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1.1 THE PROJECT

The theme of the study is set in the Prinshof area of Pretoria. With analysis of the area the need to plan for disabled people was identified. This need is predicated upon the city's ecological development over time where facilities for the disabled settled there, such as the Prinshof School for the Blind, Pretoria School for Cerebral Palsied and the Northern Gauteng Association for the Disabled. The concentration of disabled facilities was further entrenched by the City's Zoning, indicating the area for education, health facilities and preservation of the city's natural resources (Apies River Precinct). Spatially the area became segregated from the rest of Pretoria and formed an 'island' of disabled, which is not integrated and therefore removed from the inner city.

It is generally accepted that although the needs for people with disabilities are catered for in the National Constitution, these are still excluded from society. Special arrangements exist for the disabled in the field of sport and recreation, but there are still serious gaps with integration of the disabled into the general economy of the country, especially the employment labour market. This is despite equity regulations legislated in compliance with the Constitution.

Statistically, only one percent of the disabled are integrated into the formal economy. (statssa:2007)

The question arises: "Why only one percent? What happens to disabled children when they leave

school?"

Gutman (1968:3), in his proposals for the disabled, says that social interaction is probably one of the most important aspects that needs to be designed into a building.

It is from this premise that the dissertation investigates and designs a building for disabled people, bridging the gap to accommodate them in the formal economy and integrating them spatially into the 'life' of Pretoria. This gap is bridged (integrating the disabled into society) in the following ways:

- The disabled community, separated from the city due to its zoning and history, will be integrated into the greater city of Pretoria by consolidating into the immediate surround.
- Skills training, equipping them for formal employment. A gap is bridged between school education and skills required in the economy.
- Capitalising on the natural open space requirements for the Apies River precinct, by designing a building which optimises modern day sustainable environmental practices.
- Enhancing the nature corridor into the inner city by erasing the boundary between the passive open spaces and urban environment.



city



designated area



proposed area



Northern Gauteng Association for the Disabled

Pretoria School for Cerebral Palsied

Prinshof School for the Blind

Inner City

selected site

1.2 PROBLEM STATEMENT

To design an in-vocational training facility that

- introduces a school-to-work transitional model for young adults with disabilities;
- creates an accessible link between able-bodied and disabled communities; and
- is environmentally and economically sustainable.

1.3 AIM OF THE PROJECT

To design a centre where disabled people can become self-sufficient.

1.3.1 Training

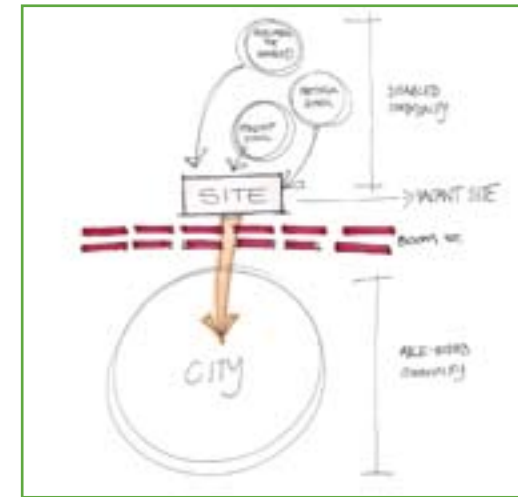
Learners may enrol for in-service vocational training.

A 'supported employment' model will be utilised whereby appropriate supported in-service training will assist learners in finding employment in the open labour market. This model is successfully used in the existing initiative, "Building Tomorrow" programme, undertaken by the Pretoria School for Cerebral Palsied. To expand the model further, the project will also integrate with the existing institutional and building structures of the Prinshof School for the Blind and the Northern Gauteng Association for the Disabled. A node will thereby be created, which will better serve the objective of integrating the disabled with the able-bodied community.

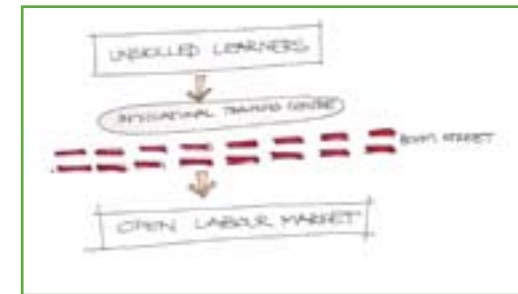
1.3.2 Link between able-bodied and disabled people

The centre focuses on training needs for the economy, especially those opportunities best suited for disabled persons. The integration into the environment of the able-bodied is facilitated by, for example:

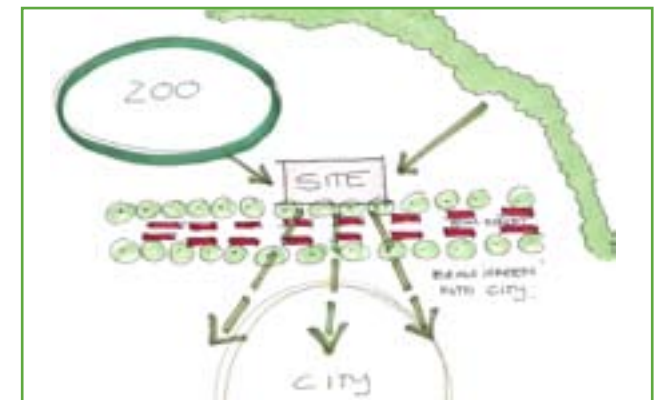
- The urban agriculture practiced at the centre, giving access and contact to outlet channels and market competitors
- Specialised training of skills and marketing these to clients to meet equity employment targets (e.g. secretarial)
- Training facility and candidates made available to companies with identified needs (e.g. photography developing industry)
- On demand training for companies with special needs using the infrastructure available at the Centre prior to accommodating the trainees into the new environment (e.g. specialised facilities and training for the blind)
- Training hall facilities in the building will be made available to the local community after hours, for example, adult training and other activities.



linking communities



transition

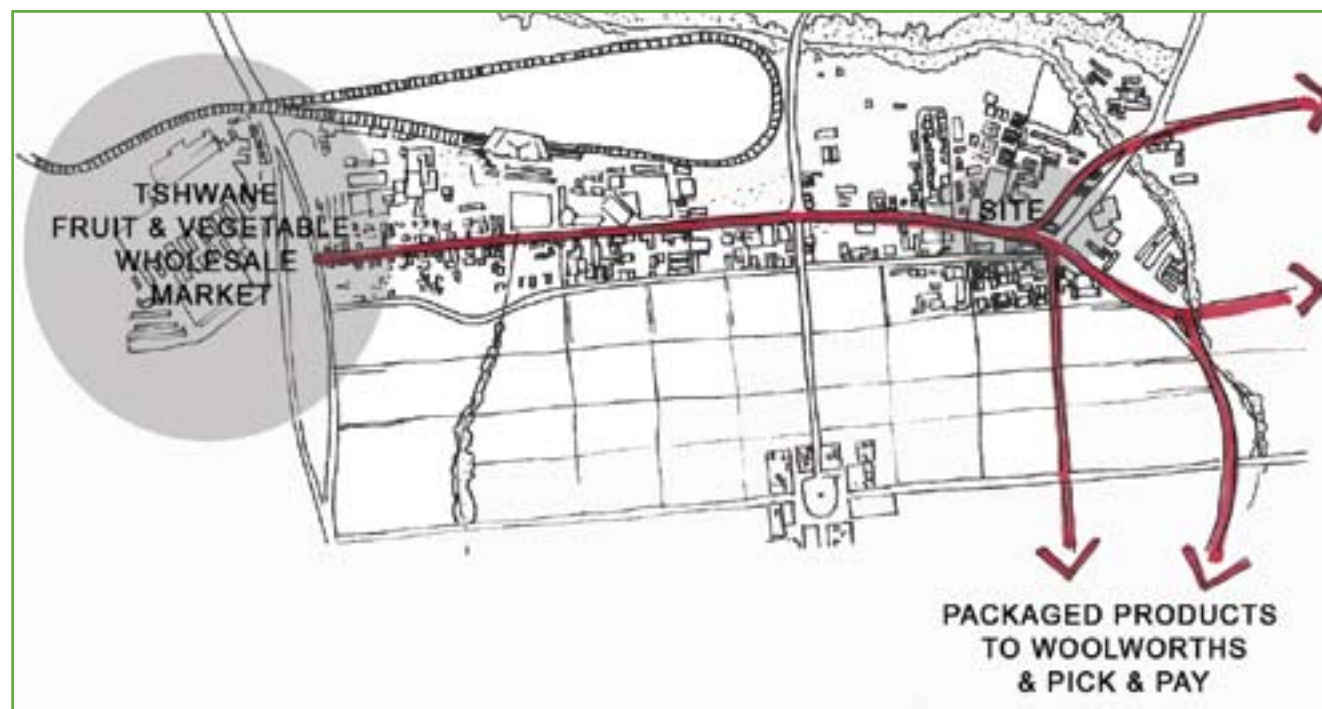


greening the city

1.3.3 Sustainability

The project aims to achieve operational self-sufficiency, i.e. financial sustainability, by:

- Rendering all services at cost recovery rates
- Linking with the Pretoria wholesale vegetable market to package vegetables for Woolworths and Pick 'n Pay
- Executing functions best suited for the disabled, e.g. packaging for the food industry and other menial tasks not suited for mechanisation (simple assembly and packaging)
- Small-scale hydroponics urban agriculture specialising in pest and bacteria free crops (lettuce, spinach and herbs) to supply contracts with Woolworths and Pick 'n Pay as well as including and expanding the existing Prinshof School's productive greenhouses and vegetable supply contracts
- Small-scale subsistence farming urban agriculture, where appropriate, to support own accommodation
- Rental of the facilities for required purposes, e.g. adult basic education after hours
- Sustainable building methods reducing building operational costs as well as water and energy consumption



1.4 WHY AN IN-VOCATIONAL TRAINING CENTRE?

Disabled people find it difficult to access the formal economy on their own, as Bradley Saunders (A hand-up –not a hand out –for disabled: 2002) states:

“Because of people’s perceptions that the disabled cannot do the job properly, people feel uncomfortable with disabled people.”

Historically people with disabilities have been vulnerable to unemployment, poverty and dependence on social grants. (This is especially the experience at the Pretoria School for Cerebral

Palsied). Therefore, skills training and employment is critical for learners with special education needs.

With promulgation of the Employment Equity Act, companies are obliged to employ the “physically challenged”. An incentive subsidy is paid by the Government for a year, for employing a physically challenged person. (A hand-up –not a hand out –for disabled: 2002)

It stands to reason that effecting the changes determined by the new legislation (Equity Act) will require support that still needs to be developed.

A 'transitional model', based on similar experiences in the United States of America, was devised by Leonora Nel and Colette van der Westhuizen, both occupational therapists from the Pretoria School of Disabilities. This model entails the identification of training for skills required in the existing local employment situations. After interviewing Mrs Leonora Nel (2007), the need for a new building complex in Pretoria (the subject of this dissertation), wherein training, accommodation and work can take place, was identified as the ideal solution.

1.5 THE CLIENT

The major client in the project will be the Northern Gauteng Association for the Disabled and "Building Tomorrow" programme of the Pretoria School for Cerebral Palsied. People from the Northern Gauteng Association for the Disabled as well as children from the surrounding schools, namely the Pretoria School and the Prinshof School, will be incorporated. The Northern Gauteng Association for the Disabled currently runs a facility near Pretoria Academic Hospital that provides work for disabled people, namely *Employment Solutions*.

Other benefactors like New Hope School for the Disabled, Unica School and Alma Training Centre will also benefit from this development.

1.6 THE STAKEHOLDERS

A range of stakeholders are identified, depending on their role in the project:

1.6.1 Ownership and financial stakeholders

- National Departments of Social Welfare (social grants), Labour (SETAs and employment), Education (training curriculum) and Treasury (financial grants).
- Private sector sponsors (corporate social investment).
- International development support.

