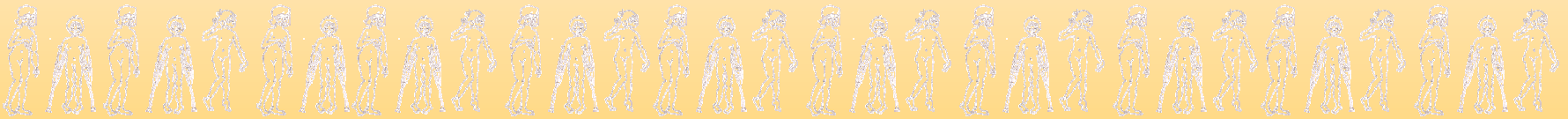
PLAY REHAB

A Rehabilitation Centre for Children with Cerebral Palsy



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Masters of Architecture (Professional)

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ABSTRACT

A Rehabilitation centre for children with cerebral palsy is the proposed project undertaken in this dissertation.

This theme was chosen after the author had been involved with New Hope School in fundraising projects for the past 3 years. The author recognized the need of a dedicated rehabilitation facility for children with cerebral palsy as well as better accommodation for rehabilitation purposes.

Spending time with cerebral palsied children, the need for basic education becomes evident. Over protectiveness from parents could prevent these children from sensory experiences, which can only be evolved through touching, smelling, seeing hearing and tasting.

This early childhood experience of sensory development usually involves play. Play is the ultimate form of exploration for any child and when disabled, free play is usually non-associative with everyday activities. Without free play, children will have a handicap in natural development of social, mental, physical and sensory skills. Through harmless play, even a lion cub learns to become a hunter.

The aim of this project would be to create a center where play would be used to rehabilitate children with cerebral palsy. New Hope School is situated in the Menlopark area, Pretoria. The proposed site for the rehabilitation centre would be consolidated to the north western corner of the existing school grounds and thus engaging this project as an addition to the existing New Hope School.

The architecture used, should be of simplistic nature which merges the interiors of the building with nature. By achieving this, the children would get a basic form of sensory development while rehabilitating in the building.

"All consciousness is perceptual...The perceived world is the always presupposed foundation of all rationality, all value and all existence."- (Maurice Merleau-Ponty Quote)

" our perceived experience of interior and exterior architectural space is primarily a sensual event involving movement" -
(tom porter, 1997:26)

"...architecture has to be experienced by all the senses, rather than just sight. The visual image may provide us with pictorial information, yet beauty is never skin deep." -(Papanek, 1995:76)

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The author attempted a technique to rehabilitate the first phase of basic education lost by disabled children because of their inability and freedom to explore. This basic education form part of sensory development which involve the act of play. The stimulation of senses would bring the child in touch with his/her body and would help the whole rehabilitation process that includes the physical and mental phases of rehabilitation.

The author do think that this above mentioned aim where achieved in the project undertaken.

However, this project could become much more in time. After a proper evaluation of the finalized project, it has become evident that the approach taken for the architecture was a materialistic style. The element of fantasy could have been brought into the concept, final design and detailing.

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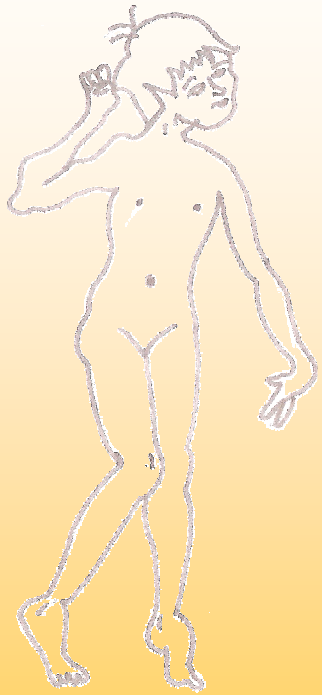


1.THE PROBLEM AND ITS SETTING

1.1 INTRODUCTION

Rehabilitation services have traditionally been neglected in South Africa. Predominantly based within the health sector, with the Departments of Labor and Education carrying some rehabilitation related programmes, these services tend to be fragmented and uncoordinated. This is mainly due to the lack of a comprehensive national intersectoral rehabilitation policy.

_*white paper on disability , 2002*

Cerebral palsy is not a disease, it's a disability. In very rare and severe cases people can die of the overwhelming impact of physical impairment.

Phelps states:

"seven children are born with Cerebral Palsy per 100 000 people. Of these seven, one dies during the first year of life; six remain. Of these six, two are so severe as to require institutional treatment and four are left for treatment; one is amenable only to home or day care, two are moderately involved and benefit from treatment, and one child is so mild that no special treatment is required"

(Bleck & Nagel, 1975:6)

People affected by Cerebral Palsy and Spinal cord injuries have to live out their potential with their impairment. Although therapy, specialized surgery and medication are means of treatment, these can only improve their condition and not remove it. This means that they need to adapt to their physical condition.

Cerebral Palsy and spinal cord injuries does not only effect the child or individual, but it also has a significant affect on their parents and immediate families. "Sometimes the parent needs more counseling and help than the actual disabled child" (interview: Evette Sunderland 2009)

These parents need to adjust their lives. They must be educated to care for their child, amend their homes and lifestyles.

Physical disability in people of all ages is more common than people realize and can happen to any of us at any time.

More than 20% of the South African population may either have a disability or live in a household with a person who has a disability. (South Africa Human Rights Commission Report, November 2002)

The proposed precinct for this project is New Hope School in the Menlo Park area in Pretoria. New Hope School is one of the biggest schools in South Africa that provides education for disabled children, in particular for children with Cerebral Palsy .

1.2 PROBLEM STATEMENT

Pretoria is in need for a proper rehabilitation centre for children with cerebral palsy. Although New Hope School provides education and rehabilitation for children with Cerebral Palsy, these facilities are inadequate and outdated

The area that is currently allocated for rehabilitation is not big enough for the number of children in need of rehabilitation and uses space where more class rooms could be built.

The design problem is to create a new rehabilitation facility for New Hope School that will accommodate children from all over Gauteng and South Africa.

BRIEF

1.3 THE PROJECT

A Rehabilitation Centre for Children with Cerebral Palsy is the proposed project for this dissertation.

The proposed site is bordering to the north western side of the existing campus of New Hope School in the Menlo Park area in Pretoria. The author proposes for the existing School site to be consolidated with the project site, as the project would form an extension of the School's services.

New Hope School is one of the major Schools in Pretoria and Gauteng which caters only for children with mobility and mental impairments.

The School is located on the border of a very important economical node that connects to a direct link between Pretoria east and the CBD.

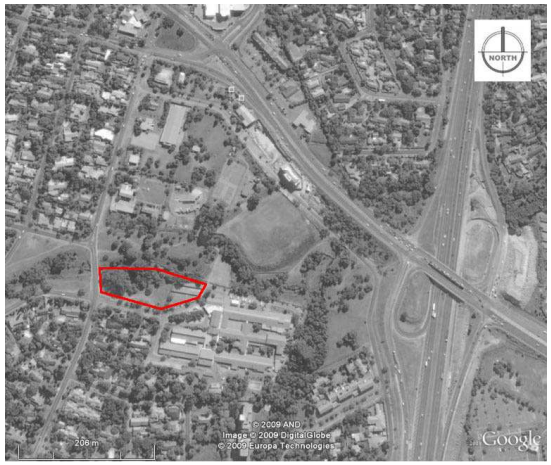


Figure 1. Location of site

"...architecture has to be experienced by all the senses, rather than just sight. The visual image may provide us with pictorial information, yet beauty is never skin deep." (Papanek, 1995:76)

1.3.1 THE AIM OF THE PROJECT

The centre will be seen as a play therapy centre, which is rehabilitation through play or enjoyment. The children will be physically and mentally rehabilitated, while being sensory developed by moving through and around the building.

Although children will receive a form of education and medical attention, this centre will not be used as a school or a hospital. The main idea of this centre will be to rehabilitate through alternative non-medical methods.

This centre will help educate and prepare the disabled children along with their parents or caretakers for the future, with the hope of one day integrating the disabled person into society.

The vision for this project is to create a "Cerebral Palsy" play environment. This could become their only normal, place where everything will be designed for their purposes and upliftment of their spirits and skill levels.

1.3.2 WHY A REHABILITATION CENTRE FOR CHILDREN WITH CEREBRAL PALSY?

1. To develop each child to his/her full potential and to integrate him/her into society.
2. To create a specialized facility for Cerebral Palsy children up to the age of 16, covering all aspects and phases of their rehabilitation.
3. To provide a 24 hour care facility for babies born with Cerebral Palsy and newly diagnosed children after they leave hospital.
4. To help educate the parents for the lifestyle changes they need to accommodate their Child's specific needs.
5. To create a support structure for people with cerebral palsy and educate people about cerebral palsy and spinal cord injuries.
6. Create an environment where people will notice and recognize a disabled person's rightful place as part of society.

1.3.3 THE CLIENT

The Life Healthcare Group in association with the Cerebral Palsy organization of South Africa will be the primary clients for this project along with New Hope School for disabled children in Menlo Park.

Life Healthcare group is one of the largest private hospital groups in South Africa, operating 62 acute care facilities and 4 rehabilitation units across the country. Life Rehabilitation runs a group of quality rehabilitation units whose main purpose is to provide acute rehabilitation for patients disabled by traumatic brain injury, stroke, spinal cord injuries and other disabling conditions, facilitating optimal functional independence.

New Hope School is multi-cultural School for Cerebral palsied and multi-disabled learners.

The school has hostel facilities to accommodate pupils from rural areas and neighbouring countries like Namibia, Zimbabwe, Botswana, Swaziland and Tanzania.

New Hope School is responsible for all transport of disabled pupils to and from all suburbs in the Pretoria region and would be utilized to make the proposed Rehabilitation Centre accessible on a daily basis to all children from Pretoria.

National Association for Persons with Cerebral Palsy. This is a non-profit organization that assists and care for all persons with Cerebral Palsy. This organization also helps disabled people to integrate into the community. They also contribute to establishment of schools for children with Cerebral Palsy, raising funds for support and educate and train individuals working with CP people.

Figure 2. Life healthcare logo

Figure 3. New Hope School logo

Figure 4. United Cerebral Palsy logo

BRIEF

1.4 PROJECT BRIEF

- To design a centre for children with Cerebral Palsy which will accommodate educational, mental and physical forms of rehabilitation under one roof.
- Rehabilitation should take place as a form of play and enjoyment through sensory development.
- Educational, social, rehabilitation and play areas to be integrated with each other.
- The building should be integrated with the natural and urban environment.
- The center should form part of the functions that New Hope School provides for their scholars as well as the public.

1.5 DESIGN OBJECTIVES

- Create a tranquil environment suitable for rehabilitation.
- Provide a designed environment for disabled children.
- To provide the pupils with sensory stimulation as they walk through the building, which in turn helps the therapists with their therapy.
- Associate nature with the building thereby exposing the visitor to natural textures, sounds and views.
- The architecture should be simplistic and should follow the existing style of the school.
- Movement should be economical and predictable.
- Rehabilitation should happed through enjoyment.

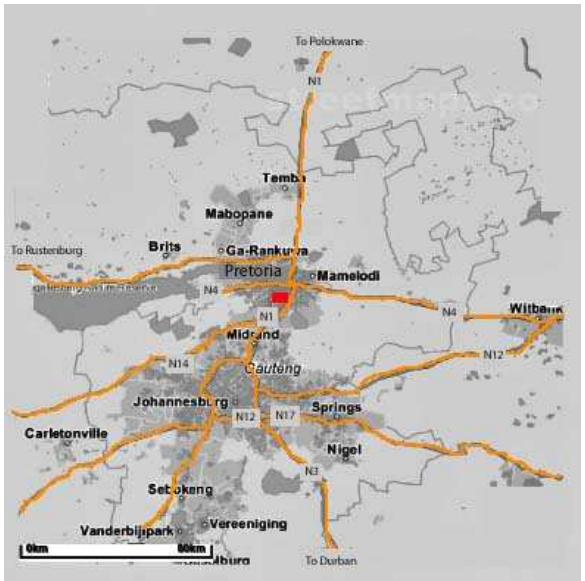


Figure 5.Gauteng context map

Figure 6. 20 km radius map

Figure 7. 2 km radius map

1.6 WHAT IS CEREBRAL PALSY?

Cerebral Palsy (CP) is the name given to a group of conditions in which there are disorders of movement, balance or posture caused by a defect or lesion/damage to parts of the brain, which control the muscles, balance and voluntary movements. (A Guide for parents, Genop healthcare pamphlet,2008)

Cerebral Palsy affects the messages sent between the brain and the muscles. There are three types of Cerebral Palsy, depending on which part of the brain is affected. They are spastic, dyskinetic and ataxic. Many people with Cerebral Palsy have a combination of two or more types, and one of the difficult things about the condition is that its effects vary so much from one person to another. (Bleck & Nagel, 1975:4)

1.6.1 SPASTIC CEREBRAL PALSY

Spastic Cerebral Palsy is due to damage or abnormal development of the cortex (brain cells), which controls movement. Spastic describes the disorder in which some muscles become stiff and makes movement difficult. (Bleck & Nagel, 1975:4)

1.6.2 DYSKINETIC CEREBRAL PALSY

Dyskinetic Cerebral Palsy occurs due to an abnormality in the basal ganglia (group of brain cells deep in the brain). As basal ganglia help movement become organized and graceful, an abnormality causes various involuntary movement disorders. (Uncontrollable movements of limbs and body) (Bleck & Nagel, 1975:4)

1.6.3 ATAXIC CEREBRAL PALSY

Children with ataxic cerebral palsy find it difficult to balance and co-ordinate hand movements. They are unsteady and may have frequent falls. They may also have shaky hand movements and unclear jerky speech. Ataxic cerebral palsy is a result of defect or damage of the cerebellum at the base of the brain. (Bleck & Nagel, 1975:4)

There is no cure for Cerebral Palsy. With detailed assessment of the child's problems, and skilful patient rehabilitation, partnership of professionals and parents, a great deal can be done to minimize the secondary problems and ensure that each child achieves as much of their potential as possible. Appropriate active management from an early age can enable many children to lead a full and reasonably independent life. This involves the creation of an individual treatment plan with clearly identified practical goals. (A Guide for parents, Genop healthcare pamphlet,2008)

1.7 RELEVANCE TO DESIGN

Movement becomes a very important aspect when designing for children with Cerebral Palsy, as this can provide a sensory stimulation to the child as they move through a space.

Movement through the building should be economical and because movement will be slow, attention to detail of all textures, elements and connections becomes integral for the designer.

Figure 8; 9 & 10. visual identification of children with Cerebral Palsy

1.8 CAUSES OF CEREBRAL PALSY

This may be caused by a developmental abnormality or an injury to the brain occurring while the baby is developing in the womb or during pregnancy, delivery, or shortly after birth. Cerebral Palsy is a permanent condition but sometimes the effects become less. *(Lingam and Lloyd-Evans, 1997: 9)*

The following activities form part of one's everyday life that could cause cerebral palsy and spinal cord injuries.

Prenatal Causes Infections in the mother during pregnancy

- It could be inherited (very small percentages)
- Pregnant woman in a motor accident
- Premature birth
- Diabetes in pregnant women
- Birth injuries

Postnatal Causes

- Head injuries
- Brain infections like meningitis and viral infections
- Drowning
- Cardiac arrest
- Brain tumors.

(Bleck & Nagel, 1975: 21)

1.8.1 TREATMENT

The treatment of Cerebral Palsy comes from various therapists and professionals and it's vital that the child undergo these treatments with their parents or caretaker.

The various professionals are:

- Physiotherapy
- Orthopedic surgeon
- Pediatrician
- Community or district nurse
- Psychologist
- Occupational therapist
- Speech therapist
- Social worker

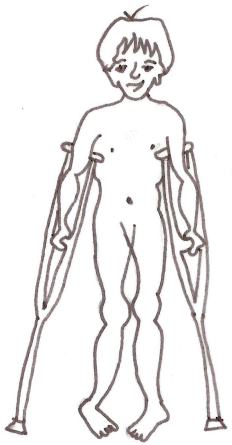
1.8.2 THE WAY FORWARD

More effort, funding and research should go into the designing and site selection of rehabilitation centers in South Africa.

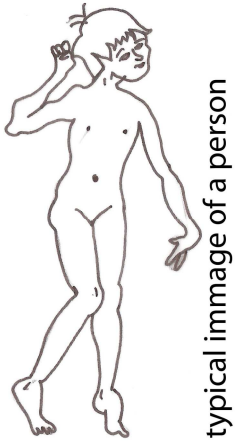
The government, as well as the private sector tend to discard design values when it comes to building for the disabled.

These institutions always seem to be the background buildings and priorities in the cities and need to be Incorporated into the able-bodied society for more opportunities.

typical immage of a person with spastic CP



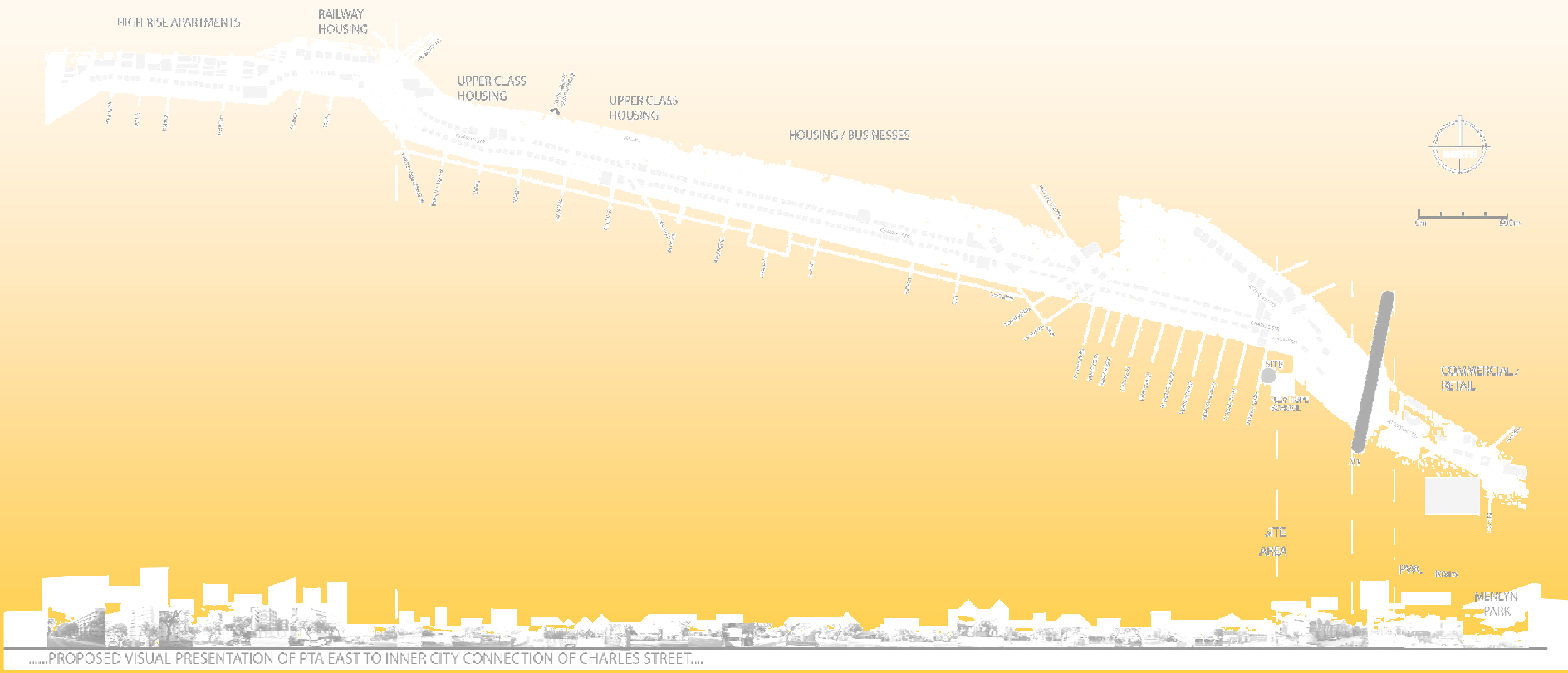
typical immage of a person with ataxic CP



typical immage of a person with dyskinetic CP

Figure 11; 12 & 13. Illustrations from cerebral palsy brochure, life health, 2009

‘ Nothing is as dangerous in architecture as dealing with separated problems; If we split it into separated problems, we split the possibilities to make good building art’ - Alvar Aalto



2.CONTEXT STUDY & SITE ANALYSIS

2.1 INTRODUCTION

The proposed context study will be divided into 2 categories: Macro & Micro sites.

The macro site includes the surrounding suburbs of the proposed site. Movement and context are aspects that will be studied within this area.

The micro site will be an in-depth study of the proposed project site and its immediate context.

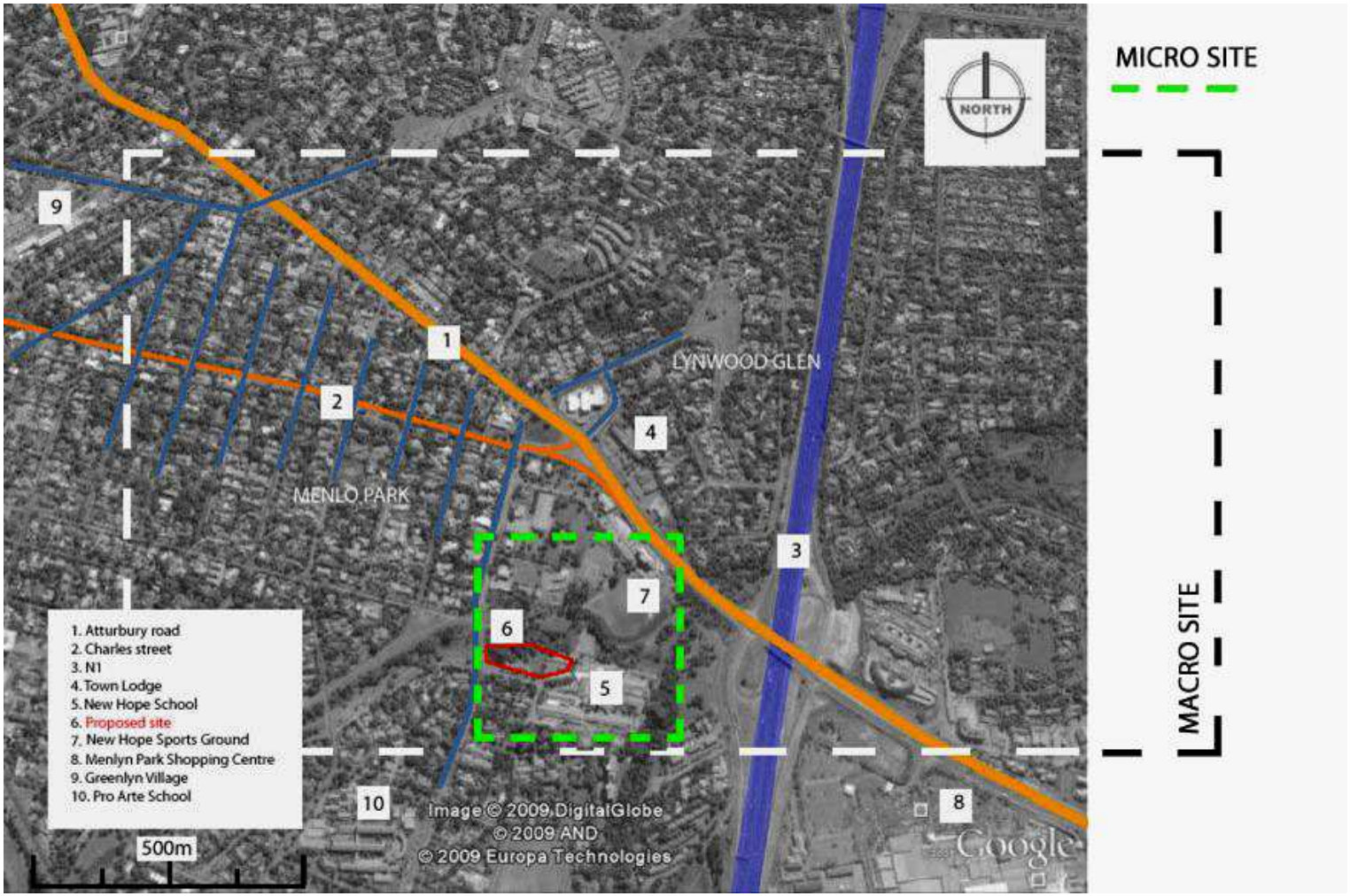


Figure 14. Arial photo indicating the micro and macro site, Google earth map

2.2 MACRO SITE

Menlo Park, Pretoria, is mainly a residential suburb which is bordered by upmarket areas such as Waterkloof, Brooklyn and Lynwood. It is believed that Menlo Park was first established in the late 1950's. At that time it was the most eastern suburb of Pretoria.

Menlo Park is situated next to the N1 between JHB and Pretoria and is central to the main economic nodes of the greater Pretoria area. It is easily accessible from other cities via the N1, N4, R21, R28 and other major routes. Menlo Park is also linked to the inner city through a network of major arterial routes that borders this suburb.

