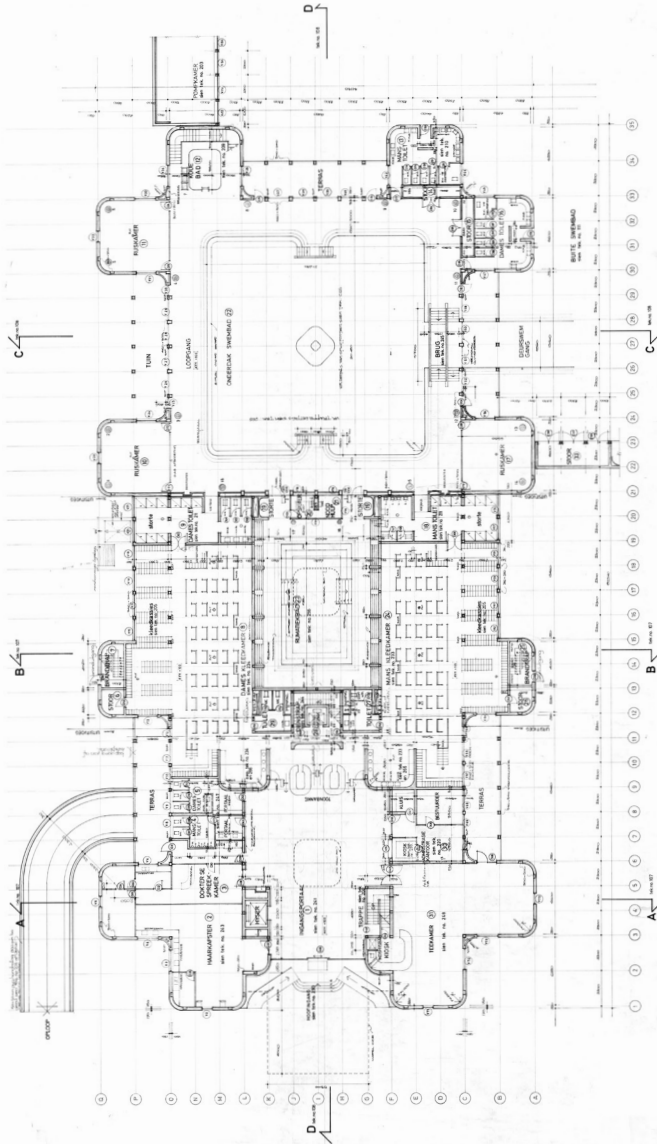


Figure 2.19
The plan and cross section of the Hydro Spa
(Jan Bosch and Partners, 1973)

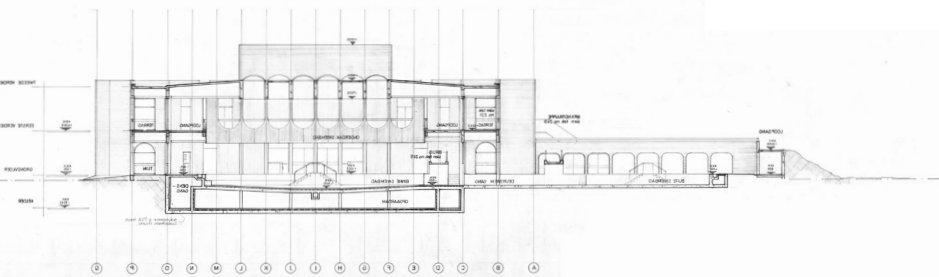


Figure 2.20
The rheumatic pool in the Hydro spa with a light shaft or oculus above in the centre
(Author, 2015)

Figure 2.21
The continuous pool flows to the outside where it is ringed by a loggia. The gardens beyond are sloped upwards to become a pathway over the enclosure.
(Author, 2015)



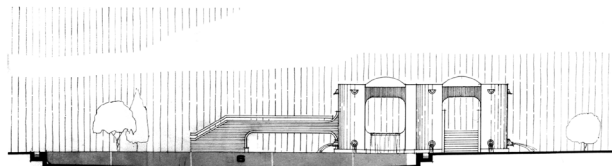
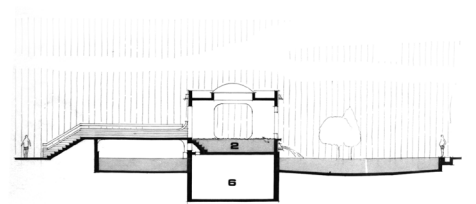
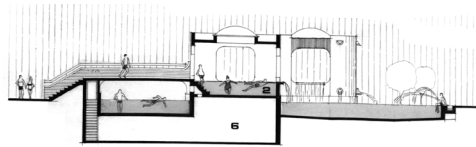
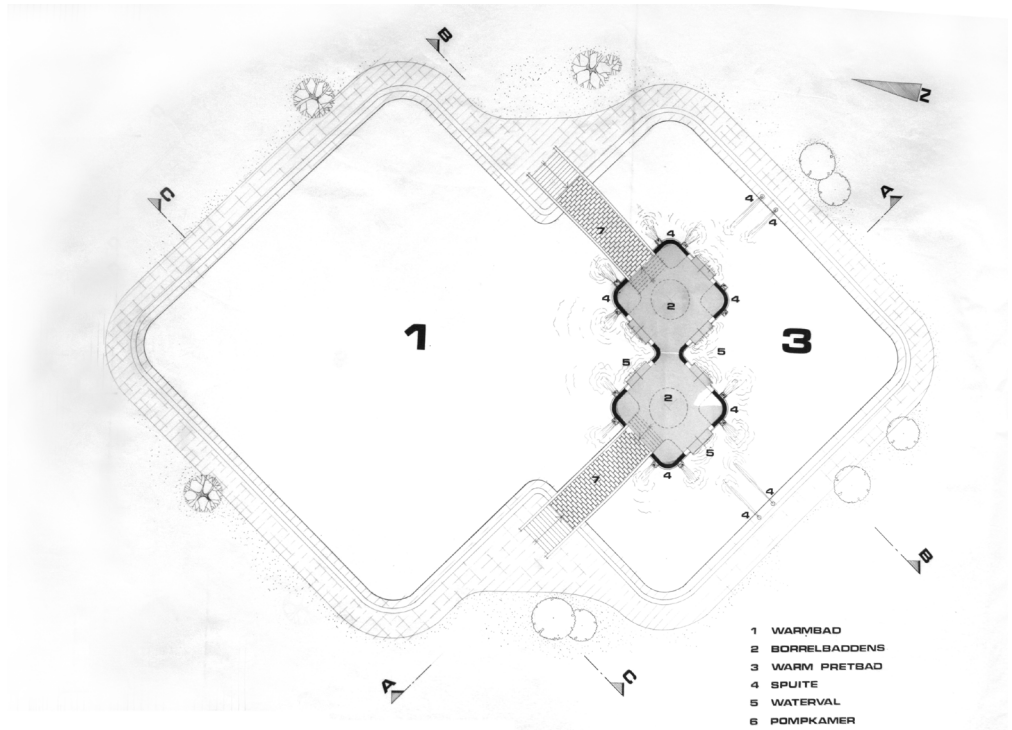




Figure 2.22 (above)
The hot water garden pool
(Author, 2015)

Figure 2.23 (top left)
Plan of the hot water
garden pool
(Jan Bosch, Enri & Favre
Architects, 1983)

Figure 2.24 (left)
Sections through the hot
water garden pool
(Jan Bosch, Enri & Favre
Architects, 1983)

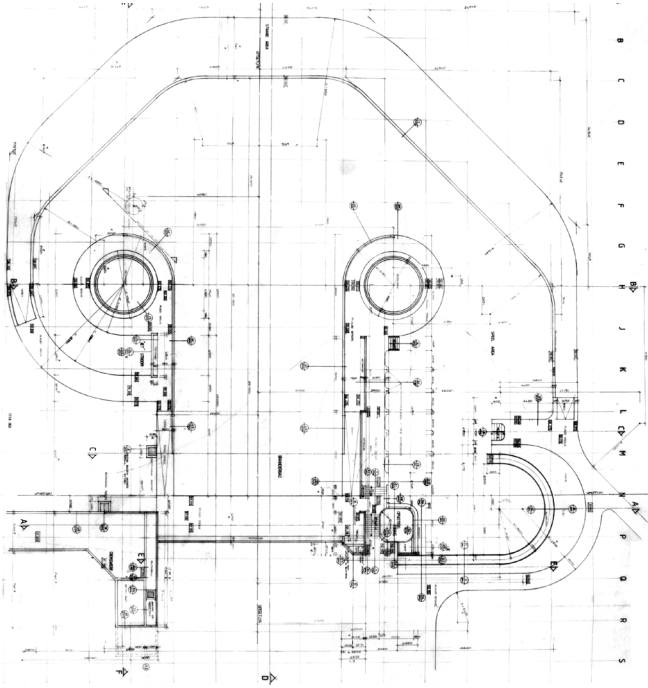
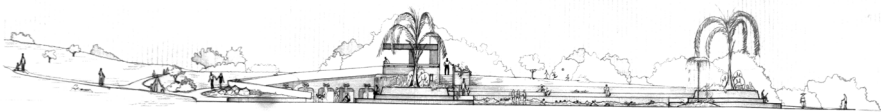
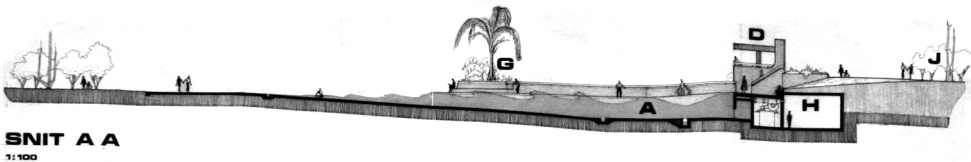


Figure 2.25 (left)
Wave pool plan
(Jan Bosch, Enri & Favre
Architects, 1983)

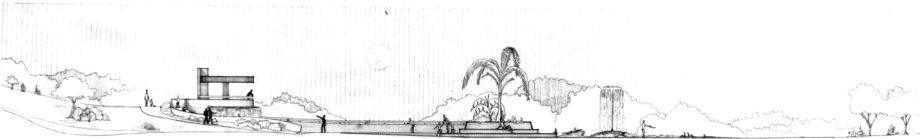
Figure 2.26 (below)
Sections through wave pool
(Jan Bosch, Enri & Favre
Architects, 1983)

Figure 2.27 (right)
The wave pool
(Author, 2015)

Figure 2.28 (right below)
The garden setting along the
paddleboat dam
(Author, 2015)



NOORD AANSIG
1:100



OOS AANSIG
1:100





Figure 2.29
The Waterslide
(Author, 2015)





Figure 2.30

The tower slide and resort below

(Author, 2015)

Figure 2.31

An embankment to east of the garden setting provides privacy from the enveloping town.

(Author, 2015)



3

CONTEXT

BELA-BELA

Settlement Genesis and Historical Development

Chapter three indicates an analysis of the Warmbaths fountain and the natural environment as settlement genesis to Bela-Bela. A study of the historical development of the town is made, which is preceded by the historical development of the resort. The problem statement is derived from the condition arising from the historical and urban landscape and concludes the chapter.



THE FOUNTAIN AND THE ENVIRONMENT

GEOMORPHOLOGY

To the west of the Springbok flats, where the flat horizontal planes of the region meet the bulging topography of the Waterberg range at the Hoekberge, is a local presence of deep geological structures such as folds, faults and dykes (Olivier and Jonker, 2013: 20-21). These serve as the conduit to the Warmbaths thermal spring that continuously provides “circulating artesian systems where rain and surface water descends to depth, is heated by the rocks, before rapidly returning to the surface without losing much heat” (Olivier and Jonker, 2013: 20-21 & Kent, 1969).

The water to the springs in the Limpopo Soutpansberg depositional basin rises along wall-like bodies of impermeable rock (dykes) that impede the free movement of ground water (Olivier and Jonker, 2013: 20-21 & Ashton and Schoeman, 1986). These impermeable sections of fault zones, folds or dykes may restrict the direct percolation of water from the intake area to the spring eye, forcing the hot groundwater to the surface (Olivier and Jonker, 2013: 20-21 & Kent, 1969).

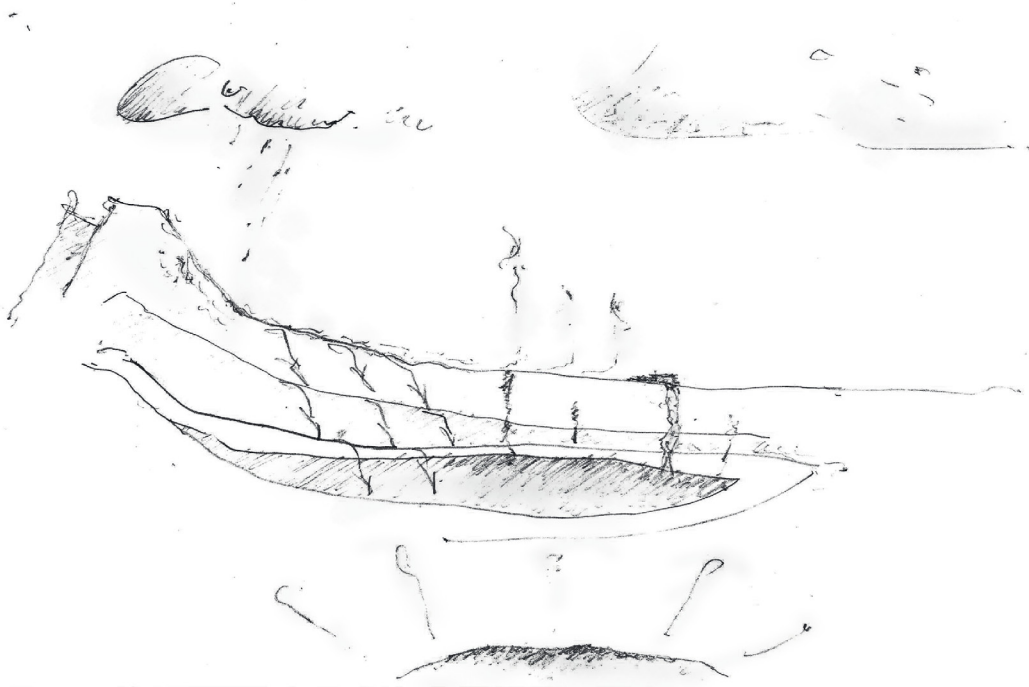


Figure 3.1
Waterberg
(Limpopo tourism Agency, 2015)

Figure 3.2
Geomorphology and Hydrology
(Author, 2015)



TOPOGRAPHY

To the south, downslope of where the fountain surfaces, a marshland existed. This marshland was drained and set aside as a nature reserve with the establishment of the town that developed radially to the north from the fountain. The reserve, along with the Springbok Flats and the Hoekeberge, form part of what is demarcated as the larger Waterberg district. This district is the only Savanna Biosphere Reserve in Southern Africa and “features a mix of rock formations, formed over millions of years, significant San (Bushmen) rock art sites and abundant bushveld plains that support a diverse array of fauna and flora” (southafrica.net, 2015).

The Waterberg district is the first region in the northern part of South Africa to be named as a Biosphere Reserve by UNESCO. A biosphere is an area designated by UNESCO’S Man and Biosphere (MAB) program that “aims to establish a scientific basis for the improvement of relationships between people and their environments” (Unesco.org, 2015). MAB combines the sciences, economics and education to improve human livelihoods, to foster their cultural values and promote a harmonious integration with the remarkable natural environment as to conserve biological diversity (Ibid).

HYDROLOGY AND CLIMATE

The Waterberg Water Mountain), as the name implies, serves as an important catchment area and reservoir to the enveloping arid region (environment.gov.za, 2015). Several perennial streams, concentrated in the mountainous area, flows south towards the town. This flow and the downstream drainage from the facilities at the fountain, traditionally known as “Bad se loop”, meet the Plat River, which abuts the town to the west, a few kilometres to the south. The drainage is naturally filtered through retention dams and natural processes as it traverses the resort and the nature reserve to the south. The average rainfall in Bela-Bela for a year is 625 mm with dry winters and most of the precipitation during December, averaging 122 mm (en.climate-data.org, 2015).

In Bela-Bela, a local steppe climate presides (en.climate-data.org, 2015) with little rainfall and is considered to be Bsh (Arid), according to the CSIR Köppen-Geiger climate classification Map for South Africa. The average annual temperature is 18.7 °C with January being the warmest, at an average of 23.3 ° C, and June being the coldest month, with temperatures averaging 11.7 °C (en.climate-data.org, 2015). At the Hoekeberge to the north of Bela-Bela, the climate changes to Cwb or Temperate Highland Tropical. This produces a variety of habitats and landscapes, and a vast diversity therefore characterises the flora and fauna.

Although a considerable deviation between daily maximum and minimum temperatures exists, the climatic conditions present a pleasant outdoors environment with clear skies, scenic views and shady coverage by the unique Bushveld vegetation.

Figure 3.3

Sunflower crops in the Springbok Flats

(Author 2015)



FLORA & AGRICULTURE

The vegetation is predominantly different veld types. Sour Bushveld and Mixed Bushveld, which are typical Savanna vegetation types, as well as the Waterberg Moist Mountain Bushveld (environment.gov.za, 2015). Amongst other, the Acacia species thrive here and are an identifiable characteristic of the environment. More than 500 plant species grow in the Waterberg region and is considered a 'floral hotspot' with a portion being endemic to only this area and other parts in Namibia (Waterberg Wilderness, 2015). Along depressions in the bulging topography and rock formations, water fountains and floral habitats preside with aquatic plants biodiversity.

"The Waterberg District presents a rich rural environment with practically every form of farming practiced here" (Nylstroom and Warmbaths and Waterberg district, 1931: 16). Flowers, sunflowers, cotton, mielies and peanuts are cultivated in the Bela-Bela and Modimolle areas, while tropical fruit, such as bananas, litchis, pineapples, mangoes and pawpaws, as well as a variety of nuts, are grown in the Tzaneen and Makhado areas (southafrica.info, 2015).

Located to the southeast of the town is the Toowoomba agricultural research centre of the Limpopo Department of Agriculture which provides valuable research towards progressive and sustainable agricultural practices for Limpopo and South Africa.

FAUNA

Because of the rich vegetation of trees, the dry woodlands are home to elephants, black rhino, giraffe, springbok, steenbok, impala, sable and hartebeest (Rabbaney & Masolotata, 2003: 35). Thus the region is rich with eco-tourism, game conservation and hunting farms, of which many are accessed by traversing the town of Bela-Bela.

TOURISM

Limpopo is known as the "garden of South Africa" (southafrica.info, 2015). The Unique natural environment and conservation farms; a multitude of mineral springs and recreation facilities; and 80% of South Africa's hunting industry make the region a traditionally popular tourist destination. Bela-Bela serves as the gateway to this natural hinterland with eco-tourism initiatives extending into the natural environment.

Figure 3.4

The Waterberg beyond the Springbok Fats

(Author 2015)

EXISTENTIAL DIALECT

SETTLEMENT GENESIS

The Tswana first *dwelled* here and had strong spiritual ties with the *place* and the fountain. A promotional pamphlet of the Northern Transvaal notes: “Native tribal beliefs and superstitions, be it remembered, associate the smoking waters with the spirits of the great chiefs of the past” (Publicity and Travel Department South African Railways: 15).

Due to an abundance of mountain springs and fountains, the Waterberg region attracted the Trekboere who first settled in Warmbaths in the 1850s, when the springs had already become a popular refuge for the sick (Savva, Fok, Kinver, 2003: 15).

“Tradition tells that Grobler and Van Heerden (The Voortrekkers that discovered the spring at Warmbaths) noticed a huge cloud in the early morning that looked like steam covering a large territory. On closer inspection, they found it was about a mile long and about a hundred feet in breadth” (Savva et al. 2003: 16).

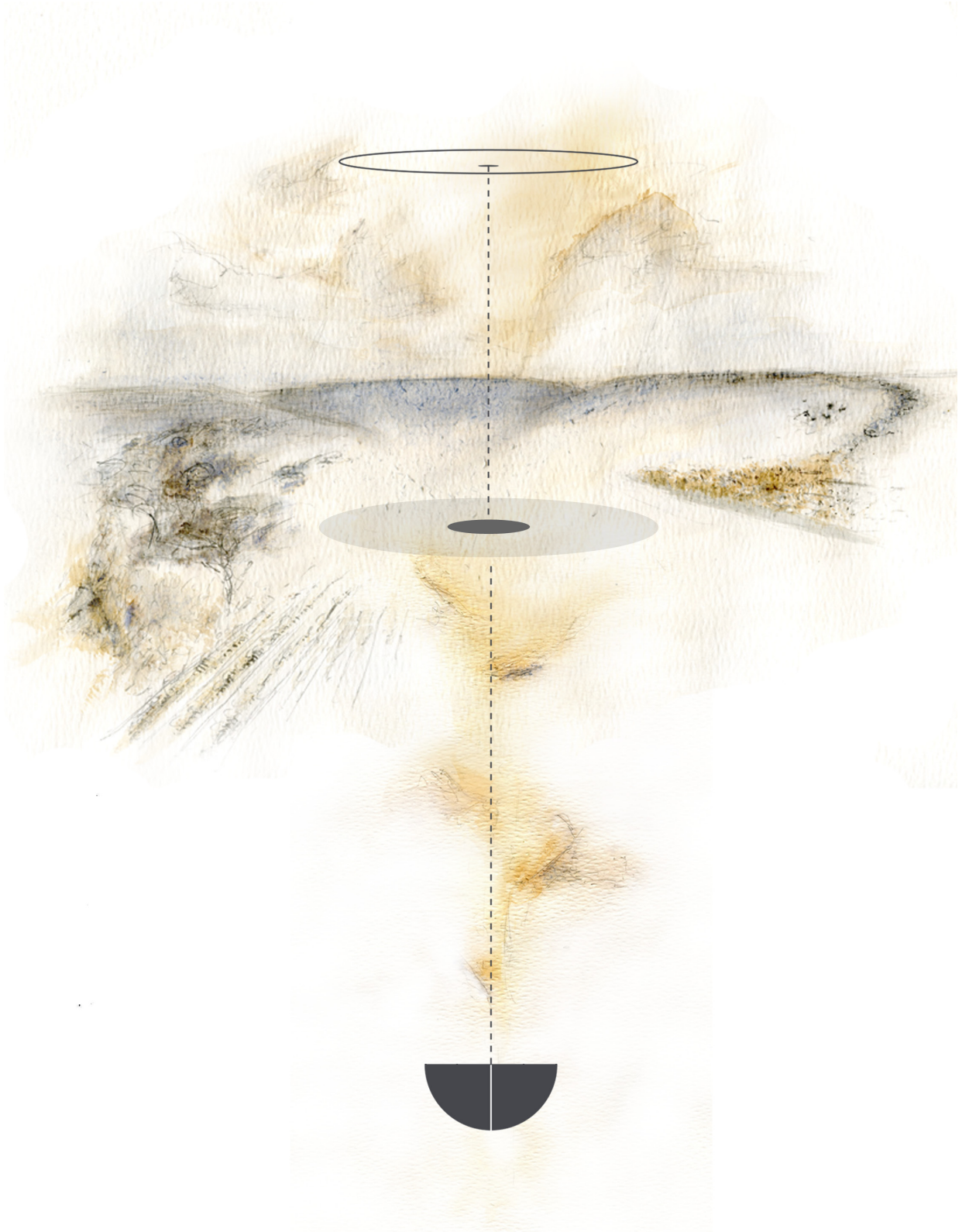
Thus, once the discovery was understood, they drained the marshland and discovered the eye of the spring (Savva et al. 2003: 16) radially around which settlement developed. Warmbaths was also located on the Great North Road that aimed to connect all British colonies from Cape to Cairo (Chandler, Jankelow, Livneh, 2003: 47). “Good access by means of rail and road, coupled with the spring, were the *raison d’être* for the town.”

The Boers referred to it as “Het Bad”, “Badplaas” and “Warmbad” and extensively patronised the baths for the health-restoring and medicinal properties of the waters (Ibid: 87). The waters and the natural splendour of the environment served as the basis for establishment of settlement around the spring and its surrounds.

Figure 3.5

The Warmbaths fountain and enveloping natural environment as settlement genesis to the Bela-Bela township.

(Author 2015)





An Avenue.



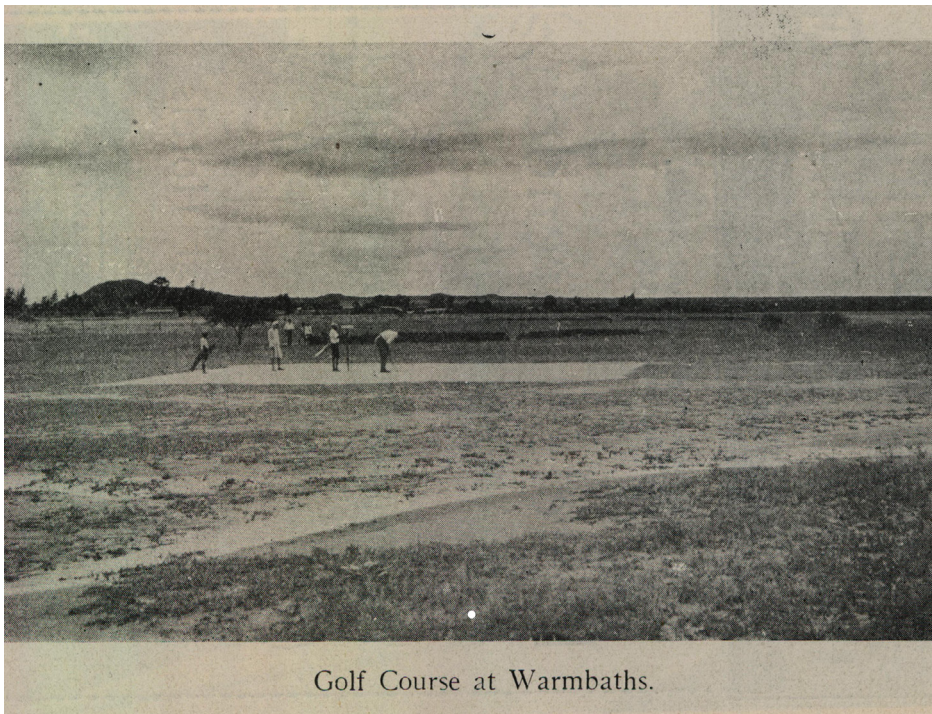
Carnation Farm.

INTERNALISATION

“Die bad het gou bekend geraak en Boere het met waens gekom en soms maande lank hier by die geneesende waters vertoef” (Booyens, 1981: 86). In 1872 Warmbaths was proclaimed as a township (Ibid: 87) and when Old President T.F. Burgers visited the bath in 1873 he felt compelled to liberate the bath from its authorities through its acquisition by the *Volksraad*, to allow the public to make use of the bath “sonder prys en sonder geld” (Ibid: 86) or free of charge. Development at the baths happened slowly, and in an attempt to encourage this much-needed development, the *Volksraad* established the town of Hartingsburg in 1882 (Ibid: 87). The name, however, did not have much appeal as “Warmbad” or “Warmbaths” portrayed the essence and main unique identity of the place.

As Warmbaths gained a reputation as a health resort, it became necessary to place the institution under proper management. The *Volksraad* of the Zuid-Afrikaansche Republiek subsequently issued the “regulatiën voor den Badopzichter te Warmbad” on 2 July 1895, which outlined the regulations over the bathing facilities and the use thereof and bestowed the care therefore onto the “Badopsigter” or Bath-Custodian (Ibid: 88). By the 1900s, Warmbaths had become the “retreat and sanatorium” of the Capital and Johannesburg (Ibid: 87), major metropolises to the north, and so a hotel was erected that drew water through reticulation from the oar.

There existed a “Bronhuis” (House at the oar) and the “badhuisjes” (personal bathhouses) around pools, and two alone-standing bathhouses for those with transmittable diseases. Tents of visitors were to be located away from the facilities and their access routes and a separate pool were formalised for the washing of clothing (Ibid: 88). Alongside these facilities, a hotel and the transient tent settlements of the fleeting visitors from the Metropolises were the first settlement formations around the fountain.





Swimming Baths.



The Main Street.

CONSOLIDATION

During the South African War (1899-1902), the Boer commandos sought refuge in the therapeutic and hygienic baths and fled there in dire times (89). However, by the end of the war, the baths had been destroyed; neither the British nor the Boers took control over the land, and the facilities and the pools became watering pits for horses (*De Volkstem*, 1921).

Finally, the British gained control over Hartingsburg after the war and changed the post-office name to 'Warmbaths' (Savva, Fok, Kinver, 2003: 18). After the war Mr Robertson, the newly appointed Administrator of the Transvaal, instructed efforts towards improving the baths and their condition (Savva et al., 2003: 18). These efforts proved fruitful as the town started to develop. The hotel was taken over by Sutter and Van Hees, and was the only hotel in Warmbaths for many years after the war (McCord, 1950: 3). A proclamation from April 1905 states that Warmbaths (since then the name Hartingsburg disappeared altogether) is to be extended over more portions of the farm 'Het Bad' (Warmbaths Brochure, 1959: 3).

In 1920 Warmbaths was re-proclaimed as a township (Potgieter, 1976: (11) 321; Savva et al., 2003: 20). It was administered by a health committee from 1923 and it became a municipality in 1932 (Potgieter, 1976: (11) 321). The erven for the re-proclaimed town of Warmbaths were advertised in *De Volkstem* and to be auctioned on the 2nd of November 1921 at 10 am in the Pretoria Town Hall (*De Volkstem*, 1921). A plan of the town and drawings of new bathing facilities under construction heralded in this Afrikaans Journal (Savva et al., 2003:21). After that, the town developed rapidly with new settlers arriving and the town thriving as a holiday destination.

Figure 3. 6 - 3. 10

Warmbaths promotional
material ca. 1930

(Warmbaths board of trustees,
n.d.)

WARMBATHS

A GARDEN CITY

During the early 20s, town planning-initiatives commenced for the establishment of the Warmbaths Township (Savva et al., 2003:20). Such plans are illustrated in the delicate project that proposed a settlement pattern reminiscent of the Garden City Model plan by Ebenezer Howard of the period.

This plan, thought to precede the final surveyor general's diagram in 1921 (Savva et al., 2003:20), situates the centre of the town just northeast of the fountain and the facilities, with sites zoned for public and recreational use, including the facilities as an extension to the central garden, around its core.

Surrounding this first public spatial radial is another radial of erven earmarked for residential development to the north, with the provision for public sector development along the east-west axis extending alongside the facilities. This development axis terminates with the CBD and at the railway station, with green and recreational spaces and facilities integral to this axis and sector. Recreational facilities, green spaces and the CBD would thus be firstly accessed from the major railway and road transportation interchanges.

One thus finds the public sector intertwined and interchangeable, animated by recreation and green spaces, extending along an east-west axis with the facilities and the fountain at the heart of this axis. This axis furthermore demarcates a development boundary to the south of the town, so that the fountain and its enveloping recreation facilities would preside upslope of the natural environment to the south.

The proposed residential development, in radial towards the north, clusters dwelling erven around central gardens and includes a public park with attractions and public usages where the radial intersect the east-west axis. Beyond this radial, another similar spatial radial exists, but includes sites for schools and terminates with a park to the east and the natural environment.

Roads inhabit the radials in triangular form and radiate from the nucleus (and not the fountain), undulating where it enters from the west. A grand avenue extends south, from a school site in the north, past sites for public offices and the town hall opposite one another, to a central square, which splits the geometry of the town, enveloped by public facilities and terminates in the south with the major approach axis of the railway.

CADASTRAL PLAN

The Triangular plan of Warmbaths can be ascribed to the land-surveyor WH Gilfillan. In 1921, he surveyed the region and devised the triangular plan measuring 220 morgen and 538.67 squares. Roods, Savva et al. (2003: 20) note that land speculation, rather than compositional clarity, appears to have driven the plan, resulting in many of the urban components to the Garden City plan proposal being abandoned.

The formal plan lacks the public heart and civic centre, while many green spaces and sites zoned for recreation have been replaced by saleable erven. The cadastral plan made for an effective transfer of land, however, it stripped the character of the proposal from a public and civic sphere that was animated by the water and natural landscapes. The cemetery and the resort dominating over the south remained features of the new plan.

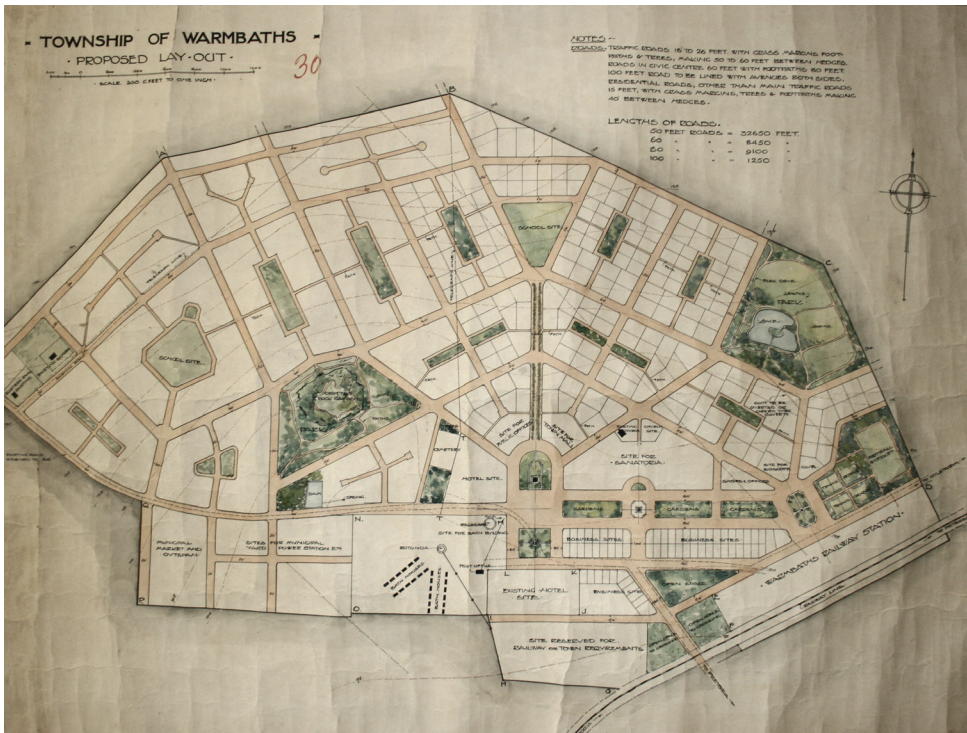


Figure 3. 11
Warmbaths Garden
City plan
(Warmbaths
Municipality
archives ca 1921,
n.d.)

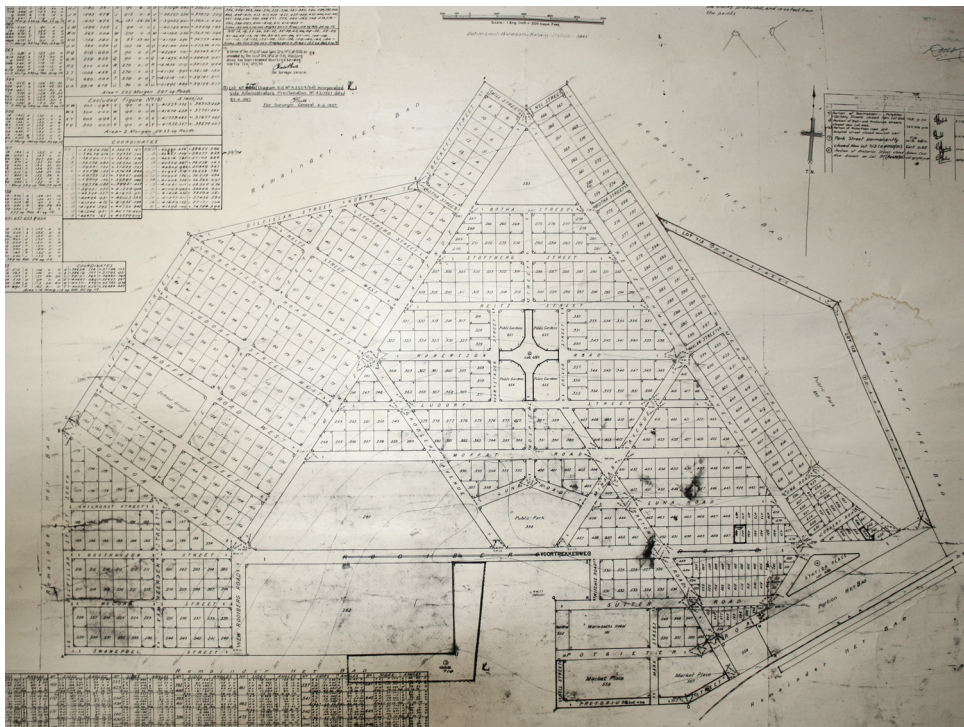


Figure 3. 12
Warmbaths
Cadastral plan
(Warmbaths
Municipality
archives, 1921)

THE BATHING AND RECREATIONAL FACILITIES

FIRST ACT

The early developments around the spring were formalised into the first resort during 1921 with the commencement of the planning of new swimming baths, changing facilities and a hall (Lacovig, 2003: 174). The development represented a significant public investment intended to attract private sector development (Ibid: 174), as well as residential inhabitancy of the newly laid out township with the fountain, the baths and the gardens at its physical and metaphysical nucleus.

SECOND ACT

In 1933 the Board of Mineral Baths was formed which controlled the Warmbaths mineral baths along with the others of the Witwatersrand region (Ibid: 174). The town saw a substantial growth and by the 1960's the facilities received considerable investment in its mineral baths (Ibid: 174). The modernisation of the facilities (Fig.) accommodated a variety of luxurious activities and inhabited the central heart of the town. The traveller's accommodation at the resort extended into the town's grain and tied the resort to the town by accommodating visitors with baths alongside the existing hotels at the inner core of the town. The hierarchies of use and segregated "white" and "non-white" site localities of the facilities intended, are indicative of the spirit of the times.

THIRD ACT

By the middle 60s these improvements proved insufficient and a large investment in the facilities came into works (Ibid: 175). A master plan was developed, which entailed an outdoor pool area in a garden setting, as well as the Hydro complex containing indoor and outdoor pools (Ibid: 176). The Hydro Spa (David Brink Centre) was the first to be constructed. By 1978 (ibid:176), when the centre was opened to the public, new admission and reception buildings to the resort had been built, and a perimeter wall was being planned (Fig.).

FOURTH ACT

The early 80's saw the development of a master plan for the outdoor pool area in the garden setting. This plan included various outdoor water facilities such a slides and pools, but also included a hotel inside the facilities, which meant "the holiday-maker had no need to even leave the resort" (Ibid: 184). The facilities pertaining to the master plan were constructed up until 1986 before it opened to the public (Ibid: 184). Ever since the late 80s, only a few additions have been made compared to earlier ventures. A ski boat dam and Caribbean bungalows were constructed (Ibid: 184), along with the inclusion of more land to intertwine a game reserve with the facilities.

FIFTH ACT

The perimeter condition of the resort has been in an evolving state in response to the urban and social conditions of the town. As the resort transformed from public-owned, to semi-private/public, to private ownership over time, the facilities have retracted inwards onto the site. It is now bordered off from the town's urban core by a wall or fence, with the reception and admissions buildings serving as the only dialect the entire nucleus serves with the urbanity.

EXTERNALISATION

The urban core: the fountain; the facilities; the gardens and the pools have evolved from integral part, and responsive core, to the town's fabric towards an inwards orientation catering only for tourism. Apart from the recreational usage and job creation, the resort and its boundary condition have no relationship with the urbanity, local conditions and local components.

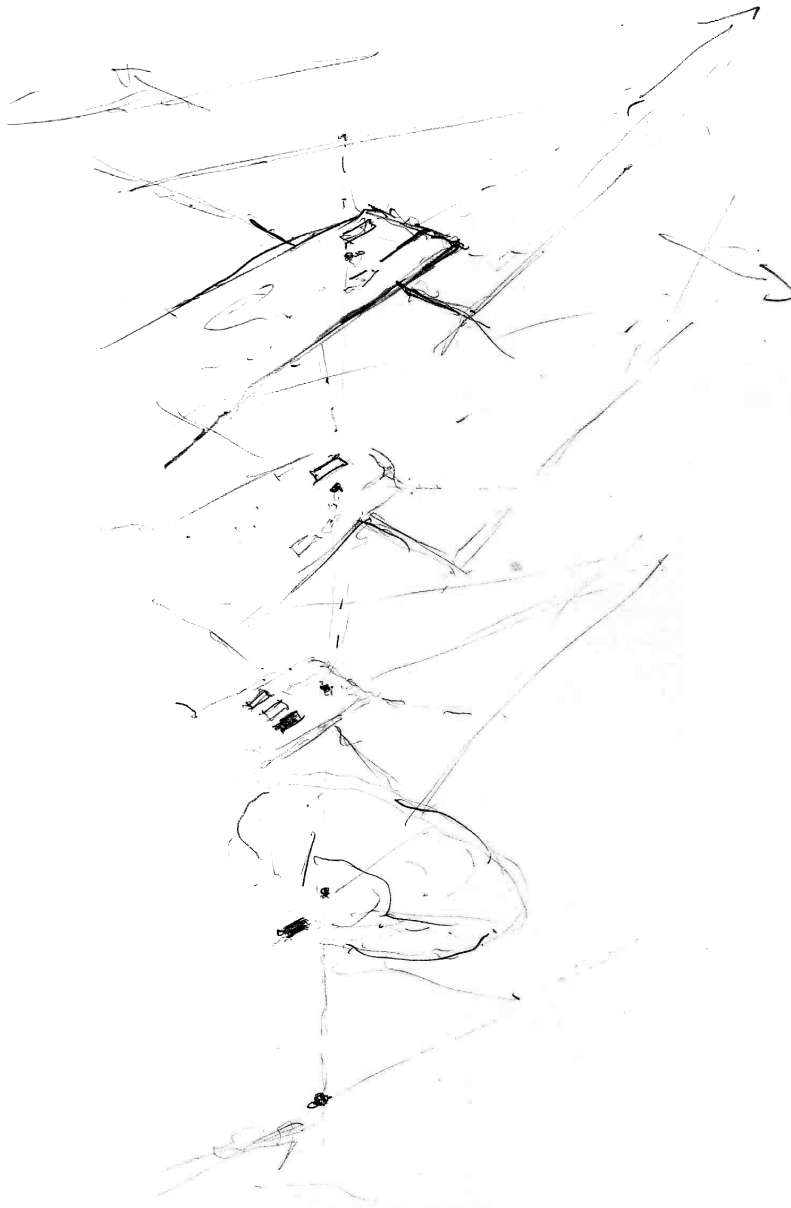


Figure 3. 13

Development of the resort towards an insular entity from the town

(Author, 2015)

VIOLENT COLLISIONS

In 1922 the Stallard Commission recommended “That permanent residence in the town was the exclusive right of the whites” (Fisher 1998: 157; Feliciano, Hart, Mayat, Sherman., 2003: 42) and in 1923 the doctrine had been integrated into the Natives (Urban Areas) Act (Fisher 1998: 158; Feliciano et al., 2003: 42). While rigorous measures were employed to segregate other social and racial classes during early town establishment periods in South Africa, Warmbaths saw nearly all principals of segregating spatial planning employed in its character by the Apartheid regime. “Apartheid city planning is marked by a number of features which, read in a historical context, could be interpreted as part of a segregationist residential policy. Taken as a whole, however, they fall into a pattern that reveals a wider ideological intent” (Frescura, 2015).

Apart from Warmbaths Proper (the triangle) being inhabited solely by the white residency, natural barriers and existing infrastructure could be utilised as socio-spatial barriers between them and the other racial classes (Feliciano et al., 2003: 42). These characteristics employed within Warmbaths are summarised in the figure 3.14.

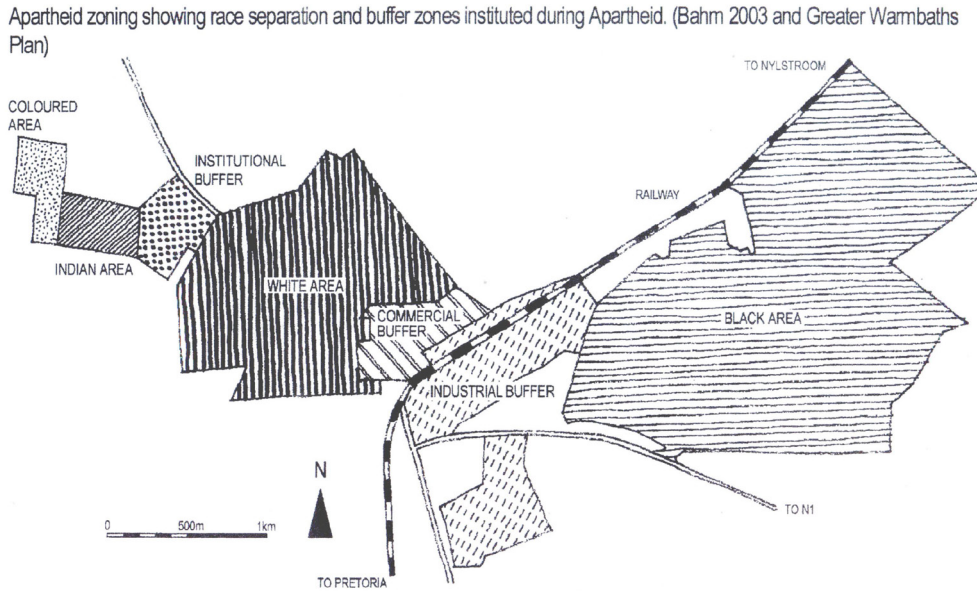


Figure 3. 14
Apartheid zoning for the town
establishment of Warmbaths
(Feliciano et al, 2003)

Figure 3. 15
The boundary of the resort
(Author, 2015)

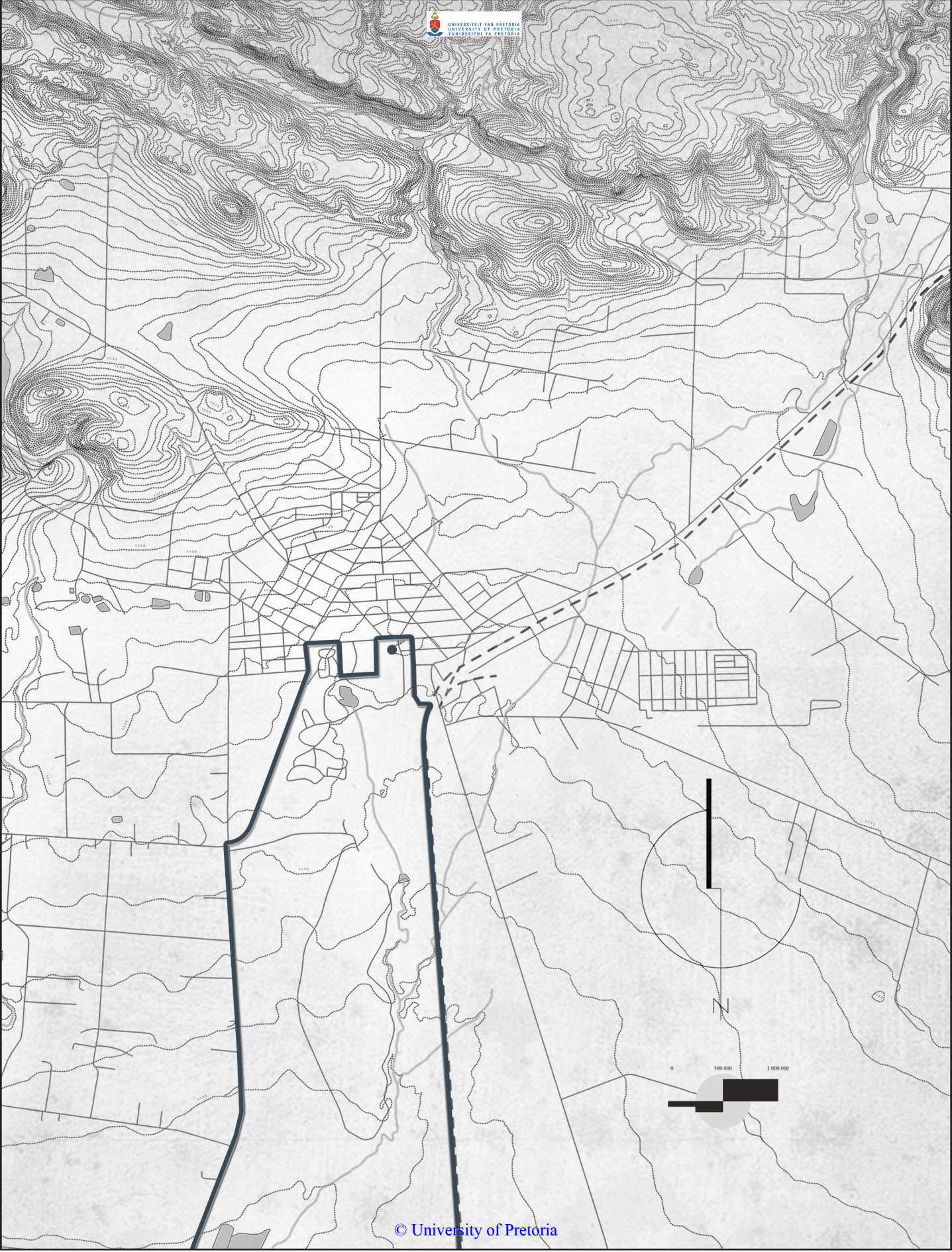




Figure 3.16
Bela-Bela - Urban edge
(Author, 2015)

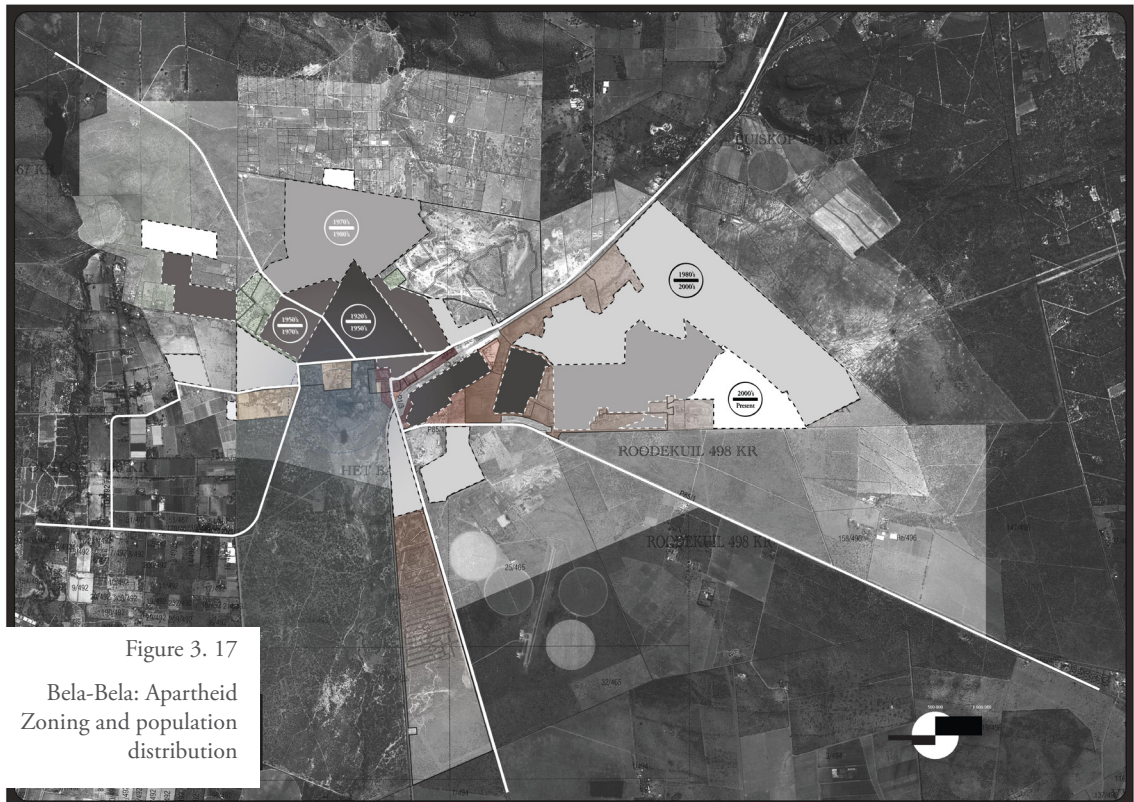


Figure 3.17
Bela-Bela: Apartheid
Zoning and population
distribution



Figure 3. 18
Bela-Bela: Historical
development
(Author, 2015)



Figure 3. 19
Socio-spatial capsules
(Author, 2015)



Figure 3. 20

The 'wall' deters connections
between components
(Author, 2015)

DETERRENCE – THE ‘WALL’

Deterrence is a very peculiar form of action: It is what causes something not to take place. It dominates the whole of our contemporary period that tend not to produce too many events as to cause something not to occur (Baudrillard and Poster, 2001: 256).

