

Adaptive Healing

Exploring therapeutic architecture and the integration of addiction rehabilitation
into the Cape Flats, Mitchells Plain

Johan Basson

Master of Architecture (Professional) 2014

UNIVERSITY OF CAPE TOWN

Design Dissertation Research Report

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Adaptive Healing

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This dissertation is presented as part fulfilment of the degree of Master of Architecture (Professional) in the School of Architecture, Planning and Geometrics, University of Cape Town

Date 22 October 2014

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Adaptive Healing

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Abstract

This dissertation explores therapeutic architecture and the integration of addiction rehabilitation into the Cape Flats, Mitchells Plain area.

This project ultimately introduces the concept of an integrated community rehabilitation and wellness centre in one of the most notorious, unhealthy urban environments in the Western Cape, Mitchells Plain. This will demonstrate that a healing environment can be achieved in any context, urban or rural.

A rehabilitation centre that engages with its surrounding community, fostering various levels of controlled interaction between patient and public. An integrated facility that gives back to its community through shared facilities.

This investigation also unpacks the existing rehabilitation ecology and the gradual transition process in the formulation of a new hybrid system that combines the various stages of rehabilitation within a centralised facility. The project aims to deinstitutionalize the existing rehabilitation programme through the 'simulation of a real life' concept, where the facility will incorporate familiar elements, such

as the house, neighbourhood and downtown to replicate the variety of environments in our everyday lives.

The design uses 'nature as therapy through architecture' with the implementation of various concepts, which includes a raised therapeutic platform and a perimeter planter, serving as an urban filter that defuses the harsh urban context of Mitchells Plain.

This project also explores the role of Architectural technology in therapy and ultimately introduces the concept of a highly localised adaptive façade system that allows for individual patient control and to filter the interactive visual relationship between patient and public.

Our modern healing facilities have been designed to house apparatus for healing but not to be healing instruments in themselves. Architecture should be considered just as significant as the treatments that it houses.



"We shape our buildings; thereafter, our buildings shape us"

Winston Churchill, 1994

Table of contents

| | |
|---|------------|
| Front page | |
| Plagiarism declaration | Page 3 |
| Abstract | Page 4 |
| Table of contents | Page 6-7 |
| Table of figures | Page 8-9 |
| Introduction | Page 10 |
| - The role of therapeutic architecture | Page 11 |
| - The existing institution | Page 12-13 |
| - Evidence based design | Page 14 |
| Exploring nature as therapy through architecture | |
| - The therapeutic effects of nature | Page 15-17 |
| - Understanding the stimulation of the human senses | Page 18-19 |
| - Effects of light, shadow and colour psychology | Page 20-21 |
| In Search of site | |
| - The existing conditions in the Cape Flats | Page 25-26 |
| - The need for intervention | Page 27 |
| - Targeting the heart of the problem | Page 29 |
| - Mitchells Plain contextual investigation | Page 30-33 |
| - Site selection and justification | Page 34 |
| - Site parameters and potential design informants | Page 35 |
| - Understanding rehabilitation ecology and the gradual transition process | Page 36 |
| - Rethinking the rehabilitation programme | Page 37 |
| Design strategies and concepts | |
| - The gradual transition system | Page 36-37 |
| - Programmatic stratification and deinstitutionalisation | Page 40-45 |
| - Nature as the therapy through architecture | Page 46-47 |
| - Community integration | Page 48-49 |
| - Circulation, accessibility and security | Page 50-51 |
| Technical resolution of the building skin | Page 52 |
| - The role of architectural technology in therapy | Page 53-55 |
| - Adaptive façade concept | Page 56-57 |
| - Massing in relation to orientation | Page 58-59 |
| - Proposed façade system analysis | Page 60-63 |
| Final design development | Page 64 |
| - Contextual site plan | Page 65 |
| - Floor plans | Page 66-71 |
| - Roof plan | Page 72 |
| - Elevations | Page 73 |
| - Main cross sections | Page 74 |
| - Rendered perspectives | Page 75-81 |
| Conclusion | Page 82 |
| References | |
| - Glossary | Page 83 |
| - Bibliography | Page 85 |

Table of Figures

All images are by the author unless otherwise noted.

1. *Stimulation of the human senses (Author 2014)*
2. *Photos of initial explorations, the moon jellyfish and other conceptual models (Author 2014)*
3. *Image indicating Nature as therapy*
<http://imgarcade.com/1/pooktre-arborsculpture/>
4. *Sketch indicating the Isolation and confinement created by most of our modern rehabilitation facilities*
<http://bemag.org/on-solitary-confinement/>
5. *Gaurang Makhwana – A painting that contrast rural versus urban ethos and their variances...the progress of technology and deterioration of values...growing material comfort and lessening mental peace...*
http://tbshstudio.com/makwana/makwana_art.html
6. *Epidemiologic Triangle - A model that scientists have developed for studying health problem (Edited by Author)*
[Myers et al, Identifying perceived barriers to monitoring service quality among substance abuse treatment providers in South Africa, Published BMC Psychiatry \(2014\)](#)
7. *Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen - within a natural context* <http://www.ecofriend.com/rehabilitation-centre-groot-klimmendaal-shortlisted-for-mies-van-der-rohe-award.html>
8. *Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen – the power of the window*<http://www.ecofriend.com/rehabilitation-centre-groot-klimmendaal-shortlisted-for-mies-van-der-rohe-award.html>
9. *Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen – view framing*<http://www.ecofriend.com/rehabilitation-centre-groot-klimmendaal-shortlisted-for-mies-van-der-rohe-award.html>
10. *The Moon jellyfish that functions through an autonomous network of senses allowing it to communicate a deep connection with its environment. (Edited by Author)*
<http://life-sea.blogspot.com/2011/07/life-of-sea-waps-box-jellyfish.html>
11. *Diagram indicating the experience of space through the senses*
<http://internalmartialartstraining.blogspot.com/>
12. *Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen – passage play of light and color contrast* <http://www.ecofriend.com/rehabilitation-centre-groot-klimmendaal-shortlisted-for-mies-van-der-rohe-award.html>
13. *Colour wheel of emotional psychology*
<http://www.smashingmagazine.com/2013/03/12/design-multifaceted-user/>
14. *Creating a healing oasis within the urban desert of depression(Edited by Author)*
http://www.streetartutopia.com/?attachment_id=6931
15. *How can architecture create a healing environment within a socio economic depressed community? (Author 2014)*
16. *Map indicating the segregation of rehabilitation facilities to the peripheries of our socio-depressed economic communities. Cape Flats – Western Cape – South Africa (Author 2014)*
17. *Diagram indicating the segregation of rehabilitation facilities to the peripheries of our socio-depressed economic communities. Cape Flats – Western Cape – South Africa (Author 2014)*
18. *The need for an intervention(Edited by Author)*
<http://bemag.org/on-solitary-confinement/>
19. *Searching for site – Cape Flats (Author 2014)*

20. *Diagram proposing the integration of rehabilitation facilities to the centres of our socio-depressed economic communities. Cape Flats – Western Cape – South Africa (Author 2014)*
21. *Mapping, Mitchells Plain, Accessibility(Author 2014)*
22. *Mapping, Mitchells Plain, Occupancy(Author 2014)*
23. *Mapping, Mitchells Plain, Biodiversity(Author 2014)*
24. *Mapping, Mitchells Plain, Mapping Overlay(Author 2014)*
25. *Mapping, Mitchells site selection Town Centre(Author 2014)*
26. *Site Parameters and potential design Informants(Author 2014)*
27. *The rehabilitation process(Author 2014)*
28. *Contextual Influence on Programmatic Allocation (Author 2014)*
29. *Programmatic allocation rationalization and gradual transition process (Author 2014)*
30. *3D Massing gradual transition process diagram (Author 2014)*
31. *The simulation of real life concept (Author 2014)*
32. *The urban village concept – Simulation of real life 3d explosion (Author 2014)*
33. *Vertical programmatic section (Author 2014)*
34. *Typical accommodation level – The therapeutic community (Author 2014)*
35. *First floor plan – downtown concept(Author 2014)*
36. *Nature as therapy through architecture diagram(Author 2014)*
37. *Community integration diagram(Author 2014)*
38. *Circulation, accessibility and security diagram(Author 2014)*
39. *Technical resolution - Adaptive façade systems (Author 2014)*
40. *The various façade technologies explored in this paper 1 (Author 2014)*
41. *The various façade technologies explored in this paper 2 (Author 2014)*
42. *The various façade technologies explored in this paper 3 (Author 2014)*
43. *The jellyfish and the autonomous network of senses(Author 2014)*
44. *Adaptive façade concept(Author 2014)*
45. *The accommodation spine raised above the therapeutic platform (Author 2014)*
46. *Solar study-massing in relation to orientation(Author 2014)*
47. *Typical east – west façade condition - strip section*
48. *Typical north-south condition*
49. *Typical east – west condition*
50. *Final design development intro render(Author 2014)*
51. *Site and locality plan(Author 2014)*
52. *Ground floor plan(Author 2014)*
53. *First floor plan – downtown concept(Author 2014)*
54. *Second floor plan – Accommodation level 1(Author 2014)*
55. *Third floor plan – Accommodation level 2(Author 2014)*
56. *Fourth floor plan – Accommodation level 3(Author 2014)*
57. *Fifth floor plan – Communal roof terrace(Author 2014)*
58. *Site and roof plan(Author 2014)*
59. *Elevations (Author 2014)*
60. *Main cross sections(Author 2014)*
61. *Render – North corner perspective (Author 2014)*
62. *Render – Spiritual Courtyard (Author 2014)*
63. *Render – Typical External circulation spine (Author 2014)*
64. *Render – Therapeutic level accommodation entrance(Author 2014)*
65. *Render – East west Accommodation internal atrium (Author 2014)*
66. *Render – Perimeter Retail (Author 2014)*
67. *Render – Reintegration Street perspective (Author 2014)*

Introduction

My personal fascination with nature and the opportunity to learn from her inspired this projects initial direction with the discovery of the moon jellyfish, the only organism that functions on an autonomous network of senses; allowing a deep connection with its immediate environment.

Technologically and programmatically, this project draws ideas from the jellyfish concept and investigates how architecture can create spaces that encourage or induce healing, while also exploring the need for adaptability within these environments.

The project investigates the existing addiction conditions in the Western Cape region and the need for an architectural intervention, while also exploring the opportunities and constraints of therapeutic architecture within an urban context.

Through various mapping exercises, this investigation emphasizes the segregation of our rehabilitation facilities to the peripheries of the Cape Flats, highlighting the resultant complications prior to the introduction of an integrated community rehabilitation and wellness centre into the Western Cape, Mitchells Plain Town Centre.

The challenge is therefore to create the therapeutic effects that a rural environment provides within an urban context.



*Figure 2 – Photos of initial explorations, the moon jellyfish and other conceptual models
(Author 2014)*

The role of therapeutic architecture

The term therapeutic architecture has evolved into a recognised concept as a reaction against the austerity of modern treatment facilities. This concept embodies the vision of well-designed architectural spaces that encourage healing and human wellbeing.¹

The concept does not propose that the architecture itself has the ability to heal, but that the architectural manipulation of space can provide the platform for other natural factors like sound, light, colour, privacy, views, and even smell to promote a healing environment that effects the physical and psychological healing of patients.²

The 21st century, with its rapid technological advancements and the fast paced evolution of medical science in combination with the architectural focus primarily on functionality and rationality has in many cases resulted in our inhumane “healing” environments.³



Figure 3 – Image indicating Nature as therapy

¹ *Grinde et al, Biophilia: International Journal of Environmental Research and Public Health*
Published: Multidisciplinary Digital Publishing Institute (MDPI) (2009)

² *ibid*

³ *Horsburgh, C. R. Healing by design* Publishe The New England Journal of Medicine. (1995)

The existing institution

Modern rehabilitation facilities are synonymous with the prison system, in the way in which they function by isolating individuals from the general public in order to rehabilitate them. However, the exact opposite is accomplished as the isolated institutional atmosphere only delays rehabilitation and consequently creates patients that come to be a replication of their environment. Rehabilitation facilities require organizational and security measures. However, the therapeutic effects of such an environment should outweigh any other concerns.⁴

Various experts including architects, therapists and sociologists, have throughout the years argued about the healing capacity of place and the physical qualities of its spaces having the ability to induce healing. These elements are vital to individuals that receive long term care, particularly to recuperate from exposure to social, physical and emotional volatility as a latent defect of drug addiction.



Figure 4 – Image indicating the Isolation and confinement created by most of our modern rehabilitation facilities

⁴ *Grinde et al, Biophilia: International Journal of Environmental Research and Public Health*
Published: Multidisciplinary Digital Publishing Institute (MDPI) (2009)

Past and present models of healing centres advocate the isolation of people from society with the intention of replacing the undesirable distractions associated with an urban lifestyle with the more desirable effects of a rural one, which is believed to increase the rate of healing.⁵

However, the disorientation and confusion created by removing and isolating a patient from their everyday life and environment ultimately challenges the permanency of treatment success. The environmental conditions of a healing space, when compared to a patient's home, are understandably different, and this disparity often results in a patient associating their 'rehabilitated self' with the centre where they received treatment, and their 'un-rehabilitated self' with their home, creating future psychological imbalances that in many cases result in addiction relapse.⁶

Throughout history, people have sought to escape the stresses associated with urban living. This desire to escape the busy urban conditions of cities is still very much a reality today in providing a mental retreat for relaxation and the opportunity to psychologically rebalance. This further demonstrates our human desire to be close to nature and the necessity of a healing environment within an urban context.

This project takes on the challenge of introducing a rehabilitation centre within an urban context, away from the therapeutic effects of a rural environment. The

⁵ **Ulrich, R. S.** *View through a window may influence recovery from surgery.* Published: American Association for the Advancement of Science (1991)

⁶ **Myers et al.** *Identifying perceived barriers to monitoring service quality among substance abuse treatment providers in South Africa,* Published BMC Psychiatry (2014)

challenge is therefore to generate the therapeutic effects of a rural environment within an urban context.



Figure 5 – Gaurang Makhwana – *A painting that contrast rural versus urban ethos and their variances...the progress of technology and deterioration of values...growing material comfort and lessening mental peace...*

Evidence based design

The epidemiologic triangle identifies the three factors that contribute to addiction relapse, proposing that by disrupting at least one side of the triangle, one can stop the continuation of disease. Architecture can be used as a tool to disrupt the epidemiologic triangle at the environmental level in an attempt to positively change high risk environments like the Cape Flats, through a community-based architectural healing intervention.

The idea of modern-day evidence is no longer only associated with technology and medical science, but it has also been recognised through the concept of evidence based design in the field of architecture. This concept explores and records the effects and benefits of well-designed spaces on patients spending long periods of time in healing environments.⁷ For instance the health related effects of a therapeutic environment regarding a patient's pain levels, duration of stay, stress levels, emotions, and even medication intake. In the following sections, this paper will explore some of the research that contribute to the creation of architectural healing environments looking at the effects of light, colour, power of the window, stimulation of the senses and the incorporation of nature as contributing elements.



Figure 6 – Epidemiologic Triangle - A model that scientists have developed for studying health problem (Edited by Author)

⁷ *Ulrich et al, A review of the research literature on evidence-based healthcare design*
Published: Georgia Institute of Technology (2008)

Exploring nature as therapy through architecture

The therapeutic effects of nature

The theory of biophilia suggests that humans have an innate preference to connect with the natural world. This, in combination with experiments undertaken by Ulrich and various other scientists, suggest that the integration of our natural surroundings into our living areas can induce healing and positive emotional changes, which have an indirect impact on stress levels and physical and emotional well-being.⁸

Ulrich suggests four probable reasons for the beneficial effects provided by nature. One, we associate nature with physical activity which evidently stimulates health. Two, socializing is also in most cases directly linked with nature, for example walking or sitting on a bench in a park with a friend. Three, nature provides a temporary escape from our everyday reality. The fourth possibility is that nature itself has a significant influence on the mind. Bearing this in mind, do these social and physical activities alone contribute to healing and well-being or do people gain extra benefits from engaging in these activities in a natural environment?⁹



Figure 7 - Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen - within a natural context

⁸ *Grinde et al, Biophilia: International Journal of Environmental Research and Public Health*
Published: Multidisciplinary Digital Publishing Institute (MDPI) (2009)

⁹ *Ibid*

There are several ways in which nature can contribute to health and well-being. Nature's inherent beauty has the ability to promote stress relief, improve moods and even induce mental restoration.¹⁰

Ulrich revealed the 'power of the window' through a science experiment that confirmed that patients in hospital recovered faster when their rooms had a direct view of the external natural environment rather than a blank wall. A window is not seen merely as a functional necessity that provides light and ventilation, but also a gateway that has the ability to transport a patient from a harsh reality to a place of contemplation, serving as a temporary escape.¹¹

Society has begun to favour nature as a result of our association with nature as a restorative experience, while we associate our everyday urban settings with traffic, frustration, congestion, stress, crime, and pollution, which result in our psychological desire to escape it.¹²



Figure 8 - Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen – the power of the window

¹⁰ **Grinde et al**, *Biophilia: International Journal of Environmental Research and Public Health* Published: Multidisciplinary Digital Publishing Institute (MDPI) (2009)

¹¹ **Ulrich, R. S.** *View through a window may influence recovery from surgery.* Published: American Association for the Advancement of Science (1991)

¹² **Ruga, W** *Designing for the Six Senses.* Published J Health Care Inter Des. (1989).

Ulrich also introduces the concept of 'framing of views', engaging patients with specific elements like a water feature or a tree in the landscape, which allows for a moment of self-awareness, that serves as a distraction from pain and suffering. This concept also generates comfort and relaxation, which allows a patient to heal faster by creating the perception of an environment, where patients view the external world rather than being viewed by others, thereby moving away from the inherent qualities of institutionalisation.¹³

The Groot Klimmendaal Rehabilitation Centre, designed by Koen van Velsen brings together transparency, diversity, continuity, the play of light and shadow, color psychology and the experience of nature into a stimulating revalidation centre.¹⁴

The building maintains a transparent connection with its natural surroundings, blending interior and exterior and maintaining a strong natural presence throughout the building; which allows patients to rejuvenate even while walking. Light wells and atriums are used in combination to bring natural light in and to create visual connections between levels. The interior also includes subtle interplays of color in combination with natural and artificial lighting to enliven the space.¹⁵



Figure 9 - Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen – view framing

¹³ **Ulrich, R. S.** *View through a window may influence recovery from surgery.* Published: American Association for the Advancement of Science (1991)

¹⁴ **Velsen, K.** "Milimetdesign where the convergence of unique creatives" 2011 architecture books and magazines (Accessed 07 May 2014)

¹⁵ *Ibid*

Understanding the **stimulation** of the human **senses**

Our physical surroundings have a direct effect on our emotions and reactions that essentially contribute to the process of healing within a space. Pallasmaa explains how;

“all the senses, including vision, are extensions of the tactile sense; the senses are specializations of skin tissue and all sensory experiences are modes of touching and thus related to tactility. Our contact with the world takes place at the boundary line of the self, through specialized parts of our enveloping membrane”¹⁶

The process of healing is permitted by specific brain molecules formulating our ‘internal perception’, through a combination of signals that enable our senses to perceive our environment. Our emotional reactions to our surrounding unconsciously stimulate our immune systems that essentially improve the process of healing.¹⁷

Our world perception is formulated by nerve chemicals that control our mood balance, while information received through the human senses ultimately formulates an image of our perception of place. Our mood and health is an

¹⁶ Pallasmaa, J. *The Eyes of the Skin*, Published: Academy Press. (2005) page 12

¹⁷ Barbara, et al. *Invisible Architecture: Experiencing Places through the Senses*. Published: Skira Editor Milano (2013)

unconscious result of our perception of place as our environment changes, so does our emotional response to it.¹⁸



Figure 10 – the Moon jellyfish that functions through an autonomous network of senses allowing it to communicate a deep connection with its environment.

¹⁸ Sternberg, E. M. *Healing Spaces: The Science of Place and Well Being*. Published: Belknap Press; 1 edition (2010)

Technically, through the stimulation of certain brain molecules and chemicals with certain spatial quality adjustments we can manipulate the human emotions and change individual moods positively to promote further healing.¹⁹

Our human senses can be perceived as the portal linking our emotions with our perceived reality. Architecture can be described as the tailor of our sensual experience of space, possessing the ability to deprive or stimulate the human senses.

Architectural phenomenological theories regarding spatial experience are mainly concentrated towards the stimulation of all the human senses, in order to ultimately formulate an intensified experience. Architecture can in many cases, be considered as a container of human stimulation through the experience of its environment, by means of the senses, namely touch, sound, smell, sight.²⁰

Pallasmaa also explains how the absence of our human senses, apart from our visual sense, has largely contributed to our impoverished environments and in turn created a sense of dispassion and hostility. He states that:

The very essence of the lived experience is molded by hapticity and peripheral unfocused vision. Focused vision confronts us with the world, whereas peripheral vision envelops us in the flesh of the world.²¹

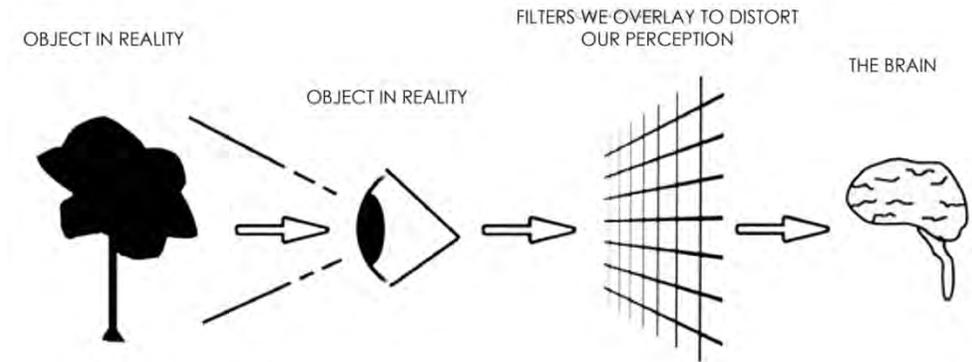


Figure 11 – Diagram indicating the experience of space through the senses

¹⁹ Sternberg, E. M. *Healing Spaces: The Science of Place and Well Being*. Published: Belknap Press; 1 edition (2010)

²⁰ Pallasmaa, J. *The Eyes of the Skin*, Published: Academy Press. (2005)

²¹ Pallasmaa, J. *The Eyes of the Skin*, Published: Academy Press. (2005) page 14

Effects of **Light**, **shadow** and **colour** psychology

Natural light and the sun's rays are recognised as elements capable of promoting healing and thus should form an integral part of the design of buildings constructed specifically for rehabilitation.

