



mindscape

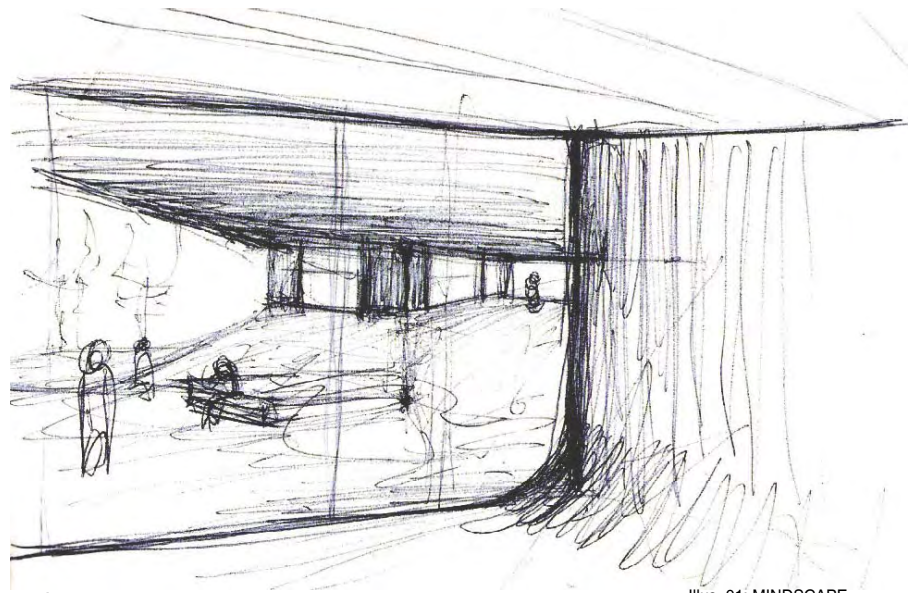
a centre for creative development in Sunnyside

edna peres

Submitted in partial fulfilment of the requirements for the degree Magister in Architecture [Professional], in the Faculty of Engineering, the Built Environment and Information Technology.

University of Pretoria
Department of Architecture
November 2005

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dedicado aos meus pais
dedicated to my parents

Illus. 01: MINDSCAPE

manifesto

Buildings have a profound effect on the human psyche.

Lives slowly unfold within their spaces.

Society either dictates, or is dictated by them.

In a sense, they become living things, constantly communicating through their spatial qualities and capable of being manipulated to suit changing needs and desires. Yet, the human element is often neglected...

buildings become empty shells designed for an average human being or for a specific function. The objective becomes the profitability of capital to attain a desired form versus that which they could be:

Enablers.

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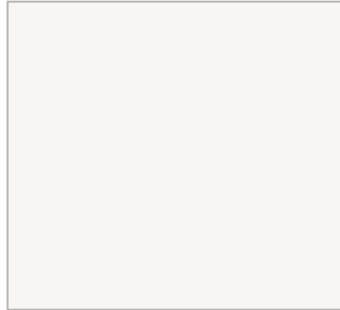
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Mindscape, the subject of this dissertation, is a centre for creative and holistic development in Sunnyside, which will demonstrate how built environments communicate with users through their perception and sensory exploration. The topic covers various fields. The context of the study will be discussed initially, followed by the brief itself. Thereafter, the findings resulting from research conducted in the fields of developmental and environmental psychology will be provided. Architectural theory will then be investigated. The study will conclude with the interpretation of these findings into a new architectural form, supported by design studies and analytical tools.

ntroduction

contextual study parameters



the city

socio-economic conditions

urban features

- * meso context
- * project area_ sunnyside

site construction

- * site photos
- * neighbouring buildings
- * ground-figure analysis
- * site construction

biophysical analysis

- * walkerspruit
- * climate
- * vegetation

The capital is currently undergoing an administrative identity crisis with the result that Cape Town and Johannesburg enjoy international focus as hubs for tourism and economic development. The public perception exists that Tshwane does not hold as much potential for development as other South African cities do [Illus. 3-7].

The Tshwane mission statement envisions that it will become an internationally acclaimed African capital of excellence. It is believed that this status will be achieved through the provision of sustainable services and activities which will improve the quality of life for citizens. As yet, there are few settings that promote community development within sustainable environments in the city. Emphasis is mainly placed on statistics, infrastructure and increased economic status by the city's administration.

Apart from efforts to improve the city's infrastructure for the 2010 Soccer World Cup, there is no overall vision to encompass its diversity. It is not necessary for urban identity to be provided by a symbol such as a landmark or natural feature. Since a city is not a personality which can assume a character, one could rather say that identity should form part of an underlying perception of and ambition for the city by its citizens, which embodies a direction for the future.



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Tshwane is a relatively young urban city, which owes its origin to early continental trade route settlements of the 1400's. From these beginnings it grew to become the ZAR capital in 1855. It was subjected to British influences during the early 1900's and was declared a city in 1931 [Jordaan: 65]. Its historical layering is not complex since it has always been an administrative capital. Like most cities, Tshwane neglects its history; existing buildings, trees, roads and parks make way for contemporary needs. The old is temporarily reflected on, and then abandoned. It must be accepted that cities evolve.

The 1944 Town Planning Scheme introduced mono-functional zoning to the city, which is prevalent even today. The 1970's and 1980's were marked by tower developments with arcade systems promoting dense pedestrian movement routes within city blocks [Jordaan: 68-69]. These systems terminate abruptly at the CBD peripheries, where a sharp reduction in scale occurs.

The CBD functions on two levels: formal and informal. The formal sector has all but disappeared and institutional buildings stand as empty reminders of their past functionalities. The city exists independently of humans, like a machine which humans inhabit. Urban growth is no longer holistically planned. Isolated mega-developments occur through private sponsorship. Because of this, the city will remain Post-Modern since it quickly adapts to trends. In a democracy such as this, even a Tuscan skyscraper may be built.

The decrease in urbanism that grasped the world after the May '68 student uprisings in Paris supports this trend. *Sous le pave, la plage* (under the pavement, beach) has not created a natural city; instead it has destroyed urban structure, resulting in indiscriminate consumer-based (image) architecture. Contemporary urbanism abandons that which doesn't work. In Pretoria, City Property's efforts to convert abandoned buildings into residential buildings seems small in comparison to the abundance of new construction on the peripheries. The city is exploding in size and numbers.



Illus. 3: Tshwane skyline



Fig. 4. Tswana Pretoria landmarks (Peres, 2006)

Illus. 5: Resistance toward the city's name change



Illus. 6: Floor detail in Polley's Arcade



Illus. 7: Menlyn Park: eastern suburbs



Tshwane embodies several aspects of an African city, dominated by the impermanence of people, places and things. The demographics of the CBD and adjacent neighbourhoods are now multi-racial and multi-cultural. The eastward progression of business has not resulted in these areas becoming slums. Instead, the CBD and suburbs like Sunnyside continue to be inhabited by students, young families and middle to low income groups.

The African City relates to Rem Koolhaas' Generic City. A result of globalisation, it is found everywhere and is inherently the same wherever it occurs [Koolhaas: 1248]. Its character disappears only to be replaced either by a lack of identity or an imprisoning form of identity. It seems that Tshwane falls under the former, in which the lack of a coherent identity is gradually making it an open city, a medley of conflicting aspects: parking lots vs. parks, shopping centres vs. informal trade areas or gated communities vs. informal housing. The city no longer has a centre or core, but finds itself stretched in a linear way with no foreseeable destination.

In the suburbs, streets are lifeless. They are merely channels for vehicular movement. Cars dominate urban functions through the linkages created by these channels. They determine the layout, growth, activities and appearance of the city. The city is viewed through the car, resulting in high speed blurs, which supports an avoidance of physical interaction with the city [Koolhaas: 1252-3].

The lack of a coherent vision for Tshwane is aggravated by isolated developments and the ongoing eastern sprawl. The old and new are thought of with a mixture of nostalgia and contempt. Perhaps the answer to creating renewed interest in the city lies in small scale community initiatives that strive for the betterment of individuals and the improvement of their perception of the cityscape. We have to redefine our relationship with the city: we become its subjects, not its makers. With this understanding, the following becomes clear: Sometimes chaotic, overindulgent or excessive, the city also provides moments of calm in which, as Koolhaas says, "The city is no longer..."



Illus. 8: Intersection on Jacob Maree_ formal and informal meet.

South African cities built upon strong centralised political or economic forces are slowly decaying. There are no positive urban structures radiating from thriving city centres. Instead, cities explode, becoming linearly interspersed activity nodes.

Observation of the movements, interactions and exchanges between people is the best platform from which to understand how cities work. From townships to gated 'communities', the separated city prevails in Tshwane. However, there is a vibrant convergence of groups in areas such as Sunnyside. Here, a new culture emerges whose characteristics are no longer traditionally African, nor Western [Illus. 8, 9].

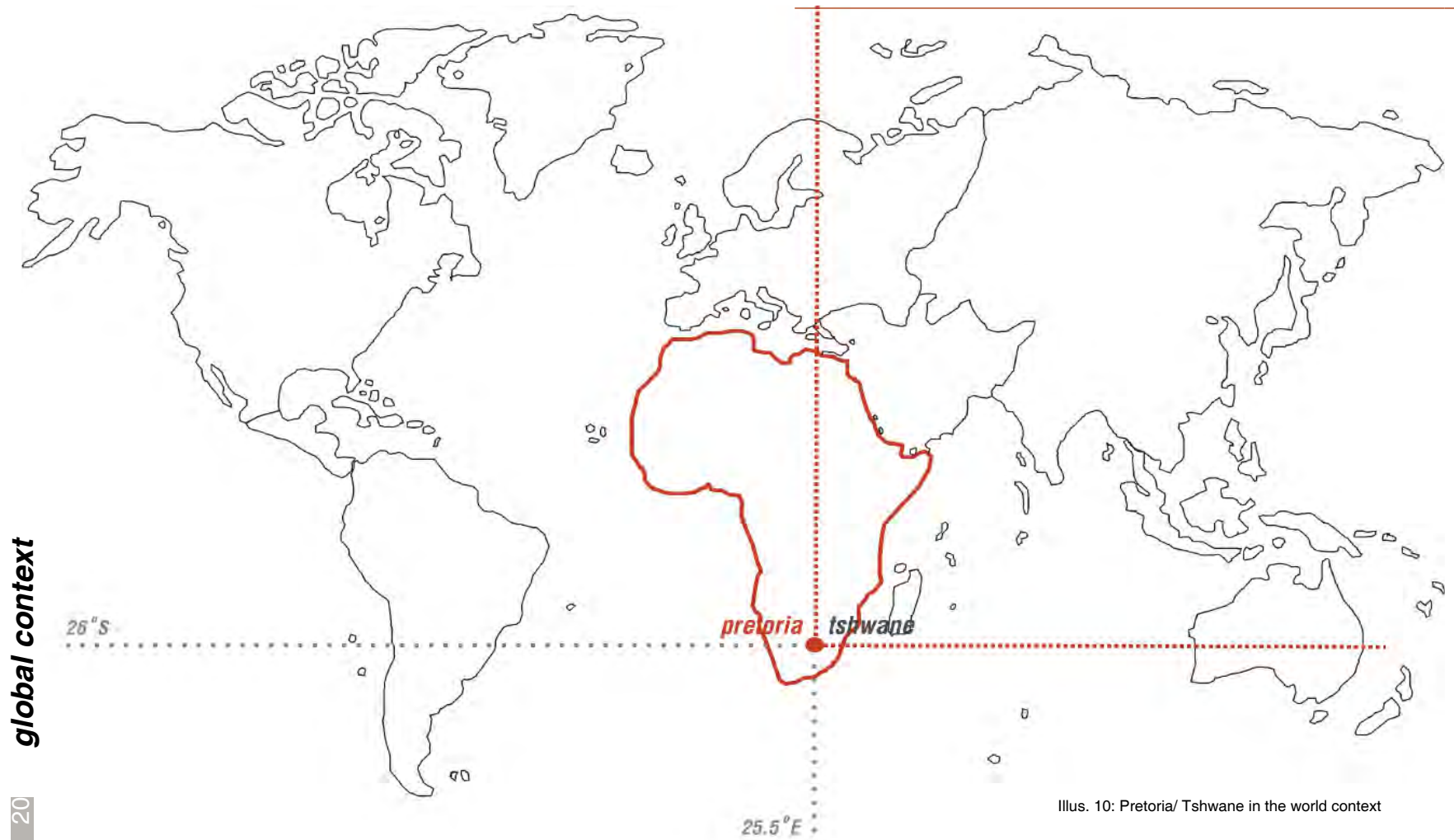
The eastward shift of business and residential typologies in Tshwane has resulted in a demographic swing within the greater city centre, which is now populated by a mixture of cultures mostly dominated by an emerging black middle class, who may not yet have great economic means, but who expect good opportunities. However, there are few places where individuals can gather in safety to participate in activities which support the genesis of this new culture.

Challenged by criminal activity, these dynamic central suburbs host a high number of drug dealers, street children, prostitutes, and incidents of gang-related violence: the demand for safety is vital. Each year, 1400 missing children and 25,000 cases of rape and sexual assault are reported in South Africa, but the actual figure is probably higher. Furthermore, more than 2,000 children are murdered each year [SACMEC: 2005]. In Sunnyside, day care can not always be afforded, so children are often left to care for themselves. It is difficult to control what these children do when unsupervised considering the degree of risk and exposure to criminal activity that they are exposed to. Can appropriate development occur in this environment?

The need to provide a safe setting where the entire community may gather, is obvious. A demand exists for recreational activities, as well as a safe environment for children to go to after school. Here, architecture has a high capacity to direct and create positive experiences for individuals, providing facilities where people can meet, play and explore in a familiar environment.



Illus. 9: Two homeless "residents" of Sunnyside

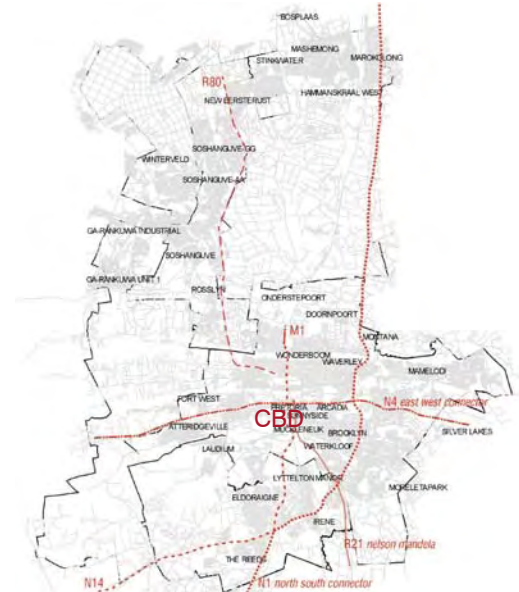
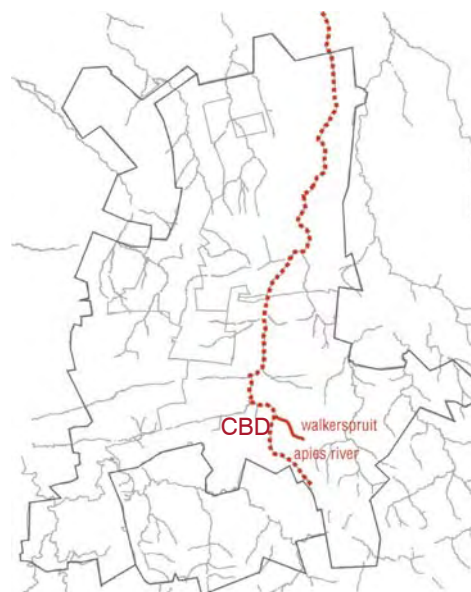
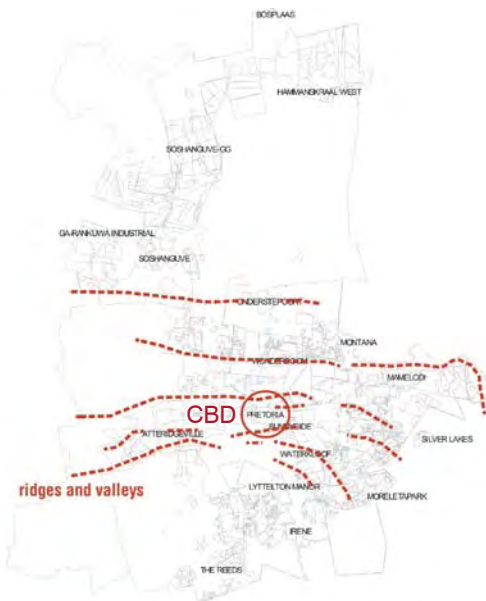


Illus. 10: Pretoria/ Tshwane in the world context

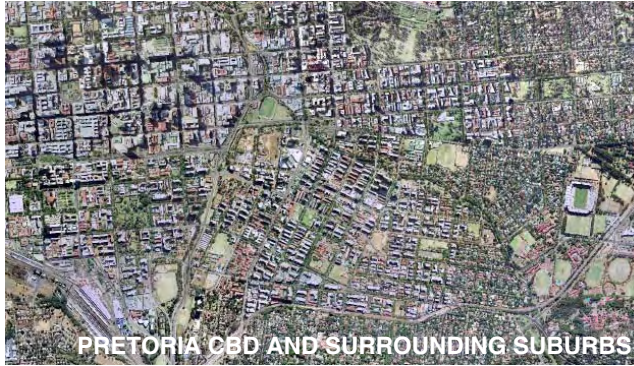


On a macro scale, Tshwane seems to have developed along a north-south axis, determined by historical movement routes. The most obvious modern north-south connector is the N1 highway. Further analysis shows that in the city, the highest density exists along the east-west

axis. The natural features of the area support this directional development. Ridges, valleys and rivers were the earliest indicators of settlements, and the prevalent urban sprawl has followed its cues [Illus 10-16].



Illus. 11: Representation of the determining features of the city: topography, rivers and roads



Illus. 12: Aerial photo of central Tshwane. [GIS UP, 2005]



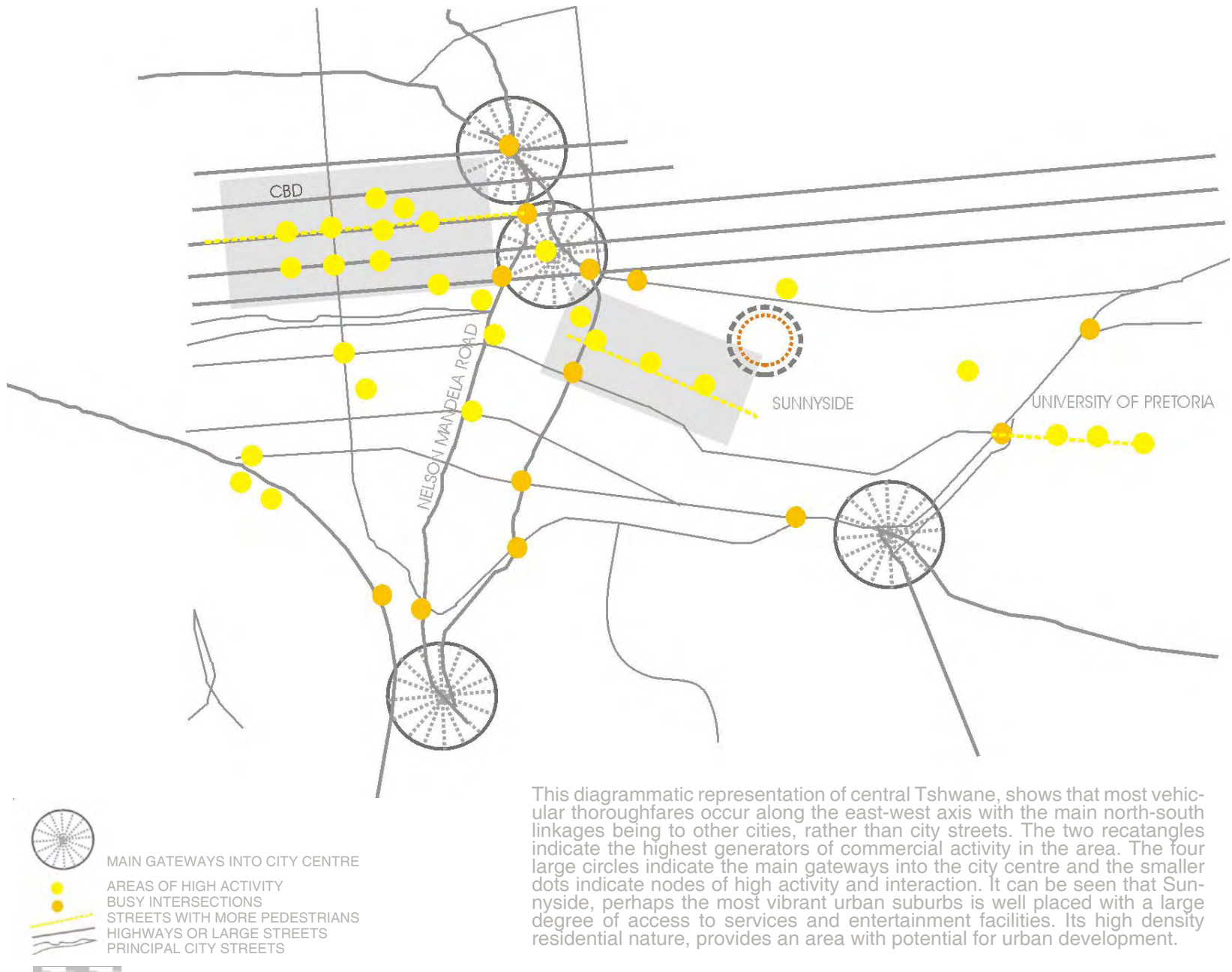
Illus. 13: Aerial photo of Sunnyside. [GIS UP, 2005]



Illus. 14: Land uses within Sunnyside: commercial, residential and other.