These collisions still preside today, demarcating and determining access and opportunity between races, classes and social hierarchies. In the absence of an urban condenser, residential development sprawls over productive rural land. The unresponsive boundary ‘wall’ to the facilities serves as deterrence to ‘transactions’ between urban components and a compact form at the centre of the town. It deters cohesion to the urban core, and also the dialect between the urbanity that exists and the central gardens with the fountain at the core. It furthermore deters connections with the naturally rich extended environment by guarding off the open gardens and fountain at the nucleus of Bela-Bela, which serve as the gateway to the natural hinterland of the region. The process of deterrence ultimately fends of tourism in the region too.

The urban conditions of the town are exemplified in the Authors mapping fig 3.14 - 3. 20.

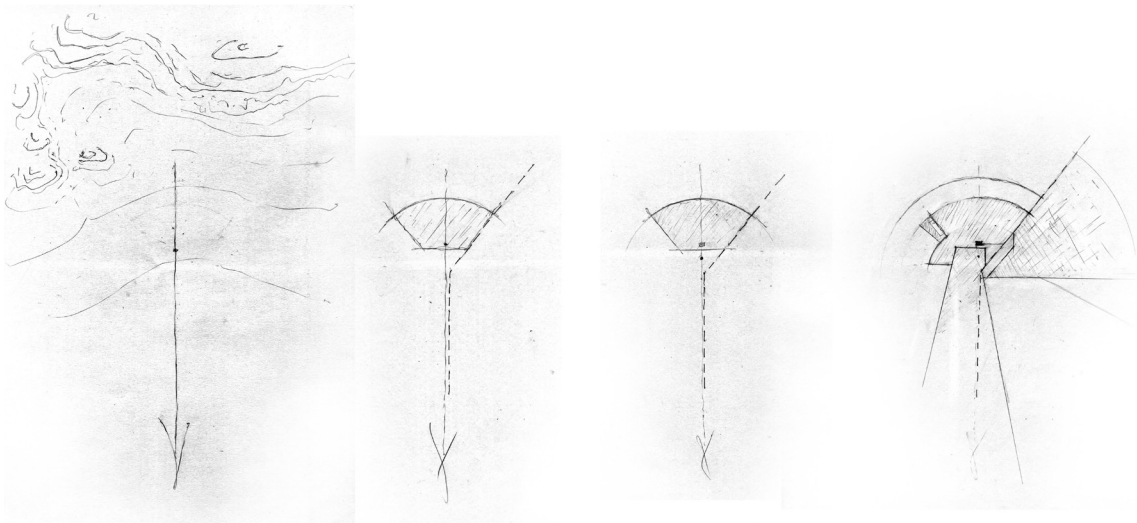


Figure 3. 21

The town, conceived as integral with the fountain and central gardens, has evolved into independent entities where the spatial fabric of the town restricts connections and associations.

(Author, 2015)



'L'ESPRIT NOUVEAU'

THEORETICAL PREMISE

“We have never been “Modern”

A conceptual premise is developed from theoretical discourse. The premise draws from a discourse that proposes the integration of dualistic conceptions between a “cultural realm” and a “natural realm”, architecture and environment, self and other, and between difference and monotony.



“WE HAVE NEVER BEEN MODERN”

THE DUALITIES

Ever since the Enlightenment, humanity has acquired an endless fascination with the quantification of things. Modernity proclaimed these ideals to state a nature-culture dichotomy through which the world is conceived of through two separate realms - a natural realm and a cultural realm (Latour, 1993: 11).

Things find a way to “elude a dialectic of meaning” (Baudrillard and Poster, 2001: 188). It does so by outmatching its essence or by evading a dialectical stance with its counterpart (Ibid: 188). The universe, Baudrillard notes, is not dialectical in its current state (Ibid: 188): “It moves towards extremes, and not towards equilibrium.” By the conception of society, emotion and behavioural stimuli in its own realm and nature and science in another, we elude a dialectical stance with our essentials and counterparts. This dualistic conception between natural phenomena, such as a sunrise or tidal flow, and social phenomena such as emotive or behavioural responses, notes Latour (1993), have never existed in contemporary matters of public concern, like global warming, politics, science, and popular and specialist discourse.

We have endlessly failed to be Modern, since the Modern ideal of the segregation of nature and culture has never existed (Latour, 1993: 11). We choose to stand a little longer in the sun on a cold day or to feel our skin respond to winds that blow over it. The two realms operate within one another and become inseparably one and the same thing.

The rational being is as much a sensorial being that, as an individual and within a collective, we share essential relations with meaningful encounters, because the human being is an emotion machine (Sharr, 2007: 32) (Minsky, 2006). “We are political all the way down to the unconscious bodily responses that we could not call ‘thoughts’, and to the things (which might be outside our bodies) that prompt those responses.”

THE *EVERYDAY* AND *EVERYDAY*-NESS

“The *everyday* implies, on the one hand, cycles - nights and days, seasons and harvests, activity and rest, hunger and satisfaction, desire and its fulfilment, life and death - while, on the other hand, it implies the repetitive gestures of work and consumption (Lefebvre and Levich, 1987: 36).

Lefebvre (Ibid: 35) argues a dualism between natural cycles and modernity’s *everyday* that tends to mask and crush the cycles and subsequently impose its monotony. “It is the invariable constant of the variations it envelops.” The *everyday* cycles rationalise the wondrous complexities and poetics of life, leaving it breathless. The concept of *everyday*-ness becomes determinant of existing systems and standardises it to where mystery is rendered obsolete. “Are not the surreal, the extraordinary, the surprising, even the magical, also part of the real? Why wouldn’t the concept of *everyday*-ness reveal the extraordinary in the ordinary?” (Ibid: 35).

Figure 4. 1

Ferns receive their nutrients from glass vases designed by (R&Sic(n), 2010)

PRESENCE OF DIFFERENCE

THE 'OTHER'

The ancient Greeks would see and interpret the “fullness of life” represented in their environment and the interconnections between them (Sennett, 1990: xi). “The spaces full of people in the modern city are either spaces that are carefully orchestrating consumption, like the shopping mall, or spaces limited to and carefully orchestrating the experience of tourism,” thus the choreography to a neutralised city (Ibid: xii). Beyond the economic and demographic reasons for this condition, the ‘modern’ fear of exposure to the ‘other’ or ‘otherness’ perpetuates the condition (Ibid: xii). The urban environment ultimately portrays a series of segregations that assumes that differences pose mutually threatening, rather than mutually stimulating, situations (Ibid: xii).

Modern culture suffers from a divide between outside and inside, between subjective experience and worldly experience, between city and self (Ibid: xii). Through this dualistic conception, the being is turned ‘inwards’ towards a subjectivity where counterparts are disallowed as integral to daily life. Our towns and cities encompass the milieu of the *everyday* to the human. Sennett (1990:127) argues for the shift of conception, from the city (or town) as a *place* that permits differences, towards a *place* that encourages a concentration of difference. “Its ‘moral order’, the lack of moral order that exercises hegemony over the city as a whole.”

The modern city (and town) enables people to turn ‘outward’, instead of ‘inward’ - “rather than wholeness, the city can give them experiences of otherness. The ability of the city to reorient people in this way lies in its diversity; in the presence of difference people have at least the possibility to step outside themselves” (Sennett, 1990: 123).

Essential to developing as a human being, is developing the capacity for evermore-complex experience (Ibid: 131). If the experience of complexity is losing its value in the environment, it threatens our spirituality (Sennett, 1990: 131) as we endlessly endeavour to orientate ourselves. Socio-spatial barriers inflicted upon environments serve as deterrence to complexity and difference within societies. By re-scripting these barriers, people are enabled to create meaningful engagement, and sustainably vivid and enabling environments.

ARCHITECTURE AND ENVIRONMENT

“Man knows himself only to the extent that he knows the world; he becomes aware of himself only within the world, and aware of the world only within himself” (Goethe and Miller, 1988: 39).

The cultural problem of the modern city, notes Sennett (1990: xiii), is to find a way to make this impersonal milieu speak - how to relieve its current blandness and neutrality that originates from the belief that the world outside of things, is in itself unreal. Our urban problem, he notes, is how to revive the reality of the outside as a dimension of human experience and integral to the self (Ibid: xiii).

To be able to dwell between heaven and earth, Norberg-Schulz (1980: 23) proclaims that man has to “understand” these two elements, as well as their interactions. He continues that the word “understand” here does not mean scientific knowledge, but rather an existential concept that denotes the experience of *meanings* or meaningful encounters. The conception of architecture as a thing in itself rationalises all its relations and capacity to convey meaning when, in fact, it operates and unfolds in the social, political and natural realms. The houses and buildings we dwell in and visit, are really “emotion machines” that are animated by us being implicated therein (Sharr, 2007: 37). In as much as the being animates the milieu, the milieu animates the being through its senses and ability to perceive.

Architecture and planning envelop “geographical metaphors” (Arbona, 2010: 53) that encompass not only the sustainability issues of an object in itself, but also its relation to its environment and context. Architecture, existence, and the natural and metaphorical landscapes are inextricably linked., and when we alienate ourselves from the living processes that we are part of, we end up, though unequally, in a stratified world alienating ourselves (Arbona, 2010: 48) (Williams, 2005).

‘I’m Lost in Paris’ (2008), an installation by Studio R&Sie(n) headed by French architect François Roche, exhibits the alienation and personalisation of nature, capitulating between attempts at overcoming alienation and heightening it (Arbona, 2010: 47). This is the premise of an interchanging animation; where conditions are allowed to animate one another.

INTERCHANGING ANIMATION

SENSORY ARCHITECTURE

The insertion of a new condition into a context allows new relations to arise and others to be remediated. It becomes an integral part of the narrative of *place*. Narrative denotes that an object contains some “other” existence, parallel to its function, that allow our surroundings to become fictional through an accentuation of its explicit ‘reality’ (Coates, 2012: 25). In *The Endless House* by Frederick Kiesler (1959), the inhabitant would be free to wander from room to room as the mind would shift from thought to thought, a trail of the spaces lingering as one transverse thresholds (Ibid: 27-28). In Parc Güell, mythical time and real time coexist and overlap, so that “in these ultra-imaginative surroundings, relationships are free to coalesce” (Coates, 2012: 25). One is allowed to meander along various paths and landscaping with events and scenes unfolding where nature and structure mimic one another and morphs with the context - the one becomes an extension of the other.

“Current science is based on the principle of induction: most people see a certain phenomenon and conclude therefrom that this will always be the case... but instead of formulating the law of the fall of the body towards a centre, why not give preference to that which ascend to the periphery, the vacuum being considered a unit of non-density, a hypothesis far less arbitrary than the choice of a concrete unit of positive density” (Jarry et al, 1996: 22) (Baudrillard & Poster, 2006: 257).

Architecture belongs to poetry (Norberg-Schulz, 1980: 23); and by having substance and void, content and relation; space becomes a medium (Coates, 2012: 25) that communicates a dialect of meaning and poetics. Sensory architecture responds to metaphysical socio-spatial geographies as well as natural geographies and climatic conditions of the environment; it invites its inherent poetics into its structure to animate our lives’ theatrical unfolding from within it. An interchanging animation is the reciprocal complementing of two components or conditions within a synergy or symbiosis. Where water flows through a furrow to feed vegetation, the flowers animate the furrow in as much as the furrow animates and articulates the flower. Such is architecture and the environment - it communicates with the environment and animates it through its presence and that which it allows through. Where the properties of the environment are made to animate and compliment the architecture in as much as the architecture animates and compliments networks and systems within its environment,

THE ARCHITECTURE OF THE NEAR FUTURE

In his manifesto for architecture (boiteaoutils.blogspot.com, 2009), Nic Clear delivers a 21-point philosophy outlining a theoretical premise with which to produce and engage with architecture. The author adopts four of these in his theoretical premise:

The Architecture Of The Near Future will not be a thing. It will be many wondrous and complex things - it will be inclusive and non-hierarchical, it will be about creating narratives that celebrate diversity and difference.

The Architecture Of The Near Future will redefine aesthetics and good taste; the hegemony of morality, hygiene and functionality will be re-imagined as a playful intersection of the impossible, the improbable and the dirty.

The Architecture Of The Near Future needs to re-capture the speculative and the imaginative aspirations of earlier utopian movements without becoming mired in the internecine squabbling and neurotic formalism that plagued such tendencies.

The Architecture Of The Near Future will be fun - play should be at the heart of the creative processes that inspire all architecture. We have reached a point where we understand the typological and programmatic issues that underpin the banalities of production. However, we have lost a sense of purpose and joy that should be at the heart of every project.

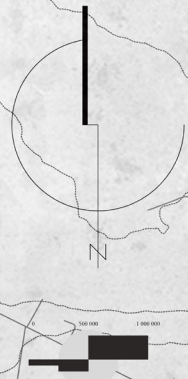
5

BELA-BELA

URBAN CONDITION, URBAN VISION AND URBAN FRAMEWORK

“A town thriving on its natural resources”

Chapter 5 Bela-Bela: This chapter outlines the author’s mapping of the urban environment around the nucleus by analysing the liminality of the location, and introducing the site on the north-eastern boundary of the resort. An urban vision is proposed concluding the mapping that intersects with this liminality. An urban framework for development in and around the nucleus of Bela-Bela concludes the chapter.



LIMINALITY

“Liminality is a topographical issue. It indicates the hovering on a boundary, an in-between place; or two or more spaces and their cross-over points, communication links, connecting doors” (Binet et al., 2001: 348). Liminal, derived from the Latin word *limen* (meaning, “a threshold”) (Simpson and Weiner, 1989), relates to an in-between condition during a ritual where there has been a shift from the pre-ritual status, but not having reached the end state yet. The liminality of a location is thus that transience of people in between conditions and components that the locality witnesses. It is this liminality that the project proposes to tap into to create urban and rural linkages between components and conditions.

BELA-BELA AS TOURIST DESTINATION

The Bela-Bela region flourishes as an eco-tourism destination (IDP: 2014; 14) with its tourism sector contributing approximately 26% to its local economy (IDP, 2013: 112). With more than a million visitors annually (Graham, Herrman, 2003: 54), the Forever Resort is the primary economic stimuli to urban Bela-Bela. The Forever Resort hosts a wide range of recreational water and eco-tourism facilities. It furthermore hosts a range of accommodations, from camping in the outdoors, to the comforts of the hotel. It resembles a microcosm of a town, within a nucleus of a town, dedicated to recreation

BELA-BELA AS AN AGRICULTURAL- RURAL- AND ECO-TOURISM CENTRE

Bela-Bela presides over fertile soil conditions (Fig.) (IDP 2013/2014: 125), which has traditionally been used in the cultivation of citrus, cattle, mielies, sunflowers and wheat. The fertile soils, along with favourable weather conditions, make it an environmentally rich locality that posits great opportunity for new environmental initiatives to arise.

Bela-Bela also forms part the greater Waterberg region that has been named a UNESCO biosphere reserve, and is surrounded by Eco-Tourism initiatives. Major transportation routes extending into this environment enfolds the resort that bares witness to the fleeting tourism. These routes link the airport, located to the south of the town (in close proximity to the nucleus), and the major metropolis of Pretoria and Johannesburg with the natural hinterland to the north.

Figure 5. 1
Bela-Bela
(Author, 2015)



Figure 5. 2
Bela-Bela urban edge
(Author, 2015)

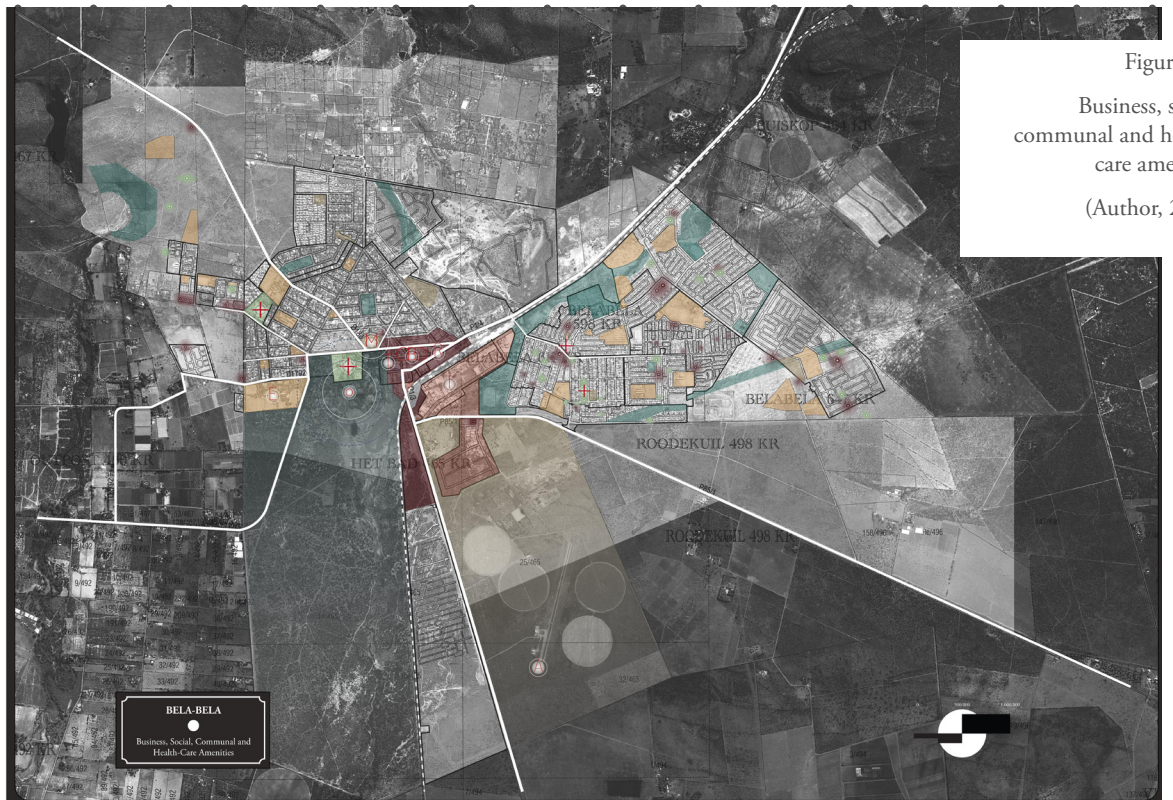


Figure 5. 2
Business, social,
communal and health-
care amenities
(Author, 2015)

BELA-BELA AS URBAN RESIDENCE

In 2013, the population of Bela-Bela was estimated at 66 500 and had increased from 2001 by 27.6% (IDP. 2014/2015: 66). The resort's grounds, forming the nucleus of the town, are ringed by all different types of land usage (Fig), ranging from industry to the southeast; the CBD and civic to the east and north; Residential to the west and north-west; and rural to the south and southwest. Beyond this fragmented radial, Residential development sprawl outwards and informally over urban peripheries (Fig). The dilapidating and segmented urban core causes fragmented development around the peripheries of the town (Fig). This perpetuates a segregated development of social and racial classes that Apartheid planning instilled. The central transit interchange, the taxi rank, also borders the resort to the east enveloped by semi-private parking spaces.

BELA-BELA AS A LEARNING CENTRE

Urban Bela-Bela hosts 13 schools (IDP. 2014: 88). The Sondela Academy offers tertiary training within Tourism (Guiding and Hospitality), Nature Conservation, and Technical Courses (IDP. 2014: 84). Similar academies, such as the Lapalala Wilderness School exist within the extended Waterberg districts. The Toowoomba Agricultural Research Station is located on the urban edge of Bela-Bela and provides valuable environmental research on the area.

BELA-BELA AS A HEALTH CENTRE

The municipal area of Bela-Bela is currently serviced by two hospitals, six clinics and two mobile clinics (IDP. 2013: 153). The hospitals are situated around the heart of urban Bela-Bela, while the warmbaths provincial hospital is located bordering the fountain. Apart from this, there are also the baths. Due to the water's medicinal and mythical properties, these are frequented by many for its health-restoring properties (Graham, Herrman, 2003: 54).

Figure 5. 3

Urban transactions around the nucleus of the town

(Author, 2015)





EXISTING
CONDITION
•

SITE

LIMINALITY

Transportation infrastructure rings the boundary of the resort. At the north-eastern boundary, major vehicular routes that diverge into the environment ring the site. The CBD rings the resort to the northeast, with a commercial presence to the east and a civic presence to the north. This site is bordered off from the town by a wall and silently witnesses the liminality of the *place*, the fleeting tourism, and the local population in and about their town.

DIALECT

This site is located on the irresponsive boundary of the core of the *place*. This boundary, in its current form, deters links and a dialect from happening between conditions and components of the larger environment. The site thus presents the opportunity to facilitate and enable connections between urban and rural conditions and components through a responsive and connective intervention.

URBAN TRANSACTIONS

The energy and transactions of the town weigh heaviest in the CBD that rings the recreational core to the east and northeast. Though, this energy remains stagnant due to the insular resort and a preference in peripheral investment that results in an unresponsive inner core and a subsequent deteriorating public realm. Through insertion of a new condition, the core is proposed to become reactive with new opportunities for investment arising in and around the nucleus of the *place*.

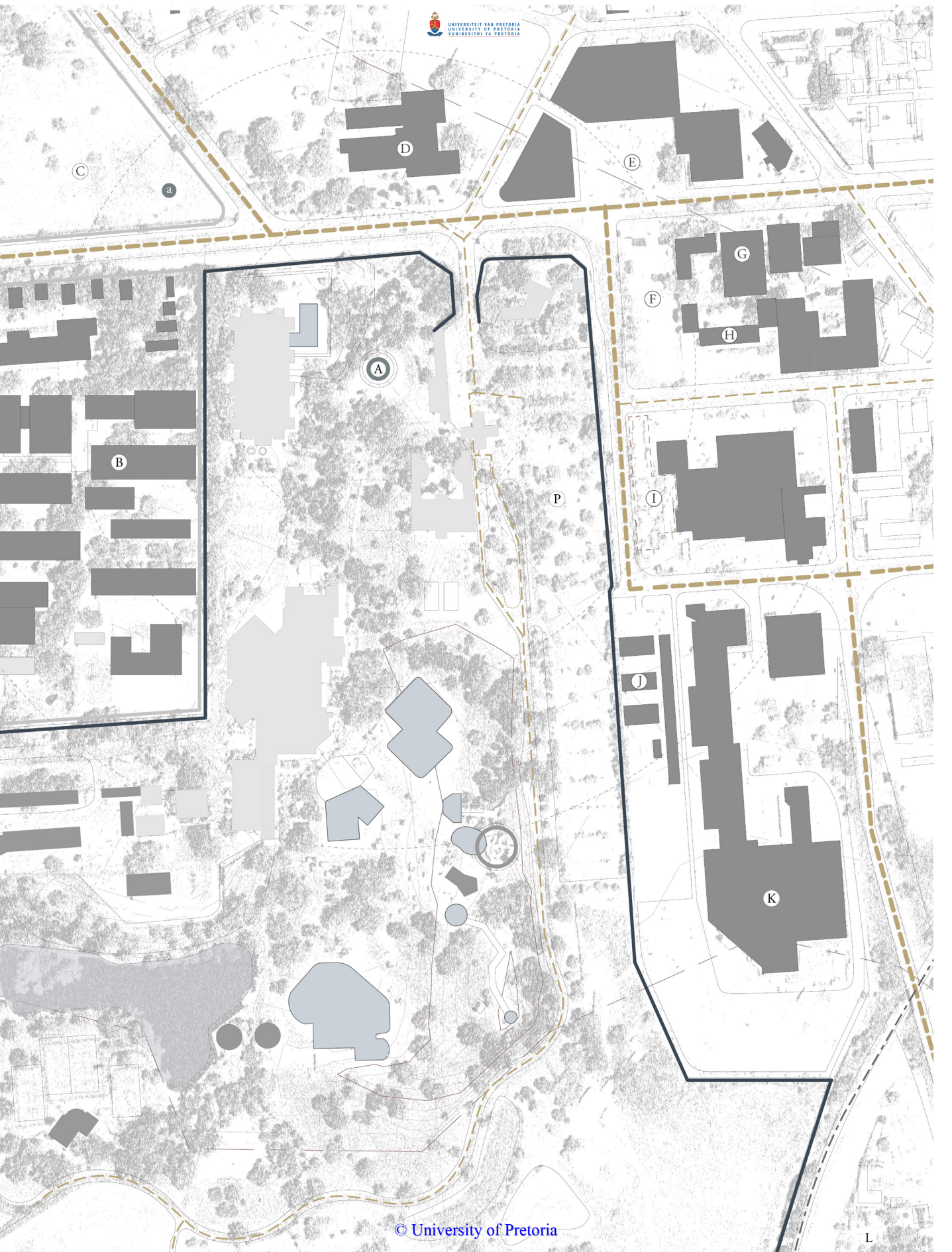
THE RESORT

The gardens around the ore of the fountain have traditionally been public grounds. The project proposes the reinstatement of these as fully accessible public grounds where from the Hydro, the garden pools, the hotel, the hospital, the proposed intervention and those of the urban framework could be individually accessed. The individual operation of these various facilities and their grounds allow the public realm to extend in-between them. It also encourages the acceptance of a mutual responsibility in the upkeep and safeguarding of this environment.

Figure 5. 4

Site

(Author, 2015)



- A: The Warmbaths fountain
- B: Bela-Bela provincial hospital
- C: Multiple residential zoned plot
- D: Bela-Bela municipality
- E: Shopping complex
- F: Vacant plot wit car sales
- G: Commercial enterprises extending along the street
- H: Hotel, cabanas, restaurant and bar
- I: Informal craft market
- J: Taxi rank
- K: Shopping mall
- L: Commercial sales and the Waterfront to the south

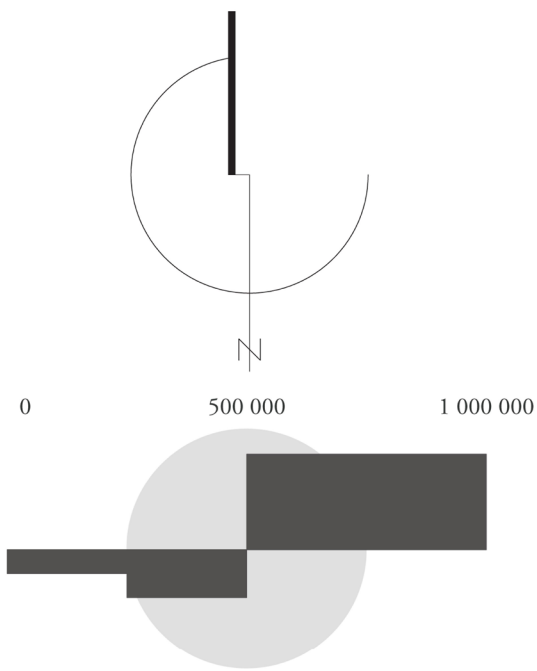


Figure 5. 5
The enveloping town
around the resort
(Author, 2015)



Figure 5. 6
The ski-boat dam to the south beyond the fence
(Author, 2015)



Figure 5. 7
The wall between the parking of the mall and the resort
(Author, 2015)



Figure 5. 8
Resort parking
and site
(Author, 2015)



Figure 5. 9
Boundary between
resort parking and
taxi rank
(Author, 2015)



Figure 5. 10
Taxi-rank
(Author, 2015)



Figure 5. 11
Looking north from
the taxi rank. The
informal market on the
right and the resort on
the left
(Author, 2015)



Figure 5. 12
The wall
(Author, 2015)



Figure 5. 13
Looking east on Chris
Hani way with the
resort entry to the right
(Author, 2015)



Figure 5. 14
Looking west on Chris
Hani way. The resort
and hospital on the left
(Author, 2015)



Figure 5. 15
The boundary wall and Hydro beyond
(Author, 2015)



Figure 5. 16
The municipality
(Author, 2015)

AN URBAN VISION

THE URBAN COMMONS

To mediate the fragmented condition, the project proposes a framework that aims at re-stitching the central core of the town and the socio-spatial hierarchies that determines access to opportunity. It furthermore aims towards instilling a relationship between urban development and the natural splendour to promote an inter-changing animation as a theme within the town.

The project proposes a spatial layer over the violent collisions where the various land usages meet the unresponsive wall of the resort. This new condition is zoned for public facilities, urban landscaping and infrastructure that reaches into the environment along transportation linkages.

The agenda for the commons is to become a threshold device that communicates the dialect of local and global conditions; to create and facilitate new urban 'transactions', narratives and opportunities; and to stimulate an urban condensation towards the core that deters urban sprawl from spreading onto the productive, and naturally rich, rural environment.

REVEALING AND FUSING THE LANDSCAPE

The Project proposes the *monumentalisation* of the natural landscape and its inherent beauty, so as to promote a harmonious *dwelling* amongst it. The project suggests that the fountain and the central gardens of the town be liberated, and to become public grounds once again. By making the natural beauty 'visible', a dialect is created with the extended rural environment that transverses the urban fabric.

The vision concentrates on the abrupt condition between the urbanity of Bela-Bela and the gardens, fountain and resort located at the Nucleus of the town. The project proposes that the urbanity of the town and the natural environment be fused so as to allow the two, through architecture and infrastructure, to animate and complement one another. New relations can then be born between urbanity and the rich rural environment. The fusion serves as a theme to the urban framework and is proposed to become the theme for future development.

ACCESS

New transportation nodes are proposed, which reconfigures the existing transportation system. It is aimed at optimising access to and from the commons, and also pedestrian movement within. The project also proposes that semi-private parking spaces be conjoined, to upgrade this space with mutual investments, and to intertwine these with proposed and existing public spaces.

TOURISM AND THE TOWN

Tourism to the town is proposed to extend beyond the borders of the resort, back into the town grain. The reinstated public gardens, along with the urban framework and the intervention, aim at stimulating a fusion between tourism, local culture and local commerce.

Figure 5. 17
The Urban
Commons
(Author, 2015)

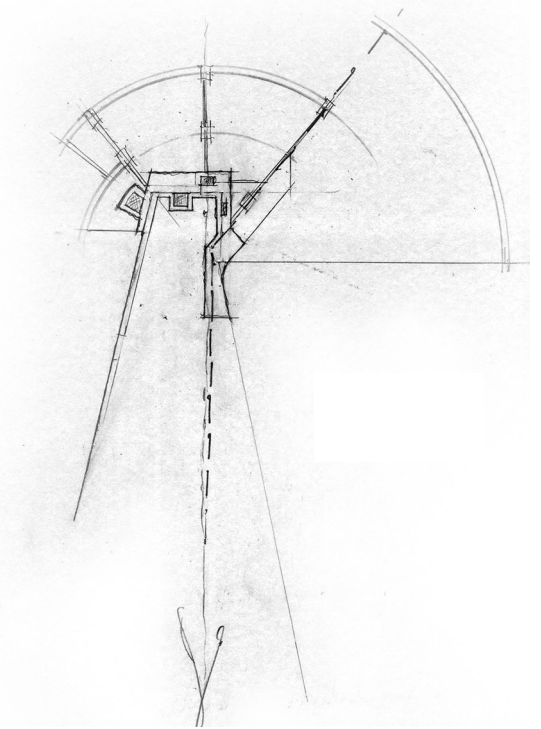


Figure 5. 18
A spatial relationship
between the nucleus
and the natural
environment that
traverses the town's
grain
(Author, 2015)

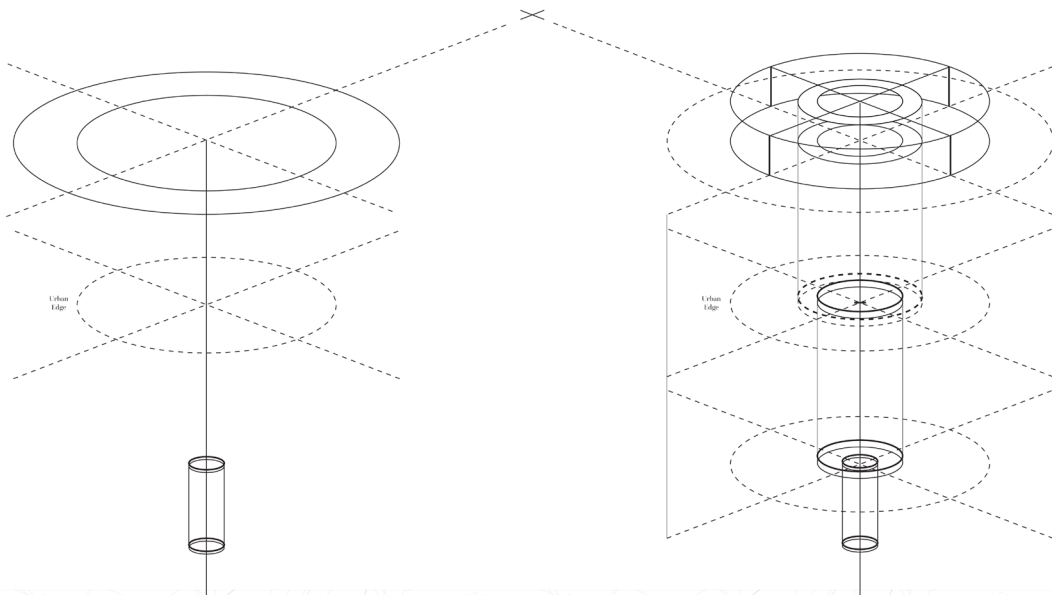
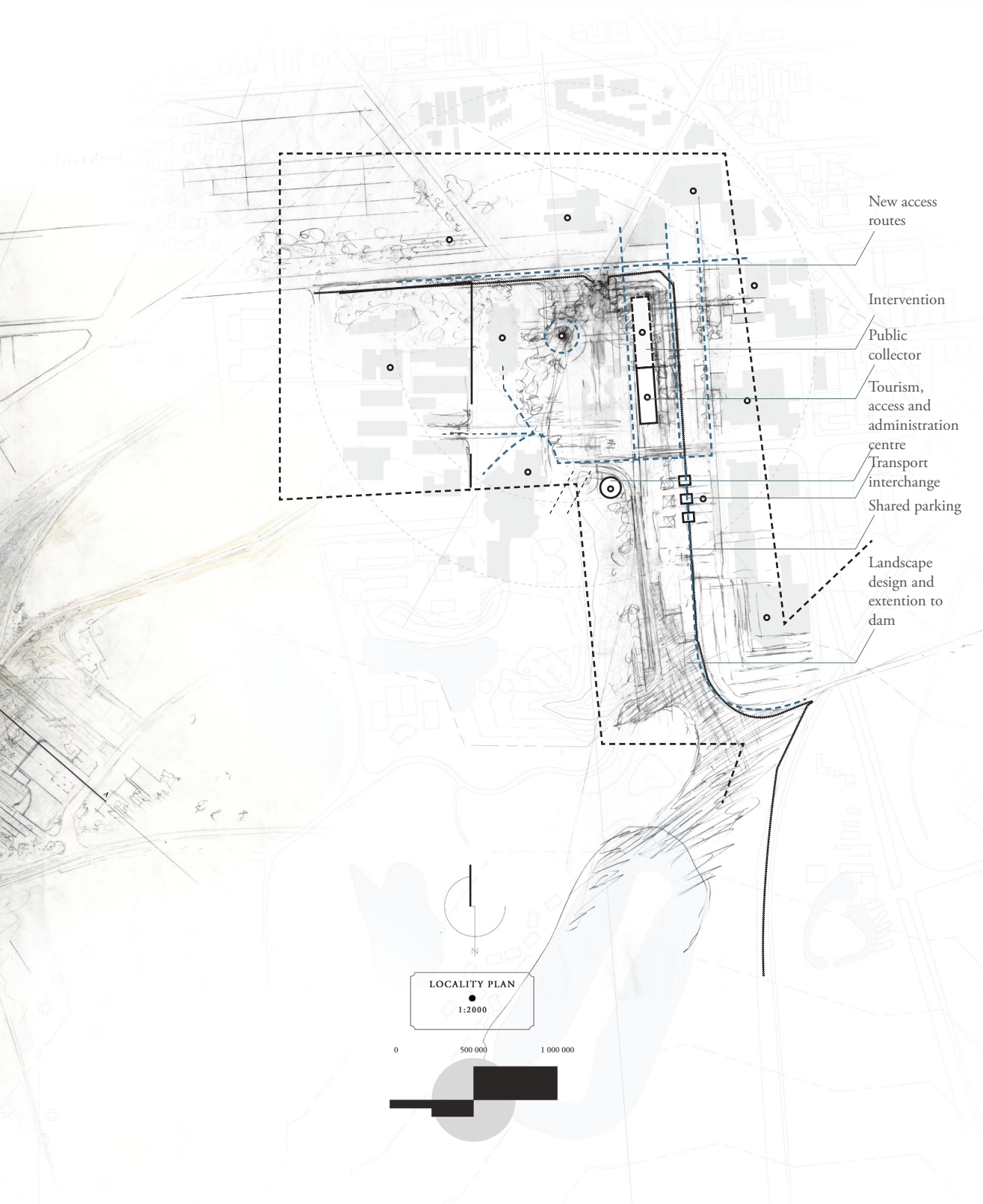




Figure 5. 19
Urban framework
design
(Author, 2015)



New access routes

Intervention

Public collector

Tourism, access and administration centre

Transport interchange

Shared parking

Landscape design and extension to dam

LOCALITY PLAN
1:2000

0 500 000 1 000 000

URBAN COMMONS

AN URBAN FRAMEWORK

THE 'WALL'

The wall enveloping the facilities is proposed to expand into a new public spatial layer that mediates between the resort and the urban condition. The gardens to the north are proposed to become publically accessible from where the Hydro; the southern gardens with water facilities; the hospital; the hotel; the urban design and the intervention are accessible. The intervention and urban design becomes the mediator to this condition. This reconfiguration defines the access into and around the resort and thus challenges existing fabric that determines the current condition. A heritage assessment of these structures are included concluding this chapter.

THE TRANSPORT INTERCHANGE AND SHARED FACILITIES

A centralised transport interchange is proposed where the current taxi rank is located. This facility is proposed along with a new, shared parking complex for the shopping centre and the resort. Due to its close proximity to other transit interchanges (such as the airport in the southern part of the urban edge), it allows for optimal access into the environment and makes global conditions local. It furthermore aids in representing the natural landscape, and acts as an urban condenser in terms of access to opportunity. The sharing of parking facilities enables sharing in the design, construction and maintenance of these facilities. These facilities intertwine with the commons through a boardwalk design alongside the water landscape.

NEW ACCESS FACILITIES AND TOURISM CENTRE

The new tourism centre is proposed within the central gardens bordering the transport interchange and parking facilities. This facility interconnects with a new access control, administration and changing amenities that lead to the southern garden with existing water facilities. The clustering of these facilities conjoins tourism of the area with the resort and integrates with the proposed transit interchange to intercept the liminality that it accommodates.

THE PUBLIC COLLECTOR

An urban square in the form of a garden, with a fresh produce market and a craft market, is proposed to the south of the site. This creates an interchange between tourism and local culture, and is intended to serve as an anchor to local cultural endeavours within the urban grain that leads from there. It furthermore serves as public space for the residences of Bela-Bela and becomes another node to the narrative of the Everyday. This collector forms an extension to the intervention to the north through a greenhouse that extends onto the site .

THE "BAD SE LOOP"

The flow and the downstream drainage from the facilities at the fountain, traditionally known as *Bad se loop*, are still visible through retention dams that host recreational usage. Extensions to the ski-boat dam are proposed so that a portion of the resort resembles the original state of the terrain - a marshland. The visibility of the transformed landscape design, throughout the region and the town, enables an understanding of what the *place* is about. The metaphysical connection between the water from the fountain and tourism industry is also proposed through mineral harvesting from the water for the industrial land-usage that forms part of the commons. The design of a water feature, that makes visible the filtration system of the water, is proposed to link and animate the downstream transferral of the water drained from the site and the promenade.



Figure 5. 20
Framework
plan
(Author, 2015)

THE MUNICIPAL AND MULTIPLE RESIDENTIAL GROUNDS

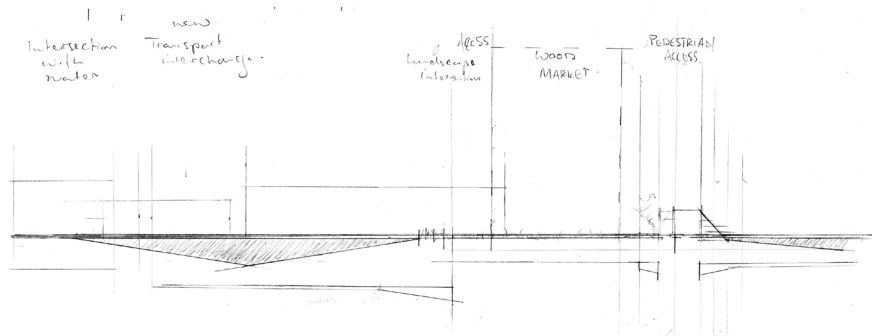
Through extending the landscape design, over the main road to the municipality and the open land to the west, the grounds, zoned as Municipal and as Multiple Residential, gain a relationship with the urban centre and recreational facilities. New Tourism-Residential, Residential and Commercial Mixed-Use developments set in the urban park, is proposed to the west, which conjoins with reformed municipal facilities and grounds.

THE PROMENADE

A promenade is proposed that envelops the eastern boundary of the site. It is proposed as articulated pathways and connects between all these interventions and the existing urban fabric. Where it meets the site of transport interchange and, it diverges into routes that extend over the site and interconnects the site with the nodes and conditions around it. This promenade form an integral component to the transit interchange in order to create new associations between remote localities and the nucleus and fountain.

SITE SECTION

B-B



SITE SECTION

A-A

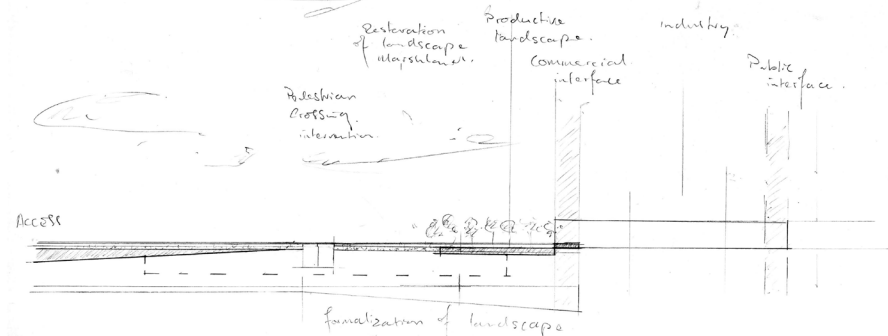


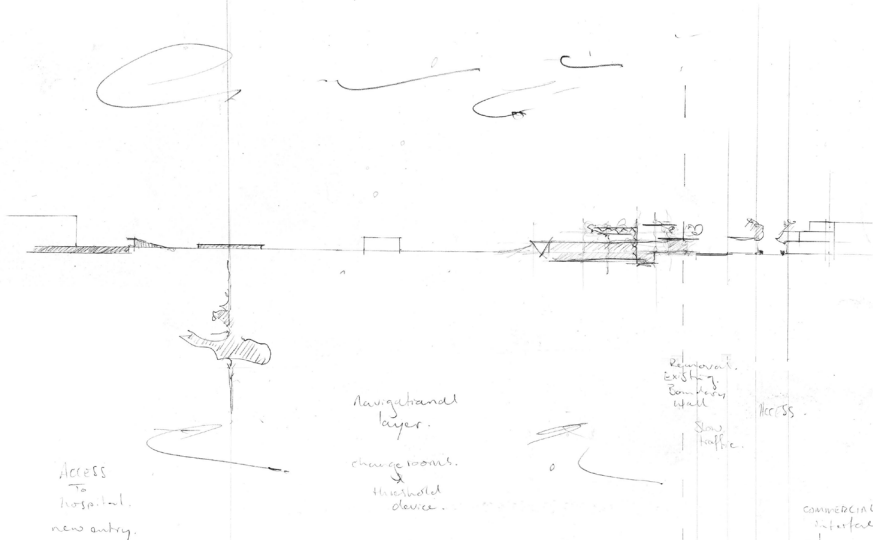
Figure 5. 21

Urban framework:
Section
development

(Author, 2015)

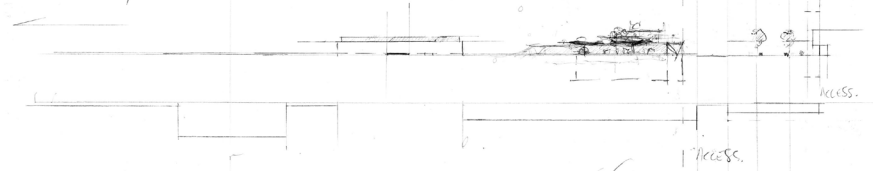
SITE SECTION

F-F



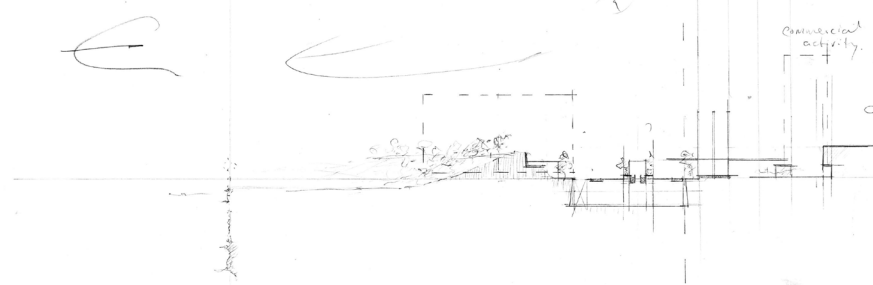
SITE SECTION

E-E



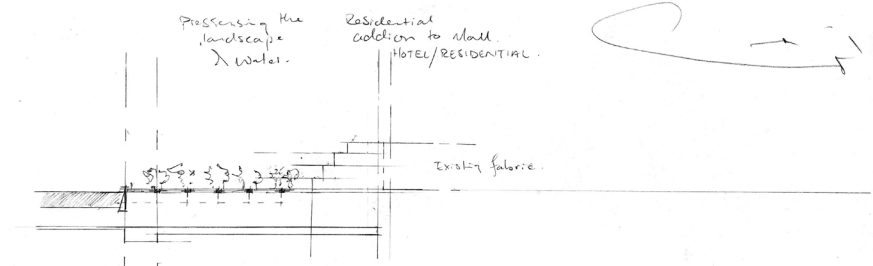
SITE SECTION

D-D



SITE SECTION

C-C



HERITAGE ASSESSMENT

THE RECEPTION AND OFFICES

This building was designed a part of the perimeter condition to the new Hydro spa centre by Jan Bosch and Partners architects 1974. It accommodates the resort's reception offices and conjoins with the with the vehicular entrance gate.

The building, less than 60 years old, is constructed of the same materials as that of the Hydro and represents thae same undulating brick skin though it is not used for the same purpose. This building merely serves an administrative function and has no cultural significance or other special value for the present and future community.

The project proposes the re-scripting of access and movement at the nucleus condition and thus proposes that the building be demolished so new relations can manifest with the re-instated public gardens and fountain.

HOUSE FOR THE SUPERINTENDENT

This building was designed at the northeastern boundary of the resort to house the superintendent to the facilities. Designed by K. J. Richards, in 1965, the structure is of no architectural or cultural significance and is less than 60 years of age. It still serves as residency to staff of the resort by is located fronting the CBD of the town.

This edge is ringed by major vehicular arteries extending into the environment and is proposed as catalytic site for the intervention which aims to mediate a relationship between the urbanity and the central gardens.

THE CHANGING FACILITIES

This building serves as changing facilities and pedestrian access control into the garden pools and facilities. This building dates out of the period when facilities were formalised at resort but has seen many additions and alterations to it. It once flanked the main pool located south of it as the changing facilities flanked the axis extending from the gardens to the north, to the centre of the loggia. Later, an addition of a tearoom was constructed on first level which was subsequently demolished years later.

The building has been a major determining factor of development at the resort but has lost its initial purpose and is amended to in function by changing rooms closer to water facilities. All the facilities and structures that once conjoined with this building have been demolished along with the initial pool. The project proposes the reinstatement of the northern gardens to public and the rehabilitation hereof as this cultural value transcends the value of the structure.