Benedetti has proved that patients exposed to an amplified concentration of natural sunlight perceive less stress, require less medication and even experience less pain. Sunlight can also be perceived as a form of psychological motivation in its utilisation in the creation of a healthy, therapeutic environment.²²

The balance or imbalance of a space can so easily be altered through the play of light and always in combination with forms, colours and natural elements. The quality of light can be manipulated and adapted to ultimately create the ability of transcending individuals into an alternate state of consciousness that could essentially be recollected in memory, after its lived experience.²³

²² **Benedetti, et al** *Morning sunlight reduces length of hospitalisations* Published: *J Affect Disord.* (2001)

²³ **Golden, et al.** *The efficacy of light therapy in the treatment of mood disorders* Published: *Am J Psychiatry.* (2005)

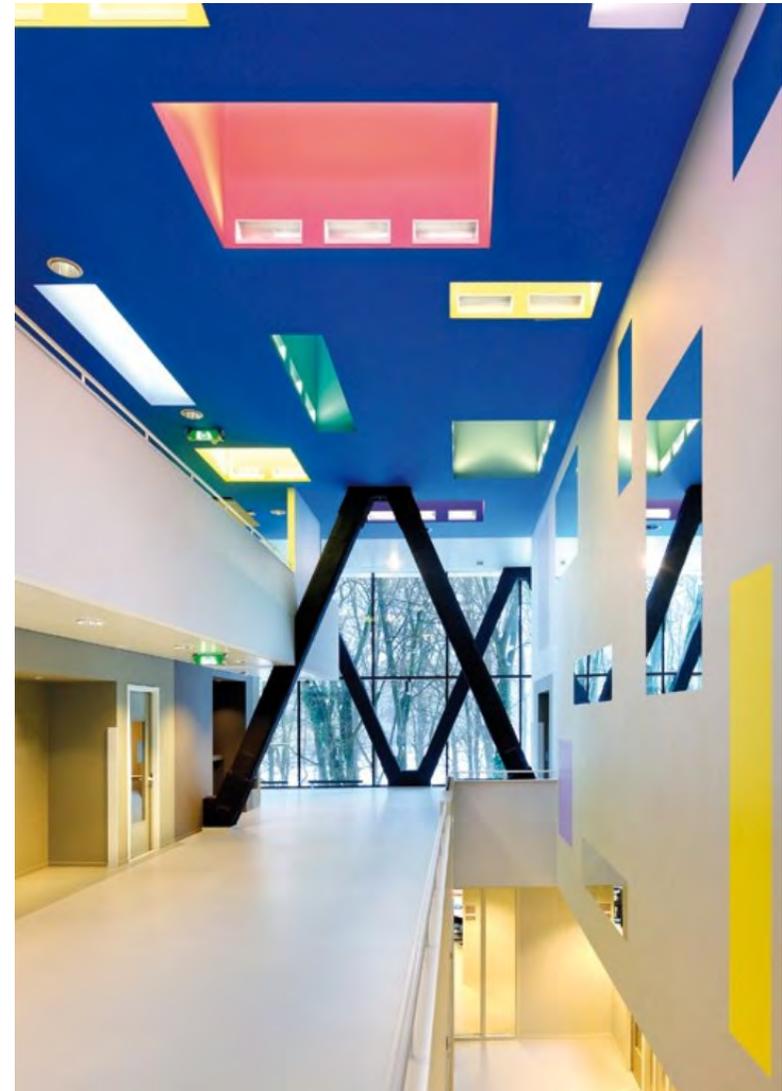


Figure 12 - Rehabilitation Centre Groot Klimmendaal design by Koen van Velsen – passage play of light and color contrast

Architecture now needs to change and adapt its traditional perceptions of institutionalization to create an environment that stimulates all the human senses and deviates from the past stigmatized approaches of institutional design.

We need to integrate rehabilitation into our city's fabrics to be part of society, generating community interaction and promoting a social environment. Therapeutic architecture should not create the notion of long-term absence from real life but should be considered as a home away from home, a road that leads to social inclusion and individual control.

A healing centre located within the heart of a socio-economic depressed community will not just serve as a rehabilitation centre but also as a public psychological retreat from the reality of our everyday urban conditions.

These transitory social spaces should not promote the feeling of exclusion, but rather imitate a society that embraces individuals through an environment that fosters measured community interaction and gradual reintegration.



Figure 14 – Creating a healing oasis within the urban desert of depression (Edited by Author)

How can architecture create a healing environment within a Socio economic depressed community?

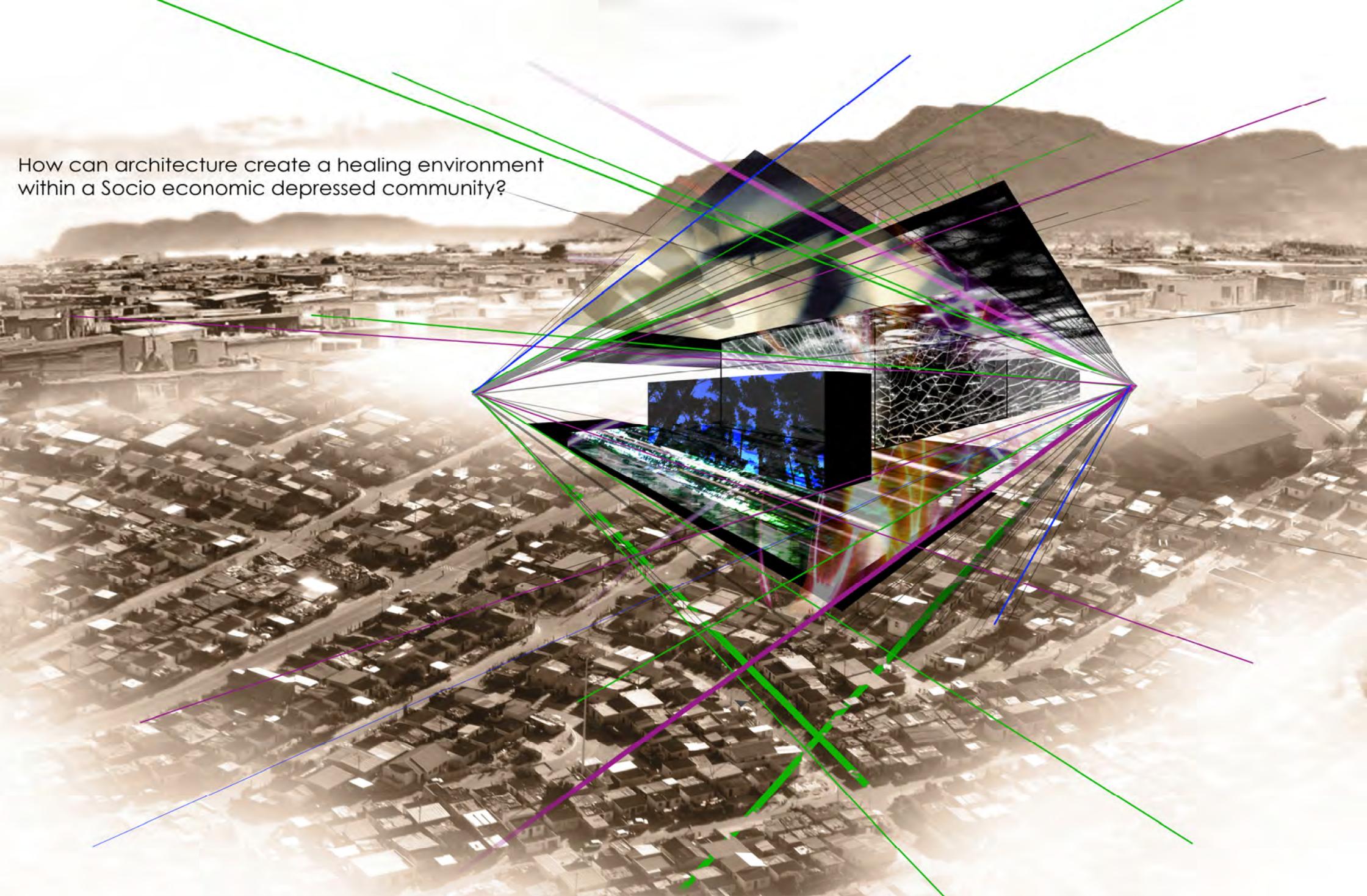


Figure 15 (Author 2014)

In search of site

The existing conditions in the Cape Flats

A recent review regarding the conditions of substance abuse in the Western Cape highlights the increasing intensity of our situation and the overwhelming burdens that are being placed on our health, social welfare and criminal justice systems.²⁶

Before the end of Apartheid in 1994, the state-subsidized addiction treatment services were in a state of chaos, with inadequate funding and an uneven distribution of facilities that were focused mainly in the white, more privileged urban areas. This situation, in combination with the recognition of the healing capacity of nature, has resulted in these facilities being located on the peripheries of socio-economic depressed communities, making them largely inaccessible to all those who require treatment.²⁷

This project will be located in the Cape Flats, Western Cape, a known breeding ground for drugs and crime, contributing to over 70% of all drug use in the country. The intention of this project is to provide a treatment facility among one of these economically vulnerable communities, where services are currently limited.

²⁶ Parry et al. 2002

²⁷ Parry et al, Report on Audit of Substance Abuse Treatment Facilities in Cape Town, Alcohol & Drug Abuse Research Group, Published Medical Research Council. (2002)

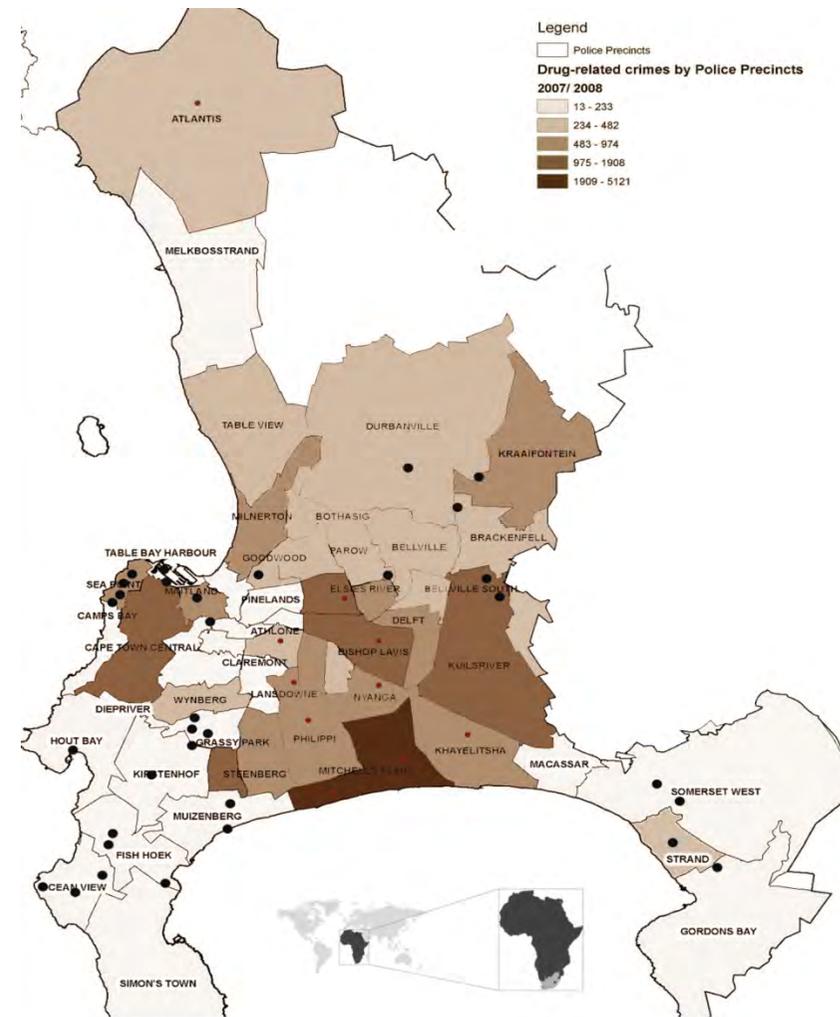


Figure 16 - Map indicating the segregation of rehabilitation facilities to the peripheries of our socio-depressed economic communities. Cape Flats – Western Cape – South Africa (Author 2014)

The conditions of these communities are a direct result of poverty, social change, rapid transformation, high unemployment rates and a radical decay in community, family, and cultural principles. These drug infested communities do not house any form of addiction rehabilitation, apart from out-patient facilities, due to the obvious healing limitations within these urban environments.²⁸

According to the Western Cape Department of Substance Abuse, numerous barriers related to treatment for people from underprivileged communities have been found; specifically physical access, awareness opportunities, affordability and service availability. The exclusion of these facilities from direct community interaction is also limiting the reintegration process and in turn, resulting in more cases of addiction-relapse.²⁹

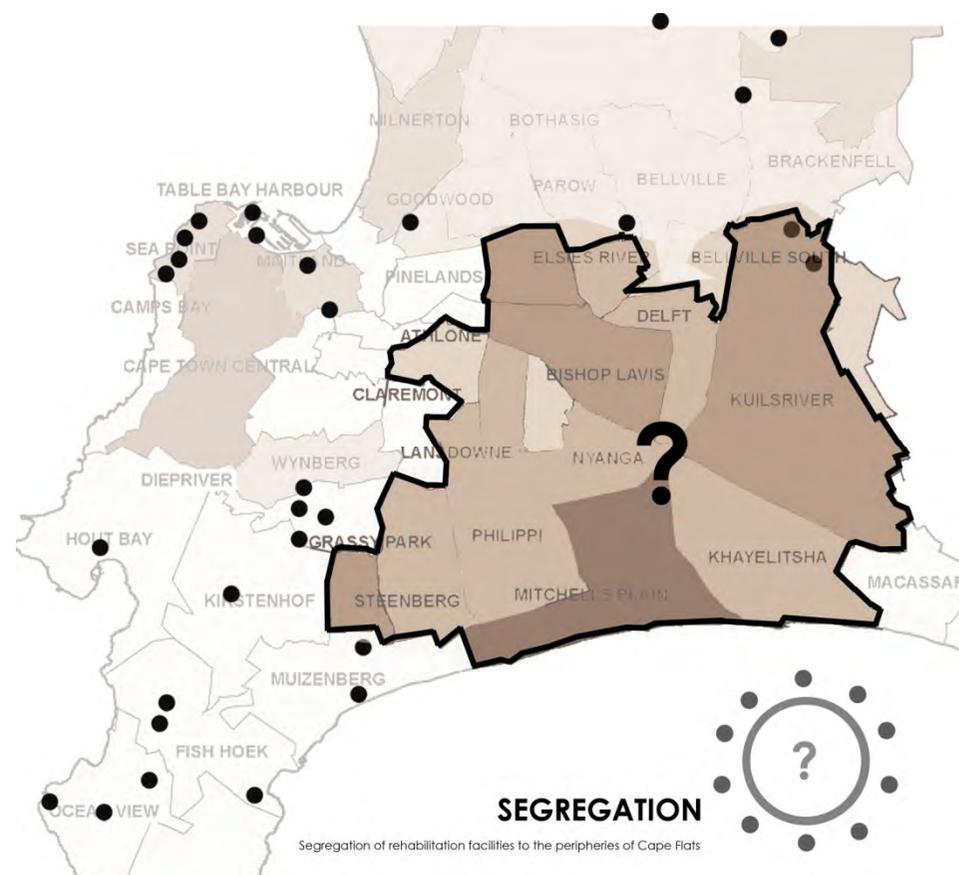


Figure 17 – Diagram indicating the segregation of rehabilitation facilities to the peripheries of our socio-depressed economic communities. Cape Flats – Western Cape – South Africa (Author 2014)

²⁸ Myers et al, Identifying perceived barriers to monitoring service quality among substance abuse treatment providers in South Africa, Published BMC Psychiatry (2014)

²⁹ Myers et al, Identifying perceived barriers to monitoring service quality among substance abuse treatment providers in South Africa, Published BMC Psychiatry (2014)

The need for intervention

The latest calculations regarding the sources and requests of substance abuse in the Western Cape proves that our drug problem is escalating, availability increasing, costs declining and treatment requests for addiction rehabilitation in these communities on the rise.³⁰

There are currently only two government funded rehabilitation facilities in the Western Cape, namely Kensington in Maitland with a capacity of 40 adults and De Novo in Kraaifontein, with a capacity of 80 adults and 20 juveniles. The shortage of these facilities have resulted in a +/- 18 month waiting list. These government funded facilities are also segregated on the outskirts of the Cape Flats, creating further awareness and accessibility limitations for potential patients.³¹

These statistics only further motivates the need for a large scale urban intervention within the cape flats. Therefore the big question follows; how can architecture remedy the aftermath of Apartheid regarding rehabilitation facilities in the Cape Flats and review the existing concept of architectural healing environments. We require an intervention that could intercept this broken system and formulate early youth prevention programmes, that can ultimately

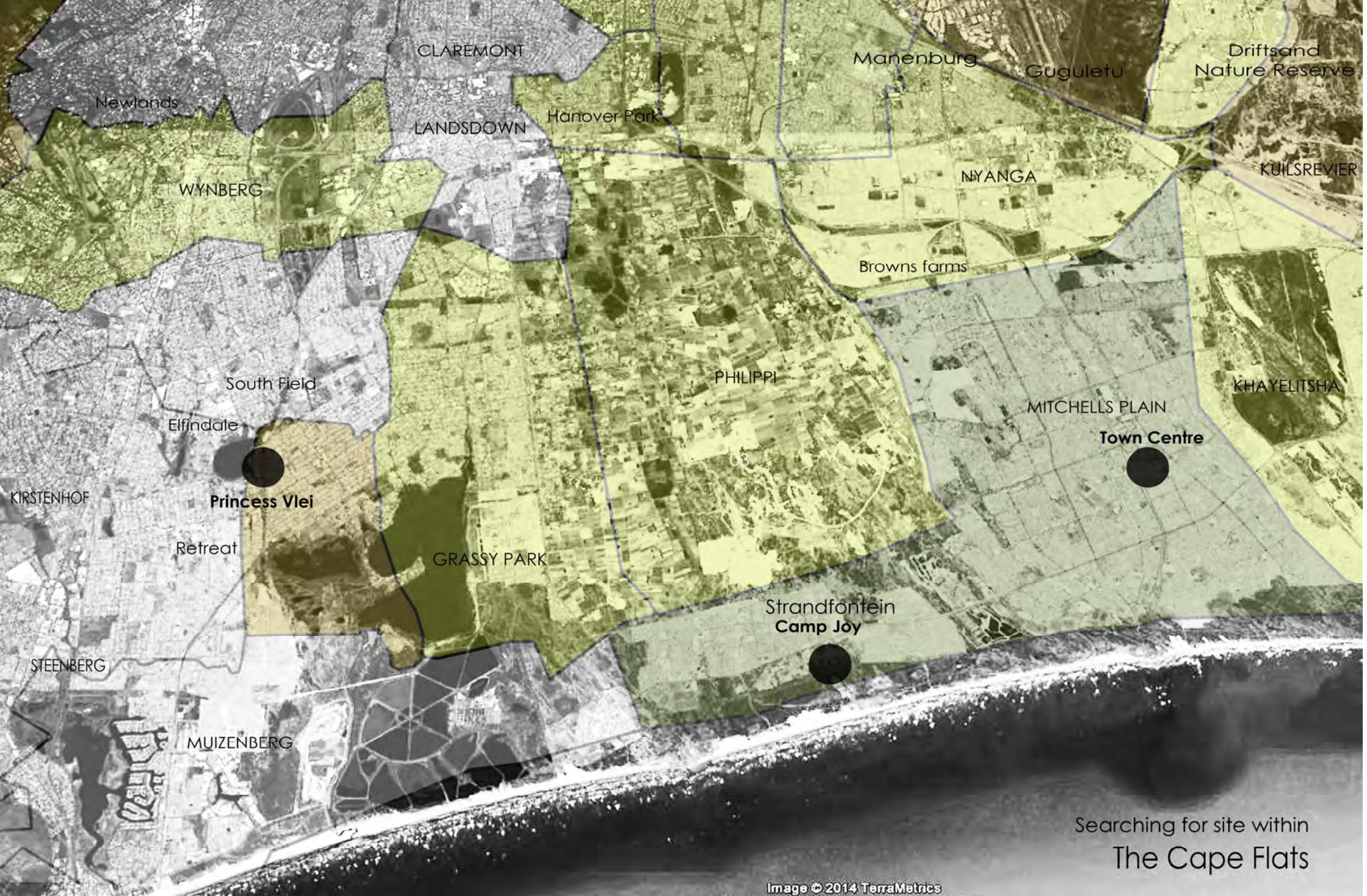
³⁰ *Burnhams Harker, B. Epidemiology of substance abuse in South Africa, Published Alcohol and Drug Abuse Research Unit. (2009)*

³¹ *Myers et al, Identifying perceived barriers to monitoring service quality among substance abuse treatment providers in South Africa, Published BMC Psychiatry (2014)*

intersect the rotational effects of addiction, violence and poverty within these urban communities.



Figure 18 – *The need for an intervention (Edited by Author)*



Searching for site within
The Cape Flats

Image © 2014 TerraMetrics

Figure 19 (Author 2014)

Targeting the core of the problem

After various investigations into relevant research obtained from the Western Cape Department of Substance Abuse, this paper takes the position of introducing an architectural healing intervention in the heart of the Cape Flats, Mitchells Plain. This will ensure a proper investigation into the opportunities and constraints that such a locality change might demand in terms of architecture.³²

An integrated rehabilitation centre could be highly advantageous compared to the segregated facilities around the Cape Flats area. This proposition also alleviates various barriers, specifically physical access, awareness opportunities, affordability and service availability.³³

A central community-based facility would further promote and foster direct community interaction and involvement and in turn, create a degree of community ownership; while creating opportunities for gradual reintegration that would ultimately result in a decrease of addiction relapse in the area.

The following section explores the Mitchells Plain area in search of site.