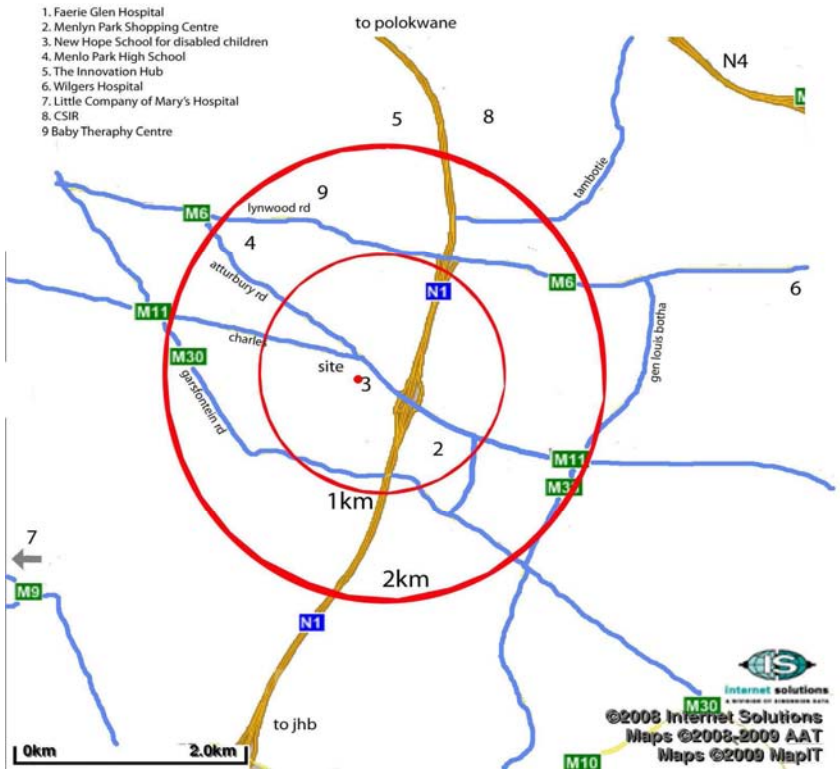


Figure 15. 2 km study area context map

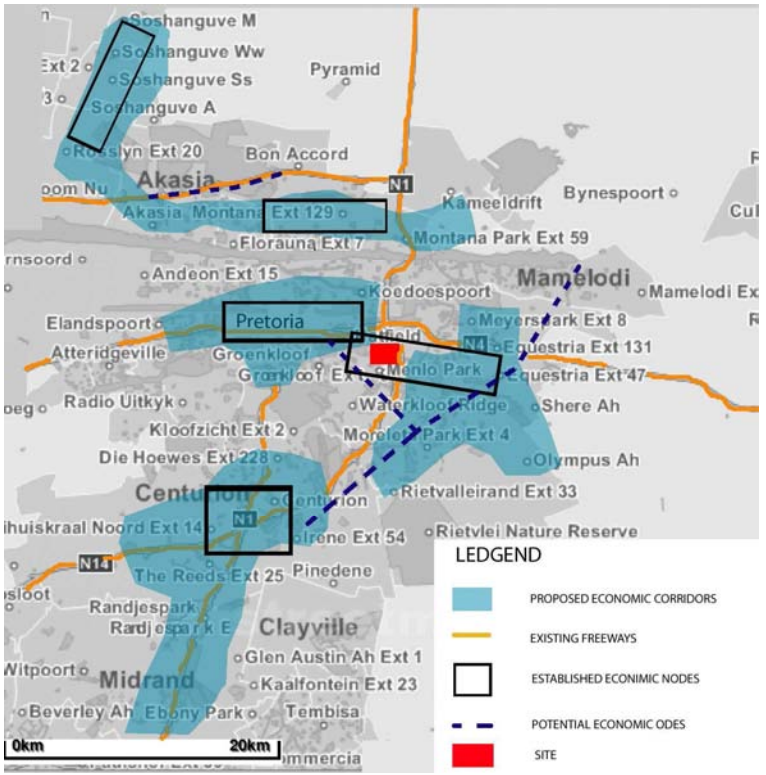


Figure 16. Existing economical node map, www.streetmap.co.za

2.2.1 MACRO SITE CONTEXT

The macro site is bordered by three main arterial routes, Garsfontein, Lynwood and General Louis Botha streets.

The site is situated less than a kilometer from Menlyn shopping Centre and in close proximity of more retail and commercial buildings.

This area is emphasized by the N1 north and south splitting it in two.

Although the area consists of more than 60% residential developments, this area is recognized by a wide range of activities, such as shopping opportunities, retail and commercial spots, schools and various recreational options.

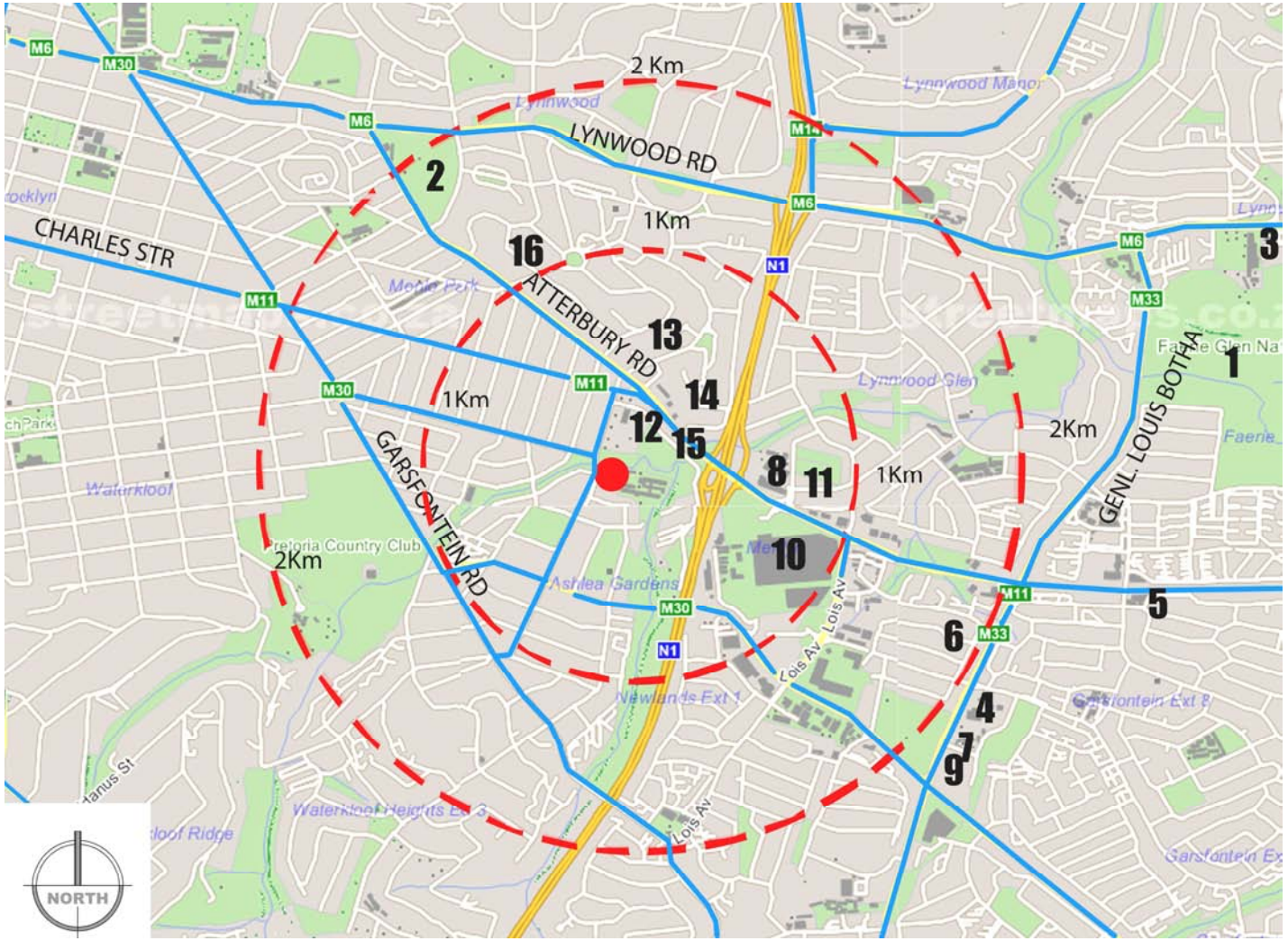


Figure 17. City-wide context map.

2.2 MACRO SITE

Figure 18. Faerie glen nature

Figure 19. Menlo park high school

Figure 20. Wilgers Hospital

Figure 21. Virgin Active Menlyn

Figure 18 to figure 33 is a photographic study of the city-wide context the proposed project should connect to.

Figure 22. Fearie glen Hospital

Figure 23. Menlyn Maine

Figure 24. Menlyn Mercedes garage

Figure 25. PWC building

Figure 26. Menlyn BMW garage

Figure 27. Menlyn shopping centre

Figure 28. RMB offices

Figure 29. View towards the west from N1, Atterbury road offramp

Figure 30. New Investec offices

Figure 31. City town lodge, Atterbury road

Figure 32. Attitude office park, Atterbury road

Figure 33. BOE building,

2.2.2 MOVEMENT & ACCESSIBILITY

The site is easy accessible from almost all major economic corridors via the N1 and various other main routes like Charles, Atterbury, Garsfontein and Lynwood roads.

The existing pick-up and drop-off transport system of New Hope School will be utilized and extended for the purpose of the new Rehabilitation Centre.

Charles Street is allocated as n proposed commercial/retail corridor that forms a direct link between the city centre and the east of Pretoria. Charles Street is currently upgraded to widen the link between the city and Pretoria east.

Although there is no train or Gautrain connections linked to the Menlo Park area, the area is frequently serviced by taxi's and busses.

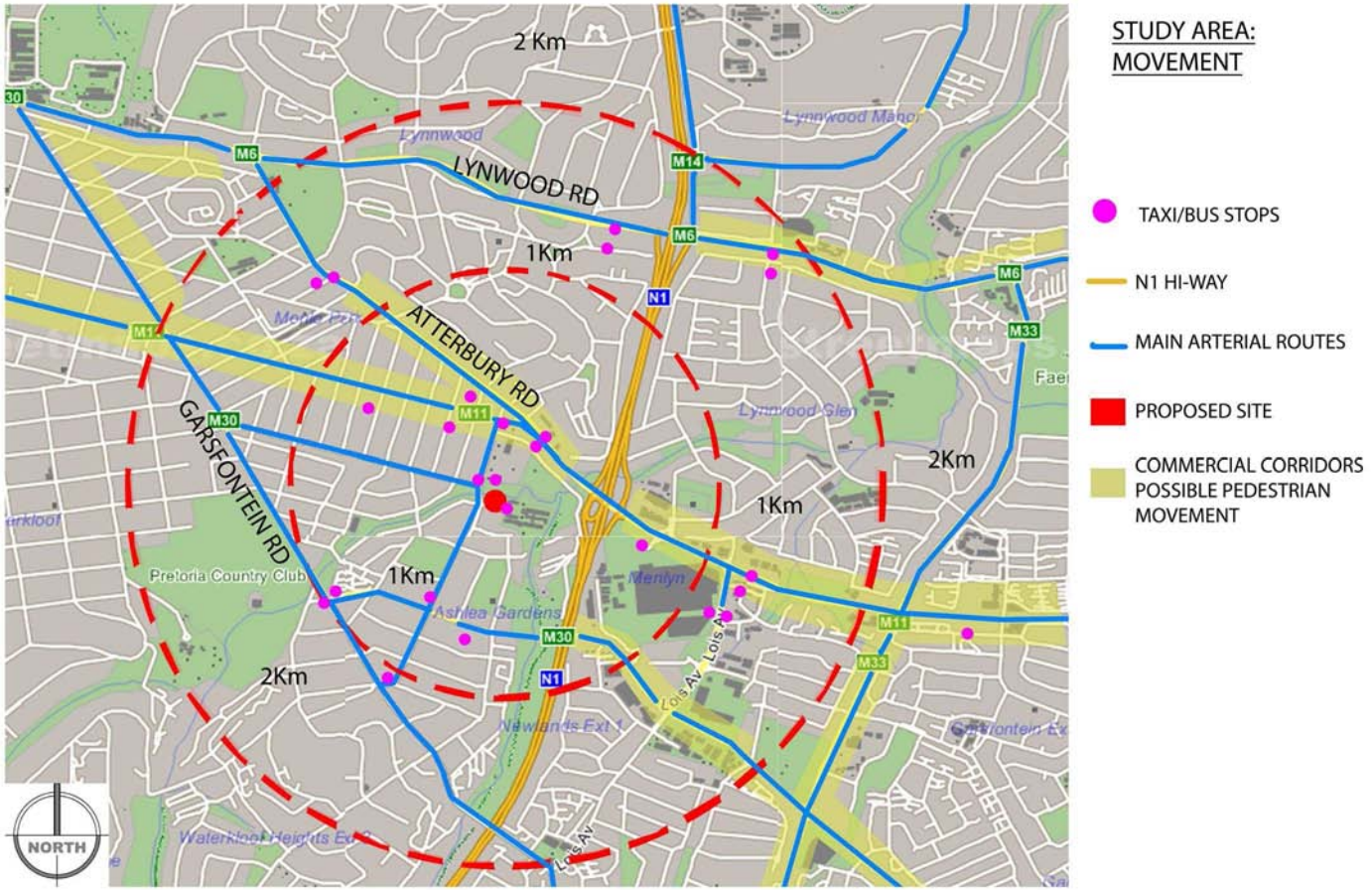


Figure 34. Movement map for macro site

2.2 MACRO SITE

This diagram indicates the direct link from the proposed site to the inner city via Charles street. Charles street is currently being up-graded by the City of Tshwane through a R87 million project .

Charles street is currently zoned with business rights and forms the basis of the economic belt with small and medium businesses between Pretoria East and the CBD.

This economic corridor would attract people and thus expose the proposed Rehabilitation Centre.

This movement study solves the problem of choosing a site within an existing economic node or belt which will be accessible for people from all parts of Pretoria as well as from cities

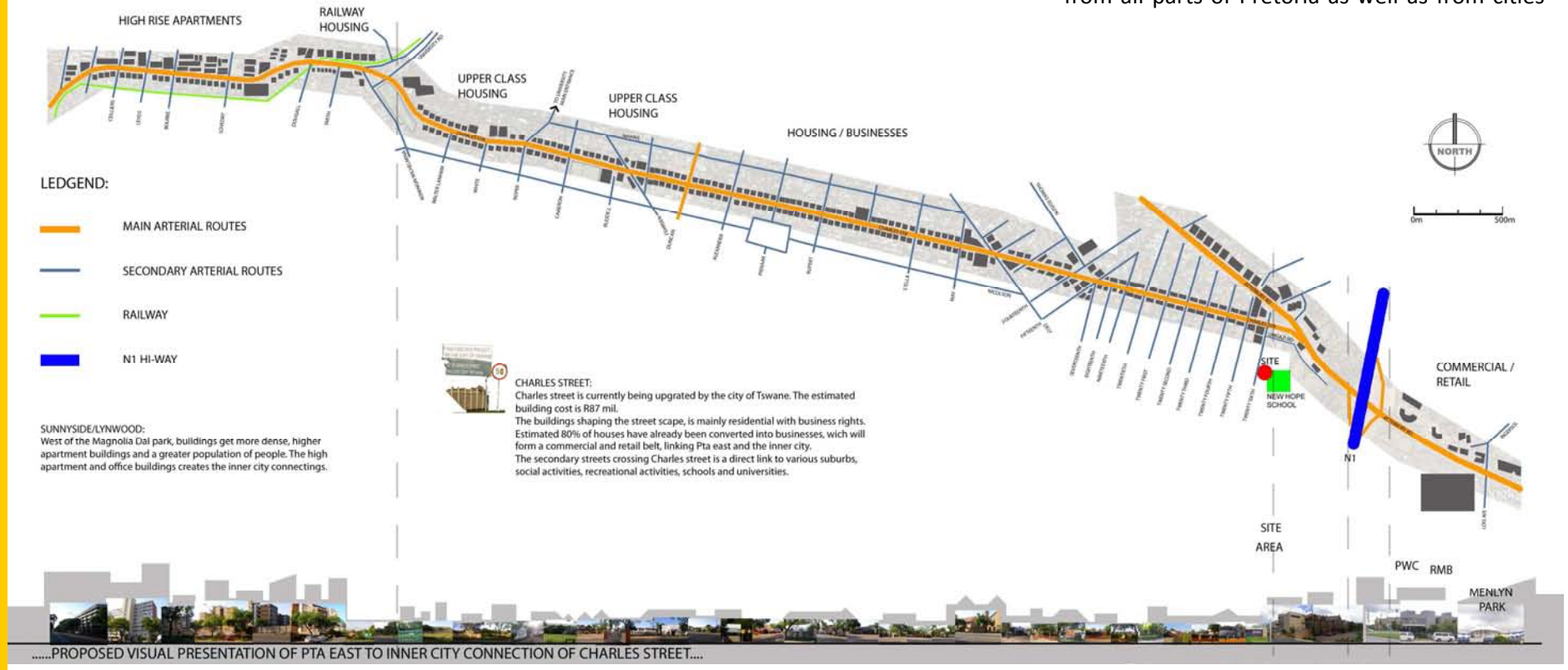


Figure 35. Charles street link between Pretoria East and the inner city

2.3 MICRO SITE

The project site is located on the north western edge of New Hope School. The proposed site would be consolidated with the existing site of New Hope School.

The site is bordered by Ceceilia road on the southern side and by 26th avenue on the western side. To the north of the site, an open green area is formed around Waterkloof spruit that is running from east to west, originating from the Waterkloof suburbs and flowing into the Struben dam in Faerie Glen.

The current stand number is 162 Ceceilia road, erf 155, Ashlea Gardens.

Figure 36. 200 m radius map of project area

2.3.1 CONTEXT

PROPOSED SITE:

The proposed site is currently zoned as open green area, but is not being used as one. However, the open green area north of the site does accommodate people using it for its purposes.

NEW HOPE SCHOOL

New Hope School was established in 1971 by Dr. Potgieter and started with only 33 children and is today one of the largest learning centers in the country, which makes provision for the education and treatment of learners with special educational needs.

Education and therapy are provided by almost 70 teachers and therapists in an educational environment which accommodates learners of all cultures, classes and beliefs. This learning center is state subsidized and is managed by a governing body.

At present New Hope has 410 learners who receive instruction on pre-primary, primary and secondary levels. Outpatients comprising of babies from 0-3 years old are treated twice a week. Cerebral palsied learners who are too disabled to follow the ordinary school curriculum are taught in special classes.

Continual education and evaluation is done by a multi-disciplinary team comprising of psychologists, speech therapists, occupational therapists, physiotherapists and teachers.

Currently the rehabilitation area is cramped into a small space which was originally allocated for classrooms.

WATERKLOOFSPRUIT:

Waterkloofspruit forms a major feature of the proposed site and could be rehabilitated and incorporated into the design. The spruit originates in the waterkloof area, mostly because of storm water run off, flowing from east to west and end up in the Struben dam in Faerie Glen.

SPORTS GROUNDS:

The school's sports grounds are detached from the school building and connected by a paved road through the green area.

Figure 37. Photo of entrance of New Hope School

Figure 38. Photo of Waterkloof spruit

Figure 39. New Hope School sport grounds

2.3 MICRO SITE

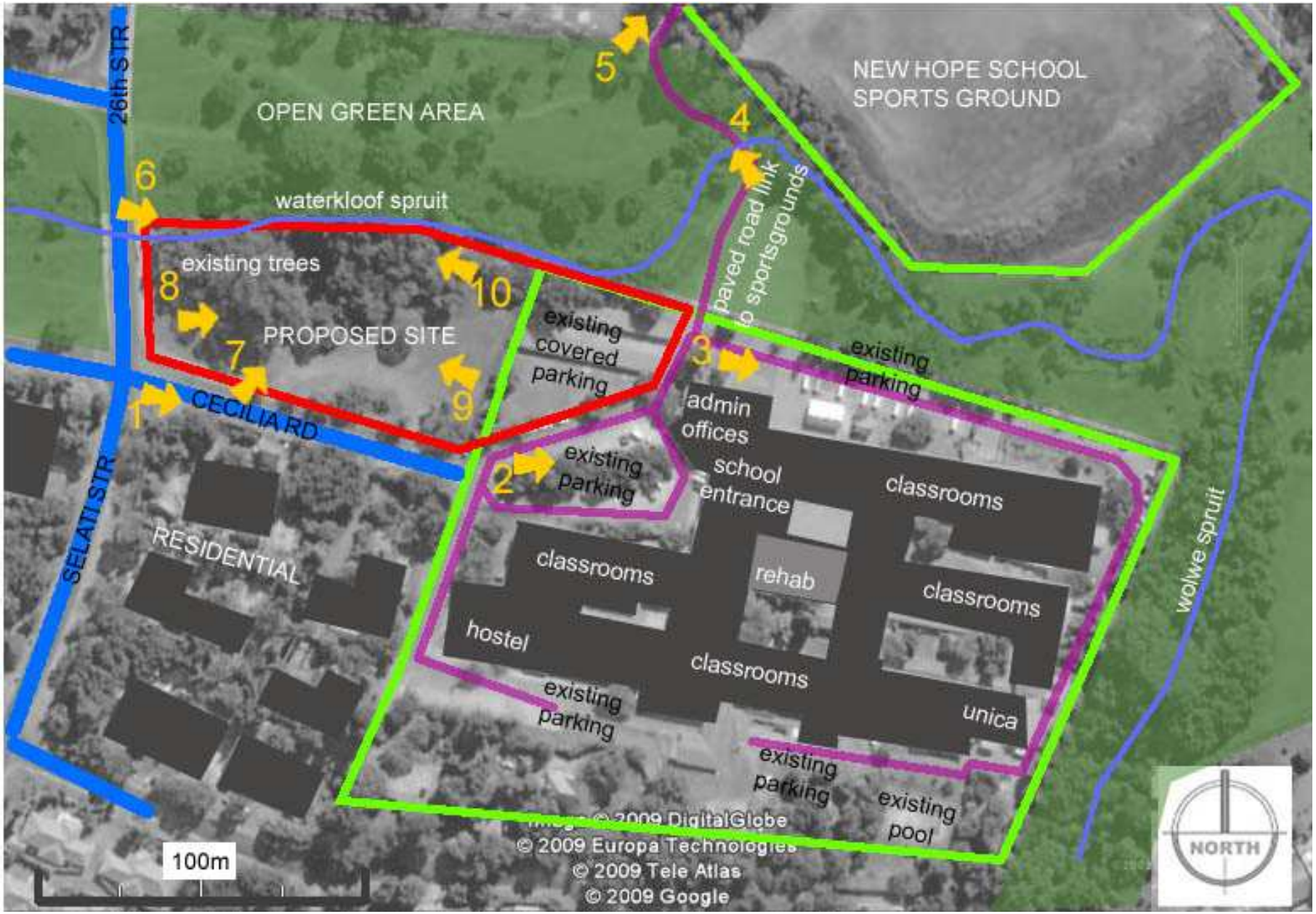


Figure 40. Accommodation diagram of micro site

2.3 MICRO SITE

Figure 41. View towards main entrance gate of New Hope School

Figure 42. Main entrance of New Hope School building

Figure 43. View towards existing New Hope School transport parking area

Figure 44. Existing bridge over Waterkloof spruit on interior road towards sport grounds

Figure 45. Road towards sport grounds

Figure 46. Waterkloof spruit

Figure 47. Proposed site photo.

Figure 48. Proposed site photo

Figure 49. Proposed site photo

Figure 50. Proposed site photo

2.3.2 MOVEMENT & ACCESSIBILITY

The main entrance to the existing school site is situated on the eastern end of Ceceilia road.

When entering the school site, the visitor will face a deformed circle that leads to the drop-off zone and all internal roads will initiate from here. The inside of the circle is currently being used for personnel parking mixed with visitor parking, if the visitor could find a space.

A 4 meter wide paved road leads to the scattered parking areas around the School, which works on a first come first serve basis.

The vehicular movement and parking arrangements within the School site could be redesigned in a more organized manner by allocating the parking.

The current circle at the entrance of the school would be redesigned to present an organized entrance to the School.

A designed square would be created to link the existing School and the new Rehabilitation Centre.