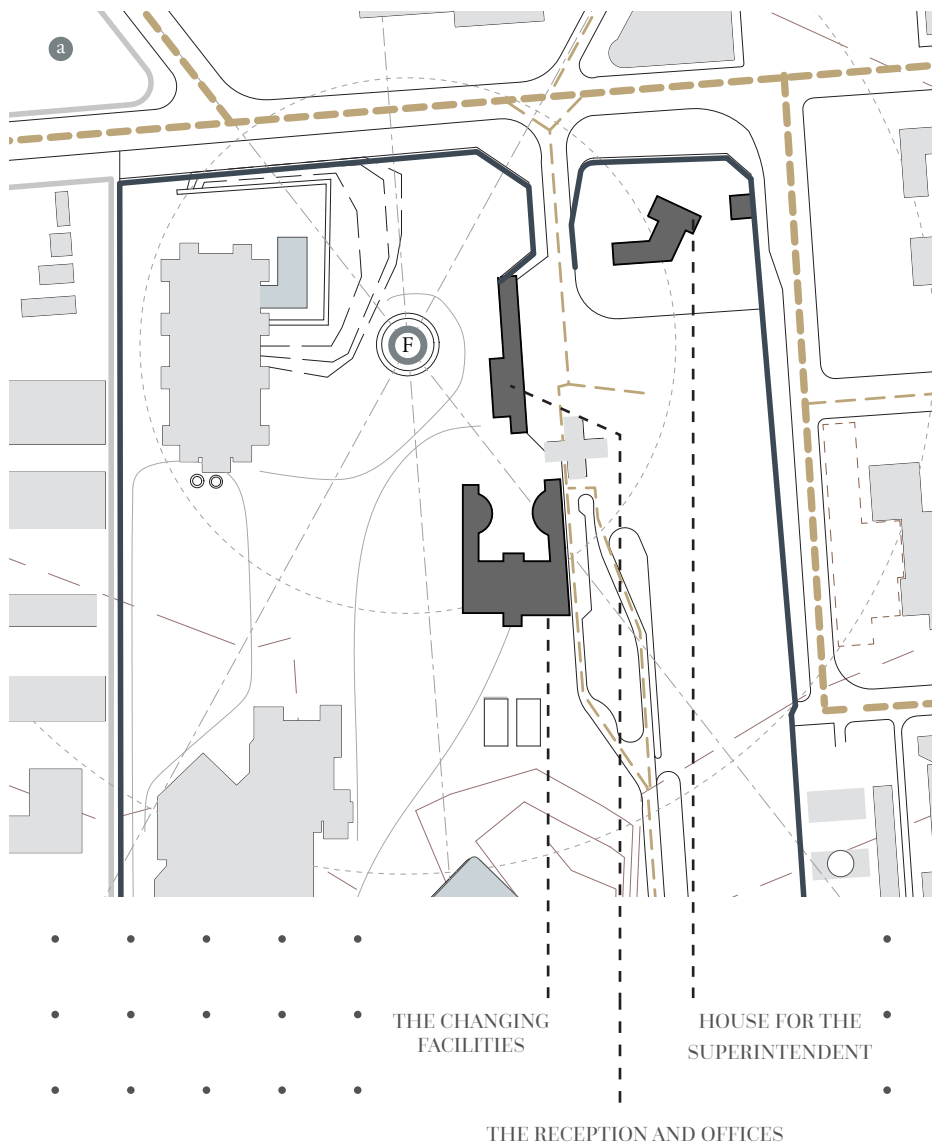


Figure 5. 22
The proposed
structures to be
demolished
(Author, 2015)

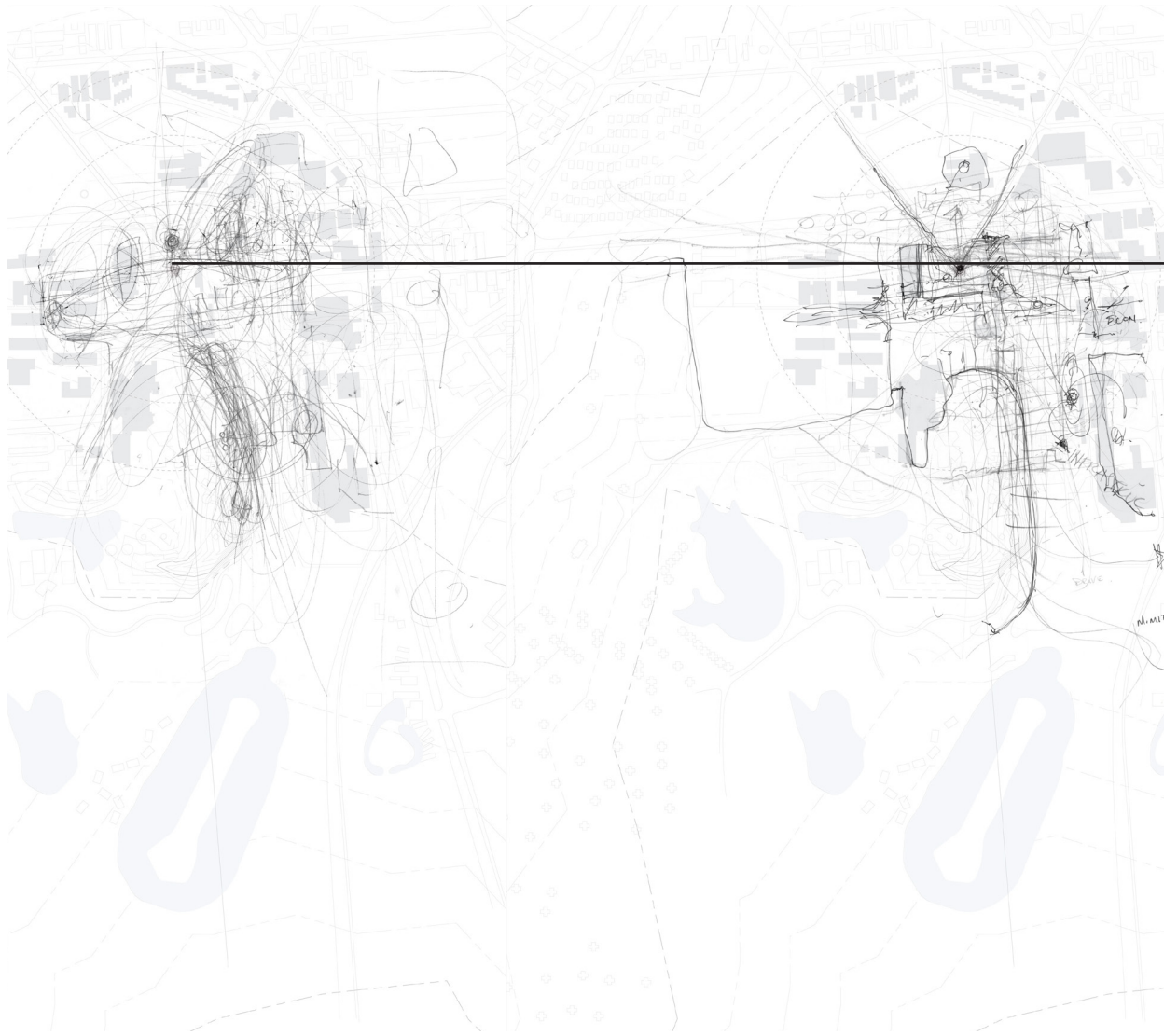


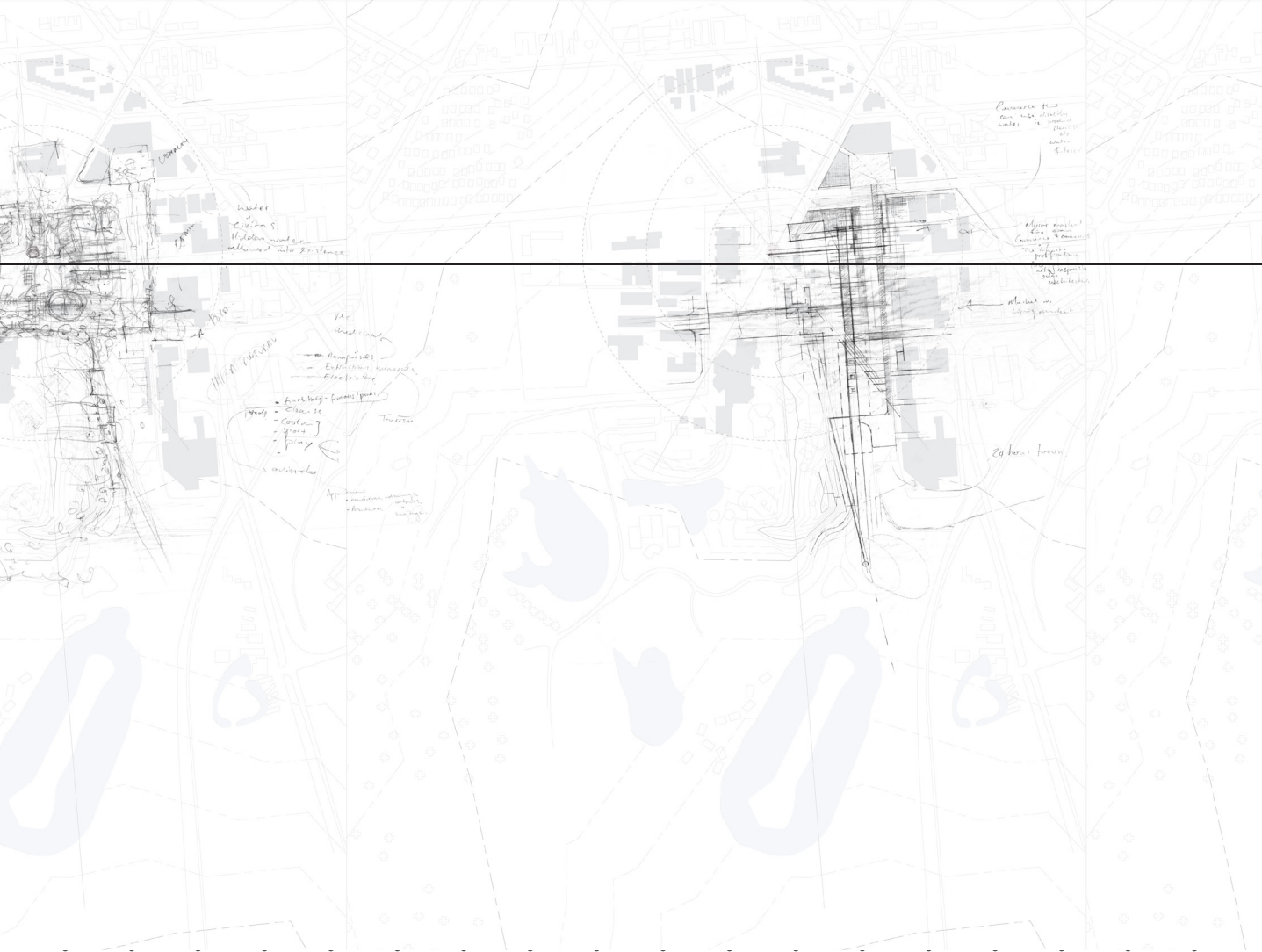


Figure 5. 23
House for the
superintendent
(Author, 2015)

Figure 5. 25
The reception
and offices
(Author, 2015)

Figure 5. 24
The changing
facilities
(Author, 2015)





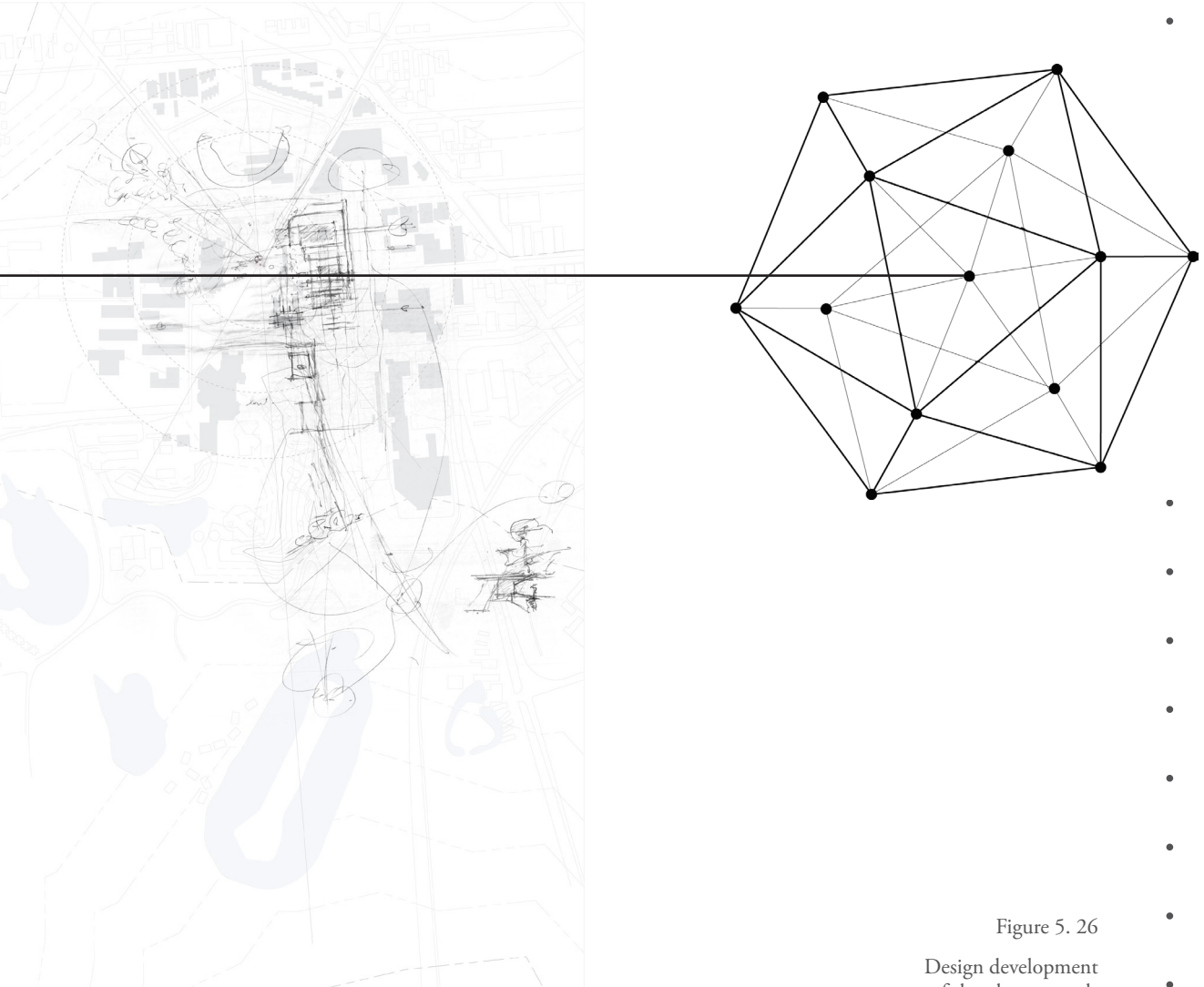


Figure 5. 26

Design development
of the plan: towards
an integration of
conditions and
components

(Author, 2015)

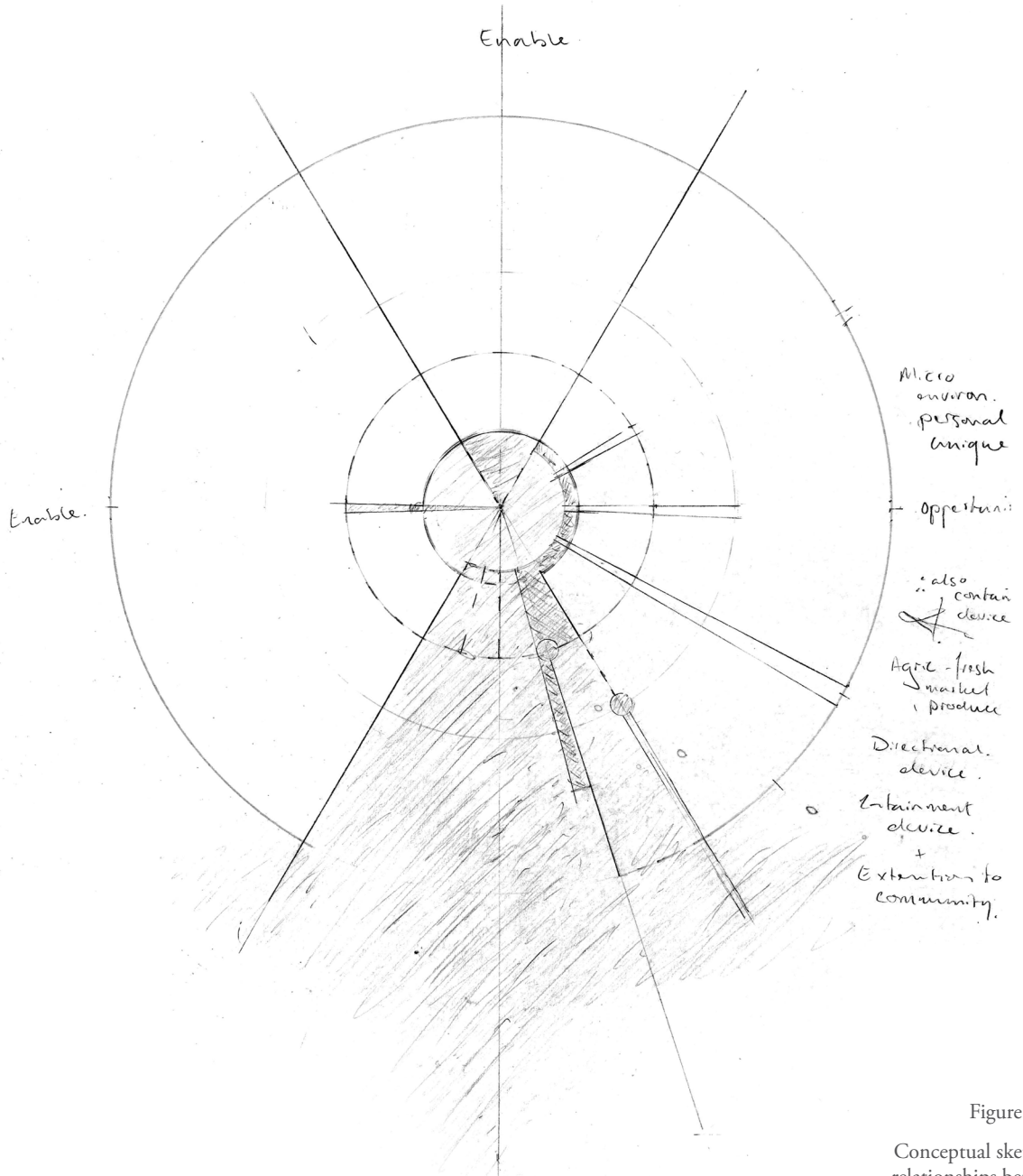


Figure 5.27
Conceptual sketch of relationships between the commons and the enveloping environment
(Author, 2015)

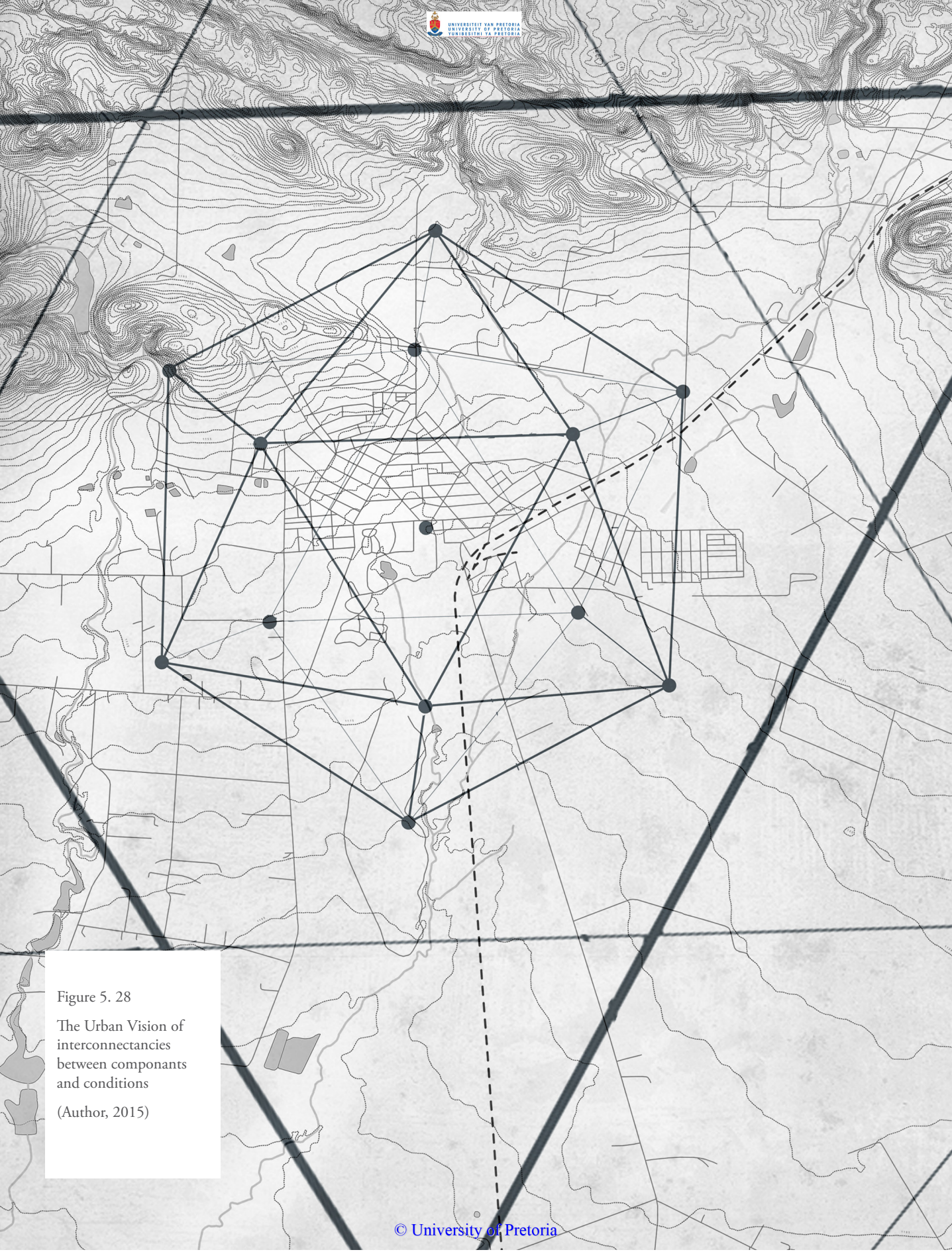


Figure 5. 28

The Urban Vision of
interconnectancies
between componants
and conditions

(Author, 2015)

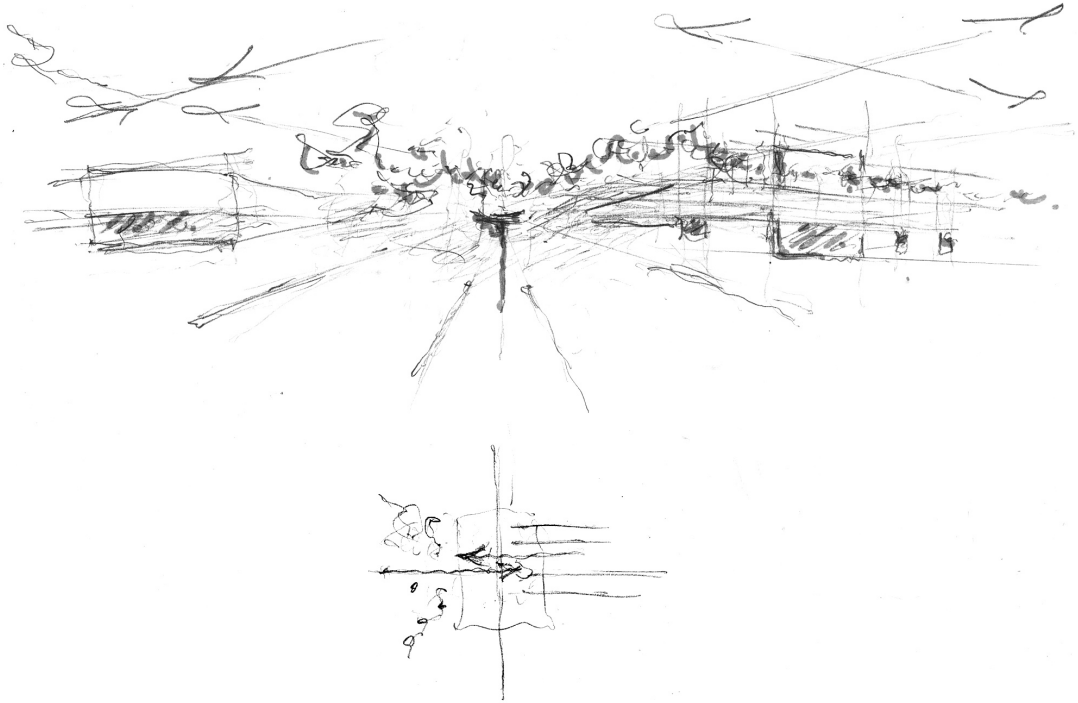
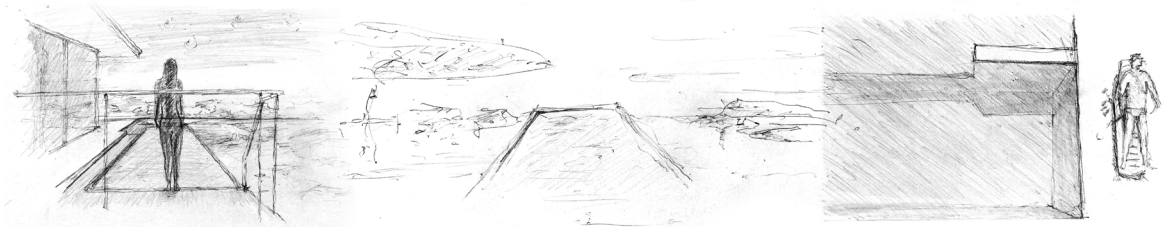
6

INTERCHANGING ANIMATION

ARCHITECTURAL CONCEPT AND PRECEDENT STUDIES

Conceptualising an Architectural “Threshold Device”

Introduces the concept of the intervention as ‘threshold device’, which allows an interchanging animation between components and conditions of the place and environment. Precedent studies and their respective influences are described where after ‘Sensory Architecture’ is presented as the spatial theme and narrative to the intervention. The author draws from concept and the liminality of the location to produce a programmatic response to the site.



AN ARCHITECTURAL THRESHOLD DEVICE

“Cities consist of many components that are ‘in motion’, that have speed, that evolve. An action in a city – the insertion of a building, law, or infrastructure - intensifies or diminishes these components and their developmental processes. Acting in the complex dynamics of cities requires the insertion of a singularity, a new condition, a rupture, which encounters existing components ‘in motion’ and harnesses their potential” (Binet, Bunschoten and Hoshino, 2001: 348).

Bela-Bela was conceived as a Garden City to which the urban grain and the central gardens were integral components. Through the process to complete privatisation, the fountain and the central gardens have lost an internalised dialect with the urbanity and extended environment of Bela-Bela, a wall and a fence being the division between the urbanity and its origin.

The device inhabits the ‘wall’, the segregating condition that divides the town and its essence and becomes a remedial, or threshold device. A threshold device invites urban (and other) components into its structure and links them with elements of other conditions (Binet et al., 2001: 348). It links and brings together existing local components and potential local or global conditions (Ibid: 348). The device becomes a spatial and programmatic linkage between the urban and rural components and conditions of Bela-Bela. By referencing and including global conditions, such as the Savanna Biosphere Reserve, the Waterberg vegetation, and the fountain, and making them local, the device allows synergies to exist in-between urban and rural components and conditions.

Figure 6. 1

Conceptualisation of the intervention on a threshold. The intervention mirrors the Hydro to reinstate a relationship with the nucleus but is turned ‘outwards’ to negotiate with the context

(Author, 2015)



THE FOUNTAIN
•
Design Concept

INTERCHANGING ANIMATION

The device enables the re-stitching of a dialect between conditions and components of the greater environment and creates an opportunity for counterparts to animate one another and become extensions of each other. It enables an interchanging animation between architecture and environment, and between the *everyday* and the extraordinary of the *place*, and subsequently interlinks these. This interchanging animation between conditions and components hosted in the device, guides the spatial organisation, form and articulation thereof.

ARCHITECTURE AND ENVIRONMENT

Through architecture and intervention, existence creates symbiotic relations with the natural environment. It allows the inherent poetics of the natural environment to be made visible, to be heightened and harnessed and to animate the sensory being's milieu. Water from the fountain and subterranean bodies, and components from the natural landscape - the Savanna and Waterberg vegetation - are invited into the architectural space and harnessed at the heart of the intervention to create this symbiotic relationship. The device entices the sensory being to intersect with this interchanging animation between the water and the natural landscape, while the metaphorical ascent of this action allows the properties of both to animate the intervention's urban edge. The device engages responsibly with the natural elements to promote its preservation, and foresees our immanent existence and symbiosis with nature.

THE EVERYDAY AND THE EXTRAORDINARY

The context provides a case where recreation lies at the physical and metaphysical core of the *place*. The device intertwines these so that the *everyday* events, and subsequently, the urbanity of the *place*, overlaps with the poetics of the fountain, the central gardens, and its associated facilities. Recreation, bathing, and swimming are thus restored as an integral part of the *everyday* of Bela-Bela.

The architecture unfolds rhythmically to form scales and modes over which the being engages with the poetic properties as well as revealing it. At the one end, it animates and becomes a part of the spaces that host the rituals and events of the *everyday*, while at the other, animates, encapsulates and inhabits the spaces for recreational usage and bathing. The dynamic narrative –the loggia and the oculus – defines privacy and scales of engagement between the *everyday* and recreation, which allows the animation of space to transverse levels.

URBANITY AND ENVIRONMENT

Through architecture, urbanity has the means to engage with the natural environment in a sensible and sustainable manner. The properties of the natural landscape and those of the water are allowed onto the urban edges of the intervention to animate, articulate, and service these. An interchanging animation is set in motion and acts as the theme for a central redevelopment of Bela-Bela. This can be used to promote the densification and rehabilitation of the inner core that could, amongst other things, reduce urban sprawl over productive land.

Figure 6. 2

An Interchanging
animation through
architecture

(Author, 2015)

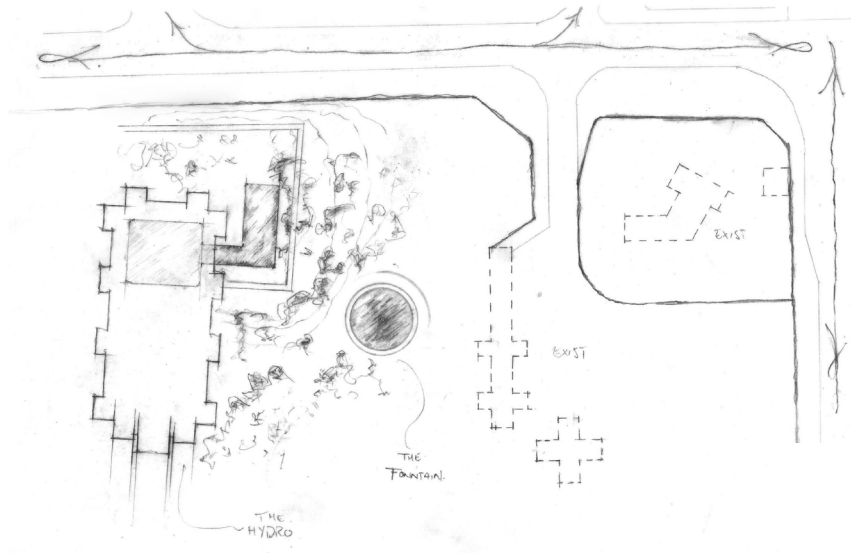


Figure 6. 3
The Site in its current
condition
(Author, 2015)

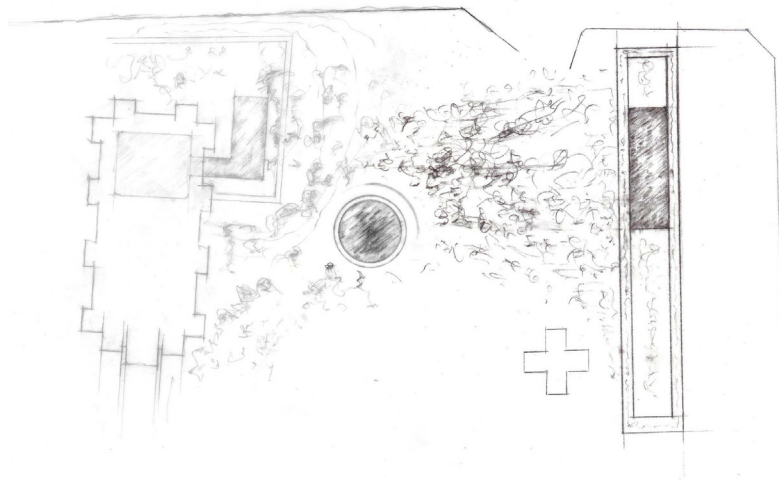


Figure 6. 4
The positioning of
the water from the
fountain and the
natural vegetation in
a relationship on site
(Author, 2015)

PROGRAMMATIC INTENTIONS

RECREATION

The intervention is to host recreational water facilities, to add to the inventory of the resort. A lap pool, a 'public' bath pool, steam rooms and saunas are served by fountain water, while they share relations to a semi-enclosed gym. Dressing, ablution, reception, foyer and administrative facilities are included for these. The building and the landscape are proposed to morph together, in order for the building to become an extension of the gardens and other clustered facilities surrounding the gardens. The independent operation of clustered facilities creates a joined concern over the public gardens, as they front the mutual edge surrounding the gardens. A semi-private entrance to therapy rooms

CIVIC AND TOURISM

This project proposes the creation of a joint custody between private and public on the site and at the gardens. The intervention hosts a multi-purpose hall with a foyer/reception and gallery, set in an urban 'conservatory' or garden, for the use of the town and the resort, and also aids the lack of civic space. The building hosts a public floral greenhouse and nursery for the production of flowers and plants for wholesale, as well as a conservatory for indigenous vegetation from the region. It references the extended environment of Bela-Bela and becomes a referential device. Furthermore, the interventions host a managerial facility, in conjunction with the greenhouse and conservatory, which will contribute research to, and offer education in the field of agriculture and the conservation of the Savanna region. Ablutions service both this facility and the multi-purpose hall.

EVERYDAY

With the decommissioning of the 'wall', a range of facilities, including the intervention, animate the public park. The intervention fuses recreation and tourism with the public through a commercial and civic edge that fronts the eastern edge. It intertwines with recreation through a florist, a restaurant and a bakery with a coffee shop. These are serviced by a kitchen for both the restaurant and the bakery, and public ablutions. A fresh produce and craft market is proposed to intertwine with the gardens and to become an extension of the intervention through the greenhouse. Therapy and water therapy rooms amongst the pools are to be publically accessible from the eastern street edge through joint operation.

URBAN ANCHOR AND ACUPUNCTURE

By the creation of a new condition to the stagnant matrix of Bela-Bela, the intervention aims to serve as an acupuncture treatment to the region, and to facilitate new relations towards an integrated environment. It also aims to serve as the typology for new development at the core, through the interchanging animation between natural landscapes and urbanity.

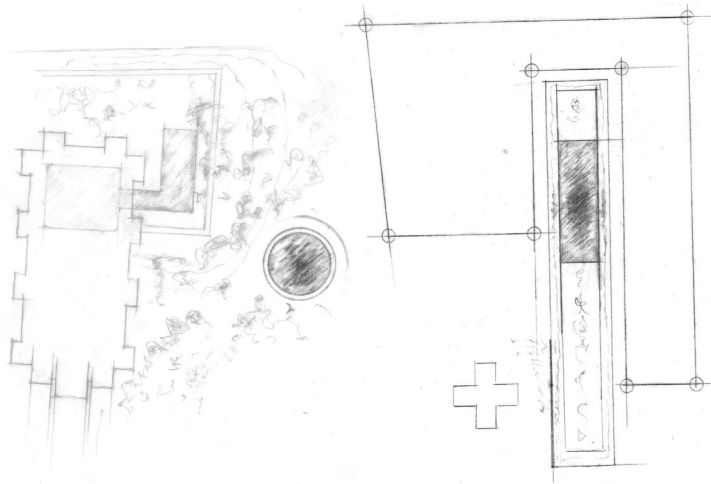


Figure 6. 5
The provision of an
urban edge
(Author, 2015)

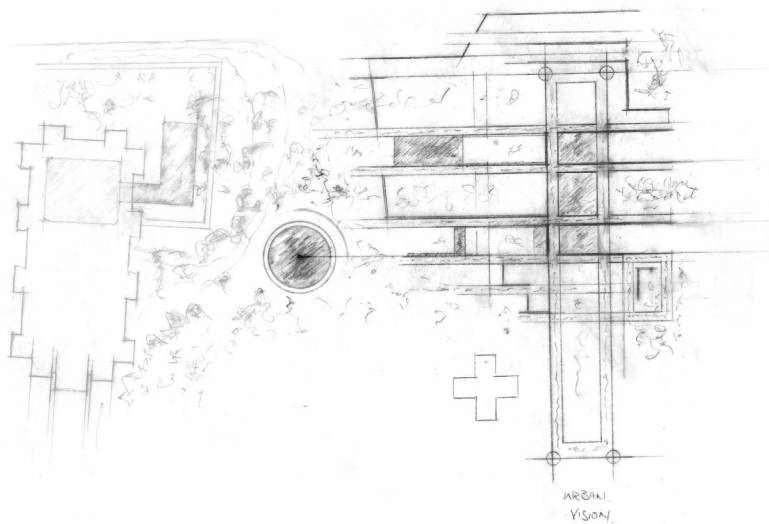


Figure 6. 6
An interchanging
animation
(Author, 2015)

PRECEDENT STUDIES

LES GRANDES TABLES DE L' ÎLE SEGUIN

(2011)

RESTAURANT, ÎLE SEGUIN, PARIS

CLIENT: LES GRAND TABLES

ARCHITECTS: 1024 ARCHITECTURE



The ephemeral scaffolding structure serves as a framework and encompasses an elongated rectangular wooden volume (Designboom, 2011). A translucent glass skin wraps the outer shell and becomes a glowing lantern at night (Ibid, 2011). This project can be described as a hybridisation between a greenhouse and a habitable space. It's tectonic structure, achieved by metal tube scaffolding “encompassed beneath a transparent umbrella”, as well as the suspended ceiling contribute towards its appropriation as habitation within a greenhouse (Dezeen, 2011). The natural landscape is allowed to become an extension to the enveloped space. By making the environment ‘visible’, and through environmental animation of the architectural space, an interchanging animation is set in motion. The structure serves as an architectural device that ‘assemblés’ the environment, as it invites the landscape into the structure, while allowing the public to intersect with its properties.

NAOSHIMA MUSEUM (1995-2006)

CONTEMPORARY ART MUSEUM,

NAOSHIMA ISLAND, JAPAN.

ARCHITECT: TADAO ANDO



The architect uses a small selection of materials and simple forms to blend the structure into the surrounding landscape. Three overlapping cubes and a circle with a rectangular guest wing form the building plan of the museum (arcspace.com, 2002). Ando's architectural style is translated into a microcosm of contrasting elements, namely past vs. present, wood vs. concrete and light vs. shadow (benesse-artsite.jp, 2015). The architecture ‘gathers’ the natural landscape into its structure, while mimicking it through the morphing of its structure. The annexed hotel rooms form an elliptical building surrounding a similarly elliptical inner impluvium. The courtyard mirrors the basin and allows circulation around it. An oculus allows daylight into deep spaces of unadorned concrete walls and, while retaining an uninterrupted relationship with the natural environment, envelops it.

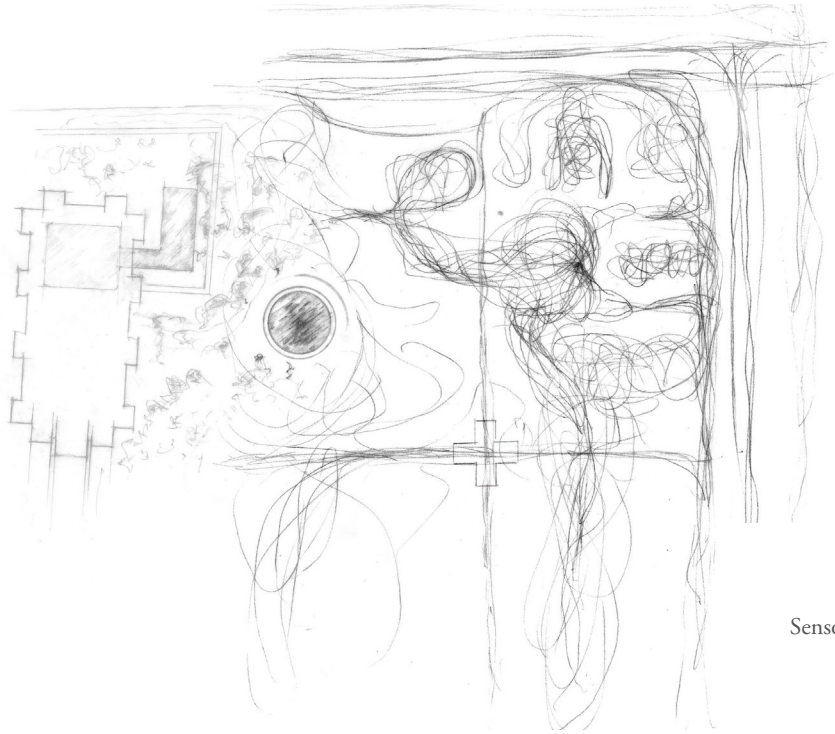


Figure 6. 7
Sensorial promenade
(Author, 2015)

NAMAN SPA, (2015)

DAY SPA RETREAT, DA NANG, VIETNAM.

ARCHITECTS: MIA DESIGN STUDIO



Consisting of 15 treatment rooms, this “oasis tranquillity” spa is renowned for its open air gardens and relaxing platforms surrounded by hanging natural vegetation. A large pool serves as an atrium space which is shielded by planting trails from the green roof, creating a vegetated screen around the water. Vertical landscapes consisting of various indigenous plants are created through the design of lattice patterns which allow sunlight to penetrate the interior space. Natural ventilation, along with this use of local plants, is carefully designed throughout the rhythmic facade screens. This serves to keep the building cool and create a healing environment throughout the treatment and exercise rooms. In this spa, nature demarcates the interior space as the network of vertical and horizontal sections that make up the facade are reflected into the building which in turn “softens the distinction between building and landscape” (Dezeen, 2015).

CHICKEN POINT CABIN, (2002)

WATERFRONT PROPERTY

ARCHITECTS: OLSON KUNDIG



The firm of kundig olson was created with the firm belief that buildings can serve as a bridge between nature, culture and people, and that inspiring surroundings have a positive effect on people’s lives (DesignRulz, 2012). The bulk structure frames a tectonic junction with the outside. This flow’s continuity is ensured by the creation of levels at this junction that mimics the exterior in its fragile form and intertwines the two spaces. This this project serves as form precedent the articulation of junctions between interior and exterior and urban and nature.

SENSORY ARCHITECTURE

A DYNAMIC NARRATIVE: THE LOGGIA AND THE OCULUS

The conceptual intentions necessitate that rituals of two polar activities be fused. To allow for a continuum in a reciprocal animation, the boundaries of spaces expand and allow nature and the water to inhabit these boundary demarcations and determine privacy. Where greater divisions of privacy are required, these demarcations expand further and deeper through interplay on different levels, to form a loggia, which is animated by the properties of the water and the natural landscape. The spatial continuum that overlaps the boundary is allowed to animate both spaces.

Along with the loggia, the courtyards are used to vary privacy and add rhythm to a theatrical unfolding of space. The courtyards become oculi that live outwards, towards the exterior; phenomena (such as steam, fountains and water circulation), arising and ascending from the central “interchanging animation”, are allowed to animate peripheral spaces of the intervention that become thresholds to the context.

ARCHITECTURAL AND THE SENSORIAL PROMENADE

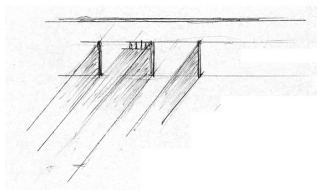
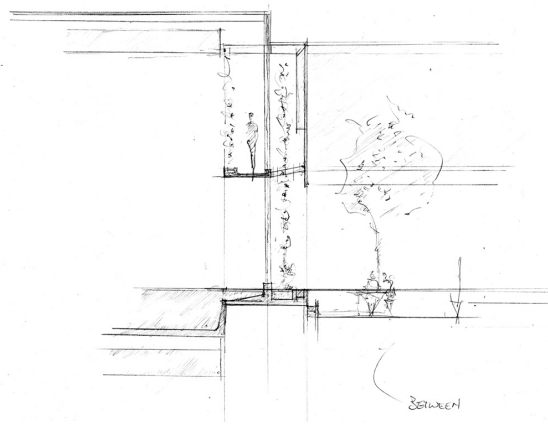
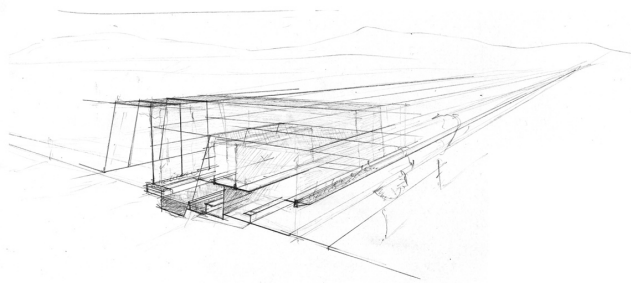
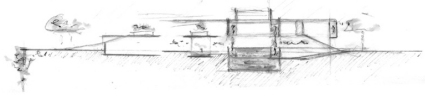
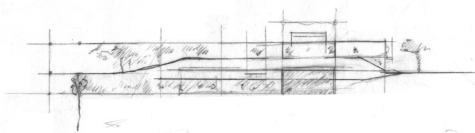
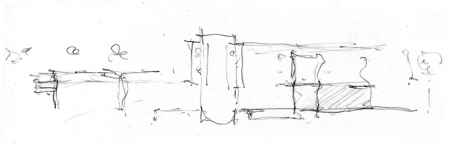
Le Corbusier describes the sculptural unfolding of space along his acclaimed ‘architectural promenade’ through where you enter the space: “The architectural spectacle at once offers itself to the eye... perspectives develop with great variety, developing a play of light or making pools of shadows” (Le Corbusier, Jeanneret, 1995: 60).

The architecture of the threshold device unfolds theatrically and opens up or encloses rhythmically along a similar promenade. It directs the being through its senses and draws him closer to the heart of the intervention through the properties of water and the natural landscape. Sensual engagement intensifies as one gets closer to the nucleus of the intervention. At the heart, it engages all the senses and submerses the being into the interchanging animation between architectural space, the natural environment and the water from the fountain.

Figure 6. 8

Conceptual translation and spatial exploration of the loggia and oculus

(Author, 2015)



7

DESIGN

DESIGN DEVELOPMENT

Creating the Device

This chapter introduces the main design generators, where after the design of the ‘threshold device’ and the ‘sensorial promenade’ is expressed through its narrative, site intentions, and development in the creation of an “interchanging animation”.

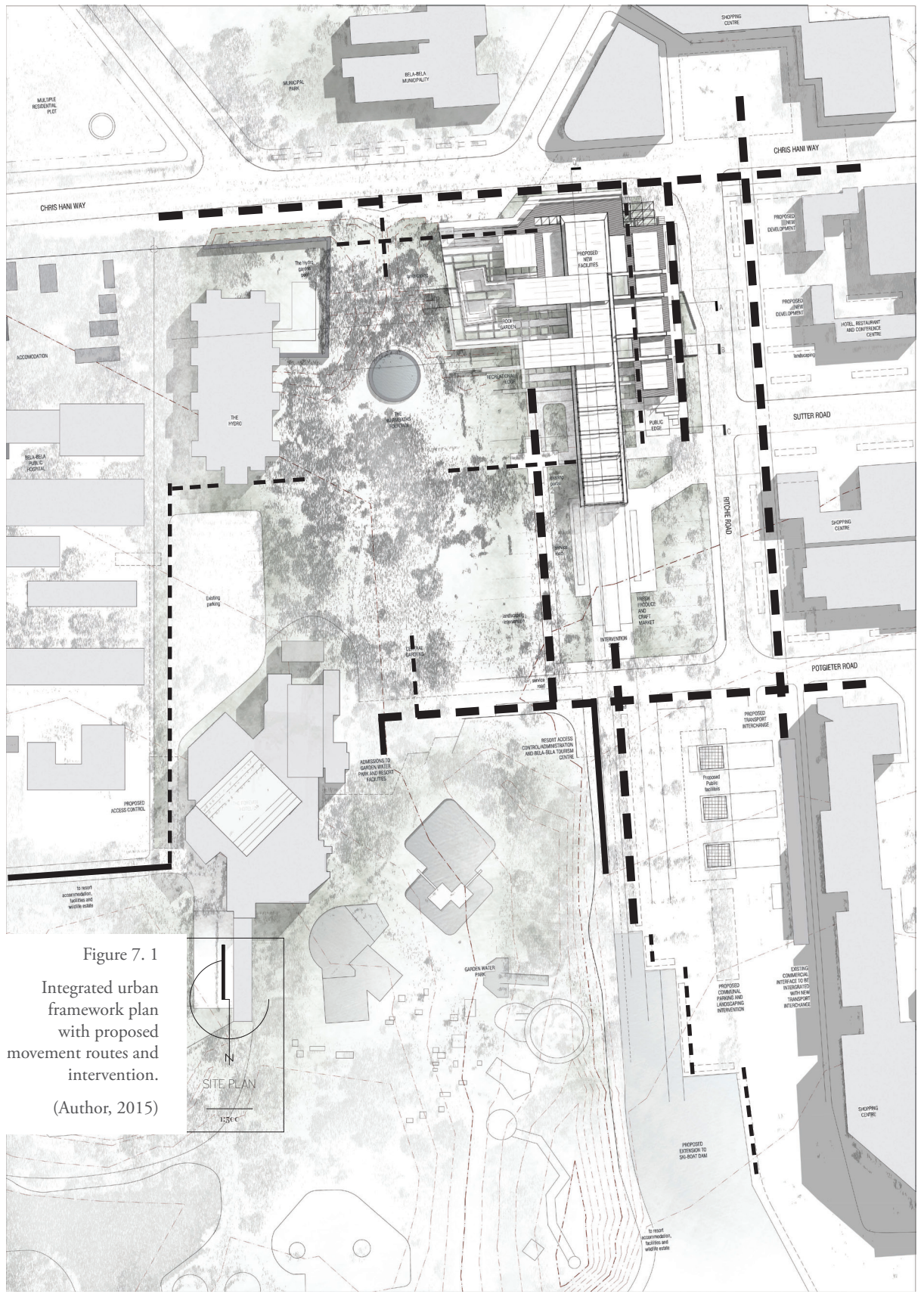


Figure 7.1
Integrated urban
framework plan
with proposed
movement routes and
intervention.
(Author, 2015)

DESIGN GENERATORS

URBAN VISION AND SITE

The urban vision proposes the re-stitching of the urban grain with the central gardens through means of the 'Urban Commons', a spatial layer that inhibits the segregating condition. A promenade extends along the eastern boundary of the resort that is flanked by new civic, public, commercial, transportation, and tourism nodes. This promenade terminates at the south of the site with a craft and fresh produce market and three routes extending onto the site - a public and semi-public one along the urban edge to the east and another into the gardens to the west. These routes extend along a floral greenhouse that becomes the spine of the intervention.

CONCEPT

The interchanging animation between natural vegetation, water, and architecture spatially envelop the nucleus of the intervention. The intervention itself simultaneously also becomes a threshold device that stitches the urban core with the central gardens that are proposed to become public. The two routes that meet the intervention diverges and becomes three sensorial promenades – a public and a semi-public route extending along the street and urban edge of the intervention, and the other into the gardens, which morphs with the building to become the recreational edge.

EXISTING FABRIC

The existing architecture of the facilities at the Warmbaths Resort expresses a relationship between the water and the sky through an interplay on the Oculus. It furthermore determines privacy and engagement through the adaptation of the Loggia. The device continues these themes in the way the space is organised, so as to have a direct spatial relation to the facilities and to introduce this theme into the town's grain.

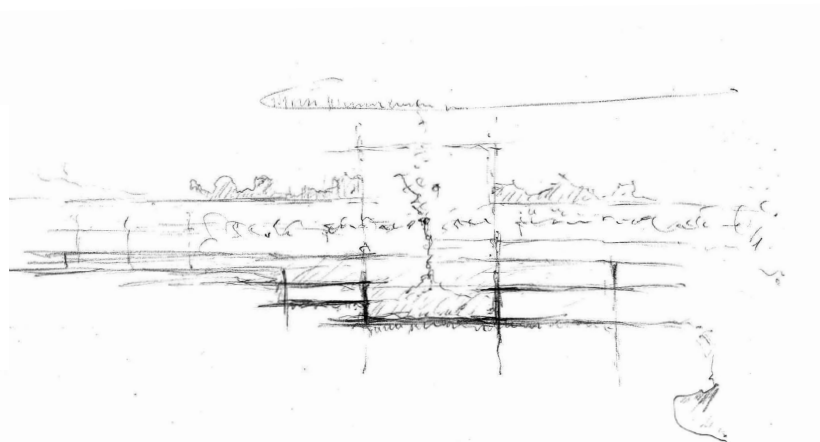
PROGRAMME

The intervention is divided into a central spine with a recreational edge towards the gardens in the west, and a public commercial edge to the east. The central spine terminates at the north and south with civic, yet tourist attractive edges. Access to therapy rooms alongside the recreational interface should also be accommodated along a semi-public route at the commercial edge. The greenhouse's enclosure is to merge with adjacent spaces so that it articulates or encloses these. The recreational edge is to merge with the gardens and open and unfold into the greenhouse enclosure. Similarly, the commercial edge is to merge with the spine so that space overlaps edges and animates not only the enclosure but also the adjacencies.

Figure 7. 2

Formal development of intentions through an interplay on the concept of the loggia and oculus

(Author, 2015)



PLANNING

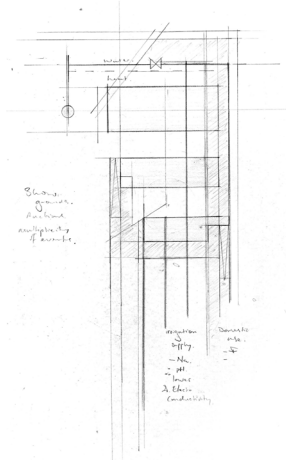


Figure 7. 3
The traditional downstream flow from the fountain as form genesis (left)
(Author, 2015)

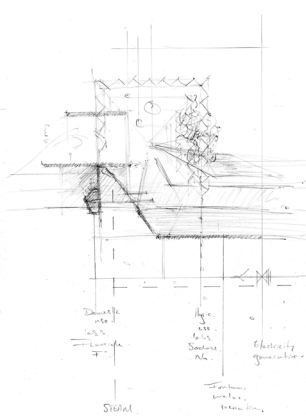


Figure 7. 4
The integration of the intentions with the spatial and formal vernacular (below)
(Author, 2015)

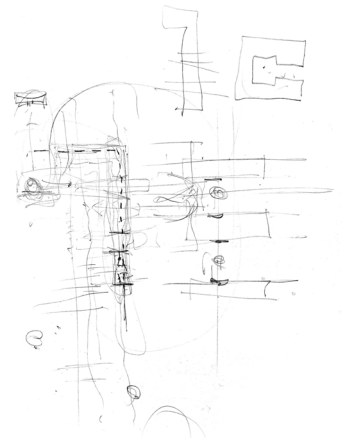


Figure 7. 5
Re-scripting the edge conditions and integration with the 'everyday' (above)
(Author, 2015)

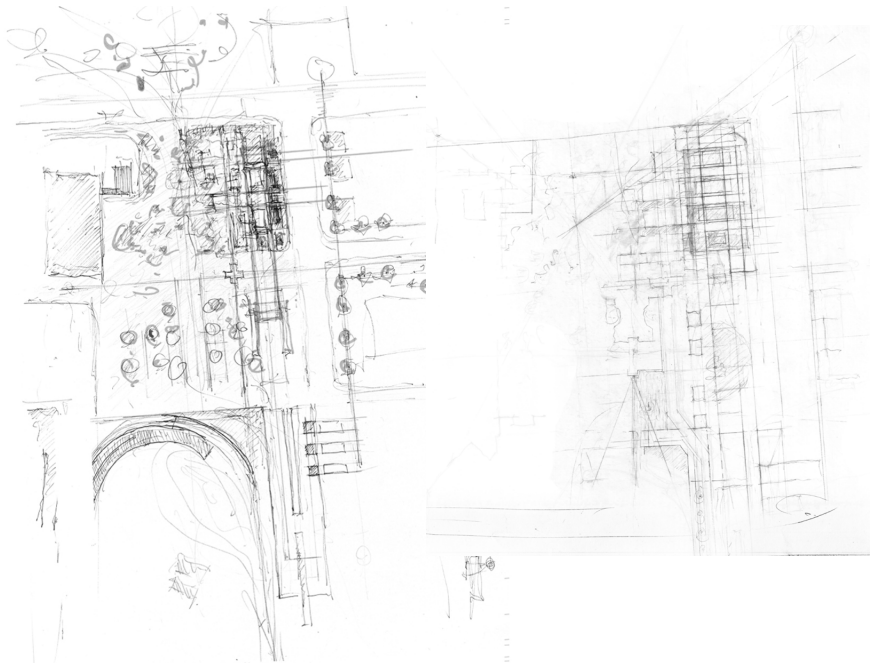




Figure 7. 6

The establishment of a central spine with a recreational edge to the west and public edge to the town. A rhythmic interplay allows space to overlap and levels to blend.