1.6.2 Operational and input stakeholders

- Skills training
- Prinshof School for the Blind
- New Hope School
- Unica School
- Alma Training Centre
- Employment Solutions
- Individual employers who are training employees and employing learners.

1.6.3 Output stakeholders

- Learners having benefited from the institution.
- Individual employers who are training employees and employing learners.
- The Tshwane Metropole.

These stakeholders would be required to take part in active debate around social responsibilities towards the disabled, the position of the new facility and the role it will play in the community.

1.7 FUNDING

Two types of funding will be required:

- Capital funding to construct the project
- Operational funding for the client to successfully sustain the business

Funding will be sourced from both Government and the private sector to render a viable and sustainable project. Partnerships therefore have to be established with both.

The sustainable building practices being applied to the building and its total planning will qualify it for Clean Development Mechanisms (CDM) funding in terms of the Kyoto Protocol. Owing to the specialised and complex nature of applying for and being evaluated for CDM funding, this aspect is not further investigated in the dissertation.

1.7.1 Government failure

Although care for the disabled is a Government obligation, insufficient funding exists. This has to be augmented from both private sector and international funders.

1.7.2 Market failure

Care for the disabled does not render an adequate return to make it viable for private sector investment. Therefore, alternative incentives must exist for the private sector to invest in these projects. Proven social investment qualifies for various types of tax rebates.

1.7.3 Capital funding

A large percentage of the capital funds will be forthcoming from the Departments of Welfare and Education. The banking sector and insurance houses favour social investment in viable projects for the disabled. Their names are often linked to elements in the project. International funders currently invest large amounts in developing projects for the disabled, such as:

- Kreditanstalt für Wiederaufbau (KfW), based in Johannesburg.
- Gesellschaft für Technische Zusammenarbeit (GTZ), based in Pretoria.

1.7.4 Operational funding

Care for the disabled and education is first and foremost a Government responsibility and hence aspects such as teachers' salaries will need to be paid by the Government. The operational cost of certain educational facilities would be the responsibility of the potential employer or beneficiary. These could, for example, be the packaging and print media and publishing sector. Their funding and implementation of learnerships for people with disabilities will assist them to meet set targets for the employment of people with disabilities.

1.8 THE CLIENT'S NEEDS

The following socio-economic needs of the physically disabled community of South Africa must be addressed:

1.8.1 Wide-scale needs

The Tshwane Metropolitan Municipality and Government have the following interests:

- The application of the Inner City Development Framework
- Compliance with applicable laws and regulations.

1.8.2 The physically disabled community's needs

- Employment creation opportunities.
- Interaction with able-bodied people.
- More training facilities.
- Training in a safe environment.
- Exposure to income-generating employment.
- Access to free or affordable accommodation, close to public transport and shopping malls whilst in training.
- An encouraging, sensory awareness and empathetic environment.

1.8.3 Local skills needs

- Northern Gauteng Association for the Disabled needs work and training facilities in surrounding areas.

1.8.4 The “Building Tomorrow” programme’s needs

- New in-vocational training facilities
- Accommodation for trainees

1.8.5 The employers of the physically disabled workers’ needs

- Accommodation at centres for workers undergoing training.
- Continued training.

1.8.6 The Prinshof community’s needs

- Improved safety and security
- More employment

1.9 WHAT DOES IT MEAN TO DESIGN FOR PEOPLE WITH PHYSICAL DISABILITIES?

The needs of the affected parties present the opportunity to research how to create spaces in an around a centre for people with physical disabilities in order to promote their independence.

1.10 THE OUTCOME

The challenge of this dissertation is to design a centre that caters for the needs of people with physical disabilities as well as an environmentally sustainable building.



2

LEVEL

FUNCTION

SPACE DESCRIPTION

ACCOMMODATION SCHEDULE

LEVEL	FUNCTION	SPACE DESCRIPTION
A. SOUTH WING		
-1		
	Basement	<ul style="list-style-type: none"> Water storage tanks
0		
	Entrance	<ul style="list-style-type: none"> Reception Waiting area
	Circulation space	<ul style="list-style-type: none"> Ramp Stairs Broad passages also used for gathering spaces
	Training halls	<ul style="list-style-type: none"> 2 clerical training rooms 4 individual to small group training rooms 1 photographic and printing training workshop 3 supervisors' offices
	WCs	<ul style="list-style-type: none"> 2 disabled 5 ambulant users Helpers' corner
	Social area / smoking patio	
1		
	Training halls	<ul style="list-style-type: none"> 4 adjustable training rooms 1 custodial training room 1 domestic training room 1 soap manufacturing hall 1 supervisor's office
	WCs	<ul style="list-style-type: none"> 2 disabled users 5 ambulant users Helpers' corner

B. EAST WING		
0		
	Administration	<ul style="list-style-type: none"> Reception Waiting area Boardroom Director's office Secretary Business Manager's office Purchasing and contracts office Safe WC Tearoom
	Cafeteria	<ul style="list-style-type: none"> Inside and outside seating WCs: <ul style="list-style-type: none"> 4 disabled 4 ambulant disabled Helpers' room
	Kitchen	<ul style="list-style-type: none"> Supervisor's office Preparation Cooking area Wash-up area Storage Yard: <ul style="list-style-type: none"> Recycle sorting area

C NORTH WING		
-1		
	Basement north	<ul style="list-style-type: none"> • Parking garage <ul style="list-style-type: none"> – 9 disabled parking bays – 1 shuttle stop • Delivery zone • Security checkpoint • Kitchen staff WCs and lockers • Pump room: <ul style="list-style-type: none"> – Water storage tanks – Water pump – Emergency generator
0		
	Staff housing (helpers)	<ul style="list-style-type: none"> • Lounge • Dining room • Kitchen • Bedroom • Bathroom • Bedroom en-suite
	Internet café	<ul style="list-style-type: none"> • 3 telephone booths • ± 5 computers
	5 apartments for wheelchair users	<ul style="list-style-type: none"> • Each apartment: <ul style="list-style-type: none"> – 2 bedrooms – Disabled bathroom – Kitchenette – Balcony with solarium
	Recreation area	<ul style="list-style-type: none"> • 1 braai facility
1		
	Laundry	<ul style="list-style-type: none"> • Drop-off and pick-up • Storage • Hand wash area • Washing and tumble drying • Ironing • Drying area (outside) • Staff WC
	1 separate bedroom	<ul style="list-style-type: none"> • Single bedroom • Kitchenette • Bathroom with shower
	5 apartments for ambulant users	<ul style="list-style-type: none"> • Each apartment: <ul style="list-style-type: none"> – 2 bedrooms sleeping 2 each – Bathroom with shower – Kitchenette – Balcony with solarium
	Lounge	<ul style="list-style-type: none"> • Adjustable to create 3 separate smaller lounges

D. WEST WING		
0		
	Sewing and ironing workshop	<ul style="list-style-type: none"> • 1 supervisor's office • Storage • 2 WCs
	Vegetable packaging workshop	<ul style="list-style-type: none"> • Supervisor's office • Men's locker rooms: <ul style="list-style-type: none"> – 2 disabled WCs – 1 ambulant WC • Ladies locker rooms: <ul style="list-style-type: none"> – 2 disabled WCs – 2 ambulant WCs
	Cool room	2
	Security checkpoint	1
	Delivery and dispatch area	<ul style="list-style-type: none"> • Area for recyclable organic waste to go to zoo • Area for other recyclable products, for example cardboard boxes • In and out
1		
	Therapists	<ul style="list-style-type: none"> • Reception • Store • Waiting area • 4 therapist's offices • 1 tearoom / lounge • Gym • Store • 2 disabled WCs
	Greenhouse	<ul style="list-style-type: none"> • Storage • 2 disabled WCs • Office • Tanks • Inside and outside planting area

3



SITE SELECTION CRITERIA

3.1 THE PHYSICALLY DISABLED COMMUNITY'S NEEDS

The needs of the people in the community determined the selection of a site for the project. Accurate information regarding the number of disabled individuals, the types of disabilities, existing facilities and potential market for products and services, guided the selection. (See Appendices 9.4)

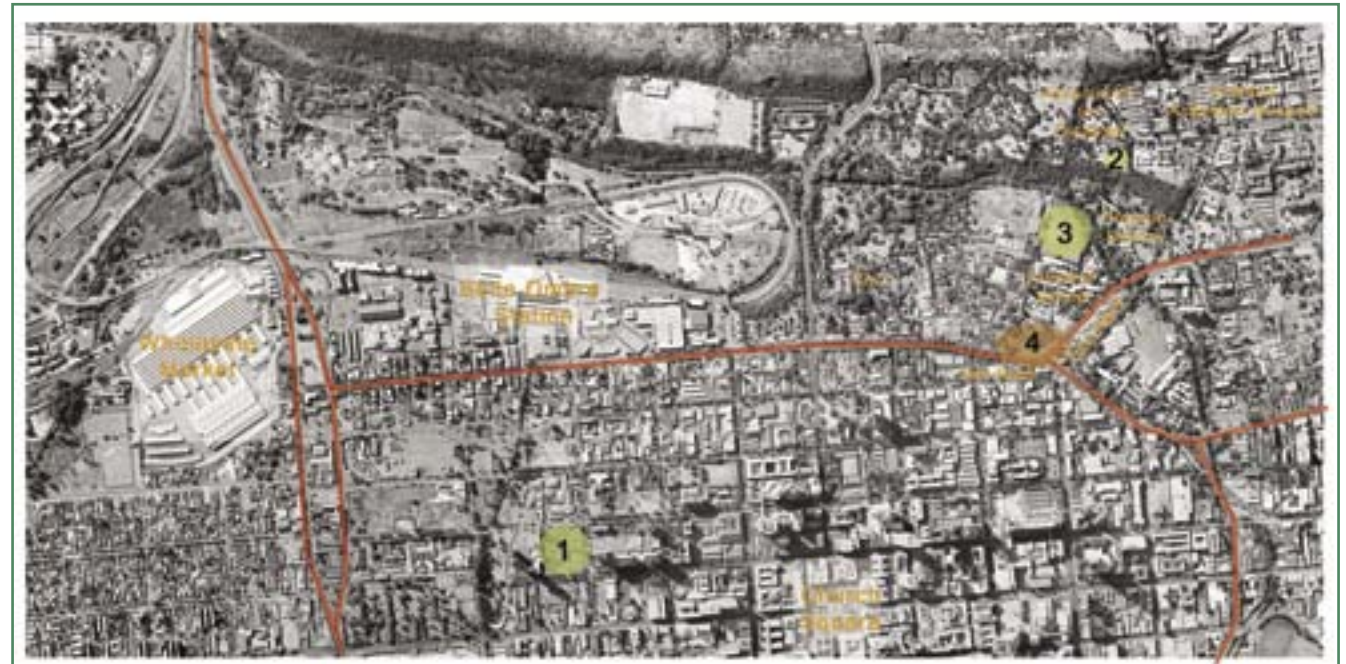
Ilze Meintjies, Chief Executive of Employment Solutions at the Northern Gauteng Association for the Disabled, stated on behalf of the physically disabled community, in March 2007, that to achieve independence the site must comply with the following requirements:

The centre must be in close proximity of public amenities, including:

- Public transport systems – bus, train, taxis, trams and Gautrain
- Shopping malls where food, clothes and appliances can be bought
- Post Office
- Worship centres
- Open spaces / Recreational facilities
- Safe areas
- Areas where association with the local community is possible
- Schools
- Social and sports amenities

Therefore the first aspect to consider when choosing a site was :

- its accessibility and
- its central location relative the amenities for the beneficiaries (see Appendices 9.1)



3.2 POSSIBLE SITES

3.2.1 Option 1:

Site in Western CBD

Advantages:

- In close proximity to the wholesale food produce market and Belle Ombre Station
- Situated on main transport routes

Disadvantages:

- Too far from other disabled facilities, e.g. Northern Gauteng Association for the Disabled

3.2.2 Option 2:

Site next to Northern Gauteng Association for the Disabled

Advantages:

- In close proximity of disabled facilities, schools and Pretoria Academic Hospital

Disadvantages:

- Not situated close enough to public transport
- The site is not large enough to accommodate the needs of such a facility

3.2.3 Option 3:

Unused sports grounds next to Prinshof School

Advantages:

- The site is large enough to accommodate the needs of the facility
- In close proximity of disabled facilities

Disadvantages:

- Slightly removed from public transport and vehicular arteries
- Difficult to access the site

3.2.4 Option 4:

Site on corner of Boom Street and Soutpansberg Road – across taxi rank

Advantages:

- In close proximity of disabled facilities, schools and Pretoria Academic Hospital
- The site is large enough to accommodate the needs of the facility
- Situated on main transport routes
- In close proximity of public transport
- Vacant site on the edge of the inner city, creating a physical link between the “abled” city to the South and the disabled community to the North

Disadvantages:

- Next to busy Boom Street

3.2.5 Conclusion

OPTION 4 will be the most appropriate for the Centre.