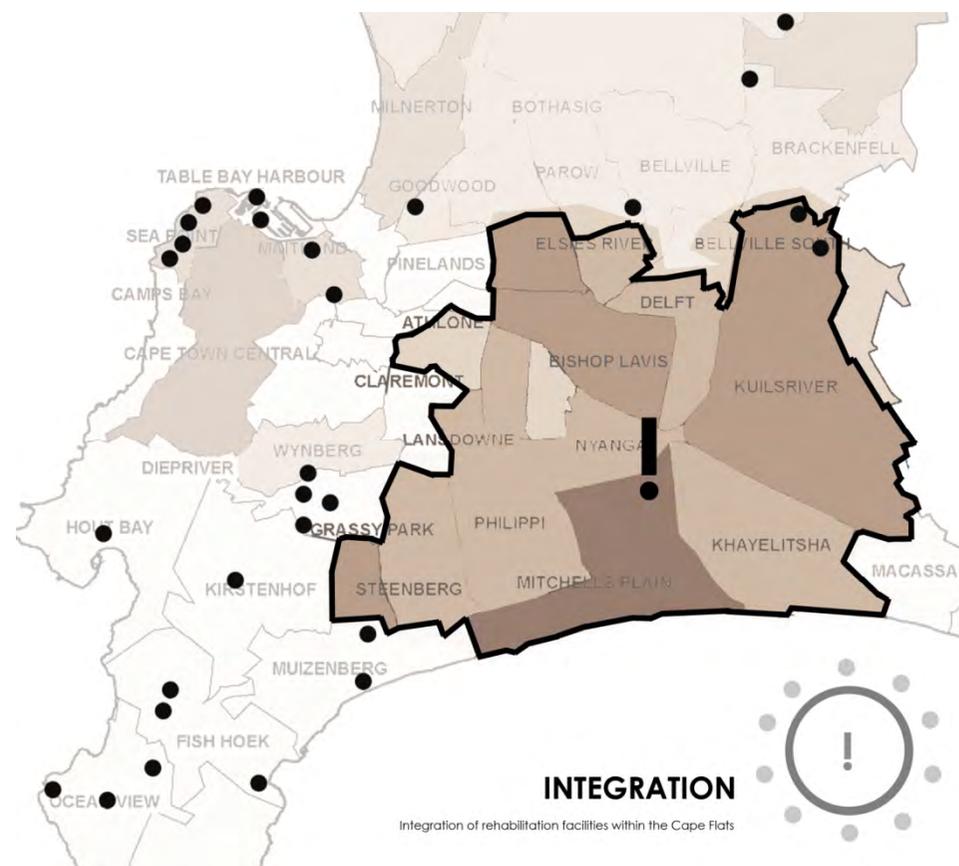


Figure 20 – Diagram proposing the integration of rehabilitation facilities to the centers of our socio-depressed economic communities. Cape Flats – Western Cape – South Africa (Author 2014)

³² Myers et al, Identifying perceived barriers to monitoring service quality among substance abuse treatment providers in South Africa, Published BMC Psychiatry (2014)

³³ Ibid

Accessibility

Mitchells Plain

The highest concentration of the various transportation systems are located within the heart of the Mitchells Plain area, the town centre.

A railway station to the west, a taxi rank to the north and the Mitchells plain main road to the east.



Legend

- Railway Station
- Bus Stop
- Primary Roads
- Secondary Routes
- Perimeter Roads
- Railway
- Activity Streets
- Activity Route

Occupancy

Mitchells Plain

The Occupancy exploration elevates a clustering of community services within the Mitchells Plain town centre, a clinic, school, day hospital, and skill centre.

These facilities within short walking distance from one another create opportunity for shared services within the community.



Legend

- Public Libraries
- Schools
- Community Skill Centre
- Other Community Services
- Out-patient Rehabilitation Unit
- Public Hospital
- Informal Settlements

Biodiversity

Mitchells Plain

The Biodiversity mapping exploration elevates the various green belts working their way into Mitchells Plain from the ocean.

These green lungs provide the potential to tap into nature.



Legend

- Special Public Space
- Public Open Space
- Agriculture
- Natural Water

Mapping Overlay

Mitchells Plain



These mapping explorations together with other mapping exercises attached as appendixes has led to a focus on the Mitchells Plain town centre.

This area provides a high concentration of opportunities in terms of accessibility, shared services, awareness and community interaction which resulted into a deeper investigation.

Legend

- Regional Node
- Distric Node
- Primary Roads
- Secondary Routes
- Perimeter Roads
- ✚ Railway
- Activity Streets
- Activity Route
- Railway Station
- Bus Stop
- Taxi Routes
- Bus Routes
- Main Roads
- ✚ Railway
- 📖 Public Libraries
- 🏫 Schools
- 🏠 Community Skill Centre
- 🏠 Other Community Services
- 🏥 Out-patient Rehabilitation Unit
- 🏥 Public Hospital
- Informal Settlements

Figure 24 (Author 2014)

Site Selection

Mitchells Plain Town Centre



The chosen site is located in the heart of Mitchells Plain bordering the town centre to the North West and the residential area to the South creating an ideal location for **community integration and interface**.

The site is also located along the city of Cape Town's future intensification route on the north and west edges generating the potential to **activate these street edges** and give back to the community.

Legend

- Regional Node
- Distric Node
- Primary Roads
- Secondary Routes
- Perimeter Roads
- ✈ Railway
- ⋯ Activity Streets
- ⊙ Activity Route
- 🚉 Railway Station
- 🚌 Bus Stop
- Taxi Routes
- Bus Routes
- Main Roads
- ✈ Railway
- 📖 Public Libraries
- 🎓 Schools
- 🏠 Community Skill Centre
- 🏠 Other Community Services
- 🏥 Out-patient Rehabilitation Unit
- 🏥 Public Hospital
- 🏠 Informal Settlements

Figure 25(Author 2014)

Site parameters and identification of potential design informants

This programmatic collision formulates interesting scale variations in massing from the town centre towards the more residential area, while also leaving great potential for the **gradual reintegration process**.

Programmatically, the site borders the Court house, day hospital, the community skill centre to the north and west, providing the potential for **shared community services**.

There is also an opportunity to formalise the existing dirt road on the southern residential edge of the site, which is bordered by residential houses that have been renovated as small businesses, together with the potential to create another active south edge condition.

The site is **highly accessible**, with the Mitchells Plain train station and the town centre taxi rank within walking distance, as well as presenting awareness opportunities with the main road passing the site on the east edge.

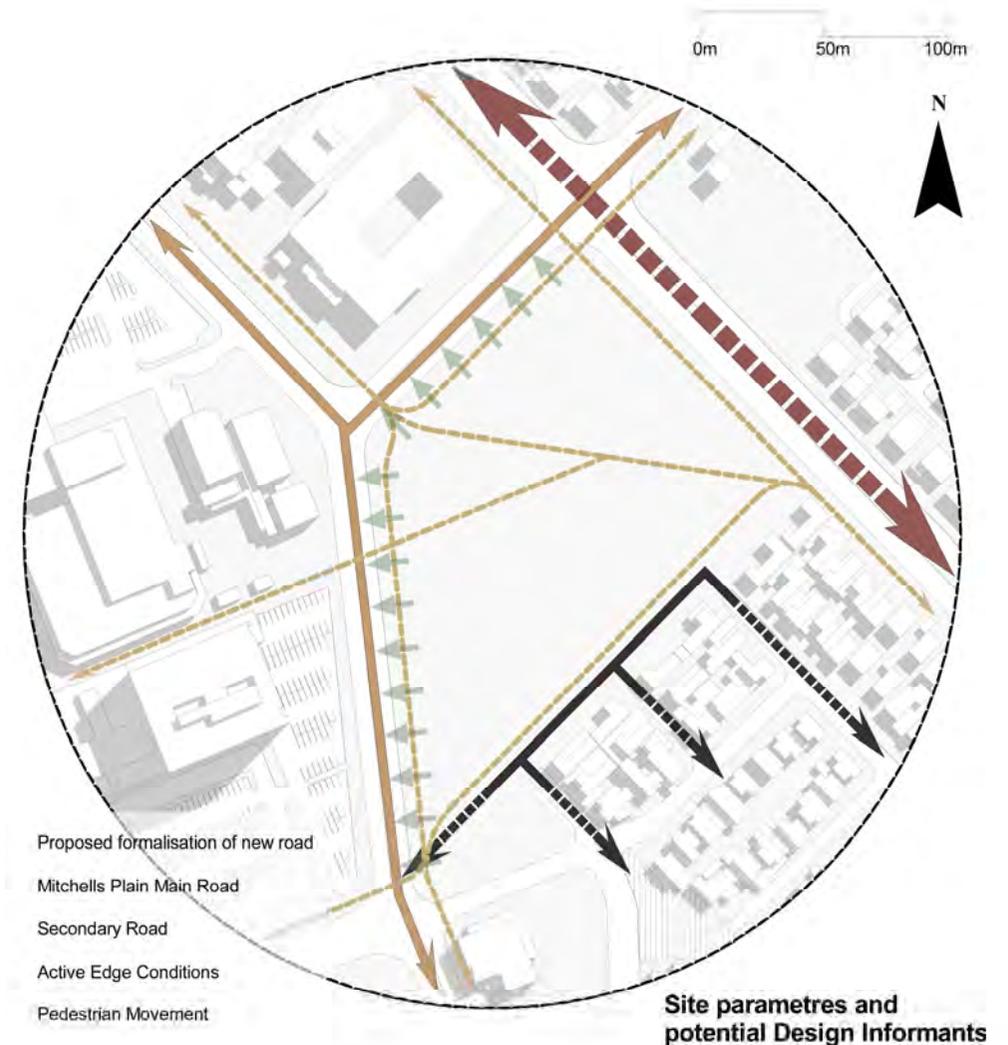


Figure 26 – Site Parameters and potential Design Informants (Author 2014)

Understanding rehabilitation ecology and the gradual transition process

The first stage in the rehabilitation process is **assessment**, where the level of addiction is determined before the patient is **administered** for detoxification process. The second stage is **detoxification**, a separate, private section within the facility where a patient spends +/- 2-4 weeks detoxifying before integration and introduction into the therapeutic community starts.³⁴

After the detoxification process, the third stage requires that the patients are admitted into an in or out-patient facility, according to the level of addiction and the phase of rehabilitation, which is determined in the initial assessment process. The **Out-Patient facility** is a day-to-day treatment programme, once a day for at least 6 weeks, while the **In-Patient facility** is a more gradual rehabilitation process. The **In-Patient facility** is the most crucial of all the stages, consisting of permanent housing for patients for anything from 6 weeks to 6 months after the detoxification process. During this stage the patient is introduced into a therapeutic community and the duration of stay is determined by the emotional state of the patient. The fourth stage is the **Re-integration** process, where patients are placed into 'halfway houses', which allow people to begin the process of reintegration with society, while still providing monitoring and support. The fifth and final stage of rehabilitation is the **Aftercare process** where patients come back for group and individual therapy sessions and also

³⁴ Myers et al, *Monitoring and Evaluation of Substance Abuse Services in South Africa: Implications for Policy and Practice*. Published: Springer Science + Business Media, LLC (2009)

motivational seminars. The facilities that provide these services require large gathering spaces for up to triple the amount of building occupancy at a certain time almost every day. Therefore a number of these spaces will be ideal.³⁵

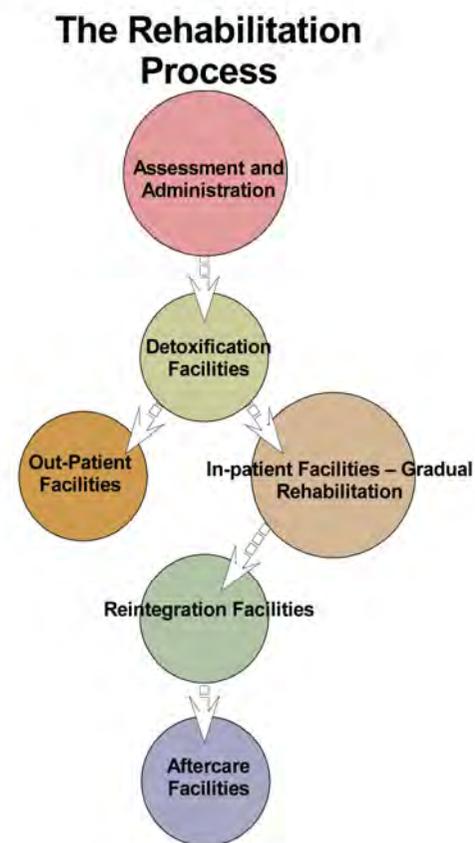


Figure 27 – The rehabilitation Process (Author 2014)

³⁵ Ibid

Rethinking the rehabilitation programme

In the Western Cape, not only our rehabilitation facilities are segregated, but also the phases within them. All of these stages mentioned earlier can be found in various separate facilities, with detoxification happening in day hospitals and clinics, rehabilitation facilities on community outskirts and reintegration facilities or 'halfway houses' spread out within communities. This segregated system only causes further addiction relapse, with the rehabilitation process constantly disrupted by the distance between these facilities.³⁶

We not only need to integrate our rehabilitation facilities into communities but also integrate the phases within them. I propose a facility that houses all of these phases using one design, namely an integrated rehabilitation facility that also serves as a community centre by promoting community interaction, strong family relations and drug awareness programmes.

This community centre will include a sport centre that fosters community interaction and a healthy environment, with a skill centre that allows for economic integration of patients and community back into society and a knowledge centre, aimed at informing people about drug addiction and giving people advice with regards to a healthy lifestyle.

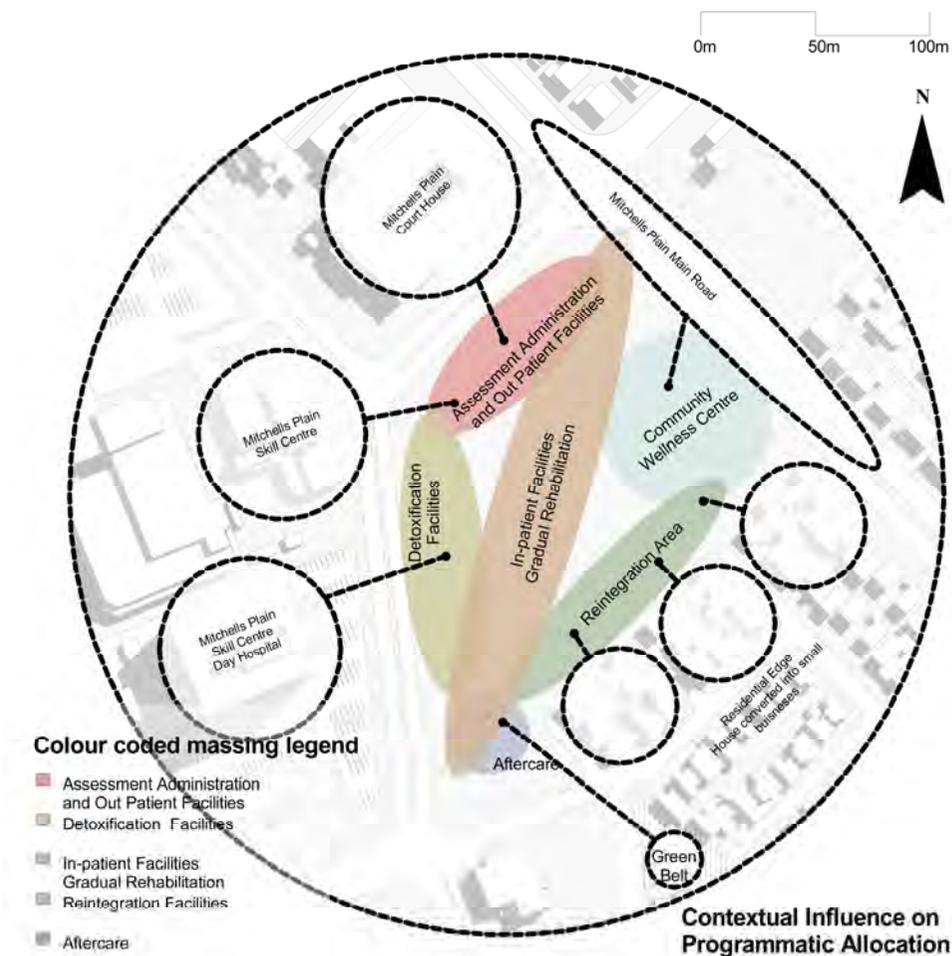


Figure 28 – Contextual Influence on Programmatic Allocation (Author 2014)

³⁶ Myers et al, *Identifying perceived barriers to monitoring service quality among substance abuse treatment providers in South Africa*, Published BMC Psychiatry (2014)

Design explorations and concepts

The gradual transition system

The existing perimeter programmes surrounding the site, together with the concept of the gradual transition process, has influenced and shaped the following programmatic allocation for the proposed design.

The assessment and administration facilities respond to Mitchell's Plain district court house to the north, while the detoxification section responds to the day hospital to the west, generating shared service opportunities. The in-patient rehabilitation spine will be located diagonally through the centre of the site with the other facilities creating a protective perimeter. The reintegration process will take place on the southern edge, which also forms the transition space between the town centre and the residential area. The Community Sport Centre will be located to the east, serving as a noise barrier against the main road.

The conceptual massing uses 10 to 15m wide building strips that step and weave to generate smaller, humanized protected courtyard platforms. These widths also allow for maximum solar gain and natural ventilation opportunities. These strips also step down from the centre of the site to the street, creating a more humanised and de-institutionalised street edge in terms of building scale.

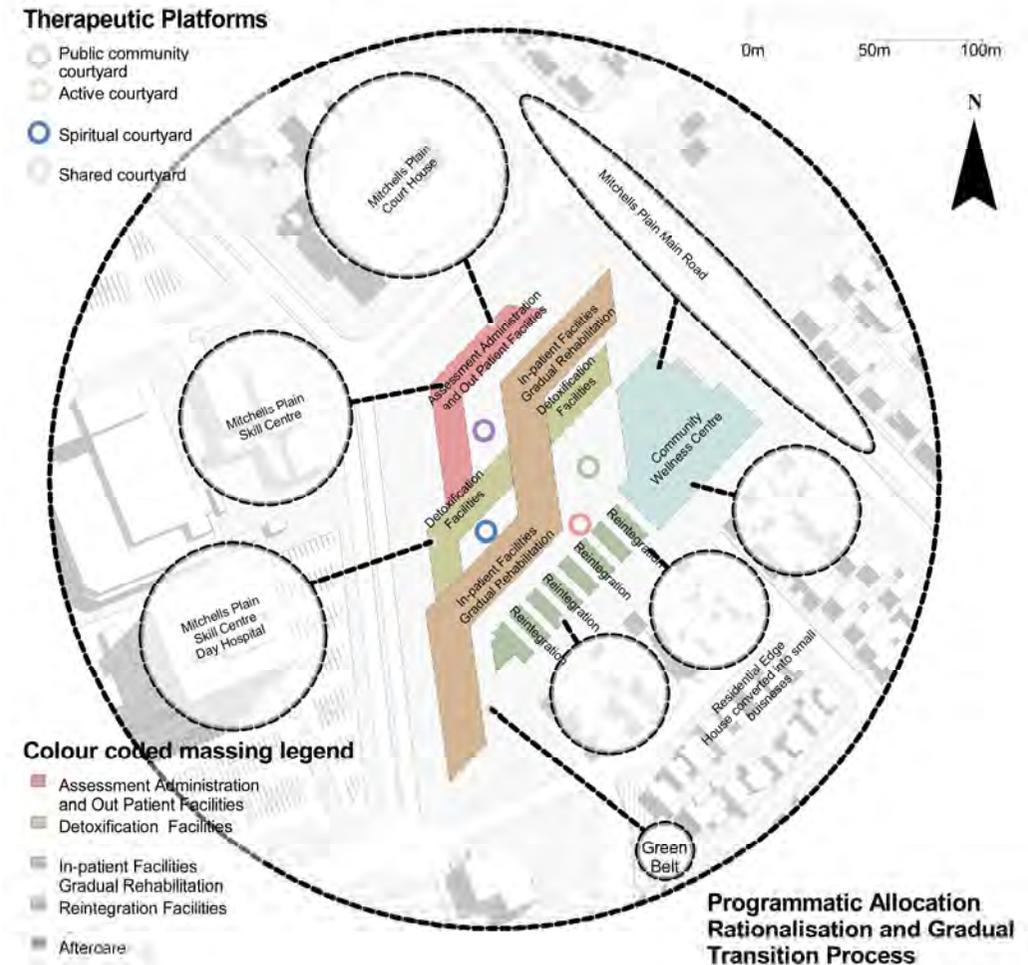


Figure 29 – Programmatic allocation rationalization and gradual transition process (Author 2014)

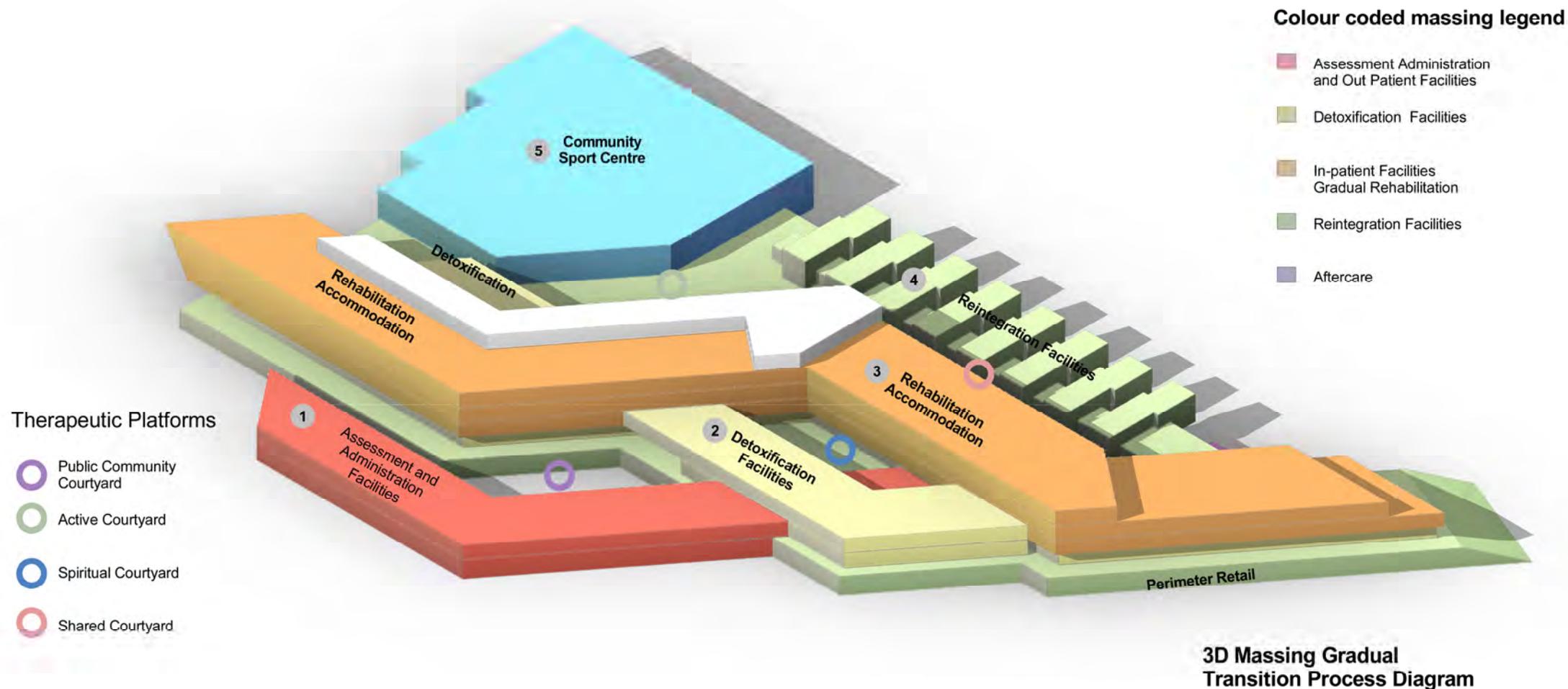


Figure 30 – 3D Massing Gradual Transition Process diagram (Author 2014)

Programmatic stratification and deinstitutionalisation

Simulation of real life concept

I explored both horizontal and vertical programmatic stratification examples before creating **hybrid rehabilitation stratification**; a more integrated conversion of programmes that operates in both planes. In terms of **deinstitutionalizing** the programmatic and hierarchical feel of the facility, I refer to the Worcester Psychiatric Hospital and Recovery Center, completed in 2012 by Ellenzweig Architects, where they programmed the building around the concept of real life simulation.³⁷

The Rehabilitation facility will incorporate familiar elements like the house, neighborhood and downtown to replicate the variety of environments in our everyday lives. As patients progress through these various stages within the facility, a variety of spaces become available. These spaces vary, from their individual rooms, to the house, to the larger neighborhood with its communal spaces and finally to the active downtown area where a unique collection of therapeutic facilities and platforms collide, before re-integration into the larger community proceeds.