Illus. 15: Site in relation to landmarks and activity nodes



This diagrammatic representation of central Tshwane, shows that most vehicular thoroughfares occur along the east-west axis with the main north-south linkages being to other cities, rather than city streets. The two rectangles indicate the highest generators of commercial activity in the area. The four large circles indicate the main gateways into the city centre and the smaller dots indicate nodes of high activity and interaction. It can be seen that Sunnyside, perhaps the most vibrant urban suburbs is well placed with a large degree of access to services and entertainment facilities. Its high density residential nature, provides an area with potential for urban development.

Illus. 16: Diagrammatic representation of the main movement routes, activity nodes, intersections and commercial hubs in the city centre.



Illus. 17: Sunnyside usage construction_ a locus with further development opportunities.

Analysis of the infrastructure in the city centre and the surrounding high density suburbs shows that services and public facilities are well established and adequately support the day to day functions of these areas.

The Sunnyside district, has since its densification in the 1960's, grown to become a vibrant, well functioning suburb within the city centre. Despite the recent movement of business and major commercial activities to the eastern peripheries, Sunnyside hosts a diversity of cultures, demographics and age groups. It is

because of these features, that Sunnyside holds potential for urban renewal and further strategic development, such as facilities which promote community involvement.

The residential characteristics of Sunnyside are however inadequately supported by few community facilities within the suburb. Private entertainment and commercial centres are found in Sunny Park on the western fringe of the suburb, and sports facilities are located along Kotze Street. Open public parks are scattered and for the amount of residential stock, limited [Illus. 17-21].



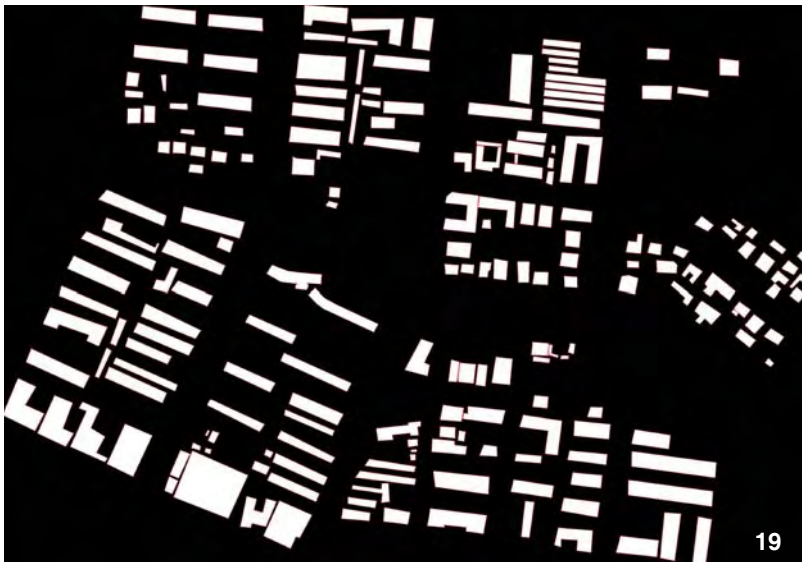
Illus. 18: Figure ground study of central Sunnyside

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Illus. 20: Site in relation to major vehicular movement routes

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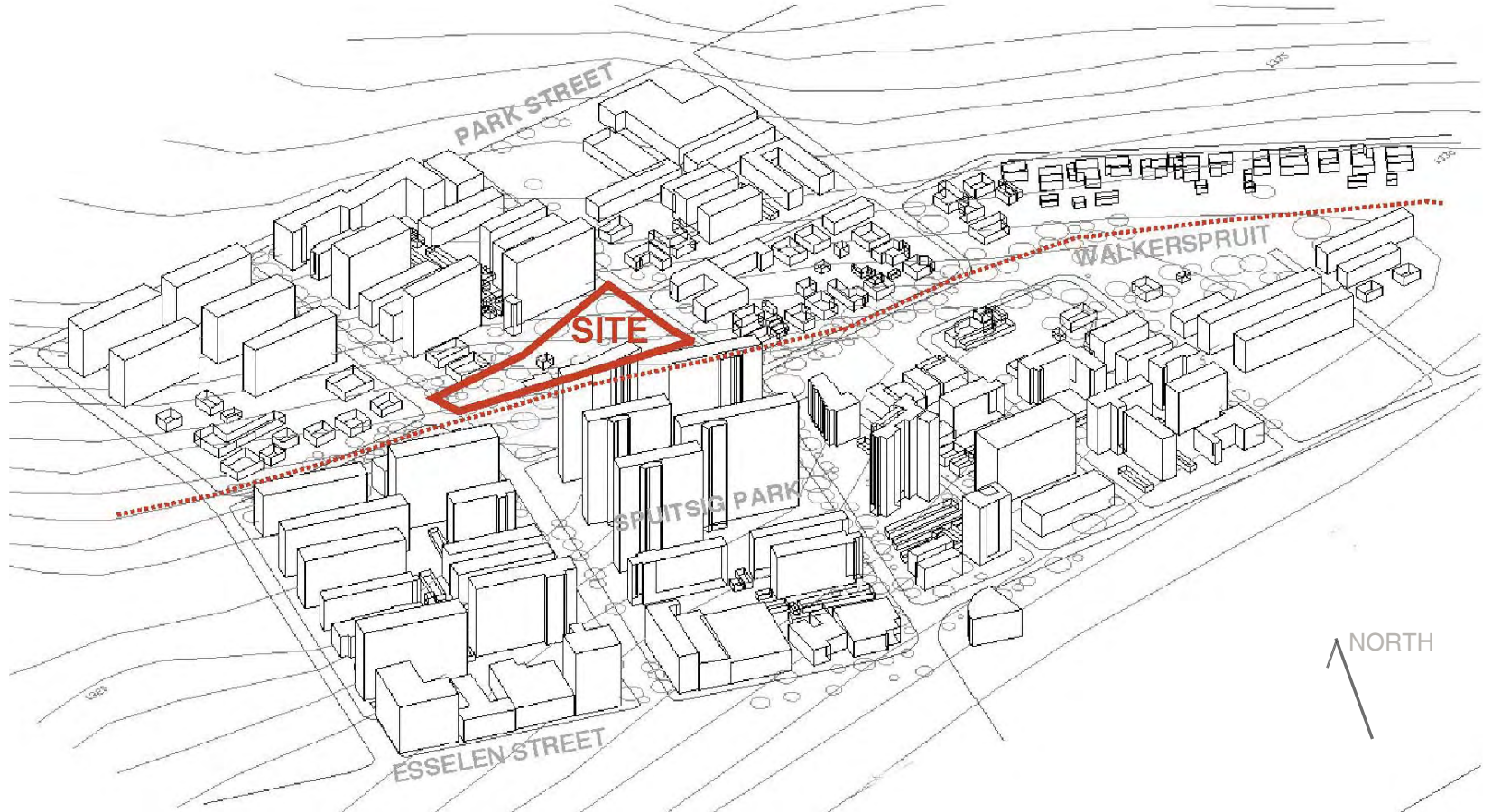
Illus. 19: Ground figure of central Sunnyside showing high and low densities

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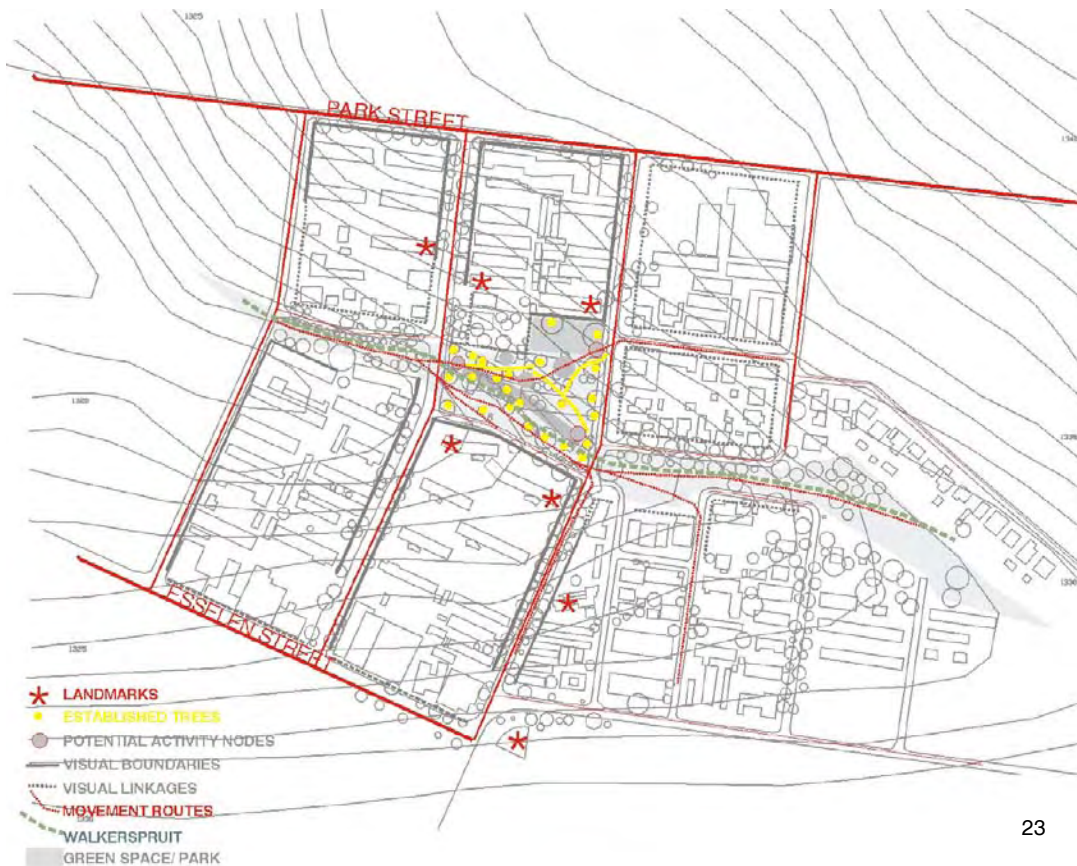


Illus. 21: Aerial photo showing the site and surrounding streets

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Illus. 22: 3D view over the site from the South-East showing the existing buildings



23

North-south streets function mainly as linkages to the principal east-west movement routes. These streets form axes that are experienced as negative spaces, with most buildings turning away from them. The selected site for the proposed building of this dissertation, has through the years been identified as one such negative space. However, it has carried its own importance within the context of the city and is by no means characterless. Its spaces are rich with activity and purpose, be it as a place of shelter for homeless people, or an abandoned landscape which forms part of the urban cityscape [Illus. 22].

A distinct difference between high and low density housing within Sunnyside is especially evident at its periphery. This also reflects the economic and demographic division existing within the suburb. It is a divide which may be diminished by generating linear activity on a seam between neighbourhoods, thereby maximising cross-community involvement within the area [Illus. 23].



Illus. 24 on this page: Views over or from the site mapped on an aerial photo.





Illus. 25: Photos of the neighbouring buildings of various scales and plotted on map

The incorporation of Walkerspruit as a feature in the design is an important aspect of the project. In 1984, a walking route along Walkerspruit, from its origin in Brooklyn up to its connection with the Apies River, was introduced. Its aim was to cater for the rising number of residents in the Sunnyside-Arcadia area who had little access to green space [Beeld: 12] [Illus. 44]. It is hoped that in future this trail will be revived, from its soft, natural character in Magnolia Dell into the hard-edged channel cutting through Sunnyside to the Apies River [ISDF: 38].

Walkerspruit is a key movement corridor through this area. Its duality needs to be considered. Firstly, it fulfills a technical role, namely the improvement of stormwater control. Secondly, it acts as a link or route which connects various districts [Illus. 41-43].



Illus. 26: Photos of Walkerspruit as it meanders through the site.

Illus. 27: "Nou kan 'n mens behoorlik wandel." Beeld article showing the upgraded Walkerspruit trail [Unknown, 1984]

The directional process of public movement on this scale creates certain spatial experiences. Here, the landscape can be manipulated using built forms to prompt a new perception of space. Secondly, technical aspects are considered, namely the improvement of flooding control.

Enhancing the quality of the Walkerspruit channel by applying softening techniques like riffles or weirs to its base may considerably affect drainage during peak flows and may exacerbate flooding. Design changes are limited to the extent in which the channel banks can be widened to accommodate the 50 and 100 year flood lines and the minimum flow of 110-120 m³/s [Illus. 45] [SRK: 17].



Flooding is currently aggravated by the position and limited dimensions of the bridges on Bourke and Leyds Streets, resulting in a differential water capacity beneath the bridges, evident in a return flow of water over the bridges and erosion of the channel banks [Chunnett Fourie: 16].

After the severe 1996 floods, the following improvements were determined by the city engineers [SRK: 29] and are incorporated in the site design:

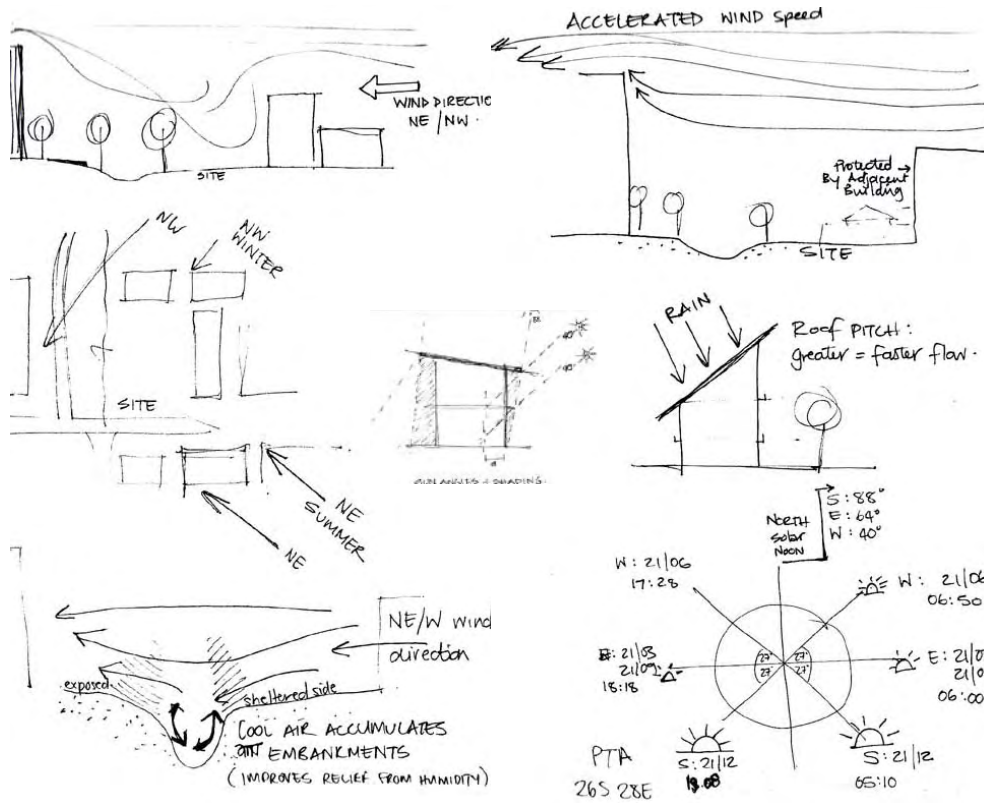
1. Widening of the channel
2. Using flood attenuation structures
3. Removing obstructions (such as trees which are too close to the channel)

4. Using indigenous vegetation
5. Not allowing any buildings below the 50 year flood line
6. Using erosion preventative measures

The use, maintenance and safety of the channel environment must also be considered. Safety is improved by providing sufficient visibility, permeability, and adequate lighting. Passive surveillance is promoted by opening the building facades towards public spaces. Street furniture requiring limited maintenance has been designed and vegetation has been used along the stream to limit soil erosion. Pedestrian priority is emphasised at road crossings by employing traffic calming techniques.



Illus. 28: The 50 and 100 year Walkerspruit floodlines between Bourke and Cilliers street. [Tshwane City Engineer, 2005]



Tshwane falls within the temperate eastern plateau and enjoys a comfortable climate. The summer rainfall average ranges from 125 to 375mm, with most rain falling during thunderstorms. The Winter average ranges between 62 and 250mm. The pitch and design of the proposed building will affect the flow rate of storm water during thunderstorms. Because of the characteristic flooding of Walkerspruit, attenuation of runoff within the built environment is advisable. Rainwater may be stored in culverts or flooding plains temporarily and be allowed to percolate through the soil gradually.

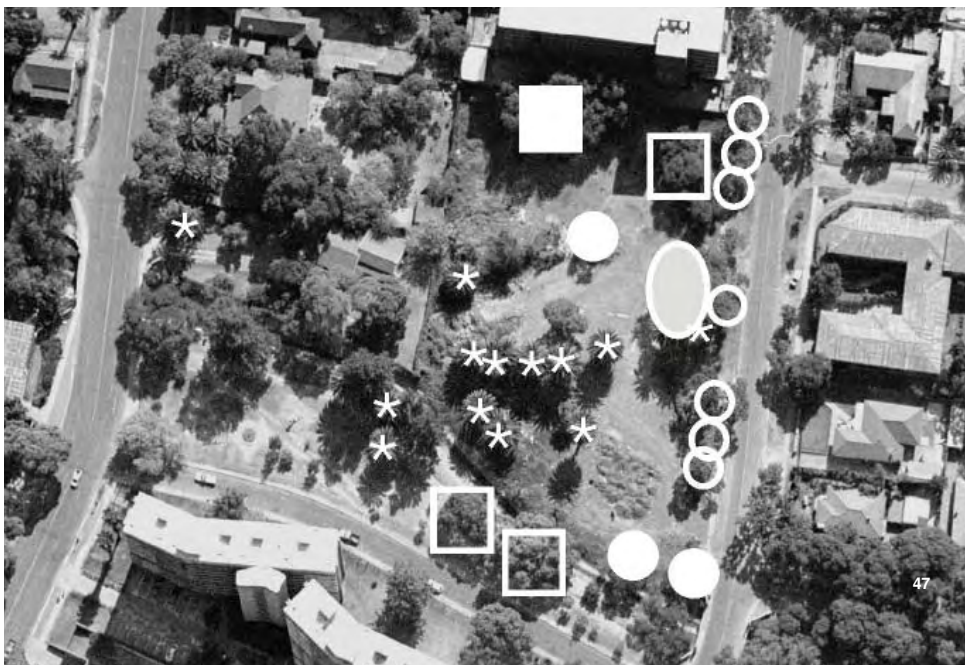
Summer humidity is about 30% and the daytime temperatures average 20-25 degrees Celsius, easily reaching the mid 30s. Winter days are sunny and temperatures range between 10-15 degrees Celsius. In Summer, winds prevail from the North-East and in winter occur from the North-West as well. Sixty to eighty percent hours of daytime sunshine occur from the west during the afternoons. The architectural implications of these climatic conditions are illustrated [Illus. 46].