3.3 OVERVIEW OF THE PROBLEM IN PRETORIA TO BE ADDRESSED

Over the past 20 years, businesses and public services have moved out of the inner city towards the new eastern developments of Menlyn, Brooklyn and Woodlands. This migration caused the CBD and surrounding inner city to decay. Designers are now faced with the challenge to rejuvenate the inner city and re-establish its sustainable economic environment by attracting business and services back to it. The current rejuvenation project for the CBD is starting to re-attract the important capital injection and is slowly returning to its economic stability. It still remains a challenge to attract skilled workers back to the CBD and this project for the disabled on the fringes of the CBD is certain to contribute to the return of skilled persons.

This new building on the fringe of the CBD respects its site and aims to enhance the location, environment and community (abled and disabled). The following frameworks were used as guidelines for the design of the Centre, ensuring that it complies with the above set aims:

- Inner City Spatial Development Framework
- Nelson Mandela Corridor – with the view of upgrading the Apies River promenade to a pedestrian spine, along with activities
- Zoo precinct
- City of Pretoria guidelines for the redevelopment of the CBD

The City of Tshwane Metropolitan

Municipality’s vision is :

“To become the leading international African capital City of Excellence that empowers the community to prosper in a safe and healthy environment.”

The vision clearly sets out the development goal of becoming the African City of Excellence. The vision of Tshwane (and its implications for the Inner City) therefore focuses strongly on two components, namely:

- People and the betterment of their lives;
- The image and functionality of the Inner City as an internally important city.

(Tshwane Inner City Development and Regeneration Strategy, 2005)

3.4 RATIONALISING THE CHOICE OF SITE

The location of the site is particularly favourable for the transport needs of the disabled, being opposite the taxi rank and along an important axis into the CBD. The advantageous access enhances the character of the area with the special provisions to be made for the disabled, which will render a pleasing view from Boom Street and Soutpansberg Road.

With further application of the previously mentioned City’s development frameworks for the area, the community, (both able and disabled) will benefit

psychologically from the green urban design qualities of the Apies River Green Strip's close proximity.

The close proximity of nearby schools, medical facilities, public amenities and transport further benefits the site, thereby ensuring success for the proposed project. The accommodation provided on the site contributes to the much needed increase in population density for the inner city.

3.5 APPROACH AND INTERPRETATION OF THE LOCATION

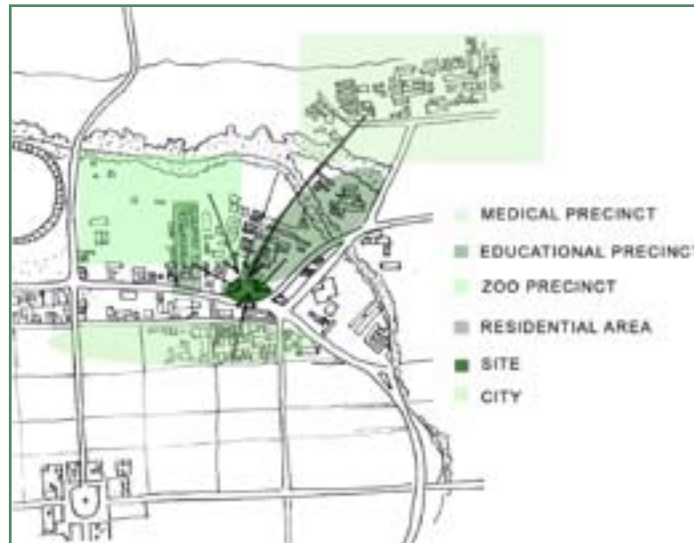
3.5.1 Approach to the site

- The site is presently a dysfunctional piece of land within a functional urban environment. The approach towards the site will be one of CONNECTION. The importance of the site will lie in the way it connects itself to the context as well as connecting different functions, communities and precincts to each other.

3.5.2 Interpreting the city

- Dewar (1997:27) stated two major shifts in thinking about the city, namely:
 - Scale the city on a model that uses the pedestrian and public transport as baseline
 - Move from a programmatic to a non programmatic approach to urban design.

The programmatic approach led to a sterile environment that became an enemy of disabled people. The disabled individual has a need for an environment that is rich in both physical and psychological opportunities and choices, if he/she is to function properly.



3.6 SITE ANALYSIS

3.6.1 Spatial Framework

- Legibility**

The exterior and interior legibility of the future Centre is of utmost importance. The facades should convey the identity of the building so as to be clearly recognizable as a quiet, subdued building on the inner city's edge.

Legibility has a different meaning to different disabled people, for example the blind perceive and read the environment differently to the deaf and mobility impaired people. This dictates the design to be understood by all. It is important that both the able and disabled people experience and perceive the functionality of the building in the same way.

- Accessibility**

Accessibility for the disabled is much more than mere movement, leading the design to possibly not have clearly defined floors, walls and roofs due to the necessity of ramps throughout the building. This leads to the inter-linking of the exterior and interior without any visual or physical barriers, thus being a physical, social, psychological and environmental barrier-free design.

- Vitality**

Vitality in the Centre will be perceived on different levels of scale. Focus must be given to detail as the facility should provide enough visual stimuli to capture the viewer's imagination. Because the type of movement in the Centre is of

critical importance, it entails that the degree of visual detail for users will differ. Being a quiet building, it displays repetitive elements on the façade, rendering different perceptions of the edge to the various onlookers. The speed at which the structure is viewed whilst passing determines the level and amount of detail as well as rhythm any onlooker will experience.

- **Mass to space relation**

Open spaces play a dominant role in the urban environment. Buildings help in defining open spaces without the 3-dimensional mass of these having effect on the spaces. Specific functions must be assigned to open spaces, without which these will serve no purpose.

The mass to space relation must fit into the context of the urban fabric by giving better definition to the streetscape as well as creating a visual link between the taxi rank (south of Boom Street) and the Prinshof School (north of Boom Street).

- **Robustness**

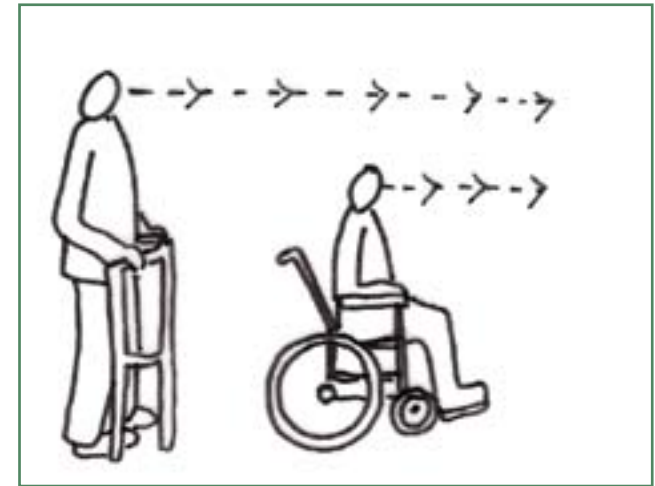
Two levels of robustness exist:

Firstly, it refers to the range of activities that the Centre will accommodate. The designed spaces must be adjustable to future changes in the function of the building.

Secondly, the structure and finishes must be able to withstand the use and function the building is put to.

3.6.2 Levels of perception

The Centre must be sensitively designed to accommodate the different natural levels of perception. An enriching design can be produced with the use of the physical environment and its various vantage points. Certain details will be enjoyed by wheelchair users at a lower level and other details by pedestrians at a higher level. This level of perception is accentuated with the use of ramps at different levels, leading to enriching the overall experience of the building. Passers-by can also become involved in the perception of the building and the users thereof.



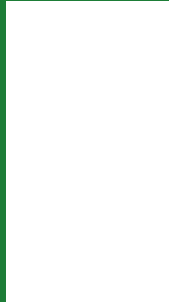
3.6.3 Movement

Movement for disabled people is an intensely personal experience. The table below explains sensations and feelings experienced by the author during an experiment (March 2007). Explanations are given on how the proposed building mitigates

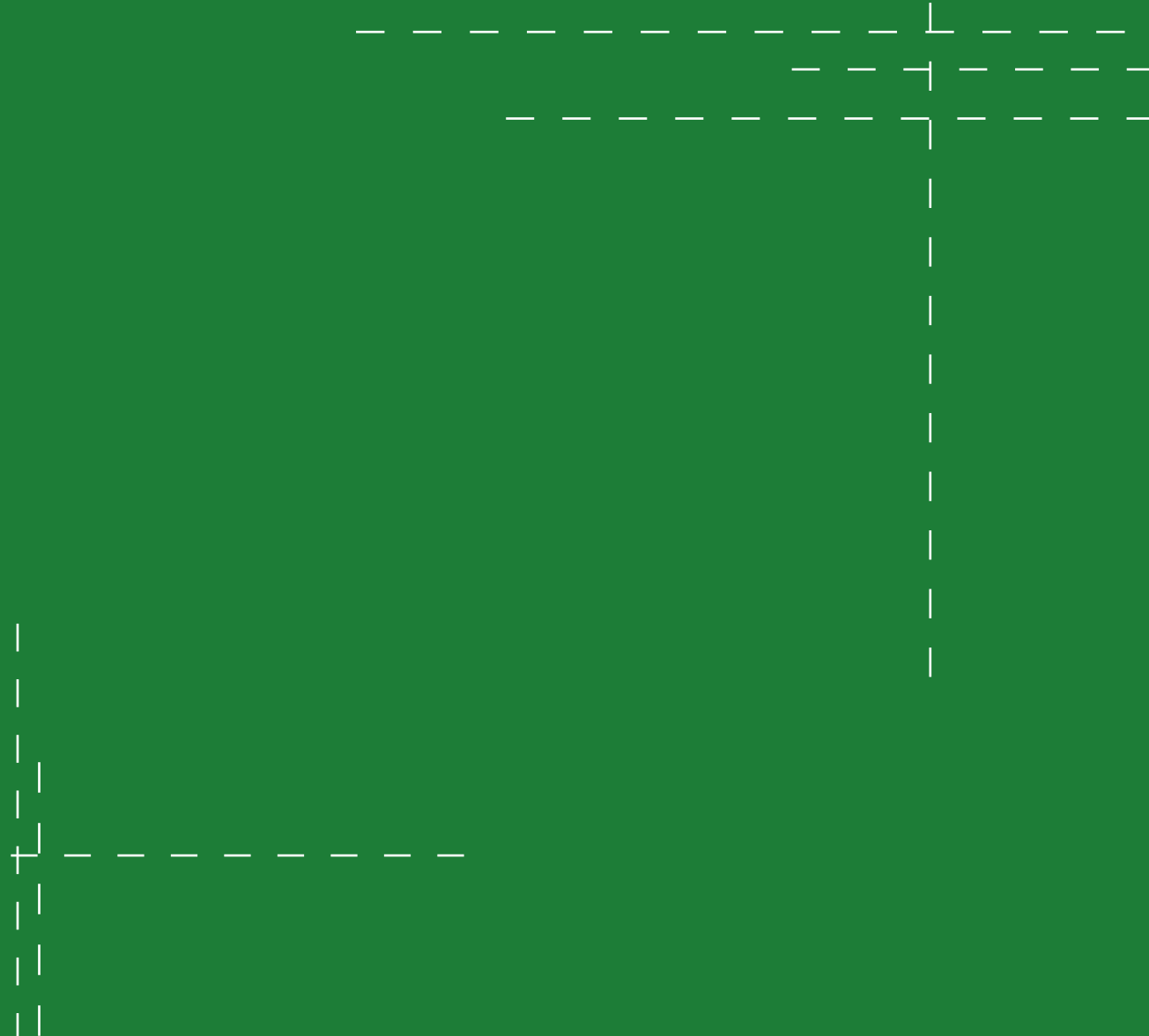
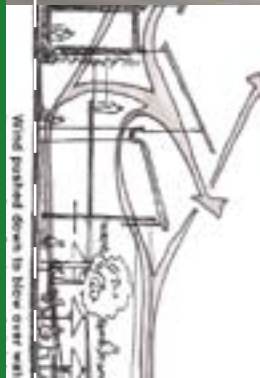


Feeling/Sensation	Mitigating intervention
Overwhelming	Building not higher than 3 storeys
Inferiority	Lowering levels to human friendly scale, e.g. suspended ceilings and canopies
Invisibility	Public is visually linked with the building occupants by using large glass panes through which activities are seen
Left out	Not applicable because the building is user-specific
Focused on	Being a quiet building, it does not attract undue spectator attention
Incapability	The building is user-specific to empower the disabled

CONTEXT



4



4.1 HISTORICAL CONTEXT

4.1.1 How Pretoria started

After 1848, ministers from various churches undertook missionary work across the Vaal River and after the founding of Rustenburg (1851) to the north, a need for a more centralised town between Potchefstroom and Rustenburg was identified.

