LIVING ON THE EDGE

Pim Artz
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Submitted in partial fulfilment of the requirements for the degree Master of Architecture (Professional) in the school of Architecture, Planning and Geomatics.

University of Cape Town

October 2013

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Living on the edge

Nature & Society -
Re-imagining architecture through Thirdspace.

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Abstract

This design dissertation report investigates the paradigm of Thirdspace theory through explorations within the tensions between nature and society, directing the focus of site towards Cape Town’s city bowl urban edge.

Thirdspace is adopted throughout the development of this dissertation and investigated at different architectural scales within the design process: from the initial conceptualised stage through to spatial programming towards realisation of the construction process and materiality.

Nature is under attack by urbanism, where architecture may act as a mediator by providing a platform for a new kind of urban form to manifest through coexistence. Where a neglected firebreak periphery once enforced a disconnected nature from society, it now presents an opportunity for a productive firebreak strategy integrated into an architectural layer, merging public space into the natural landscape.

Designing opportunity for crossprogramming in the realms of residential architecture, generates a mixed use matrix, a space where cultures and traditions merge together to form a neutral social framework, where in the urban edge condition, an architecture coexists between the realms of nature and that of the city.
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*Note: Figures 1 to 86 correspond to various stages and aspects of urban development, landscape planning, and architectural design. Each figure is referenced with a unique identifier and is associated with a specific page or location in the document.*
Fig. 1 - (left) Urban context of Maastricht, Holland, the author in front of a ground floor flat where he was brought up. (right) Windmill and bicycle lanes close to author's primary school.
Preface

The relationship between nature and society has proven to be a consistent personal fascination, perhaps through my birth and earlier upbringing in the extreme European urban context of Maastricht, situated in Holland (growing up in a split level ground floor flatlet part of a large housing block) with annual trips to visit my grandparents in South Africa, discovering excitingly vast open landscapes. I was intrigued by this contrast in living, alongside the diverse cultural expressions manifested through these juxtaposition landscape conditions. In May 1994, Nelson Mandela became president and my mother answered her inner calling to return to South Africa. I was a confused 10 year old having to re-root my European foundation in an unknown place of wilderness topped off with a challenging language barrier. However, looking back I feel that this transitional life experience has woven my cultural perception into a combinational condition I believe can be interpreted as Thirdspace. My blood and cultural background is pure Dutch but my heart lies in Africa, where I have now lived for the majority of my life. This is a reflection of my understanding within the realms of Thirdspace - as I feel a product to its conceptual result. We all live amongst a globalised society, merging cultures and traditions into a chaotic and overlapped condition. This design dissertation interprets Thirdspace methodology through architectural design thinking amongst the realms of spatial, material, social and programmatic explorations. This report aims to test the outcome of Thirdspace methodology through the tensions between nature and society by proposing architecture as a mediational intervention.

Fig. 2 - Discovering the vast natural landscapes of South Africa on my annual trips.
Fig. 3 - Aerial view of Cape Town, showing greenery scattered throughout the city and how the landscape has shaped the urban context.
Introduction

"The edge of a city is a philosophical region, where city and natural landscape overlap, existing without choice or expectations." (Hall, 1984:99)

This design dissertation report explores the relationships between society and nature as two dynamics within the conceptual strategy of ‘Thirdspace’. Thirdspace theory challenges boundaries and spaces of separation through a cultural philosophy, proposing that these in-between spaces are an opportunity for a ‘new’ culture to emerge through the overlap of the initial dynamics which define it, lending itself to a hybrid methodology - a moulded space of coexistence. The manifestation of this investigation has rooted itself into a consistent exploration within the realms of overlap.

The concept of ‘overlapping’ adjusts our perception to merge two separate dynamics into unpredictable conditions. It generates a sense of surprise and engages creative opportunities to develop a synergy in possibilities. Rethinking architectural methodology through the concept of Thirdspace, merging natural and man-made tectonics and techniques, allows for a mystical, playful yet responsive architecture.

Exploration in the paradigm of Thirdspace has led this dissertation to analyse Cape Town’s city bowl urban edge, where the city meets the mountain, generating a space which has not been integrated into the existing urban fabric but rather dislocated by a cleared vegetated space and structures developed to brutally block against this hazardous natural edge. This space acts as a firebreak and displays a representational split within the relationships between our society and nature.

The urban edge is a territory which is currently in high debate with a municipal mentality of preservation, yet in reality it presents an uninhabitable space highly under utilised whilst forming a neglected periphery to the city. A zone calling for an innovative response to renegotiate the boundaries between society and nature.

Currently the city bowl urban edge has a suburban periphery, establishing a low density urban fabric that is highly contradictory within the concept of a growing sustainable city in the modern day environment. Discovering this exciting territory paves a path to re-imagining urban living possibilities along the edge and an opportunity for a new community to form through an overlap of programmatic requirements and possibilities.

This design proposal envisions activating the current firebreak layer through living, working, recreational and cultural facilities with an integrated pedestrian public promenade as a dynamic layer to the matrix of the urban landscape. The building becomes an experimental proposition that transforms a firebreak design strategy into it’s architectural existence, encapsulating hybridity in it’s essence by challenging traditional typology through the existence of crossprogramming. This architectural strategy aims to act as a social condensers for new communities to emerge through integration of spatial overlap within public and private realms whilst anchoring the urban edge within a ‘sustainable whole’ from future development polluting the scenic brilliance of Table Mountain.

Fig. 4 - Exploring ‘thirdspace’ within nature, society and architecture.
"(...in making plans and projections for new city edges, it is necessary to discard old methods and working habits and begin with basic research." (Holl, 1994:99)
"When the presence of architecture transforms a place with a new intensity, the discovery of a new relationship with nature is possible." (Ando, 1991:75-76)
Fig. 5 - Author's creative work no.3 - a contemplative generation.

Fig. 6 - Author's first creative artefact - exploring spatial relationships of Thirdspace in nature.

Fig. 7 - Author's creative work no.4 - Interpretation of artefact in Paul Klee's drawing technique.
Society vs. Nature

Nature's mystical characteristics have presented a foundation for mankind's existence on Earth, acting as a workshop for mankind to explore her tools and their functional opportunities. A tension was born when the first shelter was established as a form of protection from nature's unfavourable characteristics. This tension has manifested towards our current interaction where there lies a troubling imbalance. It is evident that contemporary society is not using nature's tools efficiently and requires to manifest the perception of 'nature' into a more modern framework, establishing a more balanced existence, re-synchronising society with nature.

How has this relationship become so disconnected?

Contemporary society lives amongst a man-made nature, a humanly adjusted landscape, the perception of nature has shifted to a complete juxtaposition - what once was a source of dependency is now justified to suit mankind needs. An increase in global urbanisation patterns have caused massive densification within urban centers, causing tensions and strain on fundamental infrastructures, both natural and man-made. Contemporary architectural design challenges signify innovative responses to these conflicts. Rethinking architecture as a mediator to restore the balance between nature and society establishes a foundation for the investigation of this design dissertation report.

Architecture is born through integration of human needs within the framework of existing natural systems, through site and context, architecture represents society within nature. A contradiction is thereby revealed through defining a site by its boundaries, disconnecting the context of site from natural nature.

Earlier creative studies explored these tensions through an abstraction by manipulating a natural dynamic through a man-made process to establish a 'nectoric' condition. This was achieved by generating a space within a natural object to prepare a man-made intervention and thereafter analysing how both dynamics relate to one another within this new condition.