Illus. 29: Author's interpretation of the climatic conditions and the architectural consequences.

The trees on site are well established and healthy, and have, where possible, been incorporated into the design. The existing vegetation gives an established character to the site and provides the area with a neutral quality essential to the green spine formed by the Walkerspruit.

The site contains a high number of historic Pretoria palms which are of heritage value to the Pretoria cityscape. On site, there are more than 12 Palms and since they are not indigenous and are easily transported, some of them will be relocated to a more suitable setting.

Following the recommendations of the SRK City Engineers' report, all trees which are too close to the Walkerspruit and are thereby obstructing high flows will also be relocated as required.



Illus. 30: Mapping the types of trees on site

- * Pretoria palms
- Querous Sp - Oak tree
- Acacia karroo - Soetdoring tree
- Schinus molle - Pepper tree
- Jacaranda mimosafolia - Jacaranda tree
- ◌ Tipa tipuana - Tipuana tree

brief 2

problem statement

desired outcomes

***focus area and context**

***conceptual goal setting**

***activities and functional systems**

***sensory exploration_needs + activities**

client, sponsors + administrators

site requirements

problem statement

This study investigates the influence of architecture on human psychology. The subconscious improvement of sensory perception and cognition through **movement and experiential interaction** with built environments is also explored through right-brain processing, which is essential for the holistic development of individuals. The mechanistic, left-brain focus of our society is being counteracted by environments which are rich in sensory qualities and which can be used as loci for creative thinking.

The built environment is viewed as a laboratory for developmental analysis in the scientific field of environmental psychology. Science is supported by architectural theory, which periodically explores the sensual aspects of architecture. Where these fields converge, an architectural solution focussing on the rich experiential qualities of space emerges. Architecture becomes an agent in and a supportive backdrop to **life.**

An outcome of this investigation is the creation of architecture which enhances the mental, perceptual and cognitive development of human beings from infancy to adulthood. Such an outcome in an area like Sunnyside would be highly beneficial in merging the socio-economic and developmental demands of a community that would not ordinarily access quality spaces.

Following on from the socio-economic aspects previously discussed, safe and vibrant environments are lacking within Sunnyside. Facilities for creative skills development within architectural spaces which support community activities are also limited. With the influx of adults from rural areas into urban areas, the consequent unemployment rate has resulted in a higher degree of informal trade occurring in the city streets. Skills development for individuals not only provides better economic opportunities, but also enhances the individual's sense of accomplishment.

The design proposal provides facilities which cater for the above mentioned issues. These include environments which support experiential development, community facilities, including activity spaces, as well as areas which support informal trade.

The project aims to:

University of Pretoria etd – Peres, EM (2005)

1. Create a systemic program consisting of various activities and users.

2. Provide an architectural solution which promotes cross programming.

3. Develop an architectural response which supports developmental and perceptual development in early childhood.

4. Allow for the cultivation of creativity by generating spaces for right-brain activity in order to counterbalance the societal focus on left-brain activity.

5. Provide facilities for development in the adult community.

6. Cater for potential community involvement by incorporating existing practices like informal trade into the architectural response.

7. Encourage community participation, by creating entrepreneurial opportunities for economic returns which benefit the community and the centre.

8. Create a place which is a haven for the individual, where personalities are explored, where talents materialize and where freedom is expressed through art, movement, and spontaneous interaction.

The proposed design, *Mindscape_ a centre for creative development*, consists of dynamic, multi-functional spaces, which can be utilised by a broad range of users at different times without changing the core design. The program has two definite branches.

The first branch is an early childhood development centre and exploratorium. A group of trained teachers and specialists will form the permanent core of this facility and their assistants will be members of the community trained in internship programs. The developmental progress of children will be recorded by the research bodies involved. This facility will also house offices for professionals with experience in dealing with gifted or special needs children.

The second branch provides facilities for the greater community. This centre will serve as a pilot study for the provision of community services within cities. Rather than being a large centre encompassing rigid functions, it will be divided to fulfill the various context-specific needs. The success of this project will determine whether local government will implement the strategy developed here in other urban regeneration areas.

The greater community will be catered for by opening facilities up to members of the community by providing public exhibition spaces, activity halls and outdoor spaces for community meetings, private functions, extramural activities or informal trade.

Bimonthly arts and crafts workshops, emphasising right brain thinking will be held to enhance creativity and cognitive skills in adolescents and adults. Products from these workshops will be retailed to the community and the broader South African and international markets. A percentage of the sales profit will go towards the centre and the remainder will be given to the artist, creator, or author, thereby motivating the community to become involved in the initiatives of the centre and in doing so, to build the identity of the community.



Most built environments contain either too little or too much sensory stimulation. In cities, the need exists for spaces which support development through balanced neural input such as tactile, audio and motor activities. This development derived from exploration, forms the basis for learning. [Kokot, S. 2005]

Our bodies learn behaviours through observation: -from children acquiring basic skills to adults perfecting them in activities such as dance. Repetition conditions the body to function in response to stimuli.

Sensory loads may be reduced by using white noise from water sources to achieve a calming effect, incorporating natural features in the design, creating subtle boundaries

between spaces, as well as providing gradual transitions between materials such as wood, plaster, and glass. The use of slightly curved, flowing, or angular lines promotes the visual attractiveness of a space by softening the impact on the senses and prompting their exploration.

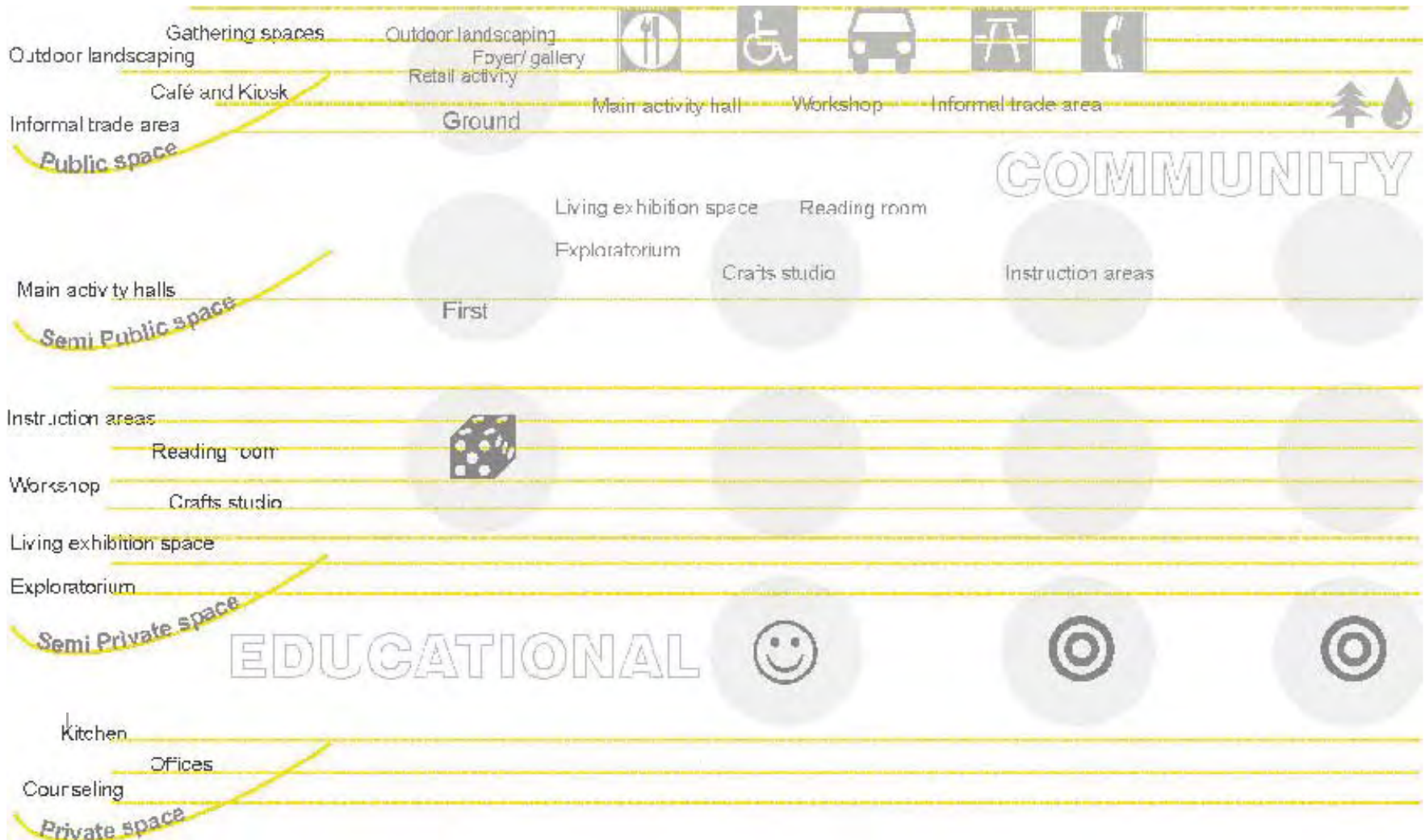
Due to their neurological immaturity, young children are easily excited and overwhelmed when confronted with excessive sensory input. In these situations they tend to shut down. This kind of sensory withdrawal which is especially induced by noise, has critical consequences for their development [Gallagher: 79]. In response to overwhelming stimuli, children react with flight, fright or fight. The behavioural manifestations of these reactions may be seen

in children who hide (to block out disturbing visual stimuli), day dream (to withdraw from a chaotic environment) or physically attack others (to attempt to control noise levels).

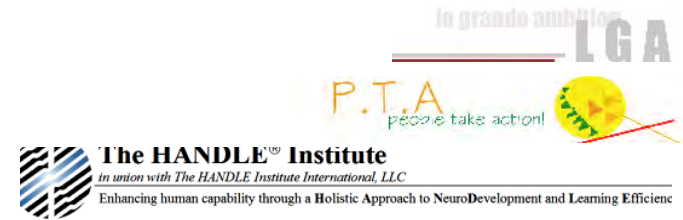
Spatial experiences are pivotal to the wellbeing of gifted children, children with special needs, or adults with a high sensitivity to sensory stimuli. Spaces should however, not be monotonous. Highest sensory sensitivity is experienced in areas with high degrees of noise, bright colours, patterned walls, and strong odours contained within what can become claustrophobic spaces. A preference for curved or angular lines with a gradual flow between spaces and materials is noted and has produced favourable results in most cases. [Kokot, S. 2005]

_ sensory exploration: needs and activities





Illus. 33: Diagrammatic representation of public/private activities and their interaction



A non-profit organisation known as People Take Action (PTA) consisting of elected members representing the Sunnyside community is eager to develop a facility which offers skills development in a safe and educative setting. The committee has assumed responsibility for the materialization of the project, as well as a sustained involvement in the management of the centre after its completion.

After consultation with local government in 2004, a piece of unused government land to the value of R 500 000 was donated to PTA. It consists of four stands between Leyds, De Rapper and Bourke Streets adjacent to the Walkerspruit, and has been rezoned as required.

Conditions set by government stated that PTA find a sponsor who would ensure project completion in time for the 2010

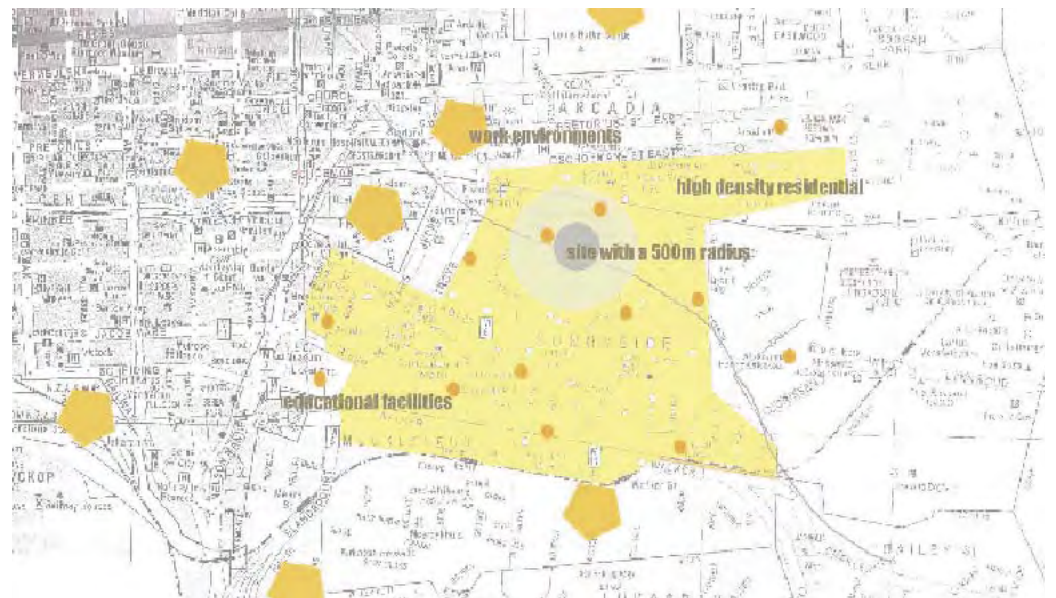
Soccer World Cup. To support the activities related to 2010, the centre should be able to provide individuals with the initiative to help create a vibrant, well-functioning city. Lastly, the said portion of Walkerspruit must be upgraded and must remain open for public use.

Local and foreign sponsors that were willing to meet the conditions were found. The foreign sponsor is represented by the foreign social investment department of Le Grande Ambition Inc (LGA), a Swiss-based corporation, which donates 6% of its yearly multi-million profits to various upliftment projects worldwide. The South African sponsor is part of the HANDEL group and requires the centre to provide a place where children can be observed so as to develop their expertise in the field of perceptual development in children and the related psychological effects of built environments on humans.

The site, positioned along the Walkerspruit between Bourke, De Rapper and Leyds streets was identified for the following reasons:

1. It is within walking distance of high-density residential environments
2. It enjoys proximity to educational facilities
3. It lies central to needs or work environments
4. It enjoys quiet surroundings
5. It will allow landscapes to be created to accommodate community activities
6. It can share services and facilities from the existing infrastructure
7. It has urban regeneration potential
8. Green areas can utilise features like the Walkerspruit

[Moore: 42, 64]



design philosophy



overview

imageability

a new order

sensuous architecture

the subconscious effects of space

placemaking

The proposed design has been influenced by the design philosophies discussed in this chapter. Firstly, the building form is based on deconstructivist principles, where the design attempts to challenge traditional built forms to produce a solution which is contextually based and which can be reprogrammed over time to maintain its usefulness. Derived from the programme and potential activities therein, the building does not conform to traditional architectural imagery.

Secondly, the spatial and material quality of the design proposal, and the effect of spaces on humans, is investigated to discover which spaces enhance the sense of place and well being in built environments. These philosophies have guided the principles of the design which is based on sensuous and experiential architecture

“In the celebrated architecture of our time...buildings attempt to conquer the foreground rather than create supportive backgrounds for human activities and perceptions” J. Pallasmaa [2000:84]

Meaningless images have become the manna of present day society. Looks sell; the new is always better than the predecessor, always, a fad. An image is recyclable; trends recur: what your parents wore in their youth, you now wear. [Illus. 55] It seems that books (and everything else) have to be judged by their covers if they are to stand a chance of being acceptable. If this is true for design, then is it true for architecture, which is popularly termed ‘grand design’ on mass media such as the BBC?

Is the image adopted in favour of the diagram for the reason that it is an existing reference to self expression? It allows the inner immaterial self to be recognised and identified by other immaterial selves according to existing universal symbols and icons. The commodity is desired through sight; therefore the image becomes seductive eye candy. The meaning is lost. The diagram becomes pointless. Basic needs are forgotten only to be replaced by addictions, to the extent that individuals are no longer satisfied with what they have, but instead demand the latest edition. Architecture does not seem to have been exempted. It now boasts ‘designer frills’ that make one want to compete with the Jones’s.

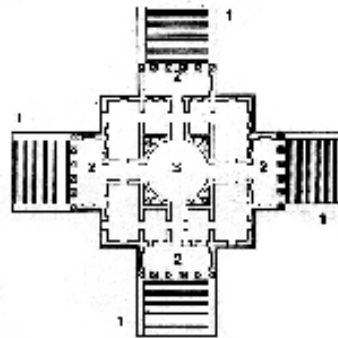
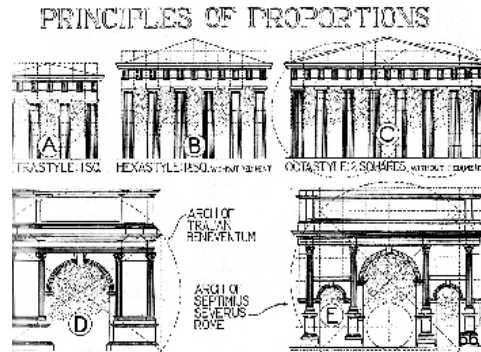
Architecture is becoming flashy and image-based; a composition of existing elements versus a system of instruction sets that generate a contextual result. It may be said that the architecture of today is just scratching at the surface. The Finnish architect and theoretician Juhani Pallasmaa describes architecture as an endangered art form, threatened by the opposing forces of a materialistic global culture: technology and economy. Our shallow and transient cultures emphasise the image over essence, from individual behaviour to fashion and politics [Pallasmaa 51-2].



imageability

Illus. 36: Fashion and its cyclic nature [Digital manipulation from Elle [spain]: January 2005: 23]

The image was introduced into architecture during the Middle Ages when gothic was cast aside in favour of the aesthetics of ancient Rome. During the Renaissance, Alberti (1400's), rediscovered and reinterpreted Vitruvius' *The Ten books on Architecture*, the only surviving roman text on architecture. The ideal principles of classical architecture expressed therein, were based on symmetry, mathematical proportion and harmony, arithmetic and geometry [Norwich: 142] [Illus 37]. The images produced were purely representative of classical roman architecture. By the 1500's Renaissance architects had developed representative imagery of classical roman architecture. This allowed them to develop personalised stylistic expressions of the ultimate art: architecture [Illus. 38]. It became pure image architecture.



Illus. 37: Renaissance principles of proportions [Fletcher: 1975: 265]

Illus. 38: Palladio's Villa Rotonda, 1569. Classical revival. [Norwich: 1979: 149]

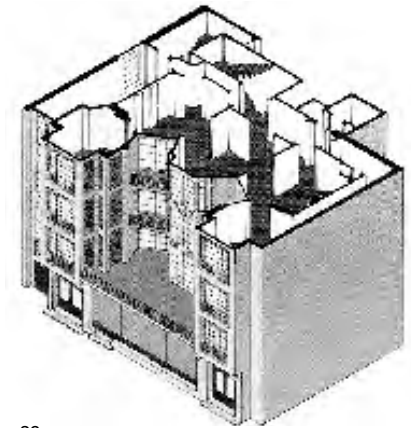
Following the theoretician Quatremère de Quincy's essays on the origins of architecture (1785 onwards), the design process changed from copying past models into the logical analysis of the technical possibilities of construction and program. This analysis was continued by the theoretical work of David de Superville (1800's). Superville sought to reduce painting, sculpture and architecture to its basic geometric patterns by moving away from the figurative image-based product toward the permanence of the abstract. It is with this exploration that the origins of the Modern Movement as well as Modern art is said to have begun [Sola-Morales: 128-133].

The early 1900s were epitomised by a search for simplicity, logic and structural ingenuity. Architects like H.P Berlage, Peter Behrens and August Perret produced a collection of works from which members of the Bauhaus, amongst others, were to take their inspiration [Illus. 39]. Efforts made to introduce a new architecture, responsive to social needs and using new materials and construction techniques, were initially isolated and tentative. Movements in art, namely Impressionism and Cubism, inspired architects to break from the confusion of 19th century styles by searching for the truth through

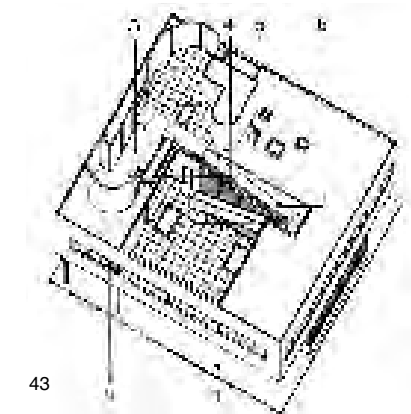
abstraction [Illus. 40]. Impressionism placed a high emphasis on the eye due to its focus on the interpretation of art through sight. As a result, the work of Cezanne, followed by Cubism, aimed to place the emphasis on the mind and on conception versus perception [Taylor: 59].