In June 1852, the Volksraad of the Zuid-Afrikaansche Republiek reserved certain areas in the Apies River district for town settlement. With this goal in mind, Mr M.W. Pretorius bought certain portions of the Elandspoot and Daspoort farms along the Apies River in 1853.

In 1854, the Volksraad founded a church community (“Kerkplaats”) on Elandspoot. Rev. van der Hoff proposed the name, Pretoria Philadelphia (“Pretoria Brotherhood”) and on 16 November 1855 the town of Pretoria was born. In 1868, F.H. Jeppe (1834-1898) recorded that Pretoria was situated north-east of Potchefstroom – a mere eighteen hours per horse.

The town consisted of 300 erven, 80 houses and 300 residents (De Waal Collection, AV13).

4.1.2 Developments north of Boom Street

Various successful and luscious farms were situated north of Boom Street, including Rus & Urbe, Sans Souci and Belle Ombre.

A plan of Old Pretoria (± 1900) indicates that the city was bordered by *Boom Street* on the north and *Du Toit Street* on the East. Both of these “end streets” extended to the Apies River.

4.1.3 Development of Prinshof

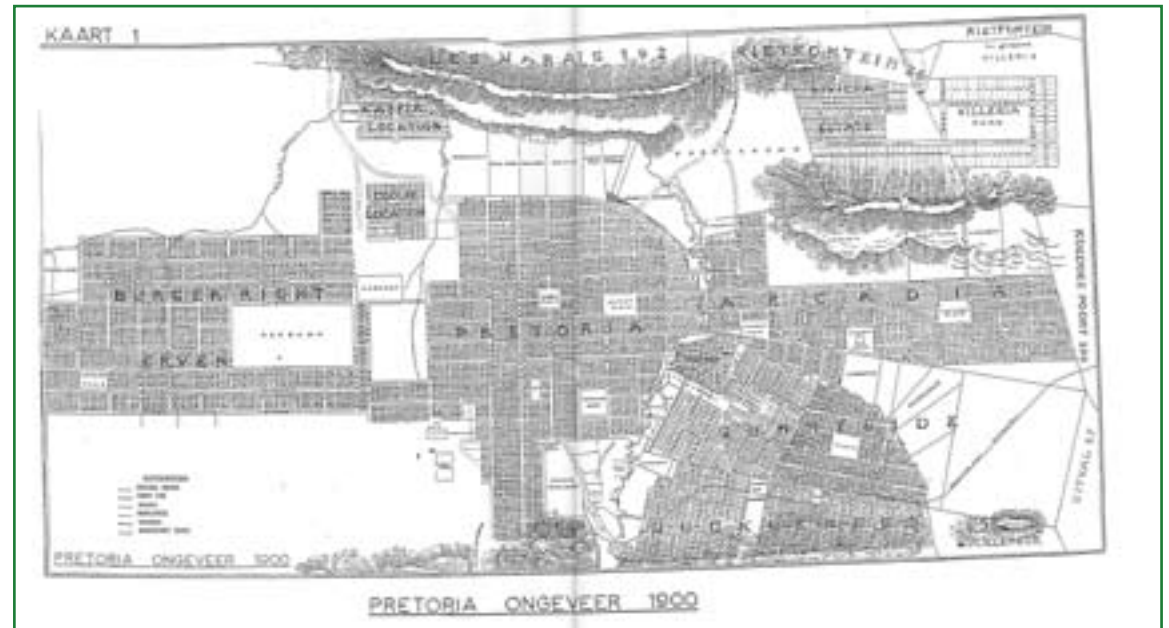
The property rights that M.W. Pretorius had over Elandspoot and Daspoort were given to the government, with exception of a portion for him to cover his expenses. This incorporated the then known Adapark, except for the remaining portion of the Daspoort farm, then called Prinshof, where J.J.P. Prinsloo still lived.

Other names in the title deeds regarding the Prinshof area are:

Wessel Schutte, Cathrine Prinsloo, P.E. Roos, L.S. Roos, Piet Roos, Philippus Roos (Snr), and David A. Botha.

The conclusion can be made that the farm was subdivided and had many changes of ownership. The Prinshof 349 JR Farm registry (no 22c) has been missing for quite some time and thus the history of the Prinshof area is quite vague.

A map was found on a certain area of Prinshof. The following information was found on the map:



“Gemeten voor den eenaar, T.H. Hove en vir goedkeuring op 23.07.1889 deur die Landmeter-generaal, J.F.B. (Johann) Rissik onderteken. Die totale oppervlak, soos toe bepaal, was 25 morg 290 vierkante voet (= 21.41 ha). “ (De Waal Collection, AV13).

On the Apies River, at Hove’s Drift, was a sign reading “Wagenweg naar Waterberg” (Wagon way to Waterberg), indicating that it was the link to the later Voortrekkers Road which crossed the Daspoort-Riviera Ridge that entered the Moot.

During 1899 the owner of the Prinshof area moved to Vryheid, Natal. After his death in 1906, the farm was sold to the government in 1908. On the street and erf map of Pretoria, 1911, Prinshof appears without an erf number and is registered as an experimental farm. Since 1916, the Prinshof Experimental Station paid particular interest to indigenous plants and its medicinal and poisonous properties, but has its claim to fame as being one of the first research stations devoted to a study of indigenous grasses (Stark: 1956).

During the 1960s the experimental farm was replaced by school buildings, which were used for a variety of educational purposes. In 1991 it suffered bomb explosions, but was re-constructed and is now used by the Technical University of Tshwane (TUT) (De Waal Collection, AV13).

A section of the site opposite Dr. Savage Road, also part of Prinshof, was excised to broaden and extend the one-way Boom Street. This piece of land is still not used, and was chosen as the site for the *In-Vocational Training Centre*.

North of this open field is the *Prinshof School for the Blind and Visually Impaired*; one of the five schools forming part of the Transoranje Institute for Special Education.

4.2 NATURAL FEATURES

4.2.1 Topography

Prinshof School is situated in a distinctive natural area defined by the Magaliesberg, Apies River and the Zoo precinct.

- **Natural systems generating order:**
 - a) Flow of Apies River
 - b) Mountains
 - c) Sun movement defining orientation

Due to later human interaction and the grid iron structure of the city, the relationship between landscape and settlement structure weakened. The natural elements, namely the Apies River and Magaliesberg’s influence on the city edge can clearly be seen where the landscape and the city grid meet at Boom Street. The site is situated on this edge.

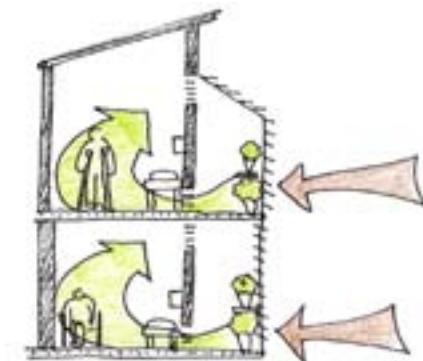


to the Centre and has both positive and negative influences on the Centre.

- **Positive aspects:**
 - Organic waste produced at the Centre can be taken to the zoo to be used as fodder for the animals
 - The sounds of animals, for example birds, have a soothing effect on the occupants of the Centre

- **Negative aspects:**

According to residents in the surrounding residential area, bad odours tend to originate from the zoo late at night. To compensate for this, fragrant plants such as Pelargoniums and Lavender are planted in the building as well as used in solariums of each individual room. At night the solarium windows are opened to the room to allow the strong floral fragrant to permeate the air and to diminish the possible bad odours from the zoo.



4.2. BAD ODOUR NIGHT AIR PASSES OVER STRONG FRAGRANT PLANTS TO SERVE AS AIR FRESHENER.

Temperature plays an important role in designing for disabled people. According to Mrs Ilze Meintjies (2007), CE of *Employment Solutions*, people with disabilities are prone to become sick easily, thus the building must strive to remain at a constant and comfortable temperature throughout the year.

The average temperature in Prinsshof during summer varies from 24°C to 36°C. Shading devices, vegetation and evaporative cooling are utilised to control internal temperatures of the Centre.

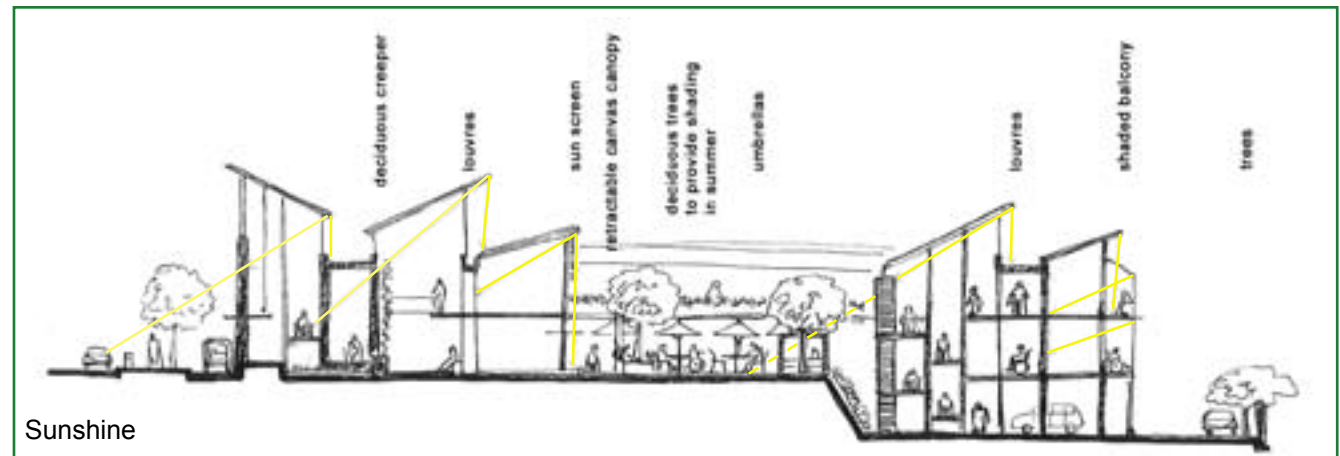
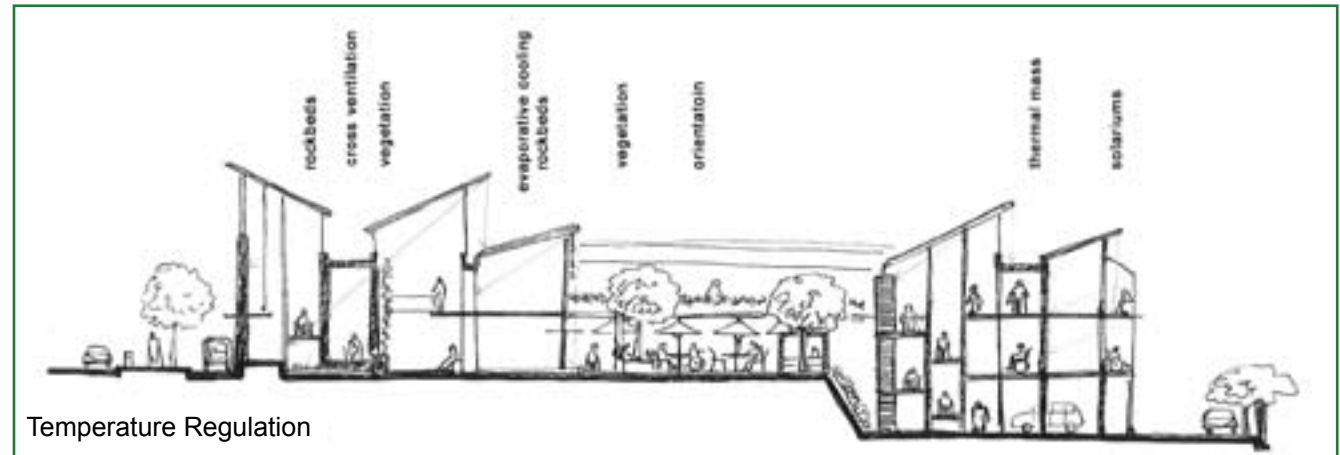
Winter month temperatures vary from 5,5°C to 12°C. Thermal mass, rock beds and solariums are used to capture the sun's energy during the day and release the energy indoors during the evenings.