³⁷Pitts, A. "Worcester Recovery Center" 2014. *Annelise Marie Byers Pitts* (Accessed 05 April 2014). <http://www.amparc.com/projects/worcester-recovery-center/>

The Simulation of Real Life Concept

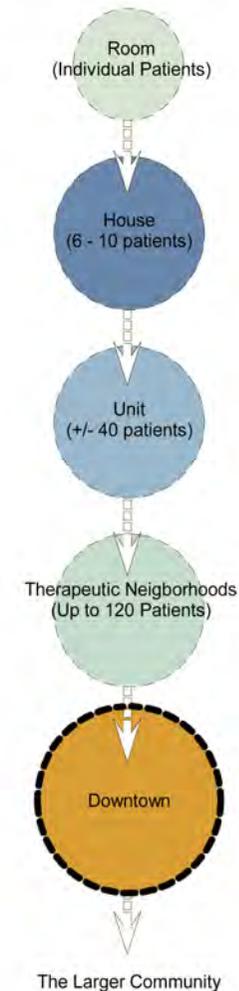


Figure 31 – The simulation of real life concept (Author 2014)

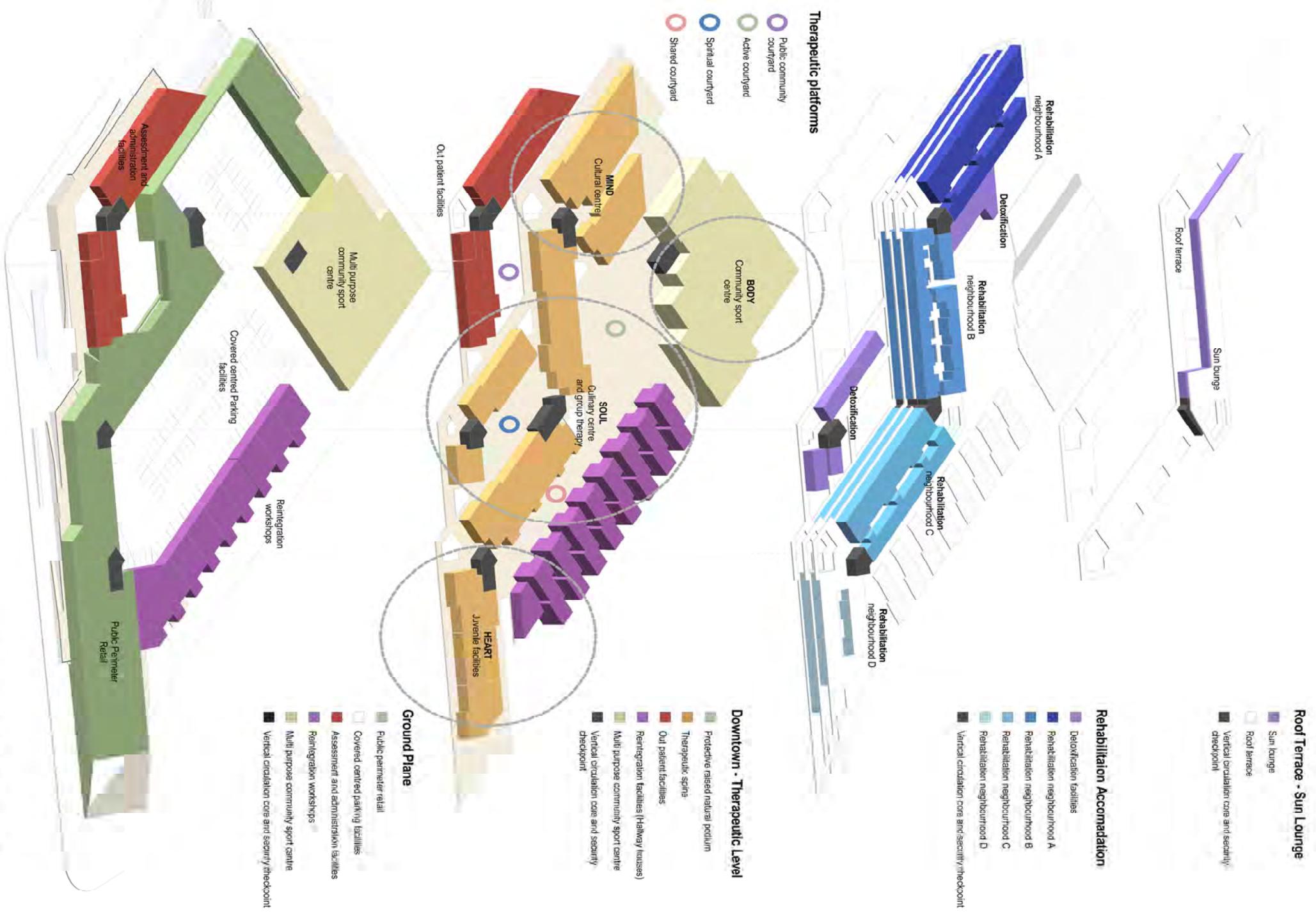


Figure 32 (Author 2014)

A home-like atmosphere is intentionally created with **the house-concept** to generate a familiar environment for retreat and reflection within the facility. Patients are provided with a sense of control over their environment due to the multiplicity of environments available within the facility for interaction with other patients and staff.

A variety of accommodation typologies within the rehabilitation spine will test the patient's abilities to maintain relationships within these various hierarchical conditions of smaller and larger communities. These typologies will range from 1 - 2 bed units to 8 – 10 bed house clusters that form neighborhoods, allowing for social groupings to be more diverse. These neighborhoods are connected to vertical circulation cores that form the transitional spaces between the quiet house typologies and the active downtown area.



Figure 33 – Vertical programmatic section (Author 2014)

Typical Accommodation level
- Therapeutic Community

1. Rehabilitation Vertical Circulation Core
2. Nursing Station
3. Atrium Space
4. Detoxification Vertical Circulation Core
5. Detoxification garden terrace
6. Secondary Vertical Circulation Fire escape
7. Fire Escape
8. Phase 2 - 1 and 2 bedroom accommodation neighbourhood clusters
9. Neighbourhood mother accommodation
10. Living/ TV room
11. Dining room / kitchen and communal Balcony
12. 8 bed room house clusters
13. 5 bedroom juvenile accommodation
14. 3 bedroom detoxification units
15. Staff detoxification facilities
16. Step back for single loaded corridor
17. Reintegration unit's accommodation level
18. Therapeutic courtyards flanking various Accommodations

Rehabilitation Accommodation Phases
Therapeutic Community

- Phase 1 - Detoxification
 Phase 2 - 2 x 3-4 bed Housing units forming neighbourhood
 Phase 3 - 1-2 bed units forming neighbourhoods with shared facilities (kitchen/dinning/living)
 Phase 4 - Reintegration (10 - 12 bed Halfway house units)

Therapeutic platforms

- Public community courtyard
- Active courtyard
- Spiritual courtyard
- Shared courtyard

- Primary Vertical Circulation Cores
- Secondary Vertical Circulation Cores

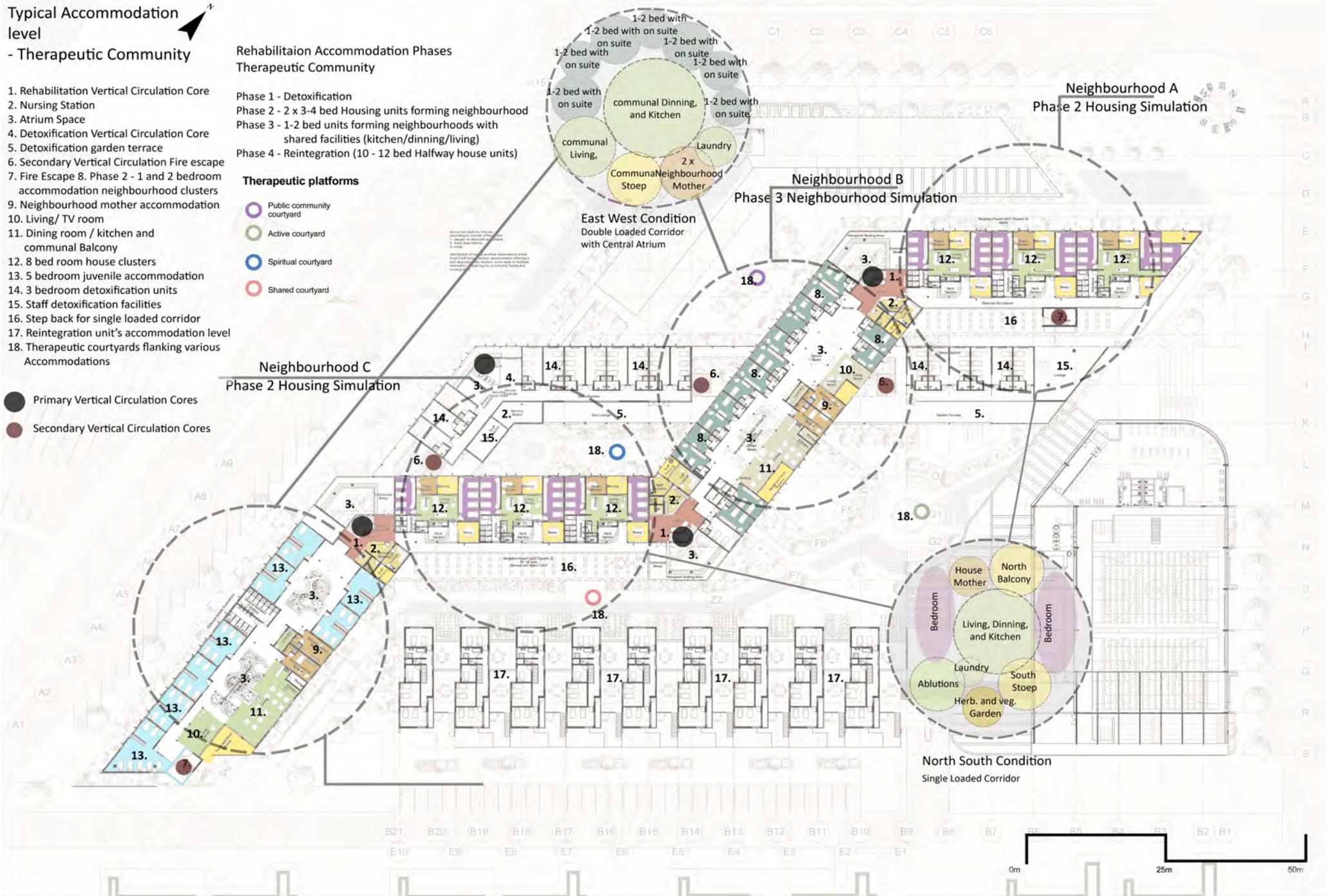


Figure 34 (Author 2014)

The downtown area will house the various facilities, including a salon, general store, restaurant, bank, library, wellness center, community skill center, individual and group therapy facilities, music, art, and dance studio's, to further the concept of real life simulation. These facilities are shared by the entire center and many are to be shared with the wider Mitchells Plain community.

The downtown area is arranged along a central weaving spine, working on the various levels of therapy namely the mind, soul, heart and body. These facilities spill into four therapeutic platforms, each working on a different therapeutic level. The spine will resemble the city street with a central circulation system that is programmed with various public spaces. The central therapeutic spine is protected by other more integrated facilities, including the reintegration facility 'halfway houses' to the south, the outpatient facility to the north and the multipurpose community sport centre to the east.

The ground plane consists of a centralised parking system for visitors and staff, with access to the various facilities above. The parking is framed by perimeter retail to the north and west, active pedestrian edges with the reintegration workshops towards the residential south edge, formalising the existing, active dirt road. The Assessment and administration facilities respond to the northern street edge, opposite the Mitchells Plain District court house.

**First Floor Plan
- Downtown Concept**



**Gradual Community Interaction
and shared service accessibility control**

1. Staff access point from ground plane
2. Vertical Circulation Core to Accommodation levels
3. Public platform to shared facilities
4. Main Active Courtyard
5. Access point from rehab to Sport centre
6. Community skill centre
7. Multi-purpose sport centre
8. Dual reception for rehab and public Access control
9. Gymnasium
10. Controlled Public access point to active courtyard
11. Controlled Public access point to sport centre and Gymnasium
12. Controlled Public access point to library
13. Library access point
14. Rehabilitation entertainment area
15. Connecting bridge between admin and therapeutic platform
16. Access point to Communal Cafeteria
17. Access to Group Therapy Zones
18. Agricultural Zones 19. Juvenile Facilities
20. Controlled access point to green belt
21. Perimeter planter as urban filter
22. Main Circulation route
23. Individual therapy
24. Spiritual room
25. Spiritual Courtyard
26. Access to Detoxification
27. Ground floor Public Courtyard
28. Family support zones
29. Administration
30. Access point from ground floor to Administration and family support
31. Administration terrace

1. Controlled Public platform to shared facilities at therapeutic level
2. Redline indicates the primary public barrier when all facilities are closed
3. Blue line indicates the secondary barrier when all facilities are open to the public
4. Purple line indicates the final barrier when all facilities and the main active courtyard is open to the public
5. Primary Vertical Circulation Cores
6. Secondary Vertical Circulation Cores

Administration
Main reception below
Access Control
Admin to rehab bridge access
Family support zones
Staff Access point from Parking

Juvenile Facilities
Class rooms
Snack kitchen
Entertainment area
Kids zone
Secure external play area

Bank
Salon
Music/ art
Exercise
Gymnasium
Multi-purpose sport centre
Skill development centre
General store 4.
Game room an entertainment
Library
Individual therapy
Group therapy
Spiritual room
Seminar rooms
Amphitheatre

Mind
Public Library

Body
Multi-purpose
sport centre
and Skill centre

Soul
Individual and Group
Therapy

Heart
Juvenile Facilities

Therapeutic platforms

- Public community courtyard
- Active courtyard
- Spiritual courtyard
- Shared courtyard

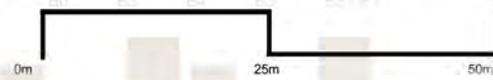


Figure 35 (Author 2014)

Nature as therapy through architecture

This project drew inspiration from the Paimio Sanatorium by Alvar Alto in the formulation of a new hybrid compilation of concepts, that utilises nature as therapy through architecture.³⁸

The parking and perimeter retail on ground level creates a natural raised protective therapeutic podium for the first floor level. This level change creates a safe and secure environment where healing can take place on various levels. This therapeutic platform is further secured with a perimeter planter, serving as an urban filter, a naturally blurred-line that defuses the harsh urban environment and conceptually separates the facility and the patients from its urban context.

The raised platform consists of 4 main therapeutic courtyards; namely the spiritual, public, active and shared courtyard and each are flanked by relevant programmes that activate them. These courtyard spaces are further broken down into smaller, more humanised spaces that consist of rose gardens, fruit tree orchards, herb and vegetable gardens, an amphitheatre, group and individual seating areas and more.

³⁸ **Anderson, D.** "Humanizing the hospital: Design lessons from a Finnish sanatorium" 10 August 2010. CMAJ (Accessed 03 April 2014.)

From a sustainability aspect, the design drew inspiration from Via Verde in the Bronx, using a Rainwater collection system in combination with retention ponds for extensive landscaping irrigation, to create a self-sufficient environment, sustained and maintained by its own occupants.³⁹

³⁹ **Sundberg, D.** "Via Verde – Via Verde / Dattner Architects + Grimshaw Architects" 2012. Arch Daily (Accessed 03 April 2014)

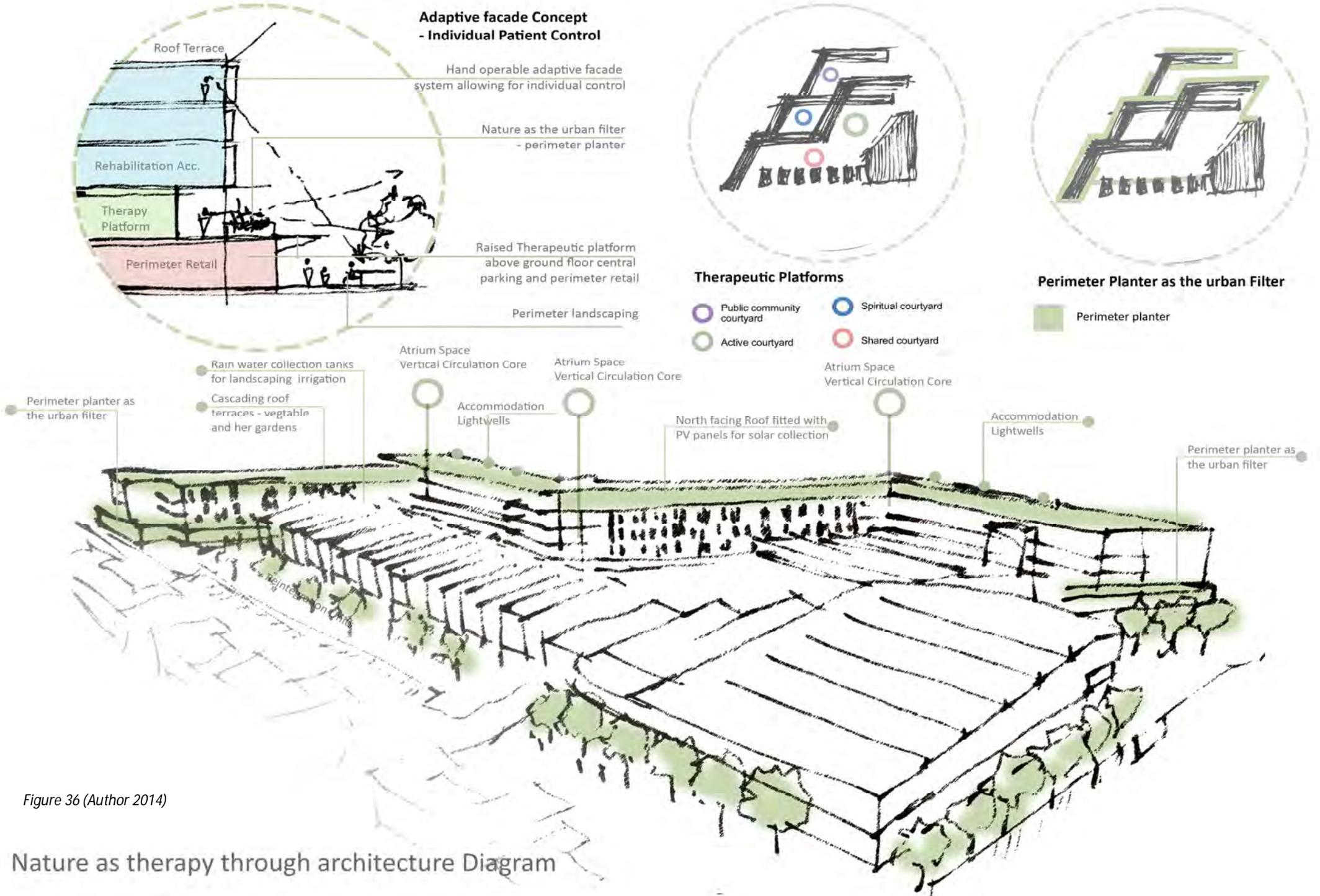


Figure 36 (Author 2014)

Nature as therapy through architecture Diagram

Community integration

A facility that brings 24 hour life to the site, with perimeter retail that activates the various street edges. This is then equipped with an adaptive fortification façade system that opens and closes with its environmental condition. This jack-knife door system, when open during the day, creates a continuous pedestrian canopy along the commercial edge to the north-west and closes down during the night, creating a fortified perimeter for the facility.