The elements of nature - water, wind, light and sky - brought into architecture aims at instilling a presence of nature within the realms of man-made life amongst it. Spatial explorations which articulate and respond to these elements allows for nature to infiltrate the architectural proposition. Proceeding to seek and extract the essence of this relationship directed this investigation towards the connections between nature and man-made, analysed through their individual tectonics and techniques.
Fig. 9 - Cape Town's city bowl - exploring the urban edge.
Identifying Thirdspace

Thirdspace theory explored by Edward W. Soja and Homi K. Bhabha have primarily been influenced by the earlier thinking of Henri Lefebvre, through the explorations of relationships between centres and peripheries, utilising his triple consciousness: "the production of space, the making of history, and the composition of social relations to society." (Soja, 1996:7)

Thirdspace interprets socially produced space as a spatial opening for the 'other' to evolve from its direct context; renegotiating boundaries and cultural identity. Creating a space where 'real' and 'imagined' spaces are thought of as a manifestation into a dualistic space of openness, derived from the diverse contextual layers where all social, historical and spatial issues can be addressed simultaneously without prioritising one over the other.

"I define Thirdspace as an-Other way of understanding and acting to change the spatiality of human life, a distinct mode of critical spatial awareness that is appropriate to the new scope and significance being brought about in the rebalanced trialectics of spatiality-historicality-sociality." (Soja, 1996:10)

Thirdspace interpreted into architectural discourse, establishes a condition of 'overlap' - questioning boundaries, rethinking borders and thresholds into a more integrated context, which may be utilised at small or large scale.

Analysing Cape Town's city bowl context from its historical birth towards its current conditions, it became apparent that the natural landscape of Table Mountain facilitated the city's existence and underlining layout. This presented an ideal representation of the relationship between nature as a landscape and society as a city, where one meets the other, revealing the urban edge, thereby creating a potential 'Thirdspace'.

Fig. 10 - Author's model of Cape Town's city bowl analysis.

Fig. 11 - The trialectics of thirdspace.
Historicality

During the 1650s Table Mountain was discovered as a visual reference point from the seaboard and chosen by the Dutch East India company as a space of rest during sea voyages between East and West. (Verschoyle 1979) In 1652, Jan van Riebeeck’s arrival developed a place of settlement within the city bowl, where the urban edge was defined by a collection of farm boundaries determined by the land’s soil conditions, water collection strategy and accessibility. (Verschoyle 1979) Over time the city’s population growth increased, adjusting the condition of the edge and evolving the characteristics and historical landmarks to where it stands today.

Spatiality

The urban edge has become a physical boundary separating the city from the mountain through use of town planning regulations. This boundary space context demonstrates a firebreak strategy through a 15m wide cleared vegetation buffer attempting to provide a protective layer to facing developments and fire fighting accessibility. The actual spatiality of this zone gives an impression of a neglected scar across the landscape where the bordering developments require a safety interface by means of ‘hiding’ behind a harsh boundary wall. This lack of passive surveillance over the urban edge territory generates highly unsafe conditions prone to vandalism. Efforts of control by safety officers in trail vehicles are not to much effect.

Sociality

Currently, the majority of the urban edge has no social interaction. However, some accessible sections are used for trail runners, mountain bikers, dog walkers and scenic strollers to access the natural trails on the mountain slopes. Denis Verschoyle [Member of Town Planning Institute, SA (1946 - 1970) and lecturer at UCT on the history of town planning (1961-1972)] prepared a document called ‘Upper Table Valley

Fig. 12 - City bowl development growth 1862-1976.
- *A Survey 1979* which was made public by the Vernacular Architecture Society of South Africa in July 2000. The survey is “after 30 years, the only full analysis of place and character that has been undertaken by the city” (Verschoyle, 1979:3) This document states that the Public Open Space on the upper slopes of the city are not clearly defined and requires a strategy to provide for passive recreation requirements for the city of the future. This document was utilised as a fundamental historical reference to the area of investigation through clearly analysing the historical change of social conditions throughout the existence of the city's documented settlement era.

Analysing the urban edge through Thirdspace within the realms of society and nature; settlement and landscape; man-made and natural, begins to expose an overlap in the context of historicality, sociality and spatiality. Our perception of the urban edge hereby juxtaposes a divided context towards a more holistic condition, through extracting the opportunity of previous and current conditions of connectivity within overlap. The dissertation progresses towards an architecture that attempts to celebrate this overlap by connecting the city with the surrounding natural landscape utilising the urban edge as a Thirdspace site condition.
What is:

conflict

A

What could be:

negotiation

A

Fig. 14 - Re-imagining the urban edge.
Thirdspace techne'

"When a thing is produced by nature, the earlier stages in every case lead up to the final development in the same way as in the operation of art, and vice-versa."

(Pelletier 1994:33)

Adopting Thirdspace theory through architectural thinking, suggests that two unique dynamics in the context of overlap generate a set of tensions. It lies within this tensional condition where a creative synthesis may be explored and manipulated to become a unique outcome; echoing the two dynamics that initially created it.

Nature embodies a mystical sensation engaging mankind with the unexpected, where separate systems overlap one another in a complex understanding that produces a natural harmonious balance. This balance captures a beauty through natural rhythm where humans interact through an imaginative and peaceful experience.

Architecture represents a man-made element within society that aids human existence through a functional autonomy within spatial organisation and expressions through materiality and form. The study and integration of nature and her natural techniques and tectonics, interpreted into architectural thinking, can intensify this interaction between form, space and technology, creating a hybrid architecture that becomes part of the natural landscape, evoking curiosity, creativity and comfort at the right time.

Precedent of existing architectural interventions uncovered that Thirdspace techne' may be interpreted through construction processes creating properties of intensity that captures a moment of tension, thereby developing a playful and responsive architecture. The three projects that were analysed: The truffle house (Ensamble Studio); Brother Klaus Field Chapel (Peter Zumthor); and the vegetative room (Cristina Iglesias), have all lent themselves, perhaps some unintentionally, to this Thirdspace techne' by producing a mystical, playful and responsive architectural outcome.
Ensamble Studio built a project called *The Truffle House*, completed in 2010 in Spain, Laxe. This project strongly links nature with architecture through explorations of weathering over time, camouflage and an interactive process of construction.

Camouflage is used in nature to hide or confuse an observer, animals or plants achieve this through use of light or actual genetic possibilities modifying their appearances. There are diverse methods of this capability within nature, but analysed as a concept may be interpreted in architecture as a connection or transformation to surrounding context. The process of the Truffle house, initiated a hole in the ground, where the volume of the interior was designed and constructed in mass by hay bales. The bales were laid out accordingly and the hole filled with poured mass cement, enclosing the hay bales and protected by the soil.

After some time, the earth was removed and the ‘truffle’ mass remained, with a luscious straw interior. The soil and concrete had exchanged properties, providing a natural form, texture and colour. Once uncovered, some openings were made to access the hay and calf Paulina arrived. Paulina feasted on some what 50m$^3$ of food which lasted her about a year. The interior space provided shelter for food and Paulina, and once the interior was fully hollowed out the architectural condition of the truffle was restored.

The interior has now been retro fitted with a grey stone and contains a kitchenette, bed, sink and shower creating a small homestead in the wilderness overlooking stunning sea views. The end result was a surprise for the architects, revealing the unexpected through overlapping natural and man-made techniques which evolved into a naturally contemplative space.
Brother Klaus Field Chapel completed in 2007 in Wachendorf, Germany by architect Peter Zumthor, captures a unique architectural experience. The architect used timber as a material through manipulations of textural and structural internal mould explorations. A hundred and twelve tree trunks were erected in a tent like formation, where 50cm of concrete was poured and rammed over twenty-four layers. In the Autumn of 2006, the internal timber structure was burnt through use of a ‘smouldering fire’ over the period of four weeks. Thereafter, the timber was brittle enough to be removed from the concrete shell, providing a hollowed, textured and charred internal surface to remain.