4.2.3 Sunshine

The Centre is designed to accommodate the sun for the following reasons:

- Plants within the building need to photosynthesise.
- Heat in winter.
- Sufficient sunlight in the greenhouse.
- Light play within the building.

Natural light permitted into the building must be easily adjusted or prevented. Light reflection from floors and ceilings could be optimised, but glare must be prevented on all surfaces. The sensation of the light's heat is not only important for blind people, but also for the physically disabled.



4.2.4 Water

- **Rainfall**

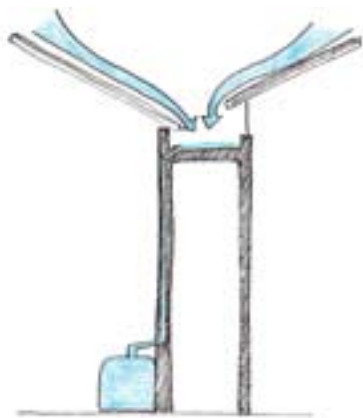
The rainy season occurs between October and April with an average annual rainfall of 674 mm per year. Rainfall is harvested and stored in tanks to be used for irrigation, hydroponics and flushing of WCs. Hail can be expected on an average of four days a year. The roof structure must be able to carry the weight of the hail as well as gutters must be wide enough to accommodate hail before it melts and is collected in the tanks. Due to the slant of the roof, hail will easily be disposed of towards the wide concrete box gutters where melting can take place without restricting the water flow down the gutter pipes.

- **Humidity and evaporation**

Minimum: 57% at 8h00 and 29% at 14h00 (value for September)

Maximum: 75% at 8h00 and 48% at 14h00 (March)

Water in the pools in front of the training halls and workshops evaporates during hot days, cooling the building.

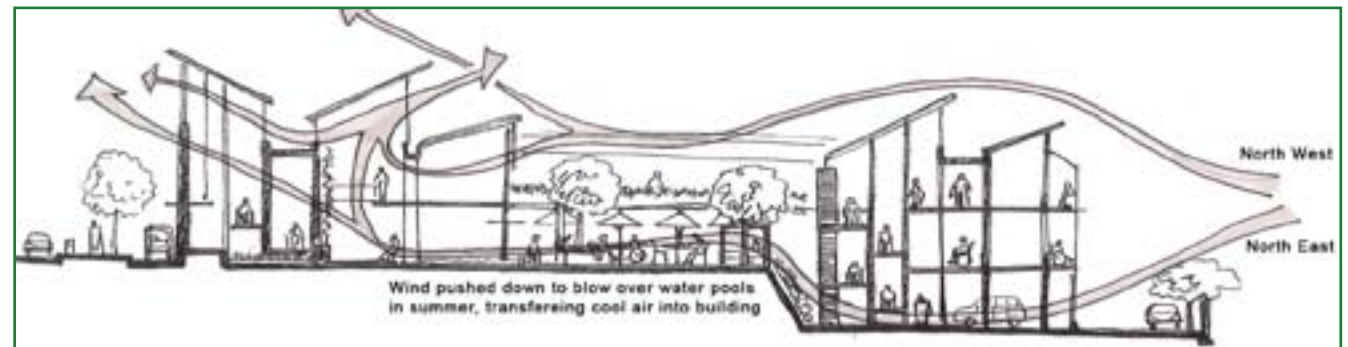
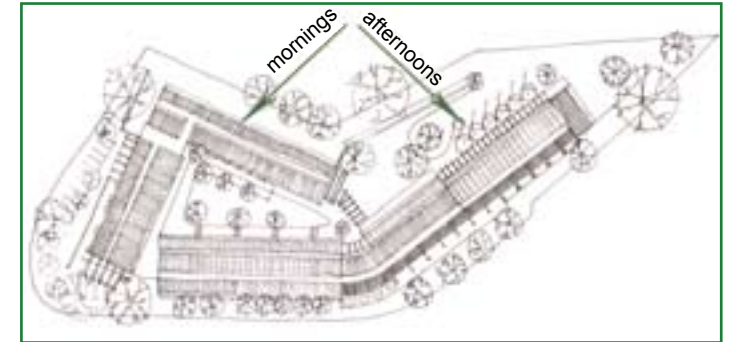


4.2.5 Wind

The general prevailing wind direction in summer is north-east in the mornings and north-west in the afternoons. In winter the prevailing winds are south-east and south-west. Wind use is maximised in the building design by orientating the courtyard in order to maximise the wind flow and encourage cross-ventilation in the building.

The northern accommodation block has a semi-basement opening towards the southern courtyard to direct wind underneath the building, thereby cooling the accommodation block as well as flowing through the courtyard, over water pools and into the training facility, creating evaporative cooling.

The north-western wind will also cool the workshops and greenhouse in the afternoons when the western sun will be at its worst.



4.2.6 Vegetation

Most of the existing trees are kept. The buildings have been designed accordingly. The trees provide character, protection and shade.

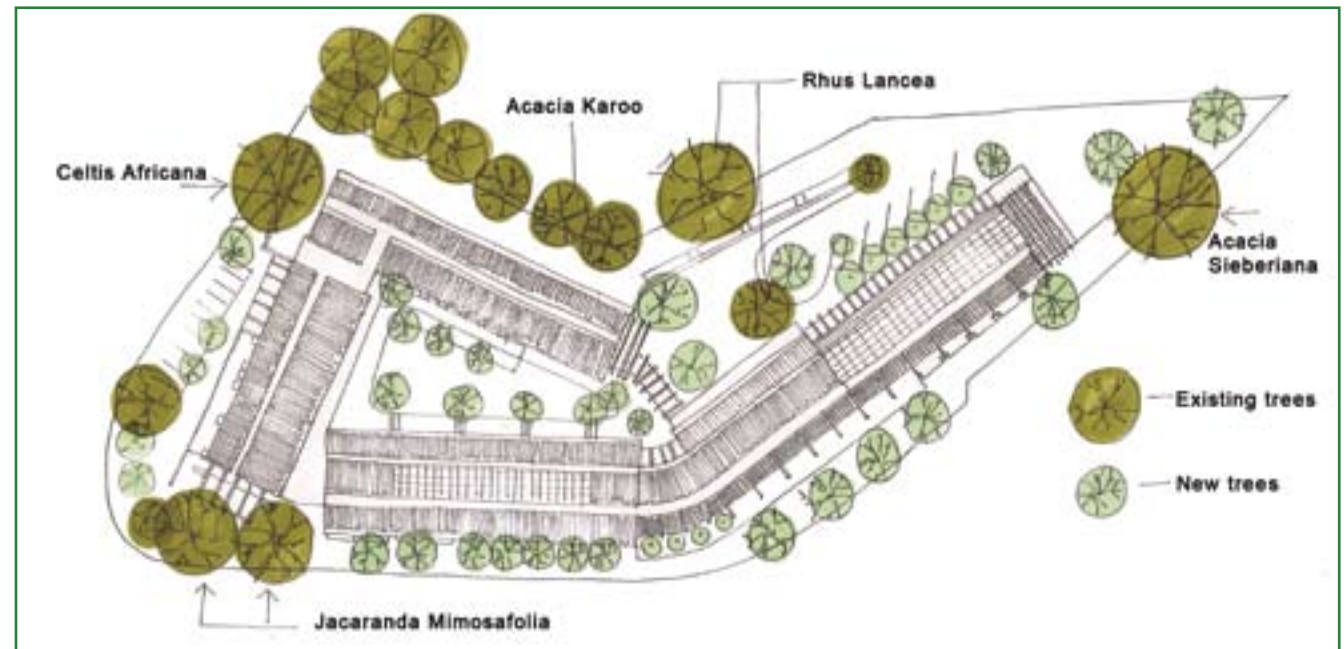
Existing trees not to be removed:

- Celtis Africana (White Stinkwood)
- Acacia Karoo (Sweet Thorn)
- Rhus Lancea (Karee)
- Acacia Sieberiana (Paperbark thorn)
- Jacaranda Mimosafolia (Jacaranda tree)

New trees (including fruit trees) to be planted:

- On the southern and eastern street fronts to create a human-friendly streetscape
- West of the site to provide shading for the parking area and decrease temperatures in the building
- On the north-western facade of the factory, creating shade for the parking area as well as decreasing the temperatures in the summer months
- In the courtyard, providing shade

Trees will enhance the sensory experience and provide food.



4.2.7 Cloud coverage

Varies from 13% in July to 54% in December.

Average = 33%

The site-specific conditions may be influenced by the proximity of the Apies River culvert as well as the Daspoort Ridge (Meyer, Pienaar, Tayob 1999; Schulze 1986).

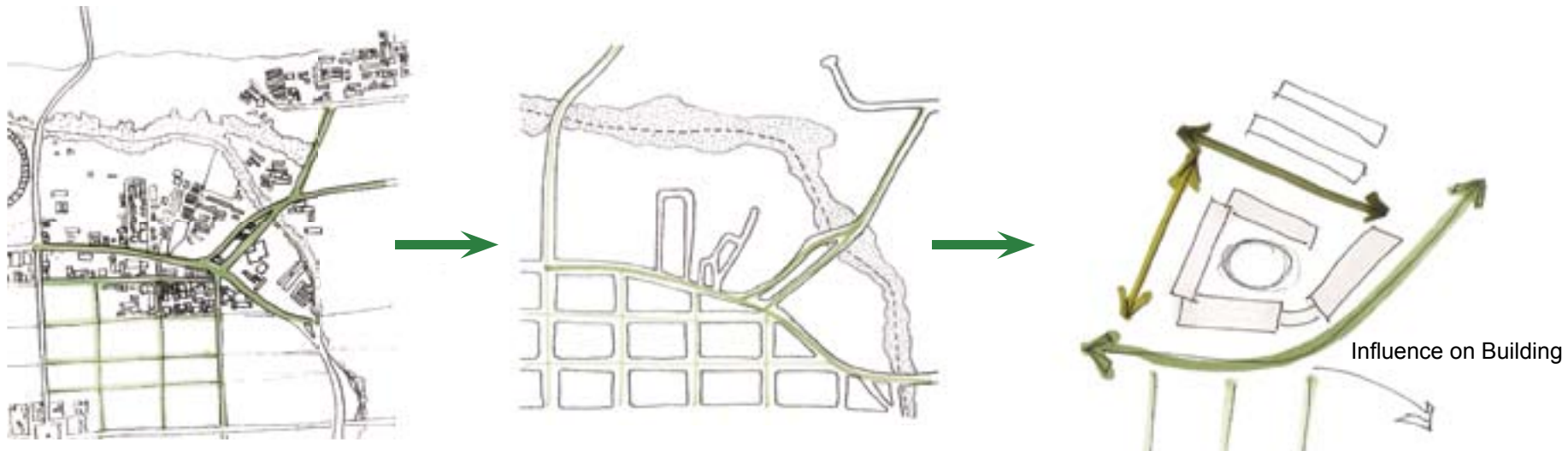
4.3 MAN-MADE FEATURES

4.3.1 Grids

The figures below indicate that the proposed site is in the transition between two grid patterns. Boom Street forms the edge of the inner city's grid system and divides the area: to the south, the busy city with its structured grid and to the north staggered streets forming *cul-de-sacs* against the Apies River or Magaliesberg.