(Author, 2015)

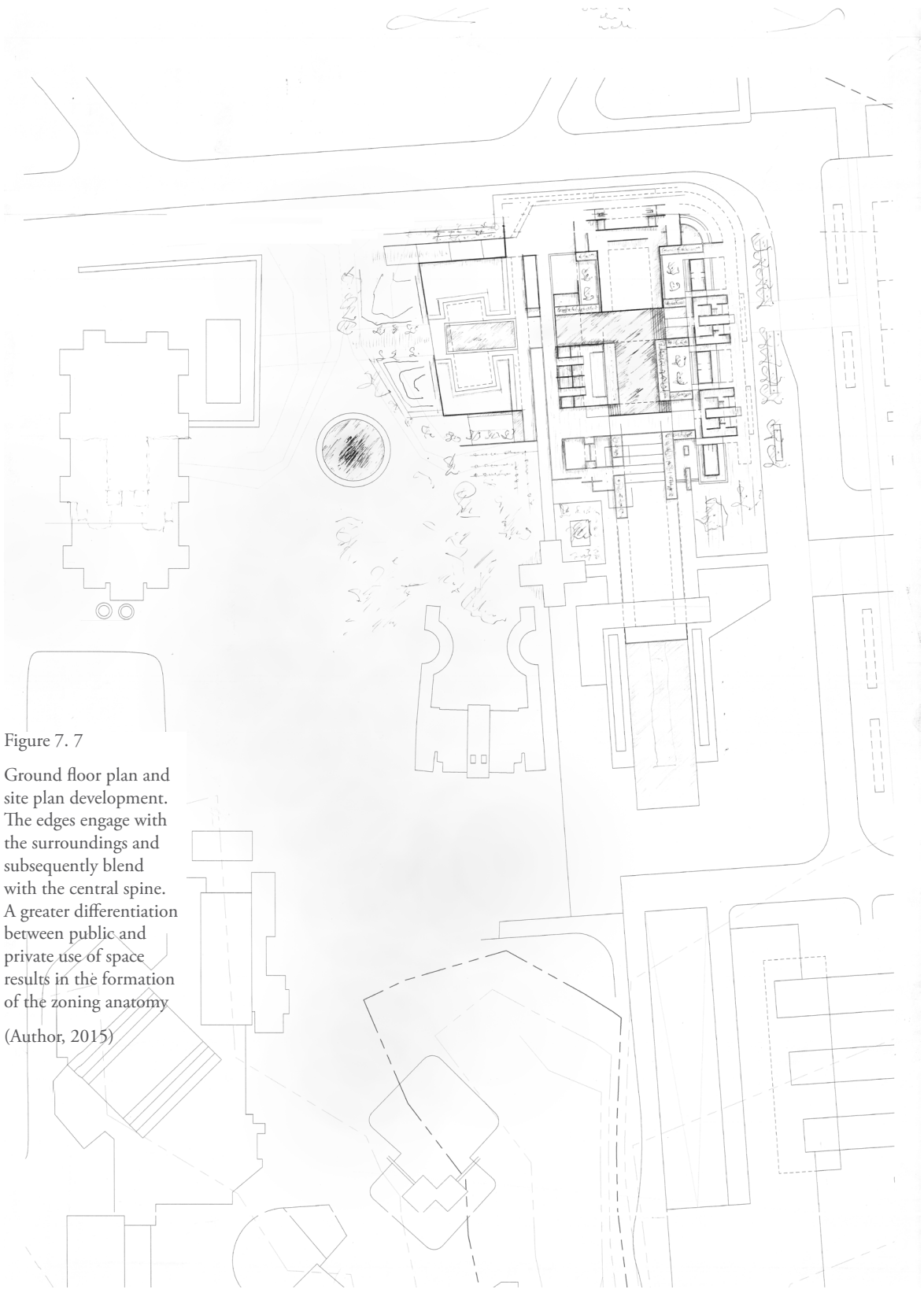


Figure 7. 7
Ground floor plan and
site plan development.
The edges engage with
the surroundings and
subsequently blend
with the central spine.
A greater differentiation
between public and
private use of space
results in the formation
of the zoning anatomy
(Author, 2015)

Figure 7. 8

Development and fusion of edges and levels. This iteration presents a central loggia to the east flanked by the street edge extending into the central spine on a first level. These spaces accommodated a florist and a greengrocer interconnected with the greenhouse but the accommodation of a greengrocer was discarded as growth conditions for fruit and vegetables couldn't be achieved if the greenhouse is to accommodate other functions as well.

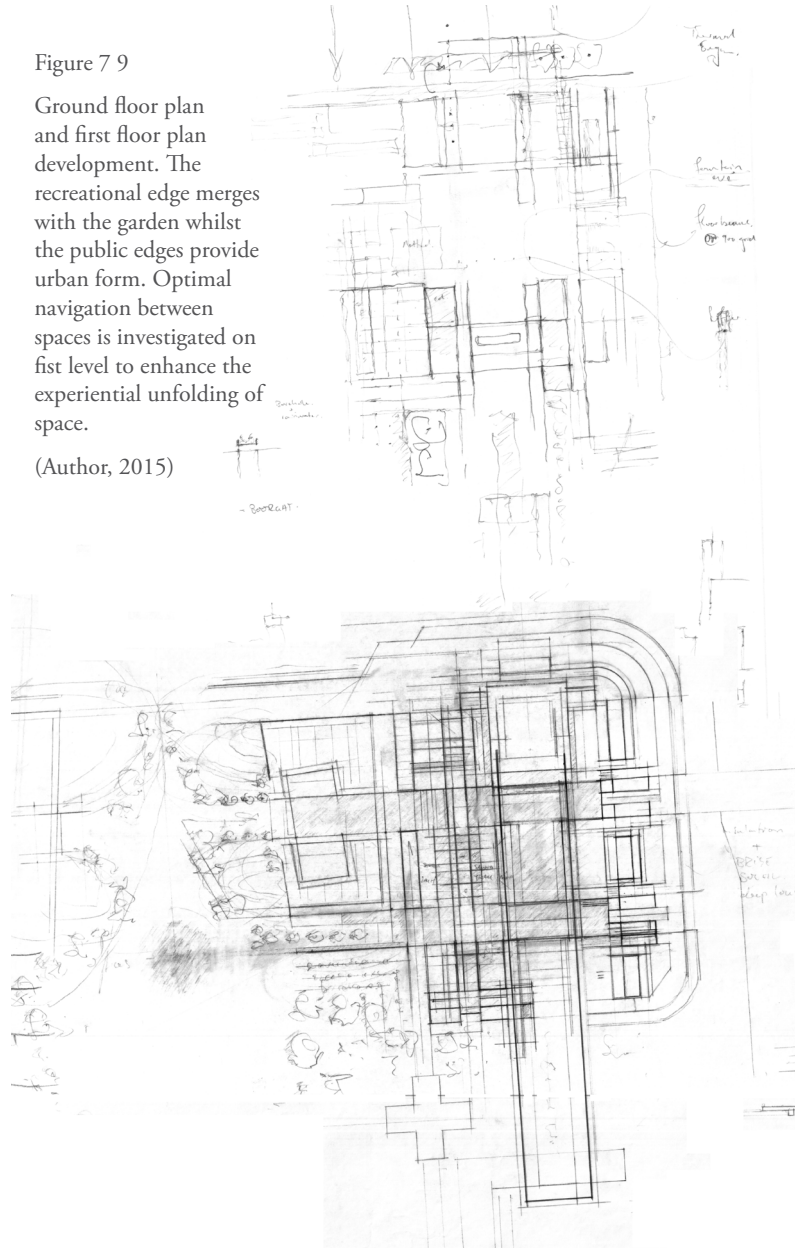
(Author, 2015)



Figure 7 9

Ground floor plan and first floor plan development. The recreational edge merges with the garden whilst the public edges provide urban form. Optimal navigation between spaces is investigated on first level to enhance the experiential unfolding of space.

(Author, 2015)



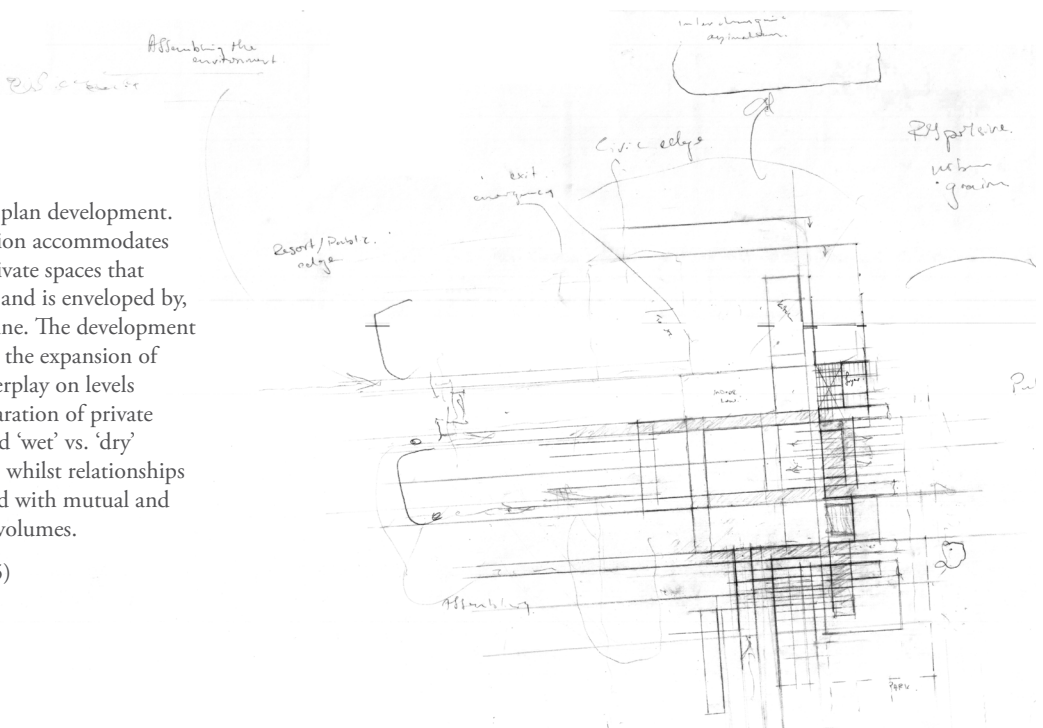
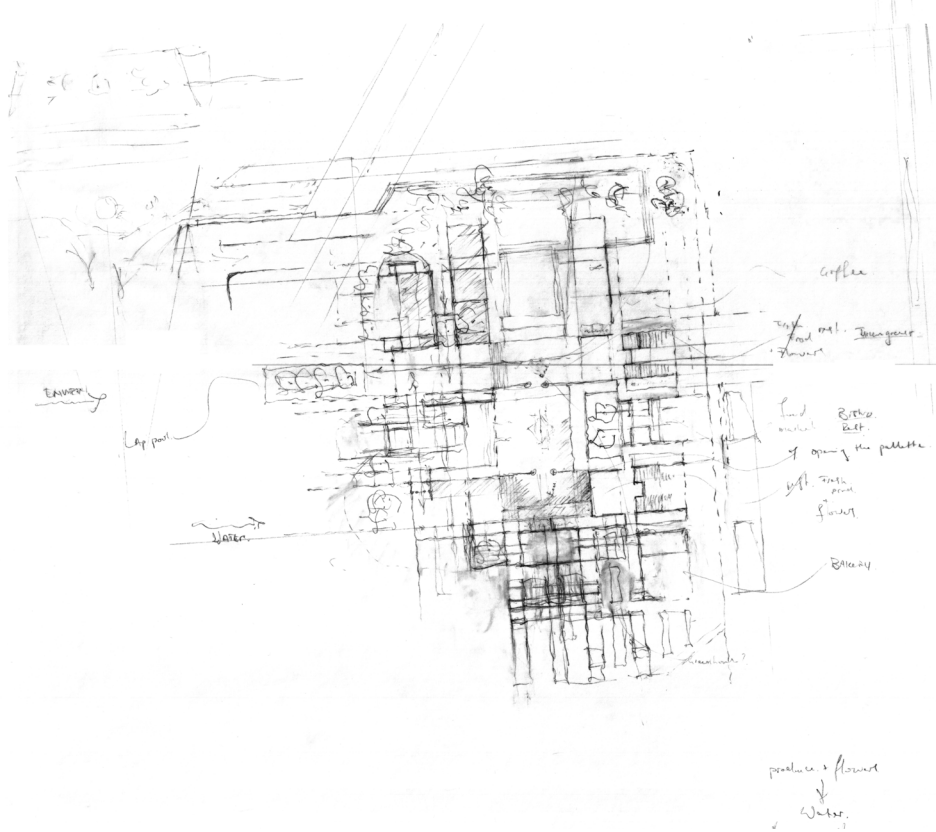


Figure 7. 10

Ground floor plan development. The intervention accommodates public and private spaces that conjoin with, and is enveloped by, the central spine. The development plans indicate the expansion of edges and interplay on levels towards a separation of private and public and 'wet' vs. 'dry' usage whilst relationships are maintained with mutual and Neighboring volumes.

(Author, 2015)



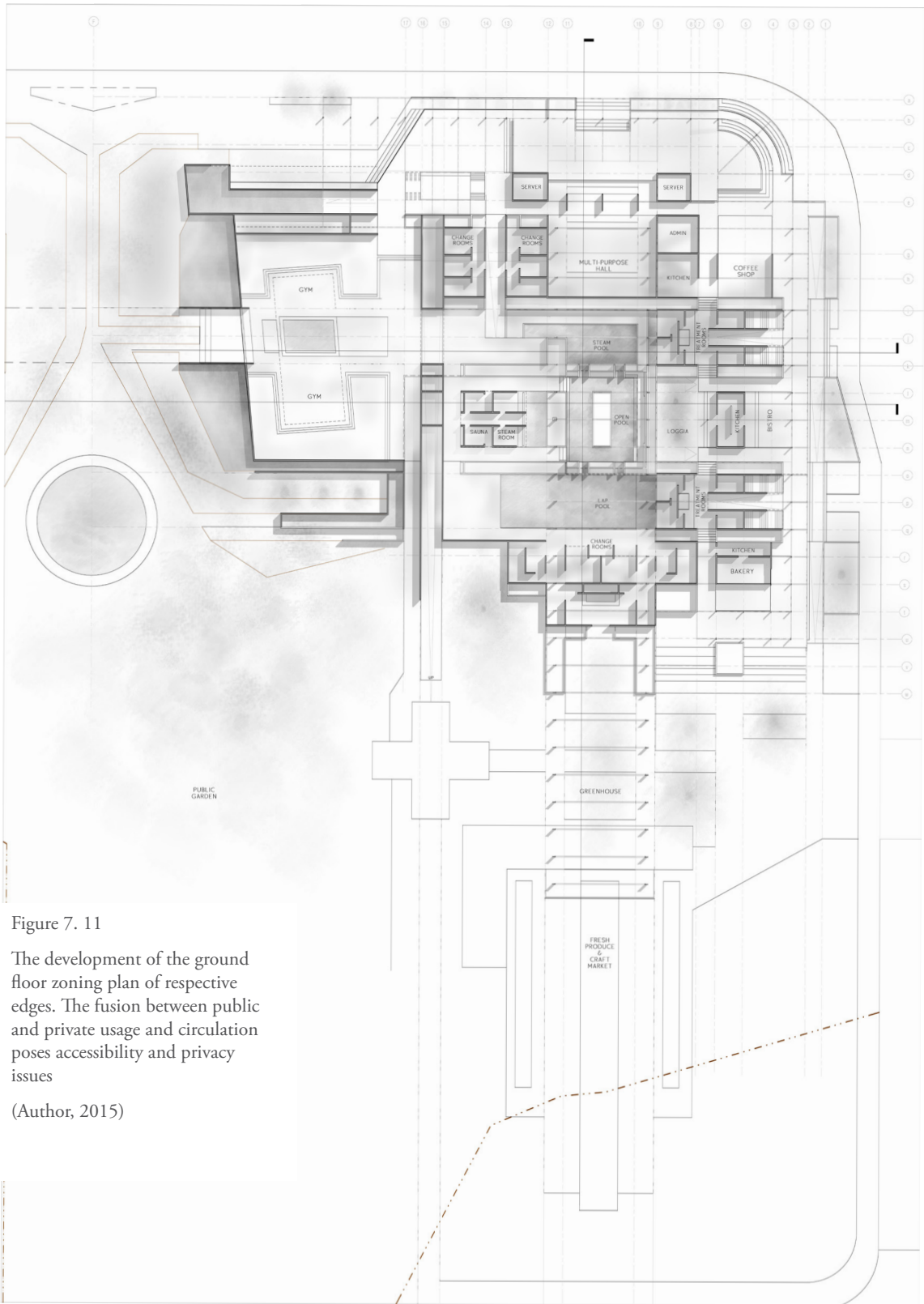


Figure 7. 11

The development of the ground floor zoning plan of respective edges. The fusion between public and private usage and circulation poses accessibility and privacy issues

(Author, 2015)

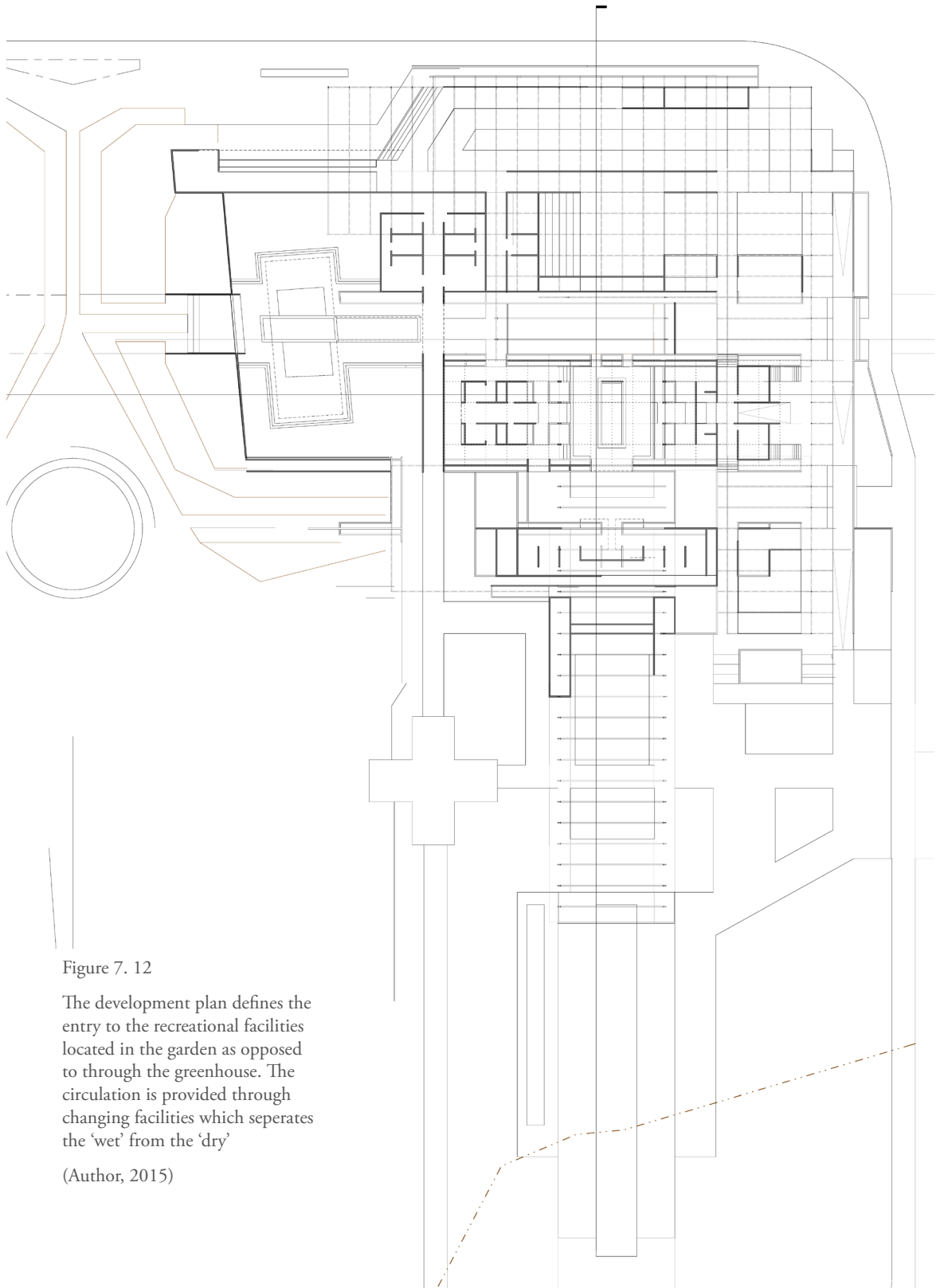


Figure 7. 12

The development plan defines the entry to the recreational facilities located in the garden as opposed to through the greenhouse. The circulation is provided through changing facilities which separates the 'wet' from the 'dry'

(Author, 2015)

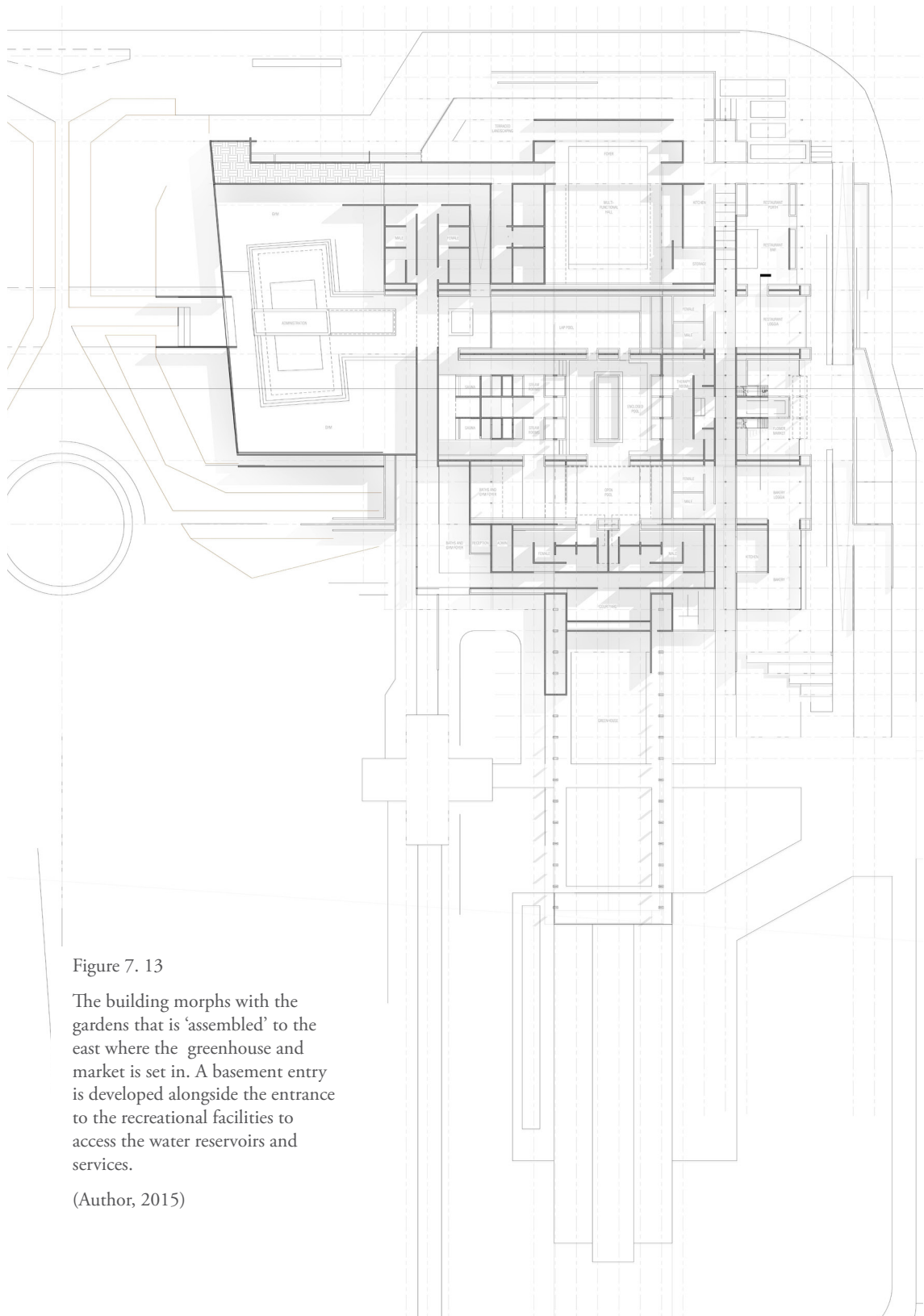


Figure 7. 13

The building morphs with the gardens that is 'assembled' to the east where the greenhouse and market is set in. A basement entry is developed alongside the entrance to the recreational facilities to access the water reservoirs and services.

(Author, 2015)

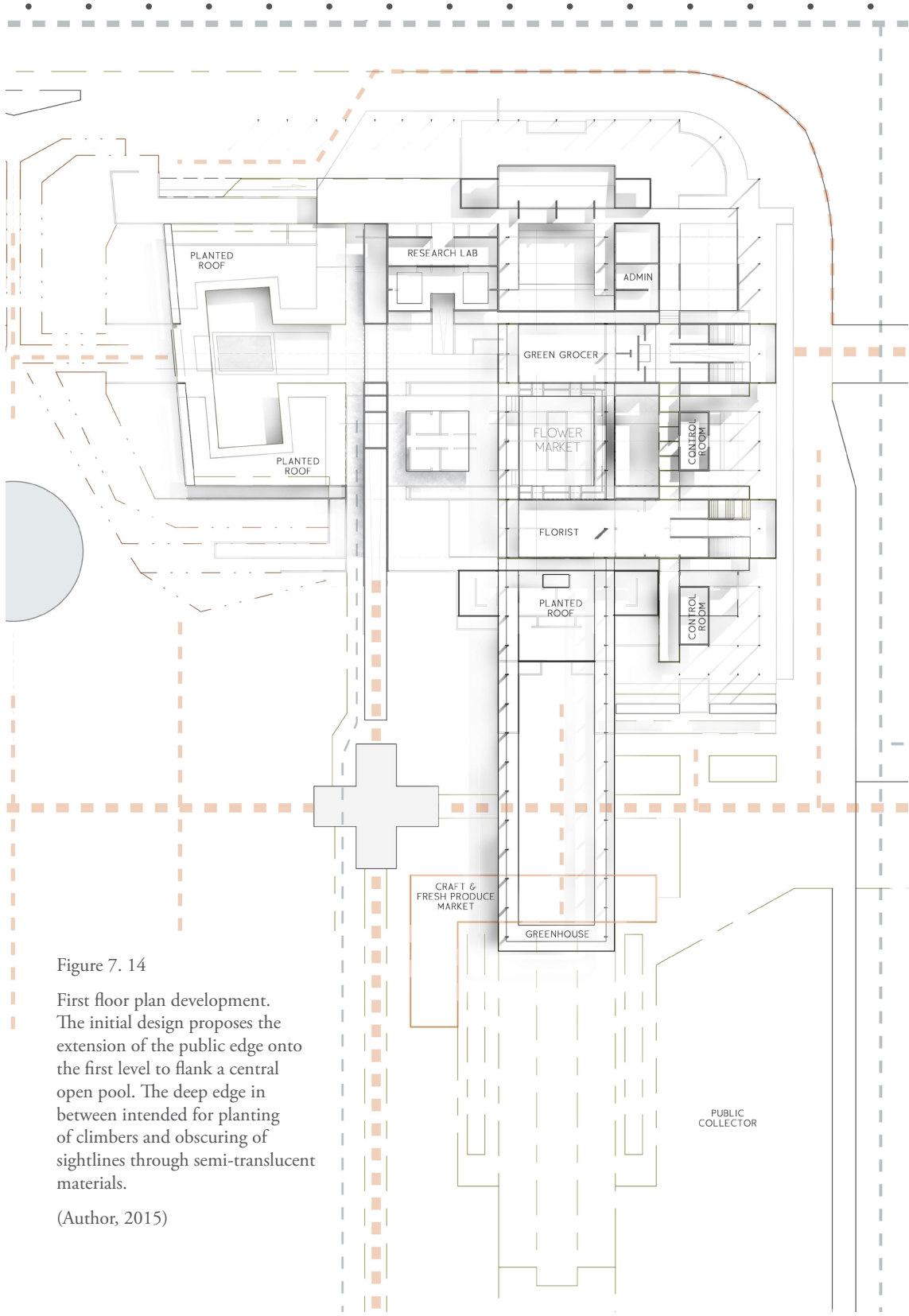


Figure 7. 14

First floor plan development. The initial design proposes the extension of the public edge onto the first level to flank a central open pool. The deep edge in between intended for planting of climbers and obscuring of sightlines through semi-translucent materials.

(Author, 2015)

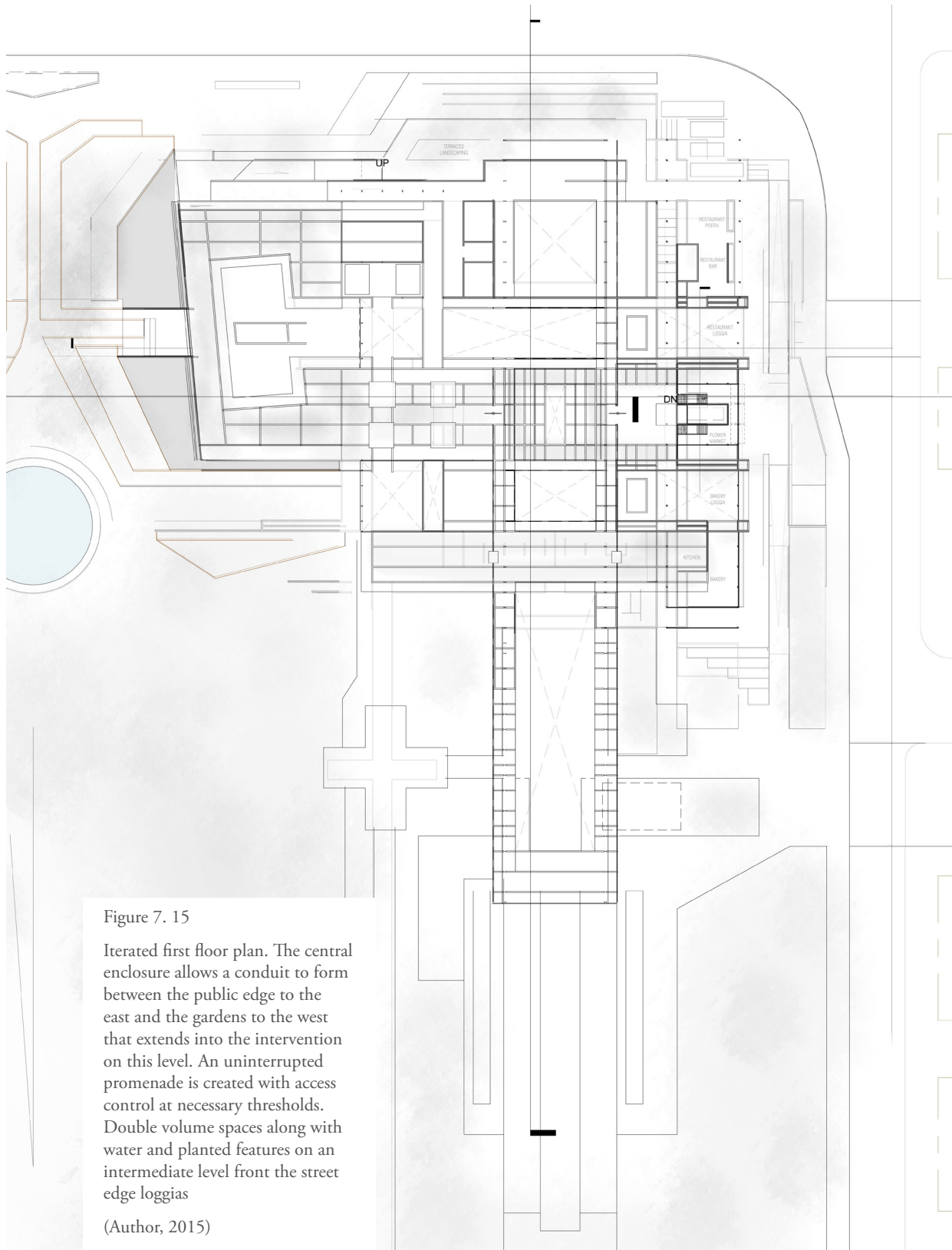


Figure 7. 15

Iterated first floor plan. The central enclosure allows a conduit to form between the public edge to the east and the gardens to the west that extends into the intervention on this level. An uninterrupted promenade is created with access control at necessary thresholds. Double volume spaces along with water and planted features on an intermediate level front the street edge loggias

(Author, 2015)

“THAT WHICH ASCENDS”

INTERCHANGING ANIMATION

The central concept of an interchanging animation between architecture and environment is made to manifest at the nucleus of the intervention. A greenhouse extends from north to south along the central spine, while the pools at the heart open up into this volume. The qualities of the natural environment are allowed to animate the space through planters (that separate privacy), and through the pools of water from the fountain to produce a new condition for bathing and swimming. Metaphorically, the design projects from the nucleus and this spine through levels where it animates the adjacent spaces with the properties from of the natural environment.

THE CIVIC EDGE(S)

Towards the south, the device monumentalises the landscape through a greenhouse and a nursery whereas to the north it projects outward with a multi-purpose hall. The hall is set in the garden that wraps around the western edge and becomes the northern threshold to the intervention and the public gardens. The northern edge responds to the municipality and the commercial centre across the street through function, spatial relation and access routes. Natural vegetation primarily inhabits these spaces and radiates its poetic qualities to the urban environment through the architecture’s transparent boundaries. A circulatory axis runs through the device and connects these on the first level. Planters and climbers, along with shadows on semi-transparent sheeting animate the circulation and adjacent spaces and divide private from public.

THE GARDEN & RECREATIONAL EDGE

The device brings about an additional condition that becomes an extension of the recreational facilities that exists there. The intervention mirrors the Hydro Spa facilities around the north-south axis that runs through the fountain from where everything, including infrastructure, radiates throughout the town. Conceptually, this mirroring takes place as well, but whereas the Hydro is spatially turned ‘inward’, towards itself, the device is turned ‘outward’, towards the natural environment and the transience of the urbanity. The design re-instates a responsive edge that relates to the origin of the *place*, the fountain. The ground plane is sloped upwards to become the vegetated first level of the building that opens up into courtyards amongst the heart and towards the street edge. The level provides for walking amongst the garden planters and invites the visitor into the greenhouse at the nucleus. The southern edge tapers eastward and becomes a transition between the natural landscape and urbanity. This edge fuses with the central heart and spine and extends into this volume, where it opens into courtyards or provides privacy under the level.

THE PUBLIC EDGE(S)

The eastern edge of the building responds to the direct urban condition where the wall once divided urbanity from the central garden. It facilitates new ‘transactions’ and narratives to arise between two routes and levels that define privacy and interaction with the nucleus. It provides a vibrant street edge animated by the properties of water from the fountain and of the natural environment. A florist is situated centrifugally to this edge, flanked by the bakery and the restaurant, each equipped with a Loggia that gazes over the phenomenology arising from the interchanging animation between the greenhouse and the pools. This vibrancy of the edge determines new relations, and new local development can emerge on the vacant plots to the east, which, as the vision proposes, becomes a lively local cultural corridor.

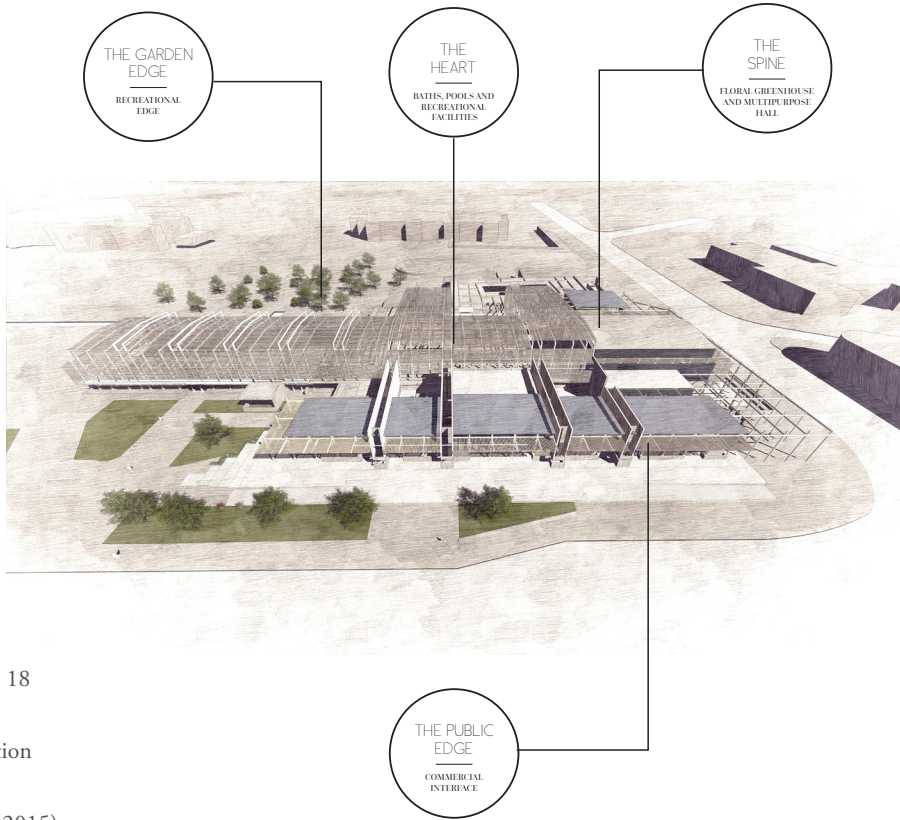
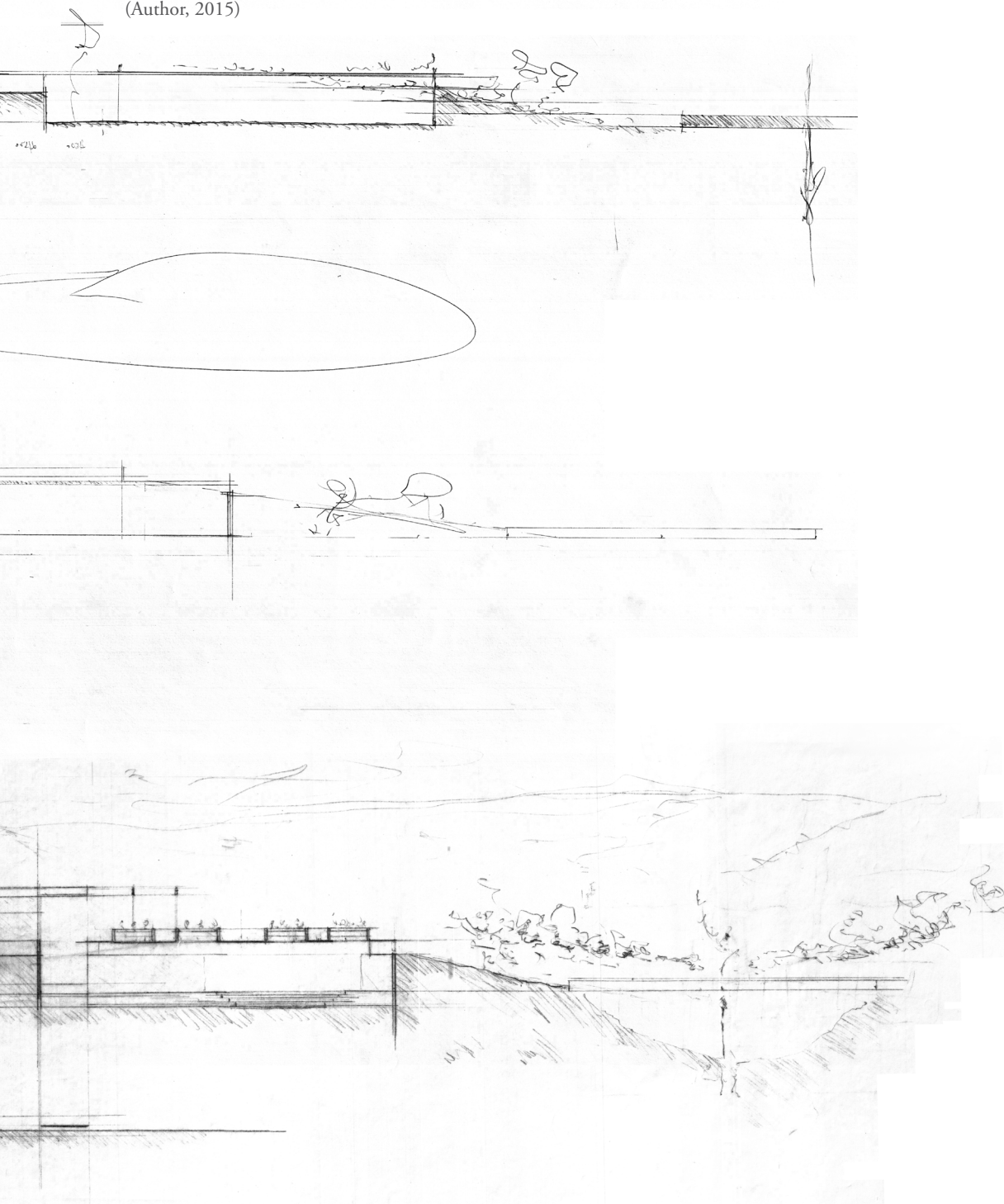


Figure 7. 18
The
intervention
anatomy
(Author, 2015)

Figure 7. 19

The section developed from the central spine that extends onto the site in accord with the urban vision. The first level, as an extension to the gardens, was proposed to ring the intervention but the scale of this could not be justified programmatically. The double volume enclosure and concept of the loggia and oculus is developed through an interplay on levels.

(Author, 2015)



SECTION A-A

1: 200

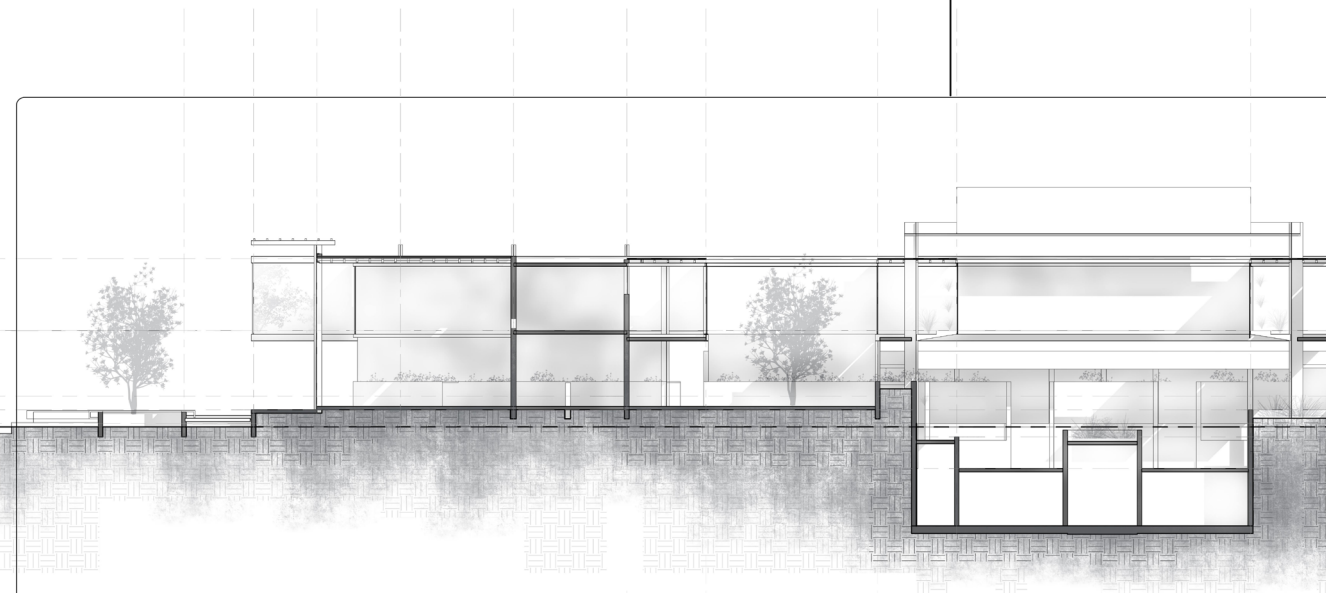
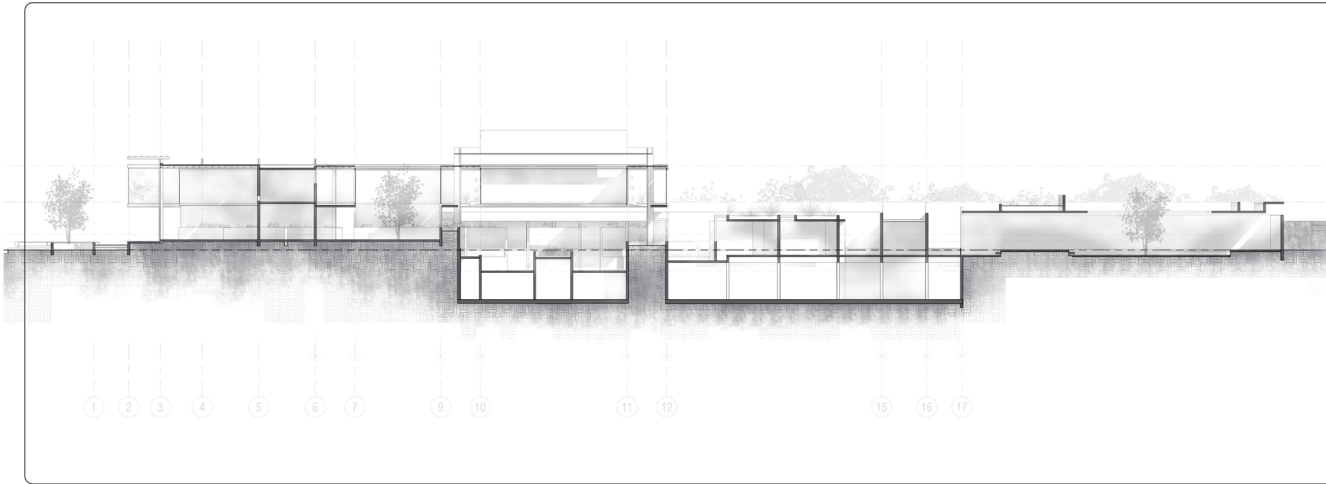
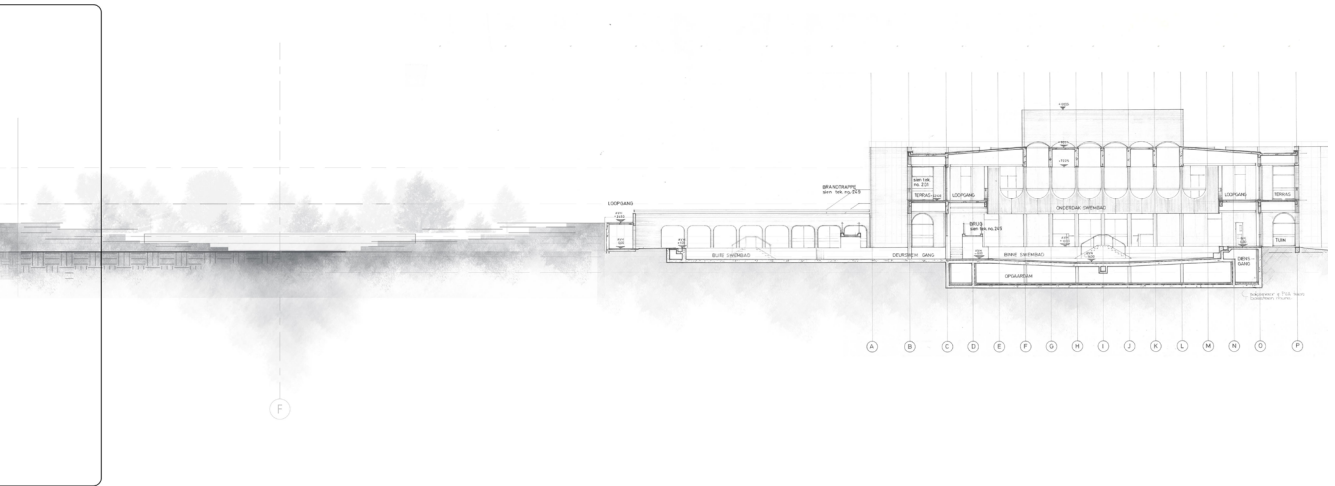


Figure 7. 20

The building mirrors the hydro around the axis extending north south through the fountain. This mirroring is to reinstate a reference to the origin of the Bela-Bela and make this origin 'visible'. Where the Hydro is orientated 'inwards' the device is orientated towards the context and natural environment.