In 1928, the Congrès Internationaux d'Architecture Moderne (CIAM) was founded to develop the planning and social role of architecture; to discover its absolute language. Amongst its members were architects Charles-Eduard Jeanneret/Le Corbusier, Alvar Aalto and Walter Gropius. Under Gropius, the Bauhaus concerned itself with the machine age, standardisation and mass-production. The emphasis was on form derived from function [Illus. 41-3]. Less was more. The International Style was adopted worldwide, but rather than maintaining the *principles* of the movement, its image and style were applied. The quest for absolute originality failed, since it based itself on existing precedents [Taylor: 50]. Dissatisfaction with Modernism's obsessive abstraction led to the counter-movement known as Post-Modernism [Norwich: 232-3].

'Less is bore': Post-Modernism rejected Modern principles, its dualist mindset and its obsession with abstraction. Instead, it focused on the figurative [Illus. 44]. Architectural meaning became the ultimate form of expression with an overall embrace of the world of excessiveness beyond utility. The focus on representation and symbolism was fundamental to the movement as was the emphasis on imitation. Like Andy Warhol's pop art, so architecture focused on cliché and popular imagery.



39



43

Illus. 39: August Perret's new concrete apartments on Rue Franklin, Paris, 1902. [Norwich: 1979: 228]

Illus. 40: Maison Stoclet by Josef Hoffmann, Brussels, 1911. The new Art Nouveau inspired geometry

Illus. 41-2: Villa Savoye, by Le Corbusier, Poissy, 1929. The Modern Movement emerges

Illus. 43: Villa Savoye: the 5 principles of the Modern Movement [Norwich: 1979: 241]

theoretical enquiry



overview: psychology in architecture

designing children's places: exploratorium

+cognitive development

+design guidelines

designing stimulating spaces_entire design

+environmental psychology

+perception

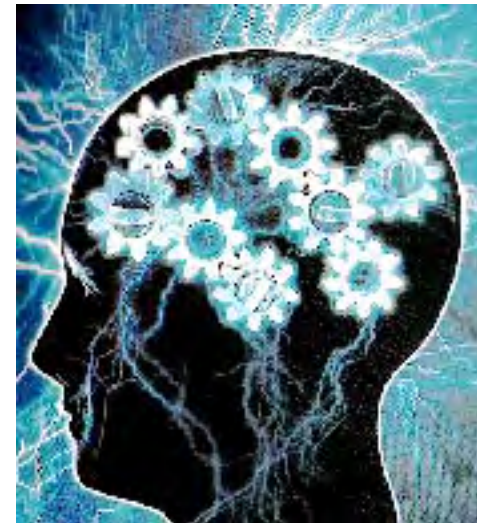
+stimulation

over

Research concerning the psychological development of humans and their responses to space often becomes so empirical that it has to generalise its results. Design solutions based on these results become depleted of any spontaneity or interactivity. Because of this, only basic principles of environmental psychology will be considered in this dissertation, with greater focus on child development.

Architectural theory has dealt with many of the issues studied in environmental psychology, without the scientific constraints. Theoreticians like Pallasmaa and the work of various architects has been used to enrich the design process.

view



“There exists in our world an unusual, partly savage tribe, ancient and widely distributed, yet until recently little studied by anthropologists or historians. All of us were at one time members of this tribe: we knew its customs, manners, and rituals, its folklore and sacred texts. I refer of course to children.”

[Alison Laurie: ix]



With these words, Alison Laurie begins her book on subversive children's literature, *Not in front of the GROWN-UPS*. We often forget what our ideas, feelings and thoughts were as children; what spaces, places, colours, and activities we liked. It is usually without these considerations that adults design spaces for children, resulting in delimited, defined and contained places. In most cases, children count the seconds until they can escape to the outdoors, and retreat into their imaginations and worlds of fantasy.

Humans relate to the world actively. We interpret it by questioning, constructing and representing it to ourselves through movement and direct exploration [Illus. 52].

At first, children are encouraged to explore and discover and create. However, the ideals and values of the educational system result in a large percentage of adolescents experiencing disappointment in a prescriptive system. Children are forced to deal with problems that do not arise from circumstance but which are posed and therefore seem 'unnatural' [Donaldson: 8, 121]. Students are forced to master a formal system without experimentation, where abstract ideas are taught, but never applied. This apartheid of the intimate and reciprocal connection between the mind and the body has negatively affected education [Donaldson: 82]. Therefore, the exploratorium design will focus on experimental learning.

designing places for children_exploratorium considerations

The effects of day care on cognitive development have been proven to be positive in the development of children from lower income environments [Moore: 43] [Illus. 53]. High-quality facilities improve the cognitive and social characteristics which these children learn, and negative effects tend to be emotional and not social. [Smith: 92]



Piaget's stages of Cognitive Development and subsequent design responses follow:

Stage	Characterisation	Design response
Sensorimotor [0-2]	Differentiates self from objects. Actions are intentional	Spaces should be flexible to encourage movement
Preoperational [2-7]	Language is used to represent objects. Classifies objects by a single feature.	Interaction between groups of children and adults should be encouraged. Promote movement.
Concrete operational [7-11]	Logic and concepts of conservation develop	Provide features which stimulate problem solving, such as mazes or puzzles.
Formal operational 11 onwards	Can logically test abstract ideas. Conceives the future and ideological problems	Encourage thought-based activities by providing workshop spaces within a structured environment

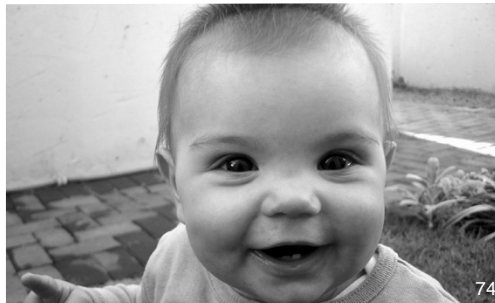
Adapted from [Weinstein: 171-181]

Illus. 53: Middle to lower income groups especially benefit from child care

Illus. 54: Infants are born with inherent learning mechanisms

Illus. 55 on facing page: Children have a rich variety of skills to develop and to dream [Digital manipulation from Tony Stone images, 1998]

cognitive development



Children develop by acquiring knowledge through the analysis of different environmental sources. The difference between the amount and depth of knowledge acquired in young children and that of adults is the only difference in their cognitive skills levels. This means that the improvement of cognition has to occur in the early years. Development is also influenced by socio-cultural aspects through which children form prototypes for action, which forms the basis for morality. [Smith:80-82]

Cognitive development in children can be accelerated through imitation, practice, extra attention, and interaction with adults. Language plays an important role in developing new skills and knowledge. Children use language to guide their own actions as they practice new skills. The critical stage in language learning occurs at the age of six, after which it is extremely difficult for a child to learn a language for the first time. [Smith: 67, 82, 323]

66

Infants are attracted to objects with curved lines, high contrasts, edges, movement and complexity. They respond to sounds and visual stimuli by voluntary movement. Infants learn and remember quickly in familiar environments and are well prepared to perceive, and learn from, the world [Smith: 70-72] [Illus. 54].

Symbolic expression	Combine sensory motor activities and symbolic play within one space	A hollow platform may be climbed on or used as a 'house'
Logical thought	Children's views are dominated by what they can see.	Views to different spaces challenge perception
Creativity and problem solving	Imaginary and fantasy play in mixed environments	Offer mixed materials and spaces with little imagery
Attention span	Structured activities should be brief	Offer space which supports complex activities e.g. jungle gym
Motor development	Achieved through free play: jumping, tumbling, balancing	Spaces should be adjustable/cater for all needs. Multi functionality



Children learn through movement [Illus. 56]. Their bodies are their primary source of education. Therefore the proposed design incorporates spaces which promote movement by stretching, reaching, crawling and altering orientation, thereby diversifying spatial perceptions. Perceptual motor activities include sliding, climbing ladders, stepping, balancing, rolling and tumbling. Space is explored within subtle boundaries, which provide intimate but not crowded spaces. The number and types of children using spaces depends on their level of development and not on their age group.

The following developmental goals and design implications have been used: There is little discrepancy in the design between what children want to do and what they can do. The following table represents the socio-emotional development of children and the related design responses:

Self-esteem [2-5]	Personal identity develops	Interaction between people and environments. Provide opportunity for individualisation
Security and comfort	Provide sensory stimulation through colour, texture, etc	A view over various spaces should be given at the entrance
Self control	Spaces promote types of behaviour and accommodate different needs	Provide a mixture of spaces, such as retreat (time-out) or activity nodes. Group complementary functions together Moveable partitions promote feelings of closeness, intimacy and safety

Adapted from [Weinstein: 162-170] [Moore: 1979]



The effects of the environment on the well-being of individuals have been observed through the centuries and are influenced by setting, which includes different seasons as well as geographical locations. In modern society, the effects of artificial indoor environments in which individuals spend most of their time prove to have negative consequences [Gallagher: 14].

It is beneficial to be cognisant of the effects that artificial environments have on people, especially in creating positive, legible spaces. Primarily, information

communication within buildings is visual, so the legibility thereof is of major importance. Positioning of information must meet users' expectations in terms of where particular information is likely to be found at any given time. This is achieved through the visual openness of buildings [Brebner: 77].

Social behaviour is influenced by design features. The frequency and conditions under which strangers meet each other affects their interaction, as demonstrated by an intimate colonnade versus an open square. People with common interests will

gather within areas which promote certain activities. Consequently, an infinite number of communication opportunities may occur [Brebner: 136] [Illus. 77].

Overcrowding affects performance negatively, due to limited privacy, and because higher noise levels create an overload of stimuli. In such cases, defensible space is essential for good social behaviour and quality of life. However, in communal spaces like a residential park, territorial people may resist the influx of outsiders invading 'their' space [Brebner: 139, 144].



Illus.57: Spontaneous, accidental interaction between various users [Digitally enhanced manipulation from Tony stone images, 1998]

Aesthetics, the interaction of cognitive and emotional processes, is learned by abstracting experiences of different environments. These experiences establish the rules by which sensory information is integrated into the perception and understanding of the world. Behaviour may be determined through the aesthetic properties of objects and environments. At a psychological level, individuals are stimulated by factors like music or the use of angular shapes or colours, whereas the presence of nature tends to create calmer environments [Brebner: 159, 169, 171].

The immune and nervous systems are particularly responsive to environmental stimuli, for example, hypersensitive introverts also suffer from allergies and hay fever. Just as our choices in life have an effect on our well-being, so do the environments in which we live. Manipulation of sensory environments is therefore necessary for improved development of individuals in

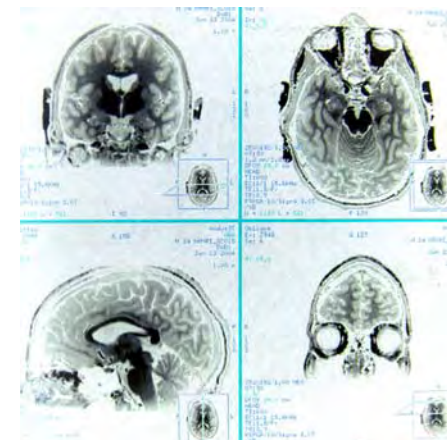
society, to the advantage of people with sensitivities towards sensory and neural stimulation [Gallagher: 18, 105] [Illus. 78].

Urban environments are complex systems of interconnected activities. When subjected to the hectic pace of urbanity, people become addicted to its rush and stress, without noticing the effect on their behaviours until they reach their limit. This stress is often relieved by going somewhere else, somewhere with a slower pace. Moving through spaces or environments which form part of larger systems of physical organisation renews the overall state of well-being. But science remains purely rational and does not seek to explain the experiential and often inexplicable effects that certain spaces have on people. [Gallagher: 21, 23, 148]

The need not to overload information processing capacities and to achieve integration of environmental stimuli, demands that environments should not

be too cluttered nor too complex. The multiplicity of different objects, colours, and edges should not conflict too much with each other. Complex environments such as those in the proposed design are improved by scaling elements and using gradual changes in settings. [Brebner: 172] It should be remembered that people feel their best in settings that foster a sense of control, impose few constraints, and offer multiple options. [Gallagher: 77]

To conclude, FM Crewdson wrote: "balance is the securing of unity in the midst of variety. Both variety and unity are necessary to sustain interest, and these opposing forces must be balanced. Variety is necessary to attract and arouse interest; unity is essential to create a favourable impression and to satisfy the moods and desires. Variety overdone is confusing and unpleasant; unity overdone is monotonous." [Crewdson 1953: 121 in Mahnke 1987: 7]



Illus.58: The Brain: the basis for environmental psychology constructs [Digital manipulation from Tony Stone Images, 1998]

perception

Perception is the process by which raw data is organised into a coherent representation of the world in order to solve problems. Whether human capabilities are inborn or develop due to experience is debatable. Nineteenth century psychologists divided perception into elements of sensations. This approach was replaced in the 1920s by newer schools: behaviourism, gestalt psychology and psychoanalysis.

+Behaviourism occurs as a result of conditioning, where the environment shapes behaviour by reinforcing specific habits based on stimulus and response, as illustrated by Ivan Pavlov's dogs [Smith: 7].

+Gestalt psychology originated in Germany around 1912. Its primary focus was on perceptual experience based on the patterns formed by stimuli. The whole is different from the sum of its parts because the whole depends on the relationships between the parts [Smith: 8].

+Psychoanalysis, developed by Sigmund Freud at the turn of the 20thC, deals with the concept of the unconscious - the thoughts, attitudes, impulses, wishes, motivations and emotions of which we are unaware. When forbidden desires are driven out of the conscious awareness, they begin to influence thoughts and feelings from within the unconscious [Smith: 8].

Contemporary psychological perspectives include aspects from most of these schools. The cognitive perspective deals with understanding mental processes such as perceiving, remembering, reasoning, deciding, and problem solving, and their relationship to behaviour. Developmental perspectives are concerned with human development and the factors that shape behaviour from birth to old age. In all cases where perception is challenged, lateral thinking is promoted. The design of the centre for creative development aims to challenge perception by creating various spaces and distorting the links between areas and by using materials in unconventional ways to create a new architectural form.

Ancient theories promote living in harmony with the environment to improve life. We appreciate these concepts in the information age more than ever before. Spaces should welcome users by emphasising entrances and movement towards places of importance. Movement through a building should provide different levels of stimulation, not only to promote diversity, but also to cater for a wider variety of users. Impoverished environments are those that deprive the senses of stimulation through minimal external cues from the natural or built environment [Gallagher: 142-143].

The effects of the environment on behaviour when individuals adapt to stress does not ameliorate the stress. In toxic stress environments such as those with high noise pollution levels, a decrease in productivity, sociability and concentration is noted. These effects have to be considered not only in response to the stimulation provided, but also to what it means to the person experiencing them. Genetic, cultural and experiential backgrounds and their differences also contribute to the effects. For example, in modern societies which are made up of many diverse cultures, it is often difficult to merge ideas of personal space and territoriality. It becomes increasingly difficult to adapt to different cultures, so that it is often better to support them within less defined spaces which provide multiple opportunities for interaction [Gallagher: 159-161, 188-187].

When we are able to perform activities that we enjoy, whether playing the violin or jogging, our actions merge with our awareness and we stop being the self-conscious spectators of our experience. This is often described as a feeling of oneness with something that is greater than the self [Gallagher: 172]. When this occurs, the built environment supports human activity in the best possible way. It provides comfortable places for humans to be in.



stimulation



design development

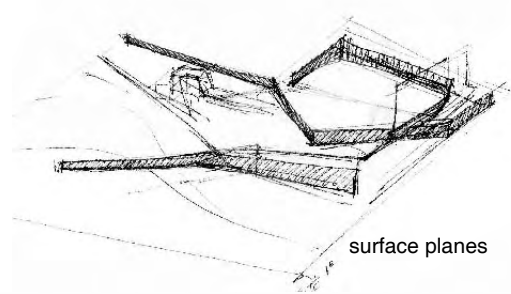


initial concepts
refinement
layered design solution
 +children's spaces
 +community activities
re-programmable spaces

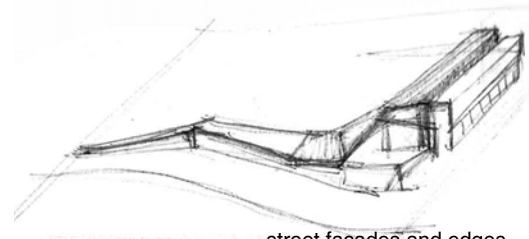
The initial programme for the centre for creative development in Sunnyside was based on formal spaces, such as an auditorium and classrooms. The result was a large, imposing building, which looked more like an alien object than an integrated contextual design. It was only after the manipulation of the Walkerspruit flood plain through extensive landscaping and earthworks that the rest of the design took shape... in response to its dominant natural feature. As the stream channels water, so the design began to take on the role of channeling movement through the site.



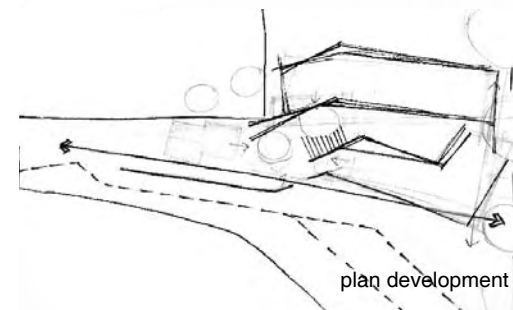
site construction



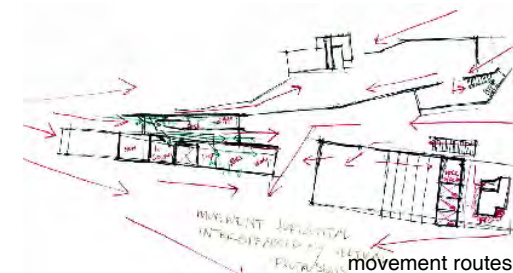
surface planes



street facades and edges

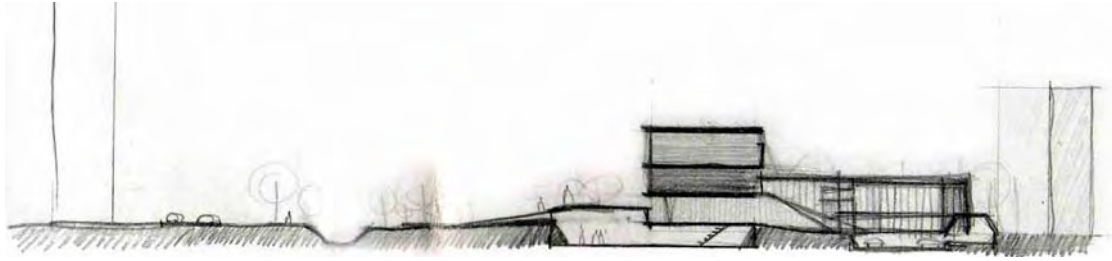


plan development

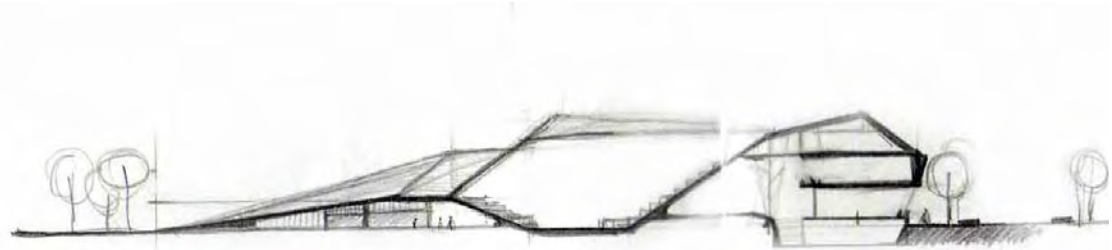


movement routes

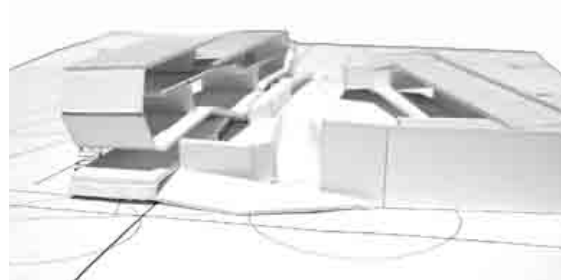
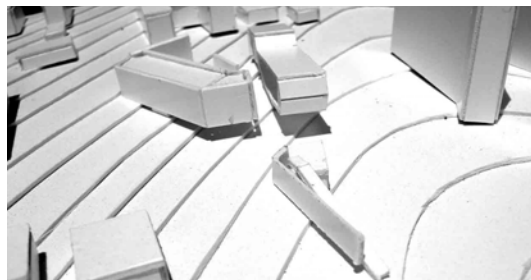
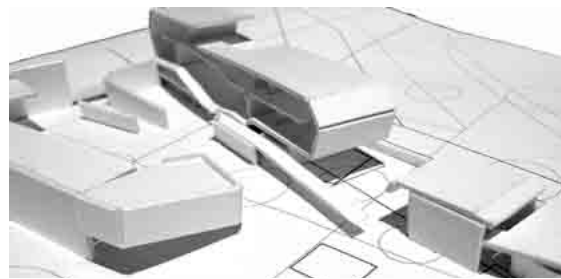
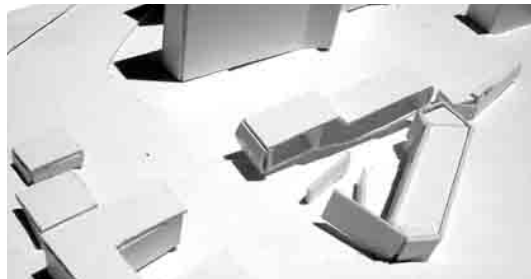
Illus.61: Sketches showing the initial design concepts on plan including movement routes and axis.