The facility will serve as a temporary retreat from the busy urban context, not just for the patients but also for the community. An integrated facility that gives back to its community; through shared facilities like the multi-purpose sport centre, skill centre, library, seminar rooms, gymnasium and the main active courtyard and amphitheatre area.

Further community integration is achieved through the deinstitutionalisation of the building; with a highly localised homogenous, adaptive facade-system that creates an interactive visual relationship between the patients and the surrounding community. An ever-changing mood-skin that in a way represents the mood of the building to the public, while opening and closing with each individual patient's needs and desires.

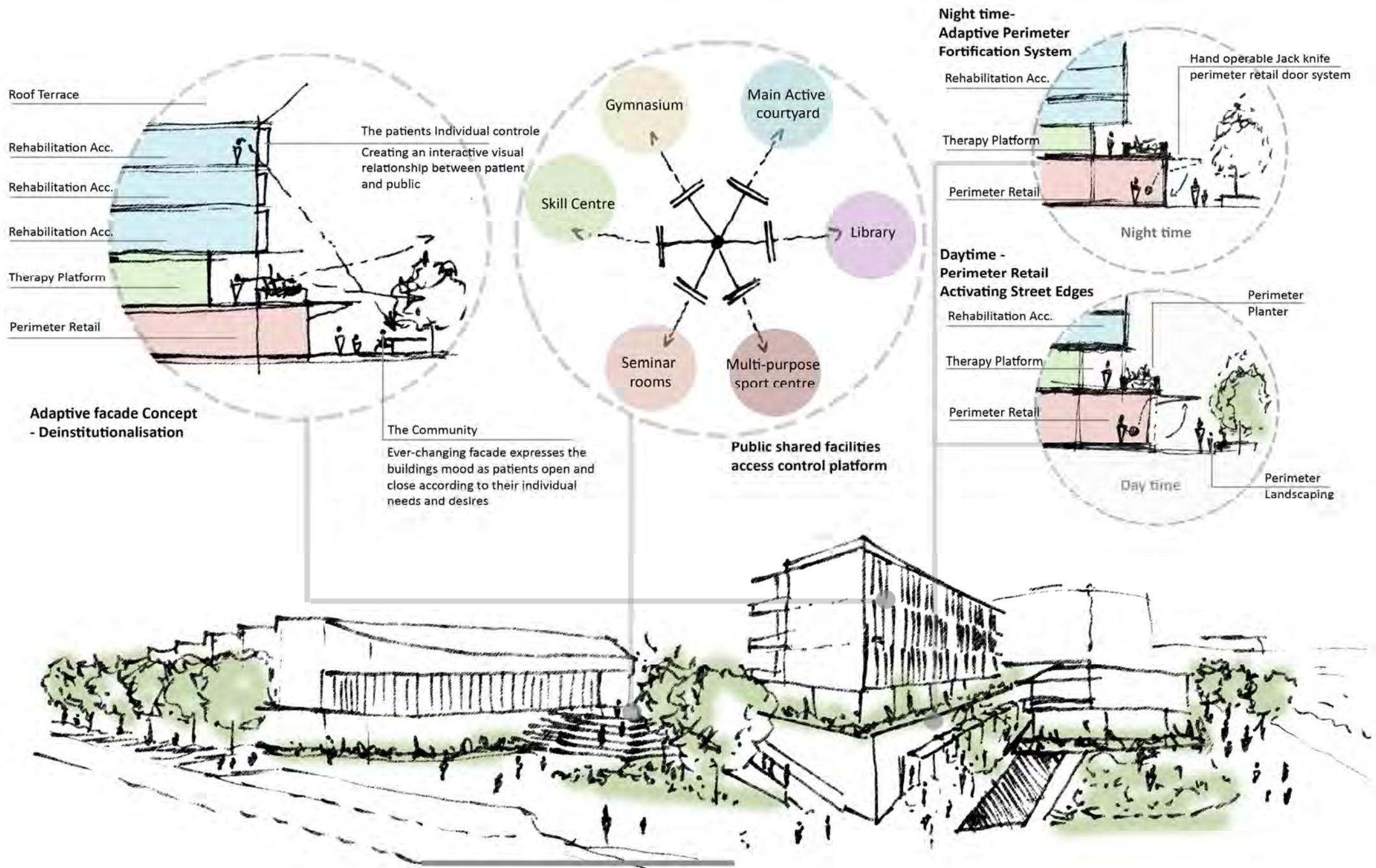


Figure 37 (Author 2014)

Community Integration Diagram

Circulation, accessibility and security

The shared facilities are accessible by the public from the raised public access control platform, a platform that links the ground plane with the therapeutic platform, allowing the facility to mediate between public and patient use of individual facilities throughout the day. This control point can completely close off the facility from the public open up individual facilities to the public, while others are being used by the patients. This could also completely open up the facility to the community during special occasions, like family support day or graduation ceremonies.

There are only 2 access control points for the staff onto the therapeutic level, either from the ground floor parking area, or from the administration building. From the therapeutic platform level, the building's joints open up in the form of 2 to 5 story light-wells that house the main vertical circulation cores, allowing an abundance of natural light and ventilation. These elements, combined with the use of colour, helps patients with the internal circulation in terms of orientation and direction. The buildings circulation routes are further enhanced with a hierarchy of staff-to-patient and patient-to-patient interaction and socialisation zones.

These vertical cores house the primary access control points at the therapeutic level, controlling circulation into the accommodation neighbourhoods, with the secondary control points being nursing stations on every other level within these vertical cores. Each neighbourhood or house cluster also has at least one house mother, situated in a relatively central position as a third control point in terms of visual security.

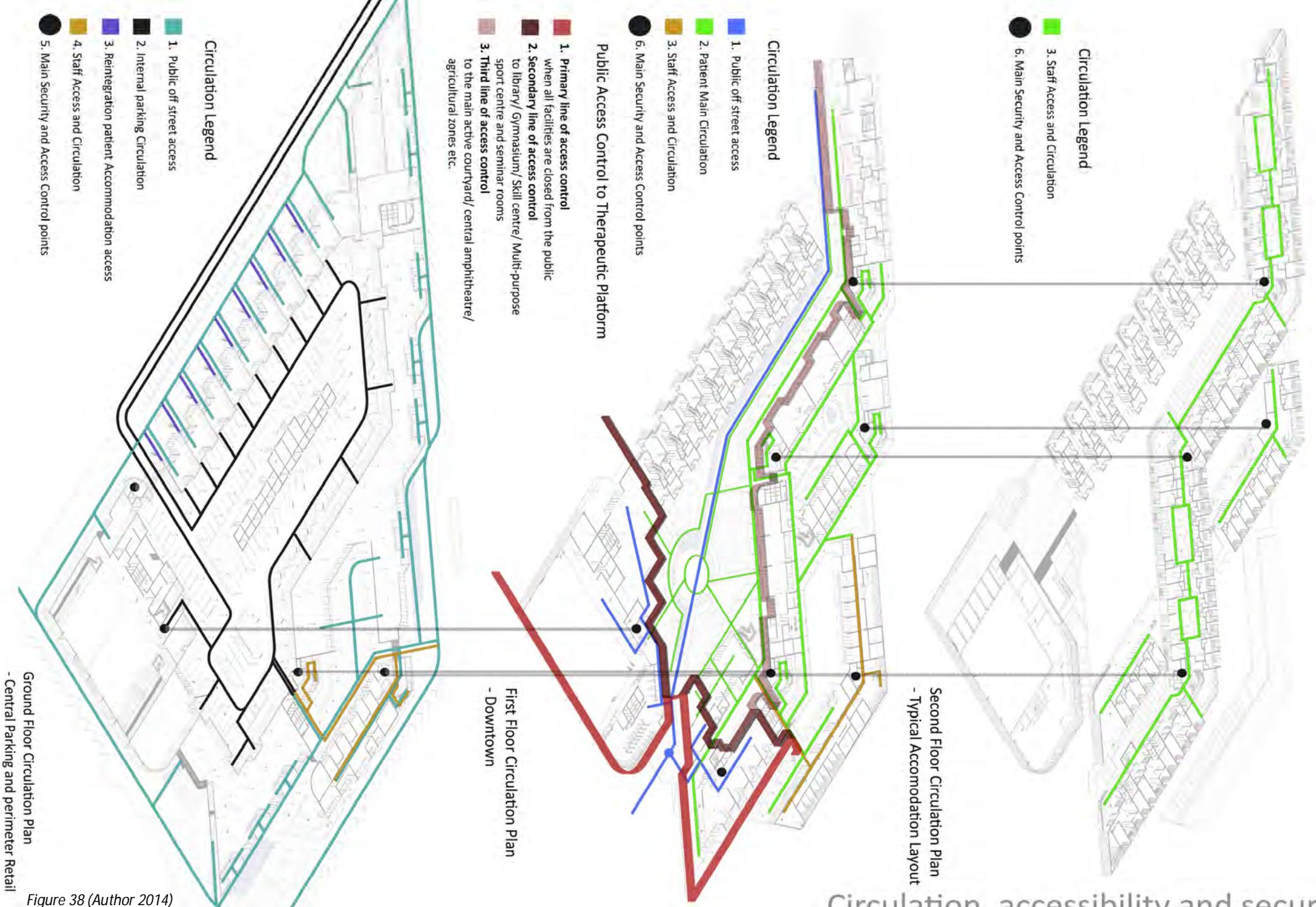


Figure 38 (Author 2014)

Technical resolution of the building skin

For the technical development process, I will be focusing on various adaptive façade technologies and strategies, to ultimately formulate a new hybrid system, that could assist with the integration of a rehabilitation centre into Mitchells Plain town centre.

This adaptive façade would promote both internal and external environmental rejuvenation, particularly in relation to the reformation of drug addiction. An adaptive building skin, inspired by the Jellyfish and the autonomous network of senses.

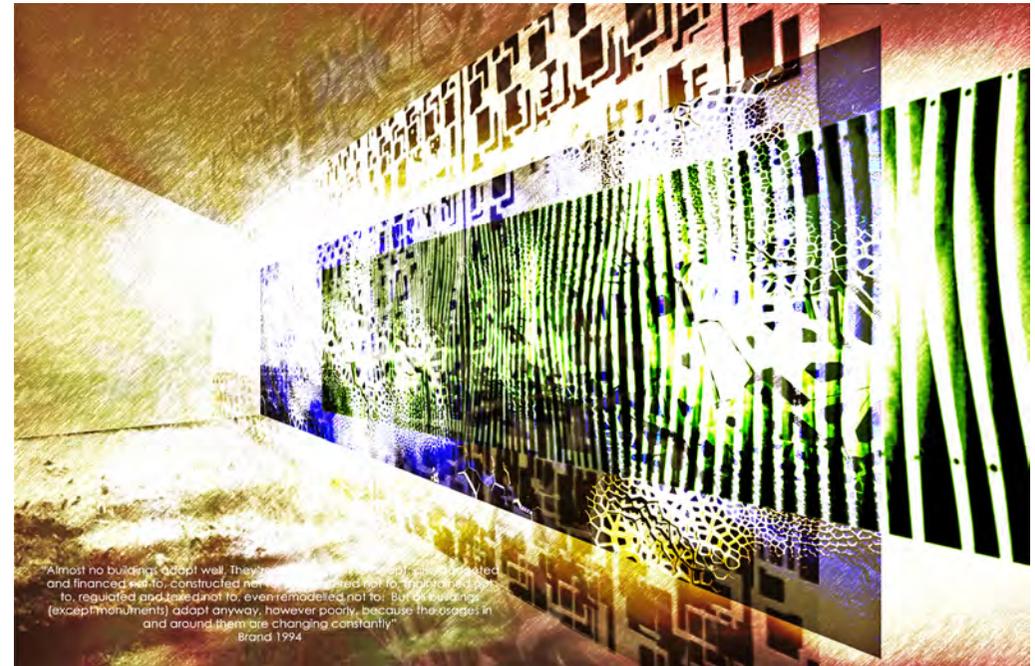


Figure 39 – Technical resolution - Adaptive façade systems (Author 2014)

The role of architectural technology in therapy

Historically a structures façade was characterized through its unique window formation in relation to certain axes and features from its specific time. A buildings floor plan and the allocation of room functions ultimately resulted in the unique formation of certain window sizes and their distribution.⁴⁰

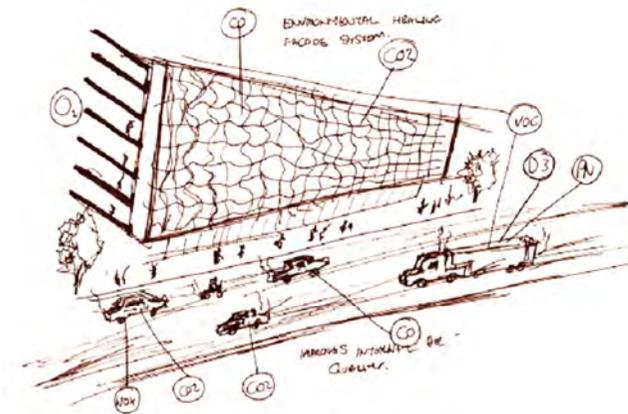
Most of these hierarchies have been abandoned after the introduction of modern window strips and full height glazing systems, this being a prevailing element of a more democratic, modern architecture that puts human comfort before visual aesthetics. This notion results in our endless explorations into more dynamic façade systems that can adapt to its external conditions and individual desires, allowing a complete controlled transparency.⁴¹

In many cases, a buildings functionality and internal environment is a direct result of its envelope. Modern façade systems have gone far beyond just serving as elegant embellishments, as it plays a vital role in a buildings energy performance and internal comfort.⁴² These systems have the ability to mediate between the various internal environmental conditions, required through interaction and adaptation, tailoring to individual patient needs to optimize internal comfort-levels. This relates directly to the relevance of adaptive façade systems, with in-patient rehabilitation facilities and other healing environments.

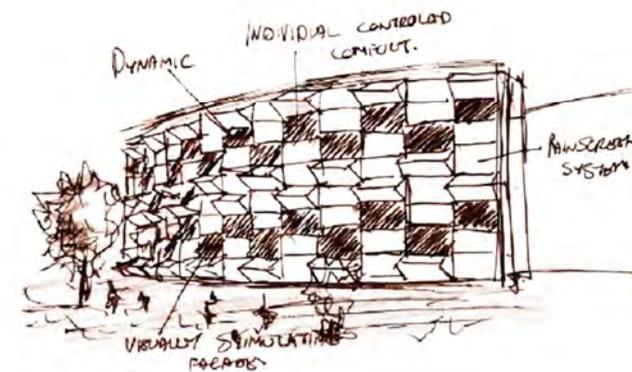
⁴⁰ Baumann, S. "Dynamic facade (Kiefer technic showroom)" 09 March 2009. Architonic Architecture and design (Accessed 04 May 2014)

⁴¹ ibid

⁴² Farquhar, D. *The Role of the Building Façade, Curtain Walls Building Enclosure Technology & Environment Council, Published McFarquhaer Group, Inc. (2012)*



The environmental healing façade
Manuel Gea Gonzalez Hospital Elegant Embellishments



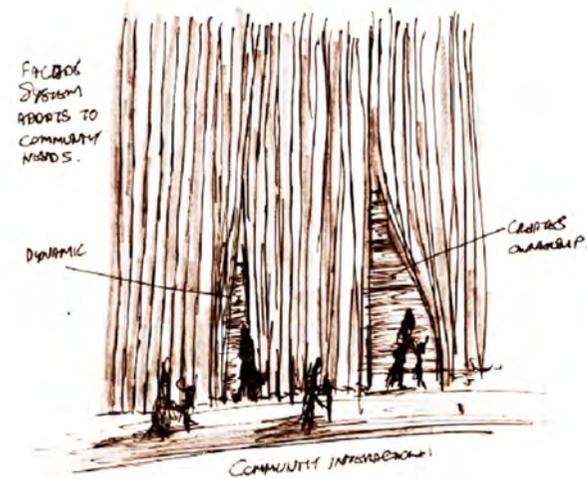
The dynamic façade
Kiefer Technic showroom Ernst Giselaerent

Figure 40 –The various façade technologies explored in this paper 1 (Author 2014)

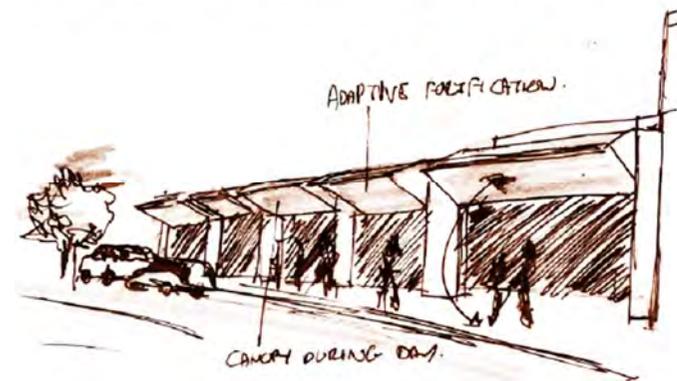
A facade system designed for a healing environment should optimize internal light quality, reduce glare, frame views of natural surroundings, protect occupants against exposure to unwanted elements and provide individual patient comfort, while allowing for community interaction and ultimate providing internal and external stimulation and rejuvenation.

Large quantities of electricity is required to operate these continuously evolving façades, compared to a standard air-conditioning systems. In relation to sustainability and long term energy saving, mechanically operated façade systems could be questioned as the way forward, especially within economically vulnerable communities with limited funding capabilities. From the total building budget point of view, the façade system can cost between fifteen and forty percent, with the lifelong maintenance of such a façade costing between five to ten times the initial installation costs.⁴³

Therefore, when considering long term durability, the numbers suggests a more robust solution. Sensibly designed façade systems do not denote to additional costs with installation, however the life time running cost and energy savings of such a building can be reduced to roughly thirty percent, when compared to other conventional alternatives.⁴⁴



The low-tech high-tech façade
Individual Twist - Nebuta Museum and Cultural Centre in Aomori



The adaptive fortification façade
Brooklyn Bushwick Shopping Centre - Andre Kikaski

⁴³ Farquhar, D. *The Role of the Building Façade, Curtain Walls Building Enclosure Technology & Environment Council, Published McFarquhaer Group, Inc. (2012)*

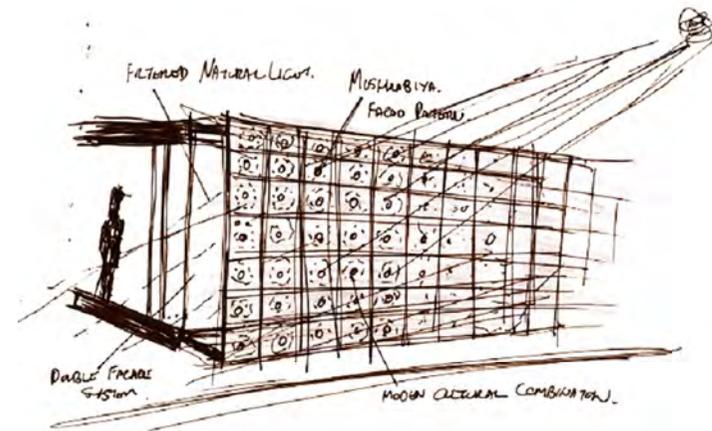
⁴⁴ *ibid*

Figure 41 – The various façade technologies explored in this paper 2 (Author 2014)

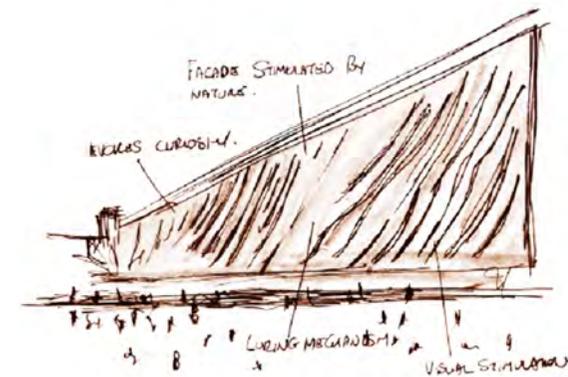
In search for the ultimate balanced adaption combination for community rejuvenation and fortification, I have explored various unique architectural façade concepts through a case study based exploration to spark some ideas for the ultimate hybrid façade. I have explored the following façade technologies: the environmental healing façade, the cultural façade, the dynamic façade, the kinetic alluring façade, the low-tech high-tech façade and the adaptive fortification façade.

After analysing these various façade technologies, it is clear that our modern mobile façade systems are both stimulating and impressive but in various instances, the long term durability of these intricate systems do not sustain its technological beauty. Architectural façades requires long-term solutions, especially within the conditions described in this paper.

I propose a low-tech, high-tech approach, consisting of a more robust, monolithic hand-operated technological façade system. A hybrid system that captures some of the abovementioned concepts for a more integrated healing centre, that formulates a balance between transparency and fortification. After all, some of the world's most inspiring architectural works did not even require electricity.