(Author, 2015)



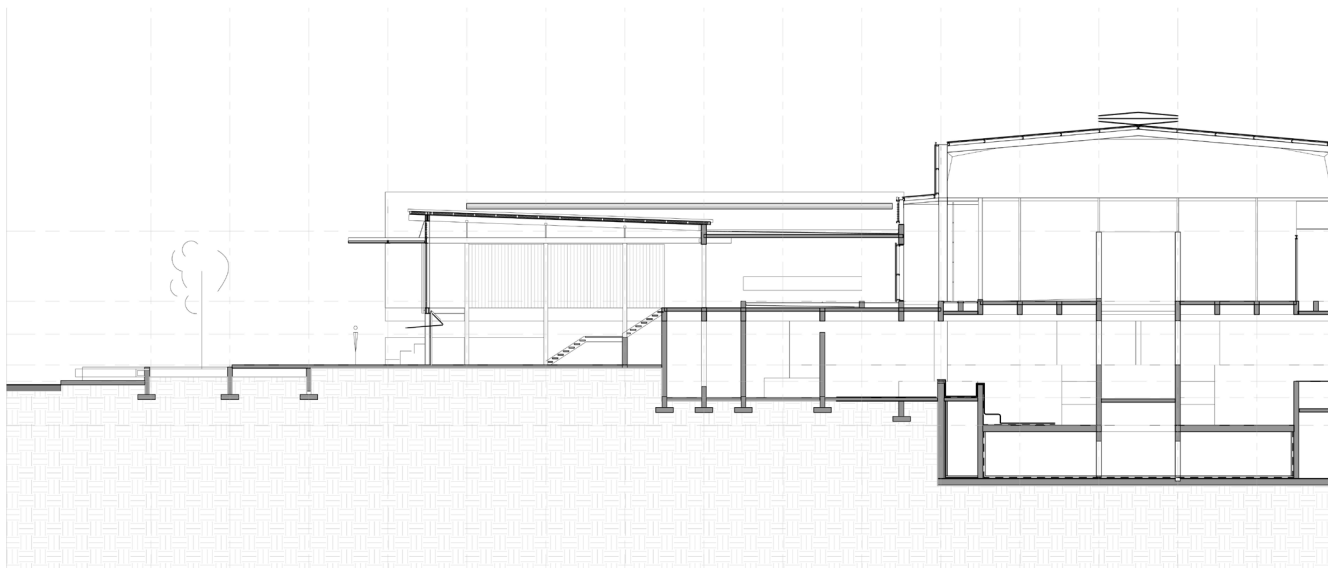
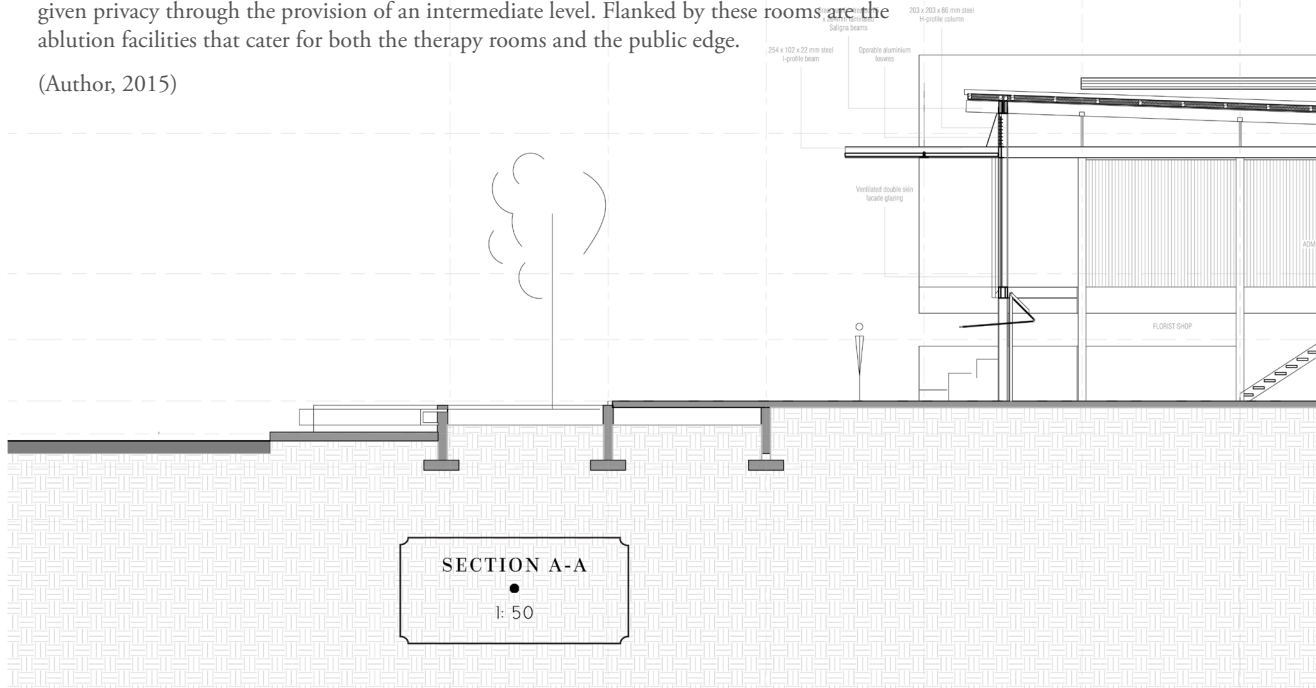
SECTION A-A
●
1: 100

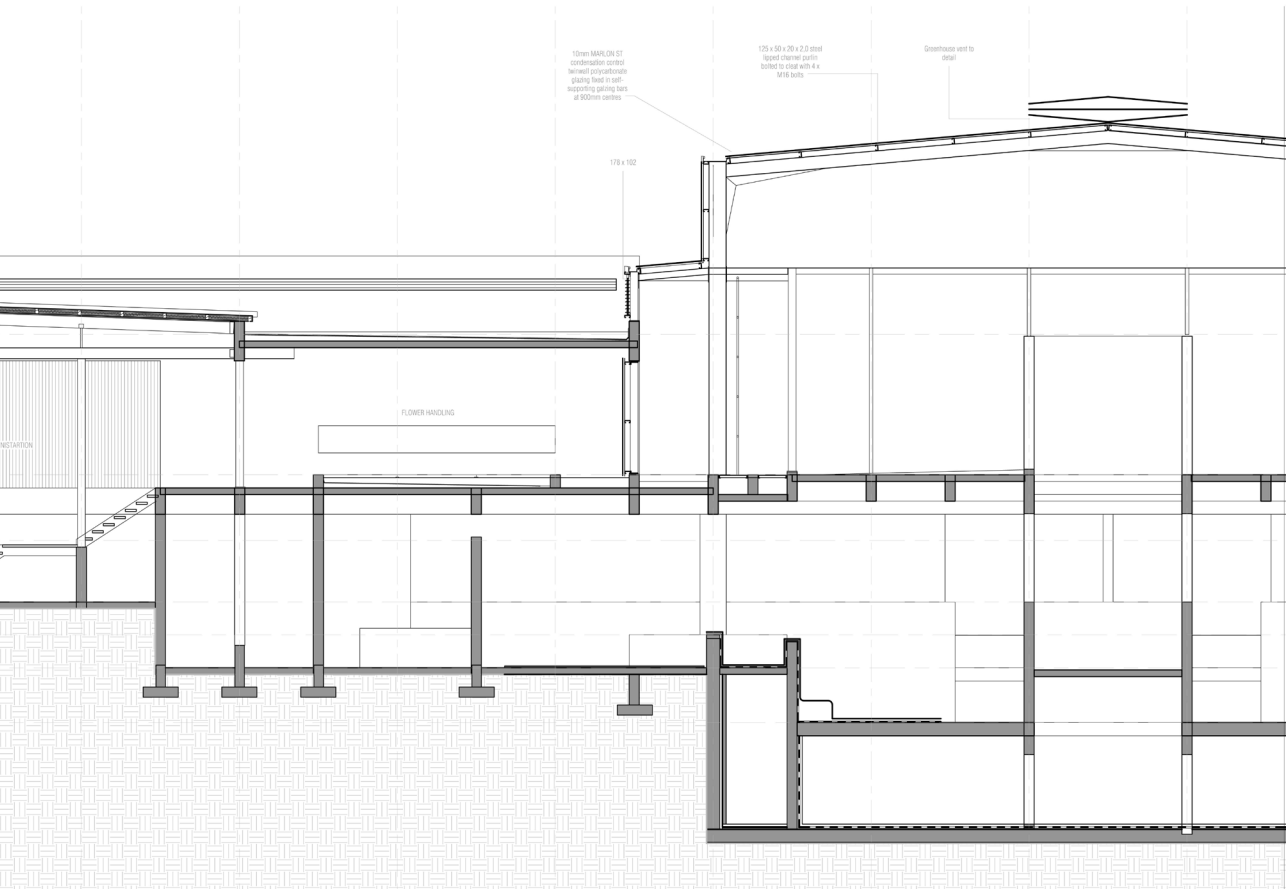


Figure 7. 21

The proposed public gardens extend onto the first level which extends through the greenhouse (in the form of a flower market) into the florist along the public edge. Below the sorting room of the florist, therapy rooms are located along a semi-public path which is given privacy through the provision of an intermediate level. Flanked by these rooms are the ablution facilities that cater for both the therapy rooms and the public edge.

(Author, 2015)





SECTION A-A
●
1: 100

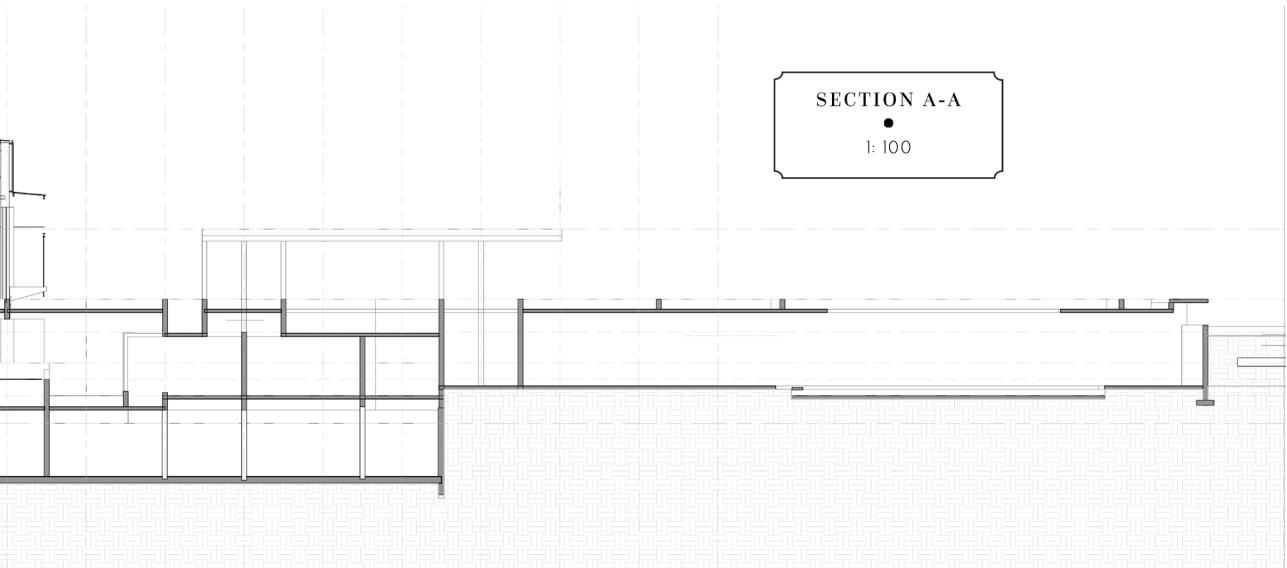
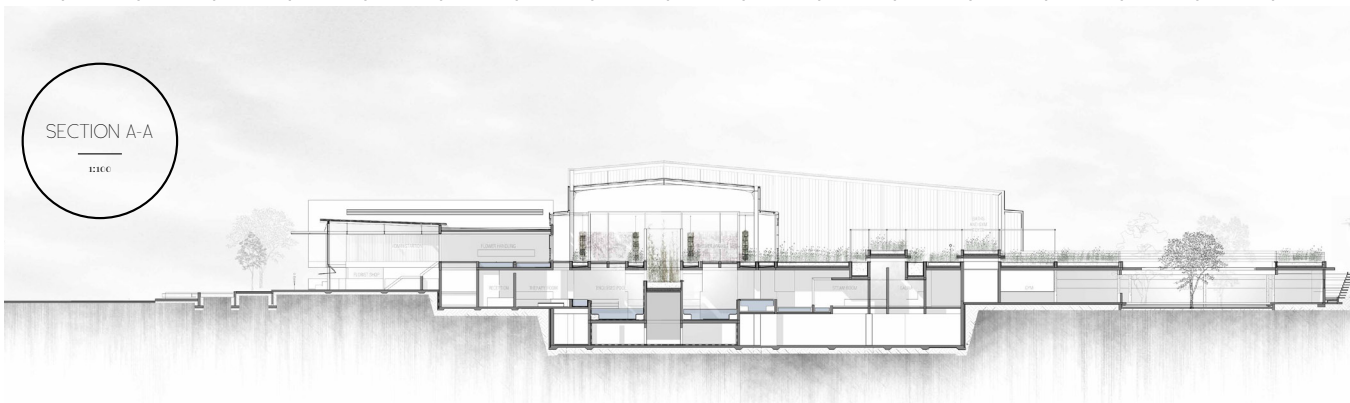
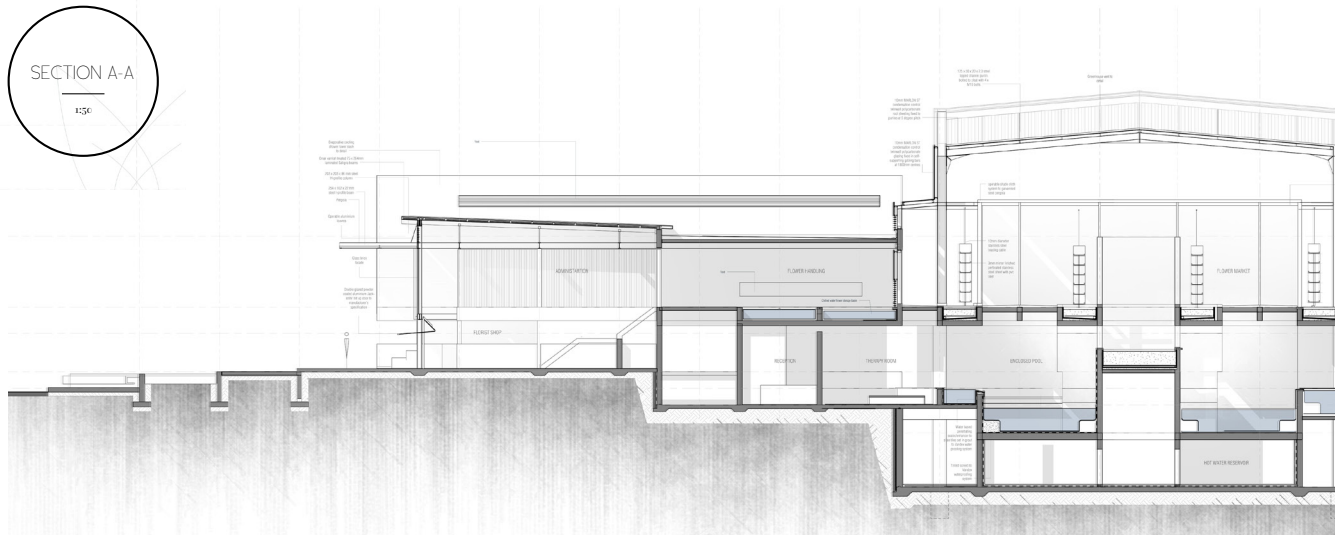
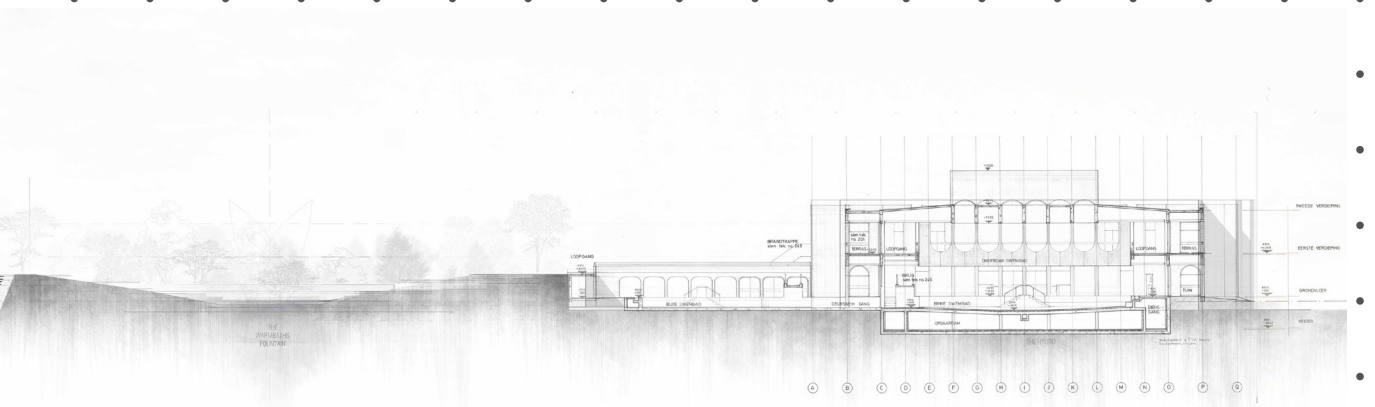
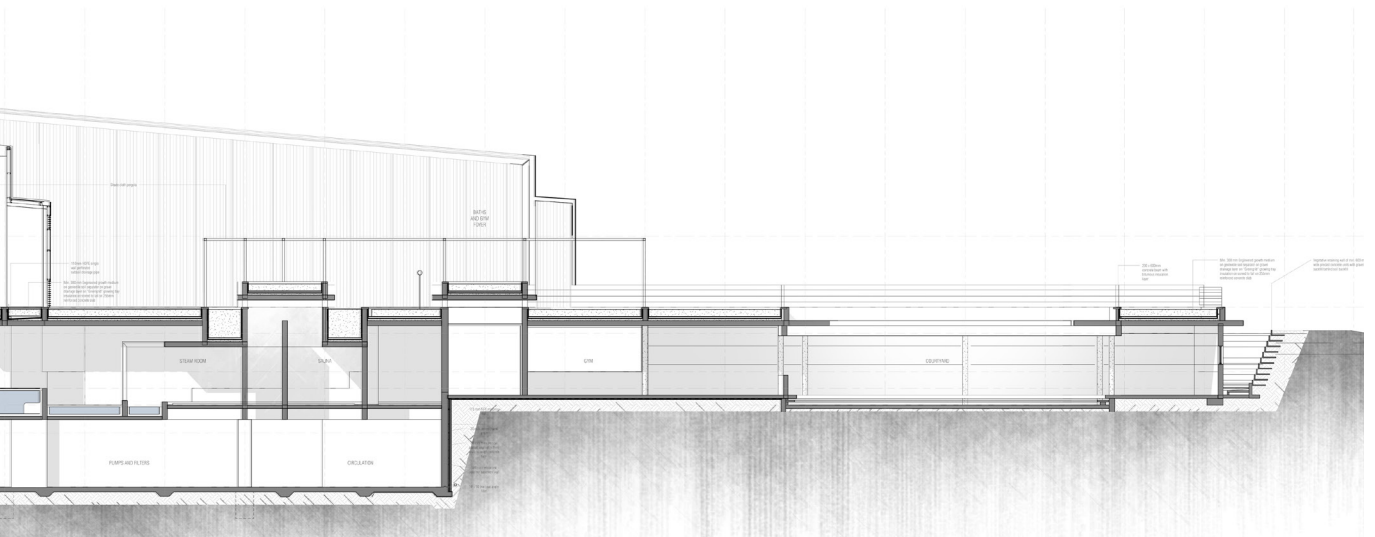


Figure 7. 22

Section A-A - Final drawings. The greenhouse volume is extended over the lap pool and the foyer to the recreational facilities.

(Author, 2015)



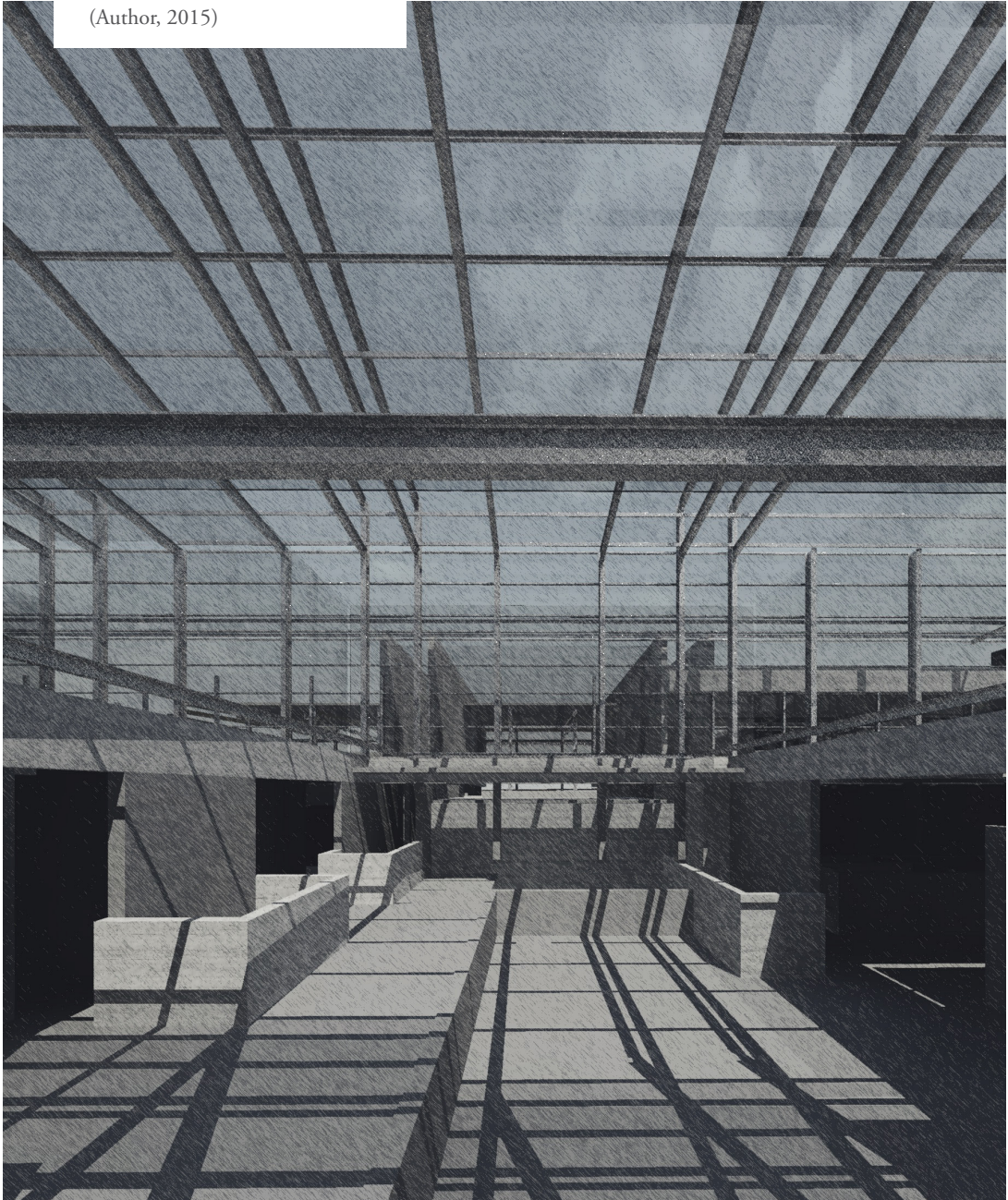


THE SENSORIAL PROMENADE

Figure 7. 23

View from the baths' loggia where climbers devise privacy from public. The spaces unfold theatrically along the paths that ring and extend into the intervention. Rhythm is created through space opening into double volumes or enclosing below the first floor as one moves through the spaces.

(Author, 2015)



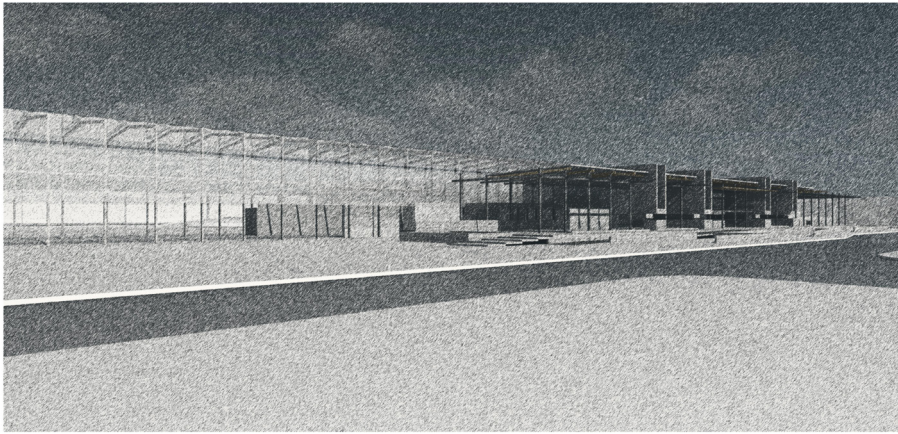
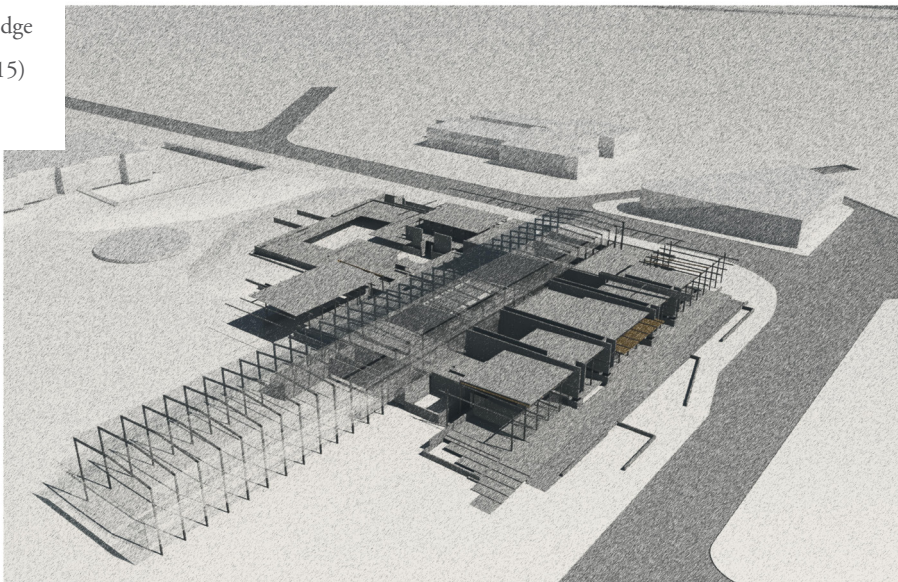


Figure 7. 24
The public edge
(Author, 2015)



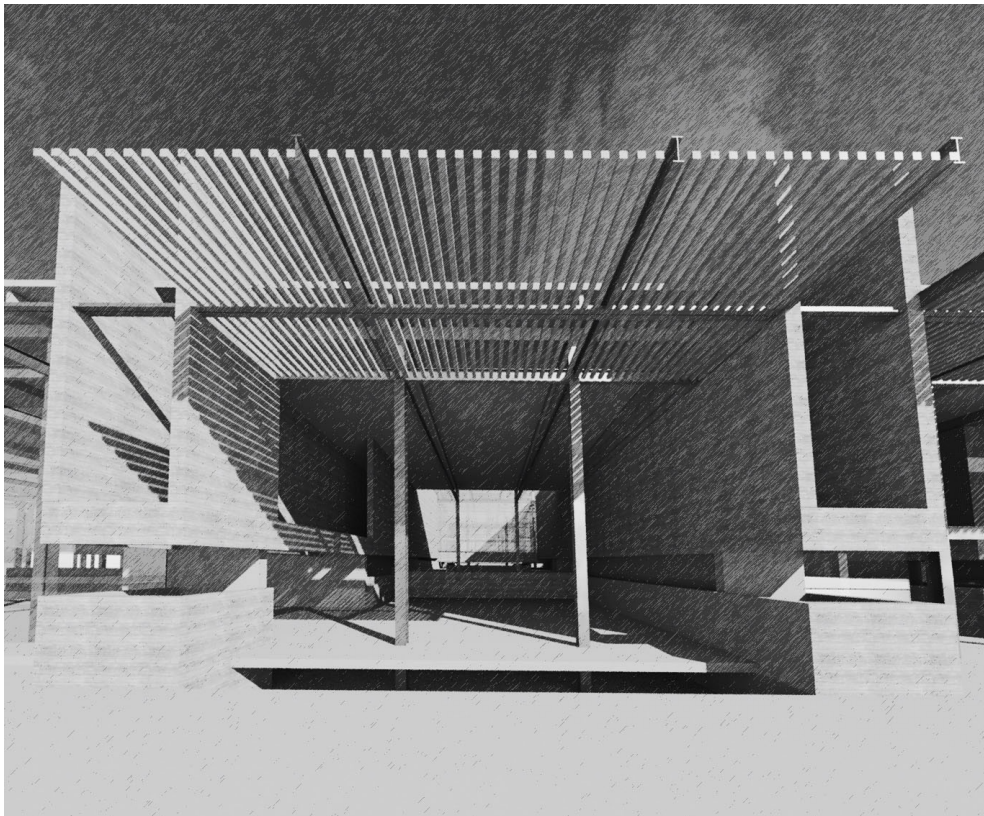
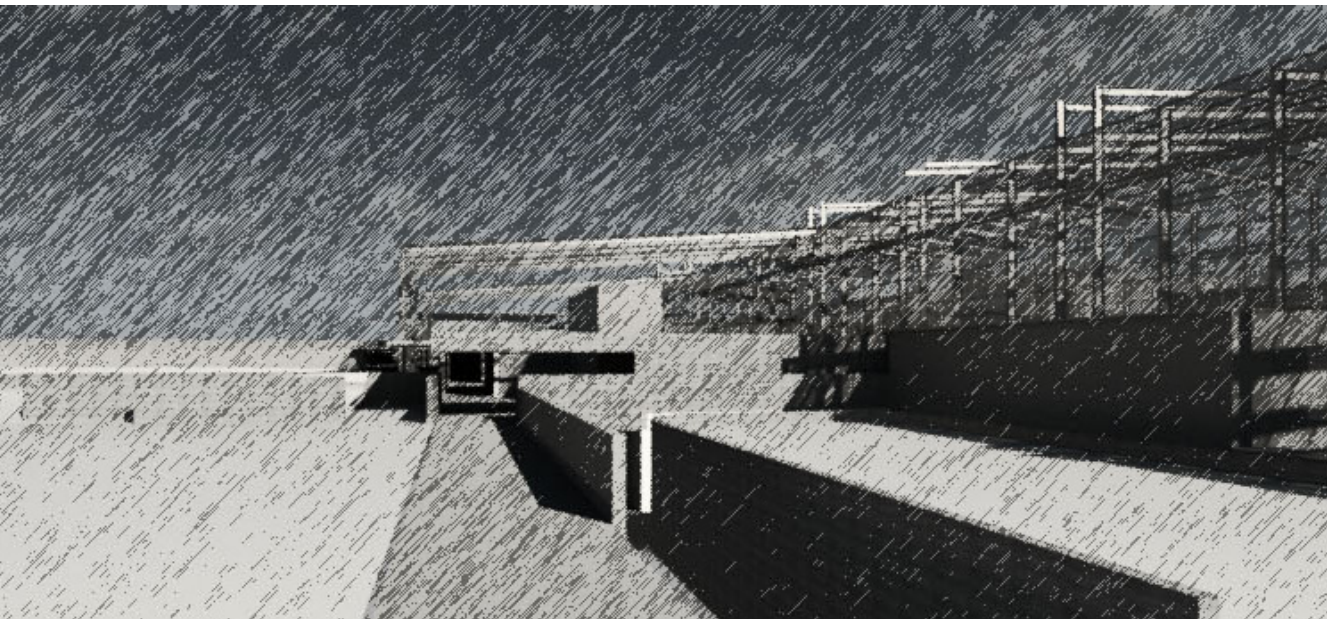


Figure 7. 25
The public loggia
(Author, 2015)

Figure 7. 26
The promenade
extending into the
recreational edge
(Author, 2015)



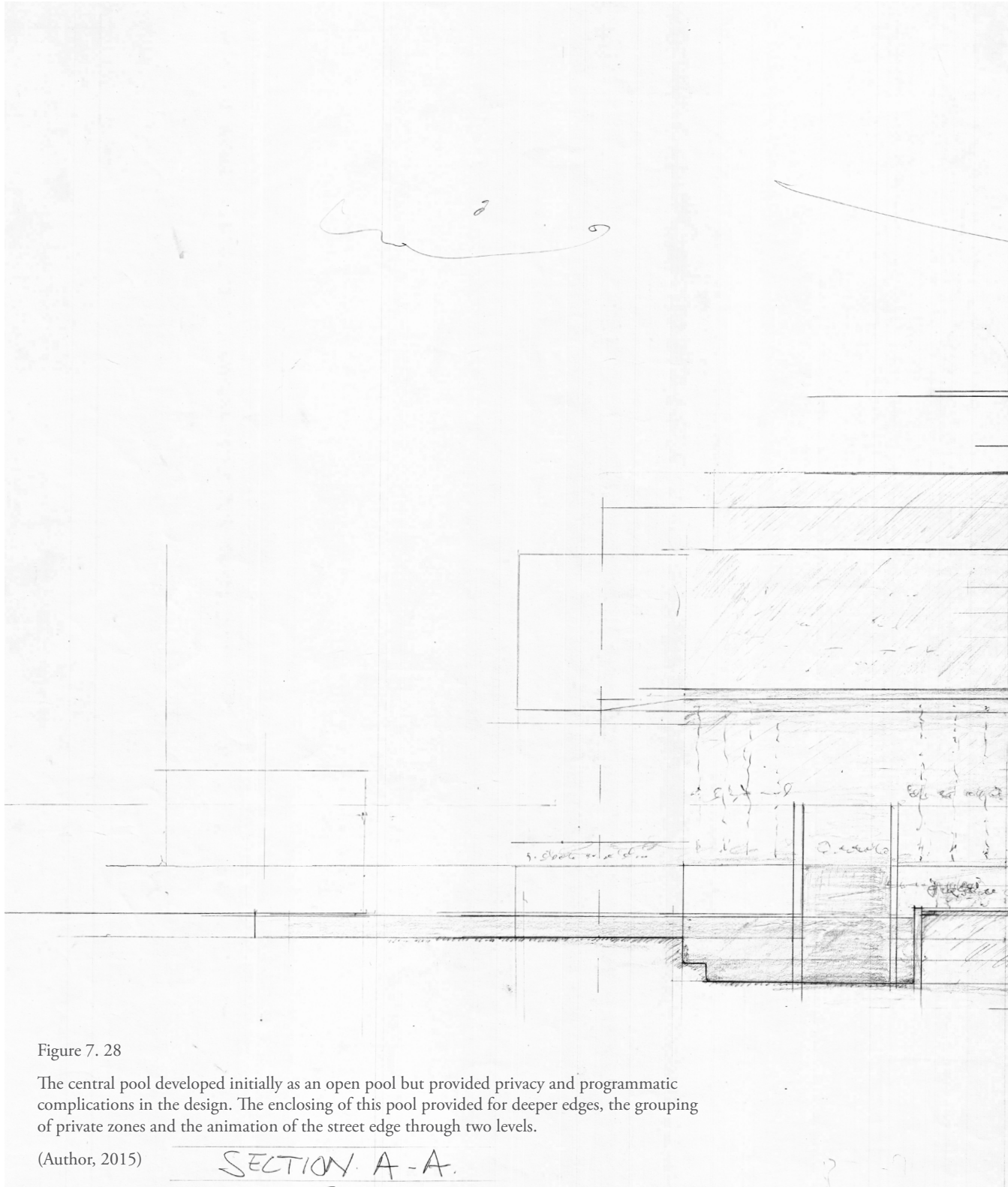
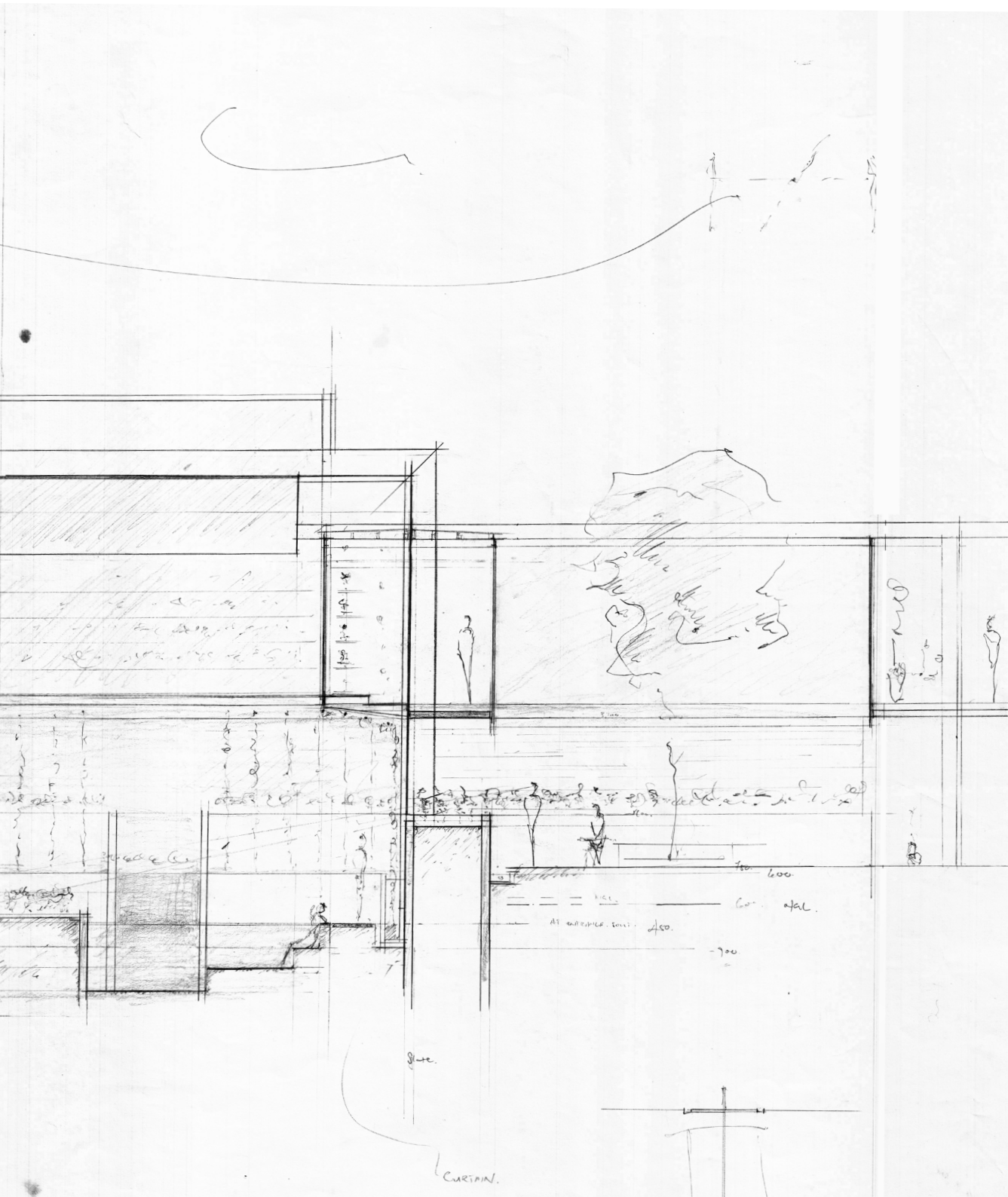


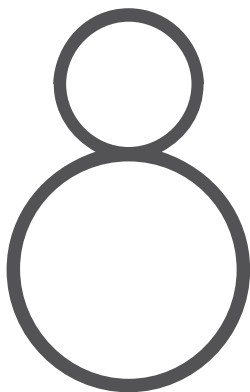
Figure 7. 28

The central pool developed initially as an open pool but provided privacy and programmatic complications in the design. The enclosing of this pool provided for deeper edges, the grouping of private zones and the animation of the street edge through two levels.

(Author, 2015)

SECTION A-A





TECHNE

TECHNICAL DEVELOPMENT

Constructing the “Device”

Chapter 8 Techne: Chapter nine introduces the major influences to the structural and other systems, and technology of the building. The technological concept is introduced, which is followed by the structural concept. The technology and materiality of the device is described through its spatial, programmatic and functional arrangements. The water and ventilation systems of the building are presented along with a planting palette of floral species.

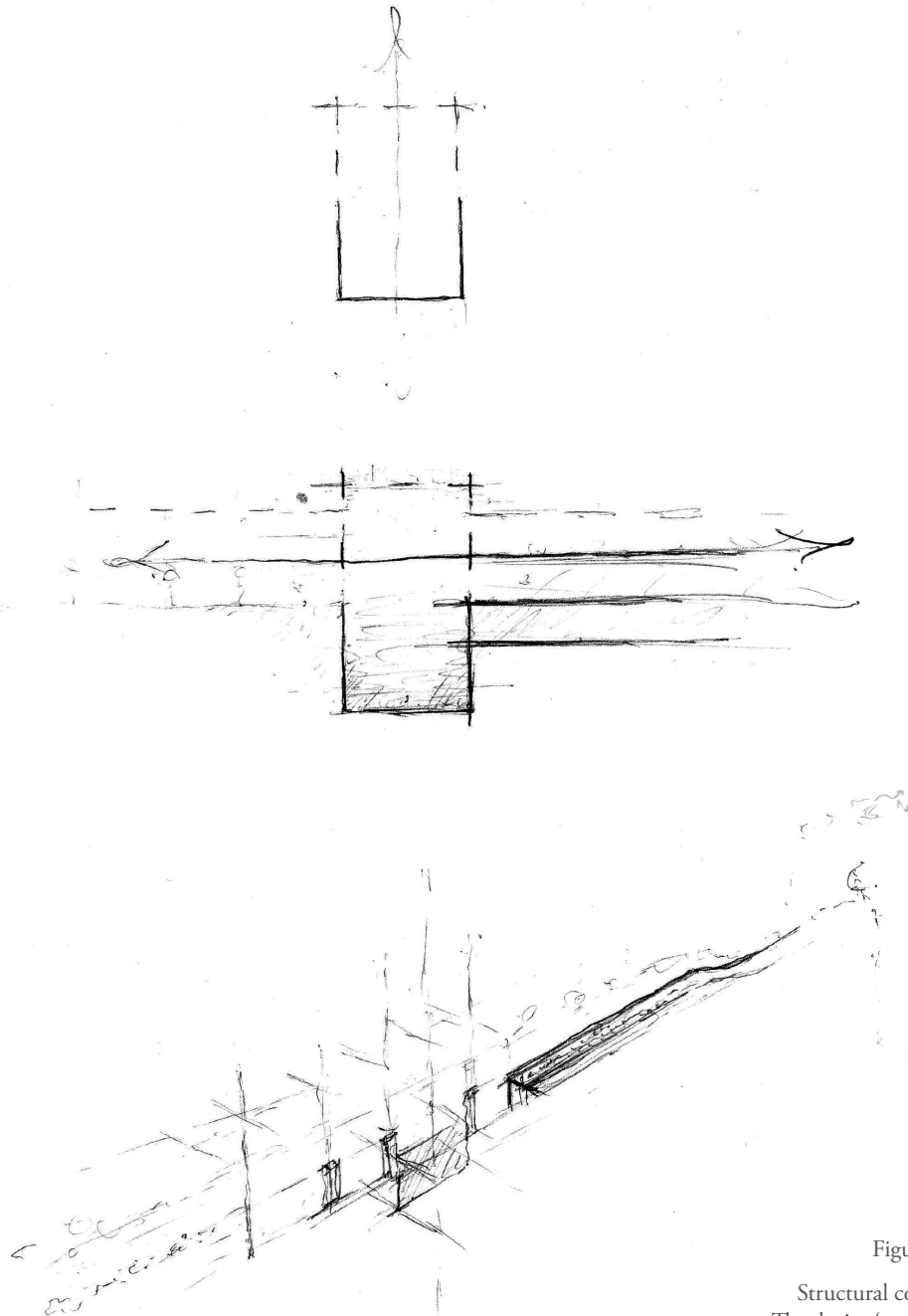


Figure 8.1
Structural concept.
The device 'assembles'
the environment and
animates the spaces
therewith
(Author, 2015)

TECHNOLOGICAL CONCEPT

The conceptual approach to the technology of the device is an interchanging animation between architecture and the natural environment. The one thus becomes an extension of the other to illuminate its counterpart's poetics and to service one another. The architecture invites nature to service the spaces with passive design strategies while nature is allowed to aid in the articulation of the architecture. The architecture makes the environment 'visible' while also enfolded natural vegetation for safekeeping and production.

STRUCTURAL CONCEPT

The Loggia is the transition between the building and natural landscape, as is the oculus the metaphorical transition between the terrestrial and the atmosphere. The building, as threshold device, mimics its transience through its structure. The structure is stereotomic where it morphs the ground plane of the gardens, and becomes more tectonic as it ascends upwards. Another axial unfolding takes place: To the west, the device is completely morphed with the gardens through the stereotomic form that unfolds rhythmically to intercept the tectonic street edge through channelled stacks. Rhythm is created continually through an interplay between tectonic and stereotomic form.

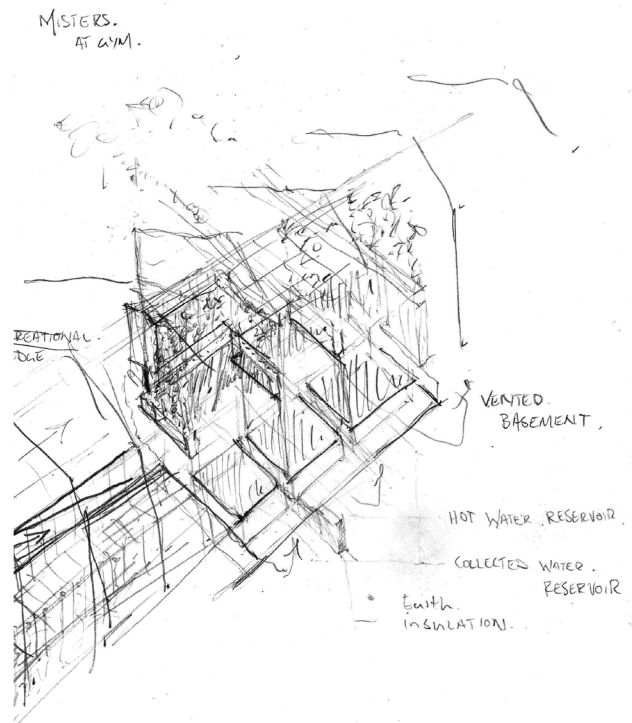


Figure 8.2
Conceptual sketch of
the structure
(Author, 2015)

INTERCHANGING ANIMATION

At the heart and spine of the intervention an interchanging animation is created in a volume between the water from the fountain, through the presencing in pools and facilities, and the natural environment, in a greenhouse conservatory, with a portal frame structure. The greenhouse's spine envelops double volume spaces, in and around the pools; it unfolds rhythmically to the west to envelop double volume spaces over the length of the lap pool and foyer to the recreational facilities. The structure is stereotomic where it morphs the ground plane of the gardens, and becomes more tectonic as it ascends upwards. It extends onto the street edge to the north to frame the multi-purpose hall.

'ASSEMBLING' THE ENVIRONMENT

The architecture "assembles" and invites the natural environment from the west towards the nucleus and central spine. The gardens and the properties of the fountain to the west are 'gathered' by a stereotomic structure that morphs into the ground plane. This structural mass retracts and unfolds geometrically and through levels to form the pools and spaces along the nucleus and central axis of the intervention while the roof becomes the ground plane of the gardens. This level unfolds and retracts underneath the greenhouse to accomplish double volume spaces in and around the baths and a second level within the greenhouse. This level relates here to the upward ascent of the building, becoming more tectonic.

ANIMATING THE ENVIRONMENT

Concrete planters extend from the western edge of the building through to the eastern edge. These serve as spatial and physical conduits to animate and service the spaces with the properties of the environment. Within the semi-enclosed gym, these planters serve as drip trays to the misters. Inside the greenhouse a stainless steel mesh, supported by the tectonic steel structure of the greenhouse, extends upward for climbing plants and serve as divisions between public and private. To the east, these planters expand into evaporative cooling stacks that rhythmically intercept the tectonic street edge with stereotomic form. These retract their form and open to water channels with chilled water for post-cut flowers or planters that serve the Loggia. The eastern edge fronts the urbanity with tectonic double volume spaces interrupted rhythmically by stereotomic stacks.

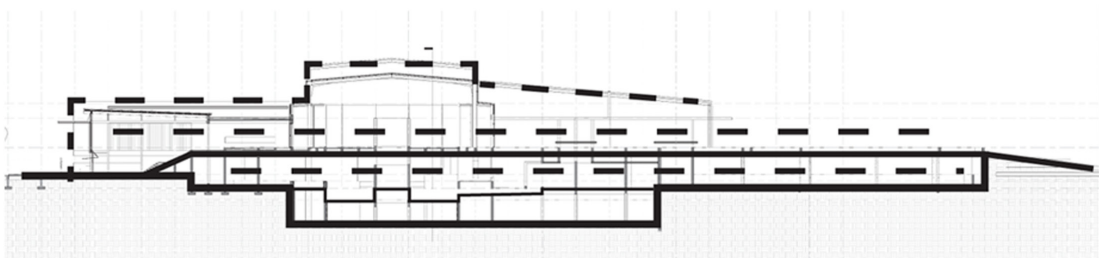
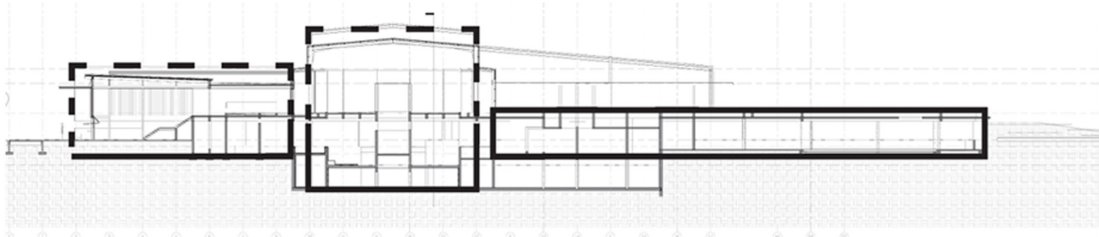
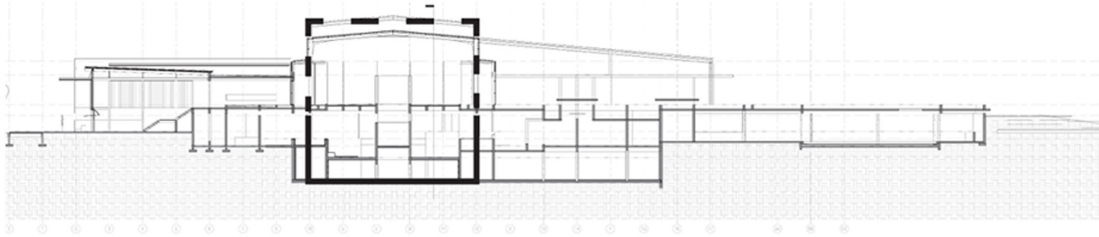


Figure 8.3 (top)
The Heart and
Spine
(Author, 2015)

Figure 8.4 (middle)
'Assembling' the
environment
(Author, 2015)

Figure 8.5 (bottom)
Interchanging
Animation
(Author, 2015)

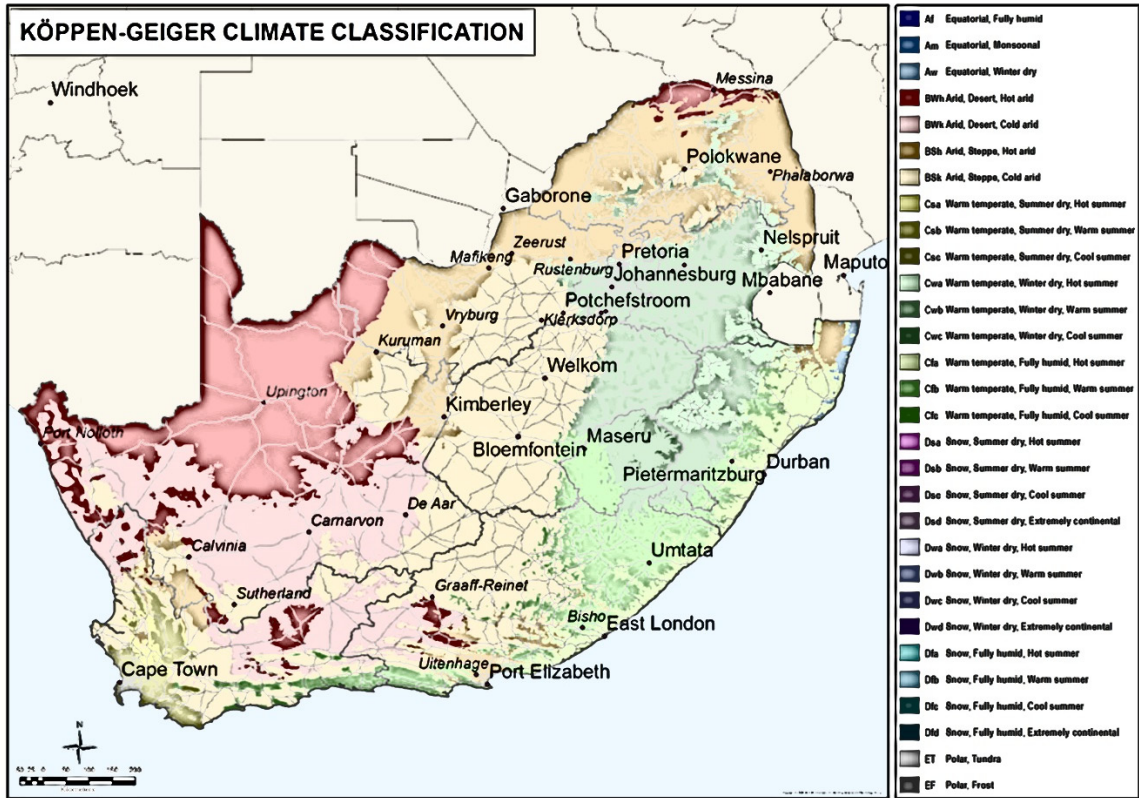


Figure 8.6
CSIR Köppen-Geiger map
(Conradie et al, 2015)

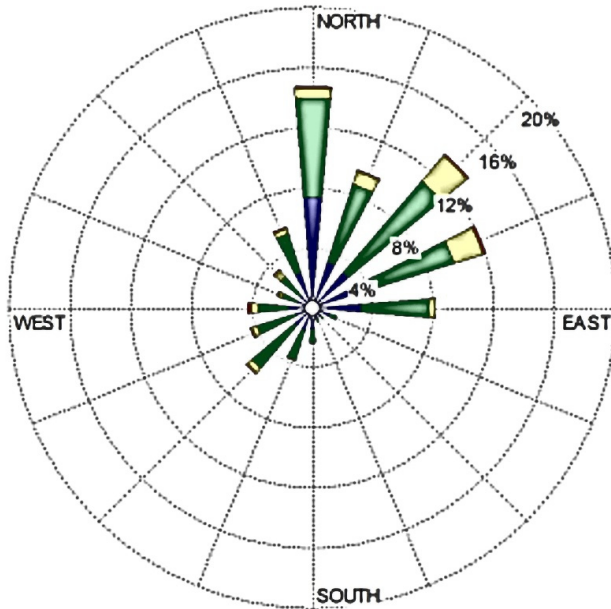


Figure 8.7
Bela-Bela period surface wind rose for period 2004 - 2008
(EMFWD, n.d.)