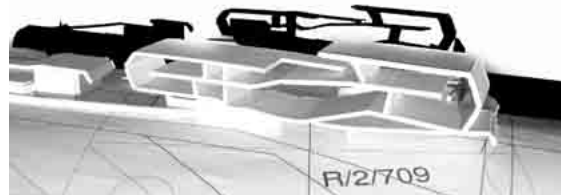
Eastern elevation of the building form in May including the Walkerspruit



Cross section through the first design concept



Model of the initial proposal which dominated the site

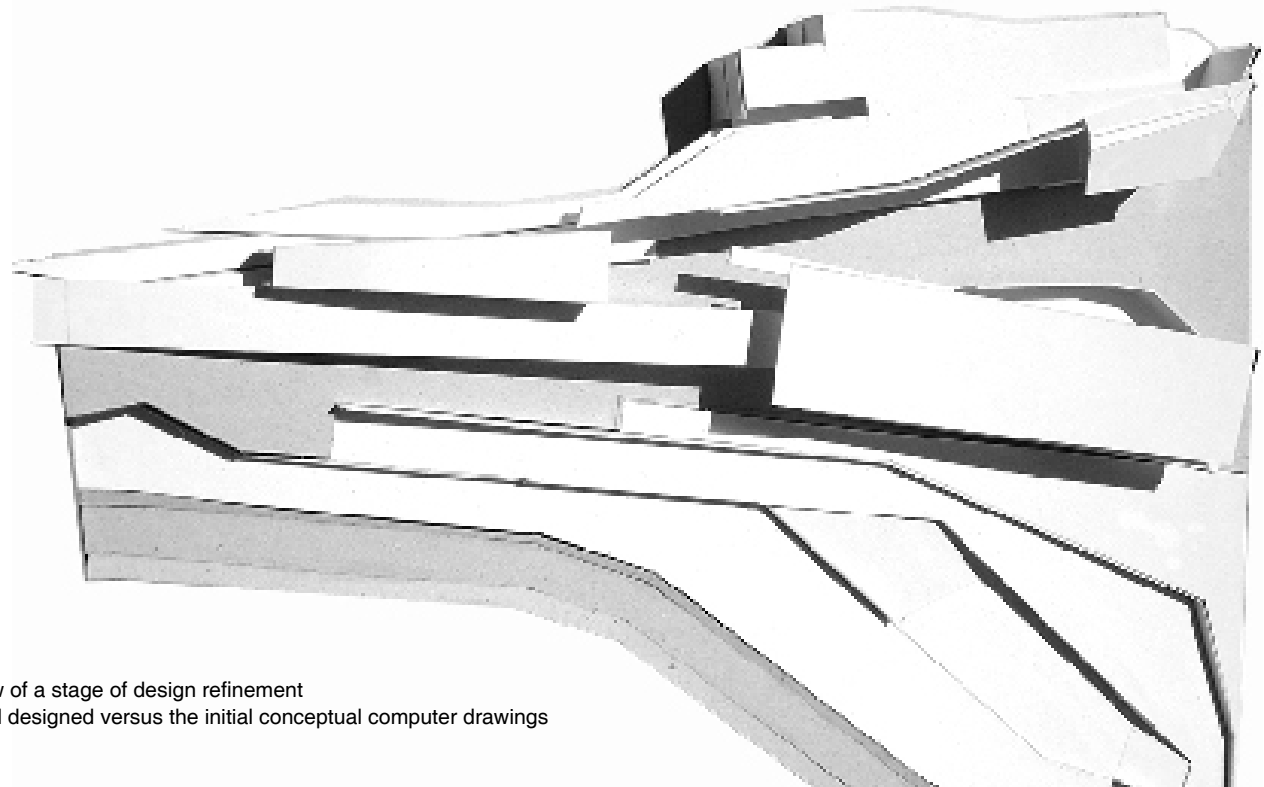


The refinement of the design began to show an architectural surface which emerged from the natural landscape. It was obvious that the building would have to split up and follow the orientation of the channel if it was to succeed in maintaining the unique sense of place and natural experiential quality of the site.

Futhermore, the programme was simplified to accommodate greater cross programming within the design. All spaces were designed to be used for multiple functions at any time of day, for example the main activity hall can be used for extra mural-activities during the day, and in the evening may be used for a political rally. The computer area in the info node,

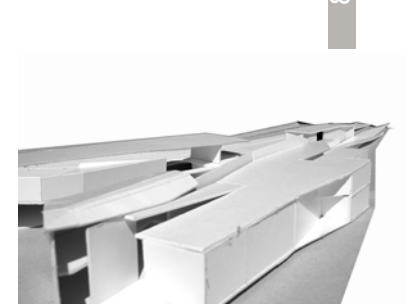
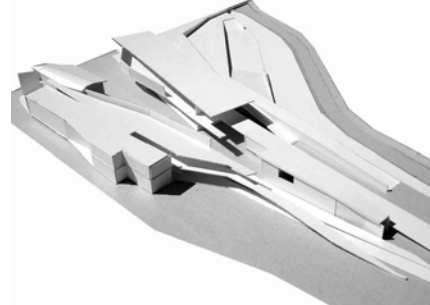
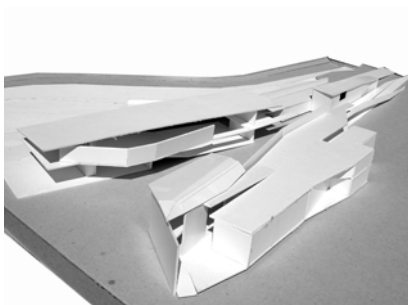
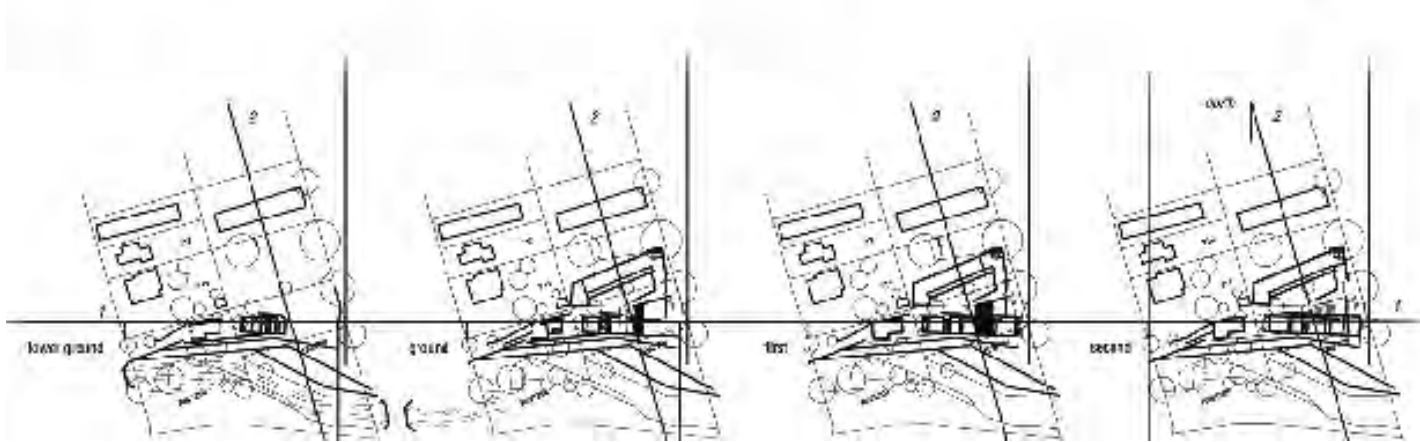
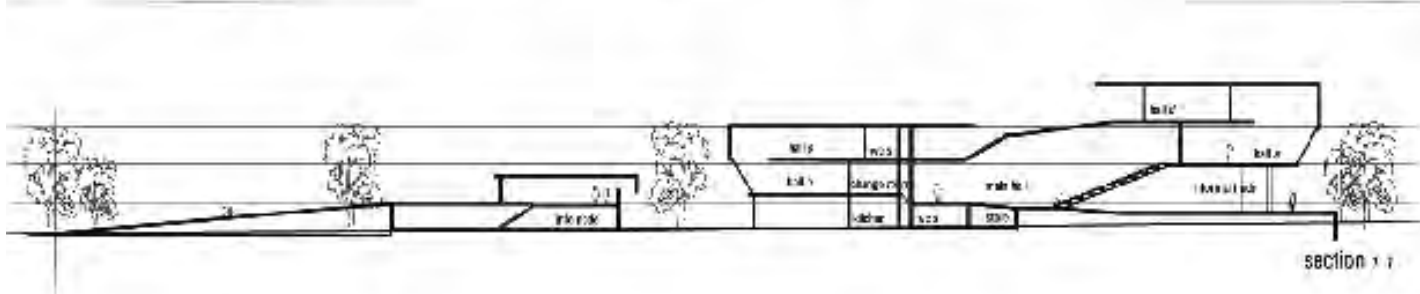
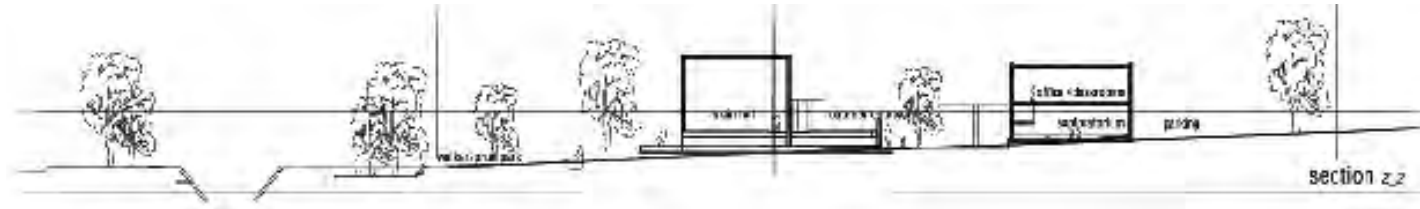
may be used as an internet cafe during the day, and as a computer training centre at night. The openness of the building is emphasised by the residual, almost accidental spaces that emerge from the placement of the buildings and which channel the movement of the public through the site.

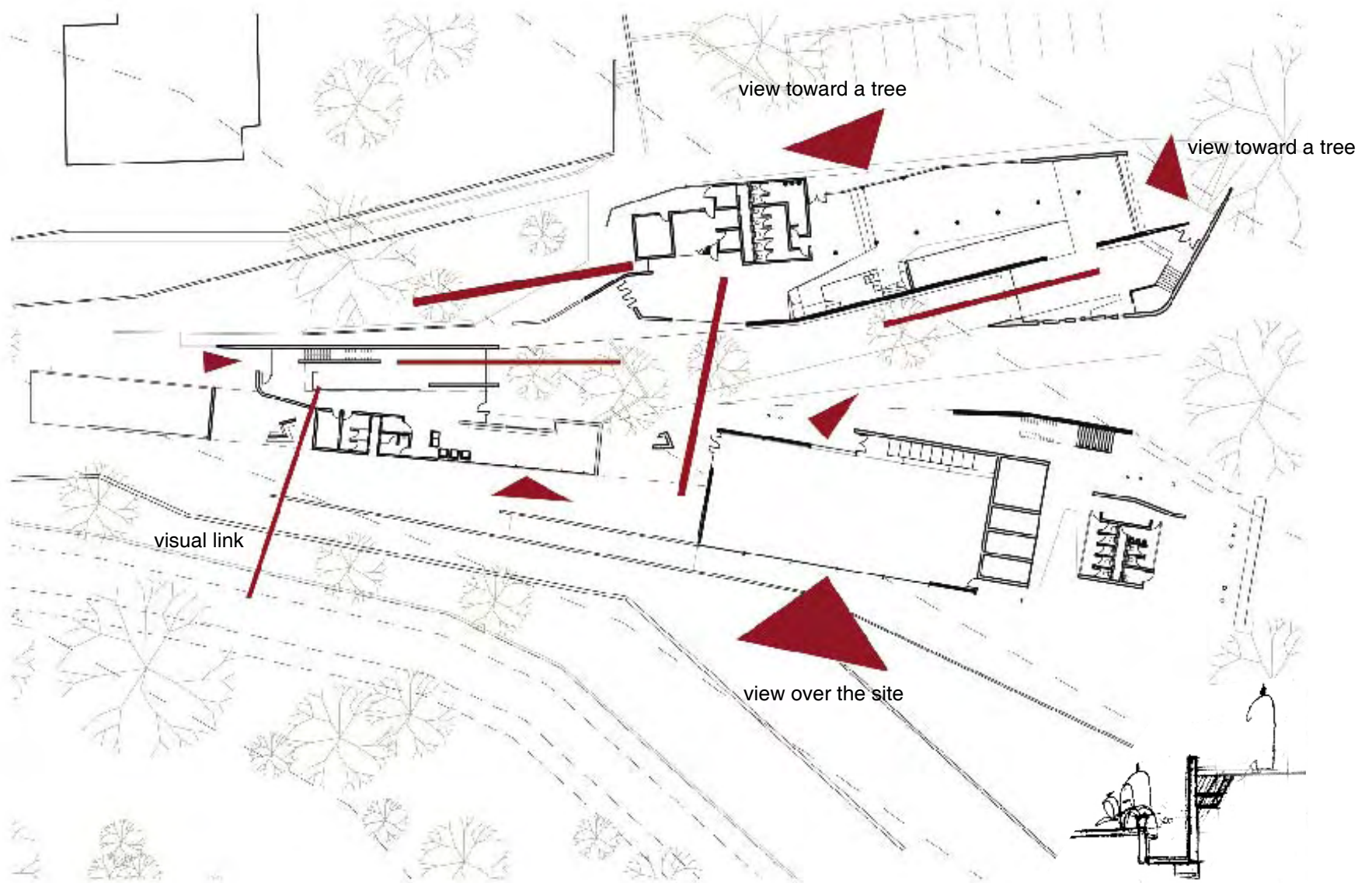
At this stage, the design began to consider responses to climate and passive systems. The needs of the internal spaces determined the facade articulation for glazing and roof design. The building form was sculptural and contained various spaces which promoted a multitude of perceptual experiences throughout.



Illus. 62: Model showing aerial view of a stage of design refinement

Illus. 63 on facing page: the refined designed versus the initial conceptual computer drawings

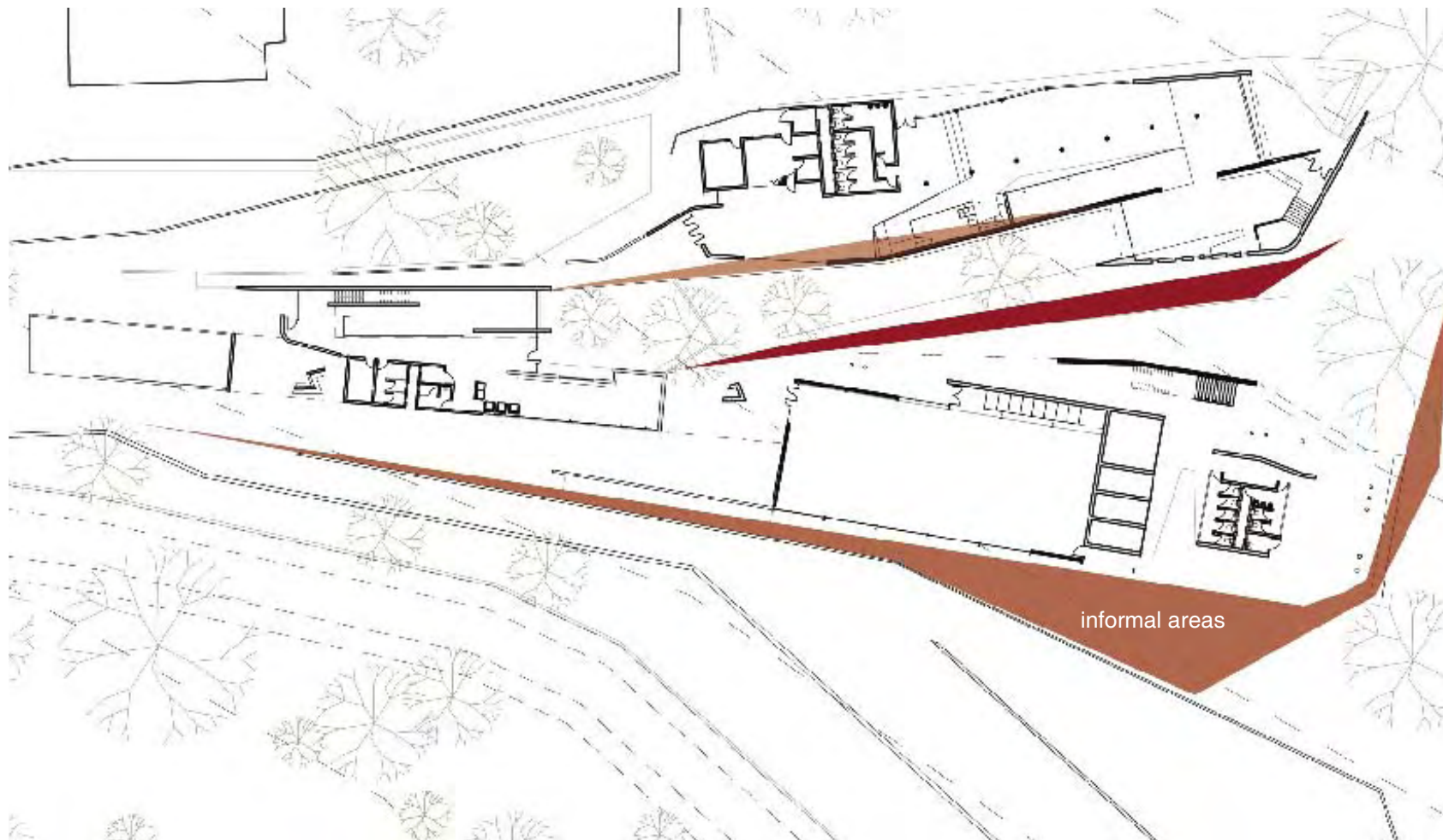




The integration of the design with the landscape is promoted through visual framed links between the interior and exterior spaces. Glazed openings give the perception of an open building, further emphasised by the heavy concrete and masonry surfaces adjacent to them. The temporal qualities

of temporary versus permanent or light versus heavy are explored through the use of building materials. The design intervention at times disappears or else becomes firmly planted within the landscape.

Illus. 64: Diagram showing the visual links between the interior and exterior spaces.



Spaces originate from surfaces which pull out of themselves into splintered entities which become embedded within the landscape, or else collide with other surfaces and merge to form new accidental spaces. Here, the opportunity for chance

meetings, views to specific spaces and a multitude of functions, become apparent. A “no-space” without restrictive detail or formal structure, provides individuals with the chance to interpret the space to suit their needs.

Illus. 65: Representation of some of the public residual, or accidental, spaces.