The cultural façade
Arab World Institut du Monde Arabe Jean Nouvel



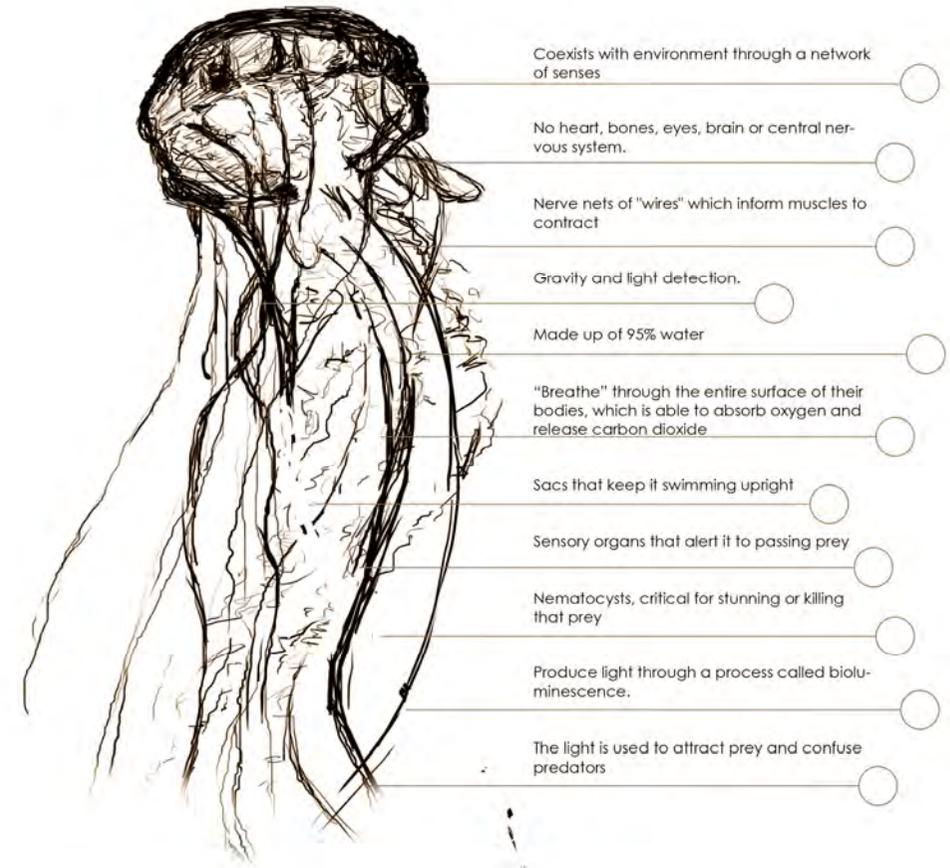
The kinetic luring façade
Brisbane Domestic Terminal Kinetic Façade Ned Kahn

Figure 42 –The various façade technologies explored in this paper 3 (Author 2014)

The adaptive façade concept

Going back to the moon jellyfish, which triggered the project's initial inspiration, the 'hydras' jellyfish has the most basic type of nervous system, known as the "nerve net". It has no distinct central nervous system or anything that resembles a brain. As a substitute, the jellyfish functions on a scattered, loose network of nerve-cell layers on the body wall. Some of these neurons distribute data from sensory organs that sense light, touch, or other variations within its immediate environment. These neurons then communicate to the neurons that regulate movement, like the muscles that allow movement.⁴⁵

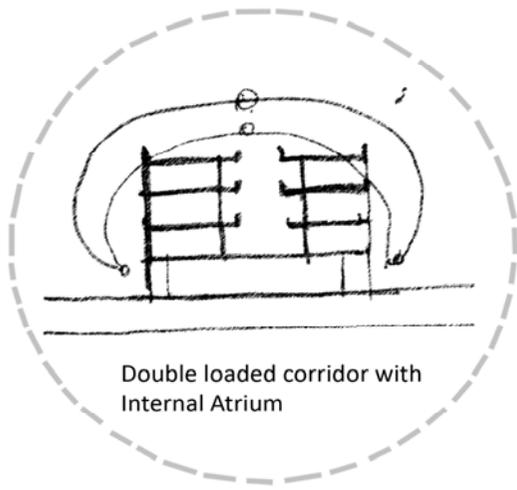
The jellyfish basically function on an independent network of senses, allowing it to adapt each part of the skin independently, according to individual nerve needs. How can architecture mimic this concept and what is architecture's autonomous network of senses? How can we create a building's skin that functions as an independent nerve network? What if each patient's room within the facility has an adaptive nerve, individually operable to suite each patient's individual needs as desired? What if the patients become the nerves triggering these independent façade adaptations; what could these skin adaptations be?



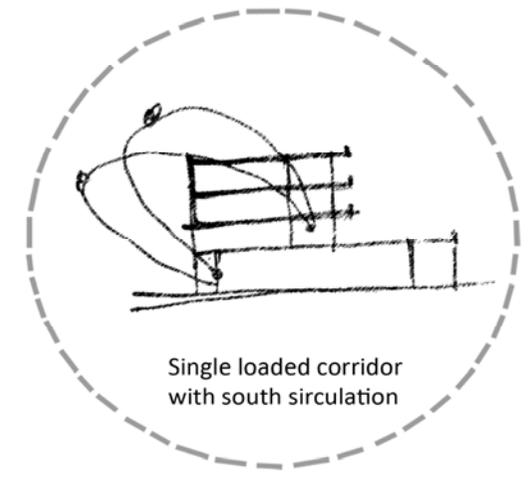
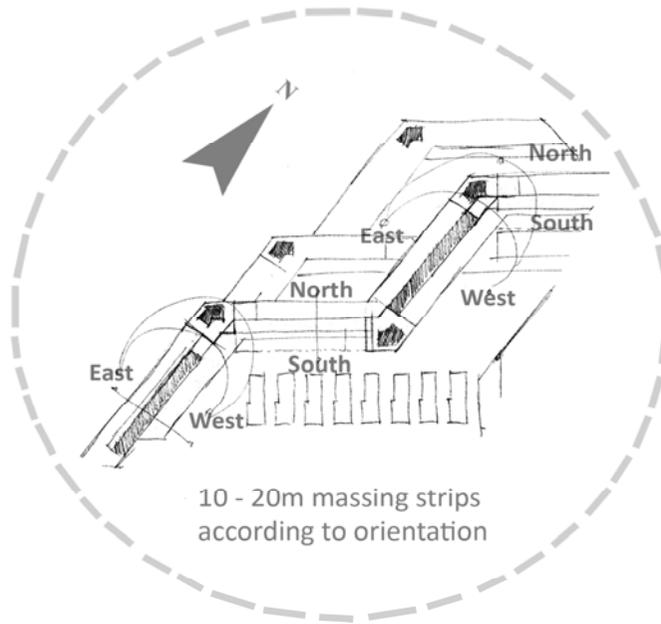
The Jellyfish and the autonomous network of senses.

Boyce, L. "Nervous Systems" 2013. [Biology Reference](http://www.biologyreference.com/Mo-Nu/Nervous-Systems.html) (Accessed 07 May 2014)
<http://www.biologyreference.com/Mo-Nu/Nervous-Systems.html>

Figure 43– The jellyfish and the autonomous network of senses (Author 2014)



East / West Condition



North / South Condition

Rehabilitation

A Highly localised homogenous Interactive adaptive hand operable facade system that allows for individual control

Detoxification

A homogenous Interactive adaptive hand operable facade system that allows for individual control

Administration

A homogenous Passive facade system

Perimeter retail
Hand operable adaptive fortification facade system

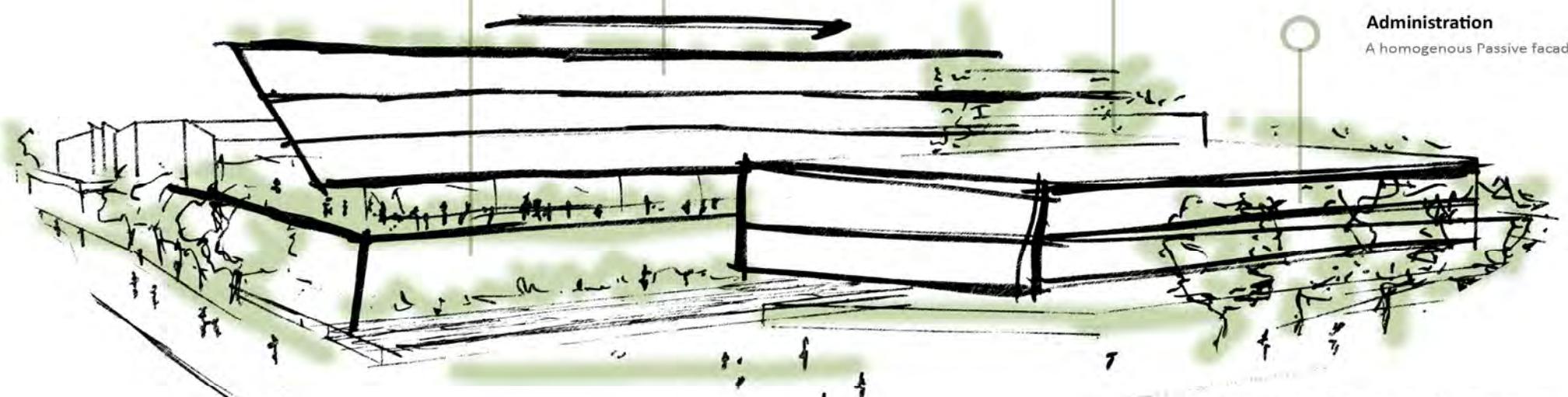


Figure 34 (Author 2014)

Adaptive Facade Concept

Massing in relation to orientation

Conceptually the building Massing was done in relation to its orientation, consisting of 15 – 20m massing strips for maximum solar gain and natural ventilation. The north-south accommodation blocks live to the north with a single loaded corridor to the south, while the east-west accommodation blocks are double loaded corridors with a central atrium that allows natural light penetration throughout the day.

The building consist of a concrete framed structure, with the main circulation cores at the building joints forming the structural anchors for the floor slabs. The floor slabs are then split between cores to create expansion joints for structural movement. The building is further anchored with fire escapes at both ends of the structure with wall stiffeners in between cores.

For the purpose of this dissertation I will focus on the rehabilitation spine façade. This facade concept should aim to be a highly localised homogenous Interactive adaptive hand operable facade system that allows for individual control and community interaction.

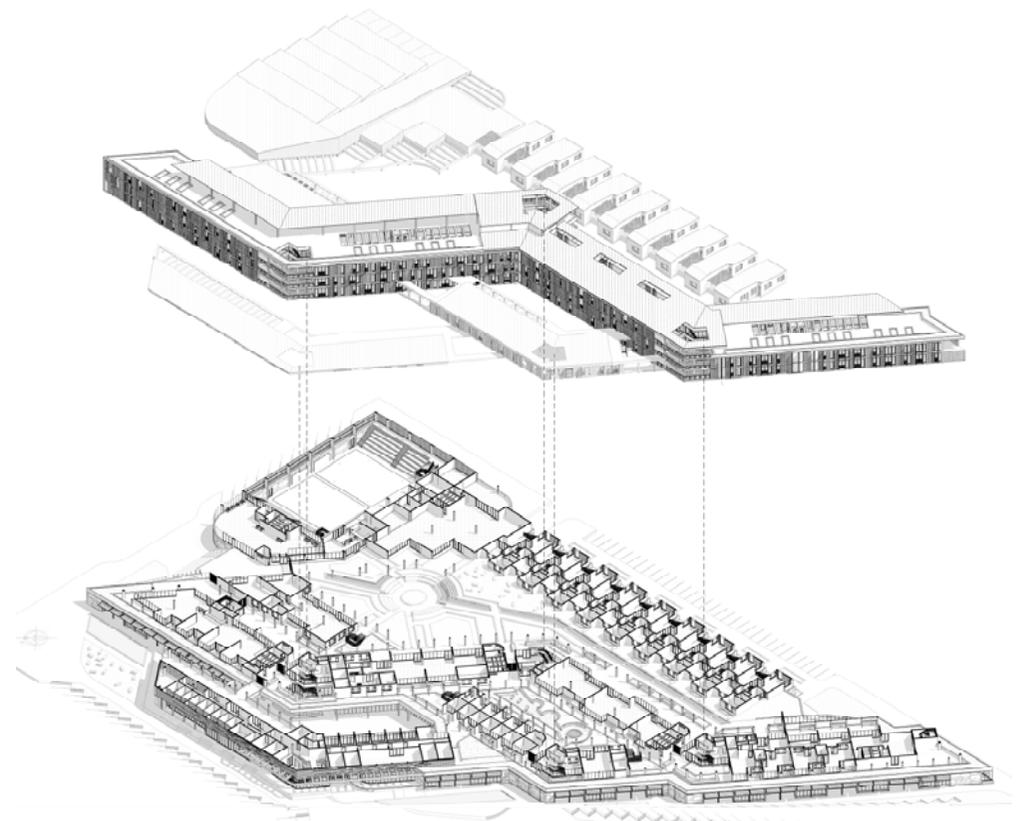
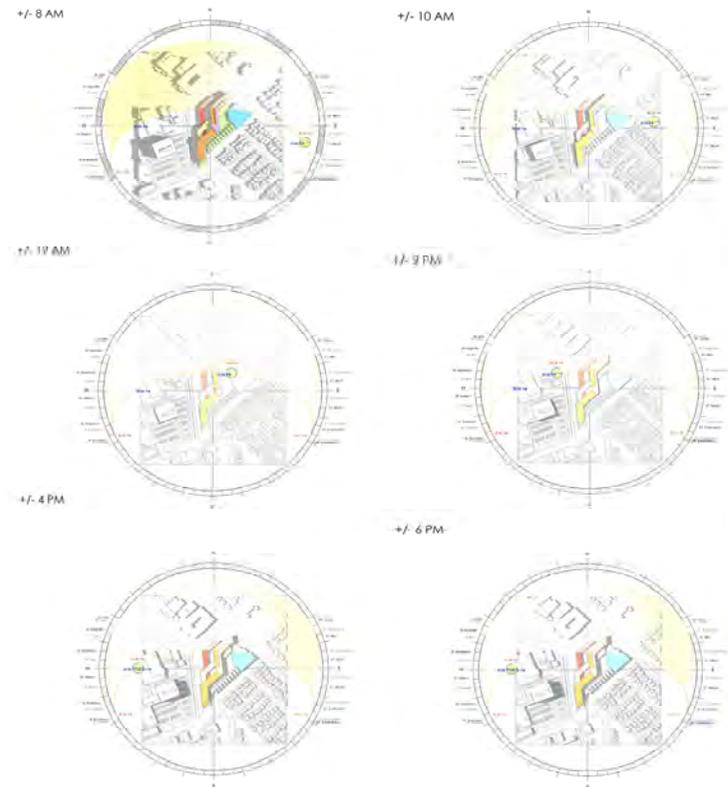
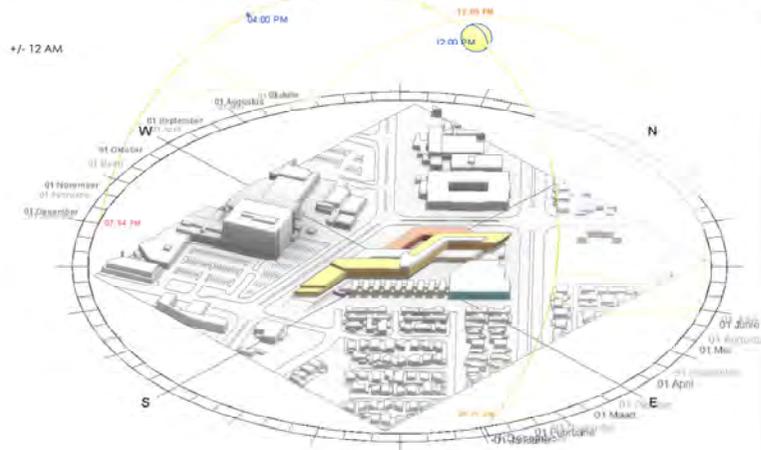
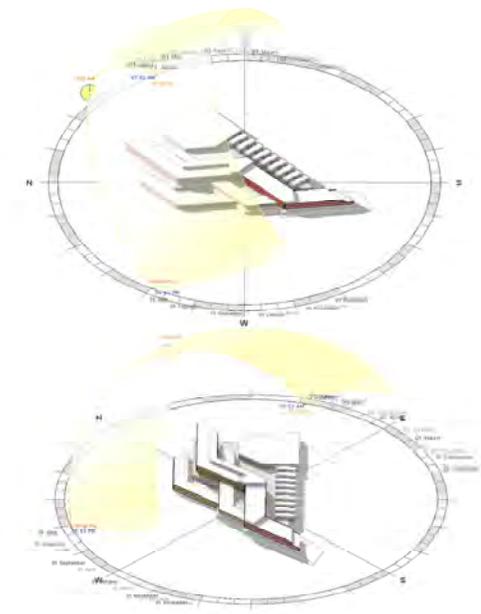
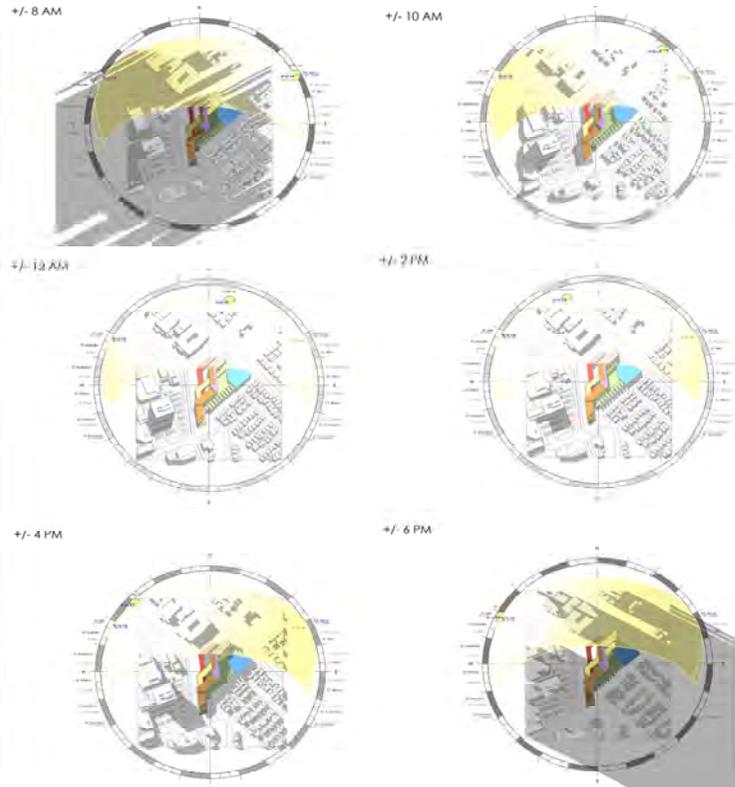
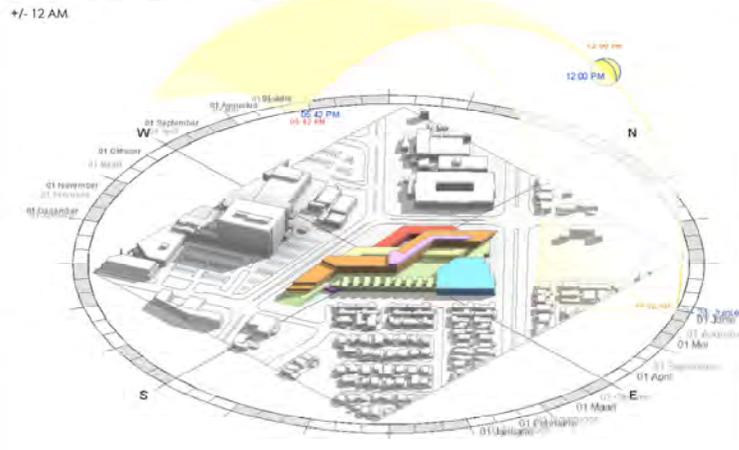


Figure 45 – The accommodation spine raised above the therapeutic platform (Author 2014)

Summer Solstice Solar Study

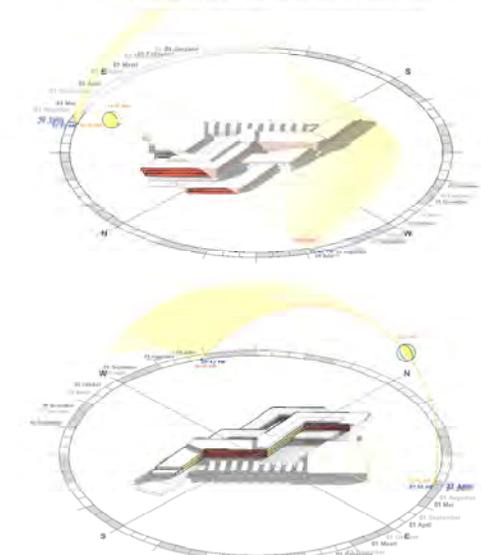


Winter Solstice Solar Study



Solar gain in relation to facade Typology Allocation

- North Mid day Intense high solar gain
- North west afternoon low solar gain
- South East low morning solar gain
- South no very little to no direct solar gain



Solar study - Massing in relation to orientation

Proposed façade system analysis

After various case studies and research into adaptive façade systems I came across the Luna building by Elenberg Fraser in Australia. The system inspired the initial direction of this proposed façade system. The Luna building façade is constructed out of golden metallic anodized woven aluminium panels that adapt to the individual needs of its occupants.⁴⁶

The façade has a unique warm therapeutic aesthetic when it catches the sun from the exterior while creating ideal internal conditions. The façade provides privacy, glare control, excessive heat gain prevention, and all while still permitting clear views of the exterior in open or closed position. The system is highly durable in terms of robustness, operability and also corrosion resistance.

However, adaptive façade systems comes at quite a steep price that evidently wouldn't be very feasible for a rehabilitation centre in Mitchell's Plain. Therefore I did more research into the technology and materiality of this specific system to generate alternative, more cost effective solutions.

I discovered that the façade can be simplified from a double skin system, into a composite system that only adapts and operates at certain points, while the left over space are cladded with solid or glazed panels. I also explored various other materials in search for a more cost effective solution that could possibly provide

the same aesthetic and long term durability properties. I came across epoxy coated steel, a material with similar durability properties and capable of generating the same aesthetic finish.

The following section are a series of axonometric perspectives that illustrate the façade systems and the building massing in relation to its orientation.

⁴⁶ Fraser, E. "Luna Apartments / Elenberg Fraser" 02 Sept 2013. [Arch Daily](#) (Accessed 03 April 2014)

GMS purpose made flashing

A Highly localised homogenous
Interactive adaptive hand operable facade
system that allows for individual control

Epoxy coated steel louvre ventilation grills -
Interpon powder coated to match facade

Adaptive facade mechanism galvinsed mild
steel track to specialist detail

Golden metallic epoxy coated steel mesh
mounted on a 50mm x 50mm Galvinsed
mild steel frame

50mm brushed stainless steel top rail tube attached to
5mm pin according to specialist detail

walkways and roof terraces - 75mm polished screed to
slope on floor slab. | - Peran comfort
Epoxy Coating from Flowcrete. Colour: pebble grey
[RAL 7032] on 260mm suspended floor slab and
30mm grano screed

Insulation - skimmed plasterboard
Isoboard insulation fixed to underside of purlins

280mm brick cavity wall to be plastered and
painted white to architects further specifications

30mm screed on 260mm reinforced concrete slab to
engineers specifications

Peran Comfort Epoxy Coating from
Flowcrete. Colour: Pebble Grey [RAL 7032] on 75mm
concrete surface bed.