Soutpansberg Road cuts diagonally away from the structured grid crossing the Apies River where it is perceived to be the exit from the inner city.

The change in the grid shapes the form of the building, where the building forms a solid edge towards Boom Street and Soutpansberg Road. The changing rhythm of the facade will translate the vehicular speed when exiting the inner city.



4.3.2 Urban fabric

The coarse grain of the city, on the southern side of Boom Street, is formed by multi-storey buildings. The finer grain to the north of Boom Street is the result of residential houses. South of the site are two-to-three storey buildings; to the north a school with two-to-three storeys and to the west, residential houses of one storey.

The height and shape of the In-Vocational Training Centre respects the tendency towards the coarser grain to the north and south and the finer grain towards the west.



4.3.3 Zoning

The following figures illustrate –

- the zoning
- building use
- services of the surrounding area.



4.3.4 Neighbours



• Refuse dump



- Medium heritage houses, of which two bigger houses which have been altered substantially and to which additions have been added. They are important as they are a remaining witness of scale and age of dwelling houses in Boom Street in comparison to those in Riverdale Street.

- Materials: Face brick, corrugated iron and plastered walls.
- Use: Optometrist and dentist.



• Prinshof School for the Blind and Partially Sighted



• Vacant building



• Vacant building



• Taxi rank

4.3.5 Height of surrounding buildings

The site is situated on the edge of the inner city where a link between the busy coarse city grain and the residential and educational fine grain must be reached. The two-storey Centre with its pitched roofs addresses the city scale on the south, while the one-storey on the west complements the one-storey residential houses.

4.3.6 Noise

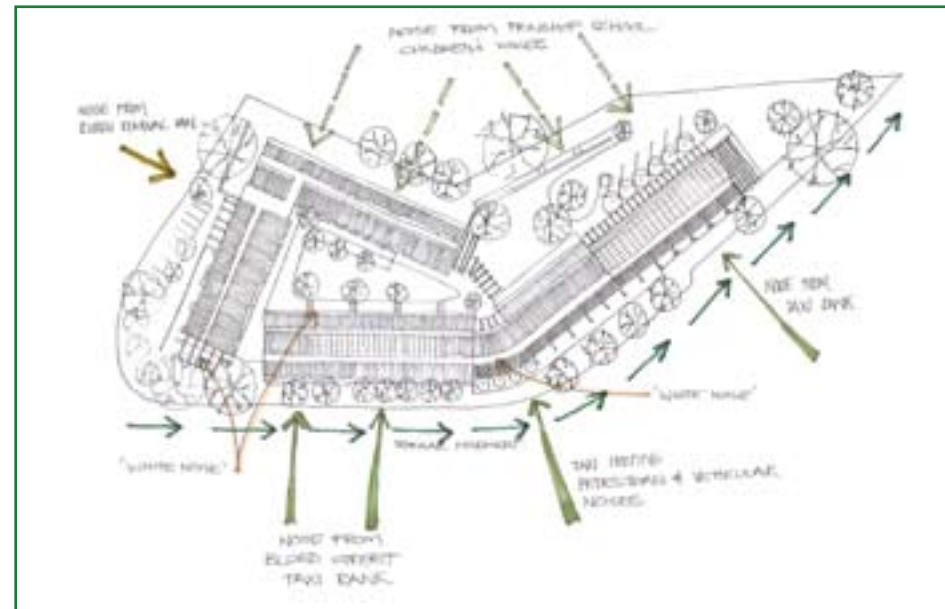
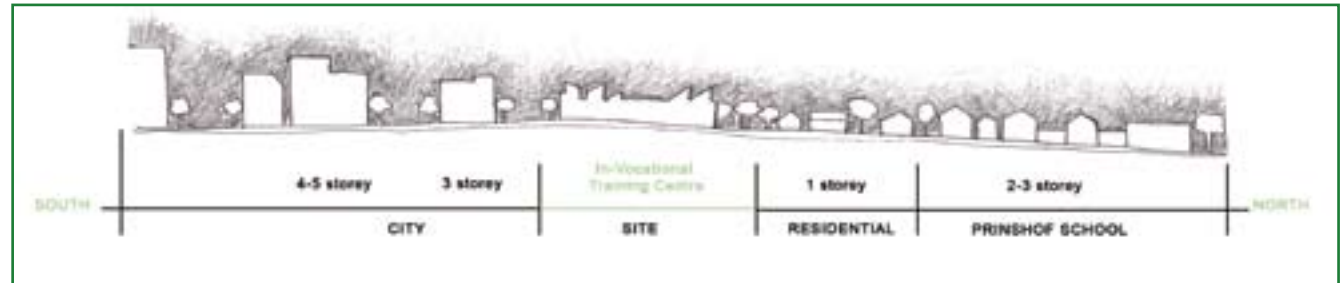
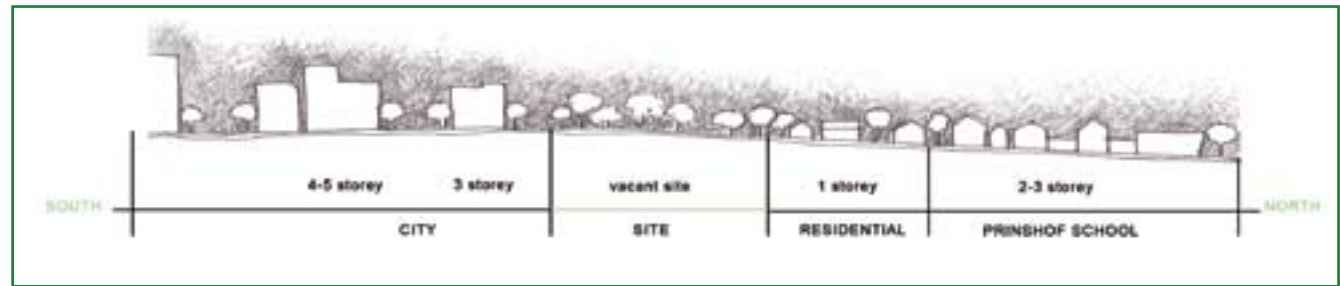
Noise can be either irritating or useful. Irritating noises can be destructive, whereas useful noises can help to orientate people in their surroundings.

- **Problem: Irritating noises**

- Vehicular noises from Boom Street and Soutpansberg Road
- Noises from the taxi rank, for example hooting
- Noise made by scholars of the Prinshof School between 7h20 and 14h00.

- **Intervention: Useful noises**

These noises can either orientate or soothe users of the building. Evaporative cooling pools in the courtyard can provide “white noise” next to the passageway as orientation. The sound of the water pool linking the south wing with the east wing has a soothing and orientating effect throughout the building.



4.3.7 Dangers in the environment

- **Problem: Crime**

Crime levels in this area are extremely high. The National Crime Prevention Strategy (NCPS) was released in 1996 after the increase of crime levels in the city. The NCPS proposes prevention of crime through reducing the opportunities for crime by changing the environment in which it occurs. Due to the fact that it is an undeveloped, open site in an urban landscape, it is prone to vagrants, drug dealers and crime.

- **Local intervention:**

By developing the site the problem regarding the vagrants will be solved.

The following three categories will influence safety and crime:

- a) **Visibility by others:**

Urban areas should be designed so as to not have environments where people feel isolated.

- b) **Awareness of the environment:**

Designing understandable layouts preventing entrapment spots, using adequate lighting and clear sight lines can avoid dangerous situations.

- c) **Finding help:**

As physically disabled people are an easy target for crime, they should be able to find easy assistance from others. This can be improved by legible design.

4.3.8 Elements in the environment

- **Problem:**

Physical injuries can occur due to elements in the environment.

- **Intervention:**

Physical injury and difficulty of movement of disabled people can be prevented by:

- Providing wide, smooth non-slip sidewalks -- thus damaged sidewalks along Boom Street should be replaced
- Introducing warning pavements to indicate crossings
- Introducing raised crossings to calm vehicular movement in Boom Street and Soutpansberg Road
- Providing a Zebra-crossing where the sidewalk crosses the drop-off driveway
- Painting dangerous obstacles in contrasting colours
- Indicating abrupt level changes
- Providing handrails at steps, ramps or level changes
- Providing glare-preventing streetlights
- Removing, replacing or repairing any obstacles, for example plant roots, irregular paving, manholes and broken bollards

4.3.1 Access

Access to the site will take place in three ways: public transport, vehicular access and pedestrian access.

- a) **Public transport:**

Due to the fact that a larger percentage of physically disabled people cannot drive their own vehicles, most depend on public transport. The site is situated across the taxi rank, next to a bus stop and within a reasonable distance from train stations.

Municipal bus routes stop in Boom Street.

Long-distance buses stop at Pretoria Station and thus a taxi, municipal bus or private shuttle will be required to shuttle travellers between the Centre and the station. After investigation, research showed that there is only one municipal bus equipped to transport wheelchair users and it the Centre will be on its route to the Association for the Disabled. A need exists for more municipal buses to be equipped with the necessary mechanisms to transport wheelchair users.

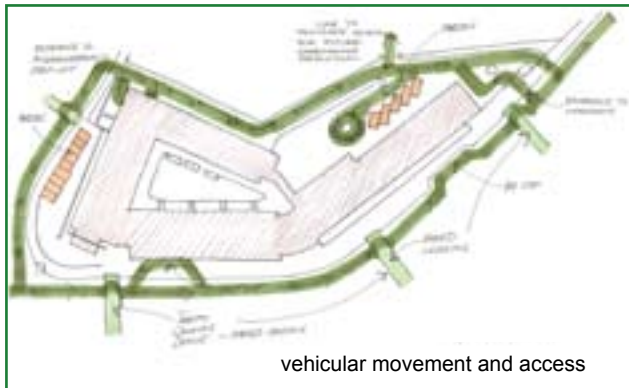
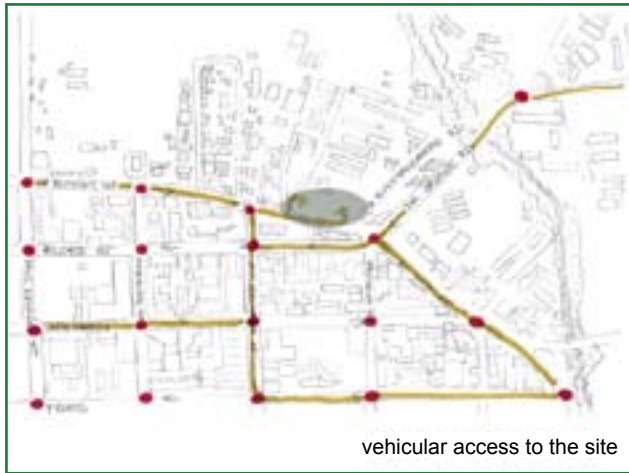
Conclusion: Mostly ambulant disabled travellers will use the municipal bus system.

Minibus taxis follow main vehicular arteries.