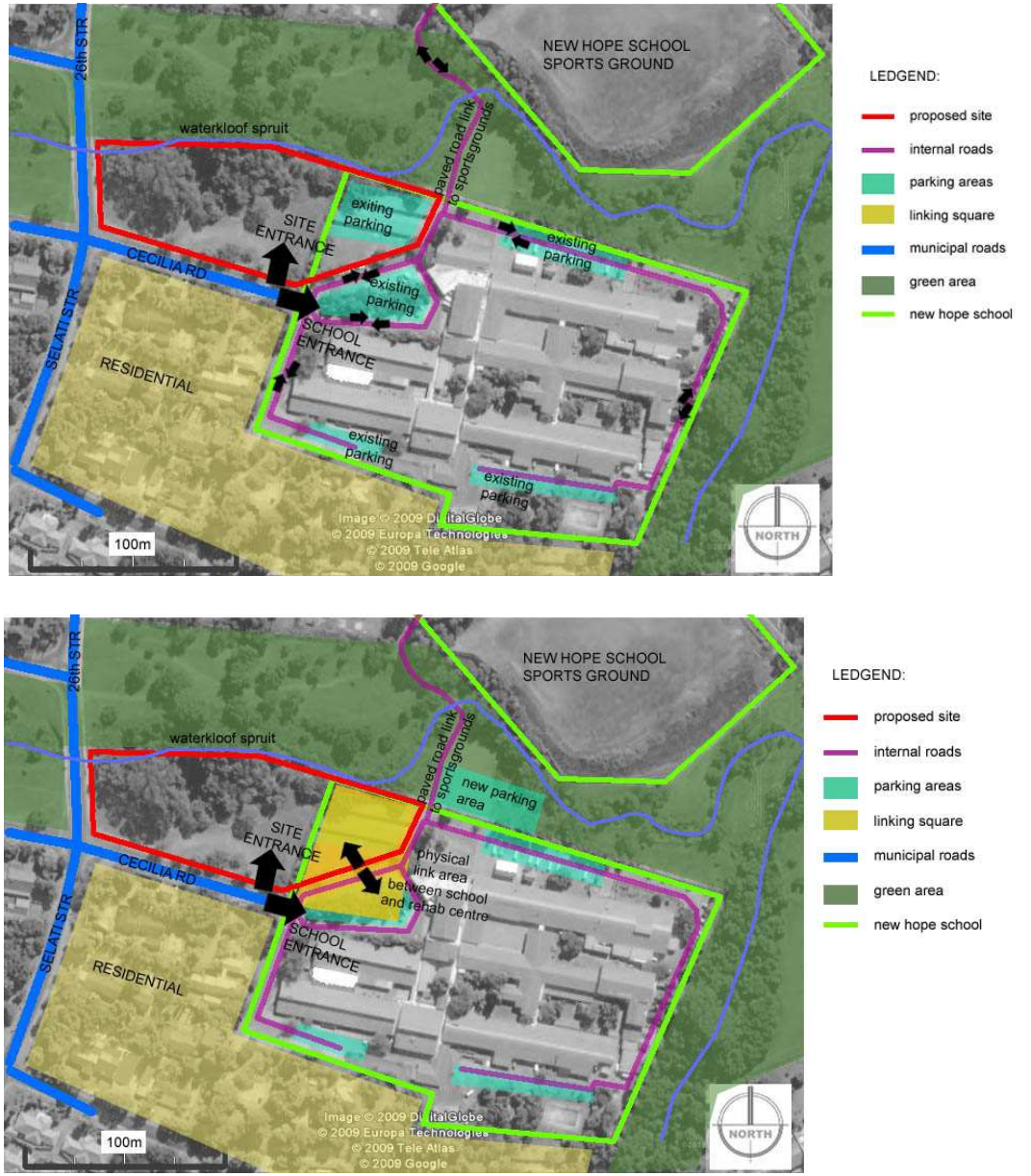


Figure 51. Movement diagrams of proposed site.

2.4 PHYSICAL CONTEXT

2.4.1 NATURAL FEATURES

CLIMATE:

Pretoria falls into the temperature eastern plateau region. Generally this area consists of predominantly grasslands with scattered trees in the wetter areas. Summers are warm to hot, with fairly dry air, relieved by thunder storms generated by thermal air movement. Hail is not uncommon. Winter days are pleasantly sunny with clear cold to very cold nights. (Napier,2000)

RAIN:

The rainy season occurs from November to March, peaking in January. 50 to 80 days of rain can be expected annually.

CLIMATE FACTS:

January temperature:	20 to 25deg C
June temperature:	10 to 15 deg C
Prevailing winds:	NE to NW in winter
Relative humidity:	3 0 %
Hours sunshine:	60%
Average Rainfall:	670mm
Winter solstice:	22 June 41deg
Summer solstice:	22 December 88deg

The large north faced site boundary provides a great opportunity for a building design that is climatically automated by natural elements. The prevailing North eastern wind in the summer flowing over the spruit could provide good cooling down possibilities with effective design.

The penetrating angle of the sun will be kept in mind when designing internal spaces. The natural elements like hail, could lead to the use of gutters for capturing of rain water and using it for external purposes.

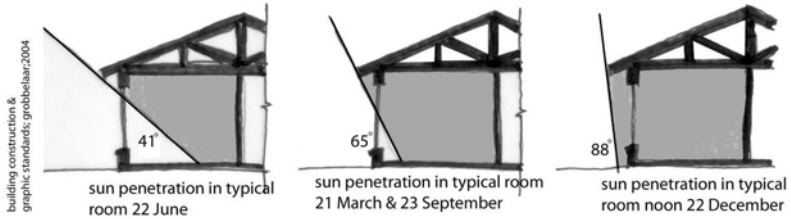


Figure 52. Penetrating angles of the sun

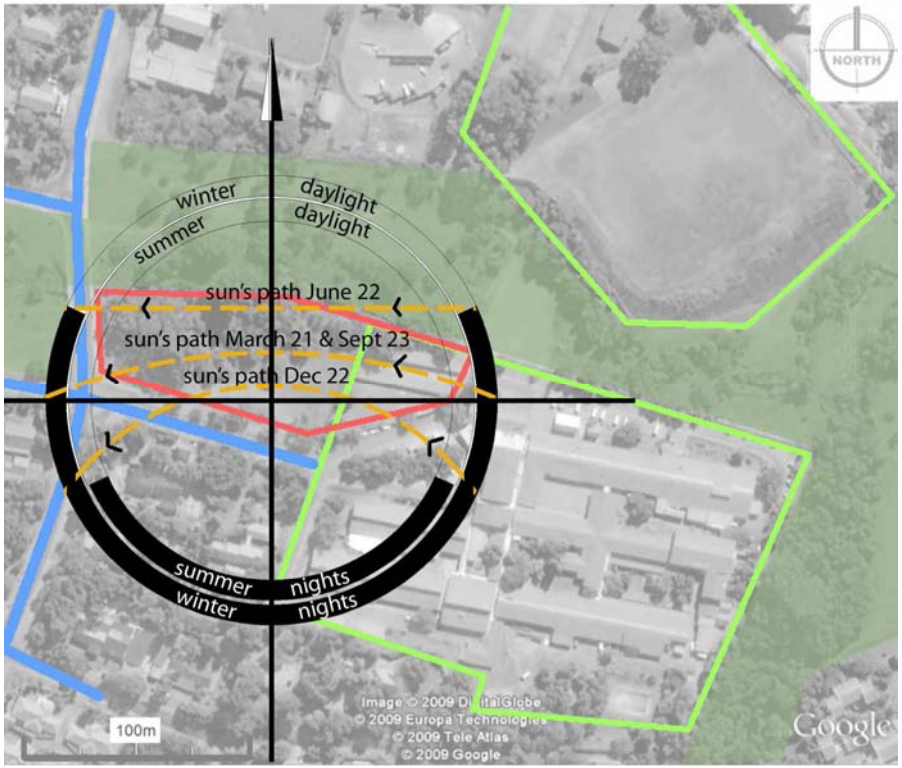


Figure 53. Sun solstice

3.PRECEDENT STUDIES

3. PRECEDENT STUDIES

3.1 INTRODUCTION:

In this chapter the author will look at various precedent studies which will be divided into different categories.

These categories include:

- Philosophy of rehabilitation of people with cerebral palsy
- Accommodation and functional layout of rehabilitation centers for disabled people
- Spaces for children
- Architectural style

In some cases, one project may be used in more than one of the above mentioned categories.

Figure 54. Precedent studies compilation

3.2 PHILOSOPHY FOR REHABILITATION OF PEOPLE WITH CEREBRAL PALSY

3.2.1 WILLIAM C HARVEY SCHOOL, LONDON

William C Harvey School is one of the leading rehabilitation schools for children with disabilities, and their specialized and innovative methods of rehabilitation makes this an ideal case study for functional purposes.

Its vision is that 'the school should be full of laughter, light and enthusiasm' has an extremely positive impact on pupils' achievements and their personal development, both of which are excellent. There's a clear focus on the individual needs of the children.

The use of innovative skills and sensory development through enjoyment makes them a leader in rehabilitation and education of disabled children.

Although William C Harvey is an educational school, much can be learned in the techniques used to educate and rehabilitate these children to develop their full potential.

3.2.2 LITTLE SCHOOL. SAN FRANCISCO ARCHITECT: MARK HORTON, 2005

A modern design for innovative children facilities that captures their imagination. Using a multi-sensory approach and incorporating current knowledge about learning.

By partnering with parents, teachers build a trusting, caring relationship with each child based on deep knowledge about that child's needs.

Little school believes that learning occurs through exploration, experimentation and discovery. By combining open, play-based times with more structured activities like music or meeting time, children experience a wide variety of settings designed to serve all learning styles. **Fun is a top priority.**

This precedent represent a philosophy of exploring through play and building relationships between child, therapists and the building.

The children build a relationship with the building because of the excitement created by the play areas.

To build a relationship with the child, the teachers of Little school spend time playing with the child and thus moving into the same social levels.

Trying to define a space that a child is attached to, would be the main idea. The spaces in the building should have special attributes and make the child aware of here and now. These children need boundaries which guide them in forming a bond with the building (Blom 2006; 25-32)

Figure 55.Play ground image, little school

Figure 56. Play ground image, little school 2

3.3 ACCOMODATION AND FUNCTIONAL LAYOUT OF REHABILITATION CENTERS

3.3.1 RIVER FIELD LODGE, MULDERSDRIFT, SOUTH AFRICA

Life River field Lodge is situated in the Fourways area, in a tranquil, peaceful setting on the banks of the Jukskei River.

The care centre accommodates about 30 adults with cerebral palsy and specializes in aspects like psychology and physical therapy. An intensive care unit for the Cerebral Palsy section of +/- 10 beds accommodate severe cases rehabilitating directly out of the hospital.

After an interview with their head psychologist, Roline Hofsure, a location with enough recreation and social space is integral for the rehabilitation of people with Cerebral Palsy.

Social spaces like TV rooms, eating halls and lapa's are necessary for interaction between disabled people, and good for their overall self confidence. The designer used courtyards to connect the building and patients to the environment.

Figure 57. Green areas between walkways and buildings

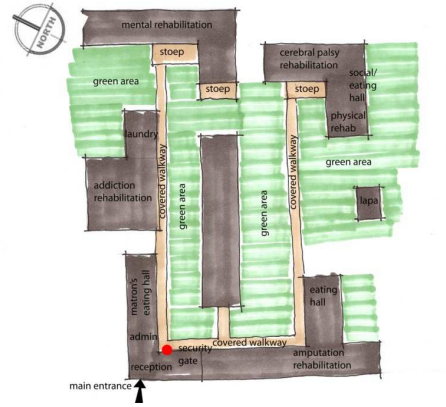


Figure 58. Schematic representation of River filed Lodge. The use of green spaces between the buildings create a quiet and relaxing atmosphere for patients.

3.3.2 WILLIAM C HARVEY SCHOOL, LONDON

As stated in precedent study 3.1.1, William C Harvey school specializes in innovative methods for rehabilitation.

The specialized therapy include rooms such as :

- Dark room therapy
- Play room therapy
- Hydro therapy

DARKROOM THERAPY:

This therapy is dedicated to channel the child's concentration to one matter where nothing else can divide their attention. The dark room also helps the child to identify with his/her

Example: Some pupils can not move their feet if they can't see them. Lava lamps are a good way to learn colours and is used for relaxing.

Figure 59. Dark room therapy

PLAYROOM THERAPY

Here, the children can express themselves through play. The playroom is equipped with various toys and equipment to accommodate any play fantasy. The theory here is that the therapist participates in the play and thereby acquires a better idea of the child's personal needs. This also builds a relationship between child and therapist.

Figure 60. Play room therapy

HYDRO THERAPY:

Physical therapy in a heated pool which helps the muscles relax, especially in case of severe spastic children. The different flows and thrusts of the water stimulate the muscles . This is a more private space than the pool area.

Figure 61. Hydro therapy pool

3.4 SPACES FOR CHILDREN

3.4.1 ASAHIKAWA SHUKODAI PARK

Location: Asahikawa, Japan, 1994

Architect: Mitsuro Man Senda

Children's adventure park.

Touching, jumping, chasing, feeling their way, climbing and sliding. Using all their senses and adapting their bodies to different situations.

Play is intermingled with nature, creating a sort of partnership. The site is located on a site affording the maximum contact with nature

"Play can involve nature as a friend"- Mitsuro Man Senda.

Senda states that it is the height of vision that is the determining factor when considering the design.

Details must be meticulously studied and materials must be both harmless and suitable, no matter how the children choose to use the play areas. (Cerver,2000: 471)

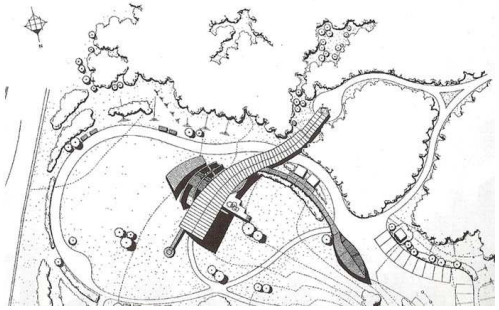


Figure 62. Image fromShukodai park

Figure 63. Image from Shukodai park

Figure 64. Image from Shukodai park

3.4.2 KIDS PLAY ROOMS

Architect: un known

COLOUR:

The use of color is very prominent in both designs for children spaces. Bright colours stimulate senses and creates excitement for children.

ACCOMMODATION:

Different play methods are specifically allocated within the play area. This will force the play to be specific and organized.

MATERIALS:

Materials are soft and suitable for any type of play. Materials create different challenges of play, example, sliding in pipe, moving over fibre net, keeping balance on different shapes of support.

Figure 65. Playground image from world wide web

Figure 66. Playground image from world wide web

3.5 ARCHITECTURAL APPROACH

3.5.1 N4 DIAMOND HILL TOLL PLAZA, GAUTENG, 2005

Architect: Mathews & Associates Architects in association with Karlien Thomashoff Argitek.

This precedent was chosen to investigate the simplicity of the architecture as well as the use of materials such as natural stone, steel and glass and its connections.

To build on a large flat open site, the architect used elements like steel light masts to create a sense of space which forms the gateway through the toll plaza.

The use of corrugated steel roof sheeting on the control building are direct references to the pre-manufactured agricultural sheds in the surrounding landscape.

The contextually inspired design approach is carried through to the choice of building materials for the building and structures.

External derailing ensures that security concerns did not destroy the aesthetics of the building.

Concealed gutters were incorporated into the design, with down pipes forming an integral part of the external fenestration.

(digest of South African Architecture, 2005: 68)

Figure 67. Rainwater down pipe detail

Figure 68. Roof and gutter detail

Figure 69. North western elevation

Figure 70. Roof deatail

3.5.2 KIRSYENBOSH RESTAURANT

Southern Cape, 1999

Architect: GAPP Architects

This precedent was chosen for the way this restaurant connects with the environment through material usage and layouts.

GAPP Architects describes the architectural language which it has used as deriving from the natural world. " Its grammar and syntax are rooted in the culture of modernism which seeks to heighten the experience of the natural world through its juxtaposition and contrast with the constructed artifact rather than by blurring the boundaries of the two" (Digest of South African Architecture, 2000 :12)

Nature is invited into the restaurant area with the use of double volume glass facades, which allows for a view towards large trees and green areas. The nature feeling is emphasized with the use of natural timber ceilings and stone.

The pergola covered patio acts as a transition area towards the garden and creates direct access to the restaurant area. The large glass facades in this instance creates an inviting feeling into the restaurant.

This is a venue competent to meet the wishes of every individual and exploit the beauty of every season.

On a warm, summers evening it is possible to savor a good wine or sip away at a cocktail whilst the Cape sun sets majestically over the mountain. In the winter it is possible to dine in intimate delight as the warmth from the glowing log fire pleasantly lulls your senses.

Figure 71. Large glass façade and restaurant area

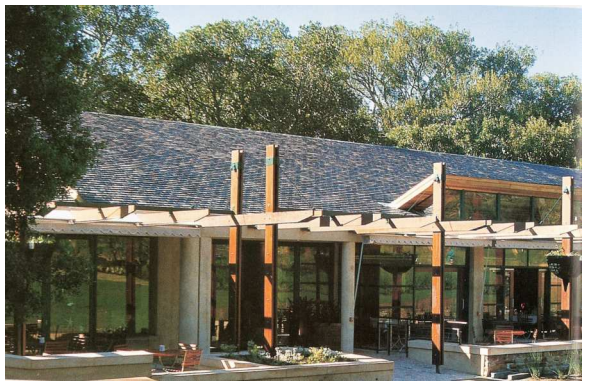


Figure 72. View towards restaurant area

Figure 73. Dining area

3.5.3 BARCELONA PAVILION

Barcelona Spain, 1928, rebuild 1959

Architect: Ludwig Mies van der Rohe

"The Barcelona pavilion was without practical purpose. No functional programme determined or even influenced its appearance. No part of its interior was taken up by exhibits: the building itself was the object on view and the 'exhibition' was an architectural space such as had never been seen. The building consisted of walls and columns arranged on a low travertine marble podium...it channeled space between separate vertical and horizontal planes. But this time the flow of space was held within clamp-like walls at each end of the podium."- Pawley

The canvas roof appear very light because it is seated on only eight steel columns. This allowed the walls to be separated from the structure and define the interior flowing spaces.

(De Sousa, 2002:14)

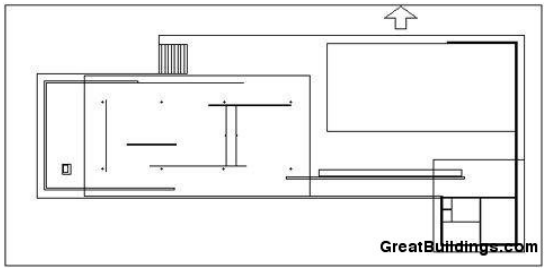


Figure 74. Plan of pavilion

"Radical rationalist that he is, his designs are governed by a passion for beautiful architecture. He is one of the very few modern architects who has carried his theories beyond a barren functional formula into the plastically beautiful. Material and space disposition are the ingredients with which he gets his effect of elegant serenity. Evincing in his work a love for beautiful materials and textures he emphasizes this predilection."— Helen Appleton

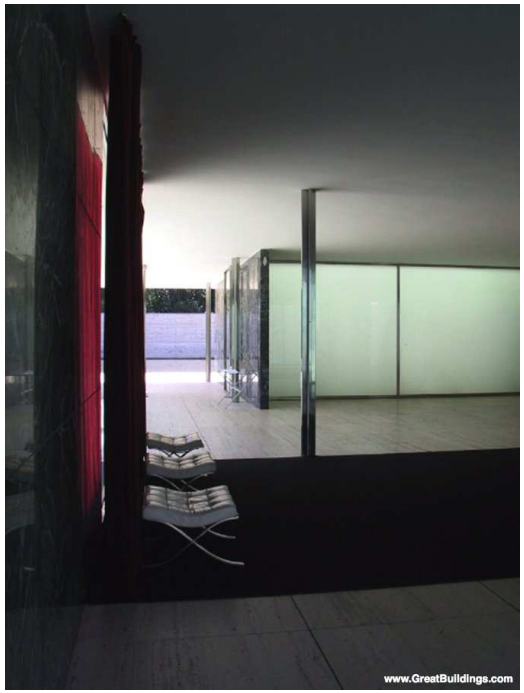


Figure 75. Steel column in building

Figure 76. Elevation over pond

Figure 77. Steel column and glass facade

3.5.4 GARDEN PAVILION

Nieuw Muckleneuk, Pretoria, 2000

Architect: Comrie Wilkinson

A very transparent method of construction is used, consisting mainly of off-shutter concrete, timber and large glazed areas.

The light structure of the rest of the building enhances the bold sculptural qualities of the off-shutter concrete wall and the square and circular geometrical shapes at the far end of the building. Together with the main roof sloping upwards to the southern side, the adjacent lush and tall tropical plants are invited into the building.

From these pictures below, the simplistic nature of this architecture is evident. By creating a solution for using a light structure, the use of materials comes to the forth.
(South African architect, 2000:22)

Figure 78. Images garden pavilion

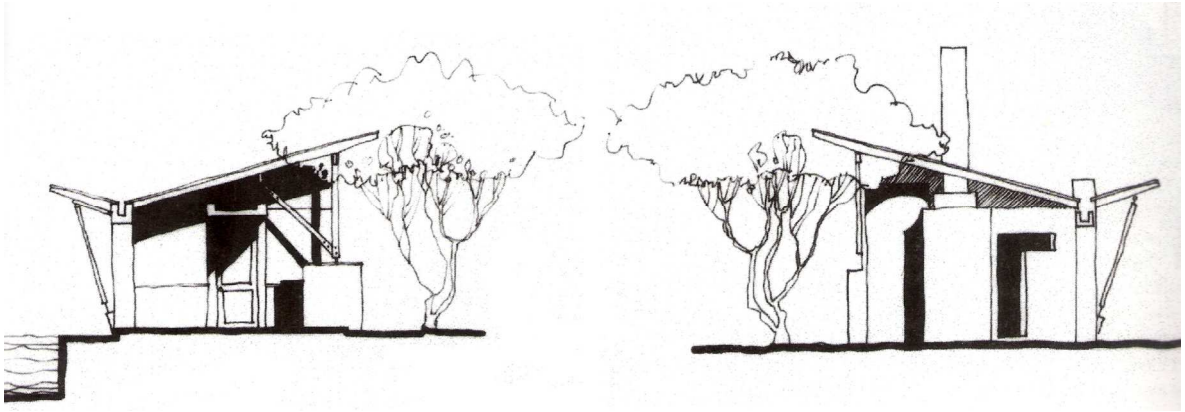
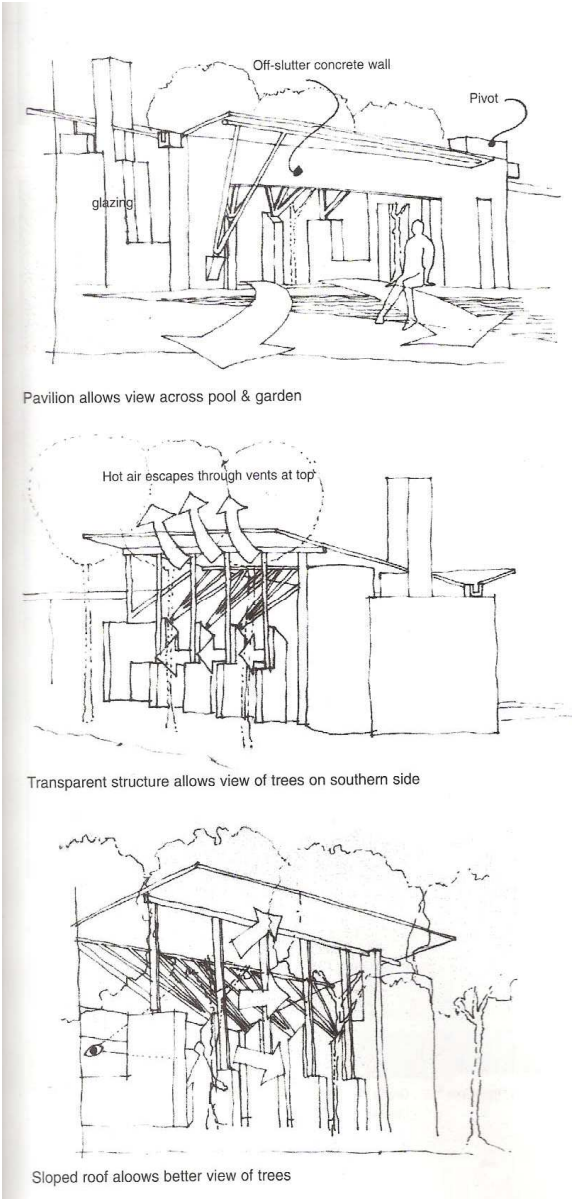


Figure 79. View of interior detail

Figure 80. Images of garden pavilion



3.5.5 TEA PAVILION

Rheden, Netherlands, 2002

Architect: Bjarne Mastenbroek

“Green is the calm component of the city, a constant factor. That is why I have a somehow obsessive relation to trees. Trees are to me something very important in urban life. I think I could never miss this basic quality."-Bjarne Mastenbroek

Mastenbroek’s ambition is to give strong spatial and natural qualities also to buildings on urban locations. He emphasizes the importance of the balance between built volume and green open space in the closest neighborhood.

To create a rustic ceiling texture, Mastenbroek used vertical hanging pieces of timber.