Gyproc 6,4mm RhinoCeil Value gypsum flush
plastered ceiling with square edged Rhinoboard
fixed print side up



Typical East - West Facade Condition

Figure 47 (Author 2014)

walkways and roof terraces - 75mm polished screed to slope on floor slab. | - Peran comfort Epoxy Coating from Flowcrete. Colour: pebble grey [RAL 7032] on 260mm suspended floor slab and 30mm grano screed

Roof terrace perimeter Planter

Golden metallic epoxy coated steel mesh mounted on a 50mm x 50mm Galvanised mild steel frame

Rehabilitation accomodation house cluster typology

Therapeutic level Perimeter Planter

Perimeter retail Hand operable adaptive fortification system

Perimeter retail Shopfronts

Perimeter 280mm brick cavity wall to be bagged brick - Dulux AcraTex 959 Contempo ADVANCE Coarse Brush texture. Colour. Charcoal Light. product Code:P13A6R

50mm sidewalk paving surface onto well-compacted in 150mm layers earth backfill.

Therapeutic platform shared Library space

50mm screed on 260mm reinforced concrete slab to engineers specifications

Roof terrace perimeter Planter

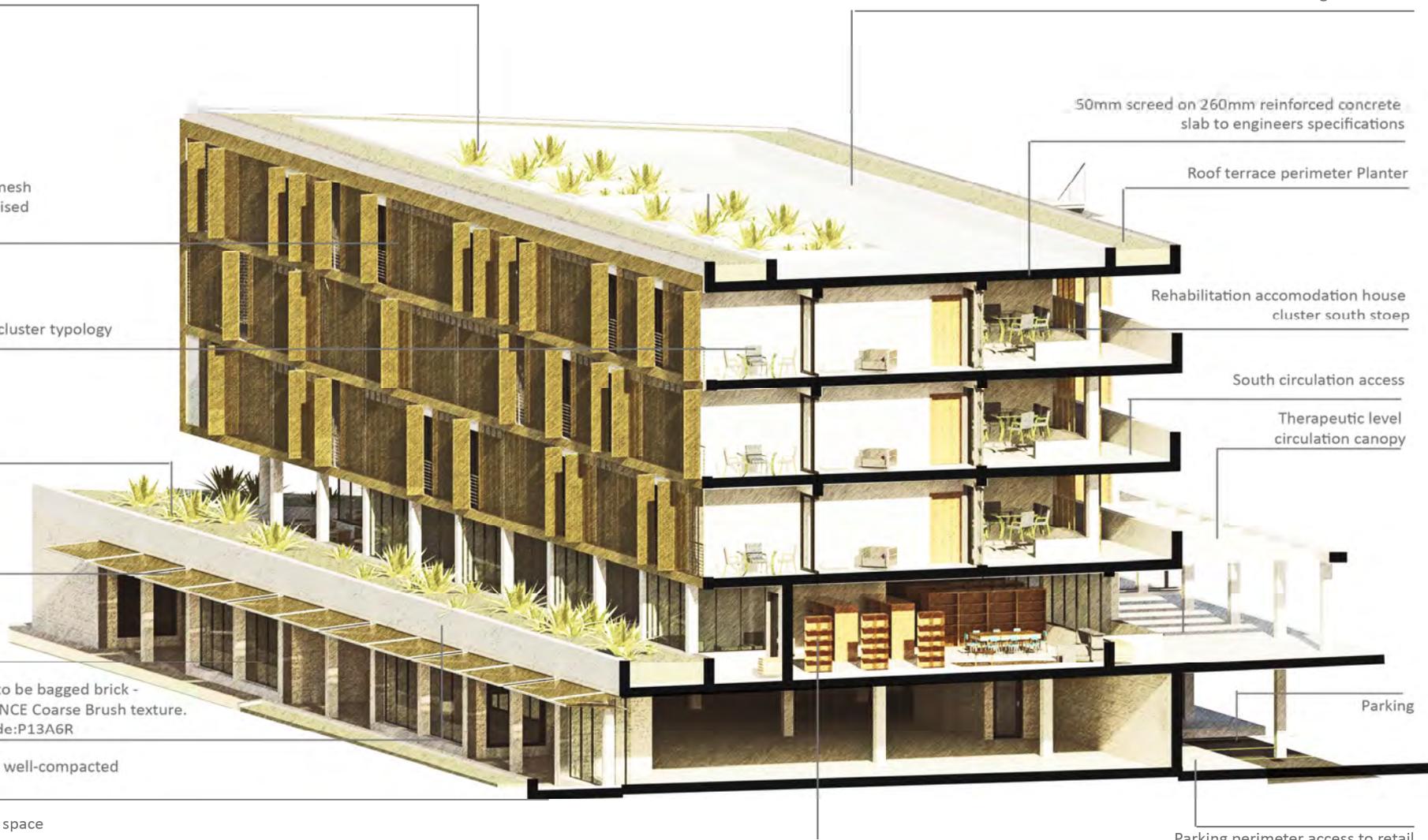
Rehabilitation accomodation house cluster south stoep

South circulation access

Therapeutic level circulation canopy

Parking

Parking perimeter access to retail for refuse and delivery



Typical North - South Facade Condition

North facing accommodation with a south facing single loaded corridor

Atrium- tinted white (Opal 50) polycarbonate translucent sheeting (Kliplok profile) 1,25mm thick (Code: P105) at 4° fall on 50x75mm purlins @ 300mm c./c. on 152x38mm rafters @ 1000mm centers.

Roof terrace perimeter Planter

Main vertical circulation core atrium space

GMS purpose made flashing

Concealed 150x150 steel downpipe fixed to canopy structure 400x180 purpose made Aluminium box gutter

Golden metallic epoxy coated steel mesh balustrading to specialist detail

Golden metallic epoxy coated steel mesh mounted on a 50mm x 50mm Galvanised mild steel frame

Therapeutic level Perimeter Planter

Perimeter retail Hand operable adaptive fortification system

Perimeter retail Shopfronts

Perimeter 280mm brick cavity wall to be bagged brick - Dulux AcraTex 959 Contempo ADVANCE Coarse Brush texture Colour. Charcoal Light. product Code:P13A6R

Rehabilitation accomodation house cluster south stoep

Central atrium and circulation access route

Brownbuilt Klip-Lok 700 steel roof sheeting, colour: Golden metallic with Modek Kliplok 812 profile at a 4° fall on 50x75mm purlins spaced @ 1200mm centers on SA pine trusses spaced at 1000mm centers.

Galvanized mild steel roof truss to specialist detail

neighbourhood communal dining and living space

Therapeutic level Perimeter Planter

Therapeutic level

Public controlled acces ramp to therapeutic level



Typical East - West Facade Condition

Double loaded corridor with an internal atrium circulation space

Final Design Development



North East Perspective

Figure 50 (Author 2014)

Site and Locality Plan

1. Mitchells Plain Magisterial Court
2. Mitchells Plain Community Skill Centre
3. Mitchells Plain Day Hospital
4. Main road AZ Berman
5. Residential Edge
6. Active Commercial Edge
7. Potential Sport Field Area
8. Formalising Existing dirt road



Figure 51 (Author 2014)

Ground Floor Plan



1. Main Visitors/staff/patient Entrance
2. Outpatient Facilities
3. Access from parking
4. Staff access point to therapeutic platform and rehabilitation spine
5. Public Courtyard Restaurant
6. Public Courtyard
7. Perimeter Retail
8. Reintegration Workshops and retail units
9. Paid parking access control point
10. Multi-purpose sport centre
11. South street edge activation with reintegration workshops and retail
12. Formalisation of existing dirt road
13. Activation of commercial edge
14. Staff and patient rentable storage units
15. Sport centre access to first floor reception from parking

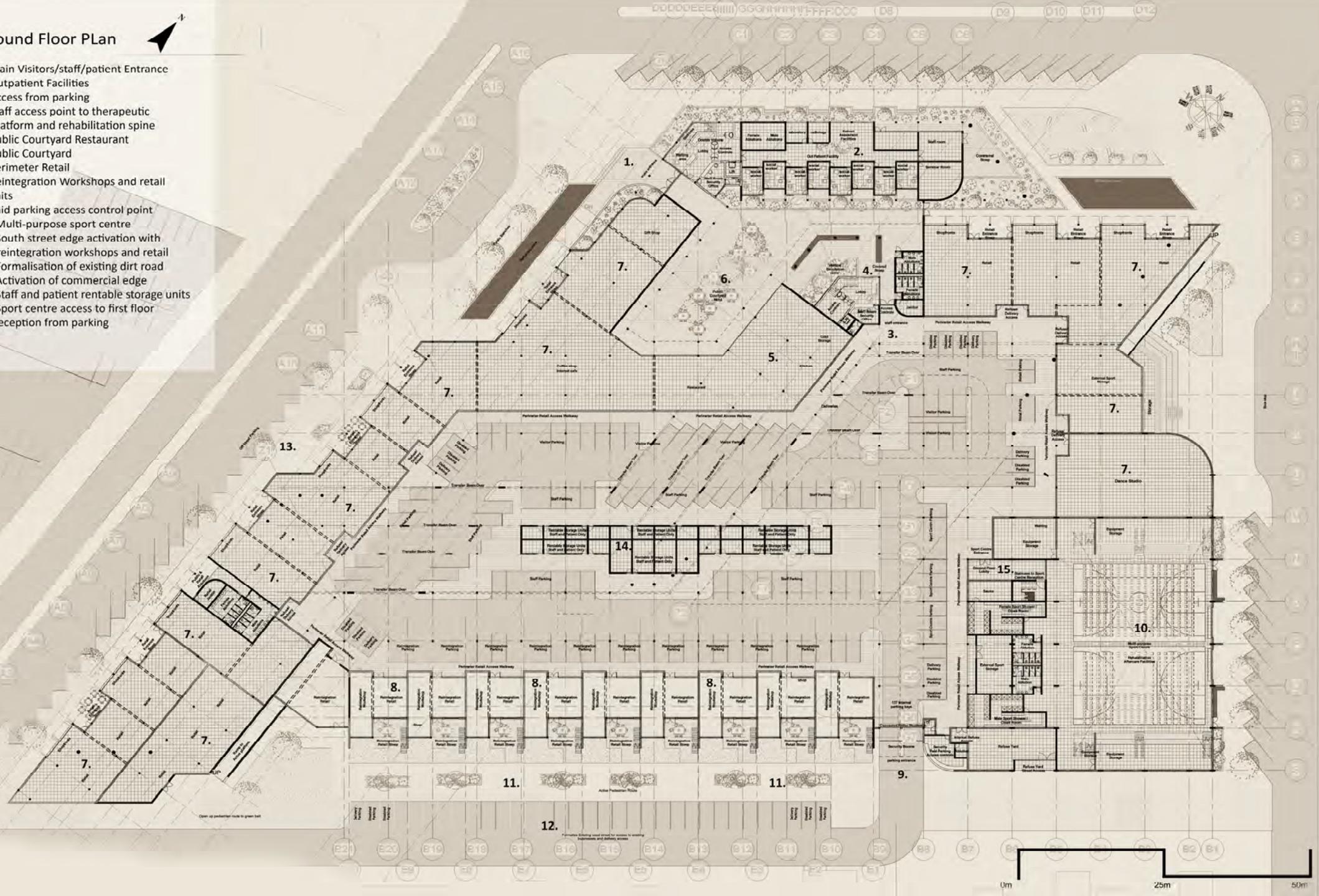


Figure 52 (Author 2014)

**First Floor Plan
- Downtown Concept**



1. Staff access point from ground plane
2. Vertical Circulation Core to Accommodation levels
3. Public platform to shared facilities
4. Main Active Courtyard
5. Access point from rehab to Sport centre
6. Community skill centre
7. Multi-purpose sport centre
8. Dual reception for rehab and public
9. Access control
10. Gymnasium
11. Controlled Public access point to active courtyard
12. Controlled Public access point to sport centre and Gymnasium
13. Controlled Public access point to library
14. Library access point
15. Rehabilitation entertainment area
16. Connecting bridge between admin and therapeutic platform
17. Access point to Communal Cafeteria
18. Access to Group Therapy Zones
19. Agricultural Zones 19. Juvenile Facilities
20. Controlled access point to green belt
21. Perimeter planter as urban filter
22. Main Circulation route
23. Individual therapy
24. Spiritual room
25. Spiritual Courtyard
26. Access to Detoxification
27. Ground floor Public Courtyard
28. Family support zones
29. Administration
30. Access point from ground floor to Administration and family support
31. Administration terrace

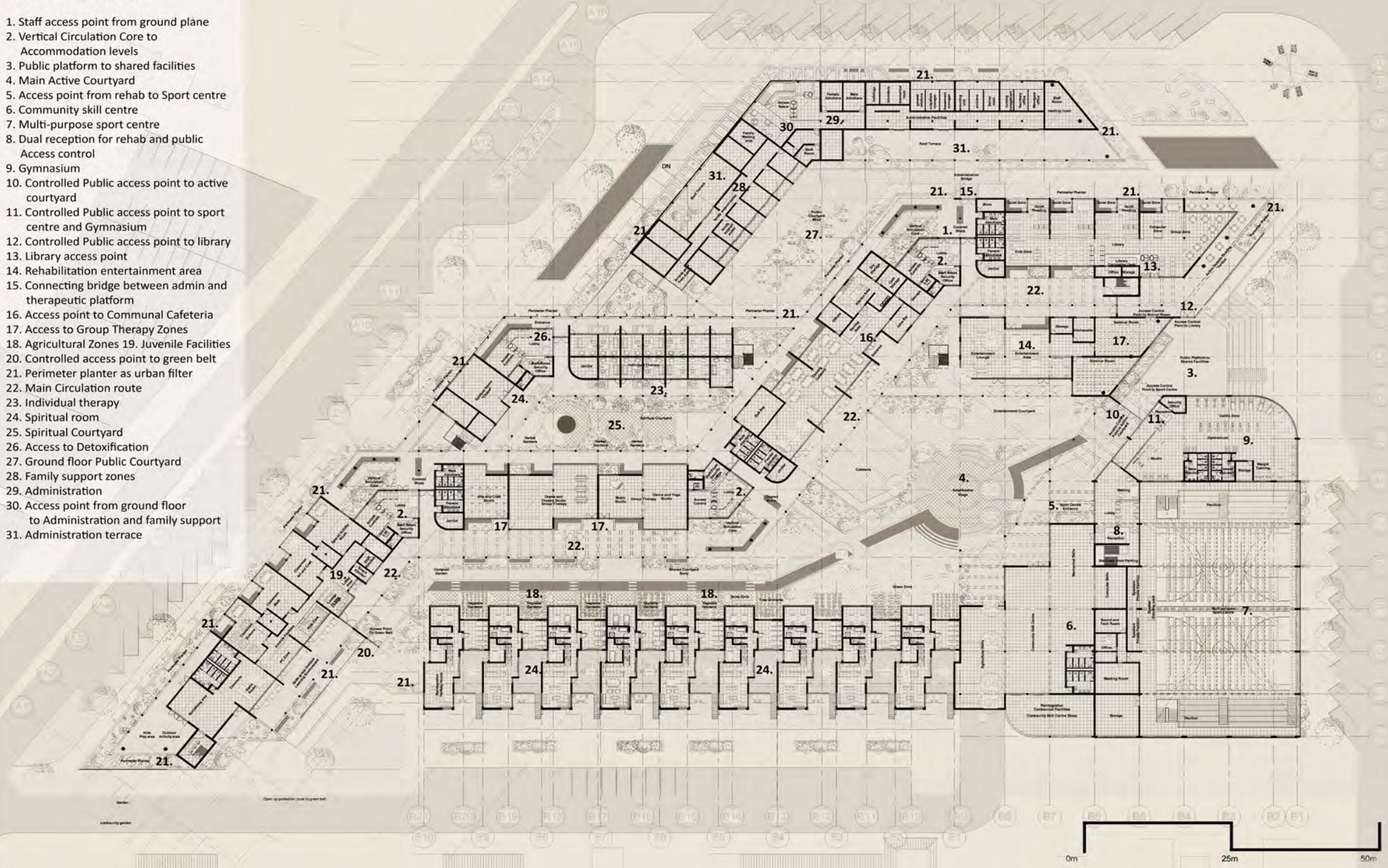


Figure 53 (Author 2014)

Second Floor Plan
- Accommodation level 1

1. Rehabilitation Vertical Circulation Core
2. Nursing Station
3. Atrium Space
4. Detoxification Vertical Circulation Core
5. Detoxification garden terrace
6. Secondary Vertical Circulation Fire escape
7. Fire Escape 8. Phase 2 - 1 and 2 bedroom accommodation neighbourhood clusters
9. Neighbourhood mother accommodation
10. Living/ TV room
11. Dining room / kitchen and communal Balcony
12. 8 bed room house clusters
13. 5 bedroom juvenile accommodation
14. 3 bedroom detoxification units
15. Staff detoxification facilities
16. Step back for single loaded corridor
17. Reintegration unit's accommodation level
18. Therapeutic courtyards flanking various Accommodations

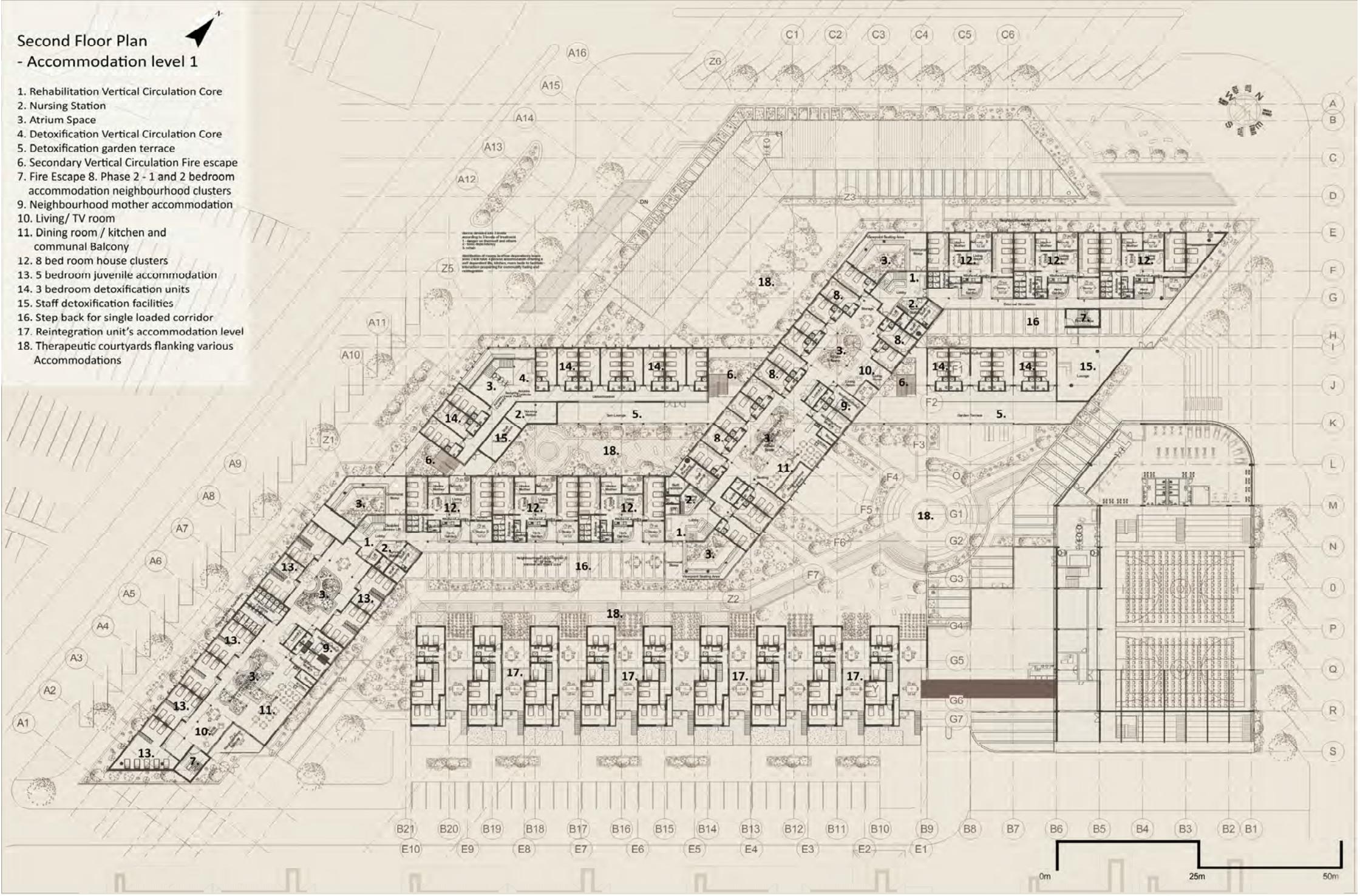


Figure 54 (Author 2014)

Third Floor Plan
- Accommodation level 2

1. Rehabilitation Vertical Circulation Core
2. Nursing Station
3. Atrium Space
4. Detoxification Vertical Circulation Core
5. Detoxification garden terrace
6. Secondary Vertical Circulation Fire escape
7. Fire Escape
8. Phase 2 - 1 and 2 bedroom accommodation neighbourhood clusters
9. Neighbourhood mother accommodation
10. Living/ TV room
11. Dining room / kitchen and communal balcony
12. 8 bed room house clusters
13. 5 bedroom juvenile accommodation
14. 3 bedroom detoxification units
15. Staff detoxification facilities
16. Step back for single loaded corridor
17. Reintegration unit's accommodation level
18. Therapeutic courtyards flanking various accommodations