The user is exposed to this charred finish that provides an internal spatial experience encapsulating the process of the buildings construction in a creative gesture. This innovative process understands the tectonics of timber and overlaps this with the technique of fire to produce a predetermined phenomenologically rich architectural space.

“To make a building live, its patterns must be generated on the site, so that each one takes its own shape according to its context.” (Alexander, 1979:462)
Cristina Iglesias built ‘The vegetation room inhotim’ completed in 2012 in Brazil, Brumadinho, presenting a small, tranquil labyrinth that disappears into the forest surroundings. The 9m² square floor plan has a stainless steel cladding system that reflects the surrounding forest context and allows for a camouflaged illusion.

The labyrinth has four separate entrances leading into comfortable small spaces that provide cracks into other surrounding spaces for a curious inspection yet inaccessible. One has to exit one space into the real wilderness to move to another entrance to experience all the other spaces. The most hidden entrance leads to a main central area where a whirlpool of water collects under a metal grate in the floor. This whirlpool generates a tranquil sound of water which can be heard from all the other interior spaces. The interior walls have a finish of artificial green plant motif, cast in bronze and polyester resin to create a soft tactile finish.

This project uses phenomenological design approaches to allow the user to connect to the surrounding context through a unique spatial experience. Stimulating the visual through camouflage, hearing through moving water, touch through tactile materiality, and curiosity through visual connects but physical barriers between spaces.

The urban edge lends its production to society’s fear of veldfire that could destroy buildings, infrastructure and even human life. Fire represents a natural technique which Zumthor, in his Brother Klaus Field Chapel, has incorporated through a man-made construction process, thereby creating a space which has properties both of intensity and tranquility. Similarly, developments in the urban edge need to minimise visual obstruction of the scenic backdrop to the surrounding city; and presents natural materials that may be utilised through the architectural language, as analysed through these precedents.
“The expression of materials that are made directly from nature, already embody a sense of truth in its existence, encapsulating the process of growth over time.” Author.
Design Development

Initiating the investigation direction into context of dissertation.
"If architecture is both concept and experience, space and use, structure and superficial image - non-hierarchically - the architecture should cease to separate these categories and instead merge them into unprecedented combinations of programs and spaces. “Crossprogramming.” (Tschumi, 1996:253)
Exploring the edge

"Nothing happens until something moves" - Albert Einstein

In art disciplines, methodologies harvest creative energy through the process of movement, which may be identified as music flowing through an order of notes on paper interpreted as movements of instruments generating sounds through space. Dance represents an expression of art through the movement of the human body. Paintings are an expression of an artist's ideas through collaboration of colourful materials to a canvas through movements of tools. The medium to creative energy is hereby expressed through movement. Architecture represents this movement through imagined-spaces by drawing, use of the hand, and the human body moving through space through interactions with materiality.

The exploration of the urban edge encapsulates a personal process of moving through these spaces by physical interaction with existing materiality and spatial relationships, whilst documenting moments of intensity through drawings and photographs. This process initiated the creative energy required to harness a foundation in the overall design. Experiencing views, slopes, edges and environmental conditions all became references for further design development.

Analysing population densities revealed the need for densification of the urban fabric directly connected to the city centre. The urban edge currently harnesses...
a suburban, low-density fabric condition, where zoning is adjusted to suburb peripheries and site conditions. However, the current zoning does not facilitate the efficient increase in densification opportunity for the near future. Disa Park generates a precedent identifying the possibilities in residential densification along the edge — perhaps an eye sore for many residents of Cape Town, yet a skyline identity to its residence and to Vredehoek. It must be stated at this point that high-rise residential buildings along the urban edge are not proposed as a solution to this problem, but rather define a shift in perception of densification opportunity.

Policies, historical and planning regulations facilitate the urban edge condition and required thorough investigation. Remaining focus on the urban edge as a spatial condition, the policies highlighted certain contradictory statements facilitating the regulations along this edge. (see fig. 35)

It became apparent that potential public interest zones within this territory are under-utilised, unaccessible and neglected spaces prone to vandalisation and unsafe conditions. Contextually, the urban edge consists of countless unique conditions. However, the study revealed several similar site characteristics.

The most evident characteristic displayed a cleared vegetated space demarcating a firebreak zone, a neglected
zone separating development from the natural landscape, thereby reinforcing this disconnected edge. The policies of the urban edge continued towards the veldfire related planning guidelines, which provide conditional strategies towards a hazardous boundary by integrating an Australian framework adjusted to suit our South African context. Through investigation it became evident that the set of design guidelines offered opportunity to be interpreted and implemented within an architectural context. 

The guideline proposes a 15m firebreak that wraps around the edge. This potentially harsh threshold acts as a conceptual development constraint within the realms of this dissertation, activating the layer through an architectural proposition that integrates a firebreak strategy into the overall design.

**Fig. 33 - Looking back at the city from Vredeheuk.**

**Fig. 34 - 15m firebreak as site constraint for development along the urban edge.**
Veldfire related planning guidelines
(April 2004 - Piet Louw Architects, Urban Designer, Planner)

- Sustainable development - Long term sustainability rather than short term gain.
- Accommodate additional stormwater after events, especially on steep slopes.
- Establish a strong built edge and therefore define the extent of the natural domain.
- For erven bordering directly onto the natural area, a sufficient building line should be imposed to allow a buffer between natural area and the first buildings.
- Significant protection to buildings can be obtained by providing a clear zone of low risk vegetation, with 9m given in International literature as a guide. (CSIR Report ENV-S-C 200-104)
- Buildings constructed on sloping land should be built on cut-in benches rather than elevated or above fill.
- Water storage on site and near buildings.
- Radiant heat and flame contact can generally be prevented by landscaping.
- Build a stone wall, earth mound, hedge or covered fence as a radiant heat shield. This should be fairly close to the building.
- Place vegetable garden, orchard, swimming pool or tennis court between house and expected fire direction.

ASSET PROTECTION ZONE

- Acts as a buffer zone between the hazard and any development with primary purpose of reducing veldfire fuels between the hazard and any habitable structure and providing appropriate access to the hazard area.
- Inner and outer protection zone with “fire trail” in between with minimum width of 6m for fire fighting vehicles.

Fig. 36 - Analysing veldfire design guidelines.
Realising programmatic intent

"The 20th century was the era dominated by individualism and materialism, based on rationalism and egoism represented with three elements: 'man', 'money' and 'material'. The 21st century will be an era of 'consciousness', 'collective intelligence' and 'co-existence'." - Yuko Hasegawa

Socially responsive design is undoubtedly a priority in contemporary South African architecture, yet many current proposals relate to a mass production of individual housing schemes rather than that of quality integrated into an overall framework. South African architecture should be used as a tool to improve conditions in society by designing the building not just for the residents, but for the community as a whole.

Re-imagining the urban edge as an overall connective tissue articulates a continuous active layer facilitating new conditions for relationships and interactions to manifest. These new conditions may provide for fixed or changeable activities to unfold over time, and evolves through integrating context within a domain anchored by public interests along the edge. Efficiently, this layer will produce its own infrastructure through programmatic coexistence within the context of site. Thus, the overall proposal aims at an 'ecological urbanism'.

The condition of the site requires a design response to veldfire, therefore the program implements the concept of an 'asset protection zone' extracted from the veldfire design guideline document. The width of the asset protection zone is adjusted to suit the context and aims at a zone minimizing potential fire fuels as an approach towards development. The zone is envisioned as an interactive layer harnessed by architectural nodes where required, integrating its existence into the landscape by merging nature and man-made, additionally acting as a connecting circulation route around the edge.