CLIMATE RESPONSE

CLIMATE

According to the CSIR Köppen-Geiger map (based on 1985 to 2005 Agricultural Research Council data on a fine 1 km x 1 km grid), Bela-Bela is classified as BSh Arid, Steppe, or hot semi-arid (Conradie and Kumirai, 2012: 5). Conradie et al. (2012: 6) propose passive solar heating, thermal mass, exposed mass and night purge ventilation, natural ventilation, direct evaporative cooling, and indirect evaporative cooling all as passive design strategies that could be employed in building designs within this region. The climate is defined by air with low levels of humidity, high irradiation levels, and hot summers and mild winters with cold evenings. The wind in Bela-Bela originates from the north, north-east and east-north-east and is considered slow to moderate apart from during the day time when speeds increase and faster winds of above 6 m/s are frequently seen (EMFWD, 79)

PASSIVE DESIGN STRATEGIES

The design is proposed to adapt climatically and provide ideal conditions for programmatic requirements by making use of passive, mechanically aided ventilation systems. The design necessitates that hot, dry air be kept outside or saturated, so as to increase the relative humidity and decrease air temperature. It furthermore necessitates that spaces be protected from high levels of solar irradiation, while insulating the spaces during cold winter nights. Spaces need to be well ventilated with the cool air of higher relative humidity and then circulated to provide the necessary air changes.

In hot, dry conditions, passive downdraft cooling or passive downdraft evaporative cooling (PDEC) is a passive cooling strategy proposed for such regions (Ford, Schiano-Phan and Francis, 2010: 13) as Bela-Bela's. The design proposes direct evaporative cooling strategies for spaces, in conjunction with passive and mechanically aided passive ventilation techniques. The Loggias and the florist are serviced with passive downdraft tower channels where the drip trays are planters by the Loggia or water circulation basins for fresh cut flowers in the florist's shop. Earth tubes are meant to provide air at desired temperatures to some spaces, while the humidification of air through misters is proposed for the greenhouse, gym and restaurant.

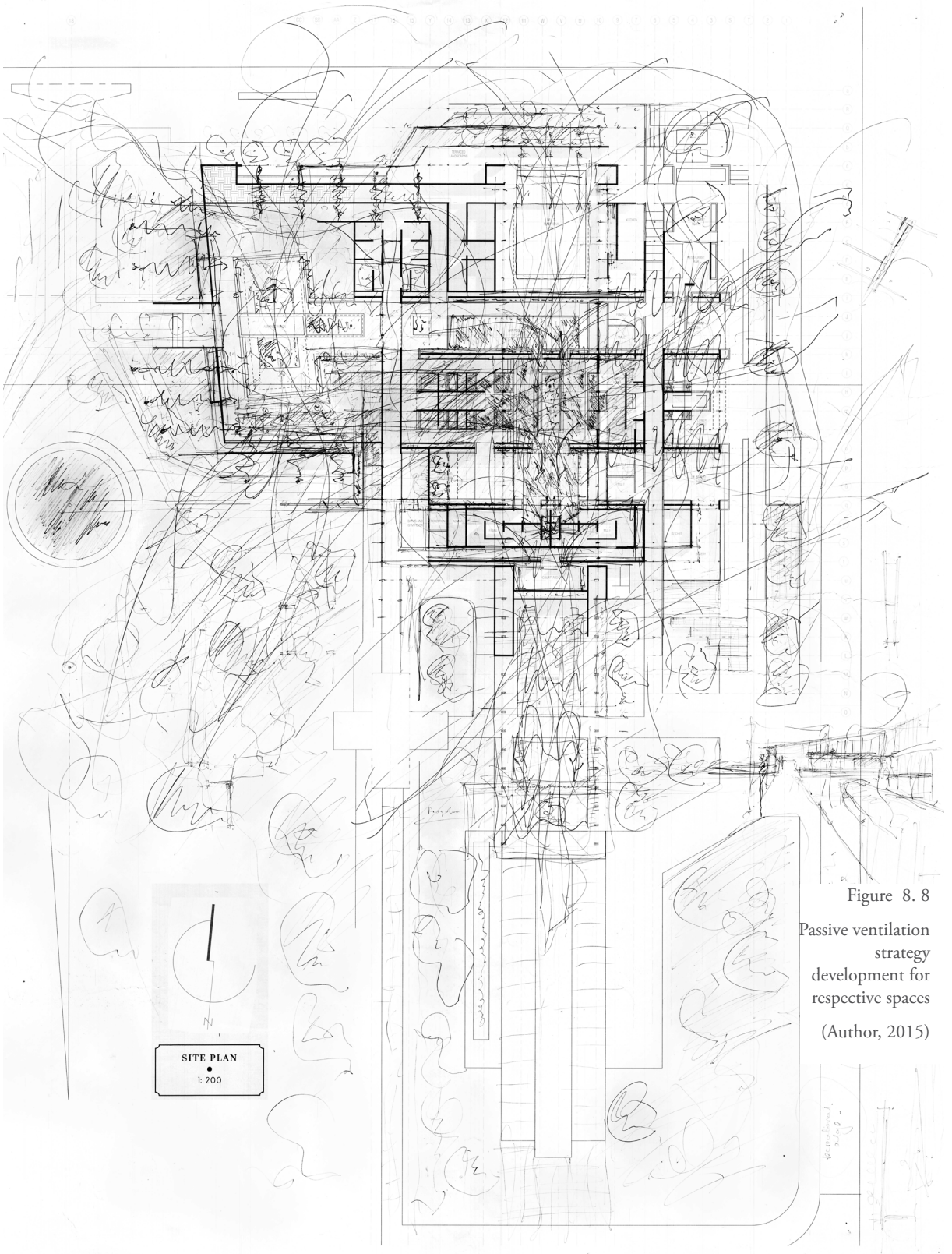


Figure 8.8
Passive ventilation
strategy
development for
respective spaces
(Author, 2015)

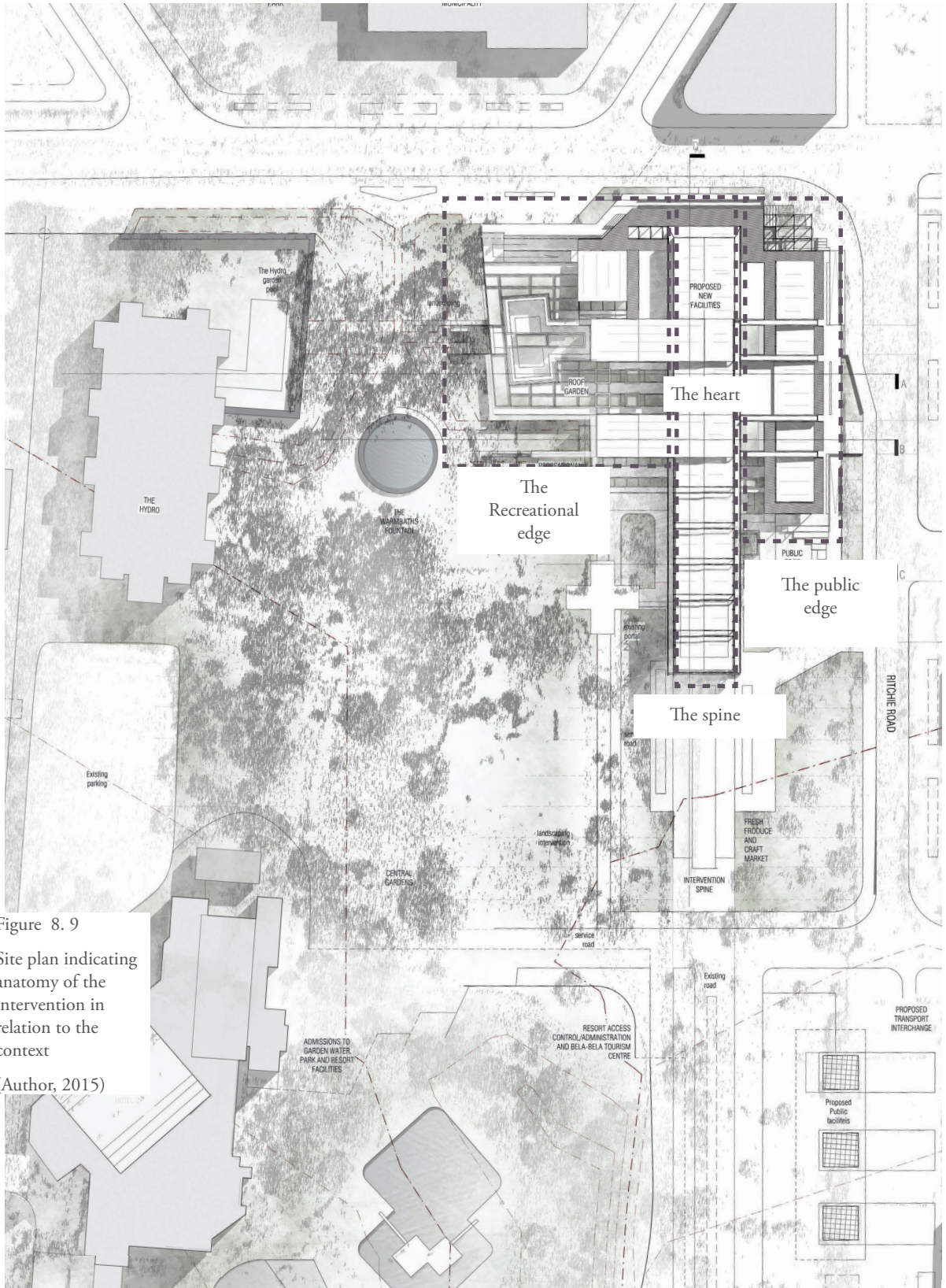


Figure 8.9
Site plan indicating
anatomy of the
intervention in
relation to the
context
(Author, 2015)

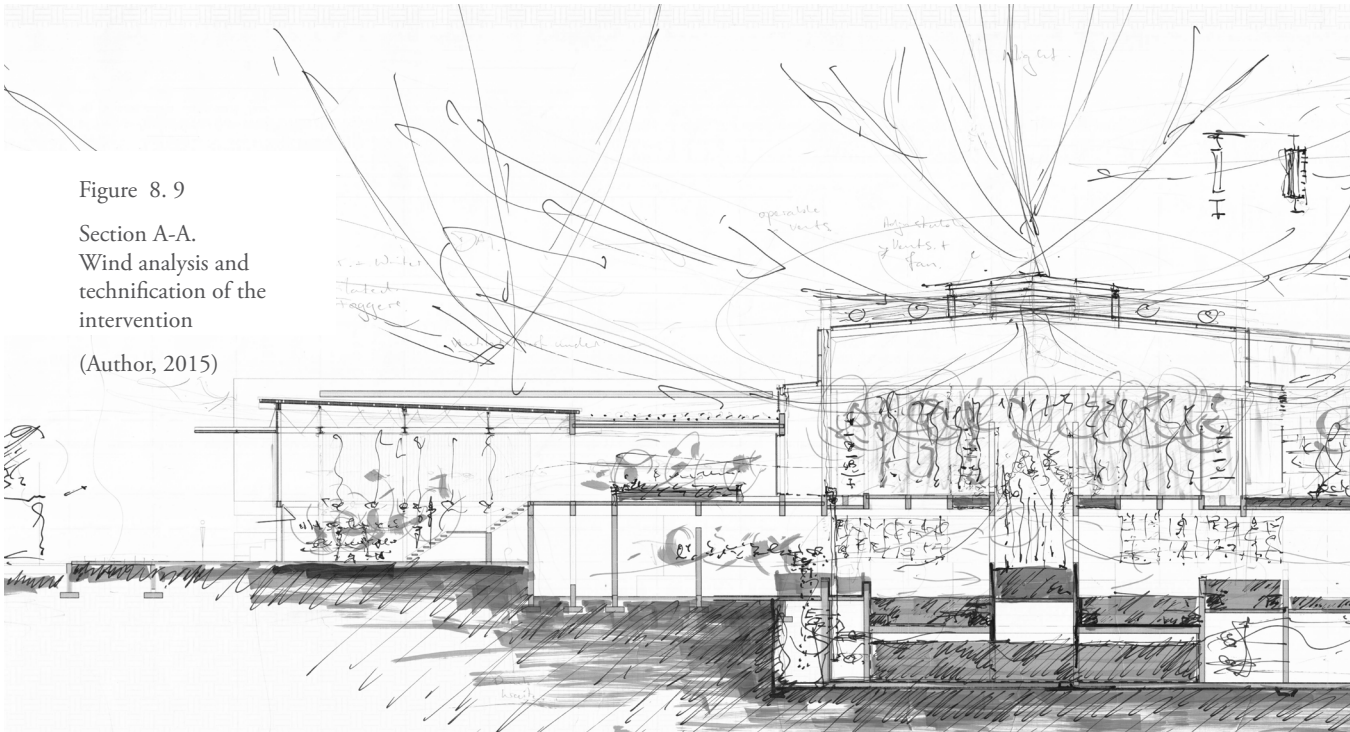


Figure 8.9
Section A-A.
Wind analysis and
technification of the
intervention
(Author, 2015)

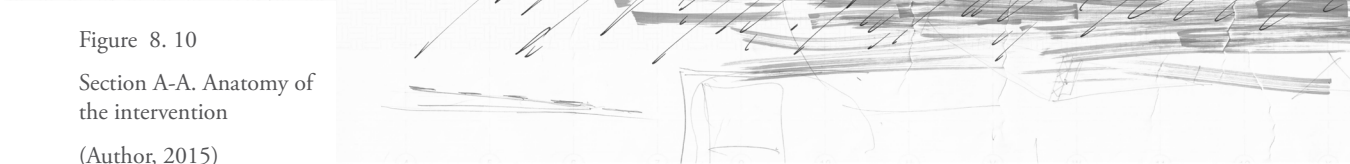
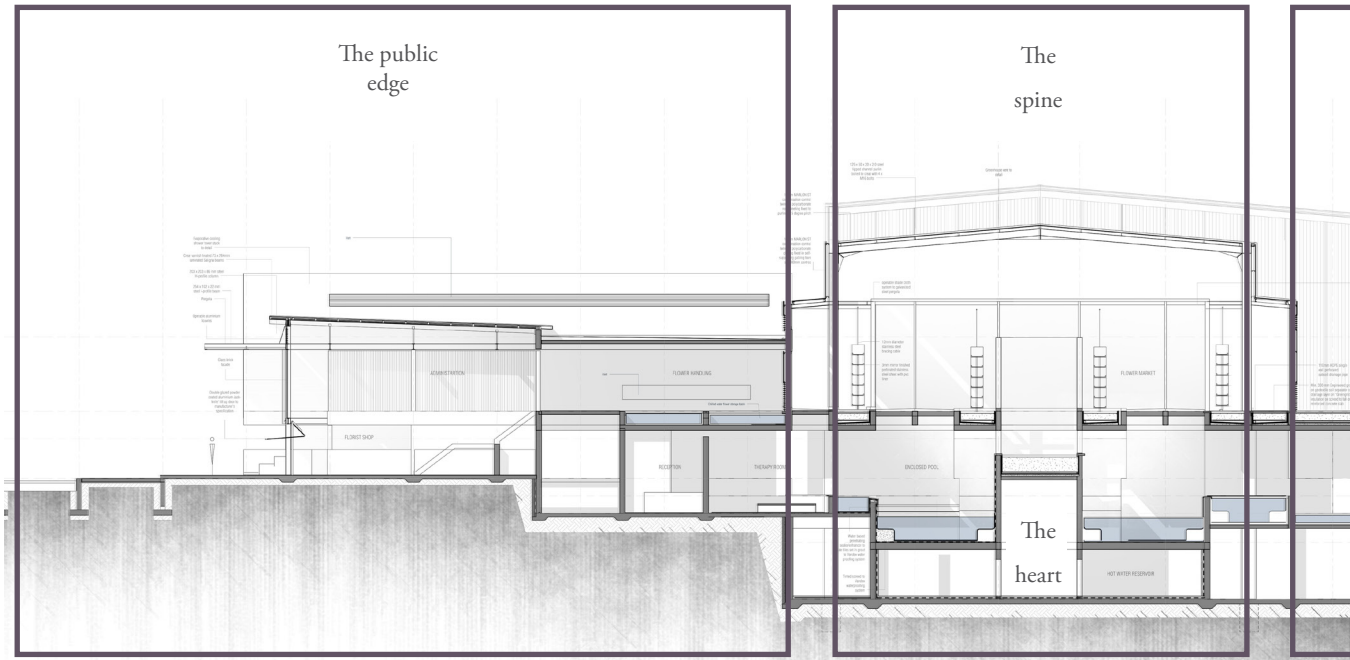
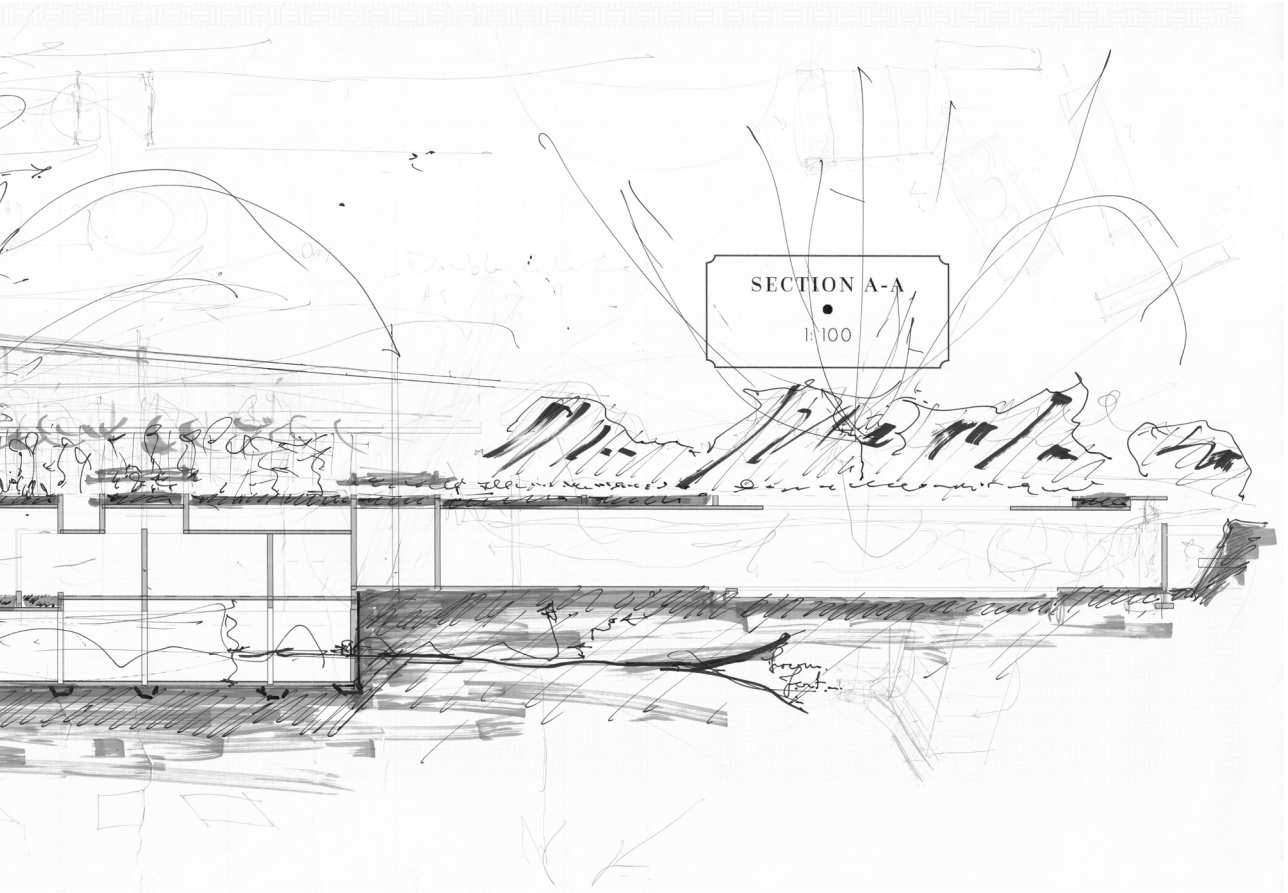
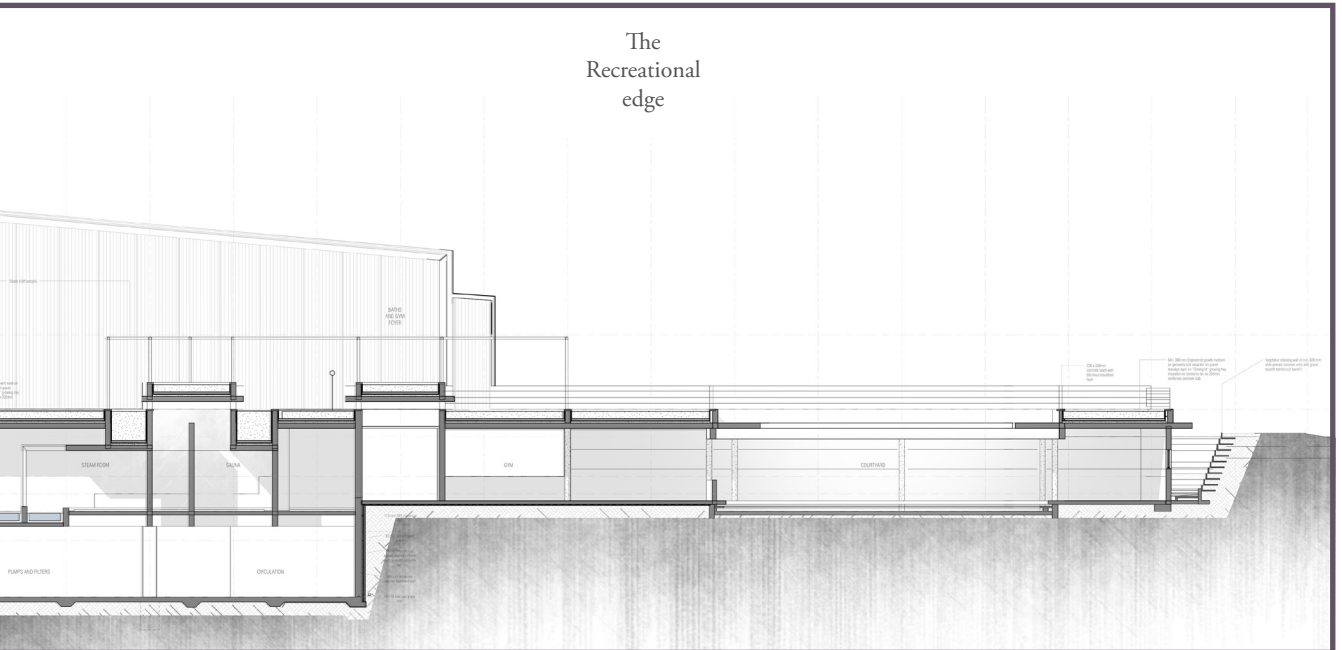


Figure 8.10
Section A-A. Anatomy of
the intervention
(Author, 2015)





The
Recreational
edge



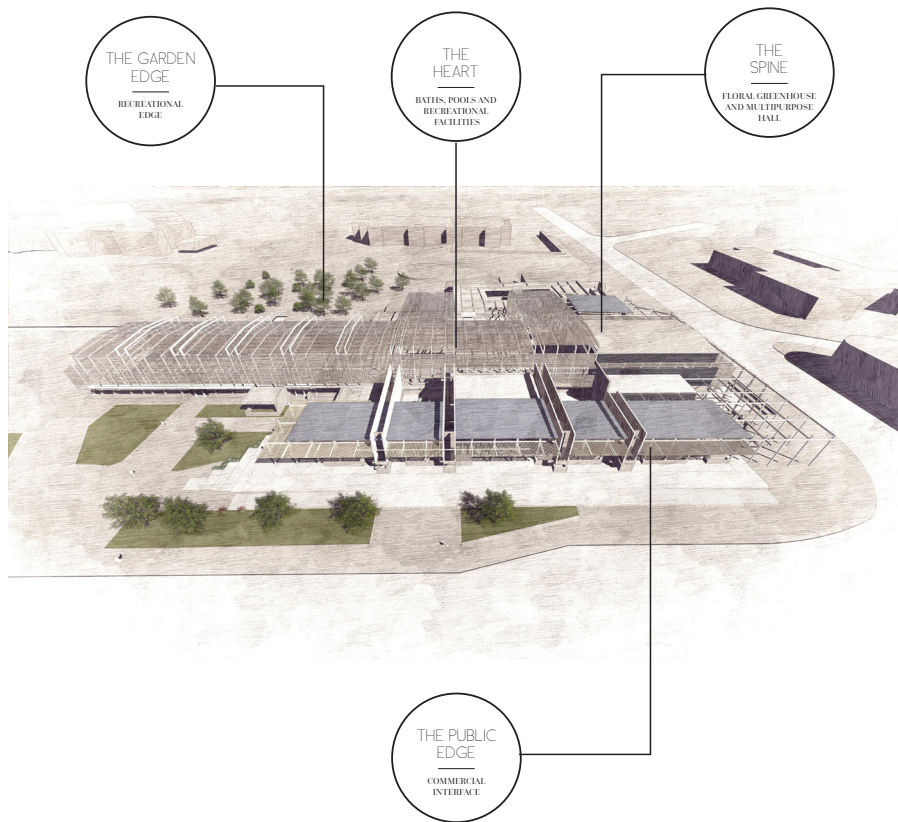


Figure 8.11
Anatomy of the
intervention
(Author, 2015)

THE HEART AND SPINE

THE BATHS

Materials

The pools are treated with a darker pigmented screed to create the effect of a more natural pool. Circulation around the pool is of light coloured concrete tiles edged with slip resistant tiles where it meets the pool. A shadow line is created in the form of a drainage channel where it meets the enclosing concrete planters. The deeper spaces around the pool are of slate tiles, where shutter concrete slabs enclose it. The first floor is a slab and beam-system supported by columns with brick infill. The beam-frame edges planters and water bodies on the first level, where smooth soffit frames the enclosed spaces. At the nucleus, the soffit of the slab moves between the top and the bottom of the beam-system, creating planters on this level and a coffered rhythm enclosing the pools. An opening for an Oculus or light shaft above the nucleus - a planter box ringed by the water - is also created.

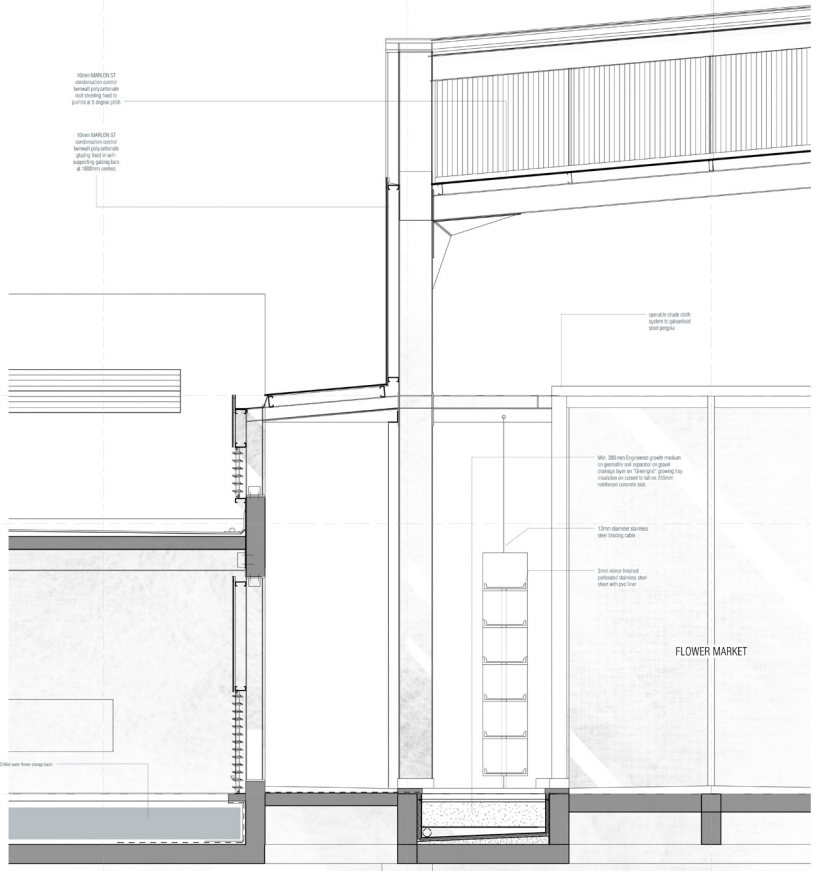
Figure 8.12

Section A-A detail. The inherent conditions of the greenhouse volume serve a motoric engine to the ventilation of adjacent spaces. The pools surrounding the central pool are designed as infinity pools which overflow into the central body. Edges to the floral market are lined with stainless steel display boxes and planters to diffuse views onto the pools. (Author, 2015)

170 x 104 x 12 x 23 mm
light fixture detail
shown to show with 4 x
1000 volts

10mm ABS/PC 20x15
used as a door sill
between any entrance
that meeting level to
outside at 30 degree pitch

10mm ABS/PC 20x15
used as a door sill
between any entrance
that meeting level to
outside at 30 degree pitch



THERAPY ROOM

ENCLOSED POOL

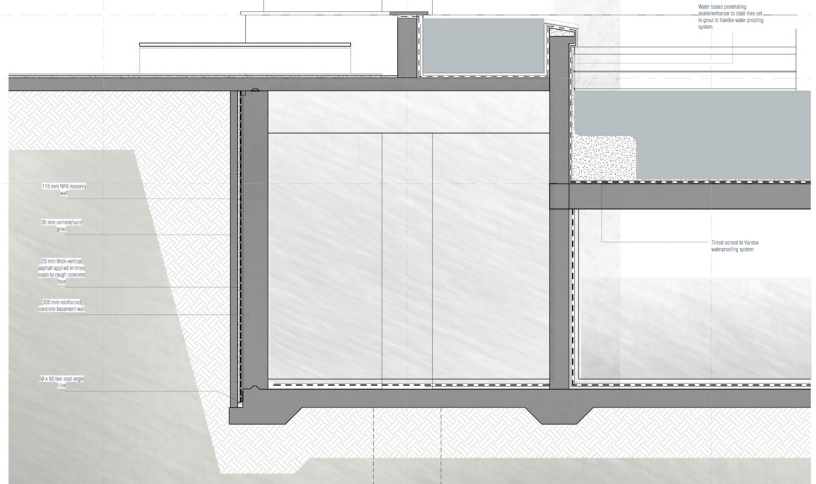
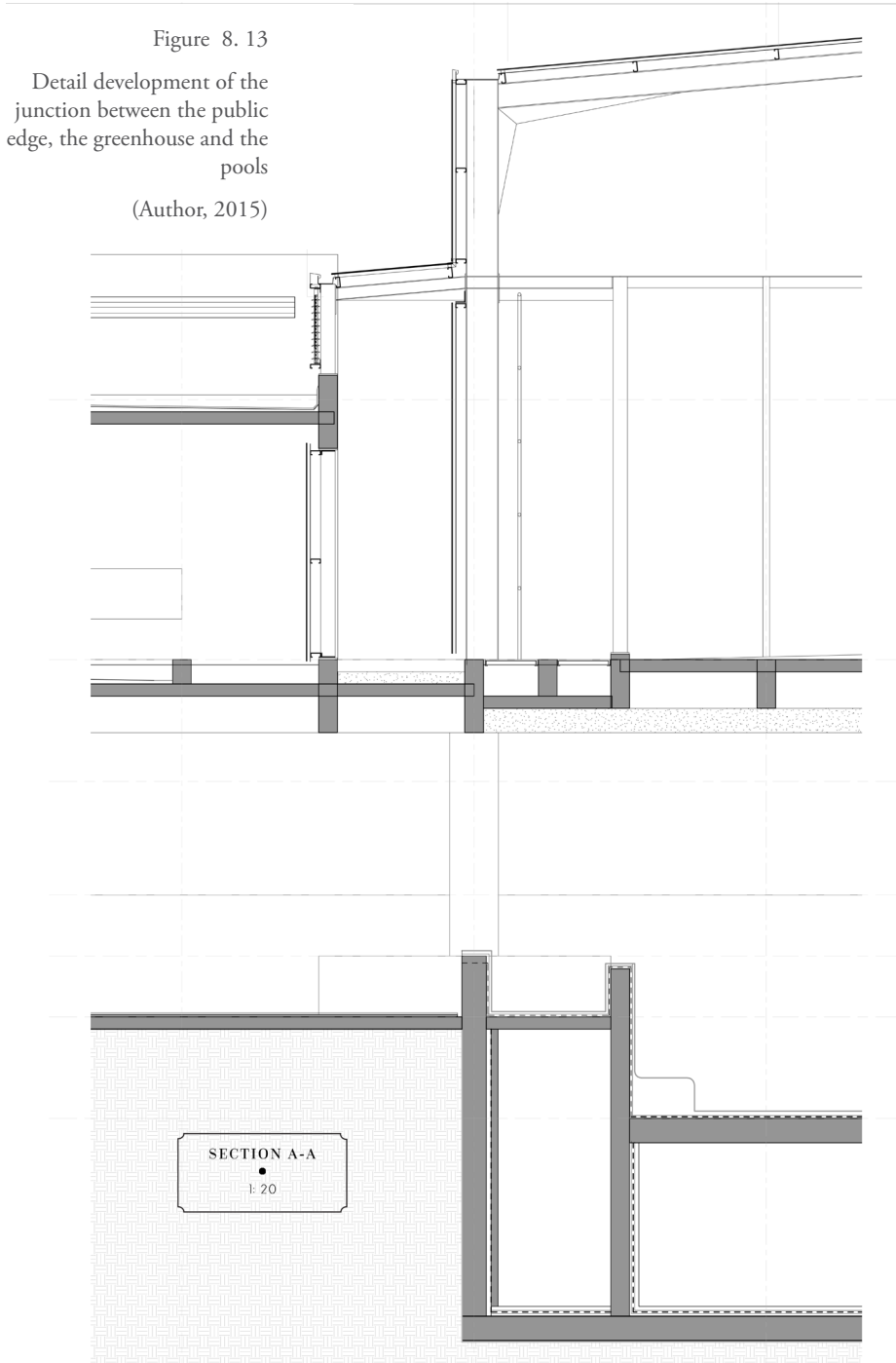


Figure 8.13

Detail development of the
junction between the public
edge, the greenhouse and the
pools

(Author, 2015)



THE GREENHOUSE SPINE

Orientation

The climatic elements to be considered for open-air and protected cultivation (and conservation) of flowers and plants are solar radiation, temperature, precipitation, humidity evaporation and evapotranspiration, and wind velocity (Von Zabeltitz, 2011: 5). In arid regions, such as Bela-Bela, Von Zabeltitz proposes that greenhouses have to protect crops from excessively high irradiation, have efficient ventilators that can be closed during the evenings, and, in the case of low humidity and high temperatures, evaporation cooling should be considered. In the southern hemisphere, and below 40 degrees north latitude, the ridge of single greenhouses should be oriented from north to south, since the angle of the sun is much higher (Ponce-Cruz et al., n.d: 45). This greenhouse is also to serve as tourist attraction and conservatory and thus the focus is not only on crop production but also on the exhibition of indigenous flora.

Figure 8.14

Section C-C. The greenhouse structure.

(Author, 2015)

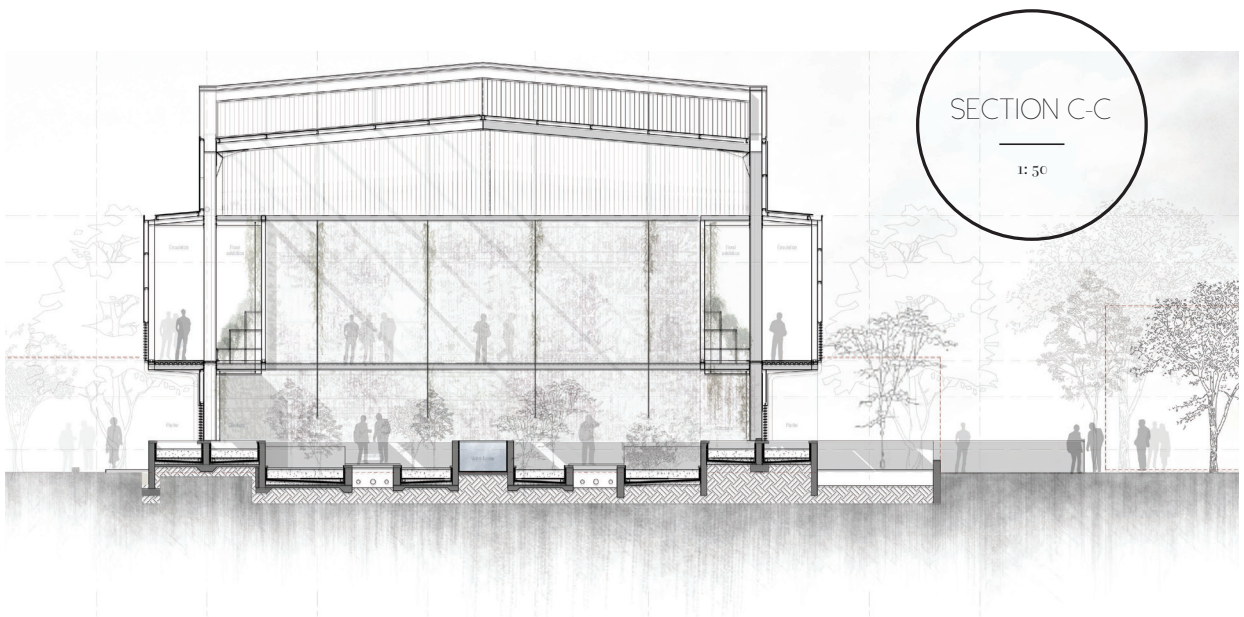


Figure 8. 15

Section C-C. Detail. The portal is expanded on first level to form pedestrian circulation on the exterior and floral display on the interior. The display is alternated with climbers

(Author, 2015)

Wind and Ventilation

The moderate speed of the wind necessitate that it be considered when passively ventilating the building. The greenhouse is orientated north-south but the prevailing wind originates from the north. The portal frame is doubled over the walls of the planters where it divides spaces. The frame becomes a shaft that protrudes past the roof of the greenhouse and extends along the fall of the chapel structure. It is covered by translucent sheathing to the north and opens to the south through louvered installation. A negative pressure arising from winds that transverses the shaft stimulates draft which is drawn from the eastern and western sides. Though, the wind is primarily strong during the day, it might not prove sufficient and thus the addition of mechanically aided ventilation through fans along the top of this shaft is proposed. These fans can be operated in times where necessary. The induced draft draws air from cool pockets along the loggias of the building. *Figure 3: Period surface wind roses for Bela-Bela during the period 2004 - 2008. Environmental Management Framework for the Waterberg District Status Quo Report (EMFWD). (n.d.).*

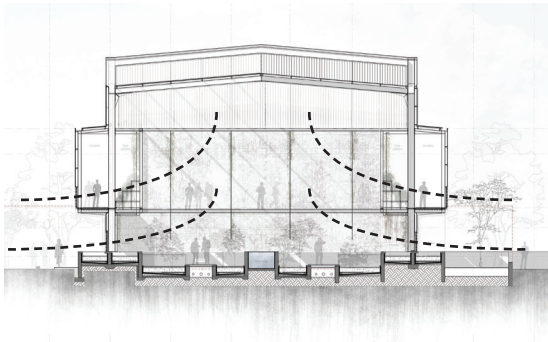
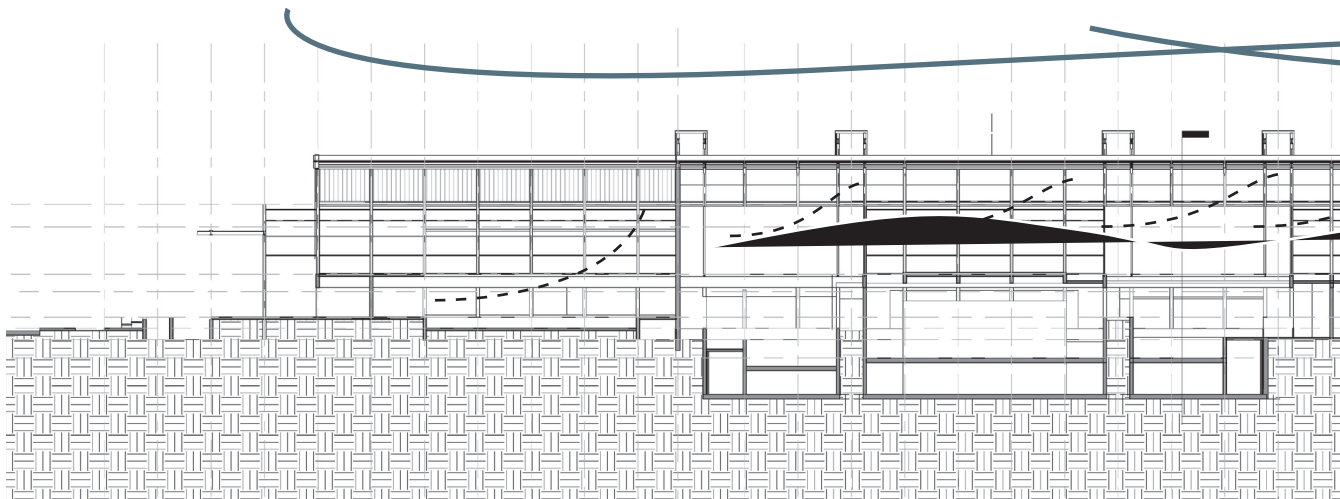


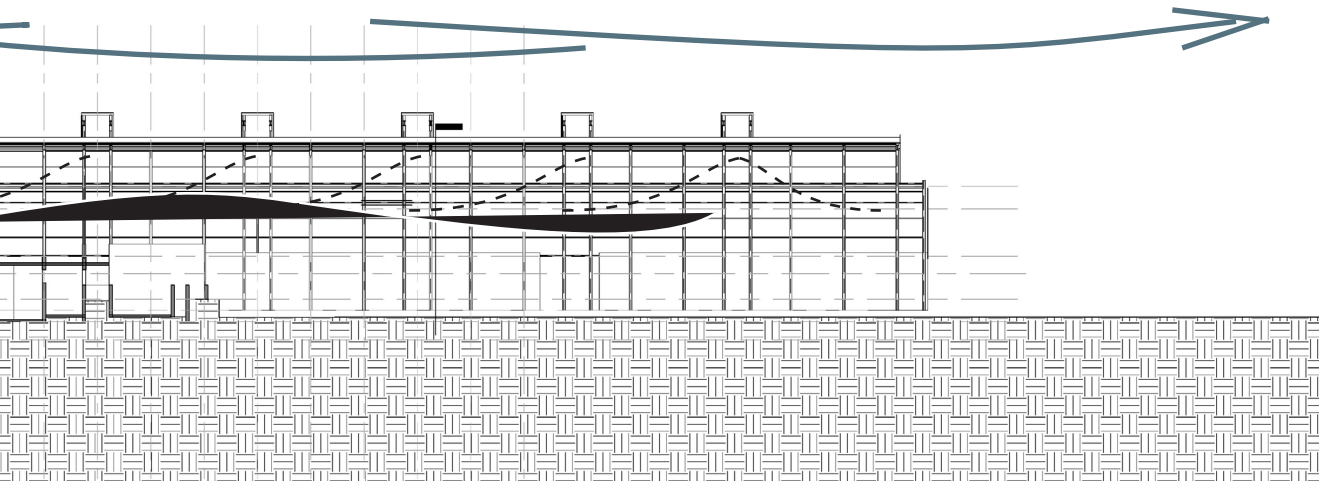
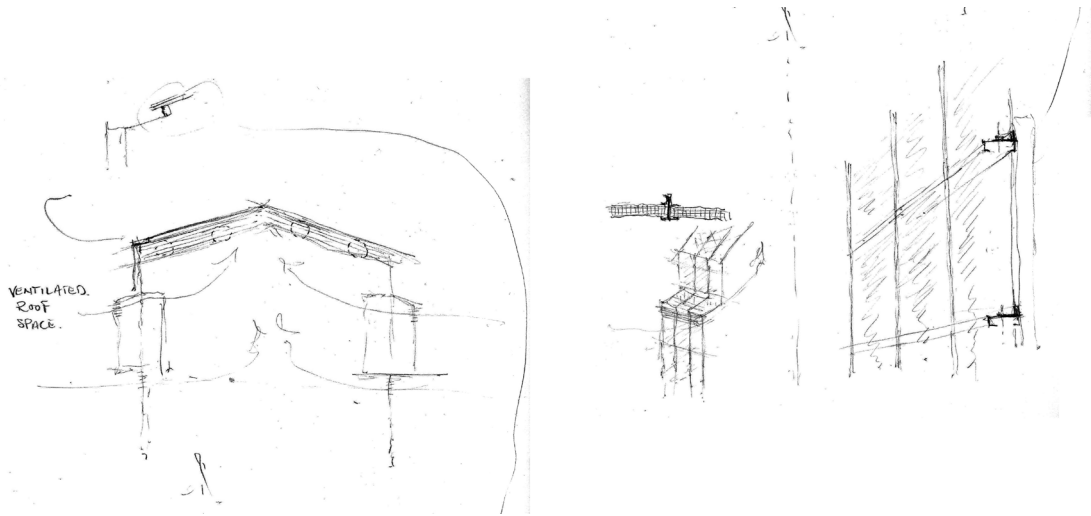
Figure 8.16
Ventilation strategy with prevailing winds from originating in the north
(Author, 2015)

Figure 8.17
The double skin condensation control polycarbonate sheeting and ventilation system
(Author, 2015)



The Skin

The cladding of a greenhouse determines the amount of sunlight reaching the crops, as well as the heat-loss and heat-gain of the structure. A 10mm Marlon ST double wall condensation control polycarbonate sheeting is proposed, as the product achieves the high levels of photosynthetic light transmission necessary for healthy plant growth, and promises high impact resistance, condensation control, and UV protection (brettmartin.com, 2015).