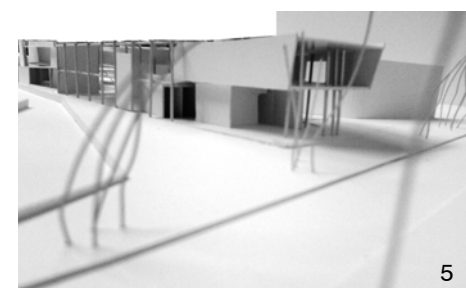
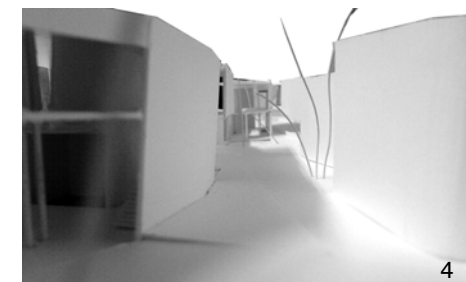
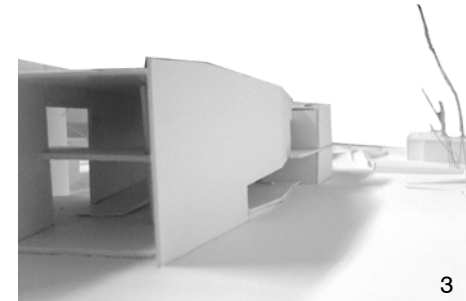
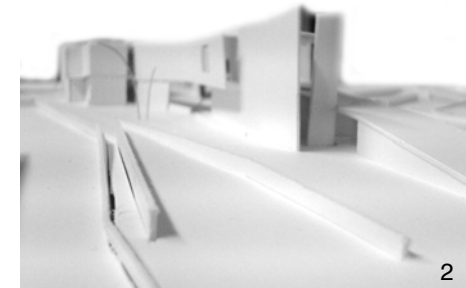
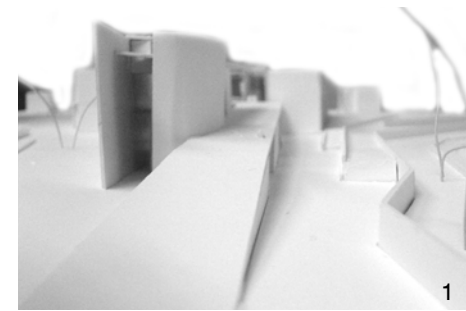


The approach toward the building from the Western edge of the site is interspersed by terraced landscaping along the Walkerspruit flood lines. A sculptural rough cast concrete wall marks the entrance to the community information centre [1] and provides shade in the warm afternoon sun. On entering the building, a double volume foyer hides the adjacent ramp structure. At the counter, books are exchanged as part of the inter-lending mobile library service and information regarding the centre's activities may be obtained from the admin staff. A curved face brick wall contains a bulletin board with on which Sunnyside events are displayed. Moving past the ablutions towards the glazed opening on the opposite axis, photostat and copying facilities mark the entrance of the reading room beneath the ramp. Here, newspapers, magazines and selected reference material may be accessed and used in the study area. A computer studio with internet access on the first floor is also used to offer night courses on computer literacy and provides views over the Walkerspruit through its glazed southern façade. The studio space opens onto a balcony which connects to the Exploratorium and to the roof terrace.

Glazed openings frame landmark elements within the landscape and provide passive surveillance over pedestrian movement routes [2]. The main community activity area is accessed by various routes and is located within a steel portal frame box which has been wrapped by lightly coloured polycarbonate sheeting [5]. The main hall is used by members of the community to perform various activities. This large double volume opens up to a multitude of balconies and stepped seating from which activities may be observed. A smaller activity hall is located on the first floor and is glazed along the street front so that activities therein may be observed by passers-by thereby encouraging involvement. Below this area, informal trade is promoted and public ablutions maintain the circulation of pedestrians. A workshop and rentable storage spaces are provided to enhance the services offered to the informal market.

A pedestrian movement route which runs between community areas and the Exploratorium, enhances the overall openness of the site [4]. A curved cast in situ concrete wall is perforated by horizontal strip glazing and marks the entrance into a centre for child development embodied within the Exploratorium [3]. The double volume entrance foyer leads into a ramped social and interactive play area in which increasing levels of motor development are encouraged through temporary design installations, such as tunnels and falling pads. A waiting area or gathering space is located next to a tuck shop which can be accessed by the public. This space is entered from one point only, to improve the security of the children within the Exploratorium. Accessed by the ramp, administration staff offices are located next to an ablution block on the first floor and can be blocked off by acoustic sliding panels. The play areas next to these spaces focus on intellectual development encouraged by activities such as puzzle building and fantasy play. Instruction areas follow on from this space and focus on specialised development such as linguistic or sensory development. These spaces are blocked off from each other by sliding acoustic panels which limit the amount of residual noise pollution from the open plan design. The Exploratorium is fully glazed on both its narrowest extremities, with smaller glazed openings located along the northern and southern façades to provide enough lighting while limiting the amount of sensory disturbance to more sensitive children.

The Exploratorium houses a secondary function: it is used as a traditional craft centre to teach older children and teenagers activities such as basket weaving, beadwork or batik. The first floor instruction areas will be used for these activities and during certain times of the year, the ground floor may be used as an exhibition gallery for crafts during which the temporary children's playscape may be removed and stored.



Children actively orchestrate their own development through playing, exploration, discovery, testing and imitating. [Moore: 45, 63] Intimate surroundings foster these activities, thereby improving academic and social learning. [Gallagher: 159]

The following general considerations were applied throughout the design and were derived from research:

- 1 The building promotes interactive behaviour through manipulation of space by providing moving walls or opportunities for hiding under stairs.
- 2 Multiple settings overlap to maintain continuity and variety: no space is limited to a single activity.
- 3 Spaces promote a sense of security by creating some private spaces within a communal space.
- 4 Socio-cultural diversity is catered for by limiting cultural imagery in the built environment [Weinstein & David: 3].

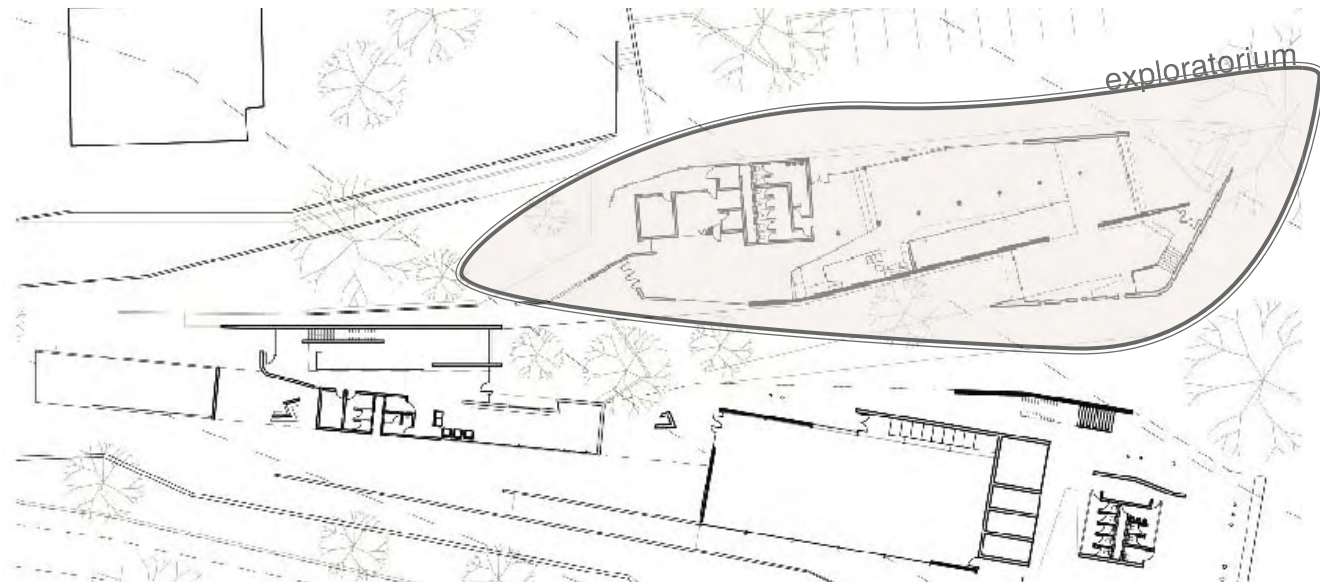
Physical settings are significant in the growth of children and affect how they derive meaning, purpose and structure from the environment. Children's experiences in educational facilities, both physical and social, form the basis of their socialisation [Wolfe & Rivlin: 90-92, 105-107]. Development away from the home nucleus represents a greater level of complexity in the variety of social roles and relationships offered. During this time, children develop their public persona and social skills [Weinstein & David: 31].

The following spatial considerations have influenced the design of the exploratorium:

- 1 Visual connection [open plan with moveable partitions to define closure of spaces]
- 2 Mixture of large open spaces and smaller enclosed spaces [appropriateness

of size and alternative uses]

- 3 Separation of adult areas from children's activity areas
 - 4 Spaces with a variety of options which cater for different levels of complexity in development
 - 5 Separation of circulation from activity areas [pathways lead to activity areas]
 - 6 Variety of storage, seating, work surfaces and display space available
 - 7 Softness of floors and play spaces
 - 8 Flexibility of spaces to accommodate alternative uses
 - 9 Complexity achieved by mono-functional spaces which are provided alongside multi-functional activities.
 - 10 High comfort levels concerning sun, shade, noise, dust, air, circulation and indoor/outdoor connectivity.
- adapted from [Moore: 60-61] and [Prescott: 75-78].



Illus. 66: The exploratorium on plan and 3D

Young children continuously experiment, feasting upon nuances of colour, light, sound, odour, and touch, unfettered by goals, times or expectations. Of the five senses, touch is said to be the most important, because it improves the child's perception of form and space [Olds: 117]. The spatial architecture of the exploratorium provides stimulation, information, movement, sound, volume, texture, various forms, colours, and rhythms.

An ideal environment for young children offers opportunities to learn by moving and stimulating the whole body. Bodily movement extends to the inner states of sensory awareness. The outdoors, with its wide variety of stimuli in natural elements is the ideal playscape for developing sensory awareness in children [Olds: 120]. It is for this reason that the landscape is emphasised in this design; through windows framing trees, or ramps which become buildings.

The floor allows children to roam freely, and challenges their balance and walking skills. This is achieved by using various changes in level such as ramps and steps which in themselves become part of a greater playscape.

Play areas support different functions, and foster any type of interaction desired by children. Since a low level of imagery is provided, these spaces allow for various types of dramatic play within the same area and can accommodate broader cultural variety of users [Olds:123-130].



_sense of place: all play environments are part of the greater architectural design. Spatial configurations, such as complex activities centred around a foyer, improve the sense of place and connectedness to other spaces.

_unified environment: open-plan design allows each activity to flow into the other, promoting smooth transitions during play. Major activities will centre on complex pieces which are temporary fixtures.

_variety of spaces: a variety of juxtaposed and contrasting spatial situations is necessary to support a rich possibilities for play. Adult supervision is integrated into the surroundings, for example by providing seating on the actual play forms within the environment.

_key places: are dominated by one major element which supports bodily movement such as a falling pad or a slide which promotes solitary play or group interaction. The spaces surrounding these elements consist of a complex juxtaposition of levels and pathways.

_systems of pathways: paths infer movement which is synonymous with play. Paths intersect so that various choices are available. Dead ends are avoided and temporary slides or tunnels can be incorporated into pathways, offering children a different perspective over the environment.

_three-dimensional juxtaposition of levels: offers a matrix of spaces, platforms, and pathways creating maximum potential for physical, verbal and visual interaction. Behaviours promoted in these spaces include hide and reveal, looping, overlooking and observing others from a position of safety, ground hogging and verbal communication between children.

_non-objective environments and loose, interlocking objects throughout the exploratorium provide no imageable or realistic representations and allow children to indulge in fantasy games.

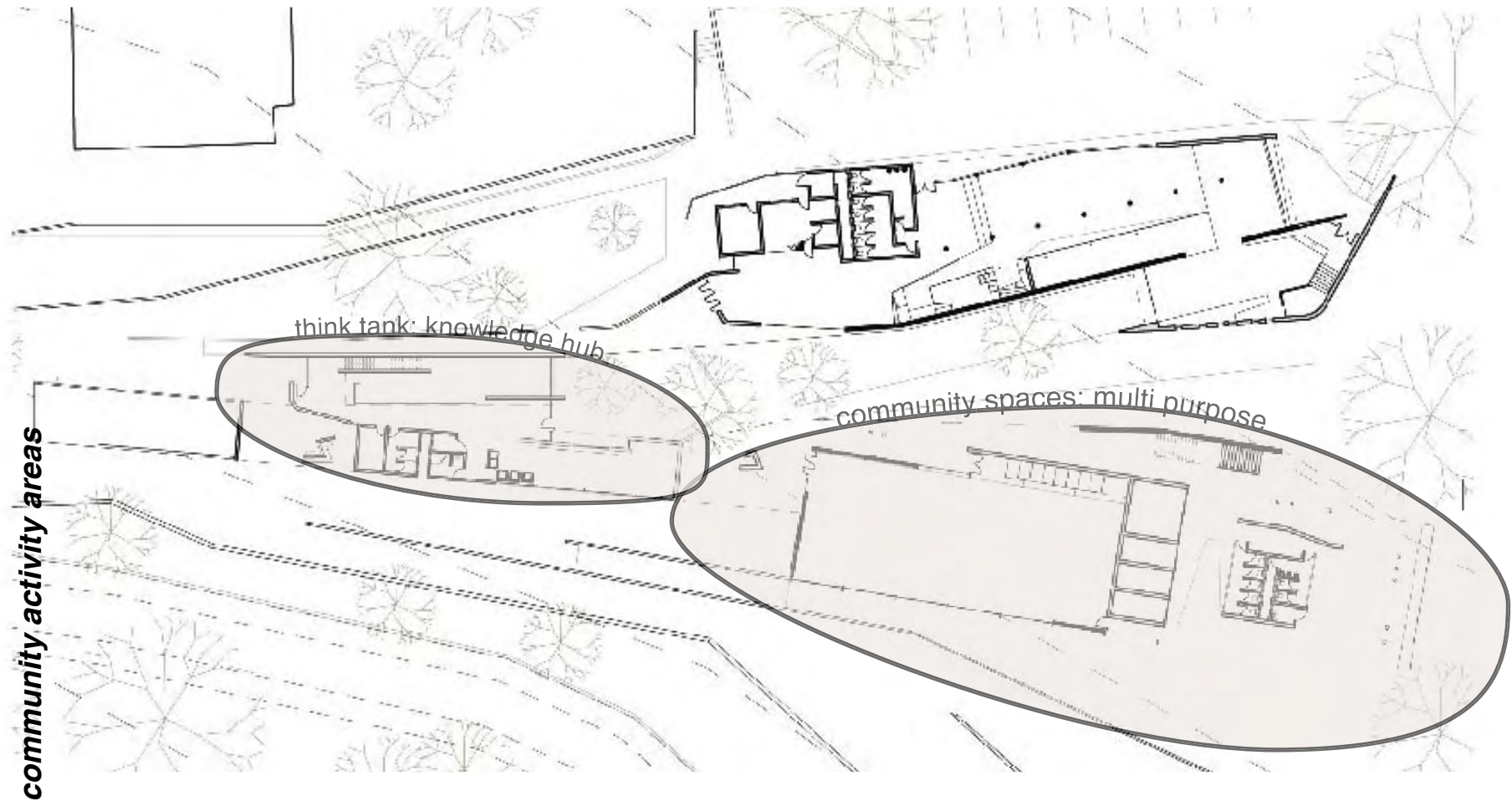
_variety of surface finishes such as concrete, timber, carpet, rubber, bricks, steel and plastic offer children a variety of tactile experiences on vertical, horizontal and inclined surfaces through which bodily contact can occur.

_Structural integration: play and sitting surfaces use floors, walls, ceilings and horizontal or vertical supports. Residual spaces, such as those under staircases, become private places within which children may retreat and release emotional anxieties such as fear, anger or frustration [Olds: 133].

_Functions are reflected by the material's used: tranquil spaces have warm, soft textures and expansive activities are located within cooler, harder, more vibrant-toned spaces [Olds: 136-137].



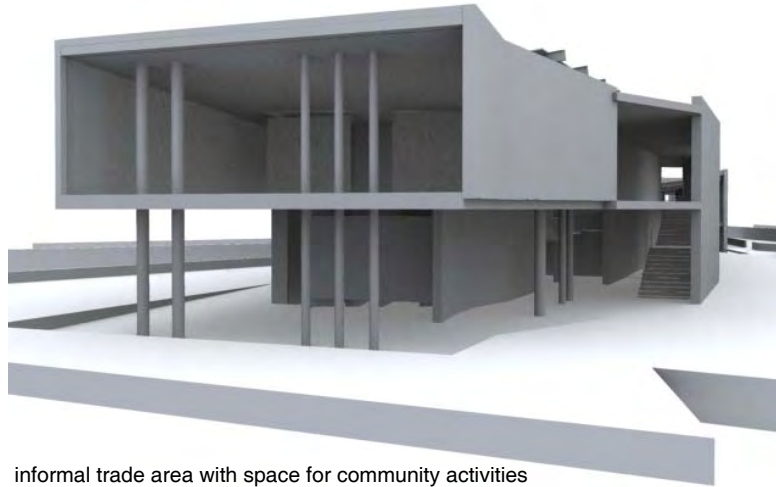
Illus67 : Environments which promote learning through pplaying [Digitally enhanced image]



As the southern edge of the area concerned is more public in nature than the northern edge, community spaces are located here. These spaces allow movement of individuals or informal trade. The exact use is entrusted to the interpretation of the community and therefore, these spaces are not

confined in nature like those of public squares. In Africa, the street edge is the place where most community interaction occurs, be it trade or simply movement. The design emphasises this fact by opening its more structural spaces to these areas, either physically, by using doors, or visually, through glazing.

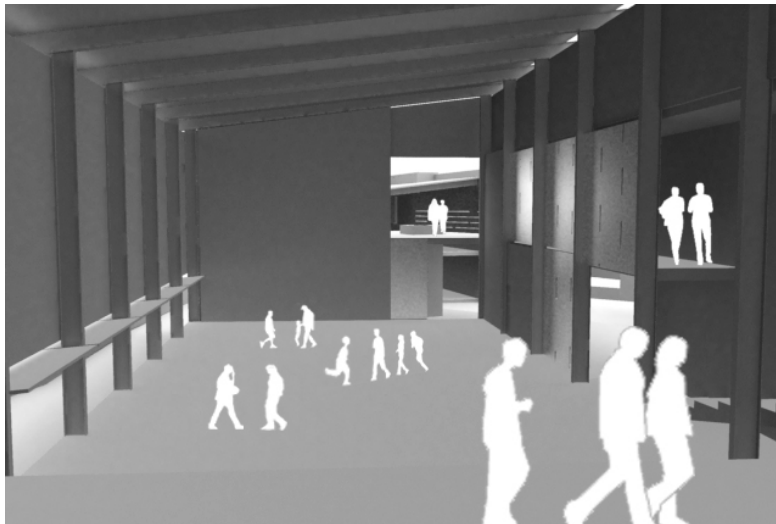
Illus. 68. Areas for indoor/outdoor community activities and sketches representing some spaces.