Experimental architecture directs our design thinking into new dimensions. This overall view requires contextual criteria to manifest into a perceived opportunity. This design vision

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Fig. 37 - Author's conceptual model - what condition would manifest if the urban edge was a productive layer and how would it affect the existing context.

Fig. 38 - Dissertation exploration strategy.
The University of Cape Town proposes two anchor points articulated through a process of critical analyses, identifying the potential beginning and end of this dynamic layer, weaving itself along the city bowl urban edge. These anchor points are located in the top edge of Vredehoek as the start, and in the top corner of the Bokaap as the end anchor.

The existing urban fabric of these two sites is residential, and directs the programmatic intent towards a low-rise high-density scheme, responding to the existing urban context by densifying the urban fabric. However, the programmatic realisation throughout the urban edge layer may be restructured to incorporate adjacent urban fabric conditions and requirements within the direct context, yet merging into the asset protection zone concept.

"New housing need be conceived through diversity and plurality, rather than homogeneity and collectiveness. A multi- and inter-active space."

(Gaussa, 2003:23)

High density housing within an urban context analysed through typology has evolved throughout history as a direct representation to social, economic and technological progressions. Particular inspiration lies within analysing the period of 1960s towards the 1980s, where a strong movement developed fantasies of a new utopia. (Corner, 1999) This period re-imagining how modern societies inhabit and utilise their cities. Works from Archigram, Rem Koolhaas, the Smithsons and the Japanese metabolists, are just some of a group that inspired a period of creative re-interpretations of living conditions. These theories portrayed flexibility, movement and moments of pleasure created by architectural methodologies. This dissertation aims at capturing this philosophy.
in the realms of grouped living program through a hybrid typology, not based on tradition but rather on future prospects.

Pedregulho’s social housing experiment in Rio De Janeiro, Brazil, built in 1947-52 by Affonso Eduardo Reidy, displays a 260m long grouped housing system with 272 housing units and other social amenities organized over seven-storeys. (Leon da barra, 2009) The building stands on a similar sloped topography to that of Cape Town’s urban edge, raising its structure off the ground by columns, whilst splitting the levels horizontally to expose a social void, sandwiched between repetitive residential layers. Due to this raised gesture, the building form separates the architecture and the internal social street from the surrounding landscape, yet providing a brilliant view over the city below. The internal social street developed a dynamic layer for interaction and gathering spaces for the residence of Pedregulho.

The dominant presence of the architecture might have been influenced by the earlier proposal of Plan Obus in Algeria by Le Corbusier around the 1930’s. This long wrapping residential block exemplifies Le Corbusier’s image of modern urban human habitation, generating a ‘machine for living.’ The proposal connects the city centre to the suburbs by introducing a motor highway integrated into a fourteen-storey residential building, literally proposing human habitation defined by the automobile’s abilities. (Leon da barra, 2009) However, analysing the architectural intentions through crossprogramming becomes a gesture worth investigating into a contemporary condition. This design dissertation adopts the methodology of overlapping functional program with traditional residential typology. However, it aims at 3 main interpretations that differ to these two precedents:

1. Merging the building into the existing landscape, rather than disconnecting the spatial and form by dominant presence.
2. Breaking free from the monotonous elevation created through systematic programming.
3. Designing for opportunity to express the social void as a more public amenity to the surrounding city, by designing moments of spatial integration with the natural topography.
Pushing program to a productive interpretation steered towards a logical process in form and organisational manifestations. Thirdspace technē is initiated to celebrate the tensions between natural/man-made; exterior/interior; void/solid and private/public thresholds.

Analysing rock formations on the faces of Table Mountain influenced the design of the sectional plane of the building by adopting these formations as a stratification methodology by interlocking vertical and horizontal spatial connections.

Spatial stratification of programming generated a public street void defined between private residential layers. This public street volume allows for intrusions of the surrounding private spaces as vertical opportunities for units to have split levels of work/live functionality. This morphological strategy of coexisting programmatic functionality allows the building to support public activities and act as a social condenser, dissolving the threshold between two worlds whilst developing an active matrix to the urban landscape. This linked active layer aims at reducing segregation of social groups in parts of the city by introducing a ‘Gap housing’ philosophy through new forms of interaction and initiating a sense of belonging within the concept of community.

This design attempts to draw nature inside the everyday life of human interaction, through Thirdspace technē – an architecture that encapsulates the presence of nature with reference to the city; a moment of juxtaposition, where society and nature are confronted under predetermined architectural moments.

Fig. 44 - Highline, New York, public layer through connectivity and visual connection to surrounding context.

Fig. 45 - Thirdspace technē - stratification of program through horizontal and vertical organisations.
Fig. 46.a - Photographs taken on the 18th of March 2009 of a veldfire spreading through the city bowl lower mountain region.
“Any recovery of landscape in contemporary culture is ultimately dependant on the development of new images and techniques of conceptualization.” (Corr, 1999:153,154)
A natural machine

"With its seemingly unlimited growth of material power, mankind found itself in the situation of a skipper who has his boat built of such heavy concentration of iron and steel, that the boat's compass points constantly to herself and not north. With a boat of that kind, no destination can be reached; she will go around in a circle, exposed to the hazards of the winds and waves."

(Hassenberg, 1977:44)

Society has arrived at a technological cross road; our knowledge develops the direction we choose. Fossil fuels, a limited resource proven to be harmful to our environment through pollution and war; or renewable and sustainable energy; a closed loop system, yet to be fully explored. Technology is hereby understood as a 'tool', yet are we using this 'tool' to its full potential?

An natural technique of processing energy through movement, facilitates natural tectonics such as wind, sun, water, growth and decay. Technology has provided opportunities for these elements to be harvested through their natural movements, generating energy through a natural gesture. This gesture becomes an example of a harmonious coexistence between human needs and the environment.

Contemporary technology transforms design thinking in architecture to a continuously progressive spectrum and can be used as a fundamental design tool. Technology can influence the aesthetic and mechanical architectural language through laying down the foundation for a more balanced relationship between society and nature. However, the technology becomes silent in representation, it becomes part of the architecture rather than an additional add on.

Power of the sun

Municipal’s electricity supply have proven expensive and harmful to our environment through over-exhaustion of resources. Solar harvesting is utilised globally and provides efficient individual energy production, decreasing costs and overall demands.

Roof planes are generally exposed to the sun and should utilise their orientation to harvest solar energy where possible. A solar water heating panel is an efficient method for harvesting solar energy to generate warm water for usage. Solar radiance begins at 10h00 and finishes around 16h00, peaking between 12h00 and 14h00 installed at a 43 degree pitch for the most efficient orientation in Cape Town. (Yes solar n.d) Utilising this technology, a household can eliminate 70-80% of their overall electrical consumption. (Solar partner 2009)

The final design will require night lighting over public spaces and circulation cores, which will be achieved through photovoltaic cells to harvest solar electricity. These cells are incorporated into certain facade cladding panels, defined by orientation possibilities, for harvesting additional

Fig. 47: Solar water heater orientation diagram.

Fig. 48 - Photovoltaic cells in black glass cladding system.

Fig. 49 - Cellular arrangements through modular layouts.
Power of the wind

Cape Town's architecture should utilise the strong natural wind power to produce and store energy wherever possible. This technological research investigates a recently tested vibration system called Vibro-Wind Piezoelectric Pads, which harnesses wind energy through a vibration technique. (Schwartz, 2010) This technological study attempts to merge the productive vibration pads with a kinetic facade system, as tested by a collaboration of artist Ned Khan and Urban art projects in Brisbane's new domestic terminal short-term multi-level car park, displayed as a public art experiment in 2011. This facade utilises the wind power to animate the facade in a flag-like motion playing with light and shadows, achieved through a simple construction method of connecting smaller aluminium plates to steel rods that are suspended in a modular panel configuration.