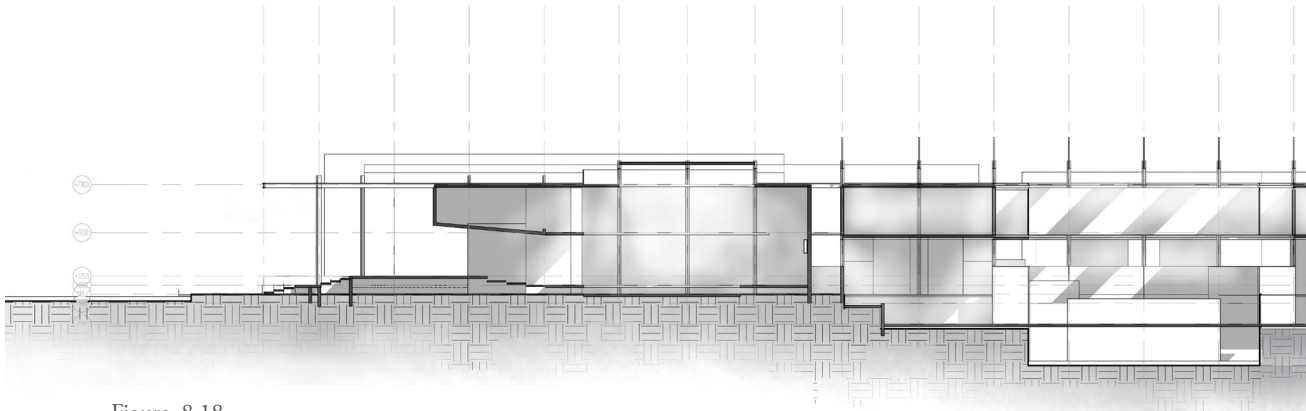
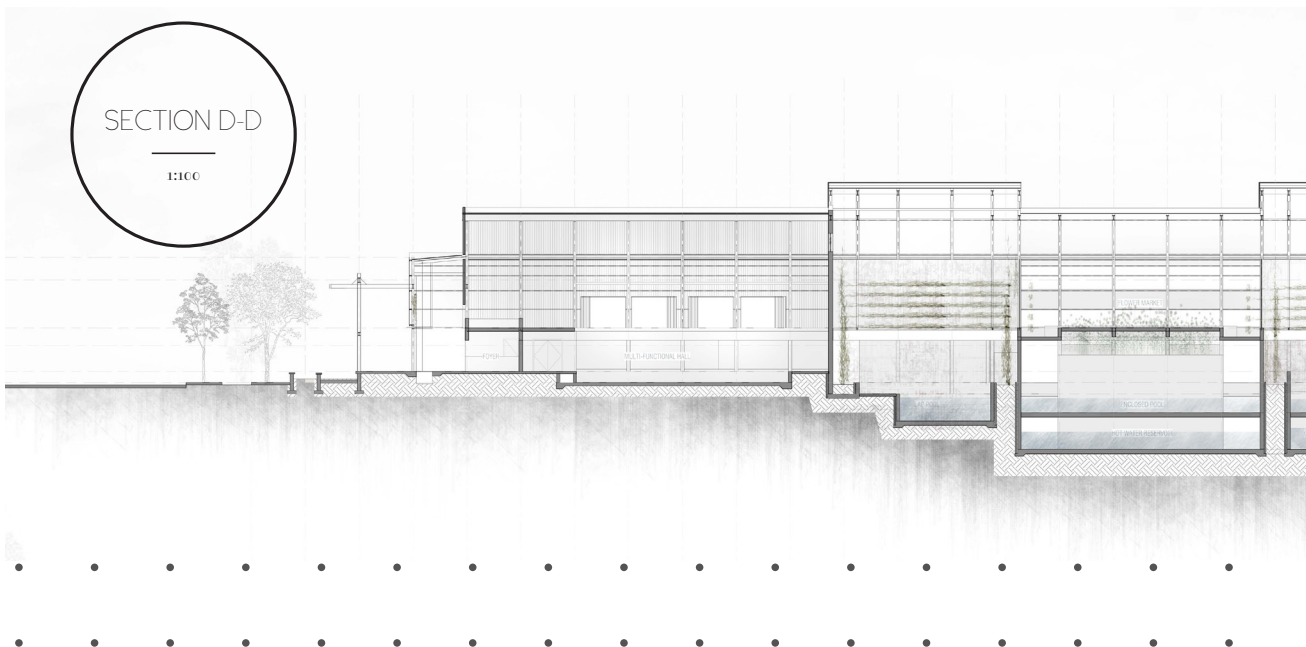
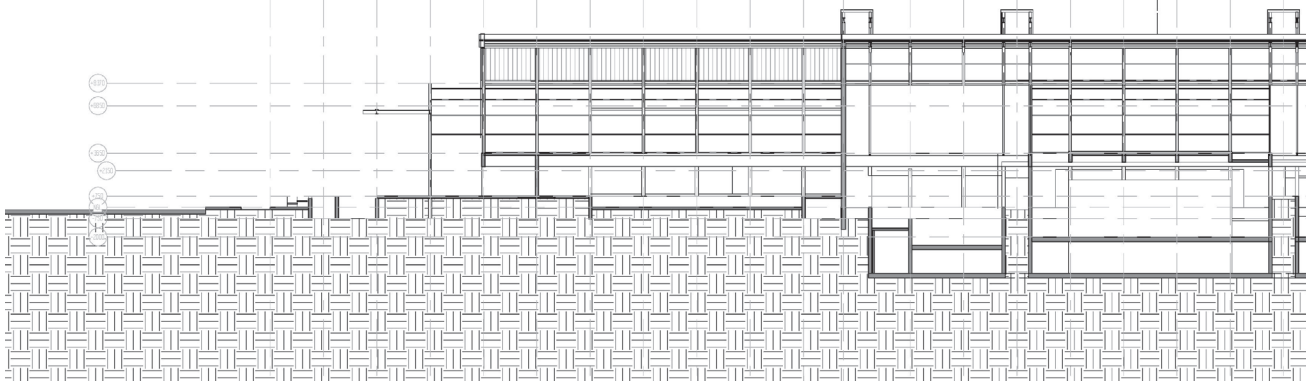
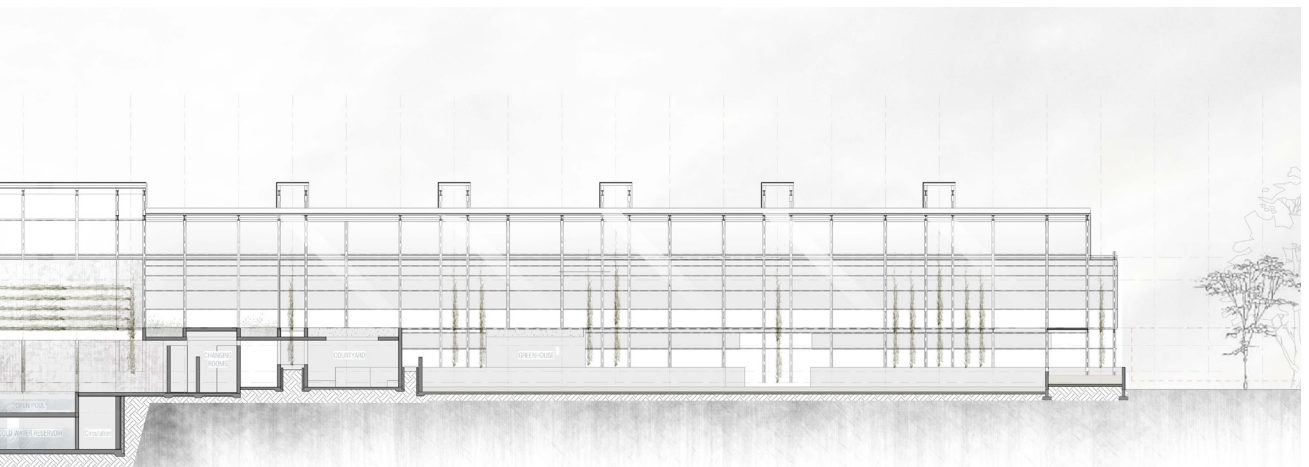
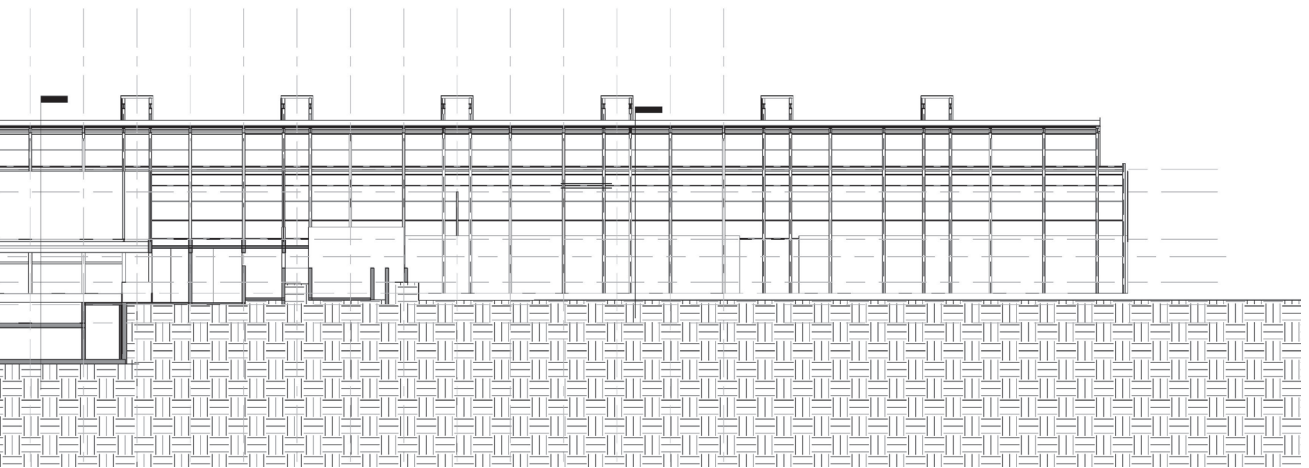
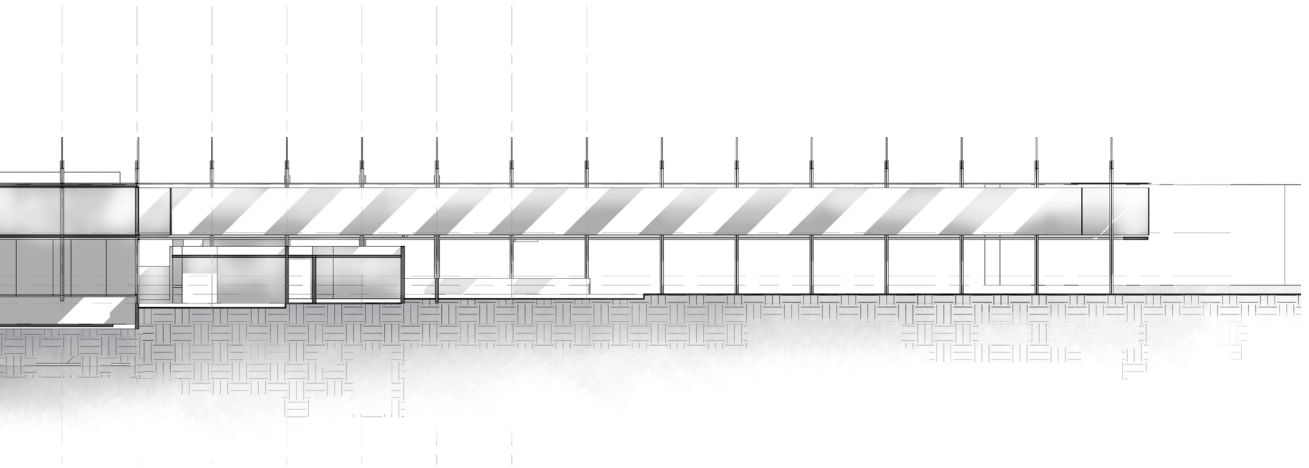


Figure 8.18
Section D-D
development.
(Author, 2015)

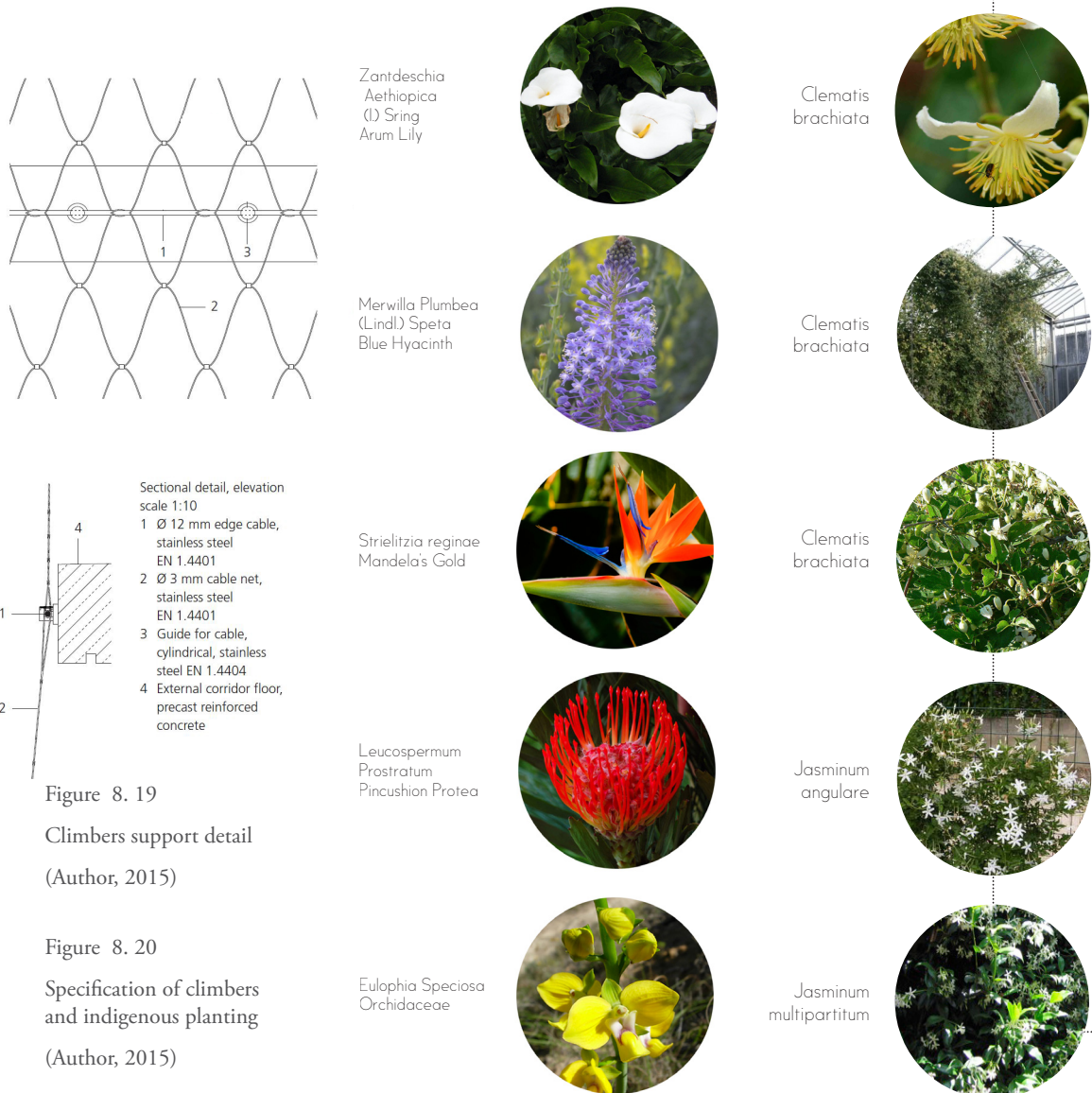




Planting

Planters line the edges of the space to create privacy around the pools. Planter boxes are integral to the floor structure or located on the ground floor from where planters climb. Suspended off these edges is a 3mm Stainless Steel net secured in between 12mm edge cables. The proposed climbers are the *Jasminum* species along the north-south axis and the *Clematis* species along the east-west axis, as their colours articulate the intersecting lines of the channels. Mistlers along these edges, along with the ventilation system, ensure a regular distribution of moisture throughout the space.

The intervention furthermore hosts a conservatory for indigenous plants of South Africa and the Waterberg region. The first level hosts this exhibition where the first floor structure interchanges between down stand beams (to articulate overhead surfaces) and upstand beams to form planter boxes for the conservatory and nursery.



THE HALL

The structure of the greenhouse extends into the hall and becomes its structure too. The circulation level becomes galleries that ring and live out onto the hall, with the eastern gallery extending into the greenhouse. A suspended ceiling, along with the provision of earth tubes, aid in converting the structure into a habitable space. The ventilation strategy yields a negative pressure to occur in the southern wall of the hall. This pressure draws air from earth tubes that surface at the north of the hall to ventilate the hall. It also draws air from the north through the ceiling cavity to ventilate and cool the void.

THE RECREATIONAL EDGE

Materials

The gym, as an extension to the recreational facilities, adopts its materiality. The roof is off shutter concrete where the upstand beams are used to frame soil for planters. A beam system is proposed that minimises columns in the gym surrounding the courtyard.

Passive Systems

The planters that line the internal edges of the gym are equipped with misters to be used for the cooling of the direct environment. The thick soil mass of the planters between beams insulates the space. The enclosing edges of the internal space are lined with earth tubes that draws air at desired temperature into the space as heat rises towards the courtyard and the wind from the north transverses it.

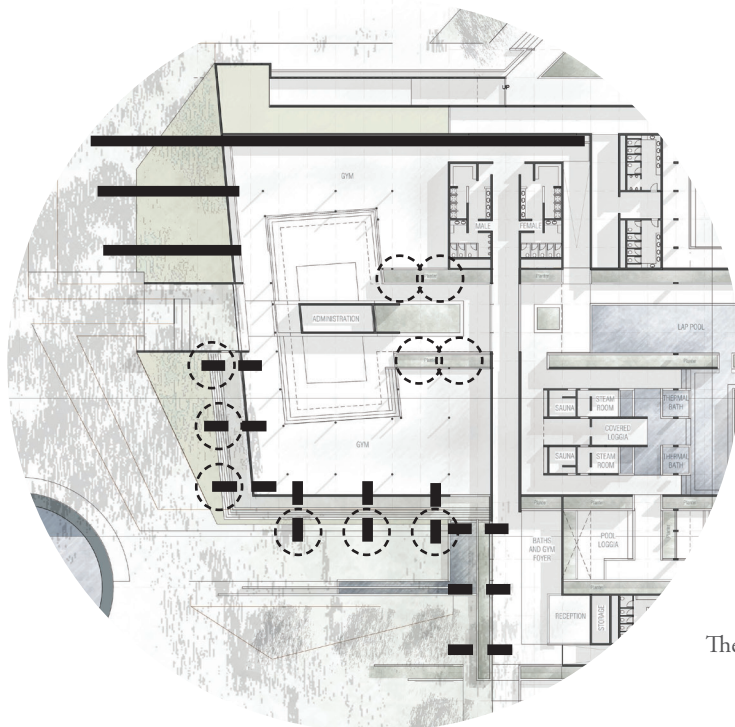


Figure 8.21
The recreational edge and
the passive ventilation
strategy
(Author, 2015)

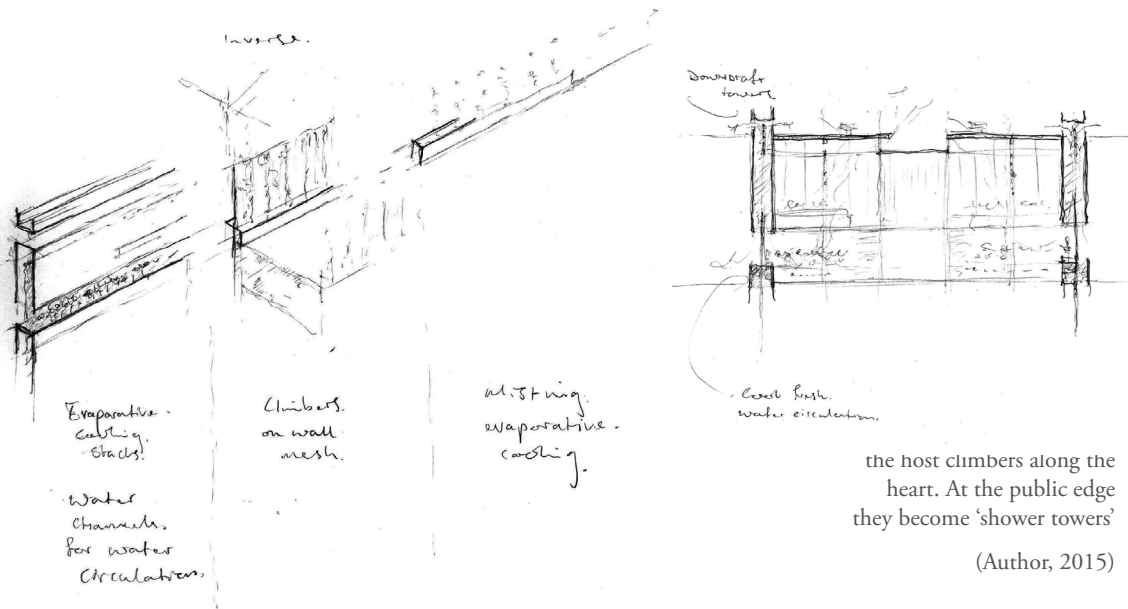
THE PUBLIC EDGE

Materials

The street edge to the east is composed of tectonic double volume spaces, intercepted rhythmically by the stereotomic stacks that run west-to-east. The stacks are bagged and painted so as to appear as a monolithic structure with openings along the length. The roof over the double volume has a double composite structure, with the steel beam frame erected as primary support. This structure supports a mono-pitched laminated saligna beam that spans from the east, and slopes to the west to drain water towards the reservoir. The primary steel frame supports form decking and concrete over the extension between the greenhouse and the florist to insulate the space.

Passive downdraft stacks

The stacks are extended past the roof structure to intercept and channel the prevailing wind from the north into the shaft past the misters to aid in a downdraft. The stack opens at ground level where it serves as conduit for the circulation of cold water that, in return, serves as a drip tray to the misters. These openings service the spaces with cool, moist air. The street edge of the stacks are planted walls, while a shading device is implemented, fronting the glazed façade, to shade spaces from a low sun angle from the east.



Iteration

The theme of the Oculus inspired a coffered roof system over double volume spaces with polycarbonate as roof sheeting. This design entails detailed steel spaceframe constructions that provide a homogeneous condition for the uninterrupted flow of space and a direct relationship between sky and earth. However, this design entails concealed gutters at each grid line and an intricate and skilled assembly, and thus it was decided to simplify the roof construction while retaining a depth in the structure and coffer articulation.

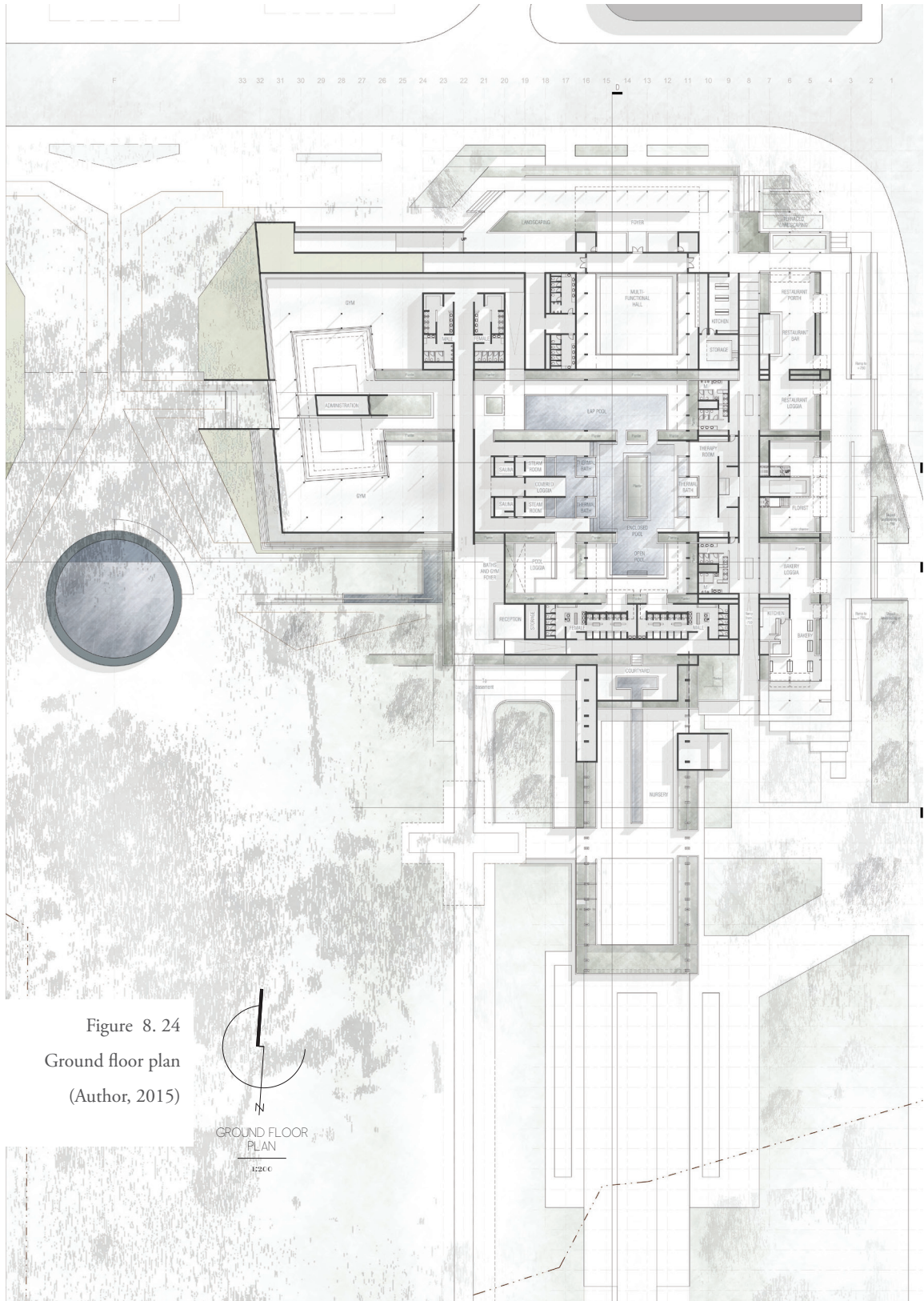


Figure 8. 24
Ground floor plan
(Author, 2015)



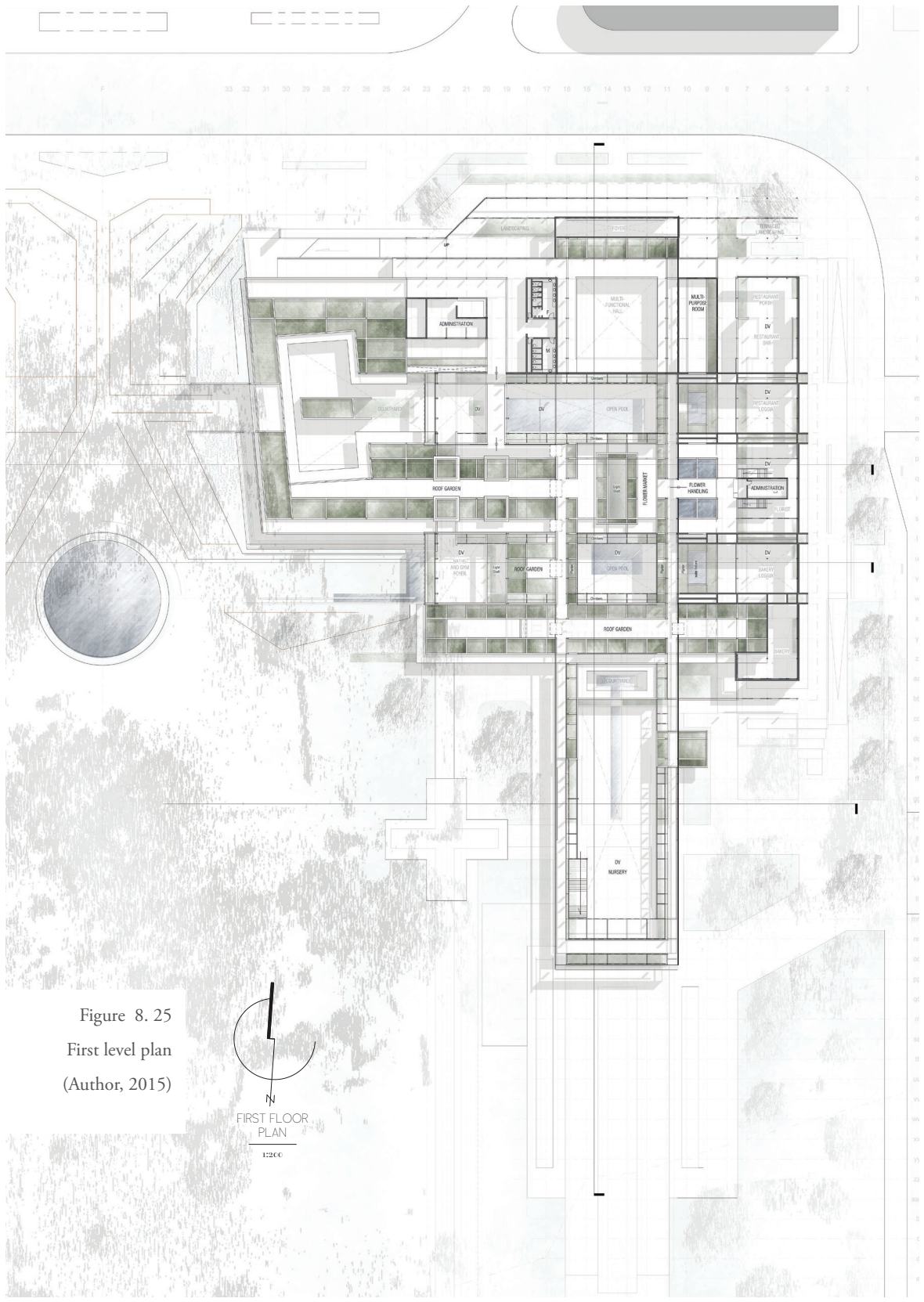
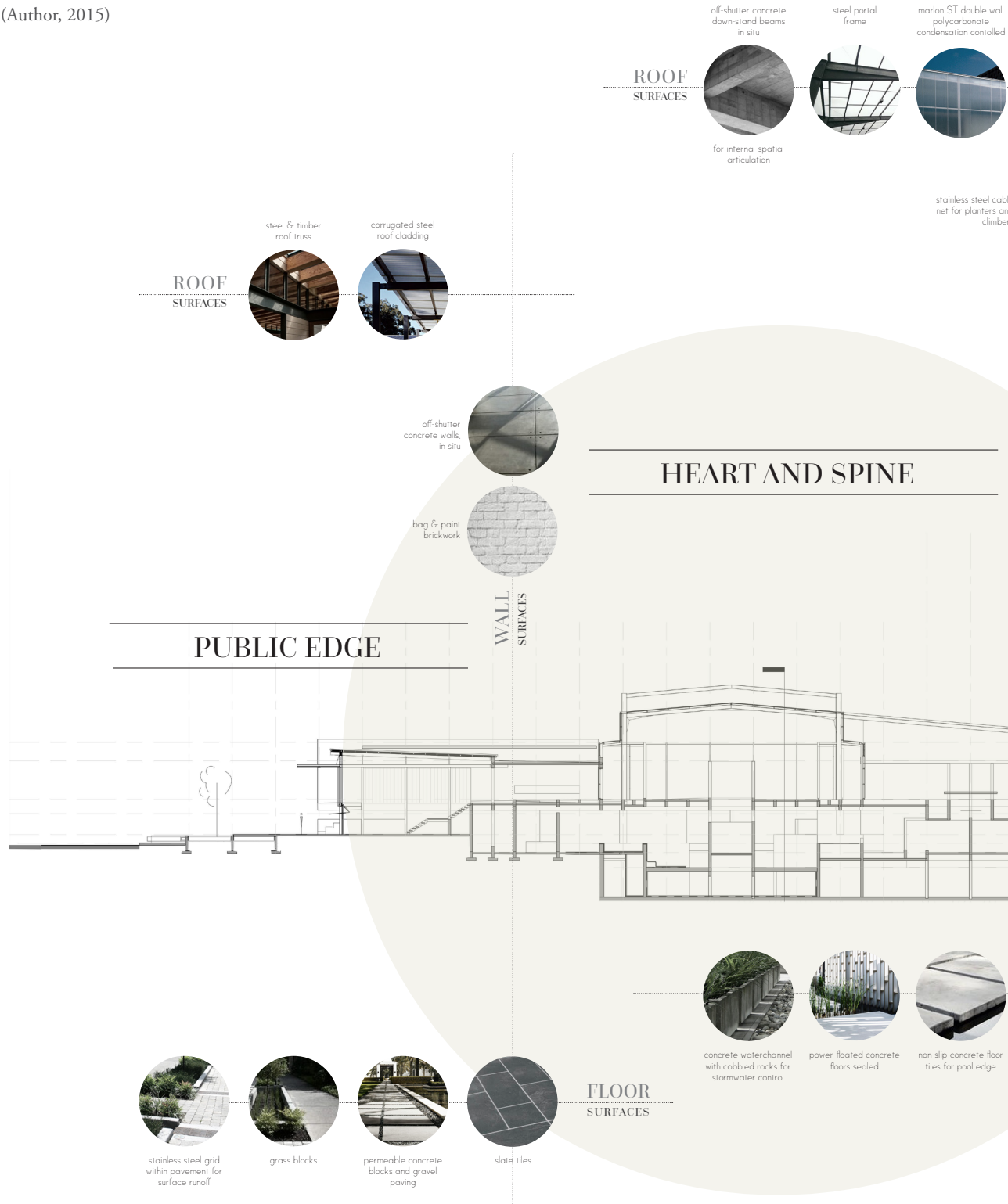
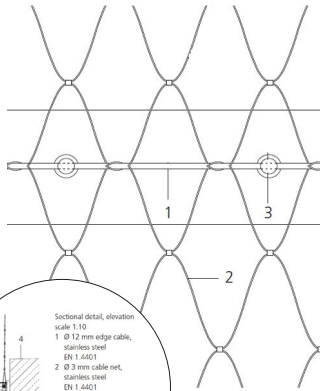


Figure 8.25
First level plan
(Author, 2015)



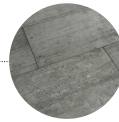
Figure 8. 26
Material palette
(Author, 2015)





ROOF SURFACES

off shutter concrete ceiling in-situ



moisture resistant timber wall cladding



moisture resistant timber benches



slate tile mosaic wall



off-shutter concrete wall casted in timber formwork

WALL SURFACES

RECREATIONAL EDGE

WALL SURFACES



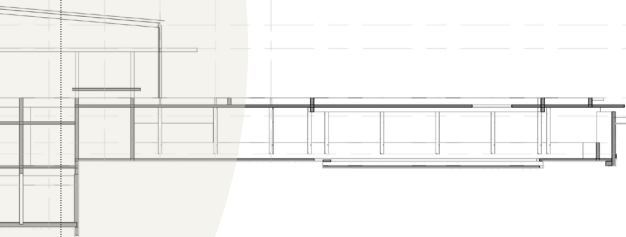
moisture controlled glass block walls (bathrooms)



interior greenwall stainless steel cable net



off-shutter concrete wall casted in timber formwork

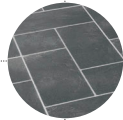


FLOOR SURFACES

pigmented screed



prefabricated concrete floor tiles



slate floor tiles

FLOOR SURFACES

DEGREE OF PERMEABILITY



WATER SYSTEMS

There exists two sources that supply water to the resort. Mineral-rich water is supplied via the Warmbaths fountain and potable water from a local borehole. The fountain has ample capacity to responsibly supply additional facilities with water, while the spare capacity on the borehole is estimated 20 000 l/h (Basson, Personal communication, 201e). The facilities treat the water with chlorine gas and an aluminium sulphate binding agent for dirt particles. The small quantity of chlorine gas, one to two parts per million, ensures clear water that supports biodiversity, aquatic life, and irrigation from the water flushed subsequently from the pools and baths (Basson, W. 2015: Personal communication).

HOT WATER

Water is pumped from the fountain into a central reservoir within the new facilities' basement. Here, the water is treated by the same method as the Hydro Spa. The treated water is circulated through the interconnected baths by a pump, and through a series of sand filters which provided a circulation for the baths. Heat exchangers are implemented that connect with the facilities' boiler and intercepts the supply to regain higher temperatures after an initial cool down.

POTABLE WATER

A reservoir edges the hot water reservoir to the south. It receives rainwater collected from the roof runoff and also greywater from the changing facilities. This body is connected with the borehole to provide additional capacity when necessary and is equipped with an overflow to drain into the resort's existing water drainage filtration system. The water is treated by circulating it through a coarse sand filter, a sand-granular activated carbon filter (GAC), an ultraviolet filter (UV) and a chlorinator (Cl). The water is then circulated through the wetlands on-site and also supplies the conservatory and greenhouse with water for irrigation. The water is circulated through the flower basins that host fresh cut flowers within the florist. Above these basin channels, water from the same source services the evaporative cooling system and irrigation system. At recreational edge, the water also serves the gym's flash evaporative cooling system.

DRAINAGE

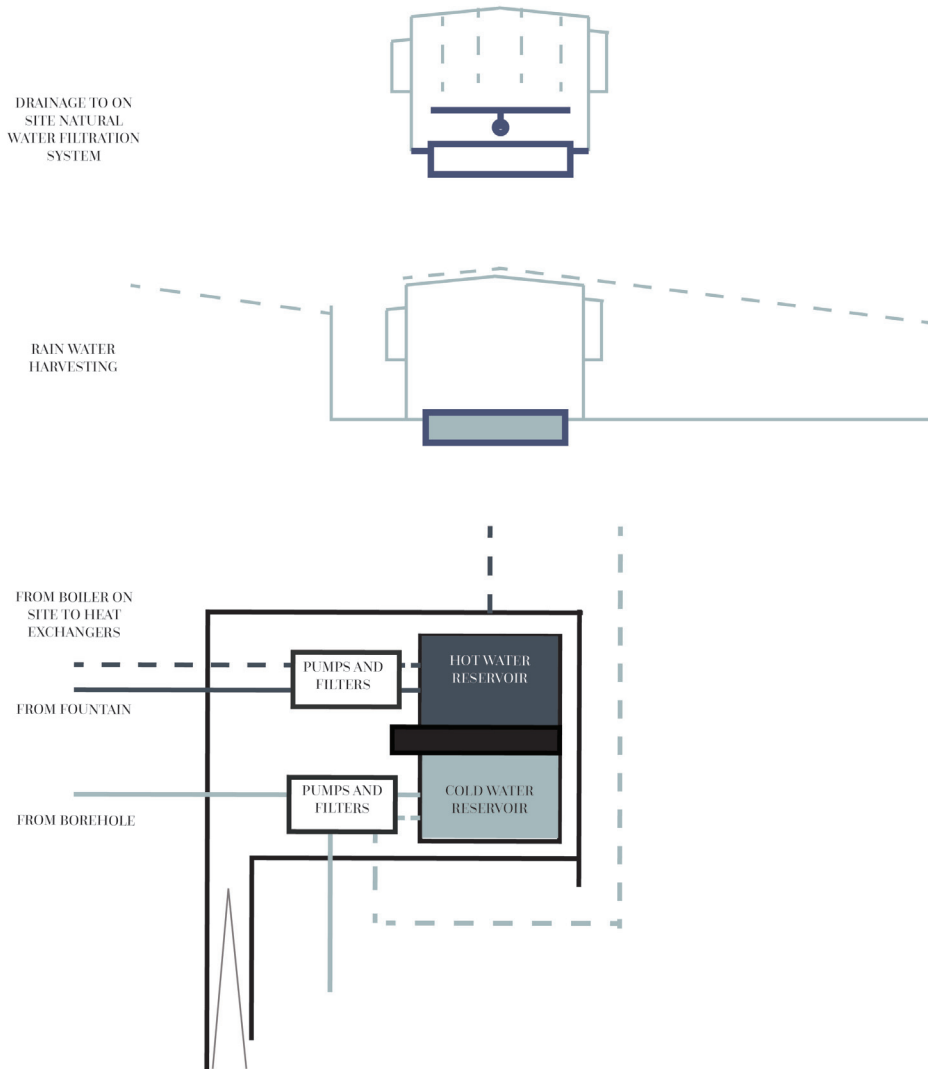
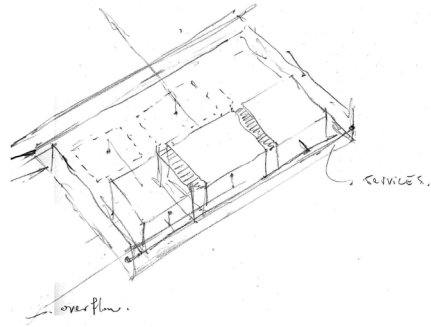
The drainage from the pools and storm water collected from ground surfaces flow into the existing natural filtration system of the resort, as with the existing water facilities. Drainage from greenhouse irrigation, planters and flower basins also flows into this system. Black water drains into the municipal sewer.

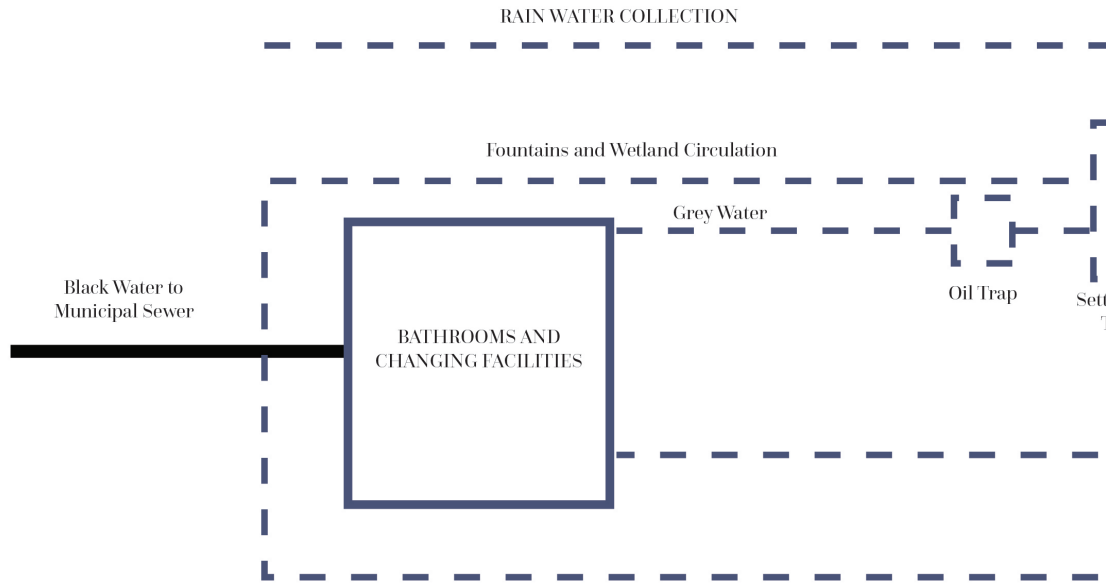
Figure 8. 28

Water storage and filtration system. The opening of the basement edges allows ventilation to cross over cold water storage and for access to service pipes

(Author, 2015)

Figure 8.27
Basement and water reservoir
construction. The hot and cold
water reservoirs are separated by
soil infill between skins
(Author, 2015)





hot water supply to
bathrooms and
ablutions

Pool circulation

Space heating Greenhouse
and Sauna

Figure 8.29
Water system
(Author, 2015)

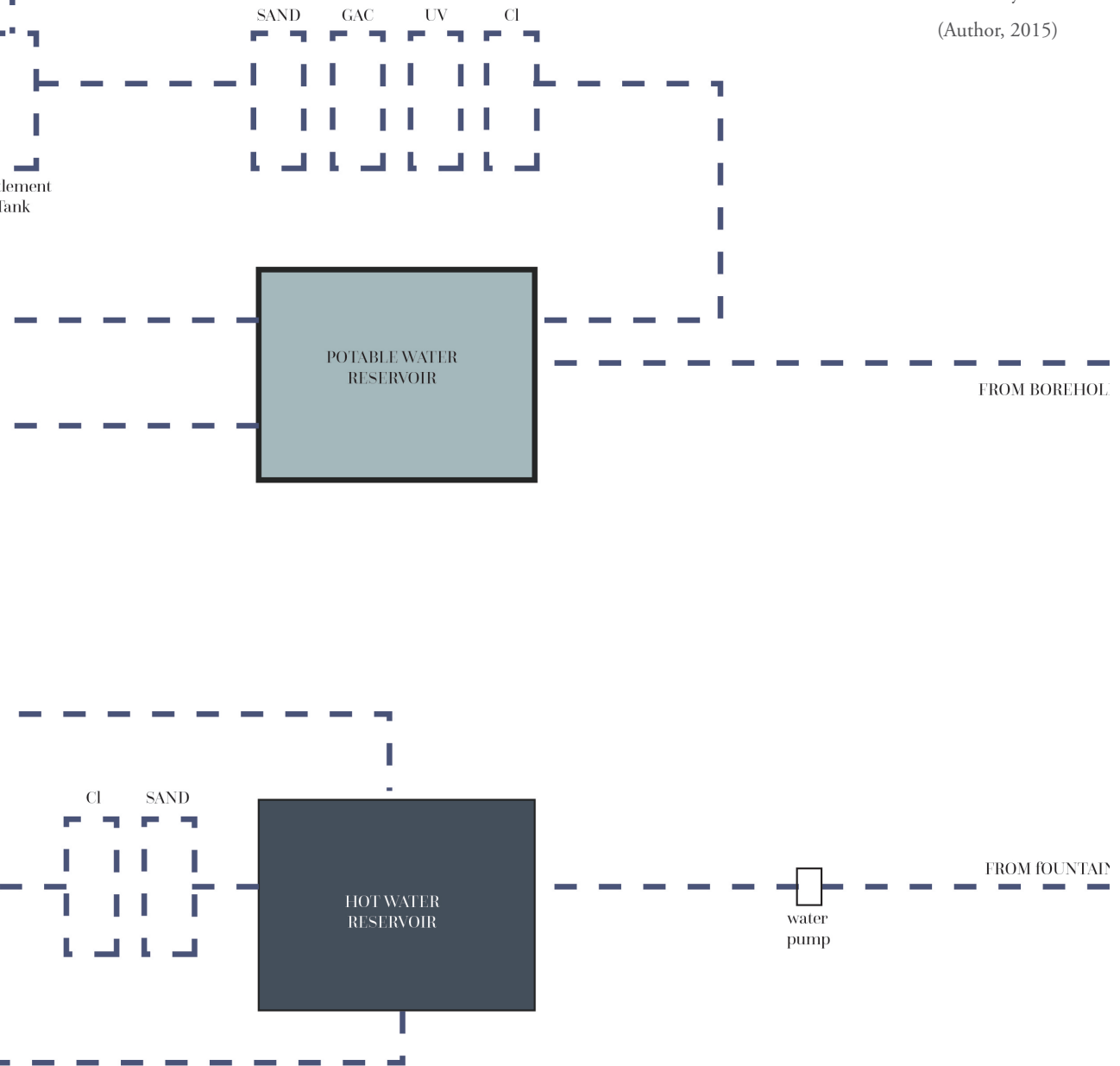
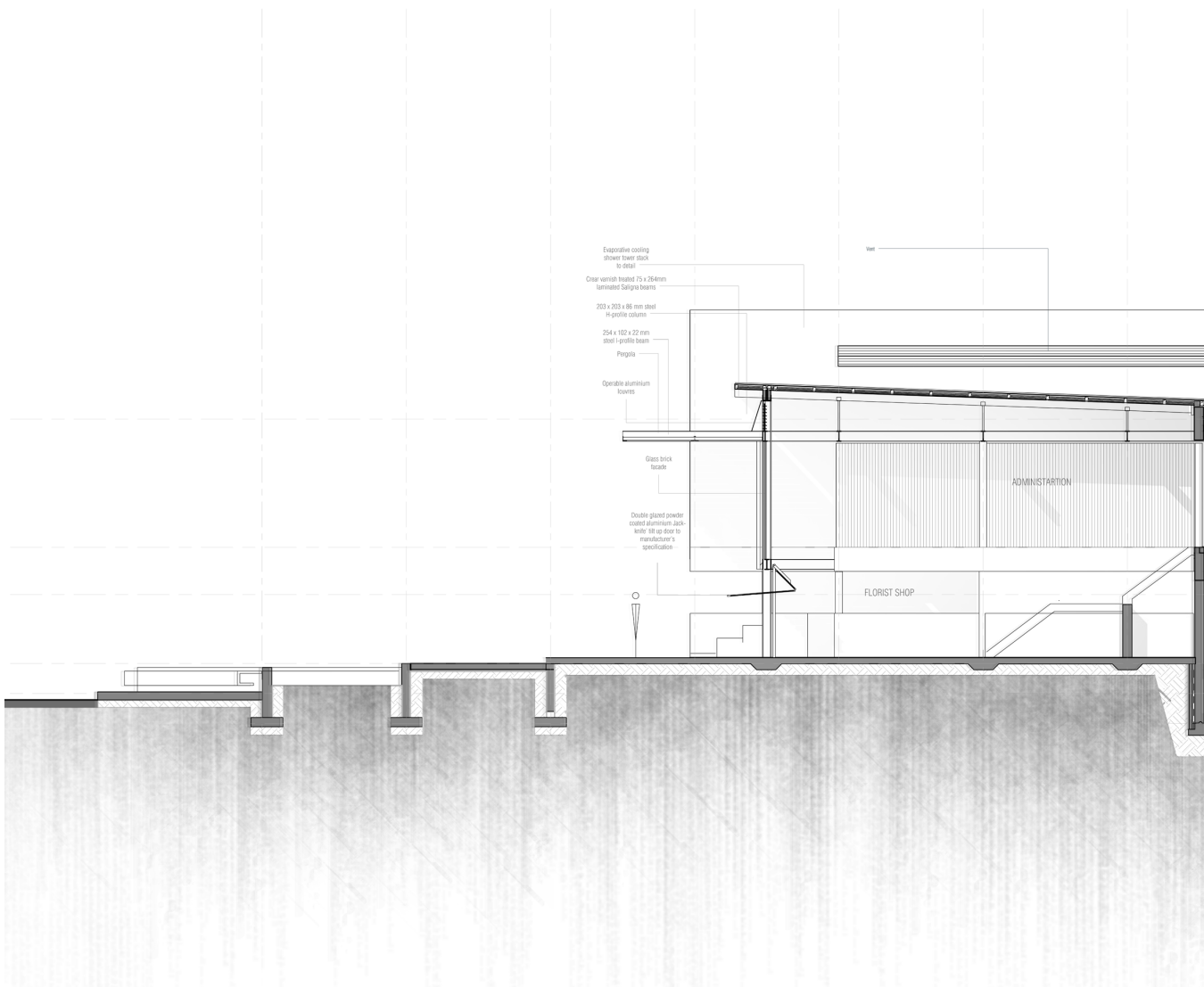
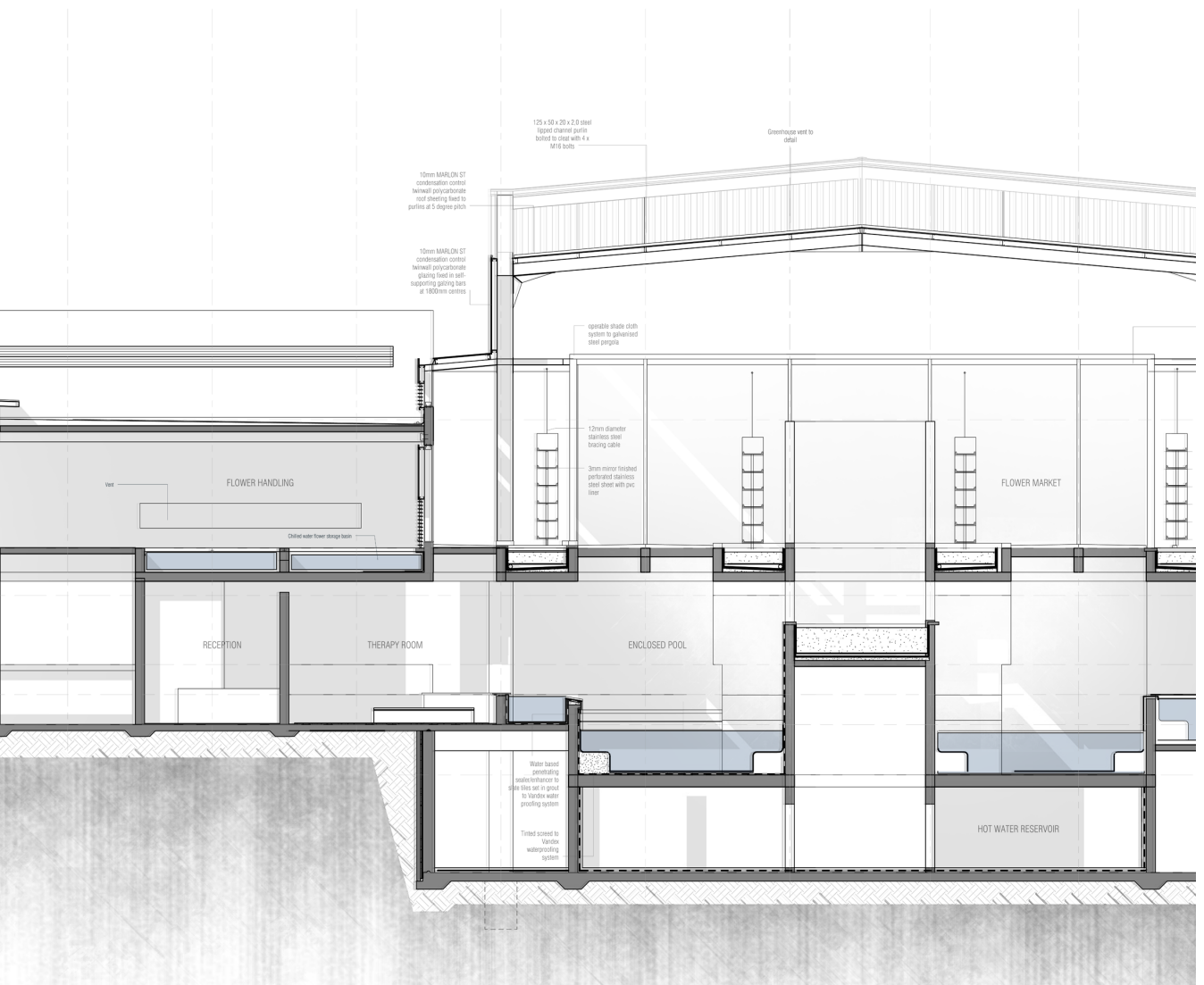
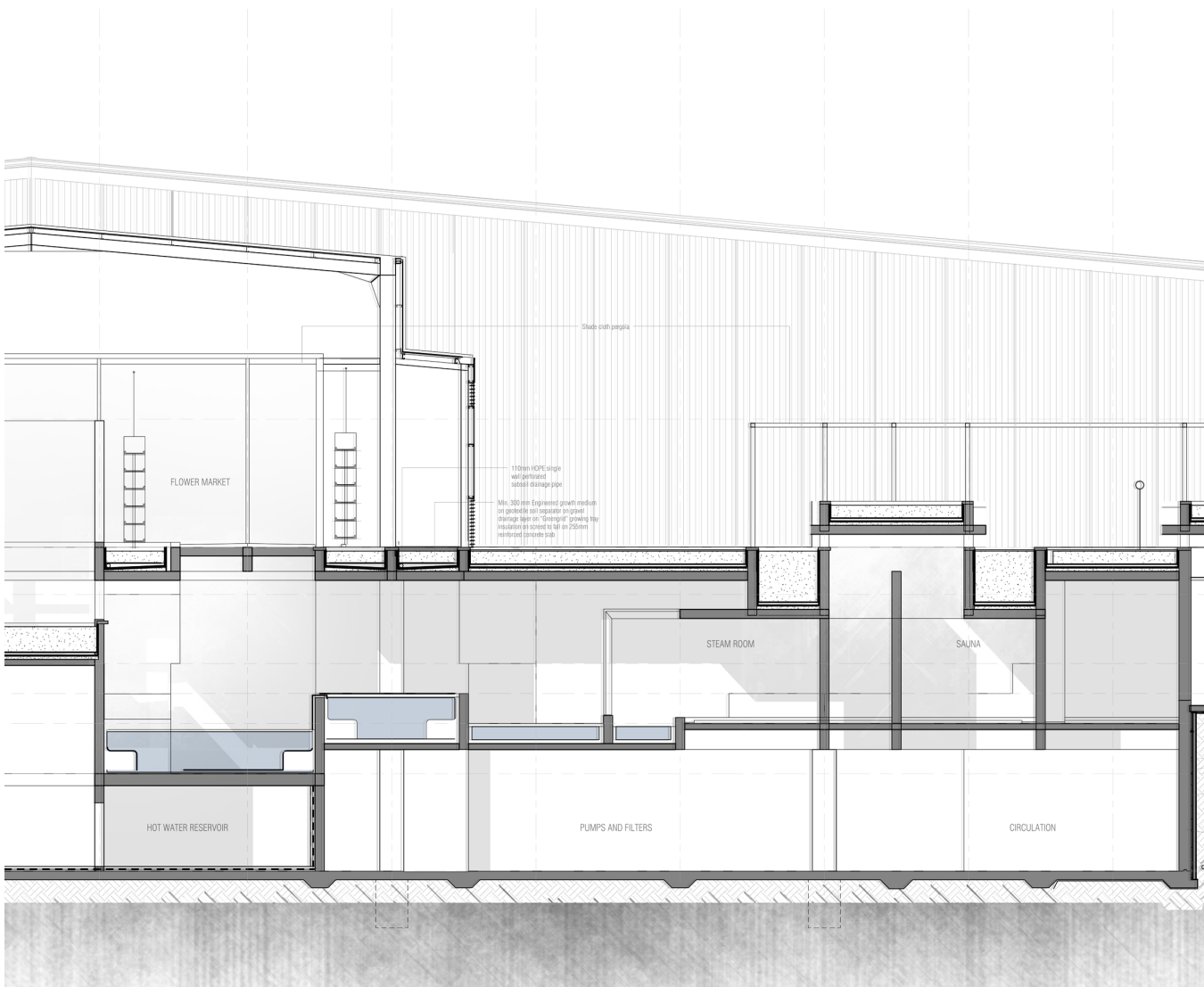
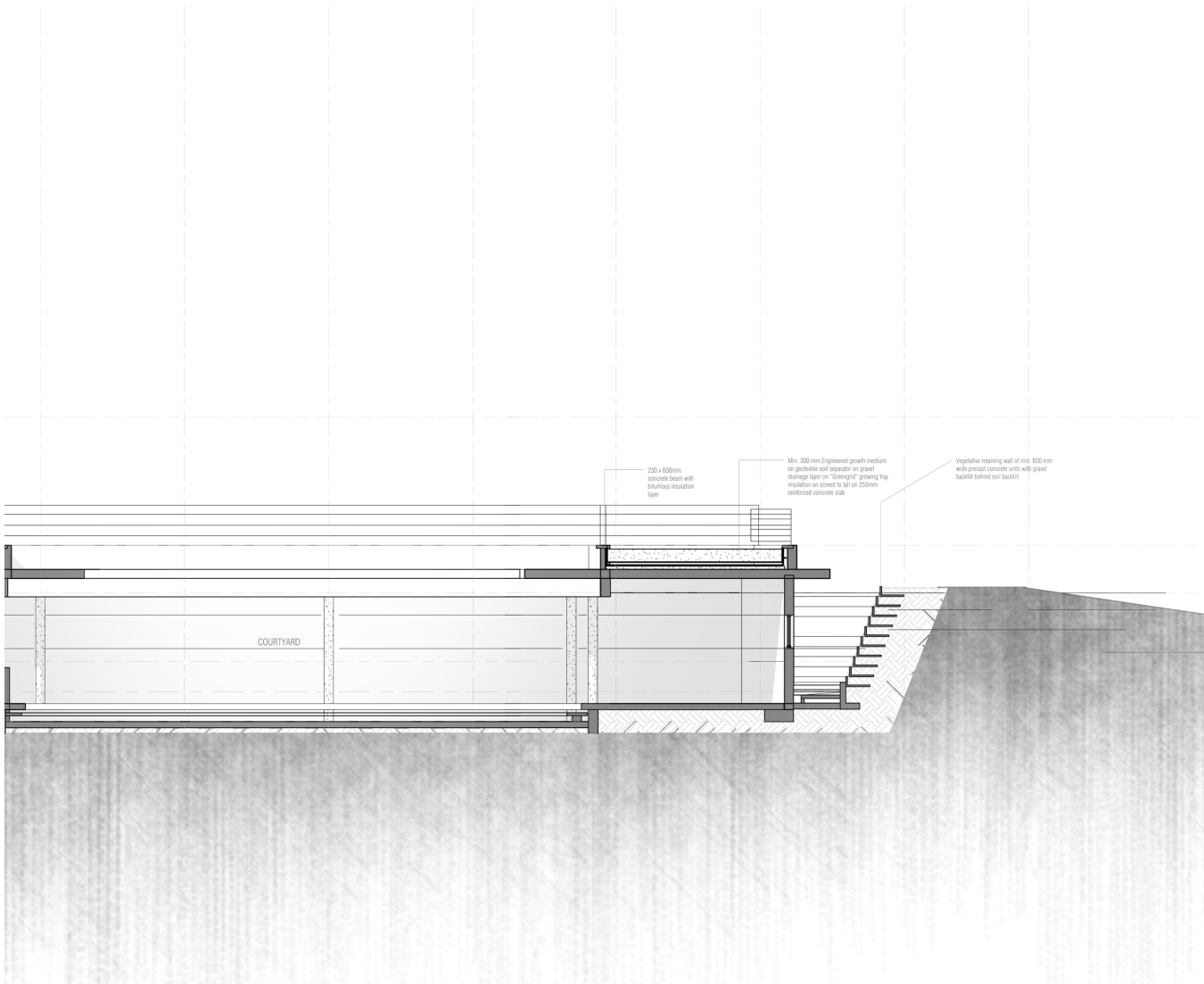