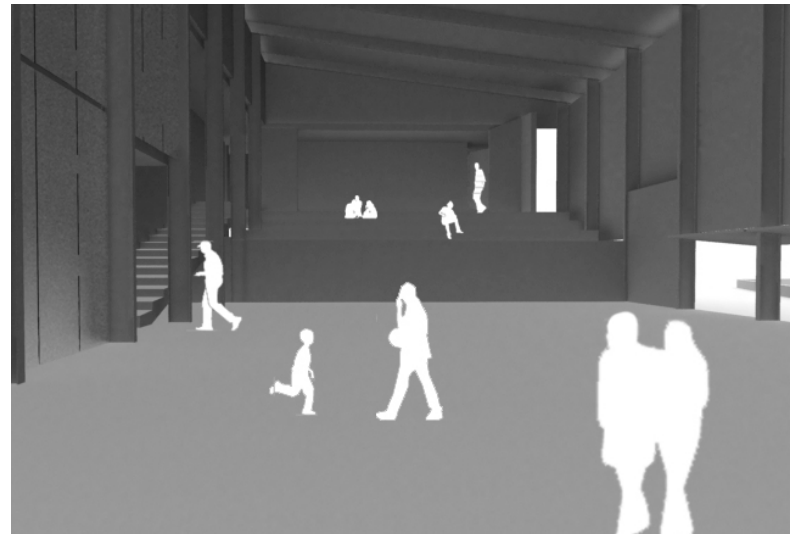
informal trade area with space for community activities



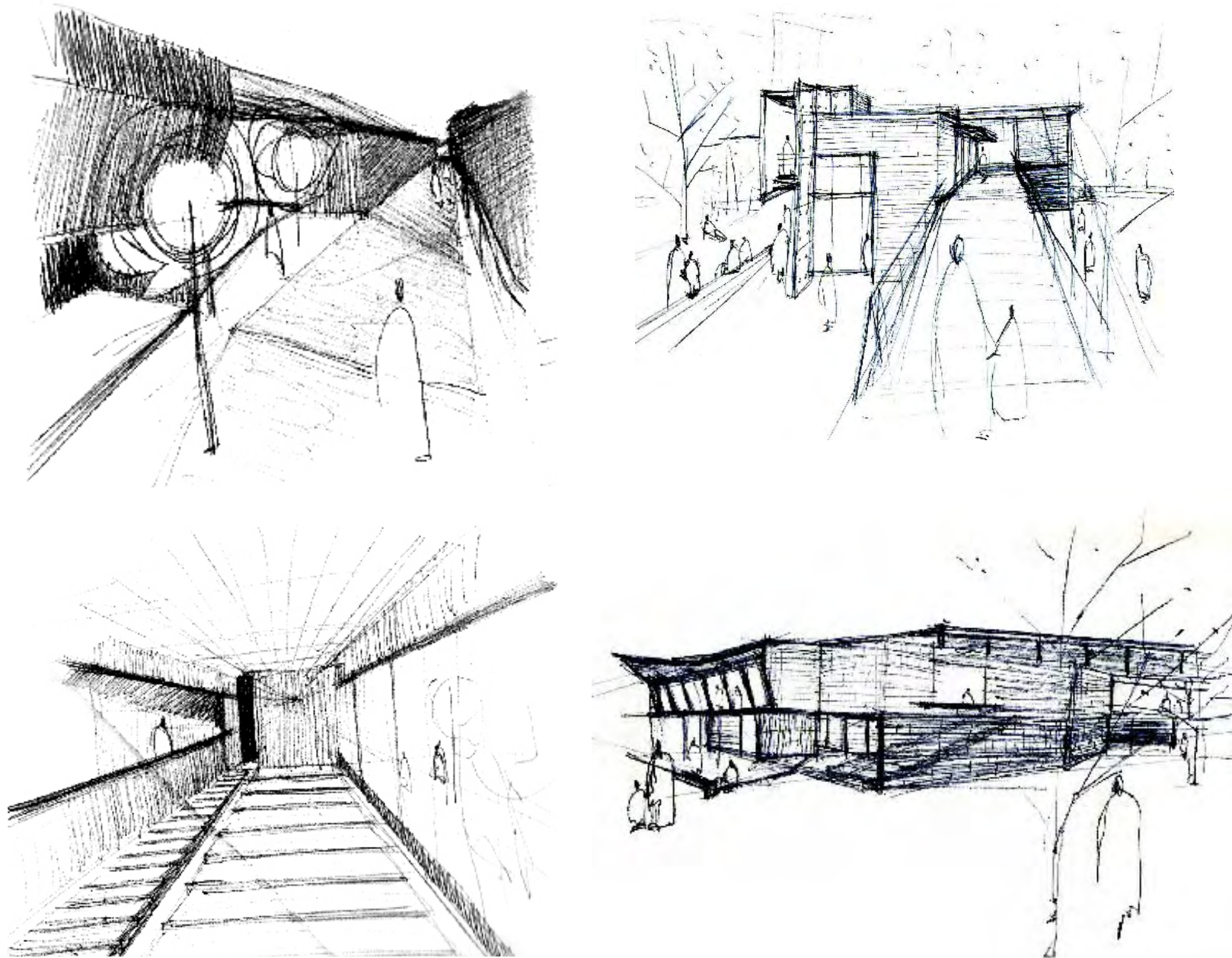
movement route



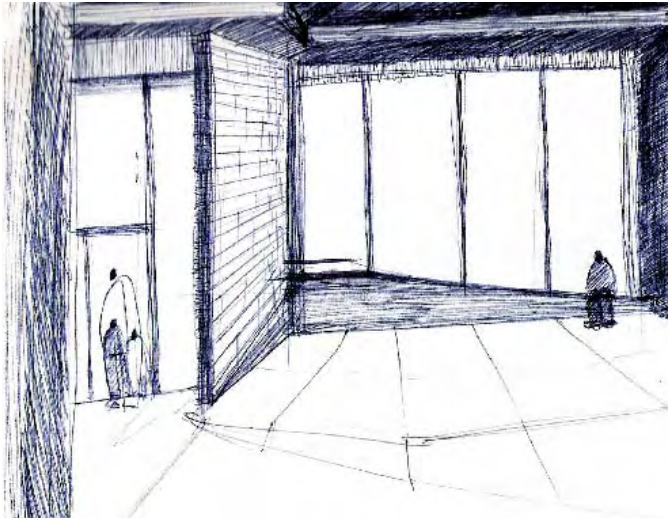
main activity hall



view towards stepped seating

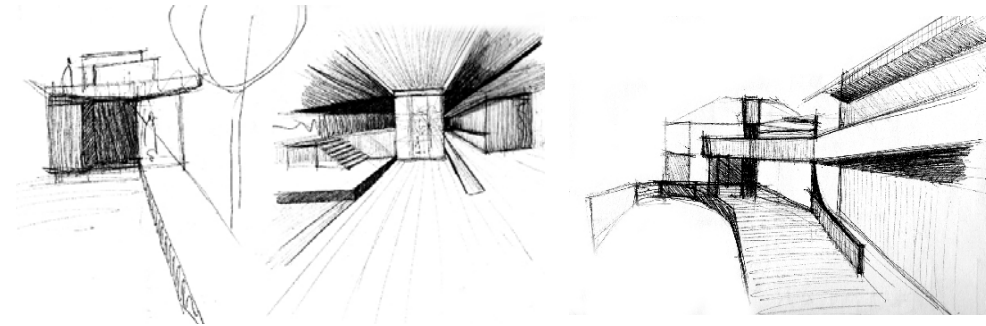
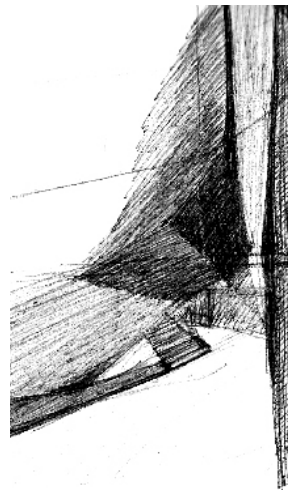
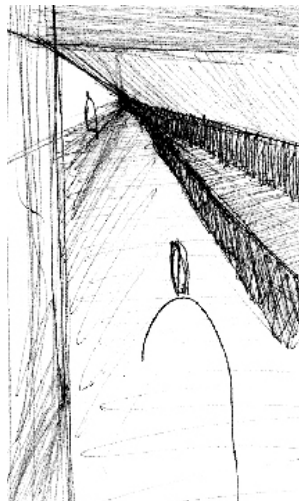


Illus. 69: Sketches representing some reprogrammable spaces.



The flexibility of the programme has resulted in an architectural solution which, from the beginning, emphasised the adaptability of the design to different uses. Within this logic, built environments are seen through a different perspective and the reinterpretation of space can be as literal as a ramp becoming a sprinting track. Interior spaces could be used for community meetings, workshops, political rallies or formal instruction, like martial arts or ballroom dancing.

Because of the location of the site within a community which is steadily evolving, it is assumed the community's needs will also evolve; therefore, as far as possible, spaces merge into one another and offer opportunities to be manipulated to house new functions, should the present ones no longer be required. This principle is apparent in the exploratorium design which has not been designed in miniature, but rather as an adaptable space. In essence, the building becomes a structural shell, permanent in its outer skin, but highly temporary in nature within.









technical investigation

structural composition

floors

glazing: curtain walls & doors

roof system

material palette

movement and safety

passive control systems

lighting requirements

noise and sound control

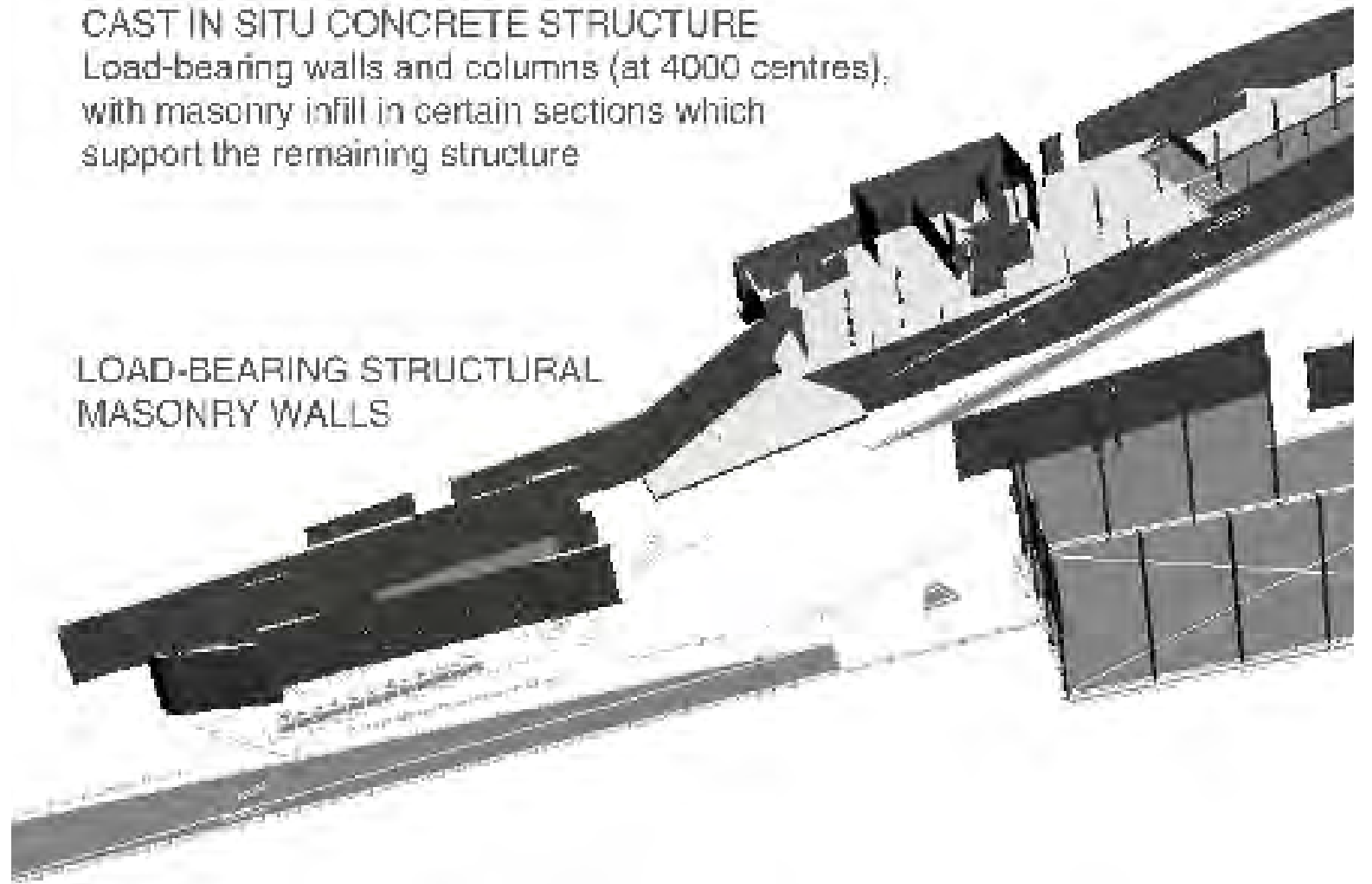
inclusive design

fire control

CAST IN SITU CONCRETE STRUCTURE

Load-bearing walls and columns (at 4000 centres),
with masonry infill in certain sections which
support the remaining structure

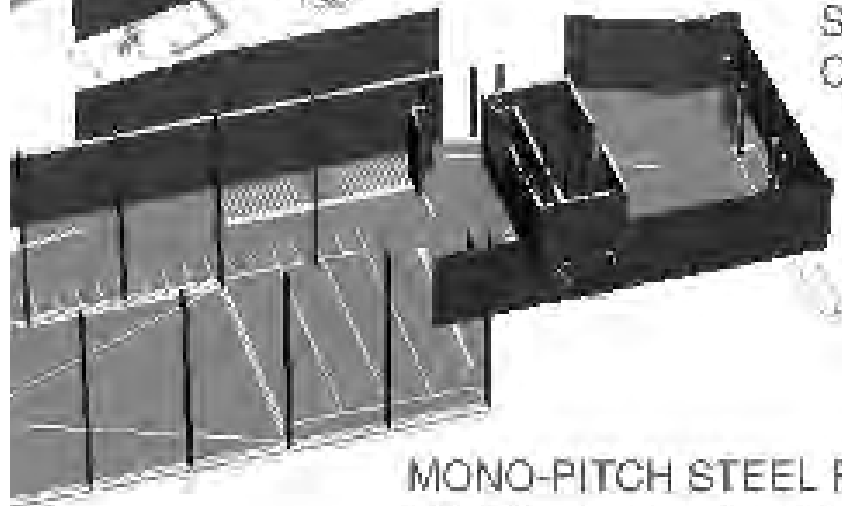
LOAD-BEARING STRUCTURAL MASONRY WALLS



Illus. 71 : 3D diagramme of the structural composition of elements



CAST IN SITU CONCRETE SLAB



STRUCTURAL STEEL COLUMNS FILLED WITH CONCRETE, WITH BEAM OVERHEAD

MONO-PITCH STEEL PORTAL FRAME
I-Profile structural steel columns (at 4500 centres)
and rafters with beams and cross bracing

NOTE: THE STRUCTURAL SYSTEM IS REPEATED ON FIRST FLOOR LEVEL AND EXTENDS TO THE ROOF



01



02



03



04



05



06



07

External landscape paving consists of different materials, each marking a movement route within the landscape and around the building. The edges of the site are emphasised by 30 x 3000 concrete blocks which alternate with the adjacent materials to provide a gradual transition over site thresholds. Main movement routes are covered with a 5 mm stone aggregate bound by a macadamised asphalt base [03]. Surfaces are pigmented in certain areas to demarcate certain spaces. Surrounding movement routes consist of fine-aggregate cast in situ concrete blocks of 1000 x 3000 mm. These blocks will be cast with patterns in certain areas which mark activity zones [02]. Parking and service areas are covered with concrete paving blocks and gravel [01]. The main ramp has an off-shutter finish, but mosaic tiles and small pieces of glass will be cast onto the surface to reflect light at certain times of the day [04].

Ground-level concrete floors are finished in one of three ways. Since all areas on the ground floor will experience very heavy traffic and may suffer potential damage in their lifetime, finishes have to be robust. Concrete surface beds within the exploratorium wing are finished with a mechanical floor grinder after most of the construction work has been completed. The finished surface is given a smooth polished look and the aggregate used in the concrete mix is slightly exposed after 2 mm of the surface has been removed. In large surface areas where cracking can occur, the concrete is cast in one session and movement joints are later cut into the

surface using a grinder [07]. In play areas, smooth rubber tiles are placed over the floor to prevent injury and to provide shock absorption [05].

In the information node, the concrete surface bed is finished with a layer of epoxy resin. All other ground-level concrete surface beds, which form part of the community activity areas, receive a concrete screed which is delay-trowelled, power-floated, and polyurethane sealed. In the informal trade areas, white mosaic tiles are inlaid into the concrete screed, presenting a uniform surface. The ground floor finishes should read as a continuous surface where different materials read more like textures and tones of the same surface rather than separate entities.

The post-tensioned slabs on the first floors are left in their off-shutter state in some areas and in others, are finished with timber laminate or parquet floor boards over the concrete slab [06]. Ablutions are finished with tiles as indicated, and service areas retain their off-shutter.

External walkways consist of a metal grid and a marine grade timber surface resting on structural steel round hollow sections. Views through the floor pane in a vertical direction challenge the perception that floors should be solid. Saligna, is also used in vertical circulation routes, and promotes the idea of a temporary versus a permanent structure or hard versus soft finishes.

Most glazing is fixed to the building structure by aluminium frames. The life span benefits of using aluminium in the building outweigh the initial costs; the recycling potential of aluminium members and their clean finish will ensure the consistent appearance of the building façade. Areas with fixed programmes such as the information node and exploratorium will use aluminium-framed glazing sections, where other areas with more open ended programmes within the public domain will use structural steel members.

Because of the public nature of the building and the potential for spontaneous, informal activities derived from community participation, glass panes used are mostly 9 mm laminated safety glass. Panel sizes do not exceed 6 m². All glass panels, which might not be obvious in their position and which may cause injury will be marked appropriately.

The curtain wall below the main ramp has a clean finish achieved by using fins and fixing the glass to the bottom of the ramp using the appropriate structural members. These will enhance the appearance of the ramp growing out of the ground unsupported.

Glazing is used in the design with the purpose of linking the exterior and interior spaces, to expose part of the structure, and to create illusions as to how the building works. It is for these reasons that most external doors are glazed. Most glazed areas are on the southern edges of the building to maximise natural light and to limit heat gain. Where glazing has been used on the eastern and western edges, overheating has been controlled by using walls, overhangs or vegetation to block the amount of direct sunlight entering the building. The ends of each wing terminate in glazed surfaces, indicating that a transition into a new space is about to occur.

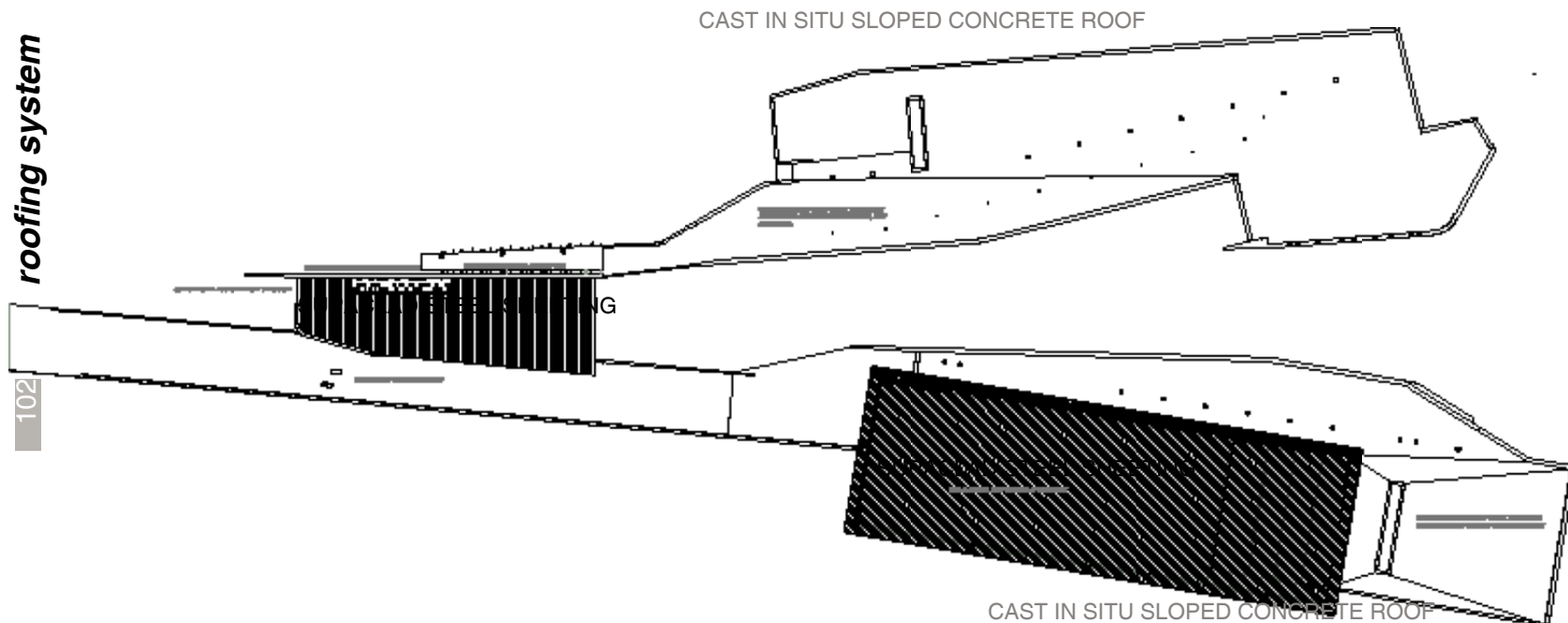
Cast in situ concrete roofs have been used for the exploratorium wing as well as the area surrounding the steel portal frame on the southern wing. Both concrete roofs are partially sloped to continue the theme of challenging perceptions of what architectural materials should do. In this case the concrete roofs appear light and slope at an angle resembling lightweight roofs. The concrete appears to emerge out of the natural landscape following the lines established by the main outdoor ramp. It provides stability to the architectural form.