Combining the idea of vibrations to create energy, the facade adopts an energy reactor within the smaller panels that generate a small current through the vibrations of the wind hitting the facade. The substructural steel rods can then transfer this smaller current through to a larger battery storage device with mechanical maintenance accessibility. The facade system may be utilised through orientation opportunities to suit wind paths at high levels.
Waste water treatment

Using the natural slope of the site, the waste water will drain through gravity towards the lowest section of the site, locating the starting point of the proposal where a service plant will be established. The water treatment system is called ‘the living machine’ developed by Dr. John Todd in the 1990s, recreating the ecology of a natural coastal wasteland. (Todd, n.d.) The system has been tested in many different environments and scales, proven efficient and cost effective. South Burlington, Vermont is a good example in terms of a semi-urban context where the municipal water is treated through this particular process. (Todd, n.d.) The waste water is directed through a mechanical treatment process that leads into a biochemical treatment facility utilising vegetated beds enclosed within a greenhouse environment. The heat gained within the greenhouse space allows for the biochemical reactors to operate, and the vegetation transpires water, naturally filtering it. As the water vapour rises the greenhouse enclosure collects the clean water and stores it for further use. The process specifications are calculated by installation specialists in collaboration with occupancy capacity and programming criteria.

Fig. 53 - Primary stage water treatment.

Fig. 54 - Vegetated greenhouse for final stage of water treatment.

Fig. 55 - Stages of water treatment involved in ‘living machine’ system.
Inhabitation

Decision making through theoretical and practical context.
"Architecture is not about the conditions of design, but about the design of conditions that will dislocate the most traditional and regressive aspects of our society and simultaneously reorganize these elements in the most liberating way, where our experience becomes the experience of events organized and strategized through architecture." (Tschumi, 1996:259)
Fig. 56 - Author’s conceptual model analysing urban fabric from mountain to sea section. Urban edge intervention of overlaying and open landscape over an urban density condition.

Fig. 57 - Collaboration of author’s design development sketches with indication to non-combustible material opportunity.

Fig. 58 - Early design sketches of methodology for the edge - developed further.
Design methodology for the edge

Design methodology for the edge was established by extracting similar site characteristics to articulate a set of design conditions. This process does not construct a prototype in its definition, but rather a design methodology containing layers of a specific architectural integrity. This section aims to highlight an underlying Thirdspace technique utilised through the design process, articulating certain interpretations of architectural elements introduced into the design. The similar site characteristics and design responses are hereby explained:

Firebreak

The existing cleared wasteland derived from a 15m firebreak in section, acts as a conceptual development constraint throughout the edge. This 15m zone transforms into programmatic requirements and integrates an extended 'asset protection zone'. This unique spatial strategy requires the adoption of the concept of a 'radiant heat shield' wall, extracted from the veldfire guidelines document, acting as a heat and flame threshold between the building and the fire interface.

The 'asset protection zone' aims at blurring the fire interface with the public promenade, merging interior and exterior by drawing nature inside the building. This layer requires accessibility for a fire truck into the hazardous interface zone to tackle fires, providing a 6m wide drivable surface and a storm water catchment strategy, which has been designed as a water storage system that fire lighters can access in event of a fire emergency. The driveable surface will be camouflaged through non-combustible materials, providing spatial opportunities for running, cycling, vegetable production and interactive landscaping techniques. Where architectural program is not required, the 'asset protection zone' will continue as a productive firebreak zone maintaining the link throughout the edge.

The 'radiant heat shield' wall protects the building from heat and flames transferred from an oncoming fire. The wall design was inspired by the tectonics of a succulent

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Fig. 59 - Sectional design sketch illustrating Thirdspace relationships between nature/city; outside/inside; public/private.
plant, which is an organism that stores water and uses it when required, has an external protection layer from predators and remains aesthetically pleasing within its existence. The wall is constructed through a composition of non-combustible materials with openings that filter the spatial experience between nature and the public space. In an event of a fire, the wall openings will utilise the water stored in the asset protection zone below as a protective water spray through a water curtain nozzle located at the head.

**Slope**

The urban edge presents a slope generally ranging between the gradients of 1:5 and 1:10 and requires a design response accommodating this steep topography. The veldfire guidelines restrict developments from being raised off the ground as this creates a void for fire to spread under the building. The methodology therefore embraces the steep condition by sinking any building structure into the slope, allowing the architecture to morph into the existing landscape.

**Vehicle Accessibility**

Access roads are required to provide an infrastructure to facilitate programmatic requirements. In some conditions there are existing roads in place and in others there will be requirements to integrate a vehicle accessibility strategy.

**Views**

Remarkable views over the city in contrast to that of the mountain create an opportunity for the architecture to respond its spatial integrity highlighting these visual connections. The massing on the edge needs to morph its spatial orientation to respond to these views in the most opportune conditions. The stratification of programs splits a public void through the centre, raising the public street off the ground by allowing the space to capture the surrounding views. The public space is given continuity into the realms of Thirdspace, in-between nature and the city as a two-way visual and spatial relationship. Another main concern with developing the edge is the fear of visual contamination of the scenic mountain views as a backdrop to the city. The massing strategy responds to this through a methodology of overlaying site contours and development grids with the mountain slope directly behind the development. This allows the massing to respond to the slope of the mountain backdrop while the public layer follows the natural topography to maintain a relation to the natural terrain of the landscape. The building correspondingly terraces backwards to allow existing buildings along the edge to maintain their view of the mountain behind.

**Public permeability**

Natural water courses erode textures into Table Mountain's face, forming lusciously vegetated ravines. The building mass parts at intervals to expose the slope of the
landscape producing a spatial connection between the city and the mountain. These spatial contrasts are envisioned as luscious social circulation plazas, dividing the long facade in a compositional condition. These plazas will allow for public and disabled accessibility to the raised public promenade and the asset protection zone behind. By carefully analysing levels and introducing ramps, stairs, pause platforms and vegetation beds, these plazas transform into a playful composition of social interaction.

Fig. 61 - Elevation and massing methodology in response to natural topography of site and landscape as backdrop.

Fig. 62 - Thirdspace technique - interpretations of water courses over mountain facade to create a rich textured ravine, building's mass to be stripped apart to expose rich social plazas.
Exploration 1

Circulation cores with suspended floor plates.

Connections between levels and freedom of floor plate shape to adjust to context or spatial requirements.

Exploration 2

Public promenade to act as dynamic skin over program.

Program extends through, under, over, inbetween and overlaps to integrate spatial relationships.

Spatial experience may be adjusted by manipulation of levels, visual connections and relations to context.
Exploration A

- Raise layer to integrate social spaces creating a public promenade.
- Spatiality of public promenade integrates asset protection zone.

Exploration B - ground and first floor

- Vertical connections from ground floor with circulation core at 45m centres.
- Circulation splits from behind.

Exploration B - Option 1 (exploration A)

- Void between layers to be public/social space, live/work units popping into space from below and above.
- Route may adjust between spaces to provide for public/private thresholds.

Exploration B - Option 2 -

- Promenade extends over roof with live/work units popping through into space.
- Route may adjust between spaces to provide for public/private thresholds.

Second floor with integrated 'asset protection zone'

- Asset protection zone contains non-combustible material configurations.
- Light boxes extrude into space for circulation light below.
"A critical element in these (public) buildings is the wall. The wall here is a space of a special sort. It reminds me of what I identify as analytic borderlands in my research. These are spaces compromising what are commonly seen as discontinuous and mutually exclusive spaces. In constituting them as analytical borderlands, discontinuities are given a terrain, discontinuities become an integral part, a component of a space, rather than a division between two different spaces articulated around the dualities of inside/outside, private/public.