The site is ideally situated across Bloed Street Taxi Rank, which is now being developed into a metro-mall.

Obstructions and barriers for disabled people, in the environment





Private taxi services are available 24 hours a day and will be able to drop travellers off in front of the Centre. Special drop-off areas are provided in front of the building as well as in the basement of the accommodation block.

Train stations are located at a reasonable distance from the Centre. The Belle Ombre Station, to the west of the Centre, is the most prominent and will be used by many clients. Travellers can make use of a taxi service between the station and the Centre.

The Gautrain will stop at the Pretoria Station and can be reached by means of bus, taxi or shuttle services.

b) Vehicular access:

Access to the site takes place at two points:

- A quiet entrance from Prinshof Street
- An entrance to the workshops from Soutpansberg Road

Boom Street is a *one-way* in the direction from west to east, from which the CBD, Nelson Mandela corridor and the N4 are easily accessible. The N1 and the Voortrekkers Road artery is made accessible by Soutpansberg Road.

Problems to be addressed:

- Boom Street is a main movement artery where traffic moves at a high speed. This becomes a noise source and a danger for pedestrians to cross the street. The taxis also have erratic movements and can create congestion in the street.
- There is limited parking space for vehicles on the site.

Interventions:

- Traffic calming devices such as raised crossings with textural changes will be installed
- Due to the fact that most users of the building will not be using cars, the parking will mostly be used for either visitors or able-bodied staff members. Public parking bays are provided on Prinshof Street as it is safer for vehicular movement. Private parking will be provided in a semi-basement under the accommodation block. All bays will be for the disabled, making the bays accessible for either disabled, ambulant or able-bodied users. Additional parking will be provided on the eastern side of the site, close to the workshops. These bays can be used by staff or clients. A drop-off point is provided at Boom Street, located close to the main entrance.

c) Pedestrian access:

Pedestrians have access through the main entrance in Boom Street. Handrails play a role in leading and supporting the disabled persons into the building. The raised crossings in Boom Street not only calm the traffic, but form an easy accessible crossing that leads to the building. Textural changes occur between the sidewalk, crossings and change of levels, making the environment more legible for disabled people.

CONTEXT

4.4 AESTHETIC CONTEXT



Site



4.5 SOCIAL CONTEXT

4.5.1 The social barrier

The general public's perception of disabled people has always been that of outsiders, degenerate or defective people, which leads to their loss of individual status and becoming almost invisible to society.

"The general culture invalidates me both by ignoring me and by its particular representations of disability. Disabled people are missing from mainstream culture. When we do appear, it is in specialized forms – from charity telethons to plays about individual struck down by tragedy – which impose the non-disabled world's definitions on us and our experience." (Morris, 1991:85)

The World Health Organization declared that the problem in facility provision is an attitudinal problem, becoming a human rights problem on a political level. The social and political context of South Africa is still in an infant stage of adjustment and re-development.

4.5.2 The site

The area is a juxtaposition between active and passive nodes with Boom Street being the dividing element.

The Bloed Street taxi rank is situated on the southern side of Boom Street, creating a *vibrant activity node*. The activity and movement pattern moves *towards*

the south (Bloed Street) and into the city along with commercial activity. This creates a vibrant social environment, leading to higher noise levels towards the south.

On the northern side of Boom Street is a quiet residential area together with the Prinshof School situated even more to the north. Between the busy Boom Street and the Prinshof School lies an open field, creating a barrier and lost space within the streetscape. The northern side of Boom Street is extremely quiet in comparison to the southern side and has little to no social practices and events taking place.

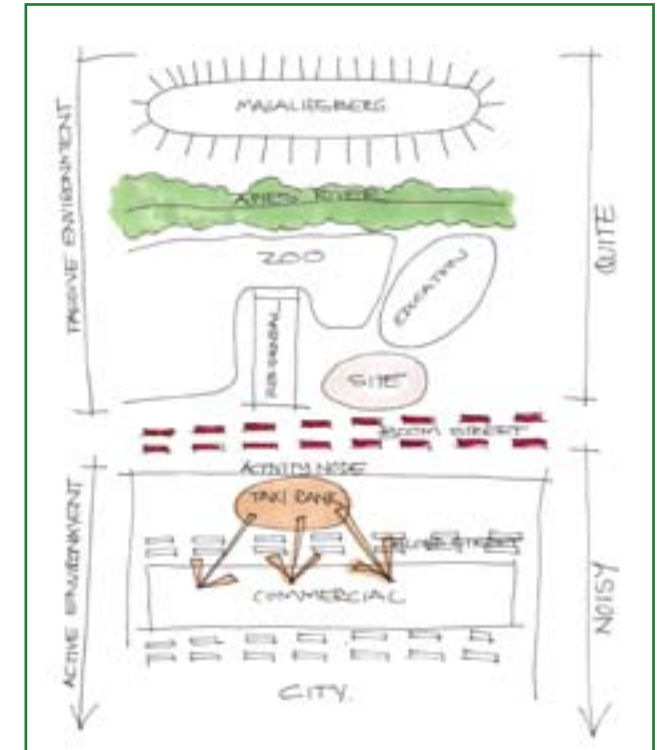
Boom Street is not only a physical divider but a social divider between the able-bodied community to the south (city) and the disabled community to the north (the schools and Northern Gauteng Association for the Disabled).

A *physical* as well as *psychological barrier* has been developed within this area of the inner city. The **link** between the south (the able community) and the north (the disabled community) is thus of great importance.

4.5.3 Consciously adapting building space

Social change, in as much to place the able-bodied and the disabled on an even plain in the building context, requires a conscious decision. Opportunity, space and environment have to be equally available to each in the built environment. It should not be

necessary to legislate and regulate the provision of facilities in buildings for the disabled, but rather to consciously and sensitively plan inclusively.



4.6 ECONOMIC CONTEXT

4.6.1 Previous economic environment

As discussed in the historic context, the area was previously successful farmlands. The Belle Ombre farm was described in 1912 as “a fine homestead with extensive grounds” and Sans Souci as “Beautiful Gardens” (De Waal Collection, AV13). Later the Rus in Urbe farm became the distinguished inner city zoo.

The conclusion can be made that it was a very distinguished location with economic power and stability.

4.6.2 Existing economic environment

Today, a lower economic population lives in the area. The area also comprises mostly commercial activities as well as the Bloed Street Taxi Rank – making it a very busy activity node in the lower inner city area. The taxi users form the buying power in this area. It is also an area where local traders find economic benefits in informal trading and spazas (the second economy). In the overall cityscape the area has a feeling of poor value and disregard. There is thus a potential to grow economic value and aesthetically improve the area.

4.6.3 The economics of the Centre

The Centre will be a combination of rehabilitation and educational services that will be operated as a business enterprise. The Centre’s economic contribution lies in its ability to include a section of society which has hitherto been excluded from the formal economy. According to Dr. N Meyer (2007) of the Development Bank of Southern Africa, the project will, through its inherent entry into the formal economy, deliver a positive economic contribution.

The former president of the World Bank stated that the millennium goals will not be reached without the inclusion of the disabled section of society.

As a sustainable building the project pursues the goals set in the Kyoto Protocol.

4.7 LEGAL CONTEXT

The landscape of South African labour law has acutely been impacted by the adoption of legislation to regulate all aspects of labour in South Africa. The matter of labour rights is entrenched in the Constitution of South Africa (Act 108 of 1996).

The Constitution in its own right entrenches the Labour Relations Act (Act 66 of 1995 as amended) and thereby makes the Labour Relations Act the second most important legislation in South Africa.

When dealing with the section of the labour force that may be defined as disabled we need to look at the other sets of legislation that were adopted to enable Government to fulfill the broadly defined purpose of the Labour Relations Act. These subsequent acts form the “checks-and-balances” that Government needs to enforce and measure its own performance in regard to the intentions it has set to meet in the labour market.

4.7.1 Employment Equity Act (Act 55 of 1998)

In terms of the Act, provision is made for “codes of good practices” relating to the implementation of employment equity. In this regard various such codes exist and are particularly focused on the various groups that make up the “designated groups”. The Minister of Labour has issued two codes of good practice regarding disabled employees:

- Disability in the workplace – This code is a guide for employers and workers on key aspects of promoting equal opportunities and fair treatment for people with disabilities.
 - Key aspects on the employment of people with disabilities – A guide for employers and workers on promoting equal opportunities and fair treatment for people with disabilities.
- *to provide employees with the opportunities to acquire new skills;*
 - *to provide opportunities for new entrants to the labour market to gain work experience; and*
 - *to employ persons who find it difficult to be employed;”* (Skills Development Act No. 97 of 1998)

4.7.2 Skills Development Act (No. 97 of 1998)

o Purpose of Act

In order to further promote the aims of both the Labour Relations Act and the Employment Equity Act there cannot only be a focus on the current job market. Therefore it was decided to actively seek to promote the skills of the “designated groups” (specifically relating to disabled people) that now need to be employed. To this end the purpose of this Act is to:

- “a) *develop the skills of the South African workforce*
 - *to improve the quality of life of workers, their prospects of work and labour mobility;*
 - *to improve productivity in the workplace and the competitiveness of employers;*
 - *to promote self-employment; and*
 - *to improve the delivery of social services;*
- b) *increase the levels of investment in education and training in the labour market and to improve the return on that investment;*
- c) *encourage employers –*
 - *to use the workplace as an active learning environment;*

4.7.1 Skills Development Levies Act (No. 9 of 1999)

• Purpose of Act

In order to promote skills, the Government needs finance. To acquire the necessary revenue a new tax has been established “*to provide for the imposition of a skills development levy; and for matters connected therewith.*” (Skills Development Levies Act No. 9 of 1999)

• Functioning of Act

Other than a legal vehicle for the imposing and collecting of this tax, the Act also provides for the distribution of the collected monies. The money collected is managed by the Minister of Labour (and related government departments) and distributed to the SETAs, who in their turn are supposed to set up development programmes with the budget allocated and in line with the aims of the SETAs as set out in the Skills Development Act.

PRECEDENTS



5.1 “EMPLOYMENT SOLUTIONS” – for people with disabilities

8 Dr Savage Road, Prinshof, Pretoria.

This precedent was chosen to gain understanding of the requirements needed to design for a work/training facility for physically disabled people.

Employment Solutions is a registered Section 21 company, committed to utilise available funds to facilitate employment options for people with disabilities.

Services rendered by *Employment Solutions*:

- Outsourcing labour intensive industrial operations
- Sales and repairs of assistive devices and wheelchairs
- Establishing contracts between employer and prospective employees with disabilities

During an interview with Mrs Ilze Meintjes, CE of *Employment Solutions*, the need for a facility to accommodate the latter service is of great importance. According to her, *Employment Solutions* is experiencing a great demand to expand. They have a waiting list of 300 disabled persons per year (Meintjes, 2007).

The existing premises will not be able to

accommodate the demand. The solution to their problem was found to be that the heavy duty training (e.g. welding, mechanical and woodwork) be separated from the other training. The current premises would then be used for the heavy duty training and the new facility would then have to be built for other training, such as:

- Printing and photography
- Clerical training
- Sewing
- Domestic and custodial training
- Individual training

Certain training at *Employment Solutions* is currently taking place under a tree.

Other problems being experienced are:

- Transport – an incredible amount of money is used for transport, therefore accommodation at the new facility will be needed
- No recreational facility or lounge area
- No gym facility
- Too small offices
- No dining room or cafeteria

All of the above as well as the following aspects determined the design of the In-vocational Training Centre.

Bathrooms:

- Seating needed
- Hooks for clothing (preferably lockers)
- Signage
- Larger door dimensions
- Showers – correctly designed so as not to become storage space as seen in the photograph
- Incorrect taps
- Doors need kickplates



Drop-off:

- Raised platform



Office space too small
Provide correct lighting



Provide sufficient storage space where needed
Natural day lighting



Kitchen

- Provide space for wheelchair footings



- Provide sufficient lockers
- Signage
- Alarm – for fire evacuation



- Provide sufficient space for sewing to promote efficiency
- Signage
- Lighting – natural lighting
- Blinds – to control lighting



- Provide cafeteria or social space for employees/trainees to enjoy lunch in a communal area instead of at their workstations.