The flooring is textured by cross-cut sections of local trees, embedded in epoxy flooring, leveled and sealed. (Hauser, 5/2004:14)

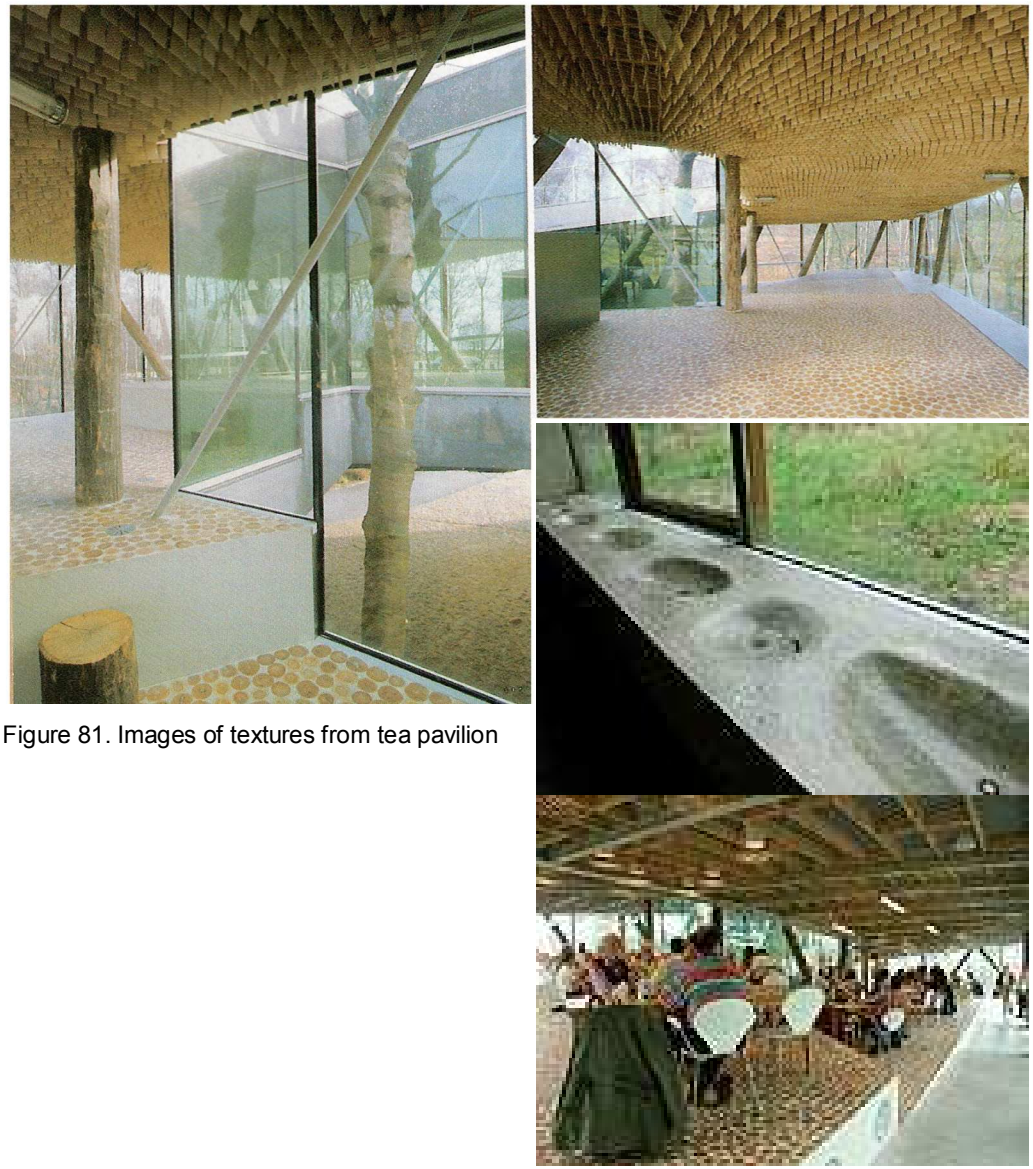


Figure 81. Images of textures from tea pavilion

4. THEORETICAL APPROACH

4.1 INTRODUCTION

The concept for this project will be based on theories about the link between human being, architecture and human senses.

The idea would be to create a building that will stimulate one's senses. Different textures, colours, the contrast between light and shadows will invite persons to touch and experience a form of rehabilitation with only moving through the building. (Figure 30 indicates a concept of the use movement through the building.)

4.2 THE HUMAN EXPERIENCE

Papanek (1995: 76) states that "architecture has to be experienced by all senses, rather than just sight. The visual image may provide us with pictorial information, yet beauty is never skin deep."

Syntesthia (the use of senses) sets out to allow us to enjoy an environment through senses that we would necessarily associate with particular information inherent to us which gives confidence. Senses can be characterised as an active detective system, constantly seeking out information from the environment. (Bloomer & Moore, 1997:27)

According to Lynch: "We touch, listen and measure the world with our entire bodily existence and the experiential world becomes organised and articulated around the centre of the body" (Lynch, 1983:7)

" Trapped in structures of minimalism, modernism or coldly-coloured post-modernism, architecture and interior design have long hesitated to embrace the trend toward tactility. Unfortunately, this means that the public has yes to encounter buildings made to stimulate their senses"

- quote Eveline Merkx

Figure 82. First cocept sketch

Maurice Merleau-Ponty said: "All consciousness is perceptual...The perceived world is the always presupposed foundation of all rationality, all value and all existence." What he means with this statement is that the core of every human being's existence is perceptual experience.

What is derived from Lynch and Merleau-Ponty's theory is that the core of every human being's knowledge is concentrated around basic forms of senses.

We perceive everything through our senses and we cannot really know anything without perceiving it. The knowledge core referred to would be example: cold and warm; light and dark; smooth and rough; different colours and the list goes on.

4.3 CEREBRAL PALSY AND ENVIRONMENTAL PERCEPTION

Parents of disabled children, especially Cerebral palsy children tend to over protect their children because of their severe vulnerability. Overprotecting could deprive disabled children from the basic forms of play, education and perception of natural elements.

"Do not underestimate the value of touch." were the words of a very experienced therapist at Hew Hope School, when asked what can be done to give these children education through enjoyment. (interview, 2009)

Learning a skill is not founded on verbal teaching but rather on the transference of skill from the muscles of the master directly to the muscles of the apprentice through the act of sensory perception and mimesis.

Hegel states that: "It's sensations of colour, shape and texture that we rely upon for simple beliefs of existence."_(Singer,1983:89)

4.4 MOVEMENT AND PERCEPTION

For any human to fully develop their senses, movement needs to be involved, as in the case of Architecture.

Merleau-Ponty describes movement as the 'thousand natural miracles' my body accomplished as it 'obey[ed] the requirements of this little drama'. (Springer,2005:55)

Tom Porter (Porter, 1997:26) states: "Our perceived experience of interior and exterior architectural space is primary a sensual event involving movement."

This experience Tom Porter speaks about is being exaggerated by the movement of disabled people.

Vivian Sobchack (springer, 2005:55) implies that when disabled persons are moving, the attention will be refocusing from 'elsewhere' to a very concrete bodily and spatial 'here'.

Movement, however, can not be possible without sufficient design, and when dealing with disabled children the access and movement through the building would form the core of the design.

Un-accommodated designs in the child's everyday life could prevent him/her to experience the normal activities that are crucial in the play development phase of all children.

Because movement is linked to sensory development, more emphasis would be placed in movement to rehabilitate, and movement through spaces to experience the architecture.

Figure 83. play through touch

Figure 84. Difficulty of movement

4.5 MOVEMENT IN BUILDINGS

According to the white paper on disability of South Africa 2002, rehabilitation is the word used to describe ways of helping people with disabilities to become fully participating members of society, with access to all the benefits and opportunities of that society.

This means that disabled people should have access to such benefits as early childhood development opportunities, education and training opportunities, job opportunities, and community development programmes.

Access to appropriate rehabilitation services can make the difference between leading an isolated and economically dependent life and leading an economically independent life and playing an active role in society.

The physical manifesto of architecture accommodates human activity. However, the arrangement and organization of the elements of form and space will determine how architecture might promote endeavours, elicit responses, and communicate meaning (Ching, 1942:10)

To create a product where everyone could participate, one need to look at design principles that accommodate all persons.

The Principles of Universal Design were developed by The Centre for Universal Design in collaboration with a consortium of universal design researchers and practitioners from across the United States.

The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities

Universal Design recognises the changes that everyone experiences during his or her lifetime, taking all people - young, old, tall, short, and persons with various disabilities - into consideration.

“Certain people in the communities whom we have not allowed to join with us in the dance; who have not celebrated life, who has never really been allowed to play in the ultimate game, which has not experienced leisure.” (kok, 1994:14) What Kok implies with this is that certain architecture in South Africa has separated the disabled people from the rest of society and thus preventing them to fully participate in a mainstream economic and business world.

Alvar Aalto reminds us of the social architecture and that responsible architects should design buildings that are of no harm to any user, nor should they be unsuitable for people. (Aalto, 1940:15)

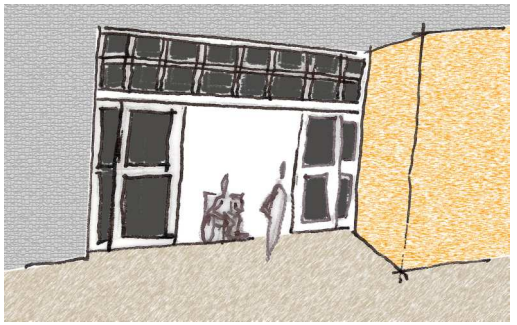


Figure 85. Accessibility in buildings should aim to be the same for both able and disabled people

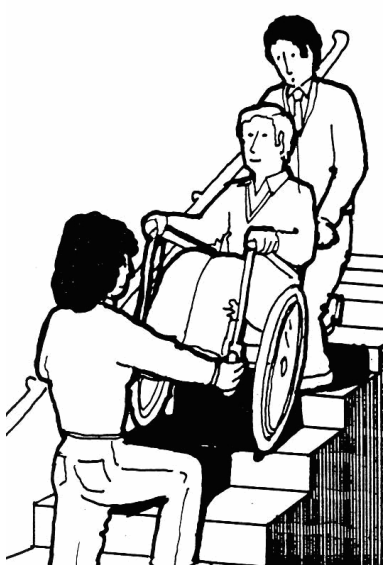


Figure 86. Typical situation to be avoided in buildings

4.6 DESIGN PRINCIPLES

The design principles are being derived from the 3 basic forms of Cerebral Palsy: Spastic, Dyskinetic and Ataxic Cerebral Palsy.

4.6.1 MOVEMENT

Spastic Cerebral Palsy is directly linked to the difficulty of movement.
The movement in the building will automatically be emphasised because of the use of ramps, slowness of the action and the economic design of movements. Movement will allow the visitor to experience different textures and spaces.
Unnecessary level changes, corners and turns should be avoided.

Figure 87. Movement

4.6.2 ORDER

Dyskinetic Cerebral Palsy can be linked to the unorganized and disorderly movements. The idea here would be to create order in design. Again, the easy flowing of movement would contribute to order in how the building would be experienced. Order in placement of different spaces and accommodation would be important here. A human scale should be used while designing the building. The children should adapt this building as their own.

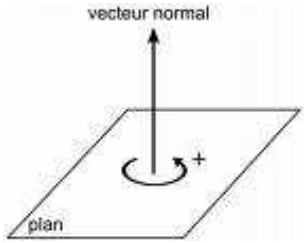


Figure 88. Order

Figure 89. Direction

4.6.3 BALANCE

Ataxic Cerebral Palsy causes problems with balance.
Balance could be brought forth in the design with the use of large overhangs, detail design of supporting structures.
A lightness of structure could be created to stand in contrast with the difficulty of balance in these children's everyday lives.

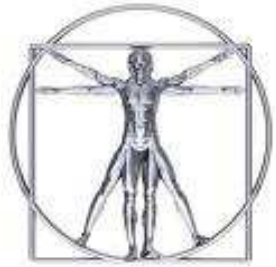


Figure 90. Proportional system

Figure 91. Balance

4.7 SPATIAL FRAMEWORK

4.7.1 LEGIBILITY

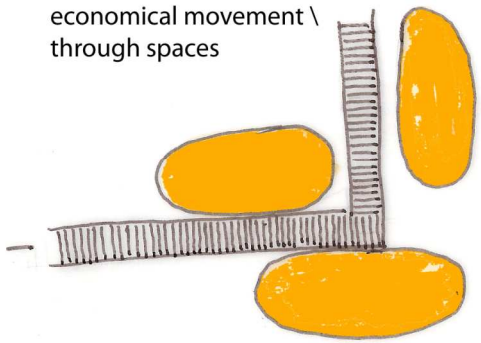
The legibility of the building's exterior and interior becomes very important when it comes to designing for Cerebral Palsied children. One of the aims of this project is to integrate legibility into the rehabilitation centre. The external facades visible from the economical belt will become even more important in presenting an acceptable front to the able bodied society.

The interior and spatial layout of the building will be significant in creating a design that is understood by all—an universal design. Because movement is a problem for people with Cerebral Palsy, orientation and order in the spatial design will be essential in economical movement through the building.

Figure 92. Skylight indicate the direction of movement

4.7.2 ACCESSIBILITY & MOVEMENT

Accessibility is the obvious criteria when designing for people in wheelchairs and people with mobility impairments. Accessibility could also play a part in the shape of the buildings to accommodate for possible ramps and lifts. This could provide opportunities for an inter-linking design which consists of 'terraces' in the building .



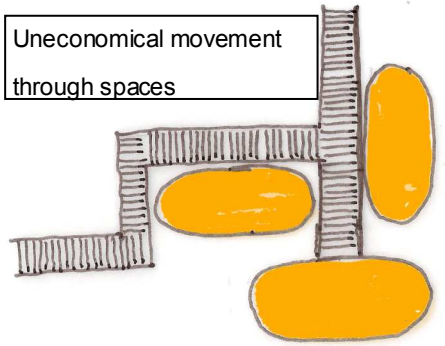


Figure 93. Concept of economical movement

4.7.3 THE VISUAL EXPERIENCE

The visual experience of a building becomes critically important when designing for disabled children. Texture and Color, for example floor surfaces and wall surfaces will be highlighted to capture the inhabitant's imagination and attention throughout his journey through the building.

The movement of cerebral Palsy people, as well as the able-body person who pushes his wheelchair or walks at his/her side, will be slow with lots of time to look around and absorb the aesthetics of the building. Thus, more emphases will be on the detail of the building.

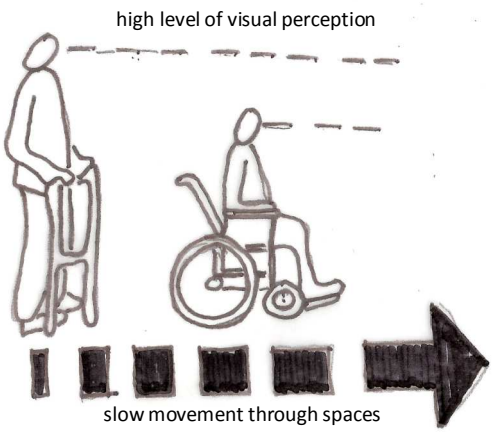


Figure 94. Visual experience of disabled person

4.7.4 MASS vs. OPEN SPACE

Rehabilitation will be done through enjoyment, thus open spaces will play a very important role in this Rehabilitation Centre. The mass to open space relation is important to create a balance between interior and exterior, and not produce a final product that will be seen as a hospital but rather one which children can relate to.

The spatial layout of interior spaces will create and define the open spaces on the outside of the building. The function of the interior spaces will determine the value of the exterior spaces and will separate it into private, semi-private and public open spaces.

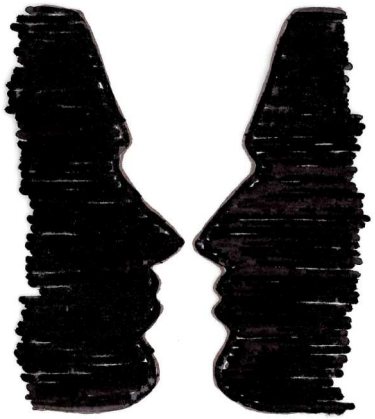


Figure 95. Figure ground model: the ambiguity of this reversible figure underlines the concept of space as a dynamic presence; the architect's eye;1997

5. DESIGN DEVELOPMENT

5.1 INTRODUCTION

The start of the design development would be to take the information retrieved from the context study done in chapter 3.

This data would form the outlined principles of the basic design to create a concept spatial layout.

The concept and design principles would then be implemented in these spaces to hopefully create a outcome in line with the aim of the project.

5.2 SITE CONSTRAINTS AND OPPORTUNITIES

CONSTRAINTS:

- Make a positive connection with New Hope School. Outside visitors to the Rehabilitation centre must not disrupt the activities of the school.
- Connect the Rehabilitation Centre with the current architecture of the school but also fit in with the contemporary architecture created by the new buildings in Atterbury road.
- Public transport is not efficient for disabled people. Drop-off to be created.
- The same main entrance as the school should be used to maximize the use of the existing parking area of the school.
- A fair amount of noise pollution will come from vehicles driving in 26th and Ceceilia streets.

OPPORTUNITIES:

- Link with existing and established Cerebral Palsy education facility New Hope School.
- Visual possibilities from 26th street as well as Ceceilia road.
- The site falls within an existing economic node and have environmental opportunities as well.
- The Rehabilitation Centre could use the existing pick-up and drop-off transport system of the school.
- The proposed site has a large northern boundary that is being bordered by the Waterkloof spruit, which could provide an aesthetically pleasing view and provide natural elements to the design.
- The large trees on the proposed site could be incorporated into the design to create well designed exterior spaces.

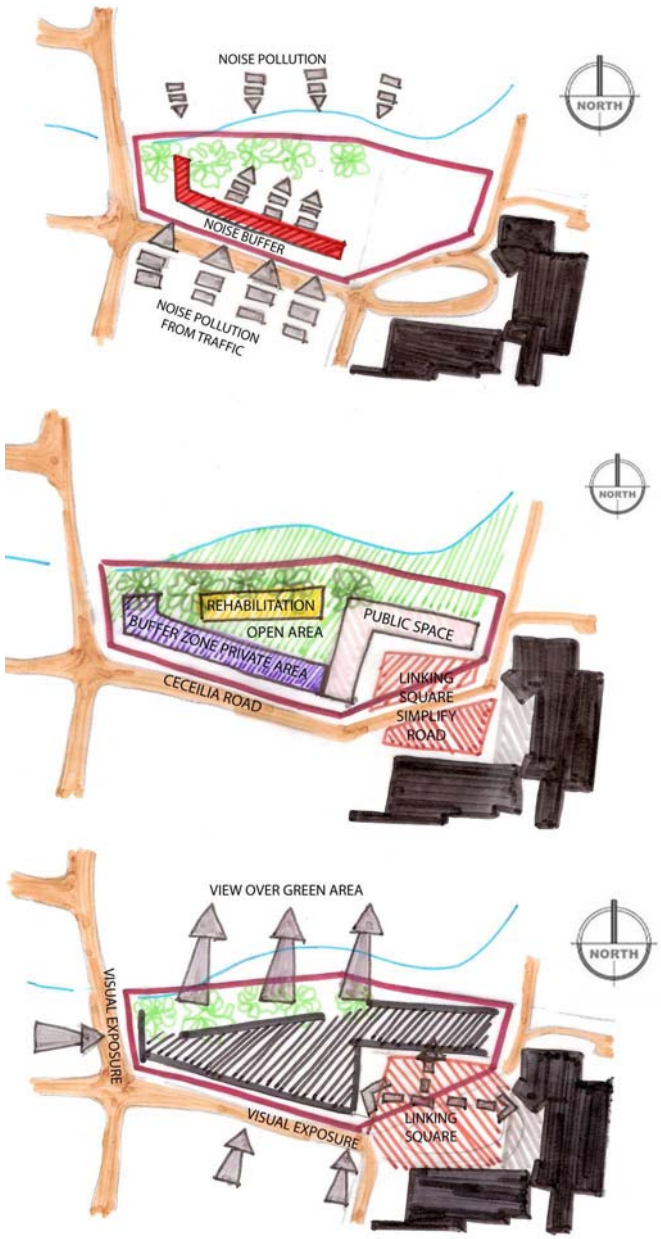


Figure 96. Conceptual design development of site plan

5.2 SITE CONSTRAINTS AND OPPORTUNITIES

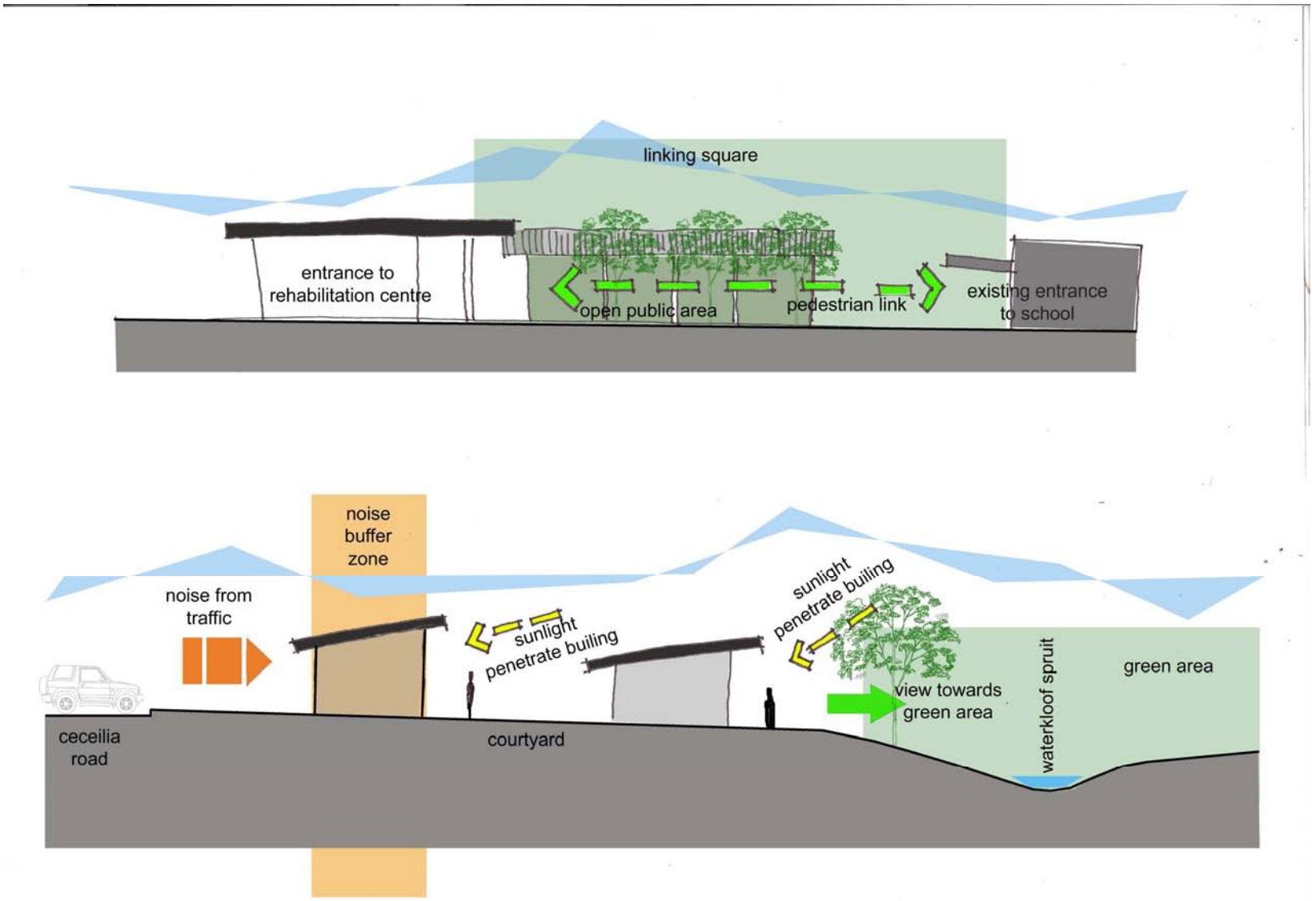


Figure 97. Conceptual design development of site plan

5.3 MOVEMENT, ACCESS AND SECURITY

There are three ways of accessing the building:

PEDESTRIAN ACCESS:

Pedestrian access will be provided towards care unit entrance and main entrance. Access towards main entrance to be along Ceceilia Road via designed pedestrian walkway. A dedicated pedestrian access would be provided from the South-West through a pedestrian gateway that leads to the care unit entrance.

VEHICULAR ACCESS:

- **Primary access** to the rehabilitation centre will be through the main entrance of New Hope school. The existing dysfunctional parking area will be redesigned into a functional parking layout that accommodates correct disabled parking and access towards the school and rehabilitation centre. Teachers parking to be relocated on existing school ground. A NHS transport drop-off will be created to the eastern side of the rehabilitation centre. This is on their way towards their dedicated parking area for drop-off and pick-up of NHS scholars.
- **Secondary vehicular access** will be created for the care centre and consulting rooms. This parking area will be accessed via 26th street. Exit will be towards Ceceilia street. Visitors of the 24 hour care centre will have this dedicated parking area for visiting hours that extends beyond the business hours of school.

SECURITY:

The nature of this project being a center for children, poses a number of security risks that need to be addressed.