(...) If the wall does indeed function as such borderland rather than borderline, then the particular materials, the visual experience, the sensory experience, all matter because they are constituting a sort of third space."

(Adjaye, 2008:14)
Experience of Thirdspace through architecture

Fig. 65 - Locality map showing two anchors to urban edge proposal and future linkage.
Figure 66 - Site mapping - showing town planning zoning and site conditions.
Site generators

The starting anchor of the urban edge development will be located behind the visual ridge line of De Waal drive - a protected scenic route entering the city bowl. New BRT systems allow for a close proximity public transportation point in Vredehoek within a 1km walkable radius from the entrance onto the site. The site is nestled between a harsh line of development walls and the Vredehoek quarry. A natural cluster of trees act as a tranquil approach, where one can park one’s car and continue on foot. The condition of the site beyond allows for access of fire trucks and Table Mountain Parks Board Safety Control officer vehicles to enter through a security boom. As one passes this threshold the landscape is separated by an eroded dirt road with vegetation cut as a firebreak zone, acting as a gateway to the mountain trails.

Reality of the context reveals the idealised 15m firebreak zone, which generally maintains its dimension yet occasionally adjusts itself by either broadening or slimming in depth by responding to direct contextual conditions. In this case, the access road required for vehicle accessibility is already defined by the existing dirt road and will be adjusted to allow for efficient circulation and fire fighting accessibility. This existing condition creates a wider firebreak as the cluster of trees requires a more protected space acting as a hazardous fuel source.

The existing public parking under the trees will be maintained and better defined by upgrading the ground conditions and allowing ground cover to visually allocate designated parking between the natural locations of the tree stumps. This natural element correspondingly acts as a North Western wind break to the facade behind and marks the approach towards the proposed building, where the architecture reveals itself as one ventures closer.
Massing

Massing activates the existing firebreak zone through articulating visual connections, circulation strategies, fire escape routes, existing landscape conditions, the main pedestrian approach and access routes, through the method of overlaying the site contours and development grids with the mountain slope directly behind the development. This allows the massing to respond to the slope of the mountain backdrop while the building’s levels follow the natural topography, to maintain a relation to the natural terrain of the landscape. The public plazas present critical social nodes by reduces monotony in the facade and acting as public gateways to nature, connecting the natural landscape with the urban context and defining a visual frame of the landscape behind. Careful considerations towards scale articulated the building mass to terrace towards the mountain, minimising visual impact and an overpowering street facade.
Program

Utilising the concept of a 3-storey walk up residential typology through adjustments by integrating vertical and horizontal connections, allowed the units to interlock into a flexible condition held together by a static grid structure. The stratification of residential program mass is split vertically by defining a central void, acting as a threshold between private and public realms. Through social sustainability this horizontal void extracts a Thirdspace techne' by allowing the private and public functions to merge together by vertical extractions into the public domain. These units are vertical work/live entities envisioned as opportunities for any form of business to manifest - bookstore, jeweller, an artist studio or gallery space, dentist or doctor's room, hairdresser, yoga studio, home cooked restaurant, tattoo studio, etc. The residential manifestation defines the function of these spaces to naturally evolve into an economic social condenser.

The driving characteristic of a hybrid building is to establish a design framework accommodating for 24-hour usage through coexisting programs. The space procures this opportunity by further providing spaces for communal laundry, creche, free gym facilities, post office and corner shops. Rentable office space is also provided for and expressed in a prime location as bridging the main public circulation plaza.

The site is currently utilised in the periods of early mornings and late afternoons as a gateway to the mountain trails for mountain bikers, trail runners, dog walkers and scenic strollers. The main entrance plaza accommodates a collaboration of programs to facilitate these activities by defining a new gateway to the trails with a small mountain sport kit shop and a split level coffee/food facility as a pause space for before and after the users' activities. The location will have an outside water drinking facility and bicycle stands, which are located directly bellow the rentable office space and envisioned to provide a food source and rest place for the workers in the afternoons.

The Vredehoek quarry presents a space of tranquil beauty and is utilised by a small group of fishermen, rock climbers and abseilers. However, the environment is currently vandalised and unsafe. The building wraps around the outer edge and articulates the main

![Fig. 70 - Design sketches illustrating public plaza and accessibility strategy.](image-url)
entrance into the quarry, which will provide an activation point where the quarry may be utilised by the public in a more efficient condition. The building will act as a passive surveillance device and can accommodate a specialised rock climbing and abseiling facility, whilst the natural beauty of the quarry may be utilised at night for theatre, visual projections or any other activity that manifests from generating a safe environment.

**Parking Strategy**

Public parking will be accommodated for by the natural existing parking space under the trees, this space will be upgraded to maximise its usage but minimise man-made impact. Residential units on ground level have an adjacent parking spot, which can act as a space for economic value during the day, or any other purpose as the space is a natural void and not defined by specific parking facilities. The parking strategy intentions are to provide a minimum of one parking bay per unit, a loading bay for each combined complex, disabled parking, extra for visitors, parking for office space and loading bays for businesses. The proposal offers street parking, however, this alone did not provide sufficient numbers as intended. A parking layout was carefully designed to provide maximum bays in the space available within the 15m site constraint and has been integrated successfully to minimise impact on the overall building methodology.

**Circulation**

Private residential circulation cores are positioned at 45m intervals for a fire escape route strategy to suit National Building Regulations. Visually these cores generate a vertical break in the elongated horizontal facade. The core takes advantage of the internal visual connections to the surrounding context; as one moves up through the space the landings create moments of intensity with views either towards the mountain or the city. The material transparency of the core allows for light filtration into the circulation space correspondingly, generating a lighting reference point at night. Circulation corridors into
Fig. 73 - Diagrams illustrating separate private and public circulation strategy.

Fig. 74 - Technical section exploring visual connections and light filtration.

The units integrate moments of relief through social viewing decks overlooking the city. The corridor spaces generate a natural experience as the excavated edge will be exposed and projects itself into the space. The corridors are located directly below the main circulation space on the public promenade above. These spaces influence each other as the floor slab above adjusts its levels to provide light filtration into the space below.

Active layer - Public promenade and asset protection zone

This active layer aims at capturing a Thiridspace spatial experience through folding the surface into functional conditions by responding to peoples movements through space. The surface material merges between the natural asset protection zone and that of the internal concrete floor slab, creating a journey through the building with moments of spatial intensity. The critical interaction of phenomenological tensions between nature and society draws both dynamics into a uniquely singular spatial experience by dissolving the interior and exterior thresholds. The surface layout design responds to moments of relief and pause spaces where public can venture into natural or city view territory with seated
contemplative spaces. Public accessibility is achieved through the integrated plazas, and circulation is directed by manipulated levels, views and materiality. Work units are extruded into this space either from above or below, controlling access onto the outer city edge of the promenade, where adjustable enclosure screens will fit between units where required as a wind barrier.

**Materiality**

The architectural synthesis by materiality explored through Thirdspace techne’ attempts to capture a moment of tension between natural and man-made. The materiality of the building needs to be highly robust through heat and fire resistance. However, the level of resistance decreases towards the outer city facing facade. During the course of this dissertation, materials were tested by merging natural elements into a concrete curing process, exploring the textures and combining a state of fire to investigate the outcome.

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**Fig. 75** - Diagram illustrating public promenade merging with asset protection zone through visual, spatial and material explorations.