- Provide outside seating and socializing space



5.2 PRETORIA SCHOOL FOR CEREBRAL PALSID, PHYSICALLY AND LEARNING DISABLED PUPILS

Dr Savage Road, Pretoria.

The following aspects were investigated to gain an understanding of the requirements needed to design for physically disabled people.

The mission of the Pretoria School is to guide their pupils, with the help of specialized teaching, physically, psychologically and intellectually, to become balanced socially acceptable adults.

- Drop-off
- Raised platform



- A small barrier is needed between walkways and storm water channels to prevent injuries



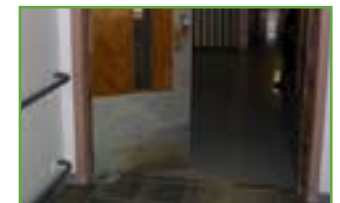
- Handrails and kickrails



Wheelchair users prefer round tables. Table legs must not create an obstruction.



- Doors with vision panels and kickplates
- Even change in floor surface
- Hand and kickrails



- Bath -- transfer seat



- Shower spray in bathtub



- Shower -- must be accessible for wheelchair users



- Lever taps are easier to handle



Grab rails



Bedrooms: beds to be parallel to windows



Recreation room -- TV placed too high, creating neck discomfort for viewers in a wheelchair



Change in floor level can cause accidents



Dangerous space

- Steep ramp – collisions can take place against opposite wall
- Gully and mat = obstruction
- Rainwater is not channelled away and forms puddles



5.3 PHYLLIS ROBERTS HOUSE

Dr Savage Road, Pretoria.

The following precedent was chosen to understand the requirements needed for housing disabled people.

The Phyllis Roberts House is a good example of the extreme poverty in which so many disabled people find themselves. For that reason materials chosen for the In-Vocational Training Centre have low maintenance qualities as well as being economical and sustainable.

Un-accessible ramp



Bad signage on too narrow parking bay



Dark, sombre dining hall



Handrails to prevent injuries at windows



Vertical grab rail in shower
Non-slip surface
Insufficient shower seating and taps
Bad hygiene



Bedroom: bad space planning



Too steep level change and irregular floor surface



Ramp into swimming pool



Lower telephones for wheelchair users



5.4 JOCOD – Johannesburg Council for the Disabled

Lenasia, Johannesburg.

This precedent was chosen to gain understanding on the design of workshops.

The building consists of an administration block, three contract workshops, a linen workshop, a detergent workshop and a dining hall. The centre, run by JOCOD, an NGO that has worked in partnership with the City of Johannesburg since 1995, employs 251 disabled people.

The centre also runs an Adult Basic Education and Training (Abet) programme.

The centrepiece of the project is its hydroponics garden. The vegetable garden supplies the Fresh Produce Market in City Deep and makes a profit of R20 000 per month, according Linda Pounasamy, Director of JOCOD (2007).

Another JOCOD success story is its detergent making division, generating a turnover of R150 000 per month.

JOCOD has become a self-sustaining NGO, and employees do not have to depend on handouts.



5.5 MUSEUM OF CONTEMPORARY ART

Barcelona, Spain

Richard Meier & Partners

This precedent was chosen as inquiring into the use of the ramp.



This precedent relates to the use of ramps not only as a necessity or requirement but as an element of a building. The ramp for both pedestrians and disabled people in this building was used as part of the design elements of the building. In this regard much of the design of the building was done around a central ramp structure. The ramp structure was further used to create a sense of space and to allow the flow of natural light. It allows natural light to filter through the louvred glass wall adjoining the ramp structure.

(<http://www.arcspace.com/architects/meier/macba>)

5.6 THE JERUSALEM CITY HALL

Jerusalem, Israel, 1998.

Diamond and Schmitt

This precedent was chosen to investigate its linking role.



The specific change to this building is the fact that one building has to crossover into different sectors of Jerusalem. This does not only relate to geographical, but also cultural differences. In this regard the building plays a linking role within the local district created for it. As part of the principle of this building an accessible yet contained urban square had to be designed with a prominent feature within Jerusalem without disrupting from it. The whole idea was the social interaction between the centre users and the public. To this end the building takes the overall scale of the precinct into account and due to a proper response to the urban

needs applicable to the site, the linking and interaction role was successfully applied.

As part of the linking role within the community the importance of movement within and throughout the building is very important. The ramp and paths of movement are specifically also adapted for the disabled person whilst making the pathways and ramps very appropriate as a means of connecting the centre to the city.

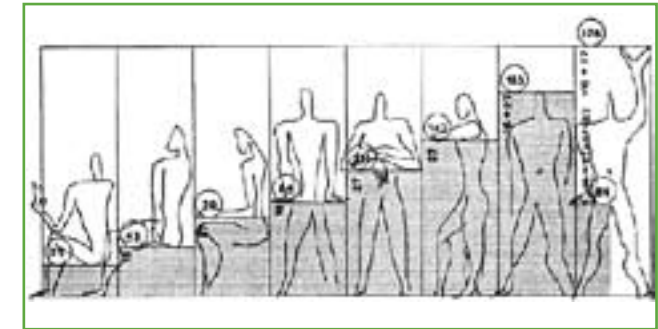
Specific emphasis was placed by providing details at eye level in order to ensure that the pedestrian enjoys the environment. A cross adaptation was also made in that different perspectives for different abilities were provided, specifically relating to the fact that the perspective of the able-bodied person would differ from that of a person with a disability. These details can take the form of textures, drawings, vistas, etc.

5.7 PROPORTIONAL SYSTEM (MODULAR) USED BY LE CORBUSIER

This precedent was chosen to investigate the use of a proportional system.

Le Corbusier created a proportional system based on the fact that the average height of a man standing with his arm raised would be 2,2 metres. Taking into account that this would create a sense of space where such a person would function in relation to ceilings,

doors, etc. the modular system was developed. The In-Vocational Training Centre is adapted to the proportional system of the average height of a person seated in a wheelchair. Using the same principles of relation to space, ceiling and doorframes for persons seated in wheelchairs, this modular system may also be applied to design for the disabled.



5.8 SYMBOLISTIC ART

The manner in which we experience something is known to psychology as *synesthesia*. Synesthesia sets out to allow us to enjoy an environment through senses that we would not necessarily associate with a particular function. In this regard a building could be made much more interesting due to the fact that other senses are also addressed in using the building. In this regard the experiencing of paintings, smells, sounds and even tastes expands our experience to multi-sensory experience rather than a single sense experience. Although this principle has long been established for able-bodied people, special adaptation is required when dealing with people with disabilities.

Each type of user has a different grasp of the building relating to the senses that he/she may or may not have. To this end touch will be much more relevant as a sense to blind people and to, for example, orientate themselves in changing zones. To the same end special consideration must be given to wheelchair-bound people due to the fact that their perspective differs from that of standing people -- therefore special consideration must be given to the synesthesia of different disabled people.



5.9 GREGORY BATESON BUILDING

Sacramento, California.

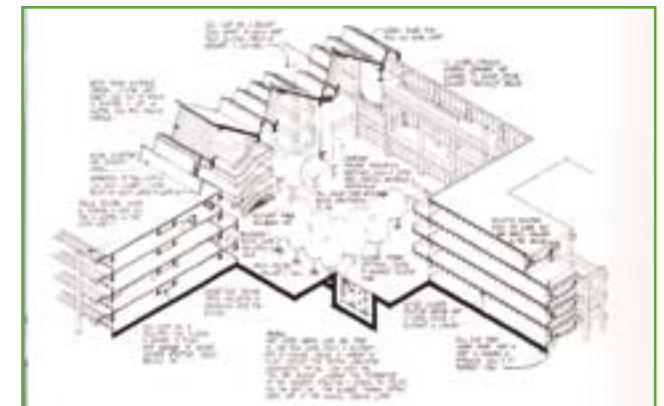
Sim van der Ryn

This precedent was chosen to gain understanding of green principles in design.

The Bateson Building was the first energy-efficient building in California. Sim van der Ryn designed with natural energy flows in the building and became sensitive to differences. He writes: "The measure became not foot-candles of quantifiable illumination, which means nothing, but the quality of light you experience, which means everything." (Van der Ryn, 2005:66)

The wall of the building is not considered a static, two-dimensional architectural element, but a living skin that is sensitive to and adapts to differences in temperature and light. Designing a building to save energy means designing a building that is sensitive to differences, which results in a building that is better for people. People are not adapted to live at uniform and constant temperatures and light levels. People are most alive when experiencing subtle cycles of difference in their surroundings.

This building becomes "the patterns which connects" people to the change and flow of climate, season, sun, shadow, constantly tuning the occupants' awareness to the natural cycles that support life.



5.10 “GREEN BUILDING” AT WESTLAKE BUSINESS PARK

Cape Town.

Sarah Ward and Mark Borchers –

Sustainable Energy for Africa

Mike Schroeder – Development Action Group

This precedent was chosen to gain understanding of green principles used in the South African context.

This particular precedent was chosen to gain more understanding of how green principles in designing construction may be applied to a commercial building in an urban environment. A lot of time and energy was spent on the optimal thermal performance of the building and in this regard materials, construction systems, insulation, ventilation and use of natural energy such as cool night air were utilised to regulate the building’s thermal performance.

A provision was made for secondary climate control mechanisms through the use of 750 mm diameter concrete pipes placed under the recycled concrete brick walls and ground floor. Two vertical chimney ducts were installed allowing the building to flush in cool night air.

Further green elements utilised include:

- Use of local sustainable materials
- Recycling of materials

- Use of recycled materials
- Harvesting and use of grey water for irrigation
- Planting of indigenous plants, fruit trees, vegetables and herbs



5.11 FREEZE FRAME VELOCITY FILMS

Rivonia – Johannesburg.

This precedent was chosen for its use of cross-ventilation and social spaces.

The simplicity and form and the honesty of the materials used in this building created a richness to the way the building is experienced. To this end the materials used and specifically the fact that the historic precedents were used in an abstract way created a very unique environment.

Regarding the climate changes and the manner in which it was responsibly considered in the design of the building is clearly reflected in the fact that much attention was given to cross-ventilation. Air is drawn from the office space surrounding an internal street where warm air is evaporated by two large mechanical fans placed on each side of it. Overhanging roofs from the first floor provide additional shading from the north of the building. Through the use of cross-ventilation and the spaces created to ensure such cross-ventilation, the connection between ‘inside’ and ‘outside’ is vastly enhanced. The use of general common social areas were established not only to create a connection between inside and outside but also to allow the opportunity for people to collaborate and socialise, specifically taking into account the creative process that is a prerequisite in the film industry.

5.12 CENTRE FOR MAXIMUM POTENTIAL BUILDING SYSTEMS

Pliny Fisk & Gail Vittori

This precedent was chosen for its use of plants in a building.



The building's appearance is the direct product of the designer's function and with this in mind, aesthetics was moved aside and left to its own devices. This resulted in a building that is very easily understandable and seems at peace with nature. The free growth and invitation to plants in the interior and exterior spaces allows a free flow from and to these areas.

The material chosen for the project was found locally and does not function in a harmful manner to the environment.

5.13 IBN-DLO – The Dutch Institute for Forestry and Nature Research

Wageningen University.

Behnisch, Behnisch & Partners

This precedent was chosen to gain understanding of green design principles.

In designing the building, specific attention was given to the culmination of interior and exterior worlds and that they be combined in one perceivable entity. This entity had to attain the equilibrium needed to define a sustainable workplace and pleasant working environment. The simple use of cross-ventilation from the three main greenhouse gardens created buffer spaces where air is either heated or cooled by using natural energy sources.

Due to the incorporation of these functional systems the building is very energy efficient. The free flow from interior and exterior buildings and the utilisation of organic growth, such as gardens and greenhouses, creates the impression that the building is not fully developed and conveys the ideal that a building does not exist in contrast to nature but as part of nature.