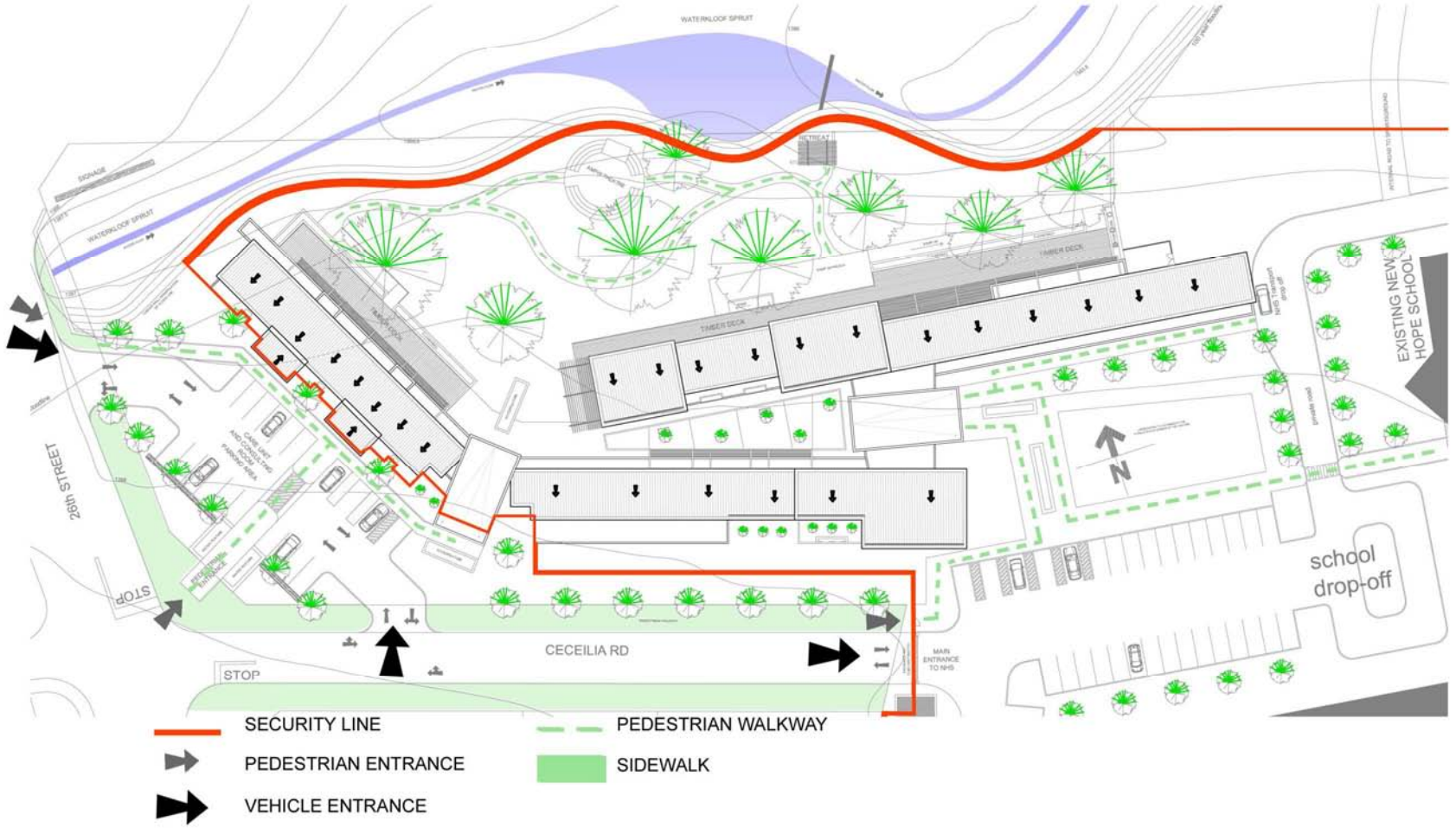
These risks are:

- Centre needs to be enclosed, which will form the security line and keep unwanted guests out as well as keeping children from leaving without supervision.
- Security from children drowning in the spruit and pools.

Existing New Hope School's guardhouse will be upgraded and reused.

New Hope School and rehabilitation security will be run from here.

5.3 MOVEMENT, ACCESS AND SECURITY



The pedestrian gateway

Signage wall seen from the corner of 26th and Ceceilia street.

Walls to be cladded with natural stone cladding.

View through two walls over a water feature look directly onto play area of the care unit.

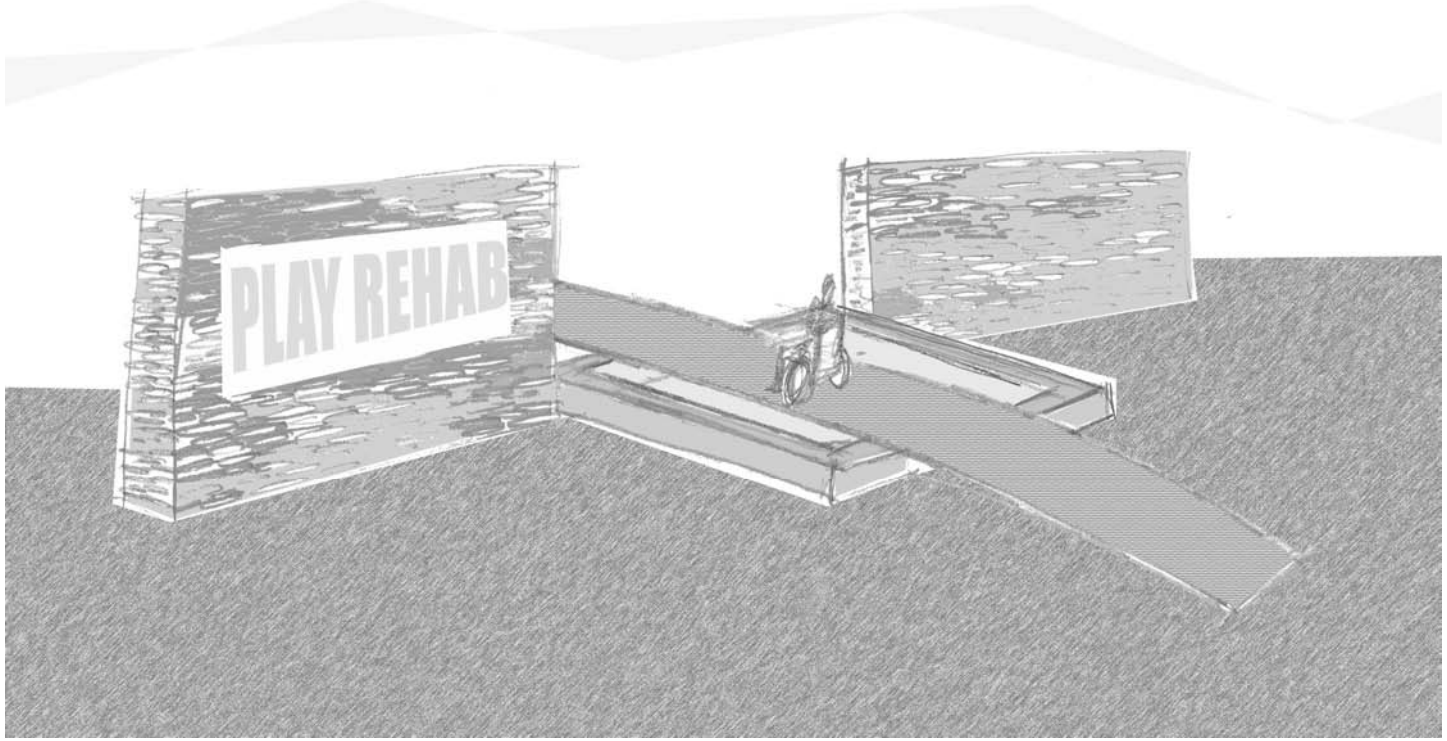
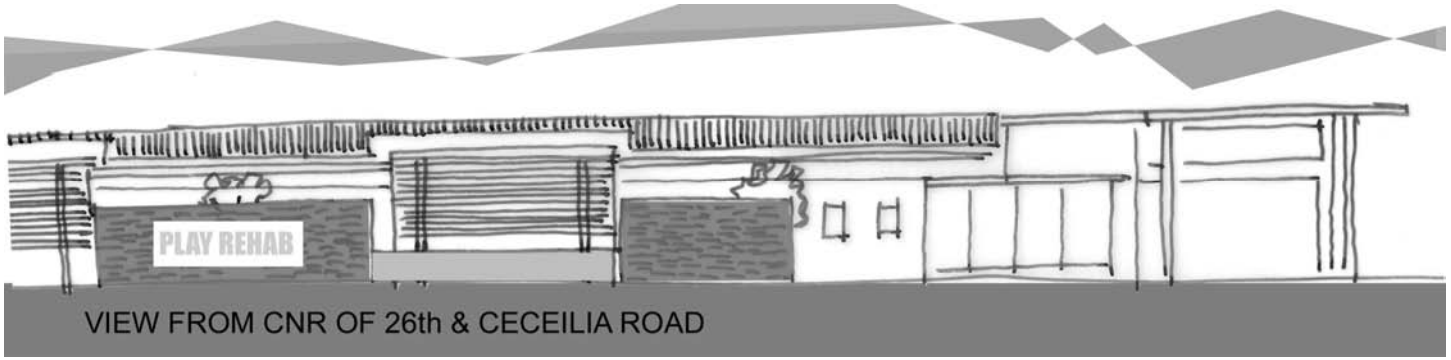


Figure 98. Pedestrian gate way from 26th & Ceceilia road



5.4 MANIPULATION OF WATERKLOOF SPRUIT 100 YEAR FLOODLINE

The existing waterkloof spruit to the north of the site flows from west to east, originating form stormwater runoff in the Waterkloof residential area.

Waterkloof spruit merge with Wolwe Spruit to the east of New Hope School. Wolwe spruit originates from stormwater collected on the Elardus park/ Wingate suburbs.

The combined spruit flows into the Struben dam in Faerie glen.

The spruit poses aesthetical opportunities as well as problems.

5.4.1 OPPORTUNITIES AND PROBLEMS OF WATERKLOOF SPRUIT

OPPORTUNITIES:

- The spruit presents great visual opportunities to create a tranquil environment for the visitors of the rehabilitation centre.
- The spruit also provides the opportunities for natural acoustic value to the visitor.
- The water stream would contribute to associating nature with the building as well as its inhabitants.

PROBLEMS:

The Spruit poses a number of problems:

- Flood line.
- An access security risk.
- Drowning security risk.
- Aesthetical problems if not properly maintained.

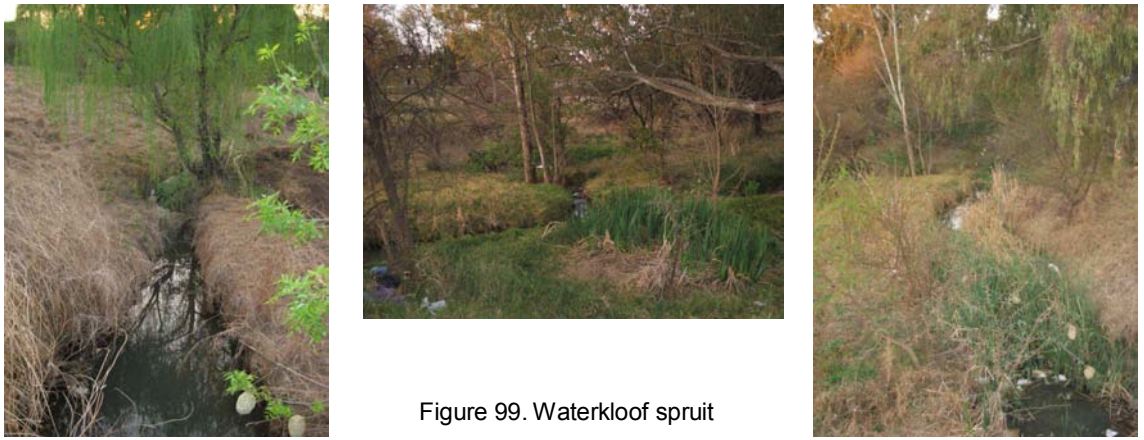


Figure 99. Waterkloof spruit

Figure 100. Arial photograph of Waterkloof spruit surrounding the proposed site

5.5 DESIGN PROPOSAL FOR

WATERKLOOF SPRUIT

The existing spruit needs to be aesthetically rehabilitated from a non maintained stream to a natural feature for its immediate environment.

Combined with the aesthetics, the solution for rehabilitating the spruit needs to be functional, to manipulate the floodline to accommodate the building at the north western end and provide security for the visitors.

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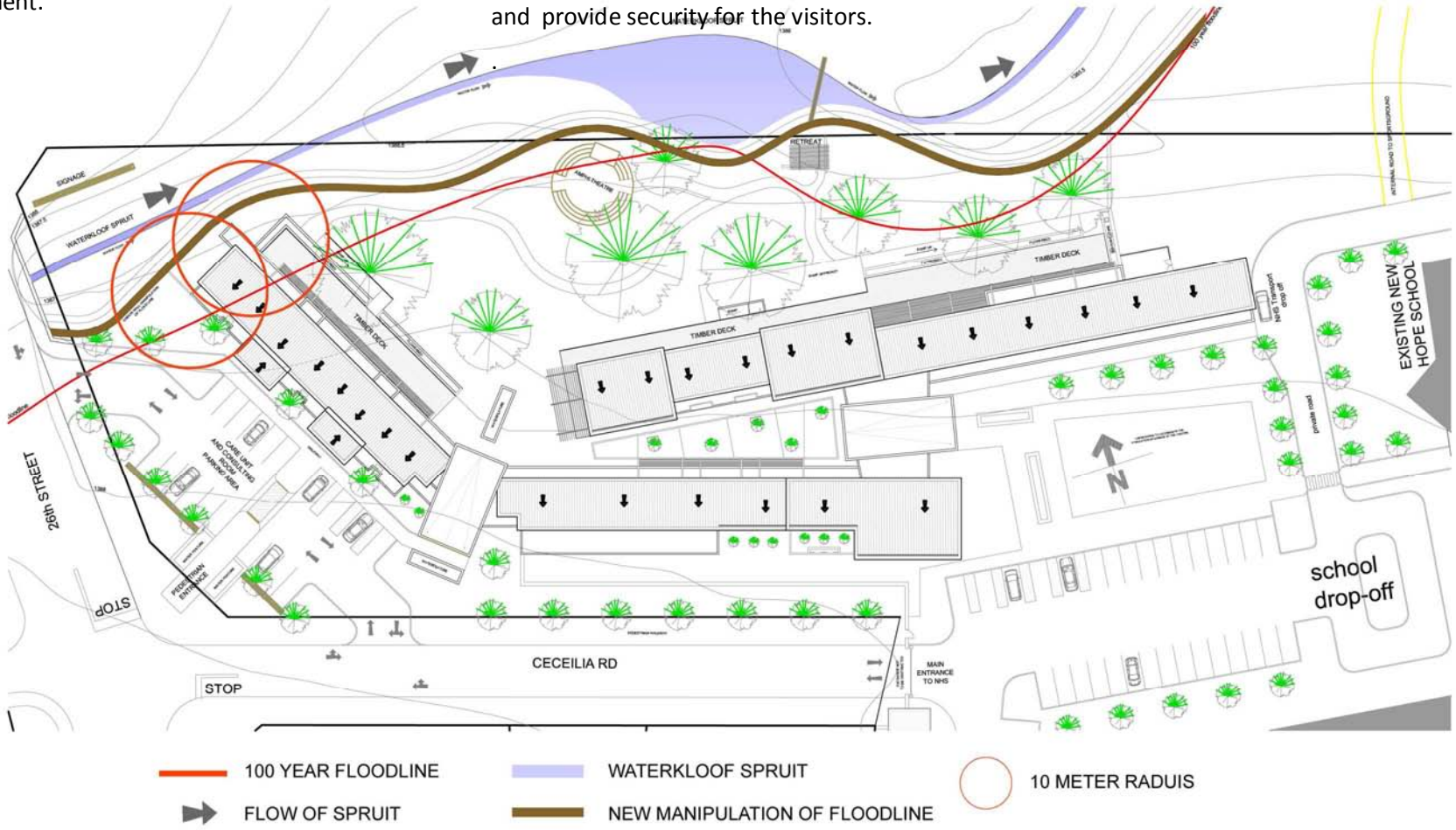
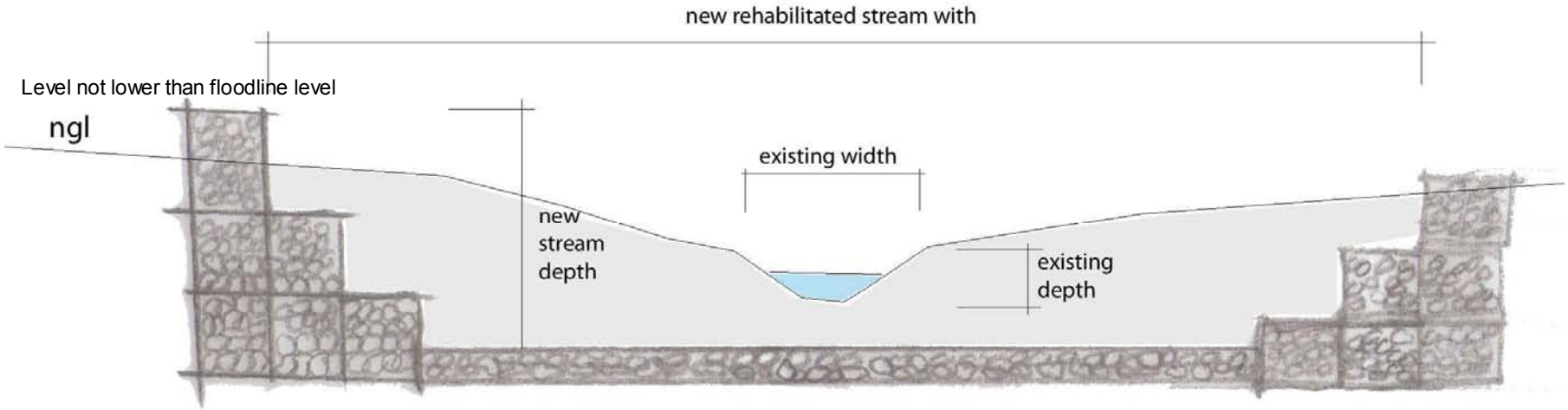


5.5.1 SOLUTIONS TO PROBLEMS

Floodline could be manipulated through:

- Lowering the flow level of the spruit, thus providing a greater volume space for the water flow.
- Through using gabions, the width of the spruit can be increased and also providing more space for normal water flow.
- These gabion retaining walls should be higher than the original level of the existing flood line.
- The new gabion retaining wall will act as the new security line to keep unwanted guests outside and children inside or safe from the water.
- By rehabilitating the spruit with the use of gabions, this could become a feature not only for the proposed rehabilitation centre, but for the surrounding area as well.
- The retaining wall within a 10 meter radius from the building on the north western wing, should be a reinforced concrete retaining wall to prevent water damage to the foundations of the building caused by access water filtering through the retaining wall, from the stream. This part of the retaining wall should also be 500 mm to 1000 mm higher than the existing flood line level.

Figure 101. Concept section of manipulation of flood line



5.5.2 SOLUTIONS TO FLOODLINE PROBLEMS

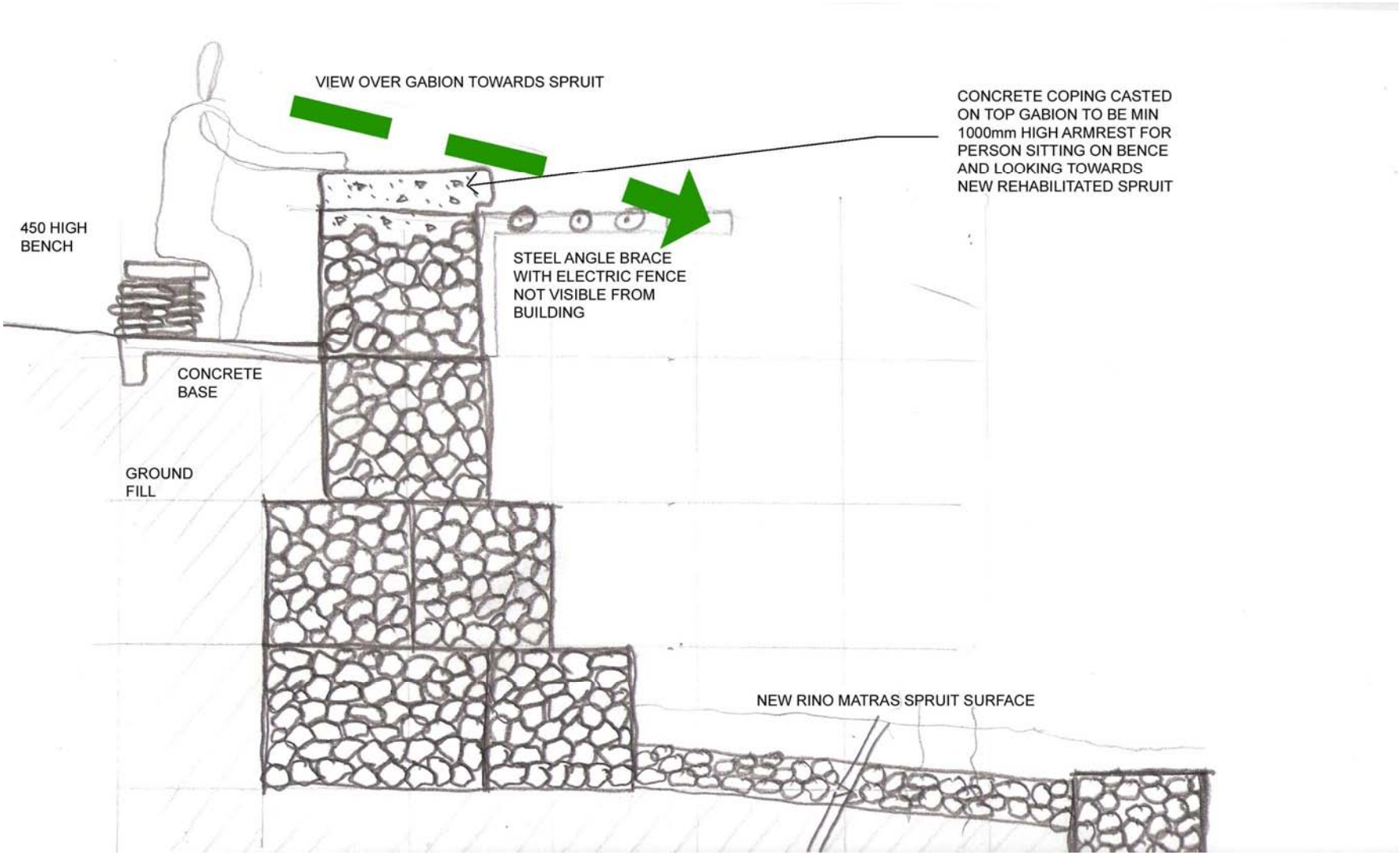


Figure 102. Section of gabion wall

5.6 MAIN ENTRANCE

Both the main entrance and the care room entrance are constructed of the same architectural style which would stand out from the rest of the building.

The two loose standing, concrete structures creates an asymmetrical, symmetry between the different wings of the building, which consist of the northern, southern and western wing.

Both entrances are made transparent to provide the incoming visitor the a view, either towards the play area or towards the green area and thus inviting them into the building.

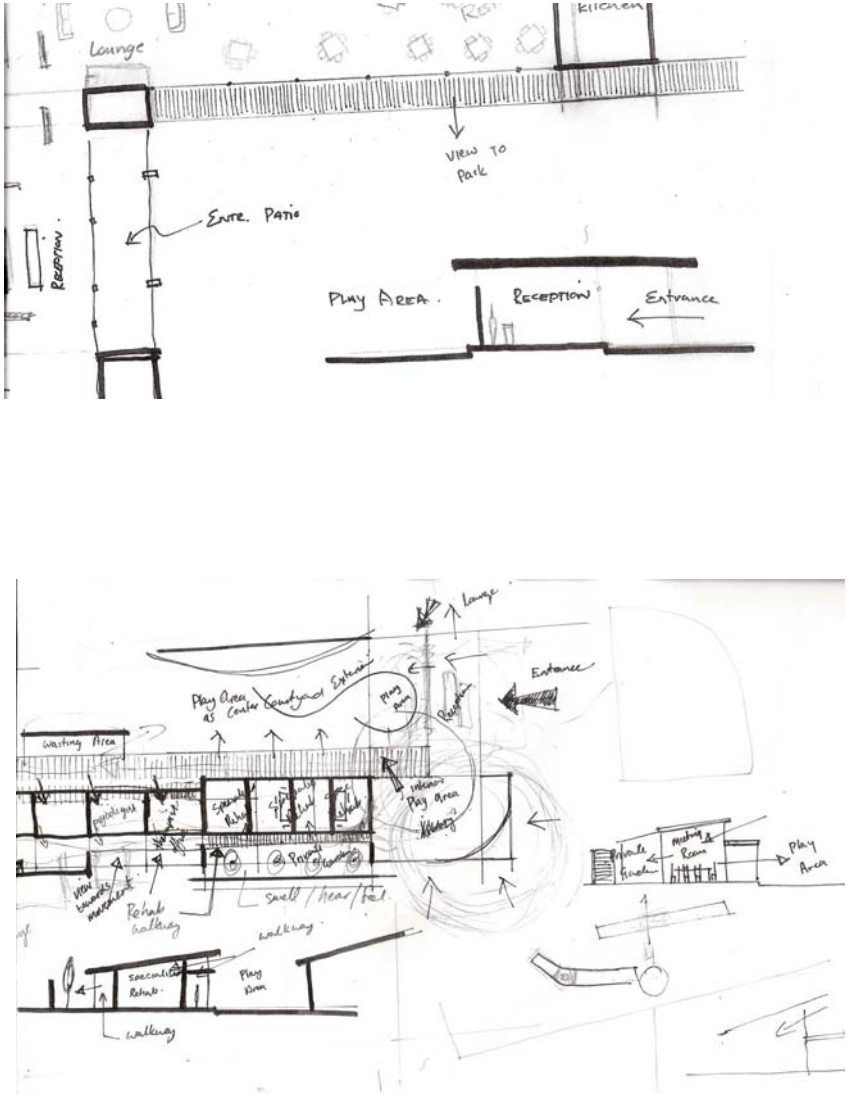


Figure 103. Concept sketches of main entrance

5.6.1 SENSES

Sight:

Before entering the building the visitor would see children playing with musical instruments in the specialized play area.

Children playing in free play area.

Smell:

Smell of plants from waiting/entrance park and food from restaurant.

Hear:

Hear sounds of laughter and children playing.