Figure 8. 30
Section A-A detail
(Author, 2015)









SECTION A-A
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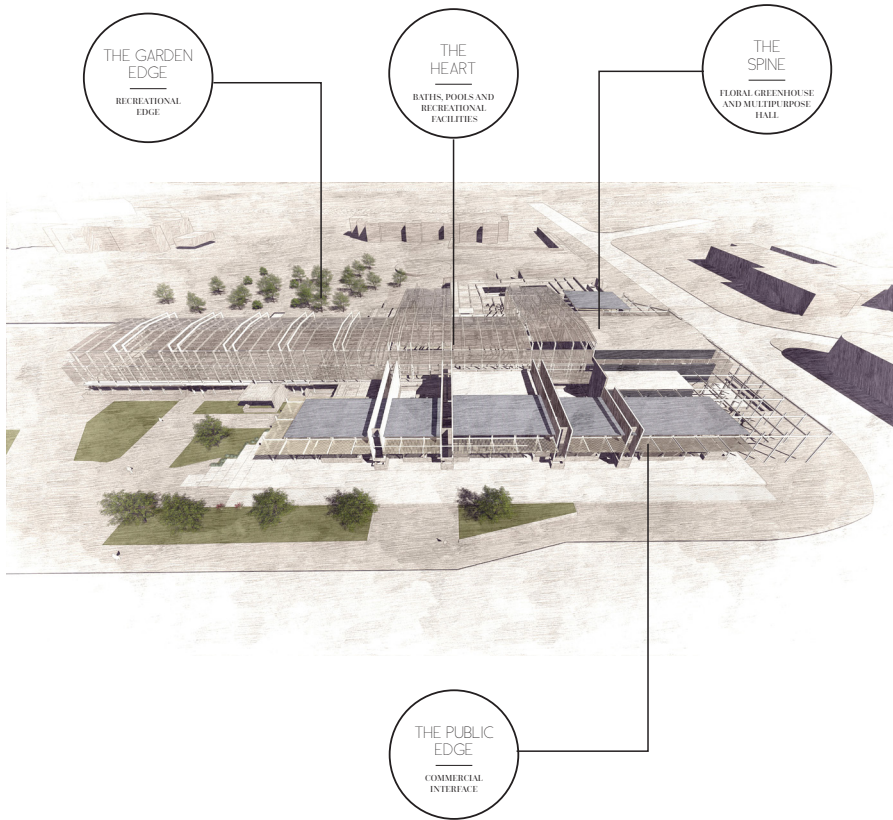
THE
WARMBATHS
FOUNTAIN

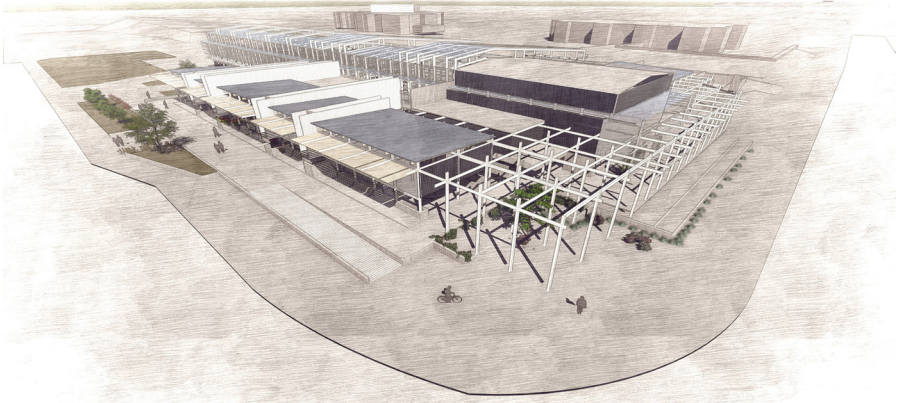
9

CONCLUSION
INTERCHANGING ANIMATION
An architectural threshold device

FINAL DRAWINGS

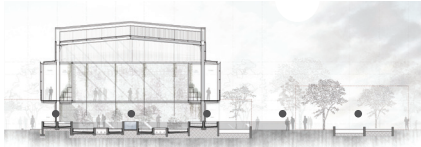
INTERCHANGING ANIMATION



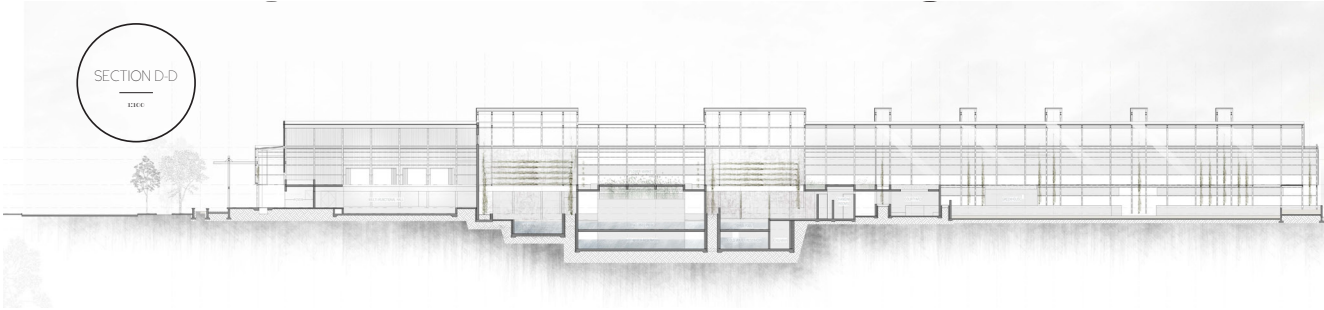


THE CIVIC
EDGE
MASSING

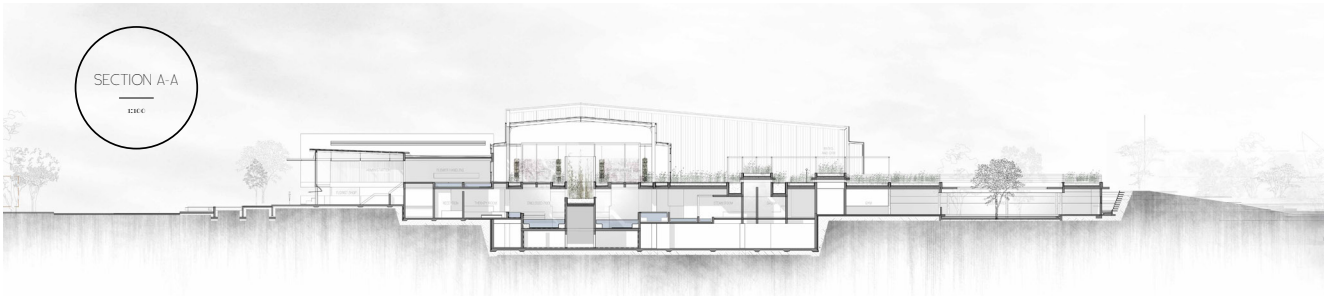
SECTION C-C
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SECTION D-D
K100



SECTION A-A
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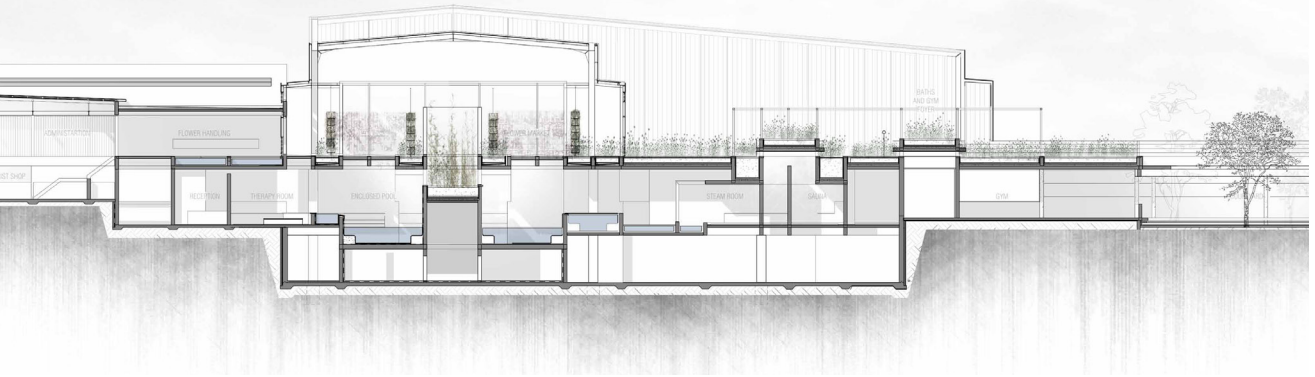
INTERSECTION
—
THE CORNER BAKERY
AND CONSERVATORY

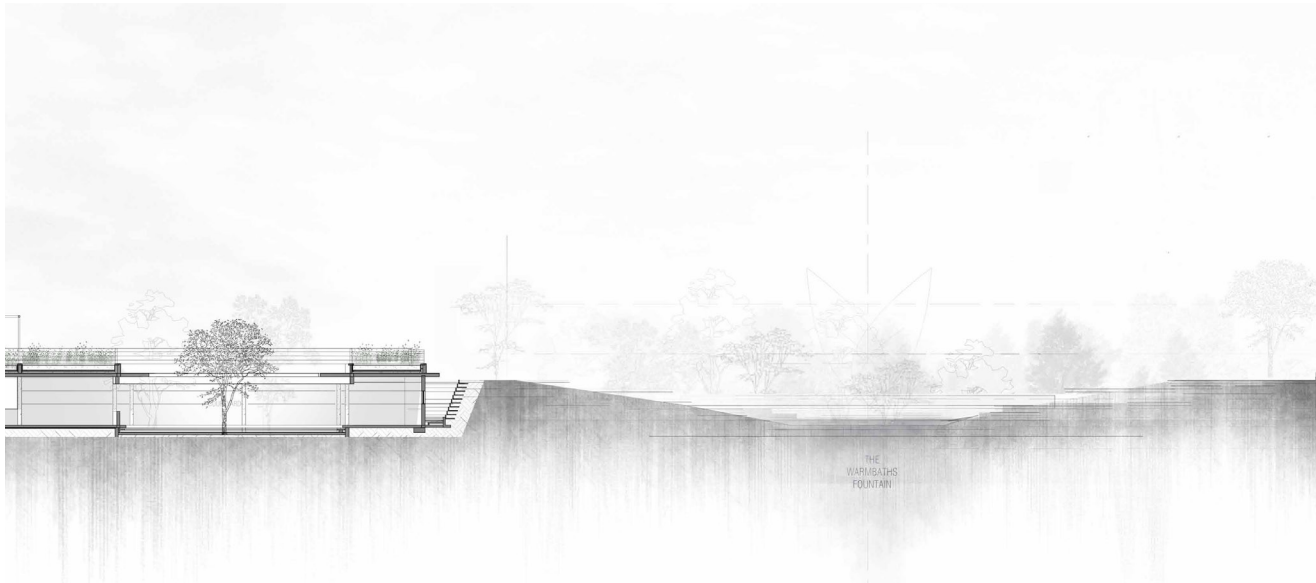
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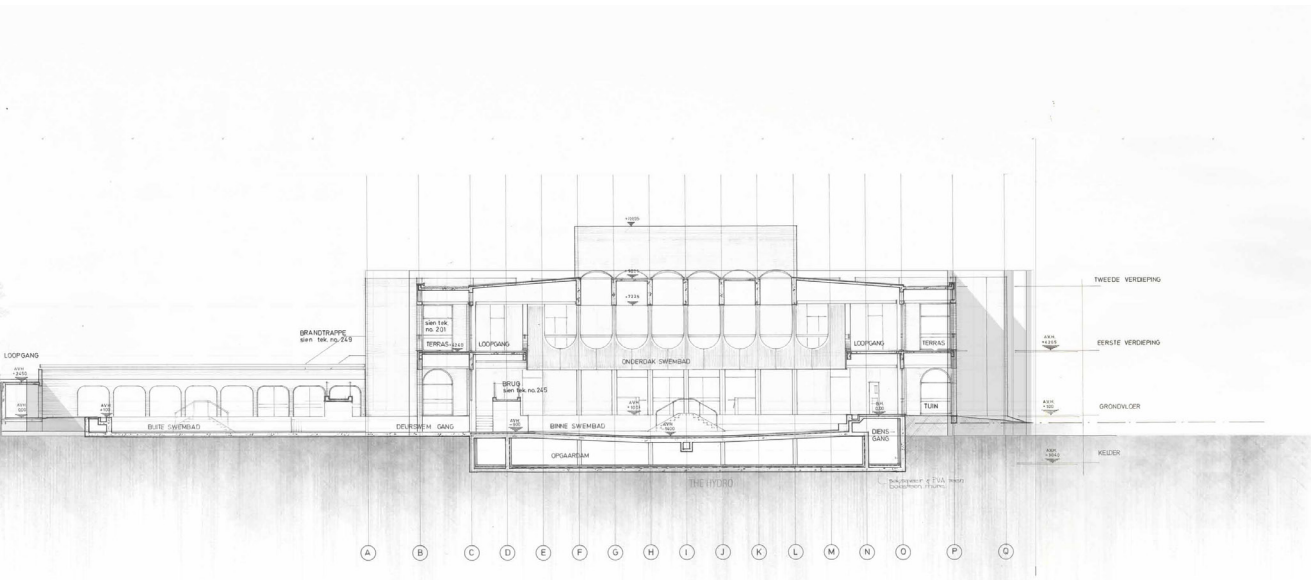


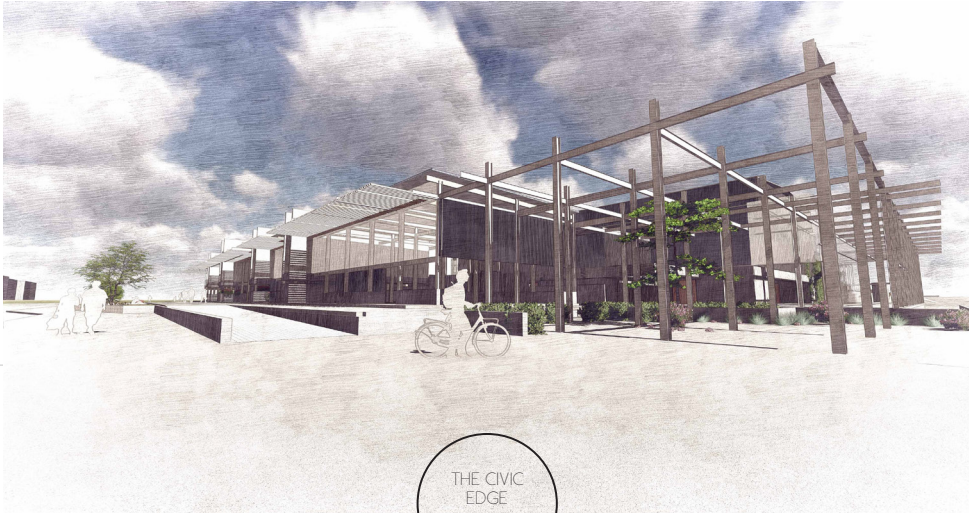


THE CENTRAL
POOLS
THE LAP POOL



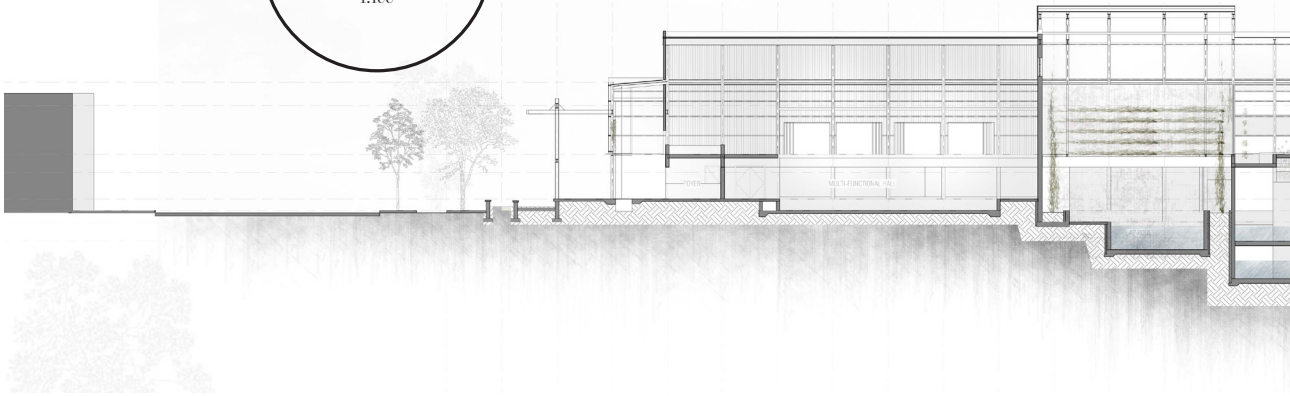


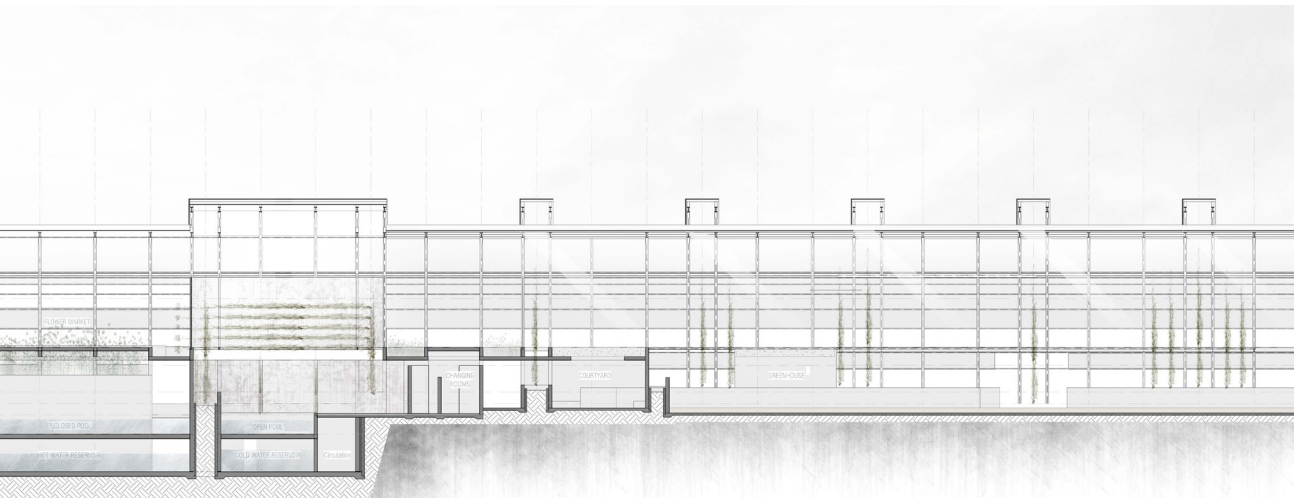
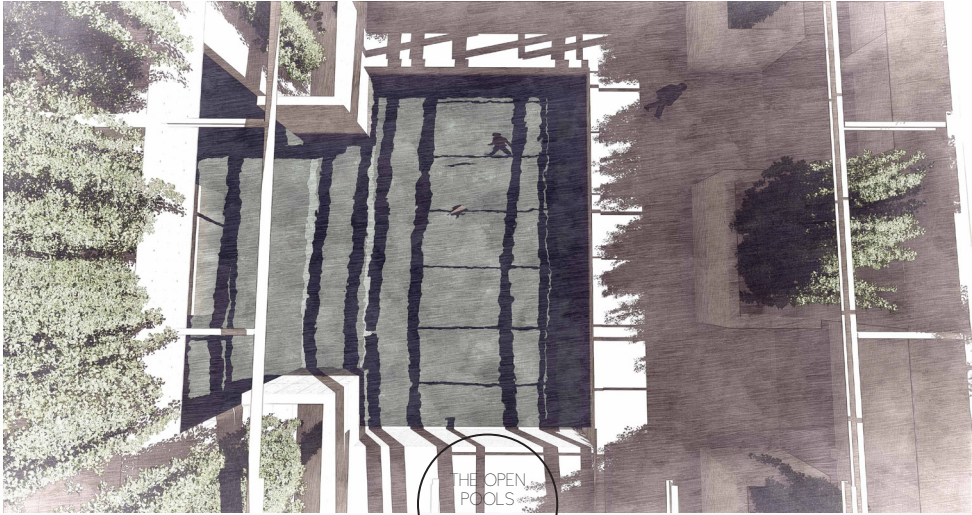


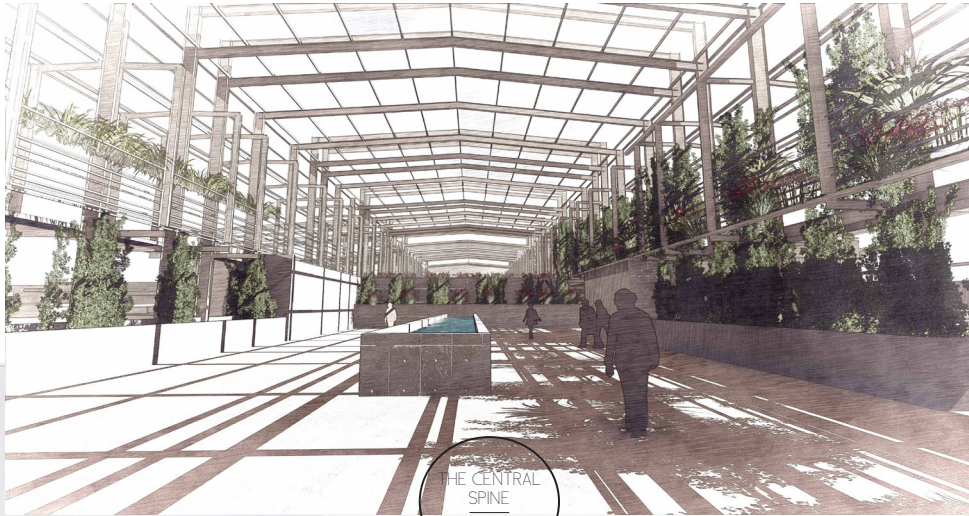


THE CIVIC
EDGE
PERGOLA AND
CIRCULATION

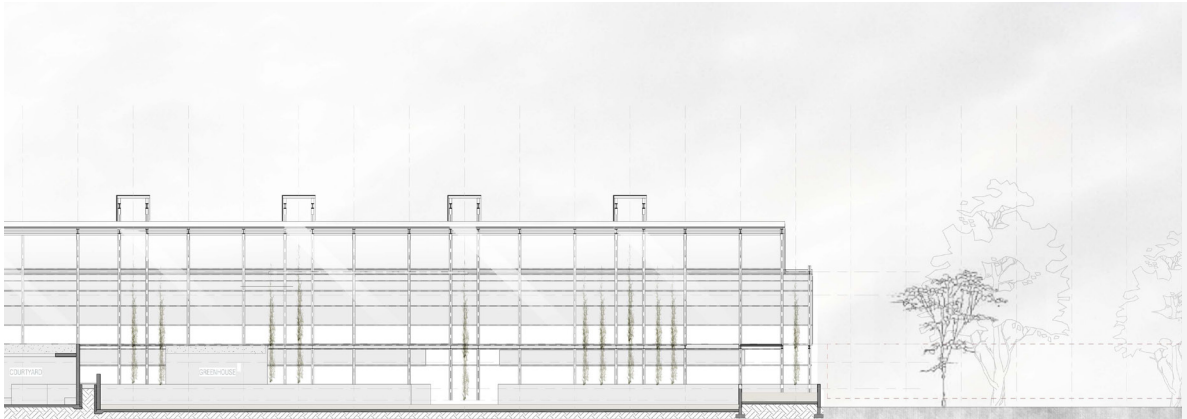
SECTION D-D
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THE CENTRAL
SPINE
THE CONSERVATORY
AND NURSERY

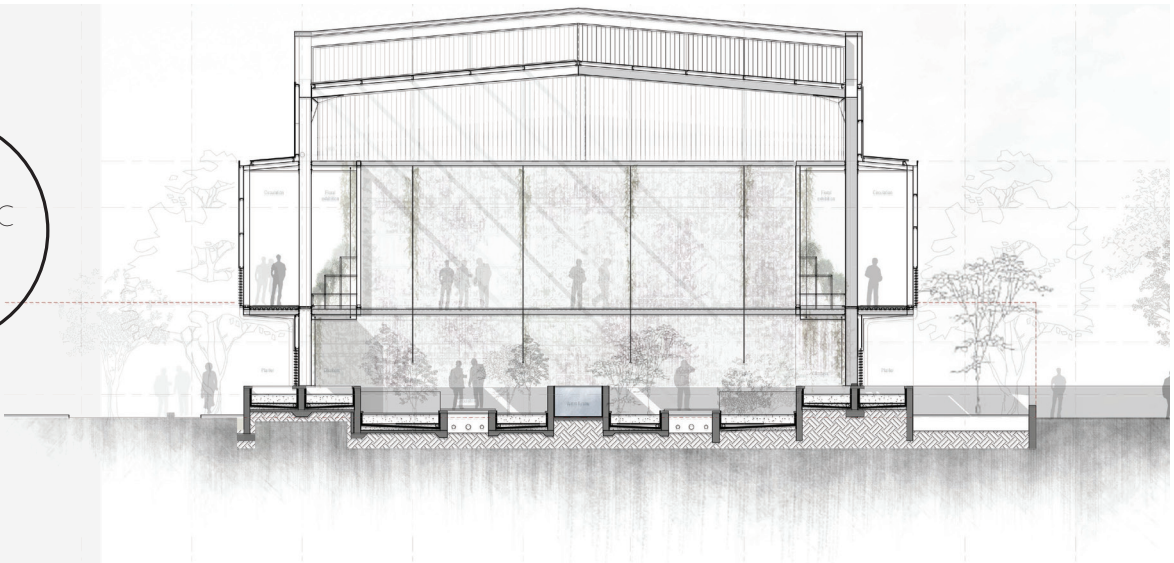


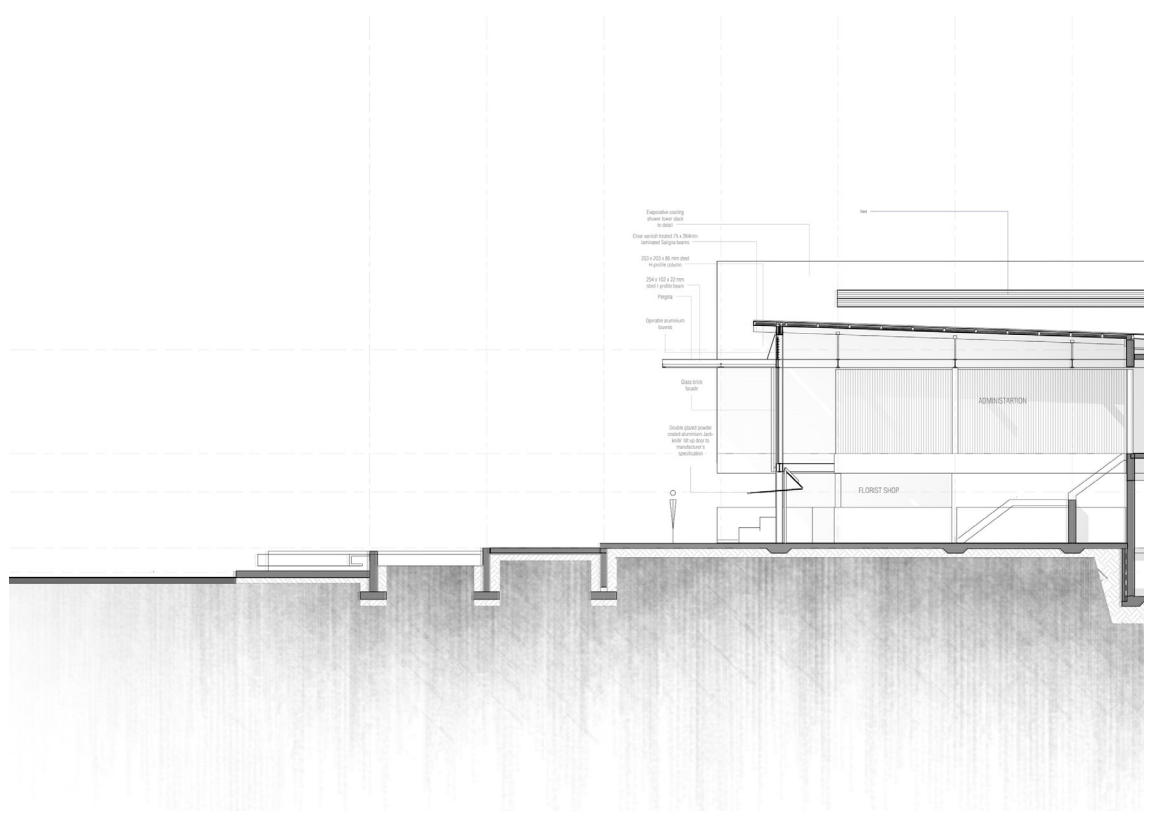
SECTION



SECTION C-C

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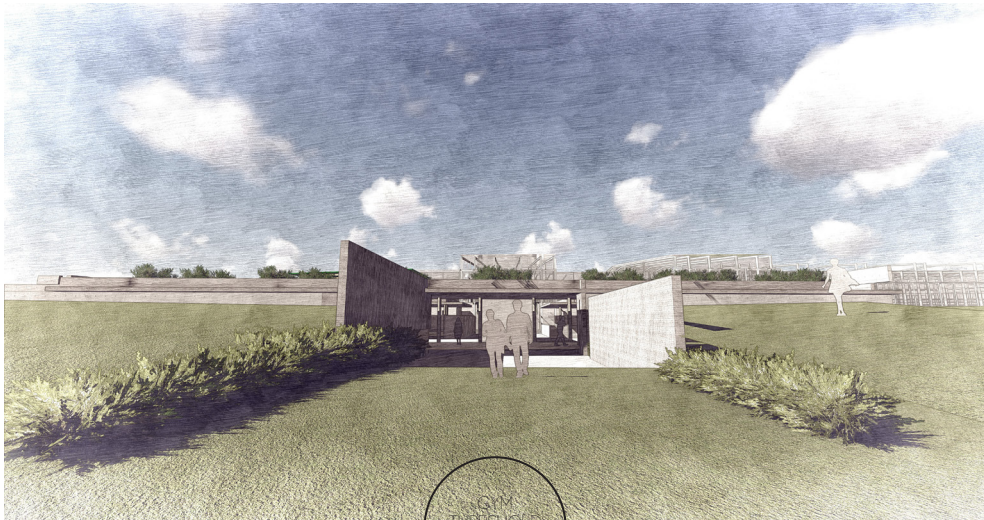








THE GARDEN
EDGE
—
MASSING



5.1
THRESHOLD,
—
GARDEN EDGE



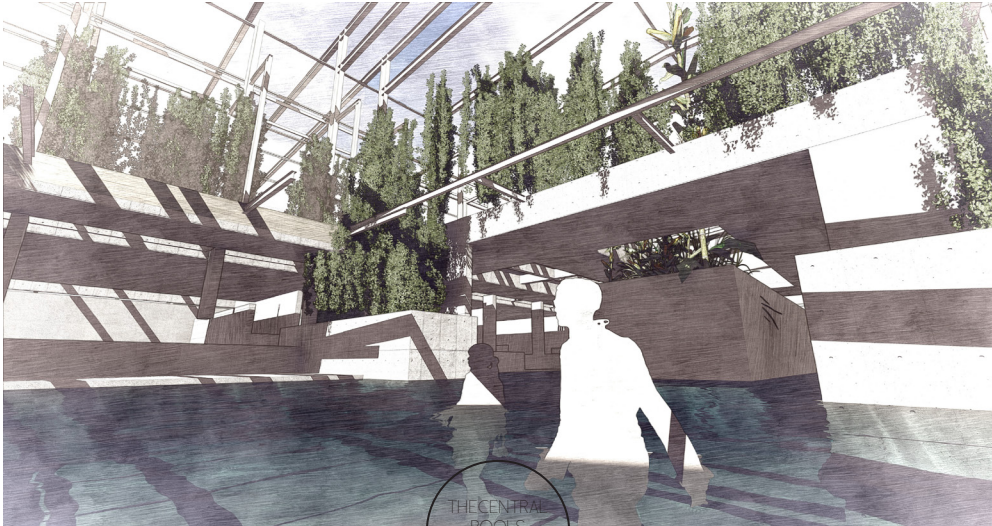
PUBLIC
INTERFACE
THE BAKERY, THE LOGGIA
AND THE FLORIST



THE FLORIST
SHOP
COOLING STACKS AND
CHILLED WATER
CONDUITS

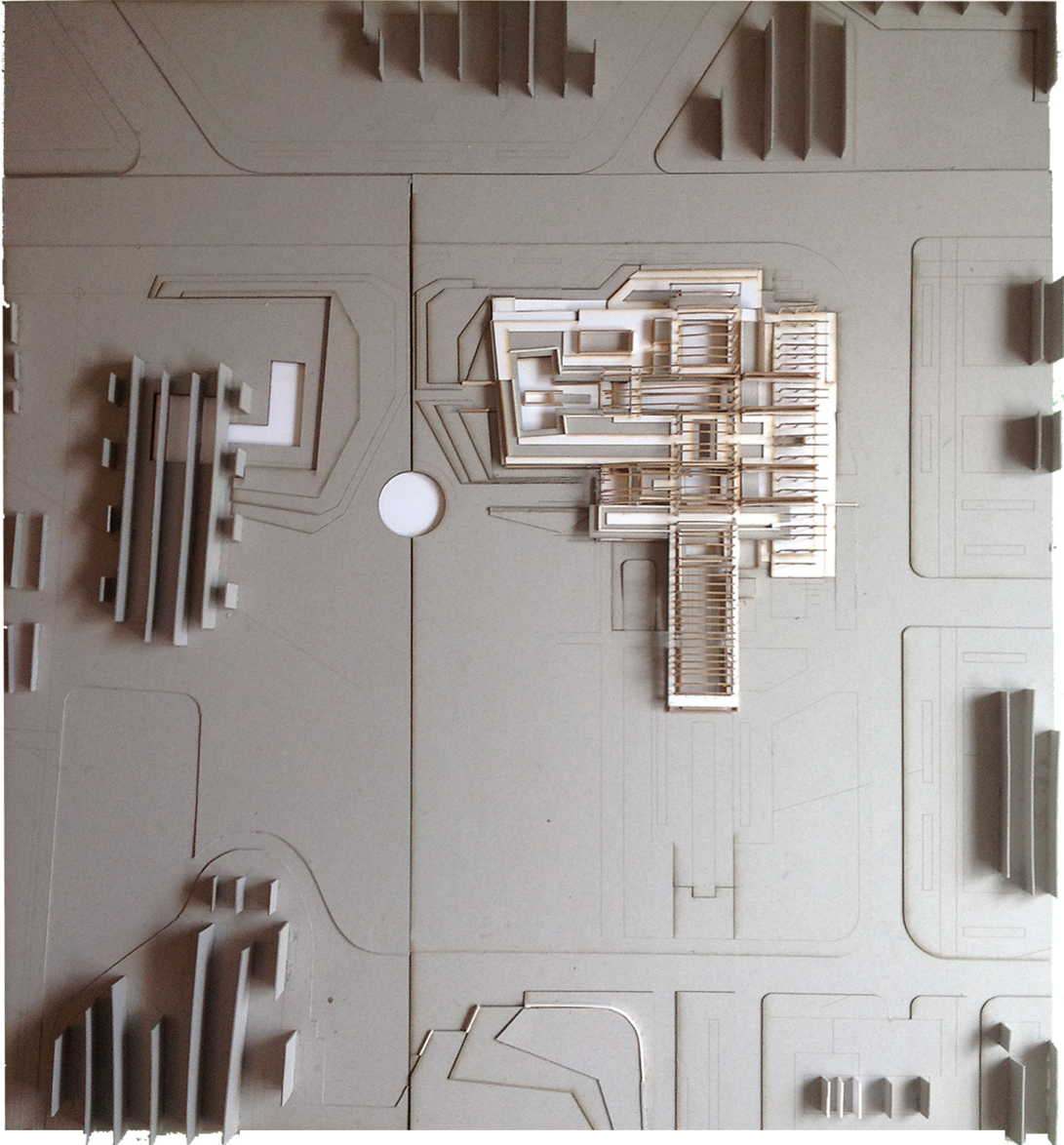


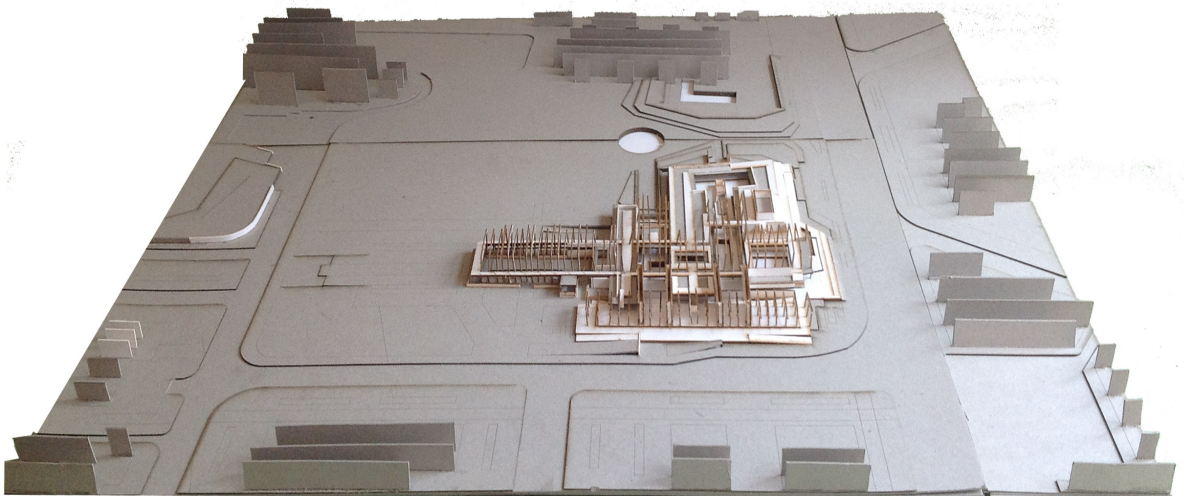
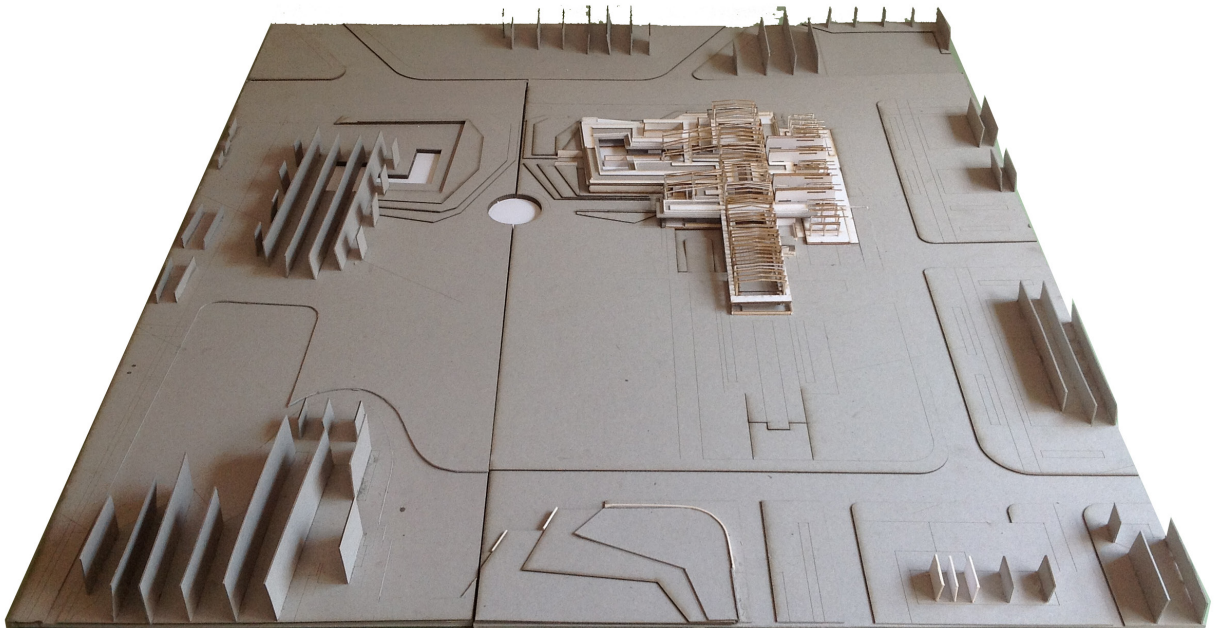
THE PUBLIC
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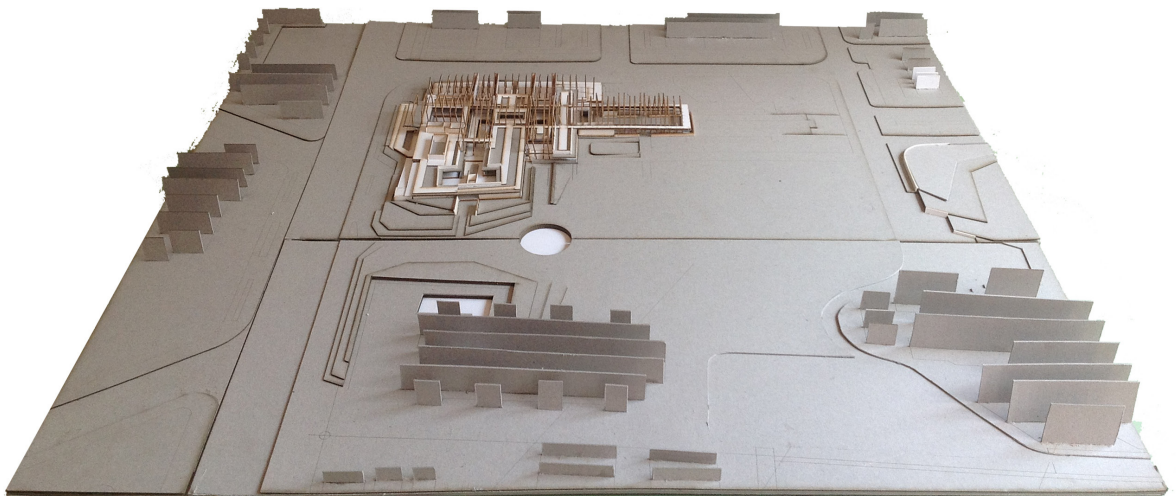
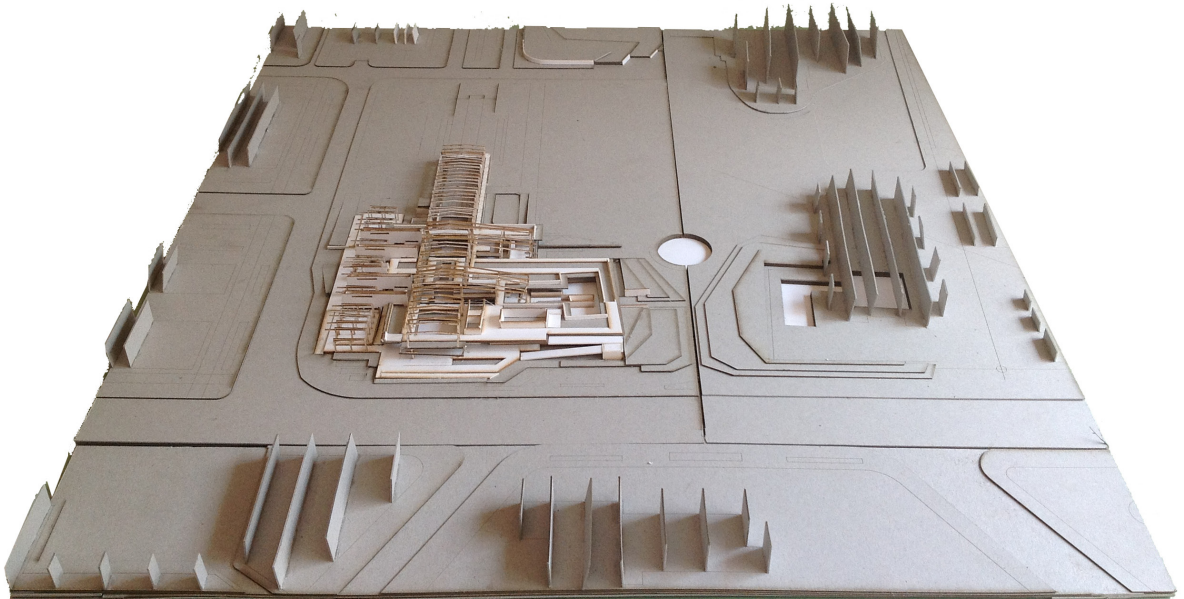


THE CENTRAL
POOLS
THE OPEN POOL

FINAL MODEL
INTERCHANGING ANIMATION







CONCLUSION

INTERCHANGING ANIMATION

An interchanging animation is where conditions or components of a *place* are allowed, through architecture, to animate and complement one another. These become interlinked and serve as a reference to one another within a larger framework. Like the fountain, the urban settlement and the natural environment are the essentials to the *place*; the project proposes a re-stitching of these essentials through an interchanging animation between architecture and the natural environment, the *everyday* and the extraordinary, and the urbanity and the rural or natural environment.

The project proposes the insertion of a new dialectical condition instead of the irresponsible “wall” or boundary that encloses the fountain and the central gardens. It proposes new public and tourism amenities within a newly established framework. It furthermore proposes the re-introduction of the recreational heart as integral and active part of the *everyday* of urban Bela-Bela. It also aims to reference the extended enveloping natural splendour that presides through integrating it with the design.

The intervention facilitates recreation programmes that interlink and merge with the facilities of the resort and the fountain in the central public gardens. It hosts commercial spaces that animate and interlink with tourism and recreation to animate the urban edge. The device hosts a public floral greenhouse and a multi-purpose hall that support the lack of civic facilities in the town and diversifies tourist attractions. The building becomes an extension of the public gardens and the recreational facilities, as well as the urban and rural environment of Bela-Bela.

The project proposes a creation of an interchanging animation between architectural spaces, the water from the fountain, and the natural landscape that, through architecture, becomes ‘visible’ and animates the architectural space. It proposes a design of a threshold device, which becomes the spatial, referential, and programmatic linkage between urban and rural components and conditions of Bela-Bela, and which allows synergies to exist in-between these. The design is aimed towards intertwining the *everyday* of Bela-Bela with the fountain, the central gardens, and recreation hosted at the nucleus of the place and towards the creation of a device that engages sensibly with the natural environment to evoke its inherent poetics and potential.

The conceptual intentions necessitate that rituals of two polar events be fused. To allow for a continuum in a reciprocal animation, the boundaries of spaces expand and allow nature and the water to inhabit these boundary demarcations and determine privacy. Where greater divisions of privacy are required, these demarcations expand further and deeper through interplay on different levels, to form a loggia, which is animated by the properties of the water and the natural landscape. The spatial continuum that overlaps the boundary is allowed to animate both spaces.

Along with the loggia, the courtyards are used to vary privacy and add rhythm to a theatrical unfolding of space. The courtyards become oculi that live outwards, towards the exterior; phenomena (such as steam, fountains and water circulation), arising and ascending from the central “interchanging animation”, are allowed to animate peripheral spaces of the intervention that become thresholds to the context.

The arid climate of Bela-Bela, a distinct diurnal variation in wind, and the ample amounts of water (hot and cold) available, all influence the design and technology of the device - it is proposed to integrate the presiding natural environment and water from the fountain with the architecture. Passive cooling and ventilation of spaces are proposed through adapting the design towards a symbiosis with the climate and environment.

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