**Fig. 76** - Diagrammatic process of natural property concrete panel for radiant heat wall.

**Fig. 77** - Exploration of colour options influenced by surrounding context.

**Fig. 78** - Carlo Sacappa’s use of concrete through detailed expressions, articulates space with rich gestures.

**Fig. 79** - Biological concrete panels act as foundation for mass growth.

**Fig. 80** - Material explorations merging natural and concrete through a fire condition.
Value and significance arises not from things (materials), but from the ways that they are handled, worked, or treated.” (Leatherbarrow, 2009:81)

Radiant heat shield

This architectural element acts as a protective layer and adjusts its form to influence the spatial experience of the public promenade. The texture of the wall needs to be non-combustible and represents a natural entity through use of natural materials integrated into a concrete curing process. The design intention of the facade is to express the process of construction and present a rhythmic composition within the landscape, playing with balance in void and solid perceptions of space. The facade will be formulated by use of reinforced concrete panels with integrated textures. Excavated soil will be reused and mixed with cement into a rammed earth construction process capturing the natural colours of site. Unique panels will be cured into the excavated site and raised into place capturing a natural texture of the earth. Other natural materials will incorporate concrete construction with timber or stone and allowed to be burnt off the building during a veldfire condition, revealing a charred facade documenting events in time. The wall’s simplified form and divisional arrangements filters light and visual connections of exterior and interior, its presence stands strong reflecting the tranquillity of a natural existence.

Environmental sustainability

Architecture represents society within nature. Thus, the proposal utilises modern sustainable technology available to minimise the inhabitants’ energy requirements and impact on environmental resources. The technology in sustainable systems are designed to become part of the architecture and not an additional add-on. Water heating will be achieved by solar water heating panels on the top unit roofs. Electricity will be generated from the *wind vibration room* located on the NW/SE wind axis on the top floor, and

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**Fig. 81** - Author’s material testing - merging nature with concrete and exposed to fire condition.

**Fig. 82** - Material fire resistance required.
orientated facades. All storm water is collected and stored under the ‘asset protection zone’ for fire fighting connection points and toilet flushing in the lower residential units. Waste water will be treated on the lowest section of the site through a process where the water will be drinkable after treatment.

Residential units will be fitted with separate recyclable bins, boosting community sustainability. Refuse collection points are located by each circulation core, positioned on the ground level in a cleanable refuse room with direct access to the street for municipal collection.

**Structural system**

Structural systems constitute a concrete column frame as the primary structure organised on a grid formation accommodating the units design intent. Collaboration with a structural engineer confirmed dimensions to suit level heights, where concrete floor slabs and gridline downbeams generate the horizontal support system. The residential units will mainly contain brick infill with plaster and paint, yet the outer city facing elevation articulates a stone cladding system to generate a richly textured facade. The primary column structure penetrates through the public void layer, where work units’ colourful cladding system conceals their presence.

**Technical studies on units**

Residential units derive from a logical gridline organisation strategy, with spacings at 3m and 4.5m intervals. The slender site constraint of 15m in depth developed a critical analyses on lighting and ventilation strategies, maintaining maximum view exposure for each individual unit. Light and ventilation is articulated through voids penetrating the floor slabs and influences the public promenade spaces. The units connected to the public promenade from below or above, will have an optional extended work space penetrating into the promenade.

Unit options include:

- 3-bedroom split level units - ground floor and first floor. 108m² (Unit A)
- 1-bedroom disabled units on ground floor 44m² (Unit B)
- 2-bedroom units on first or third floor with optional work extension into public domain on the second floor. 87m² (Unit C/ Unit D - 3F/ Unit 3FfW)
- 1-bedroom studio apartment on first or third floor with optional work extension into public domain on the second floor. 43m² (Unit E - 1F/ Unit F - 1F/W / Unit G - 3F/ Unit H - 3F/W)
- 1-bedroom studio - student facility. 30m² (Unit J)

**Definition:**

1F - First Floor
1F/W - First Floor work unit
3F - Third Floor
3F/W - Third Floor work unit

![Fig. 83. - Early design sketch illustrating residential units strategy for light and ventilation.](image-url)
maximize quantity of units with frontage, finding the minimum width dimension required for efficient unit design.
- ground floor units with adjacent parking as foundation defined grid organization above.

Fig. 84 - Structural analysis.
**PROGRAM DIAGRAM**

<table>
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<th>PUBLIC</th>
<th>SEMI - PUBLIC</th>
<th>LIMITED - PUBLIC</th>
<th>SEMI - PRIVATE</th>
<th>PRIVATE</th>
</tr>
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<td>Ablutions</td>
<td>CIRCULATION CORE</td>
<td>Social Pods</td>
<td>Residential Units</td>
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<tr>
<td>Parking</td>
<td>Work unit pop ups</td>
<td>Secure Entrance</td>
<td>Circulation</td>
<td>3 bedroom units</td>
</tr>
<tr>
<td>Access</td>
<td>Outdoor/covered gym facility</td>
<td>Residential Parking</td>
<td></td>
<td>2 bedroom units</td>
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<td>Post office</td>
<td>1 Parking / unit</td>
<td></td>
<td>Studio</td>
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<td></td>
<td>Corner shop</td>
<td>Community Hall</td>
<td></td>
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<tr>
<td></td>
<td>Sports kit shop</td>
<td>Laundry</td>
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<td></td>
<td>Crèche</td>
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<td></td>
<td></td>
<td>Waste water treatment plant</td>
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</table>

**FUNDAMENTAL DESIGN GOALS**

- Design process to integrate Thridspace methodology in natural vs. man-made tectonics and techniques.
- Existing 15m fire break space along the urban edge presents an under utilized harsh environment. Integrate an appropriate fire break design response into the architecture.
- Design a productive and sustainable periphery.
- Densify urban edge through a sustainable response to low-rise high-density residential scheme.
- Design a hybrid building to provide opportunity to establish an overlap in programmatic, spatial usage, public and private thresholds to act as a social condenser.
- Anchor the urban edge from further hap-hazard and low density development.
The design has not been full completed at this stage of the dissertation, but quantitative information has been estimated as accurately as possible.

**Site Area (Development of 15m width only): 4400m²**

**Residential Units**

- Unit A - 10 units = 1080m²
- Unit B - 4 units = 176m²
- Unit C - 3 units = 261m²
- Unit D - 5 units = 435m²
- Unit E - 6 units = 258m²
- Unit F - 3 units = 129m²
- Unit G - 9 units = 387m²
- Unit H - 5 units = 215m²
- Unit J - 10 units = 300m²

**Total** = 55 Units @ 3241m²

**Total work units** - 13 units @ 300m²

**Circulation cores** - 4 (4 Refuse rooms) @ 114m² = 456m²

- 7 x Social spaces around cores @ 30m² = 210m²
- 1 x Rock climbing shop / Quarry management @ 40m²
- 1 x Post office @ 30m²
- 1 x Corner shop @ 70m²
- 1 x Outdoor free gym facility

1 x Information desk/security @ 20m²
1 x Community function hall @ 68m²
1 x Creche @ 40m²
1 x Sports kit shop @ 33m²
1 x Restuarant / Kitchen / Toilets / Store / Management @ 95m²
2 x Rentable office space @ 185m² x 2 = 370m²
1 x Waste water treatment plant @ 620m²
1 x Wind vibration room @ 290m²
3 x Public plazas @ 193m² + 390m² + 131m² = 714m²

**Gross Development Area over 3 levels incl. units = +/− 6597m²**

Fig. 85 - Early programmatic exploration.
Fig. 86 - Author's conceptual model.
Conclusion

Thirdspace theory may be adopted in architecture by articulating a shift in design perception through working with spatial, material and programmatic intentions. This methodology juxtaposes constraints into a workable collage of opportunity, exercising complexities and tensions by celebrating their existence through facilitating a process of uncovering a space of openness. It lies in this condition where contemporary architecture may be tested by not acting as purely an object in space, but rather as a holistic presence within the surrounding context.