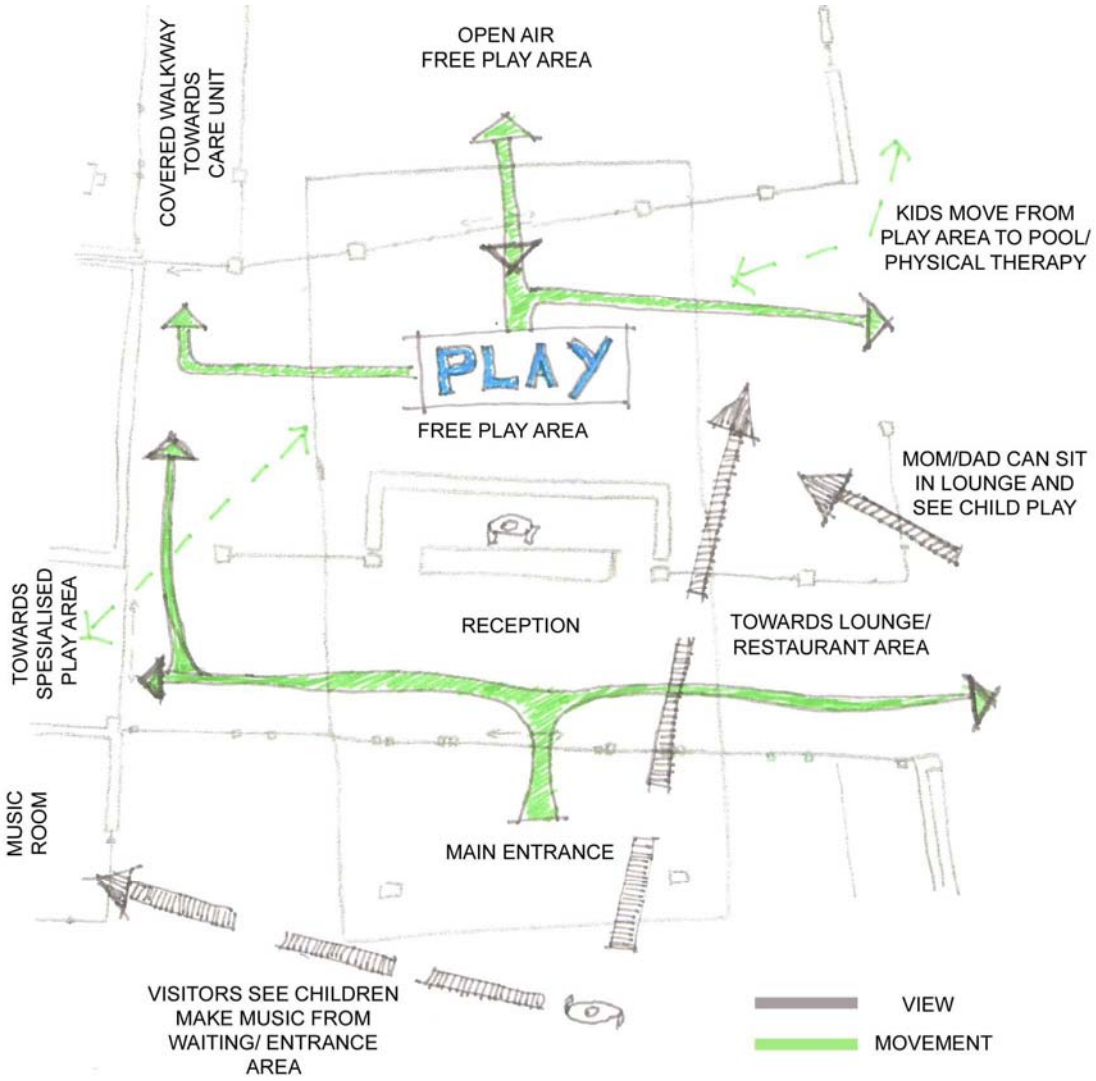
Touch:

Timber molded concrete walkway with Berg 'n Dal flush jointed face brick blocks would provide sensations when move over towards the entrance hall.

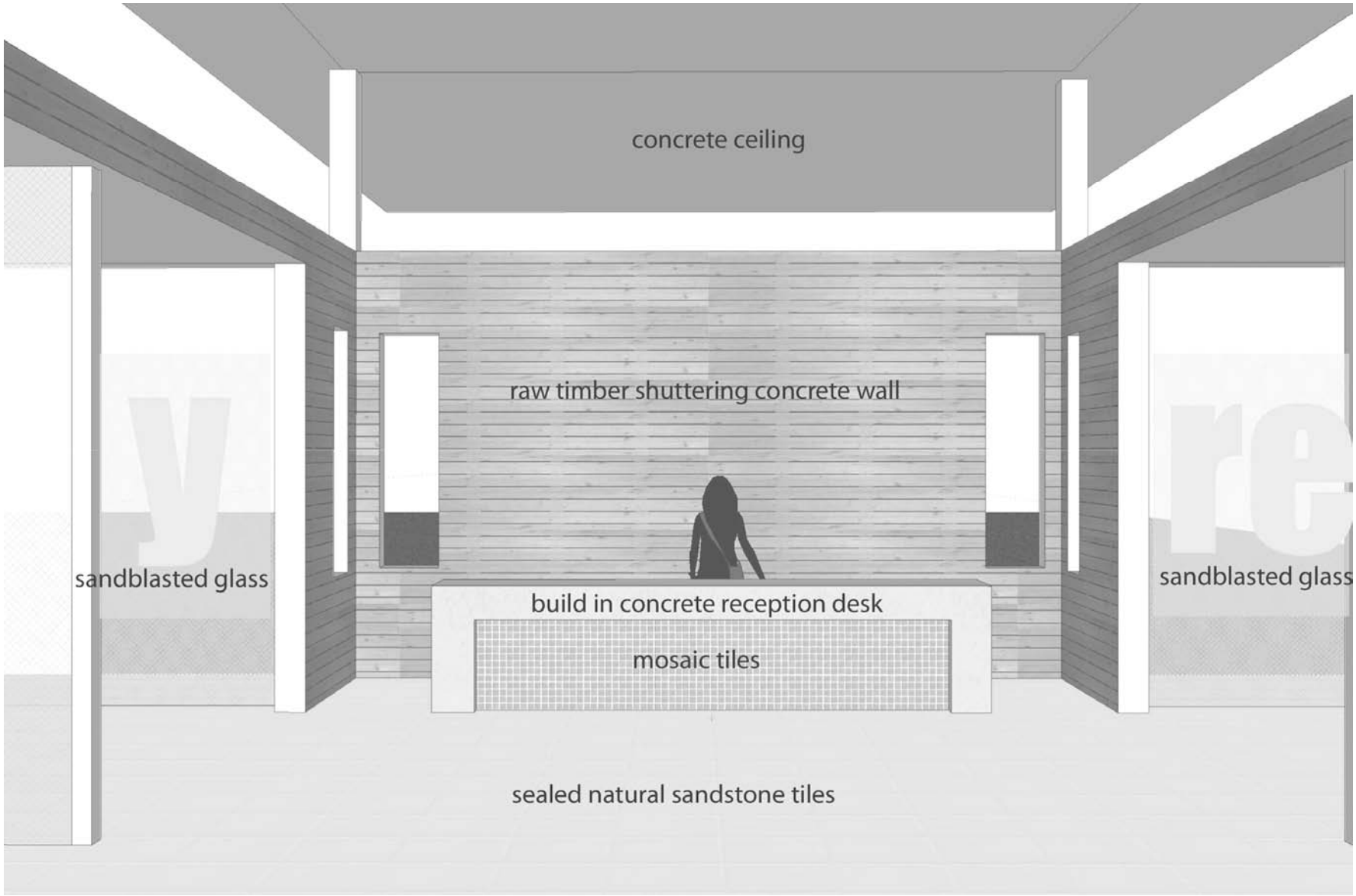
Tiles in building have large joints to create a gentle vibrating sensation through the wheel-chair.

These textures include: timber profile casted concrete in brick on edge face brick boarders.

Different textures could be touched.



5. MAIN ENTRANCE



SECTION

Take out

5.7 CARE CENTRE AND CONSULTING ROOMS ENTRANCE

This entrance would be use as an secondary entrance that is mainly dedicated to the consulting and care rooms.

This entrance would speak the same architectural language than the main entrance.

The entrance could be seen as a lass box with a concrete roof on columns. The entrance would act as a asymmetrical symmetrical link between the functional areas of the building.

When entering the reception area, the visitor would have a view on axis through towards the green area and social amphi-theater.

5.7.1 SENSES

SIGHT:

When nearing the care room entrance, the visitor will look through the “glass box” towards the green area. The social amphitheatre is on the same axis as the visitor enters the building.

HEAR:

Sound of the water from the water feature. Sound of laughter and playing of children.

TOUCH:

Natural sandstone tiles will create sensory experience through movement over it. Heat from fire place in winter days will be experienced.

Summer: Visitors would feel the cool breeze blowing in from the north.

Winter: visitors would feel the warmth of the fire place situated in the middle of the waiting area.

5. DESIGN DEVELOPMENT

5.8 SPECIALISED PLAY ROOM

This will be a fully equipped play area to keep the attention of the child for time period of 15 to 30 minutes.

During play, the parents could watch the play session with a therapist which would point out any mentally or physically features that the parent should know and attend to when back at home.

The play area have been connected with nature through their own private garden.

Northern sunlight penetrate this area through the top windows above the exterior covered walkway concrete roof.

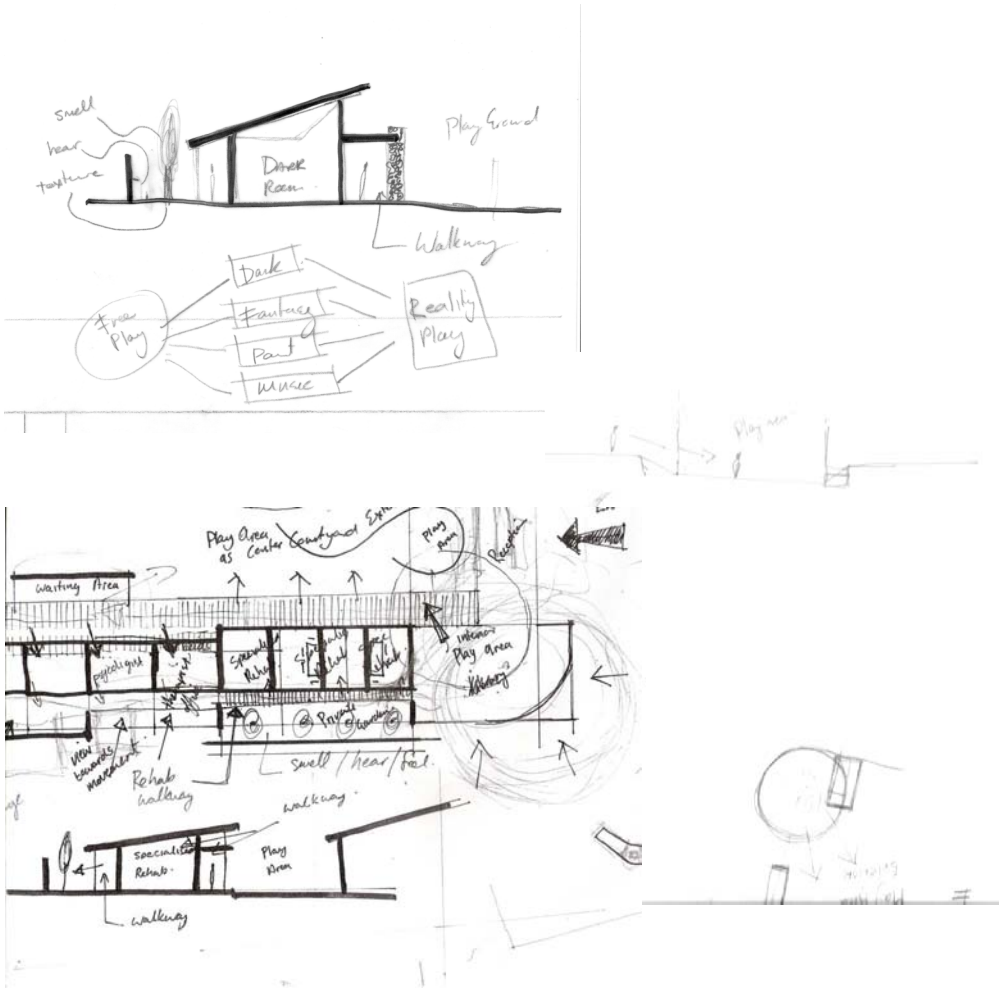


Figure 104. Concept sketches of specialized play area

5.8.1 HOW DOES THE SPECIALIZED PLAYROOM WORK?

The therapists will take child from free play area into the private specialized play area. Therapist play with child to build relationship with child. The same therapist would always work with the same child.

The child can choose any play, but need to stick with his/her decision. The theory is that any mentally or physically problems would eventually arise during play.

After 15 to 20 minutes of play, the child would be taken into the dark room, music room or the paint area.

MUSIC ROOM:

Here, the child would be able to express him/her self through music, whether its playing instruments or just listening to it in a soundproof environment.

PAINT ROOM:

The paint pit would be used for expressive paintwork.

DARK ROOM:

The dark room are used for concentration exercises as well as relaxing purposes.

Lava lamps and fish tanks are used for colour and relaxing sensations in the dark.

Concentration on exercises to move feet, specific fingers, specific lighting are used in the dark to make child aware of his/her body.

5.8.2 SENSES

SIGHT:

Children playing will be seen from the entrance/ waiting park.

Parents/caretakers would be able to see children in play therapy from private lounge.

Trees and water in the private garden would be seen from the specialized play area.

SMELL:

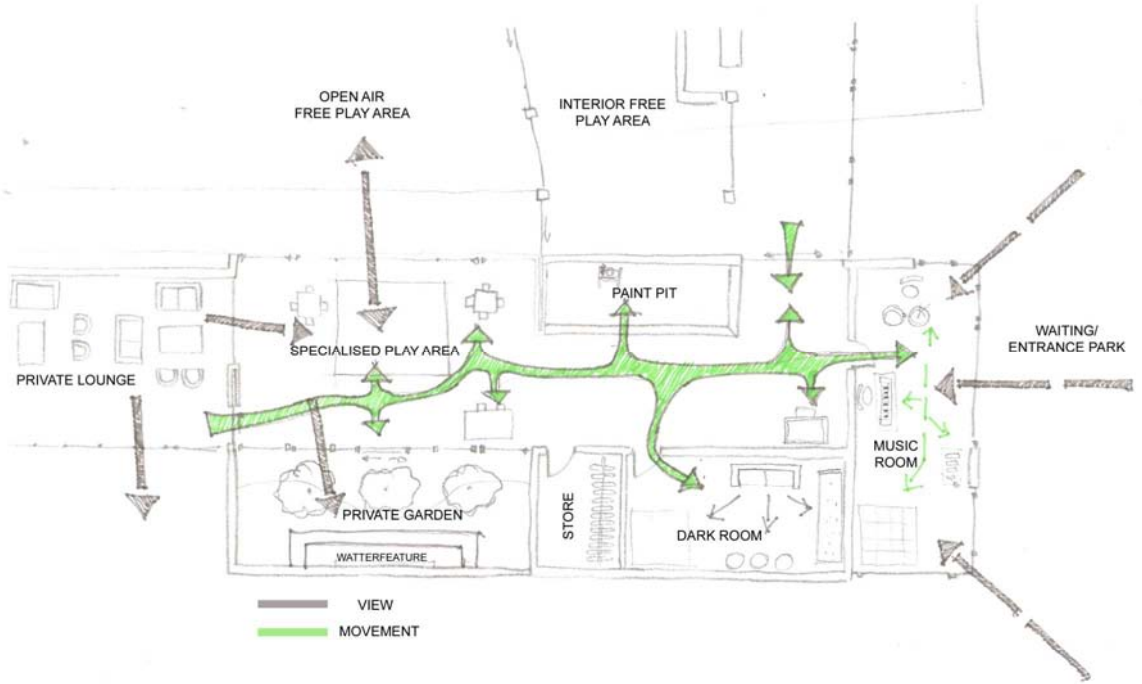
Plants that produce a strong aroma would be planted in the private garden.

HEAR:

Falling water from the water feature in the private garden.

TOUCH:

Playing with clay, paint and toys. Different materials could be seen and touched.



5.8 SPECIALISED PLAYROOM

SECTION

5.9 LOUNGE

5.9.1 SENSES:

SIGHT:

The use of glass as interior and exterior walls, makes various views possible. From the lounge, the visitor would be able to enjoy the following views:

- Towards Waterkloof spruit
- Towards pool area
- Towards free play area
- Chef while preparing food in open plan kitchen

SMELL:

Food from restaurant

HEAR:

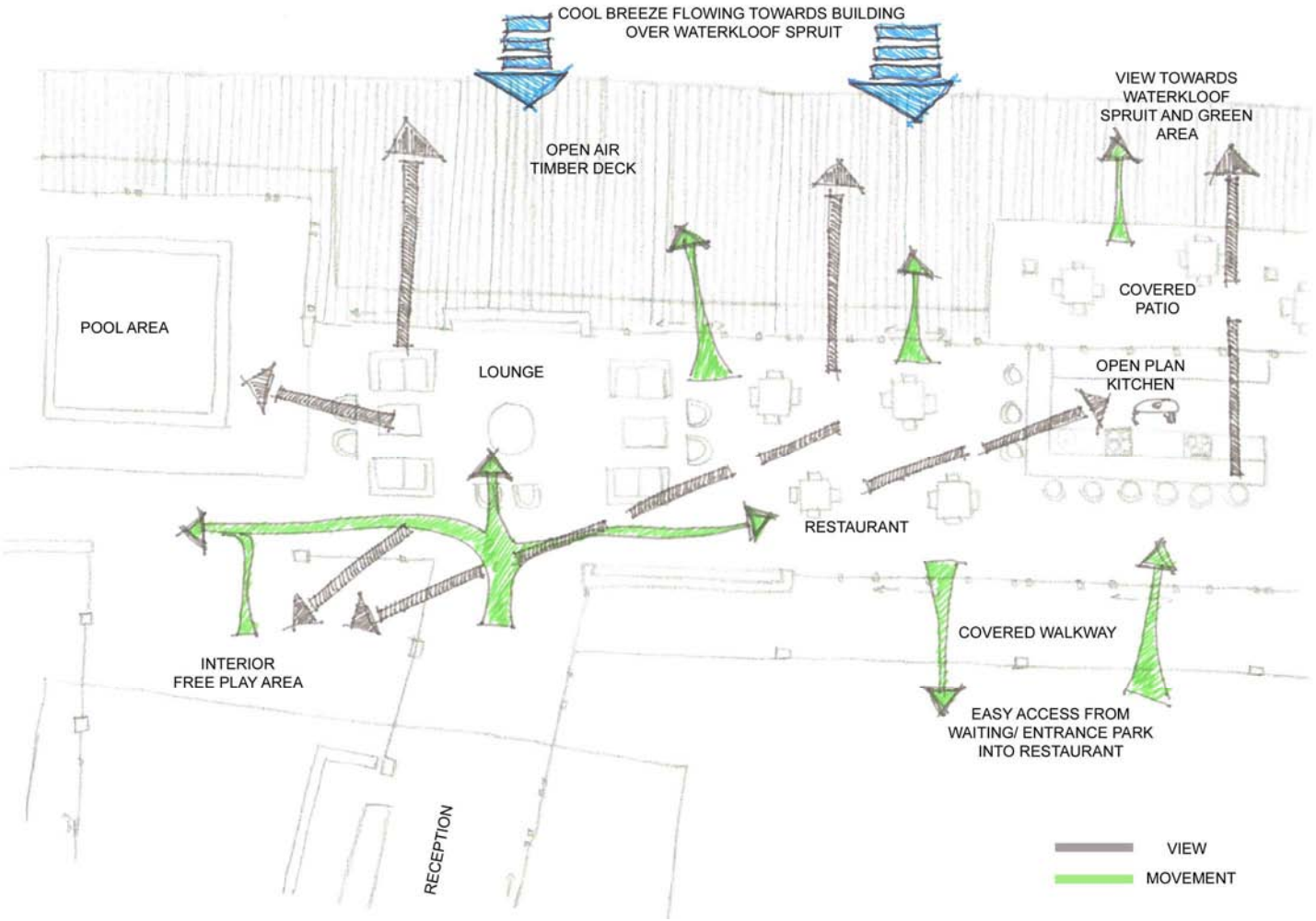
- children playing in the pool area and free play area.
- Birds in the trees to the north of the building.

TOUCH:

One would experience the cool breeze blowing into the lounge from the north.

The fire place would provide sufficient heat during the winter.

Wide joints between tiles would provide gentle vibrating sensation through wheelchair when moving over it.



5.10 OPEN PLAN KITCHEN

The open plan kitchen has been centered in the lounge and restaurant area.

Visitors sitting in the lounge are also be able to order from the menu and enjoy refreshments.

Open plan kitchen creates an informal atmosphere. The visitors are able to see the chef preparing the food.

Waiters would take the food from the kitchen counter to the visitor sitting at a table, in the lounge or the patio. When finished the waiter will pick up empty plate and take it to the scullery where it will be washed and taken back to kitchen.

5.10.1 SENSES:

SIGHT:

•View towards Waterkloof spruit

•View towards waiting/ entrance park

SMELL:

Food from kitchen

HEAR:

• **C**hildren playing in pool area and free play area.

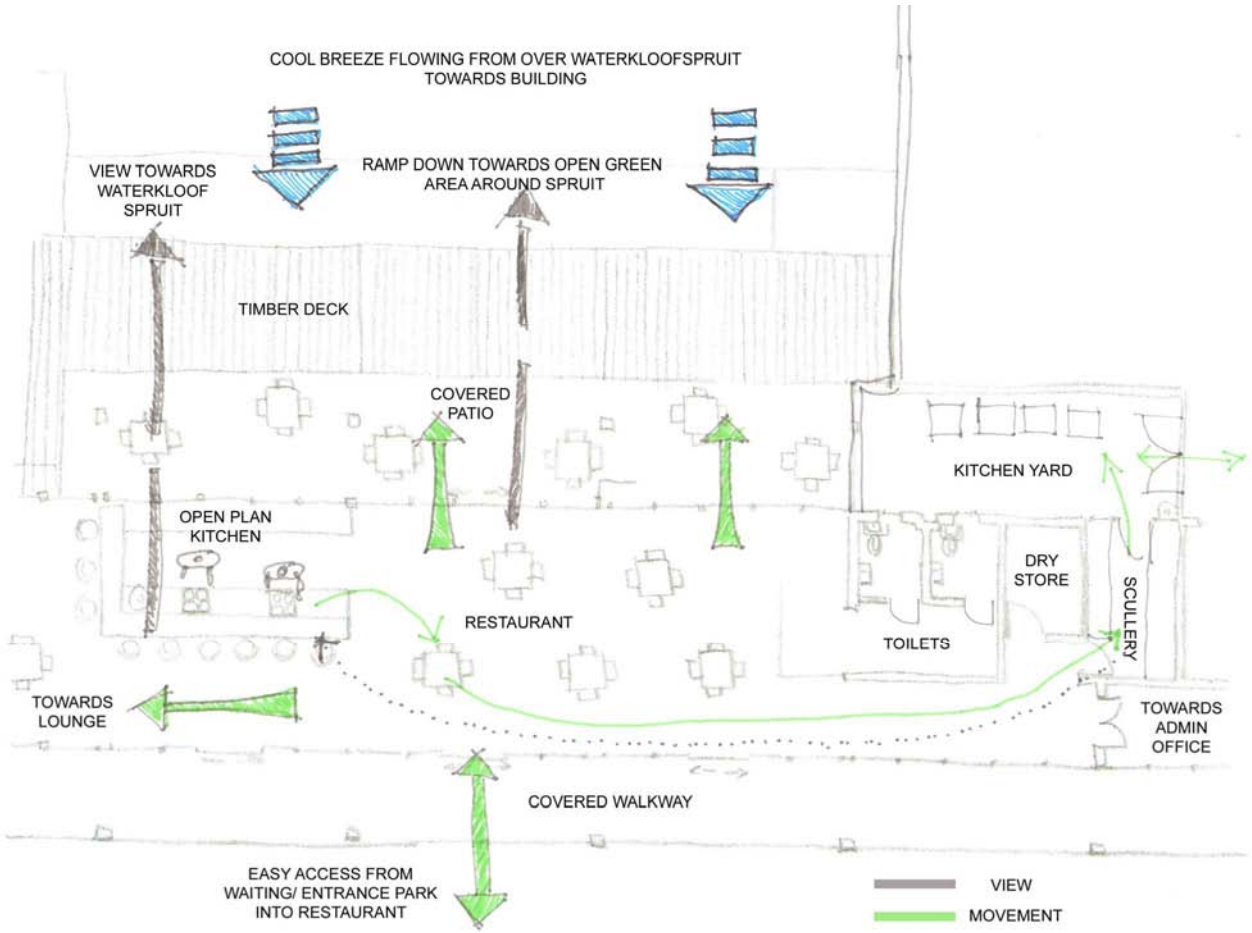
•Birds in existing trees to the north of the building.

TOUCH:

Experience the cool breeze flowing in from the north.

TASTE:

The different food in the restaurant.