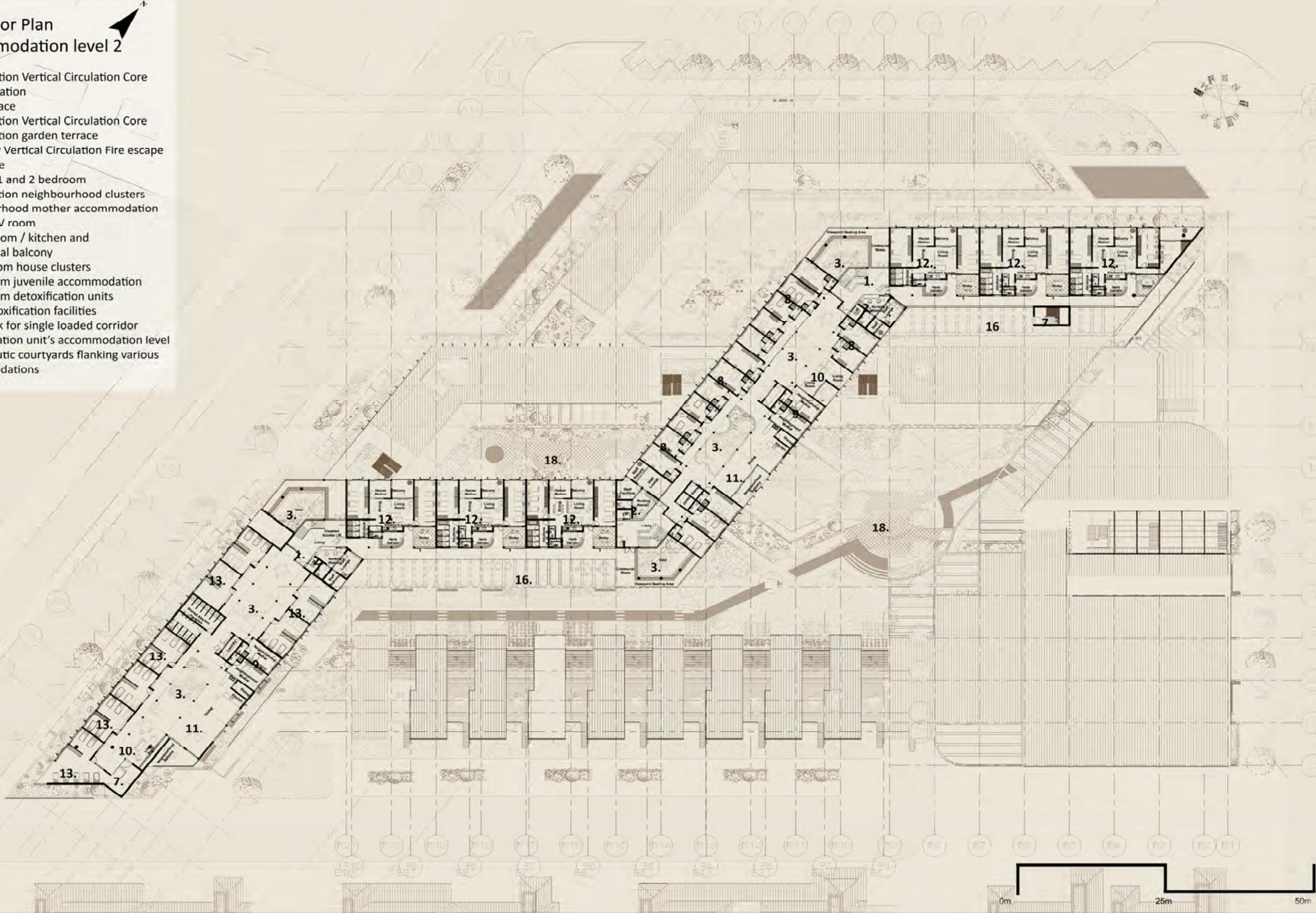


Figure 55 (Author 2014)

Fourth Floor Plan
- Accommodation level 3

- 1. Rehabilitation Vertical Circulation Core
- 2. Nursing Station
- 3. Atrium Space
- 4. Detoxification Vertical Circulation Core
- 5. Detoxification garden terrace
- 6. Secondary Vertical Circulation Fire escape
- 7. Fire Escape
- 8. Phase 2 - 1 and 2 bedroom accommodation neighbourhood clusters
- 9. Neighbourhood mother accommodation
- 10. Living/ TV room
- 11. Dining room / kitchen and communal balcony
- 12. 8 bed room house clusters
- 13. 5 bedroom juvenile accommodation
- 14. 3 bedroom detoxification units
- 15. Staff detoxification facilities
- 16. Step back for single loaded corridor
- 17. Reintegration unit's accommodation level
- 18. Therapeutic courtyards flanking various accommodations

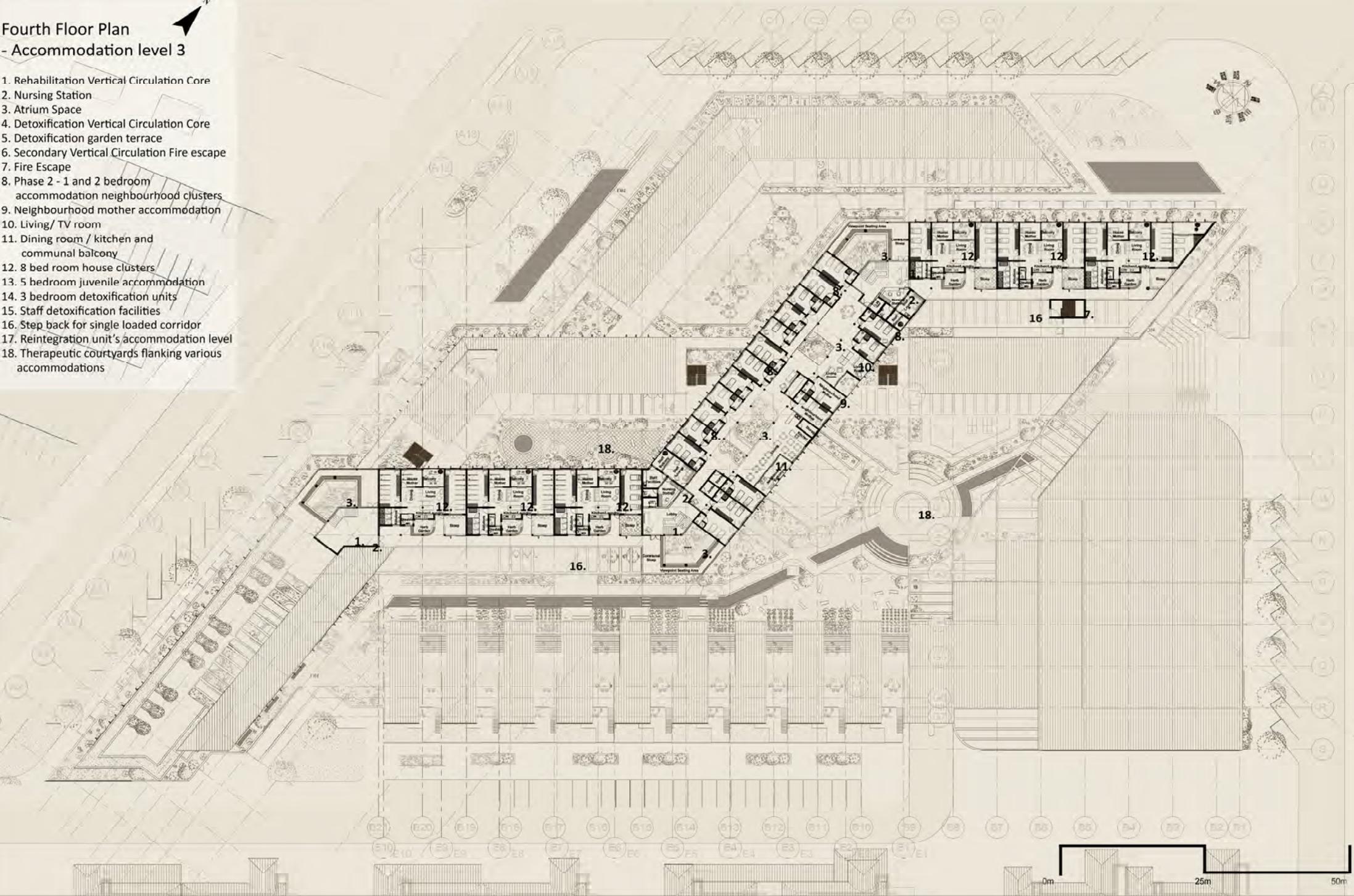


Figure 56 (Author 2014)

Fifth Floor Plan
- Communal Roof Terrace

- 1. Rehabilitation Vertical Circulation Core
- 2. Access control
- 3. Communal roof terrace
- 4. Vegetable planters

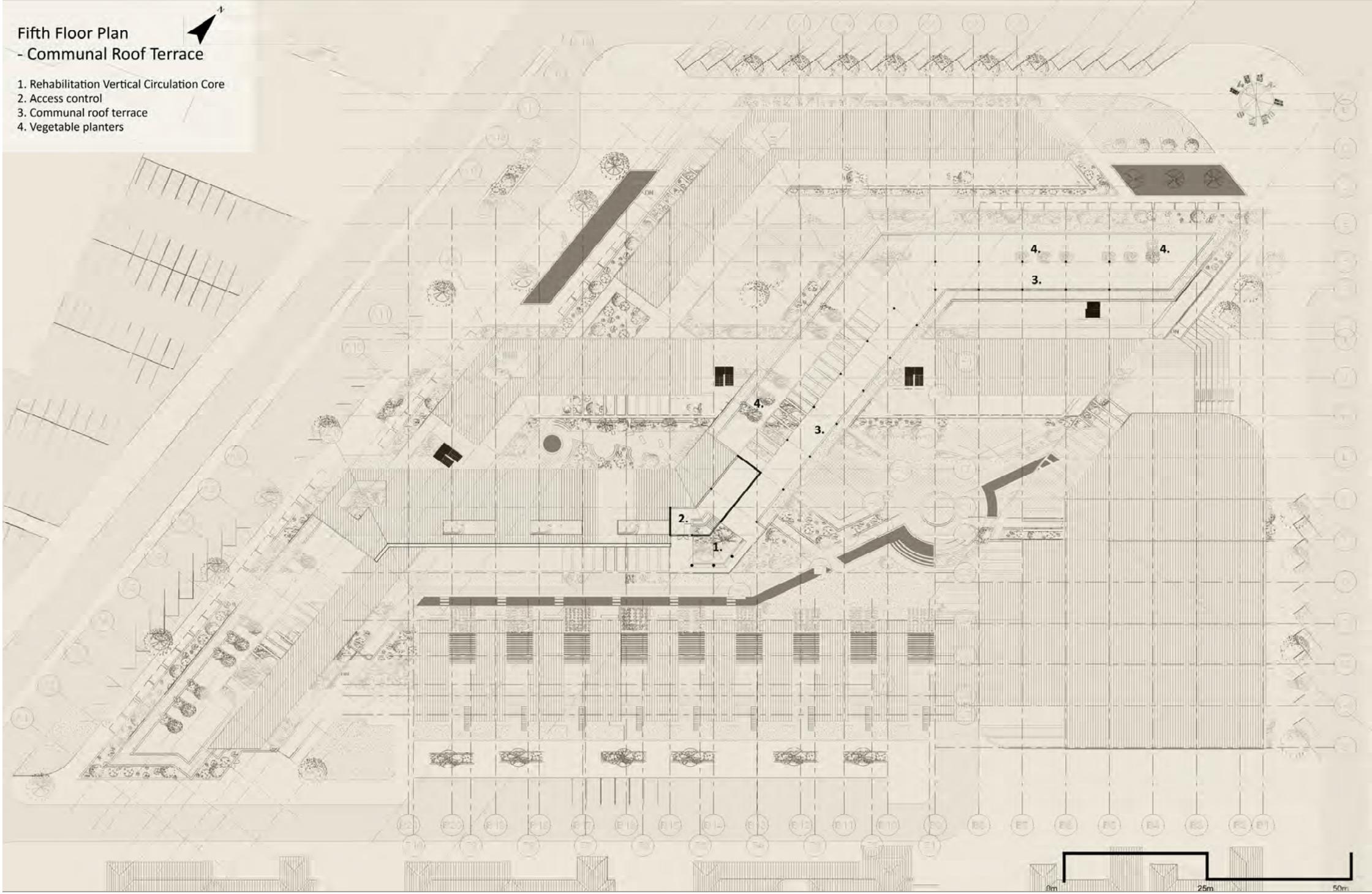


Figure 57 (Author 2014)

Site and Roof Plan



1. Administration/ Outpatient Facilities
2. Family Support Zones
3. Detoxification
4. Rehabilitation Spine
5. Reintegration (Halfway Houses)
6. Multi-purpose sport centre
7. Community Skill centre
8. Roof terrace/ garden
9. Public Courtyard
10. Spiritual Courtyard
11. Active courtyard
12. Agricultural Zone
13. Vertical Circulation Core
14. East-West Atrium Condition
15. Public platform to shared facilities
16. Main entrance patients/staff/visitors
17. Reintegration workshops activating street edge
18. Perimeter planter as urban filter
19. Formalisation of dirt road

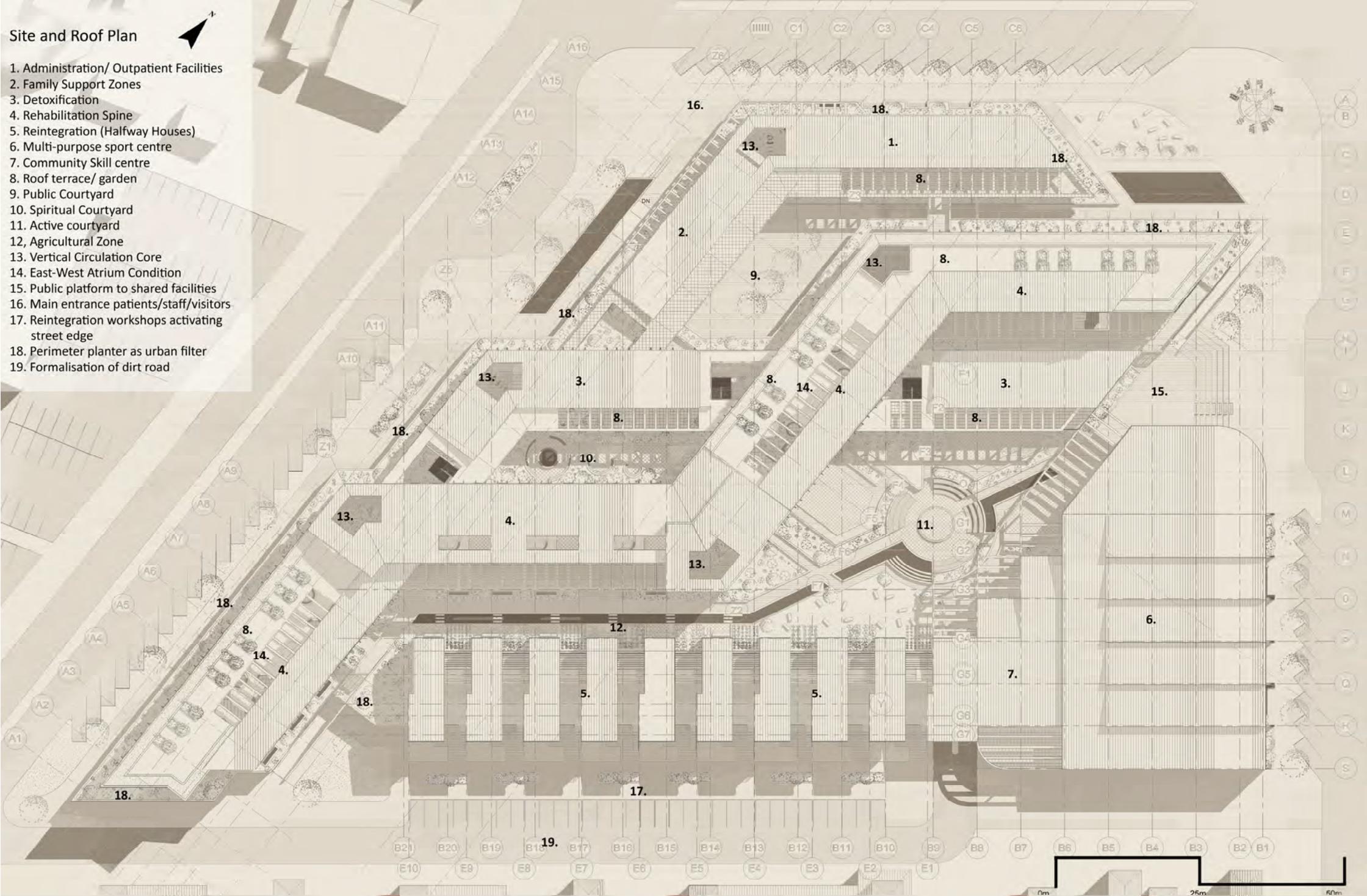


Figure 58 (Author 2014)



South East Elevation



North West Elevation



North East Elevation

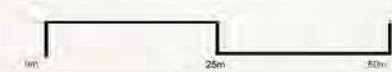


South West Elevation

Figure 59 (Author 2014)



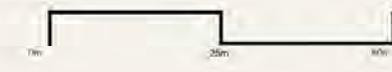
Cross Section A - A



- 1. Detoxification Accommodation
- 2. Detoxification terrace
- 3. Individual therapy
- 4. Spiritual Courtyard
- 5. Group therapy area
- 6. Rehabilitation Accommodation House Clusters
- 7. Downtown therapeutic level main external covered circulation
- 8. Accommodation external circulation
- 9. House clusters southern stoop
- 10. Agricultural area with individual and group seating areas
- 11. Reintegration balcony
- 12. Reintegration accommodation
- 13. Reintegration accommodation private courtyard
- 14. Reintegration workshop and street-edge retail
- 15. Internal parking pedestrian route for delivery and refuse access
- 16. Formalisation of old dirt road and the introduction of a new pedestrian route
- 17. Reintegration shop front area
- 18. Internal parking
- 19. Central patient and staff storage units
- 20. Perimeter retail
- 21. Perimeter planter and patient seating areas
- 22. Perimeter retail adaptive pedestrian canopy
- 23. Administration and outpatient entrance
- 24. Vertical circulation core
- 25. Roof Terrace



Cross Section B - B



- 1. Multi-purpose sport centre
- 2. Sport centre facilities
- 3. Pavilions
- 4. Sport centre main entrance
- 5. Gymnasium
- 6. Public access control platform to Shared facilities
- 7. Perimeter retail
- 8. Public studios
- 9. Access control point to gymnasium and sport centre
- 10. Access control point to library and seminar rooms
- 11. Library shared entrance and reception
- 12. Library
- 13. Perimeter planter with seating areas
- 14. Perimeter retail canopy and off street shop front circulation route
- 15. Public landscaping and seating area
- 16. Administration area
- 17. Rehabilitation accommodation stoop
- 18. Rehabilitation accommodation
- 19. Roof terrace
- 20. Vertical Circulation core

Figure 60 (Author 2014)



Figure 61 (Author 2014)

North Corner Street Perspe



Figure 62 (Author 2014)

The Therapeutic Platform
Spiritual Courtyard



Therapeutic Platform
External Patient Circulation route

Figure 63 (Author 2014)



Therapeutic Platform
Access point to vertical Circulation core to accommodation



Typical East - West Accommodation block
Internal Atrium Circulation



Perimeter Retail Street edge
Adaptive fortification shop front system



Reintegration workshops and accommodation
on the Residential edge

Conclusion

This project demonstrates through the introduction of an integrated community rehabilitation centre that a healing environment can be achieved in any context, urban or rural.

The main challenge was to create the therapeutic effects that a rural environment provides within a more urban context. This was demonstrated through the implementation of the 'nature as therapy through architecture concept', where the design uses a raised therapeutic platform to elevate patients to another level, and the perimeter planter that serves as an urban filter, defusing the harsh urban context of Mitchells Plain.

Technologically and programmatically this project drew ideas from the jellyfish concept and investigated how architecture can create spaces that encourage or induce healing, while also exploring the need for adaptability within these environments. This project also explored the role of Architectural technology in therapy and ultimately introduced the concept of a highly localised adaptive façade system.

The investigation also unpacked the existing rehabilitation ecology and the gradual transition process in the formulation of a new hybrid system that combines the various stages of rehabilitation within one centralised facility. While the design deinstitutionalised the existing rehabilitation programme through the 'simulation of a real life concept', where the facility incorporates familiar elements like the house, neighbourhood and downtown to replicate the

variety of environments in our everyday lives. The project has developed a rehabilitation centre that engages with its surrounding community, fostering various levels of controlled interaction between patient and public. An integrated facility that gives back to its community through shared facilities.

Architecture now needs to change and adapt its traditional perceptions of institutionalization to create an environment that stimulates all the human senses and deviates from the past stigmatized approaches of institutional design. Architecture can be seen as a therapeutic tool with the ability of creating spaces with the potential to induce healing. The healing effects of nature in relation to the architectural manipulation of space can occur in any condition being urban or rural.

Our modern healing environments have to adapt to the modern conditions of urban life and formulate a more integrated approach in relation to the urban context.

References

Glossary

| | |
|-----------------------|--|
| Nature | the world of living things collectively, including animals, plants, natural landscapes, excluding man and its creations. |
| Health | The overall State of the human mind and body |
| Phenomenology | Studies of the senses, sight, hear, touch, taste, smell, the human stimuli |
| Society | the global human community |
| Wellbeing | a decent acceptable state of living; a condition categorised by happiness, healthiness, and prosperity |
| Contemplation | transcending from a harsh reality to a place of meditation, serving as a temporary escape from the immediate reality |
| Urban | referring to the specific Typical conditions of city living |
| Evidence-based | past explorations and experiments being used today to assist in judgment resolutions of various decisions to ultimately have a universal design standard of best practices |
| Therapeutic | Something possessing the ability to heal or induce healing |
| Hybridity | a result that is achieved through the mixing of two opposing ideas |

| | |
|----------------------|---|
| Tension | a situation or condition of being under strain, irritation between two separate dynamics |
| Sustainable | the ability to be maintained at a certain rate or level, not at the expense of something else |
| Environment | Our immediate surroundings conditions and circumstances that have possible effects on our overall wellbeing |
| Kinetic | the energy generated by a specific object due to its motion, defined as the work required for a given mass to accelerate from still to its indicated velocity |
| Dynamic | continuously changing and adapting system |
| Cultural | involving to the concepts, customs, and social behaviour of a society |
| Adaptive | a certain object or behaviour that can adjust to suite various different situations |
| Alluring | something that evokes curiosity and attracts |
| Hybridity | a result that is achieved through the mixing of two opposing ideas |
| Fortification | to create a defensive perimeter to protect occupants |
| Sustainable | the ability to be maintained at a certain rate or level, not at the expense of something else |

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