Cape Town's city bowl urban edge, generates a platform where architecture may achieve a mediation between nature and society, through challenging and working the tensional conditions exposed within this boundary context. What once was a neglected firebreak periphery to the city, now introduces a firebreak design strategy articulating an architecture that derives it's existence through the workings of Thirdspace. Designing opportunity for crossprogramming in the realms of residential architecture, generates a mixed-use matrix; a space in which cultures and traditions merge together to form a neutral social framework, where in the urban edge condition, architecture coexists between the realms of nature and that of the city.
Early public plaza sketch.
Glossary

CLOSED-LOOPEDE / sustainable system through producing connected processes that provide for zero waste, as waste of one is re-utilized into something else that will eventually loop back to the beginning.

ECOLOGICAL URBANISM / a holistic approach to an urban environment. Inspired through the concept of ecology, a self-sustainable urban condition through coexistence of layers through systems and infrastructure.

MAN-MADE NATURE / natural landscapes or environments manipulated by mankind to suit human needs.

NATURAL MACHINE / natural elements within nature that function by themselves as an efficient machine evolved over time through adaptation.

NATURE / the phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to human or human creations: the breathtaking beauty of nature.

NEOTERIC / a new state of being. A fresh but rare occasion.

PHENOMENOLOGY / studies of the sense - sight, touch, taste, hear, smell. Phenomenology in architecture can influence a user's stimuli.

SMOULDERING FIRE / a slow, low-temperature, flameless method of combustion. Materials that are able to apply a smouldering fire are generally porous and facilitate an oxygen flow through the material, providing a prolonged state of combustibility.

SOCIETY / global human community or settlement.

TECHNEE / a way of making through craftsmanship, a craft-like knowledge applied through practical response towards a process of production.

TECTONIC / parts that make up a whole, for something to be analysed we require to unpack and discover the inner tectonics of its being.

TENSION / aggravation between two dynamics, not in harmonious understanding or being.

THIRDSPACE / exploration of overlap in cultures through historicality, sociality and spatiality. Questioning boundaries, rethinking borders and thresholds into a more integrated context to provide for a new opportunity to merge conditions on a neural platform.

TIME / mankind's symbolic representation of the rotation of the earth around the sun developing a rhythm. Time links the changes in nature, however time correspondingly defines the essences of man through history to present. We relate our existence through the representation of time, this rhythm connects the cosmos and our standing point on earth.

WILDERNESS / nature which is untouched by human interaction, naturally balanced ecosystems in constant state of adaptation - where one can die from venomous creatures.
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VERSCHOYLE, D.* Upper Table valley A Survey 1979*, in VASSA journal number 3 July 2000. ed. Malan, A.


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**World wide web.**


http://www.solarpartner.co.za/wwiksol-system/


Government


MLH Architects; Piet Louw Architects. (2003) Natural interface study - veldfire related planning guidelines. Cape Metropolitan Council, Cape town
Appendix

Site A

Site B

Site C

Site D

Site E
LIVING ON THE EDGE

nature & society
re-imagining architecture through Thirdspace

current urban edge condition
- wetland risk to developments
- firebreak embraces neglected periphery to the city
- creating a representational rift between nature and society
- utilizing Thirdspace methodology to develop a productive layer – "minor culture"

nature

urban edge
Thirdspace
society

overlap

Programming possibilities.

unrealized urban edge

natura

society

Table Mountain

Lime head

Impression

Beechill

urban edge
Thirdspace

Limehead

Table Mountain

Line 1

railroad

bridge

public void through stratification, connects steep place through cutting

Lime Head

and acthar

balkak

external sensor

Society

location

public

deadspace

Society
Fire break

The existing clear weed land derived from a 15m firebreak in section, acts as a conceptual development constraint throughout the urban edge. This 15m zone transforms into a productive layer to the matrix of the urban landscape, generating an architecture that integrates a fire break stratelY into the design - the architecture becomes the fire break. This unique spatial strategy requires to adopt the CO concept of a 'radiant heat shield' wall and an extended 'asset protection zone' extracted from the veldfire guidelines document, acting as a heat and flame threshold between the building and the fire interface.

Asset protection zone

This protective layer decreases any potential fire fuels between a development and a fire hazard interface. The layer requires accessibiility for a fire truck into the hazardous interface zone to tackle fires, providing a 6 m wide drivable surface and a storm water catchment strategy. The storm water catchment has been designed as a water storage system that firefighters can access in event of a fire emergency. The drivable surface will be camouflaged through non-combustible materials, providing spatial opportunities for running, cycling, vegetable production and interactive landaping techniques.

Radiant heat shield

The 'radiant heat shield' wall protects the building from heat and flames transferred from an oncoming fire. The wall design was inspired by the tectonics of a succulent plant, which is an organism that stores water and uses it when required, has an external protection layer from predators and remains aesthetically pleasing within its existence. The wall is constructed through a composition of non-combustible materials with openings that filter the spatial experience between nature and the public space.

In an event of a fire, the wall openings will utilise the water stored in the 'asset protection zone' as a protective water spray through a water curtain nozzle located at the head. The integration of the facade is to express the process of construction and present a rhythmic composition within the landscape, playing with balance in solid and sensor perceptions of space.

Materiality

The facade will be formulated by its use of reinforced concrete structure with integrated spaces of expressive levels. Excavated soil will be reused and mixed with cement into a rammed earth construction process capturing the natural colours of site. Unique panels will lie cured into the excavated site and raised into place capturing a natural texture of tiled earth. Biological concrete will be used to create a living green facade producing a layer of roof moss softening the concrete facade into the green surroundings.
Waste water treatment plant

By using the natural slope of the site, the waste water will drain through gravity towards the lowest section of the site, locating the starting point of the proposal where a service plant will be established. The water treatment system is called 'the living machine' developed by Dr. John Todd in the 1990s. The waste water is directed through a mechanical treatment process that leads into a biochemical treatment facility utilising vegetated beds enclosed with green house environments. The heat gained within the greenhouse space allows for the biochemical reactors to operate, and the vegetation transpires water, naturally filtering it. As the water vaporises, the greenhouse effects clean the walls and soles it for further use.

Public access nodes

Natural water courses erode rock surfaces into Table Mountain's face, forming luxuriously vegetated ravines. This natural technique influenced the building mass design, which parts at intervals to expose the slope of the landscape producing a spatial connection between the city and the mountain. These spatial contrasts are envisioned as lush social circulation plazas, dividing the long facade in a compositional condition. These plazas will allow for public and disabled accessibility to the raised public promenade and the asset protection level behind.

By carefully analysing IENe issues and introducing ramps, stairs, pause platforms and vegetation beds, these plazas transform into a playful composition of social interaction.

Wind vibration room

A kinetic facade system utilises the wind power to animate the facade in a flag-like motion playing with light and shadows, achieved through a simple construction method of connecting smaller aluminium plates to steel rods that are suspended in a modular panel configuration.

Combining the idea of vibrations to create energy in a tested system called Vibro-Wind Piezoelectric Pads, the facade adopts an energy reactor within the smaller panels that generate an electric current through the vibrations of the wind hitting the facade. The structural steel rods transfer this smaller current to a larger battery storage device with mechanical maintenance accessibility. The energy produced will power the building's public lighting requirements.

Photovoltaic strips

Photovoltaic cells are incorporated into a dark rainscreen cladding system generating a solar productive skin for the building. Each unit has a balcony and provides a sun-facing surface for installation of these energy productive strips and allow easy access for maintenance. The energy produced will be utilised for water heating within the units. This method generates a modular response that retracts its positioning from the front of the facade, producing a playful animation in the street facing elevation. 

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