5. OPEN PLAN KITCHEN

KITCHEN

MENU

ALL DAY HEALTHY BREAKFAST
Fruit salad & Yoghurt
Yoghurt and Muesli
Muffins

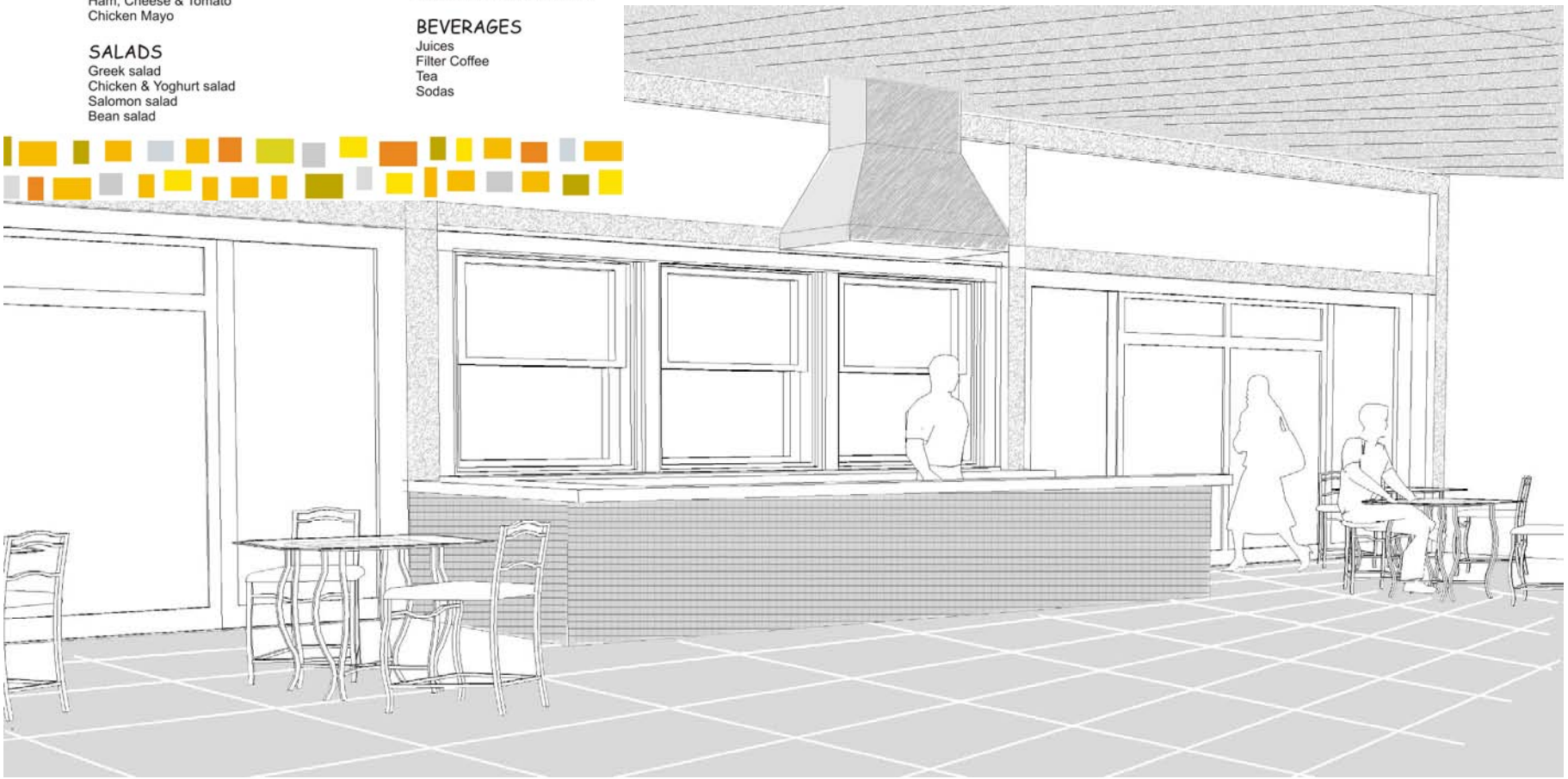
TOASTED SANDWICHES
White/Brown/Rye
Ham & Cheese
Cheese & Tomato
Ham, Cheese & Tomato
Chicken Mayo

SALADS
Greek salad
Chicken & Yoghurt salad
Salomon salad
Bean salad

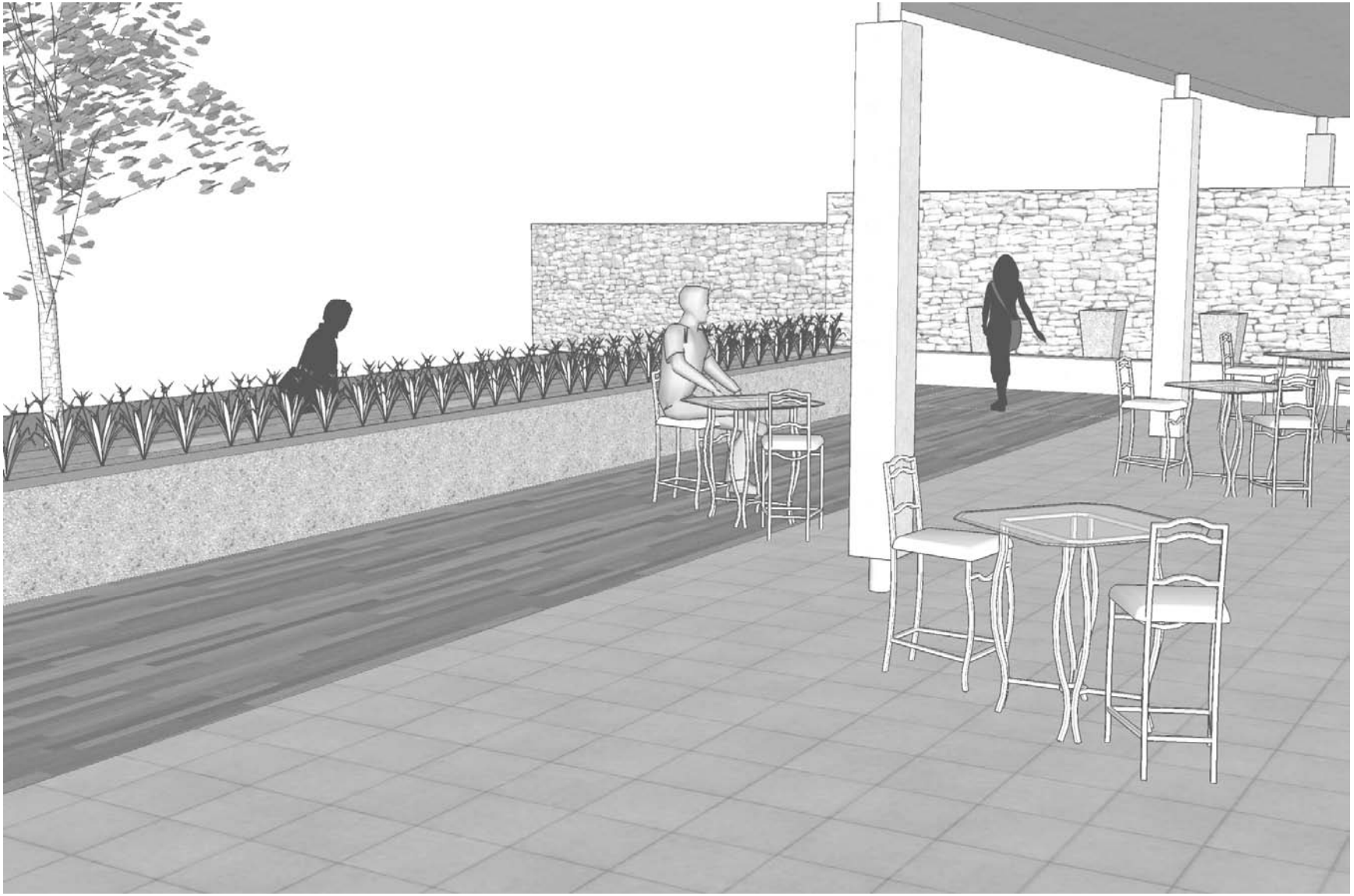
WRAPS
Chicken & Grapes wrap
Vegetarian wrap
Beef stirfry wrap
Bacon, Butternut & Sweetcorn

SWEETS
Assorted Cakes & Tartes
Ice Cream & Chocolate sauce

BEVERAGES
Juices
Filter Coffee
Tea
Sodas



RESTAURANT COVERED PATIO



5. OPEN PLAN KITCHEN

SECTION

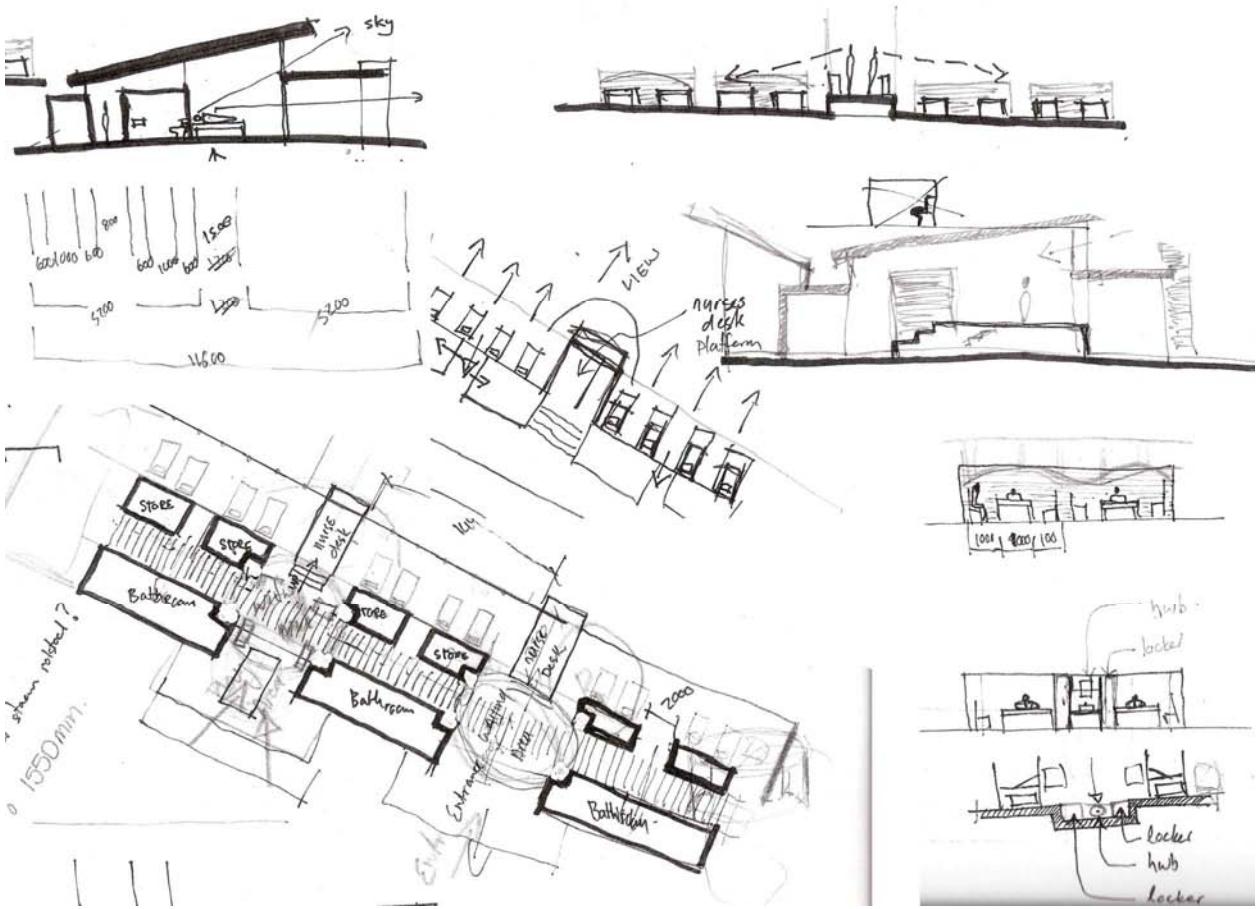
5.11 CARE ROOMS

The care rooms are designed to provide the patients with a sensory experience while admitted in the care centre.

Lying in bed, the child's senses would be spurred by the view towards the green area, and the natural sounds from the water flowing of Waterkloof spruit and birds in existing trees.

The elevated nurses desk has been designed to have a direct view over patients and play or waiting area.

When moving to the bathroom, the patient or visitors' way would be guided by light shining through skylight above. At night time, the patients' way of movement would be guided by light on tree visible from start of room.



5.11.1 NURSES DESK:

SIGHT:

- Nurses would have a clear view from an elevated desk towards the patients.
- View to play/ waiting area
- View towards the green area

HEAR:

- The children playing in play areas
- Sounds of birds in the trees

5.11.2 BEDROOMS:

SIGHT:

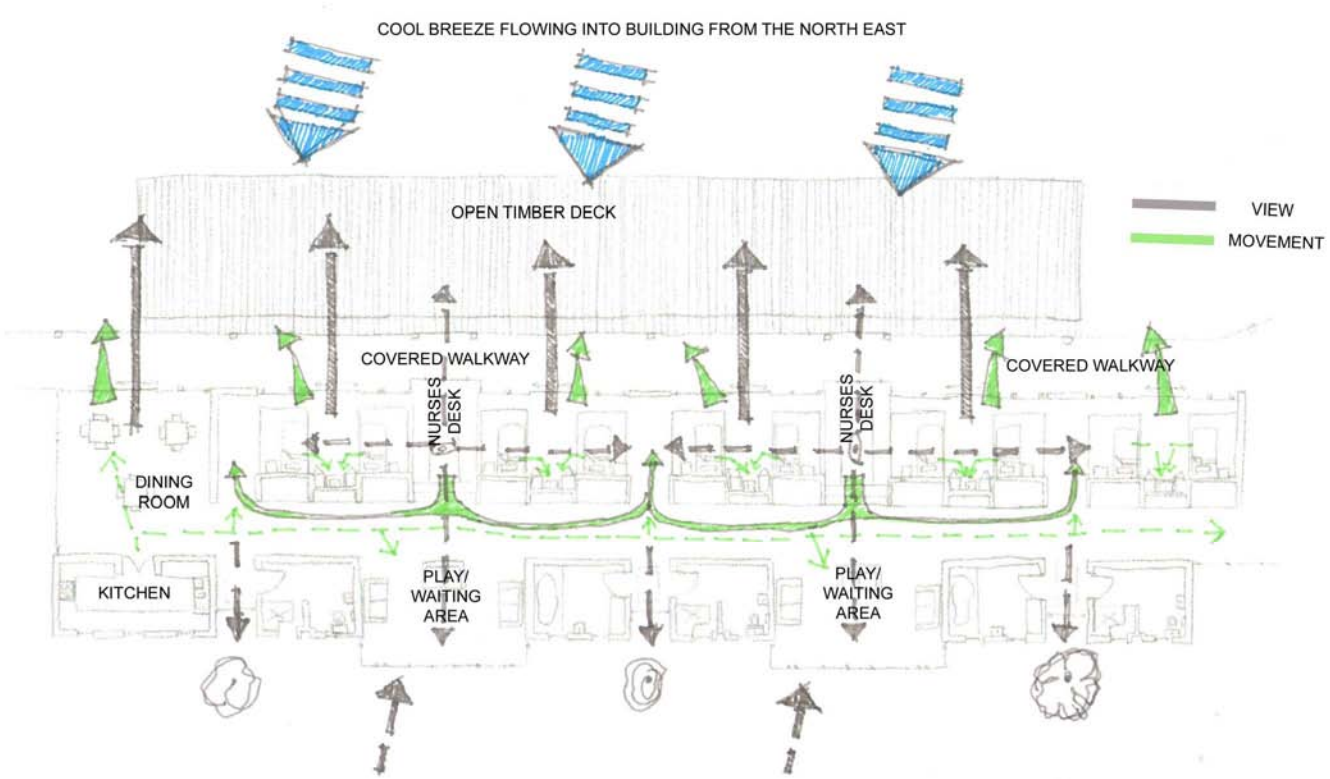
- From bed, the child would have a view towards the green area. This would contribute to a rehabilitation environment.
- When moving towards the bathroom during the day time, the pupil's movement will be led by skylights in the concrete roof above the passage to the bathroom. At night the patient's movement will be led by a lit up tree seen through the window at end of hall.

HEAR:

- Sounds of birds in existing trees
- Sounds of running water from rehabilitated Waterkloof stream

TOUCH:

- Different textures like natural timber cladding to bottom of nurses desk, rough natural sandstone floor tiles, smooth plaster finish and mosaic tiles to hand wash basin.



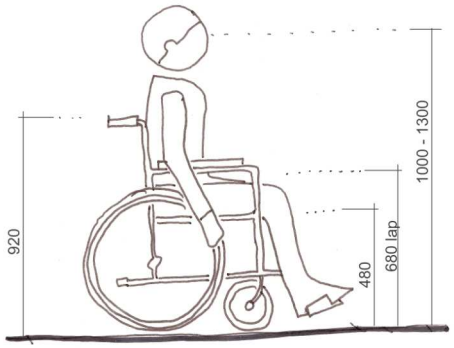
5.11 CARE ROOMS

6. TECHNICAL INVESTIGATION

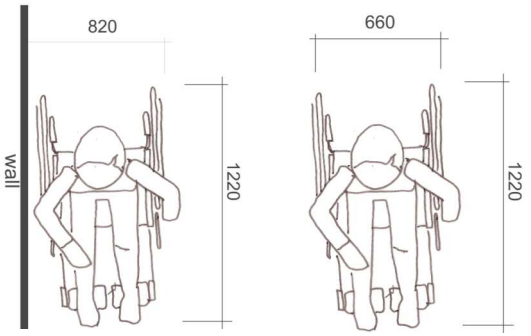
6.1 INTRODUCTION

To know the physical dimensions and proportions of a person in a wheelchair would be the appropriate start for the technical investigation for a design for disabled people.

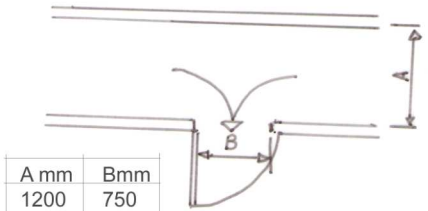
6.1.1 NORMAL WHEELCHAIR MOVEMENT



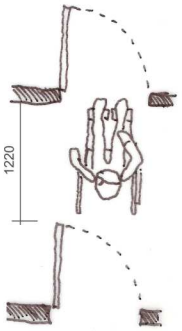
Height ergonomics of person in wheelchair



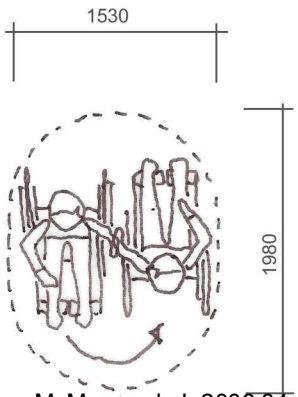
Top view of person in wheelchaire



A mm	Bmm
1200	750
1100	850
1050	900
1000	950
950	1000
900	1050



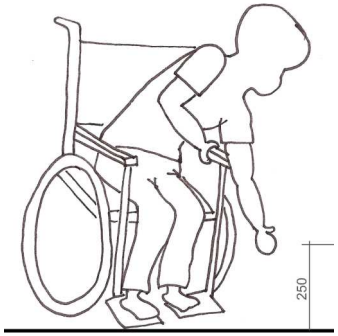
Movement dimension of wheelchair

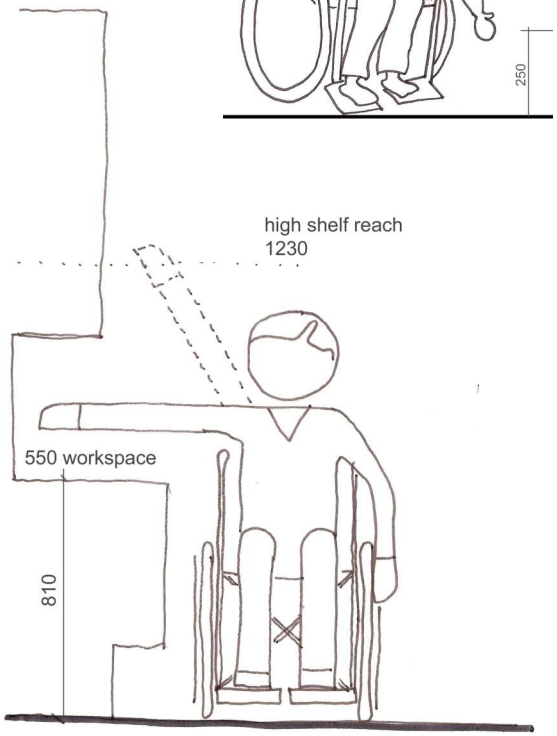


Pictures from:McMorrough J. 2006:84

SABS 0246

People in wheelchairs have different reach than able bodied people.





6.2 ACCESSIBILITY, MOVEMENT AND FUNCTIONALITY

6.2.1 PARKING & SIDEWALK

PARKING:

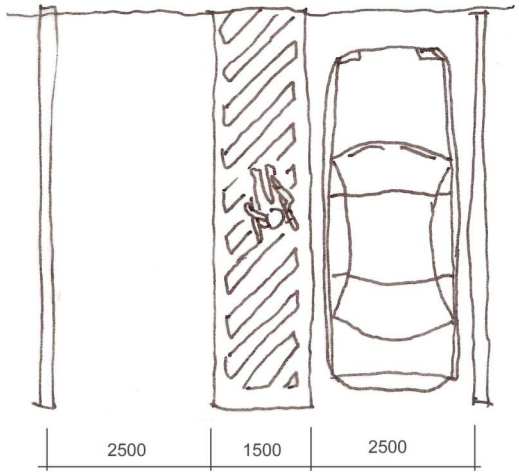
Adequate parking will be allowed for people in wheelchairs. 1500 mm Wide transfer zones should be yellow cross hatch road markings. Disabled parking spaces should be clearly marked on the ground and at eye level.

DROPPED CURB:

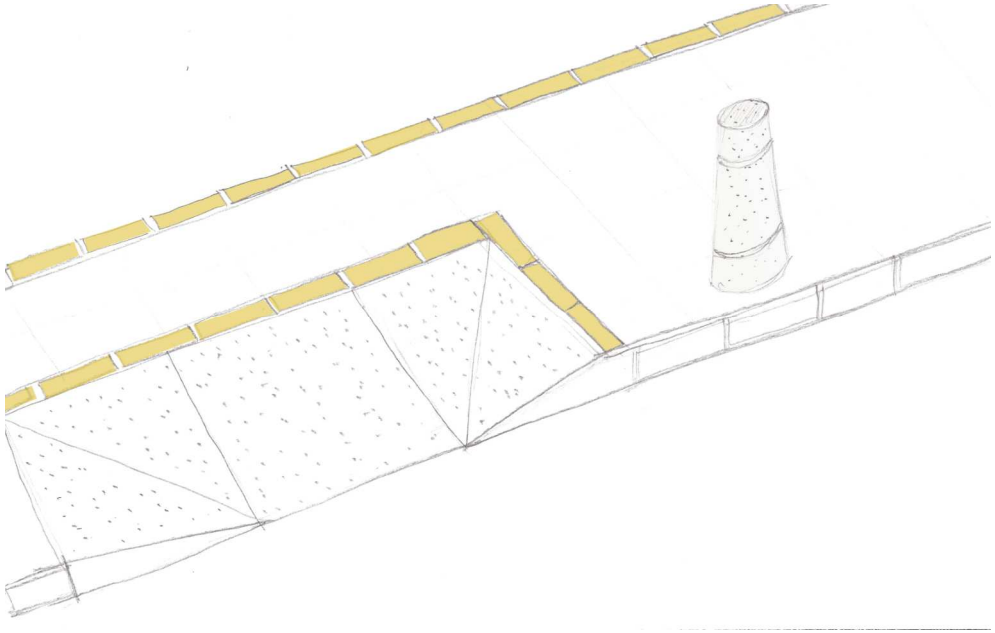
A dropped curb needs to be provided for disabled people, specially those in wheelchairs, to move from the parking area towards the pathway leading towards the building entrance.

BOLLARDS:

Protect pedestrians and playing children from vehicles in waiting park area and thus creating a definite separation between parking area and waiting park.



Parking layout



Drop curb

LIGHTING:

Sufficient lighting need to be provided from the parking area towards the entrance of the building. The lights indicate direction of movement. Light also make possible danger areas such as water features, level changes and balustrades visible to the visitor.

PAVING:

Ground under paving to be well compacted and leveled for sufficient drainage. Surfaces should not have sudden level changes of un-protected gaps.

RAMPS:

For two users to pass each other, a ramp needs to be 1800 mm wide. Minimum 1 m high balustrades on 75 mm up stand edge to be provided on both sides of main ramp.

Gradient: 1:20 at main ramps

1:15 at drop-off ramp

1:10 at parking areas

All ramps should be of a non-slip surface.

MOVEMENT SURFACES:

Provide a non slip exterior walkway. It should be standard practice to assist disabled people by indicating any change of surface and level. For the sensory development concept of this building it would appropriate to use different

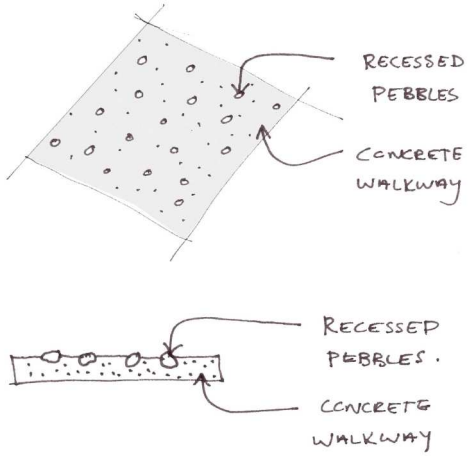


Figure 105. Walkway surfaces

walking surfaces to create different feeling sensations through the wheelchair.

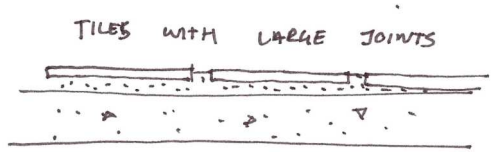


Figure 106. Walkway surfaces

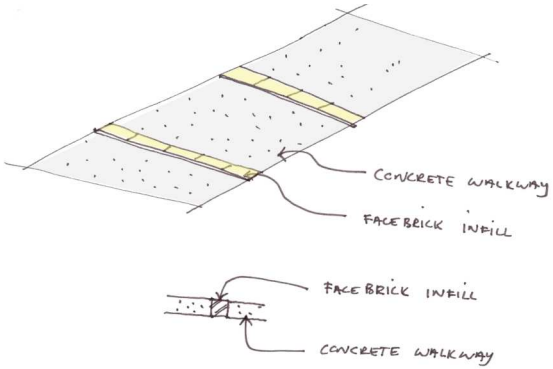


Figure 107. Walkway surfaces

VENTILATION

The simplicity of the architecture using natural ventilation would be used throughout the building.

Wind blowing from the north-east over waterkloof spruit will cool down the northern and western wing of the building .

Minimum mechanical ventilation would be provided for pool areas, care rooms, play areas and consulting rooms.

WATER COLLECTION

Rainwater to be captured on combination of chromadek and concrete roofs and channeled away through PVC rainwater down pipes towards an underground water storage system located underneath the physical therapy timber deck. This water to be used for irrigation of landscapes.

FIRE

The escape routes are in accordance with section T of the National Building Regulations. An escape route may not exceed 15 meters in one direction. Once in an escape route, two escape options exist. The total length of the escape route plus the emergency route to a safe point outside the building does not exceed 45 meters.

Fire hydrants to be placed according to section T of SABS.

Emergency sprinkler system will be installed throughout the building.

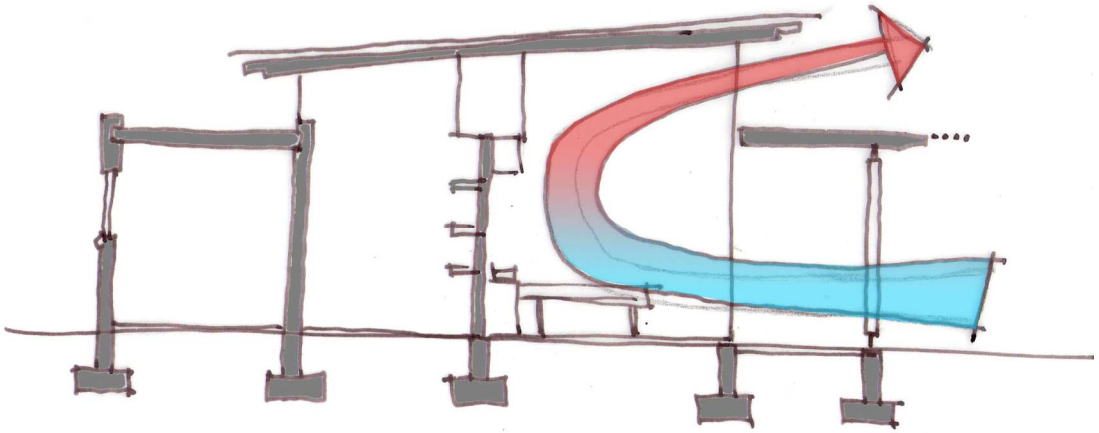


Figure: typical section indicating natural ventilation in building

6.3 ENTRANCE

The walkway to the entrance is of integral importance to create a sense of arrival.

AUTOMATIC SLIDING DOORS:

Contribute to universal design and easy access to the buildings. Sliding doors are better used in walkways for preventing accidents. Glazed areas should be sandblasted to prevent accidental collisions.

ORIENTATION:

When entering the main entrance the reception is straight in front of the visitor. Information boards and building maps indicate the location of the various facilities, as well as visible qualities of these spaces.

When standing at the reception the visitor is able to see the play area in front of them, the lounge to the right and the specialized play area to the left.

The play area forms the center of the building footprint and creates a great orientation element for any visitor.

LIGHT:

The entrance will have sufficient natural light to lessen the contrast between exterior and interior.

- Entrance Hall: 200 lux

ACOUSTICS:

With the entrance to the building the visitor will hear the sounds of play and laughter of children playing.

Acoustics according to SABS 0103

MATERIALS:

Glass, steel, timber and concrete are the main materials used in the entrance hall.

Raw timber profiled concrete wall to the back of the reception desk provides privacy for the receptionist. The desk itself has no sharp edges.

Non slip floor finish is used, but also not too porous tiles for example sandstone tiles. These tiles tend to get dirty from wheelchair marks and are very hard too clean.

SIZE:

There should be more than enough space for a medium flow visitors. The reception is an orientation space and acts as a transition area between the northern and southern wing of the building.

6.4 RESTAURANT AND LOUNGE AREA

The restaurant and lounge area is used for social and educational purposes.

MOVEMENT AND ACCESS:

Movement between tables and chairs is easy and economical. Tables have central legs to create no obstruction for wheelchair users.

VENTILATION:

The simple and honest architectural style used for this building makes it easier to use natural ventilation only.

LIGHT:

Social area: 100—300 lux

The use of large glass facades facing the north provides this area with ample natural sunlight during the day time.

ACOUSTICS:

Sounds of play and laughter will be heard in the background coming from the central play area.

Natural sounds like birds in the trees, water flowing in Waterkloof stream and the breeze blowing through grass is heard from the lounge and restaurant area.

Natural timber ceilings with a soft underlay will soften sounds from rain and access sharp noises.

Acoustics according to SABS 0103

6.5 KITCHEN

LIGHT:

Task lighting of 150 – 300 lux to be provided. The kitchen will be provided with natural sunlight through the glass façade facing north but will be partially protected by the large existing trees.

VENTILATION:

An extractor fan is used to ventilate the cooking area in the open plan kitchen.

Natural ventilation is used throughout the restaurant, kitchen and lounge area.

OTHER:

Open plan kitchen counter tops to have rounded edges and minimum 850 mm high to accommodate bar fridges. Service counter not to be higher than 1200 mm. Non slip flooring should be used.

6.6 OFFICE AREAS

LIGHT:

500 lux needed for office area. Northern sun through top window provide good natural light into office area .

Glass façade to the east will also provide the office with morning sun into space. Interior timber louvers provide protection from sun.

ACOUSTICS:

The use of carpets and primary natural timber ceilings in the offices dampen noise.

Acoustics according to SABS 0103

VENTILATION:

Windows north, east and south provide the office space with natural cross ventilation.

PLACEMENT:

The office area is located on the most eastern corner of the building layout which is close to the office space of the existing school building. The rehab centre would operate as a function of New Hope School, thus the offices of the new and old buildings should be near each other for easy management.

6.7 POOL AREA

The pool area consist of 2 parts.

- Heated pool for exercise and physical therapy
- Hydro therapy pool for private therapy sessions

LIGHT:

100—300 Lux.

Northern glass facades allow for natural light to penetrate the pool areas. Timber slats screen will protect the pool area from glare and too much heat infiltrating the space.

No task lighting needed

MATERIALS:

Non slip natural sandstone tiles around the pool areas.

Steps in the pool would be clearly indicated with coloured imbedded pebbles.

Up stand wall around hydro therapy pool to be non slip (imbedded pebbles).

Glass dividing the pool areas from the lounge to be safety glass according to SABS 0400 part N .

Glass to be sandblasted to provide the pool area with semi-privacy properties.

Sandblasted glass makes the glass wall visible in preventing people from bumping into it.

ACOUSTICS:

Natural timber ceilings in combination with suspended rhino board ceilings dampen sound.

VENTILATION:

Natural ventilation

6.8 PHYSICAL THERAPY AREA

MATERIALS:

Large glass facades according to SABS 0400 part N.

LIGHT:

100—300 Lux.

Physio office: min 500 Lux

Northern glass façade allows natural sunlight into the physical therapy area.

Large existing trees and timber slats screens protect the physical therapy space from too much heat entering through the glass façade.

ACOUSTICS:

Carpets and stretching mats and natural timber ceilings to dampen sound.

SIZE:

Physical therapy area to accommodate small open plan office, 2 massage beds, 4m x 4m stretching mat, walking frame, treadmill and gym bicycle.

VENTILATION:

Natural cross ventilation is possible with the breeze flowing in from the northern side end exits at the western side.

6.9 PLAY AREAS

A Free play area interior

B Free play area exterior

C Specialized play area

A) FREE PLAY AREA:

LOCATION:

This area forms the centre of the building and visually and functionally integrates this space with the rest of the building. The interior and exterior play areas to function as one with easy movement between each other via electronic sliding door.

MATERIALS:

The use of structural columns with glass infill and large openings on both northern and southern sides, allow the children playing to be seen from all angles. This put the play concept on a stage.

Large glass panels according to SABS 0400 part N.

Structural concrete columns and slabs according to engineer.

Carpet to be industrial type to accommodate wheelchair using.

LIGHT:

300 Lux

Natural light to infiltrate from northern, eastern and western sides. Western sun to be screened.

ACOUSTICS:

Large openings towards the lounge area will send the sounds of children's laughter and playing through the social area of the building.

Carpet dampen echo of sounds.

B) FREE PLAY AREA EXTERIOR:

MATERIALS:

The exterior play area to have combination of materials for aesthetic purposes as well as functional purposes. This enclosed exterior space floor finish can not be constructed solely of an heat absorbent material like paving or concrete.

By using soft materials like Masterfibe and with planting of trees, this exterior courtyard would not become a hot spot with an uncomfortable climate.

Using soft materials also reduce glare.

Rainwater to be channeled away from the play area via storm water drains into and underground water tank, which will be used for irrigating the green areas.

MOVEMENT AND ACCESSIBILITY:

Level changes would be indicated with security strips textured by bright imbedded pebbles. These changes not to be a step but rather a small usable ramp from exterior to interior or from play ground to covered walkway.

Masterfibre rubberized flooring to be used for exterior non slip flooring.
Masterfibre can be shaped and sculptured to provide a creative play area which would be safe and easy to move over.

C) SPECIALISED PLAY AREA

LIGHT:

Minimum 300 lux. Task lighting to be implemented at play tables and paint pit.

Natural sunlight to infiltrate space through top windows. Southern private garden to also provide natural light into specialized play area.

Dark room light to have electronic remote controlled dimmer to allow visitors eyes to adjust to change of light on his/her own time. This will also provide a safety aspect in the case where the visitor needs to switch on the light when he/she feels uncomfortable.

ACOUSTICS:

Carpets, natural timber ceilings and rhino board suspended ceilings would dampen sounds.

All windows to be double glazed to prevent outside noise from distracting the child's attention during one on one sessions with the therapist.

VENTILATION:

Although the private garden would provide some passive natural ventilation, the specialized play area would make use of mechanical cooling and heating.

SIZE:

The play area would accommodate maximum three pairs of child-therapist sessions at any one time.

The specialized rooms would only accommodate one pair per session.

6.10 CONSULTING ROOMS

LIGHT:

500 lux

Task lighting needed

Natural light from northern top windows to be provided.

VENTILATION:

Natural ventilation to be provided in all consulting rooms.

ACOUSTICS:

Carpets and natural timber ceilings would dampen sound.

Provide soundproof room in audiologist consulting room.

6.11 CARE ROOMS

LIGHT:

Minimum 300 lux. Task lighting to be implemented at nurses desks and over bed area.

Natural light to infiltrate bedroom and nurses desk area from the north. The covered walkway on the northern side of the care rooms provide protection from too much sunlight during the day.

ACOUSTICS:

Timber blinds and timber ceilings dampen sounds.

Double glazing between nurses desk and bedrooms provide a soundproof area for the nurses to do their own work and have conversations without disturbing the patients.

TV's above beds have earphones for acoustic and privacy properties.

VENTILATION:

Natural ventilation to be provided through northern windows. Cool breeze from over Waterkloof ridge to cool down room area.

Mechanical cooling and heating also to be provided.

6.12 BATHROOMS

The author looked at layouts in various disabled institutes as precedents to understand the detail needed in areas such as bathrooms.

SABS 0246 provided the necessary dimensions and standards required for a functional bathroom design.

VENTILATION:

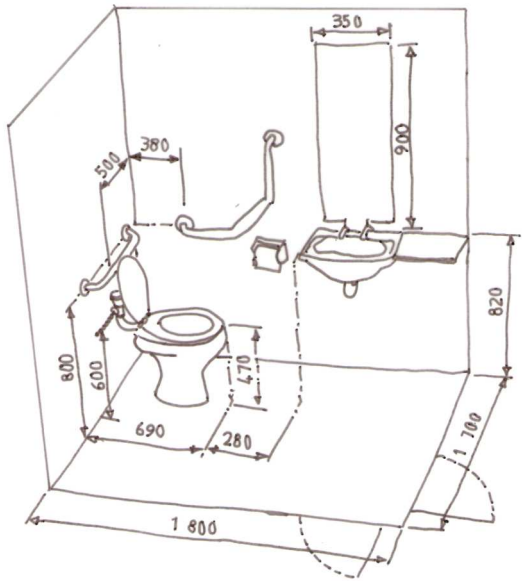
Natural ventilation

LIGHT:

100 to 300Lux

MATERIALS:

Non slip flooring, especially in showers.



Drawings from SABS 0246

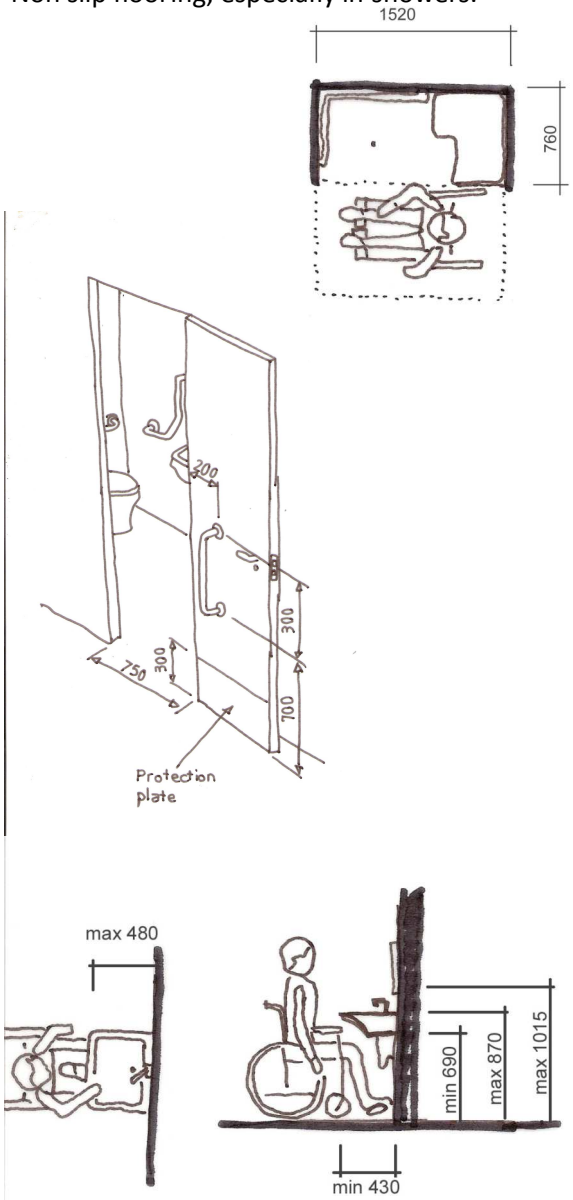


Figure 108. Bath with turn chair

Figure 109. No step in shower, enough space for shower chair

Figure 110. Grab rail for toilet layout

6.13 MATERIALS

CONCRETE

Concrete is used to construct selected roofs, covered walkway roofs, columns and selected walls.

Concrete provides versatility to building.

TIMBER

Natural Meranti timber to be used for ceilings and cladding to high interior walls.

Timber screens are used to protect glass facades from too much sunlight.

FACE BRICK

Clay FBS face brick: Berg en Dal Light Satin

Origin from Witbank, Mpumalanga

The face brick used in the existing School building needs to be respected. Although the existing face brick are not Berg en Dal FBS, this product make a positive connection to the existing school

NATURAL STONE

Natural stone originating from Ohrigstad. This stone to be used in the landscape as well as building screen walls around kitchen yards and private gardens.

These natural stone walls would provide contrast in texture and introduce natural elements into the building.

STEEL

Steel is easy to construct and add versatility with concrete. The use of thin steel columns and steel roof beams provides the opportunity for a light balanced structure with large glass facades that will allow the building and nature to integrate into each other.

GLASS

Glass gives the building a transparent feeling and thus connecting nature with the interior of the building. Tinted glass would reduce glare and heat inside the building. Double glazing also have acoustic properties to block sounds from one room to another.

ROOF SHEETING

Hulabond IBR chromadek roofsheeting will be used to connect to the existing School's architecture.

PLASTERED WALLS

Different textures could be achieved with plaster. Different finishes can be created by using different grain sand in the plaster mixture. Varieties in textures could also be provided by using different objects and techniques to apply the plaster to the walls.

CARPETS

Nylon carpets is the most popular fiber carpets used. This is a synthetic fiber that is durable and easy too clean. The under felt must be chosen to increase resilience and durability. This also reduce sound transmission. (Matthews, 2003:111)

TILES

Slip resistance would be a major factor when choosing a tile especially when disabled people will be moving on these tiles.

The author tested various tiles for slip resistance. Natural sandstone tiles would be the tile the author thought that would be the most slip resistant. However, these tiles does not support easy cleaning especially from wheelchair marks. It would be an option to seal this tile.

PAVING

Raw timber mould to make imprints into concrete walkway creating senses when moving over with wheelchair. The timber texture would also connect the use of concrete to the natural environment.

Berg en Dal clay paving bricks also to be used for paving as a change in pattern of the walkways. This would be used to connect the landscape and the building.

MASTER FIBER PLAYGROUND FLOORING

The external playground is placed between the northern and southern wings. The northern wing blocks the natural flow of wind from the north. This could generate a lot of heat in the playground courtyard.

This is a durable, safety rubber insitu “wet pour” that is a 12 to 45mm seamless application over a concrete screed or any other firm material.

The product is made from recycled materials and is durable, maintenance free, wheelchair resistant and slip resistant. See appendix.

WATER

Water would be used in the landscape to create a form of tranquility and peacefulness. Running or falling water would also be used to create sound and thus testing or stimulating the hearing senses.

GABIONS

Gabions will be used to rehabilitate existing waterkloof stream. Gabion mattresses to be used to create a new lower stream level.

6.14 FINISHING SCHEDULE

MATERIAL/FINISH	SUPPLIER	LOCATION	PHOTO
PAVING			
Concrete interlocking paving	Concor technicrete	All vehicle roads	
Moulded concrete with facebrick joints	Face brick - Corobrick , PPC cement	All walkways towards enrances	
FLOORING TILES			
Natural sandstone tiles	Tile Africa	Passages Lounge and restaurant area Care rooms Waiting area Entrance Patios Pool and Hydro pool area	
Epoxy flooring	Earth cote	Bathrooms Scullary Kitchens	

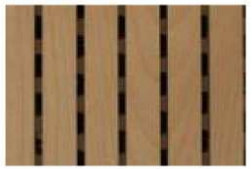
Carpets	Nouwens Carpets	Offices Play areas	
Masterfibre flooring	Masterfibre Specialist	Courtyard play area	
Timber decking		Open patio restaurant area Open patio care rooms	
COLUMNS			
Concrete	PPC Cement	Main entrance Care and consulting rooms entrances	
Steel IPE sections		As per plan	

6. FINISHING SCHEDULE

WALL FINISHES			
Scratch plaster		All plater walls except special indication	
Concrete walls	PPC Cement	As per plan	
Face brick walls	Corobrick	As per plan	
VERTICAL TILES			
Mosaic tiles	Tile Africa	All reception desks Care room handwash basin splash backs All basin splash backs Showers interior	
Ceramic tiles	Tile Africa	Bathroom walls Scullary walls	

Pool step tiles	Costum made	Hydro therapy upstand beam	
CLADDING			
Timber cladding		All walling above top window sill	
Natural stone	Natural stone warehouse	Yard walling Water feature walling North western loose standing signage wall Pedestrian access gateway Southern boundry wall infill sections	
WINDOWS & DOORS			
doors:			
Automatic glass sliding doors	Frost Automatic	Main Entrances Entrance to pool area Entrances to specialised play area	

Alluminuim framed shopfronts	Frost Automatic	All glass facades	
Specialist acoustic doors	Acoustic Systems	Audiologits - sound proof room Music room Access doors to specialised play area	
Alluminuim framed interior doors	Frost Automatic	Consulting rooms Offices Care room Kitchen doors	
Bathroom doors		All bathroom doors	
windows:			
Specialist acoustic window	Acoustic Systems	Audiologist soundproof room One way soundproof window between consulting room private lounge and specialised play area Nurses desks towards care rooms Music room exterior windows	

Alluminuim framed windows	Frost Automatic	All exterior windows	
Glass curtain walling	Frost Automatic	Surrounding of pool and hydro pool area Infill glass wall between main reception and free play area	
CEILINGS			
Timber ceilings with accoustic underlay		All ceilings except concrete roof ceilings	
Suspended ceilings		According to ceiling plan	 
VANITIES,COUNTERTOPS &BUILD IN SHELVES			
Technistone 30mm solid surfacing	Techni stone	All build in work tops	

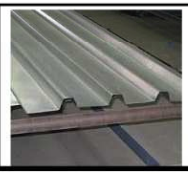
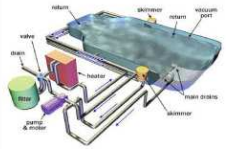
60mm Prefabricated concrete shelf	Custom made	All book shelfs	
SANITYWARE			
Hand wash basins	Sanitary warehouse	Care rooms Bath rooms	
Prep bowls	Sanitary warehouse	Kitchen Consulting room private lounge	
Sinks	Sanitary warehouse	Scullary Care area kitchen	
Bathroom accesories	Sanitary warehouse	Bathrooms WC	

6. FINISHING SCHEDULE

Bath	Sanitary warehouse	Bathrooms	
Bath- and Basin Taps	Sanitary warehouse	Bathrooms Care rooms	
Grab rails	Sanitary warehouse	WC Bath rooms Shower rooms	
Shower Tap	Sanitary warehouse	Shower rooms	
Sink Tap	Sanitary warehouse	Kitchen Scullary	

WC	Sanitary warehouse	WC	
SIGNAGE			
Statutory Signage	Fusion signs		
Directional Signage	Fusion signs		
Main building signage	Fusion signs		
WATERPROOFING			
Waterproofing	Metzi Sealants	Roof Pools	

Sealants	Metzi Sealants	Roof Pools	

ROOFSHEETING			
Roofsheeting	Hula Bond	Roofs	
GABION WALLING			
Gabions	Maccaferri Africa	Stream line	
SERVICE INSTALLATIONS			
Grey water tank pump equipment		Pool area	
Gas installation	The gas company	Kitchen	

Landscaping			
MISCELLANEOUS			
Ironmongery			
Aluminuim ballustrades			 BALCONIES

REFERENCES

BOOKS AND ARTICLES:

- Grobbelaar, A. 2004. *Building Construction & Graphic Standards.* Johannesburg: Anglo Rand Publications.
- Mathews, PJ. 2007. *Detail Housed.* Pretoria: Visual Books.
- Blom, R.2006. *The Handbook of Gestalt Play Therapy.* London: Jessica Kingsley Publishers.
- Cerver, FA. 2000. *The World of Contemporary Architecture.* Konemann
- Porter, T. 1997. *The Architect's Eye*. London: E & FN Spon Publishers
- Singer, P. 1983. *Hegel—A Very Short Introduction.* United States: Oxford University Press Inc..
- Mathews, PJ. 2003. *Architexture*. Pretoria: Visual Books.
- McMorrough, J. 2006. *Materials Structures Standards*. Massachusetts: Rockport Publishers
- *Digest of South African Architecture 2005/2006*. Cape Town: Picasso Headline (Pty)Ltd
- *SA Human Resources report.* November 2002
- *South African White Paper on Disability*. 2002
- Bleck, EE & Nagel, DA. 1975. *Physically Handicapped Children, a Medical Atlas for Teachers*. New York: Grune & Stratton Publishers
- Lingam & Lloyd-Evans. 1997. *Disappearing Cerebral Palsy*. Life Medical Health Pamphlet.
- Lingam, Prof. Life healthcare Brochure; *Cerebral Palsy and Botox treatment,* a guide for parents
- Aalto, A. 1940. *The Humanizing of Architecture*, The Technology Review. Nov. 14-16
- Bloomer, KC & Moore, CW. 1977. *Body, Memory & Architecture.* USA: Yale University Press.
- Ching, FDK. 1942. *Architecture—From, Space and Order*. New York: Van Nostrand Reinold.
- Papanek, V. 1971. *Design For The Real World.* New York: Pantheon Books.
- Sobchack, V. 2005. *A Phenomenological Meditation in Movements.* Heidelberg: Allemagne Publishers.
- Pallasmaa, J. 2007. *Embodied Experience on Sensory Thoughts*. Australia: Philosophy of Education Society of Australasia
- Johnson, M. 1989. *Embodied Knowledge.* Illinois: John Wiley & sons, inc..

INTERVIEWS:

- Leading physiotherapist at New Hope School; 2009
- Helen Venter, physiotherapist at Little Company of Mary's Cerebral Palsy unit; 2009
- Ronel Hofsure, Head psychologist at Riverfield Lodge; 2009
- Daleen Hamman, teacher in play therapy; 2009
- Michelle Grove, teacher for children with disabilities, New Hope School; 2009
- Annette Wernich,Radiologist, Drs De Beer & De Jager Radiologists, 2009
- Dawie venter, Headmaster, New Hope School; 2009
- Paul Botha, Civil Engineer; Concor; 2009
- Pieter Kelbrick, Plumbing Specialist, Kelbrick Plumbers; 2009
- MJ Wolmarans, Surveyor, LWA Quantity Surveyors; 2009
- Gavin Crisswell; Architect, KFW Architects; 2009