Lightweight roofing materials are used over areas accommodating community activities and act as more traditional roofing solutions. The lightweight structure gives the impression of being an impermanent intrusion into the

environment, capable of being removed should the community outgrow the need for these facilities.

The lightweight sheeting material used is Supaclad, a patent material which allows for the minimum slope of 3 degrees. Supaclad has a cover width of 890 mm and is connected to purlins at 1,8 m intervals. Thermal insulation is achieved by using bubble foil D10 insulation with aluminium foil on either side laid between the purlins and roof sheeting. It provides insulation of 1.71 m² K/W including air gaps.

The sloped concrete roof slabs will have a layer of waterproofing placed directly over the slabs. Areas which are flat will consist of waterproofing laid over a 1:70 gradient screed.



Illus. 73: The diagramme indicates the areas over which sheet metal or concrete placed.

The building, explodes itself into the site, forming an architectural extension of the natural landscape. Most movement in the area occurs in a north-south direction along Bourke and Leyds Streets, but a high number of people also use the site as a shortcut or prefer to walk along its shaded green areas rather than along the roads.

The openness of the site is continued in the design by allowing the open spaces between the built forms to be used as pedestrian movement routes. The choice to create a movement route rather than a square or piazza follows from the desire to create an area rich in opportunities for accidental meetings and spontaneous activities. In Tshwane, most activity takes place informally along building edges and street fronts. Most open

public squares are not utilised to the same extent as sidewalks are. These factors influenced the design of movement routes versus courtyards in the proposed building.

The spaces concerned will, however have to provide adequate safety, so apart from being properly lit at night, they will also be observed through passive surveillance during the day. Where buildings have views onto these spaces, a relative degree of control is established. Also, informal trade activity is encouraged to occur within outside spaces so that users can monitor them, for example in areas around the public ablutions. The openness of the design on plan is extended into the vertical plane by creating openings which promote views into and out of the building.



Illus. 74: Arrows indicate main movement axis

timber

As used in the design, timber represents the warm, more natural type of building materials. Within the structure of the building, timber is used in vertical circulation areas and on floors. It has also been used to clad various doors and partitions to improve the acoustic quality of spaces and to soften the interiors.

Apart from being a “warm” material, timber also acts as a reminder of the vegetation of the site, and brings these qualities into the interiors. Wood has a quality of impermanence which within the design creates a strong contrast materials such as concrete and masonry. The implication of using timber in the design is that, should the need of individuals change over time, part of the design can too.



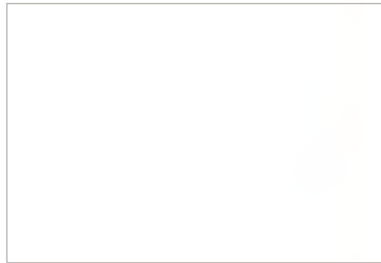
concrete

Concrete is used for the basic permanent structure of the building and consists of concrete columns with masonry infill and load bearing walls. Floors and roofs consist of concrete slabs, as mentioned previously. Although concrete can be perceived to be a heavy, cold material, this view is challenged by making it appear to be plastic and lightweight in ramp and staircase designs or by giving it a warm appearance by using different off-shutter methods. These methods include horizontal timber panels, vertical rough timber panels and smooth steel panels. In some areas the scaffolding marks will remain exposed, where in others, they will be filled in.

Pigments used in the concrete work are mainly applied to ensure that the colour remains consistent despite the aggregate used. Two neutral hues are used in the design, namely, off white and light grey. These hues have been chosen to ensure that the interior spaces seem light and airy. This is enhanced by the application of a light-transmitting concrete wall in a section of the exploratorium.

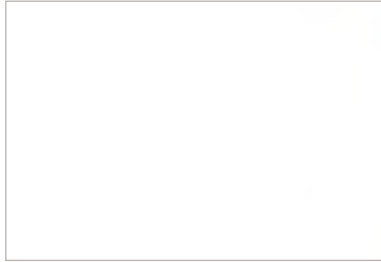


Illus. 75 Examples of timber and concrete to be used in the building design
Illus.76 on facing page: more material examples to be sourced for the design



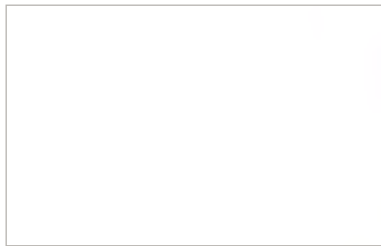
masonry

Brickwork is used as a reminder of conventional building materials and to provide an alternative texture and colour to the design. Being a durable material, it also provides suitable weather resistance and load-bearing support. Facebrick masonry work requires little maintenance and can be laid by labourers less skilled than those who do concrete work.



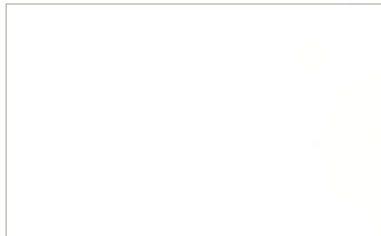
steel

Steel is used throughout the proposed design as a lightweight and seemingly temporary intervention in the concrete structure. In certain finishes, perforated cor-ten and stainless steel is used to emphasise this lightweight quality. While the concrete work in the proposed building is used in such a way that it challenges perceptions of its usual functions, the steel work is conventional and straightforward. It provides an appropriate contrast to the other materials used and can be erected very quickly. Should the lifetime of the building expire in the future, then the steel members can be removed and recycled elsewhere.



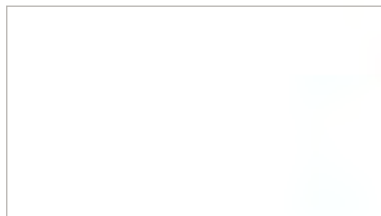
mosaic, ceramics and acrylic sheets

Mosaics and ceramic tiles are used in certain parts of the design to introduce colour and texture. As discussed, mosaics are embedded in a few concrete surface beds. Ceramic tiles have been attached to some concrete walls of the exploratorium. Whenever they are applied, they are placed individually and not laid as an entire surface. Acrylic sheets are used to transmit coloured light to interiors and to provide colour diversity.



natural site vegetation

The existing trees on site are seen as part of the design, in that the structure of the building is orientated in such a way that the existing trees are maintained and optimised in the design. As elements they are incorporated into the design by being framed as views out of the building. The feeling inside the building is that of a voyeur who is experiencing interior and exterior space from a different perspective as physical boundaries begin to blur and disappear.



massing

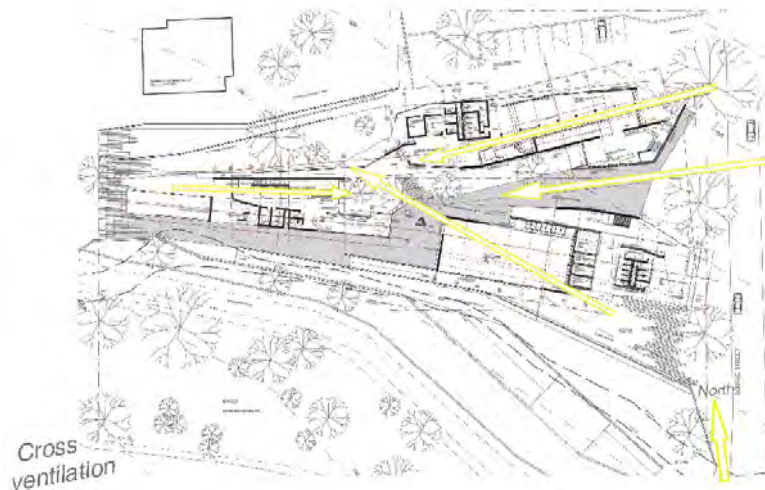
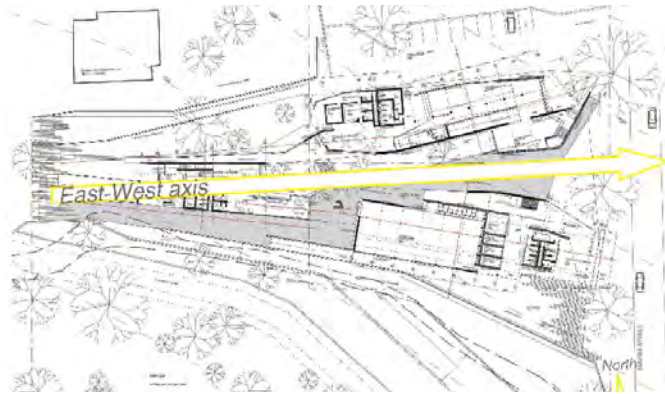
The thermal mass required is achieved by concrete work absorbing direct solar radiation during the day, and releasing the accumulated heat into the interior spaces after a certain time delay. This delay is determined by the density and thickness of the absorbent surface. A slab depth of between 230 to 500 mm is usually sufficient to produce an adequate time delay so that day and night temperatures even out.

orientation

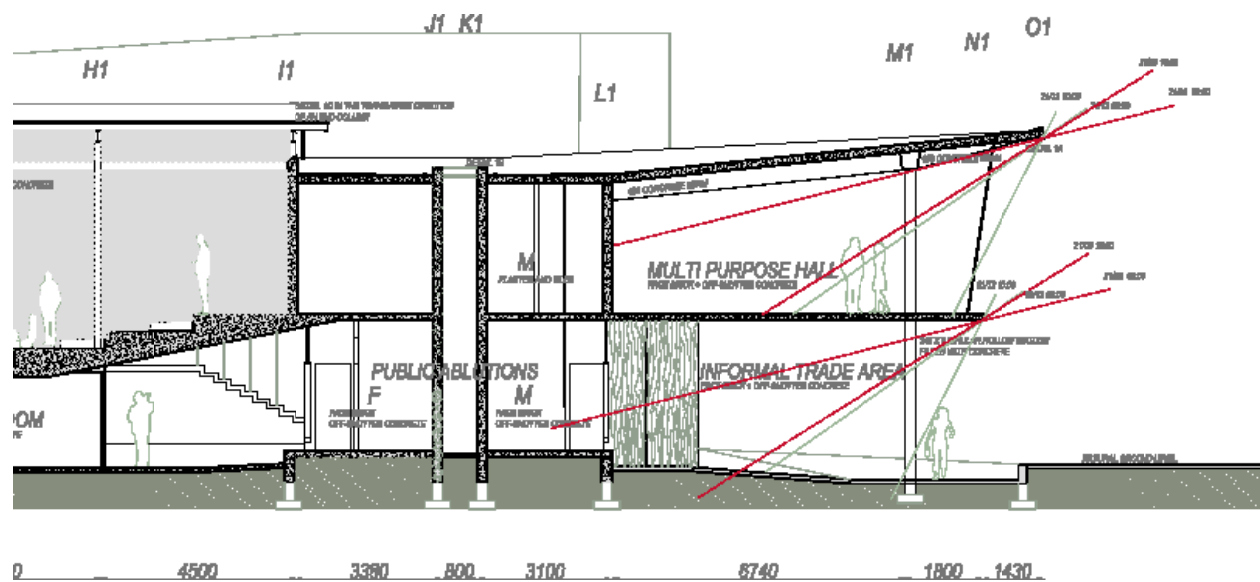
The site runs along an east-west axis, which enabled proper north orientation of most of the building. Façades facing east or west are limited in size and where they are glazed, they are screened from direct sunlight. The building is divided into three sections; by pulling these apart, the spaces within sections are exposed more effectively to the benefits of passive systems. Also, as a result, various micro-climates, such as evaporative cooling in the terraced flooding plain or shading and cooling from existing trees, develop between the built forms.

ventilation

The building dimensions allow it to rely entirely on passive control systems. The prevailing summer wind direction is from the north-east. The glazed openings in the end points of the building open up and thereby promote cross ventilation. Since cross ventilation can only occur when there is enough difference in temperature between indoor and outdoor areas, the building increases its exterior skins by layering the east, north and west elevations, thereby protecting the interior core of the building from direct heat gain from the hot afternoon sun. The design responds to the predominant winter winds by extending exterior walls out into the landscape forming wind screens during winter months. Furthermore, the curved building façade channels wind into the interior spaces and the residual movement routes formed by the building footprint.



Illus. 77: Passive control systems of orientation and cross-ventilation



Illus. 78: The effects of solar angles on part of the design facing east

During the day, indoor activities are to be naturally lit, as far as possible. Direct light into the interior cavity space is not recommended as it often causes glare and increases the internal air temperature considerably. It is for this reason that the building employs a layered façade, such as in the area adjacent to the activity hall. The concrete walkway in this case acts not only as a thermal protector, but provides an overhang so that the natural light filtering into the space may be diffused.

The following lighting requirements have been established and the building façades have been designed in response to these:

Ablutions: 50 lux

Kitchens: 100 lux

Reading areas: 150-200 lux

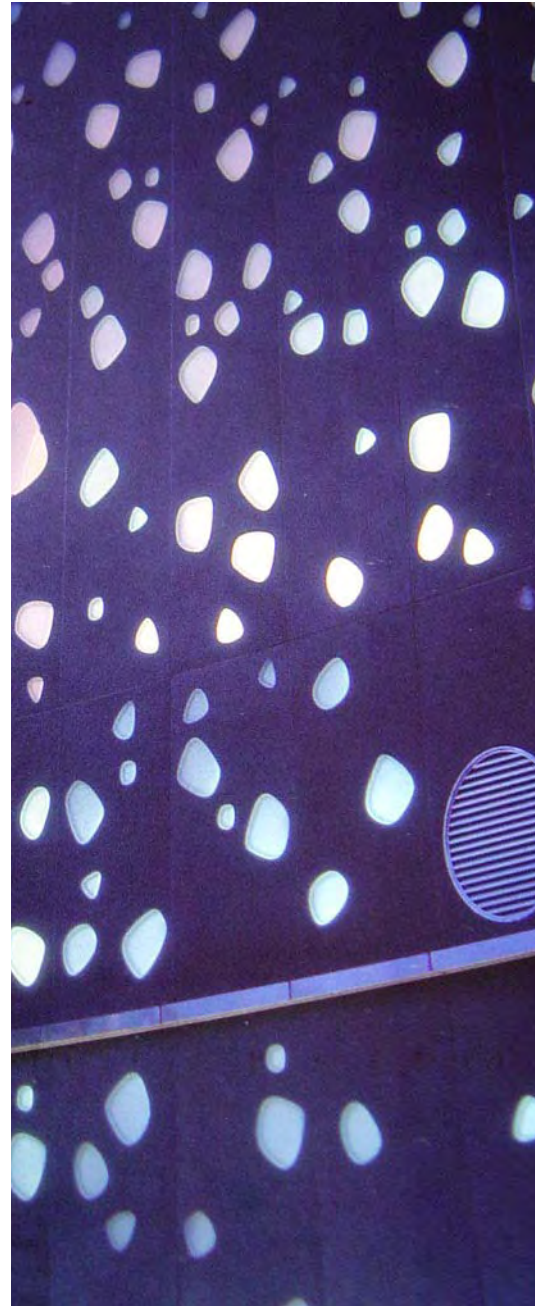
Offices, computer areas and writing areas: 200 lux

Drawing and craft work: 300 lux

Class, lecture or instruction rooms: 70 lux

Workshops: 500 lux

The exploratorium requires diffused lighting so that its areas are lit under controlled conditions. This will also allow for the area to be used as a craft exhibition space when necessary. The workshops, store rooms and the main activity hall open up on ground floor to allow for maximum daylight to penetrate the interior spaces. The top half of the southern façade of the main hall is clad with polycarbonate sheeting and continues around the uppermost part of the remaining facades, thereby increasing the amount of illumination within this space. Where direct sunlight is not desired, such as that on the main eastern and western elevations, a variety of screens provide options for its control.



Illus. 79: the quality of light as a building material.

light as a building element

Light plays a major factor in man-made environments. It has an influence on man's psychological reactions and physiological well-being [Gallagher: 75]. Lighting transports architecture beyond its physical attributes. Beyond form, it merges with other qualitative aspects of architecture: sound, texture, colour and movement. These aspects are especially relevant to the design of the exploratorium which promotes psychological development. Therefore, this wing has been design to provide a contrast between well lit and medium lit areas to emphasise the importance of light on interiors. Spaces where countless possibilities for the perception and representation of architectural form emerge from lighting techniques. Space becomes animated through the exploitation of light, thereby altering perceptions. Shadows may emphasize certain elements or may be obliterated to provide abundant light that it envelops everything.

Light traces the cyclic passage of time. Seconds, hours, days, months, seasons and years recur infinitely, whereas the time we spend in certain buildings and spaces is limited. We are reminded of the short and rapid lives we lead compared to the endless progression of universal time. The diurnal lighting effects on the building are emphasised by the placement of glazed openings, and the interaction of the building with view over the site.

Light as a powerful building element, explodes architecture into its metaphysical dimension. It plays with illusion and perception by creating a unique and qualitative experience of space. Artificial lighting, however is known to have negative physical and psychological effects on people. Natural lighting is not only a sustainable option, but is furthermore of great importance to the well-being of the users of a building.

colour_ a frequency of light

Colour in the built environment emphasises the importance of spaces. Colour is created by light and is therefore a form of energy, which affects body function just as it influences the mind and emotions. Therefore man's response to colour is complete; both psychological and physiological. [Mahnke: ix, 1]

Cultural associations affect colour perception. For example, the notion that children prefer primary colours has been disproved. When offered a wider spectrum of colours, children select a sophisticated and balanced colour palette. [Fehrman: 29, 117] Colour is introduced into the building design through finishes, from coloured roof lights to mosaic and ceramic tiles placed on surfaces. People are conscious of colour and texture variations

in built environments. Studies point out that the presence of colour on exteriors gives rise to positive reactions, while the absence of colour is generally negative [Mahnke: 62]. Therefore, the design has a varied material palette whose inherent properties provide colour and textural variations.

The proposed design tries to avoid monochromatic environments, which may be vandalised, perhaps as a result of displeasure or lack of stimulation. High-density developments with no playgrounds, little vegetation and cramped, small spaces reflect an impersonality and disregard for human emotions which is recorded in the minds of children. The environment therefore plays an important role in an individual's orientation and interaction with society [Mahnke: 64].

The site is in a residential area with low levels of noise pollution occurring from traffic or industry. Peak hour pedestrian traffic and a neighbouring crèche will produce higher levels of noise during certain times of the day, but these are low enough to be controlled by the mass of the building structure and materials. Activities have been located so that those producing more noise are placed closer to each other, while quiet environments may enjoy more private spaces. Music and sounds escaping from the main communal activity areas are allowed to filter into the surrounding areas so that people may be able to hear what is happening inside the building and therefore may be drawn to discover more. Because the building is separated into different areas, this improves the overall sound insulation to prevent noise pollution between different areas.

Acoustic solutions for large areas consist of movable screens and roof insulating materials which are added to the structure in areas such as the main activity hall and the exploratorium. Because in theory, any type of activity can occur within these spaces provision has been made for the building to adapt to changes.

Because of the public nature of the building on ground floor level and because of the open communal nature of the spaces created, the building offers design strategies to cater for people with disabilities.

People with movement-related disabilities, have the option of using one of the multiple ramps located in and around the building. The maximum gradient for any ramp used in the design is 1:12, but ramps range from 1:12 to 1:40 gradients. With gradients such as these the ease of movement between spaces is encouraged. However, for people such as the elderly who suffer from arthritis and similar conditions, there are also various staircases with generously dimensioned risers and treads and also the necessary balustrades.

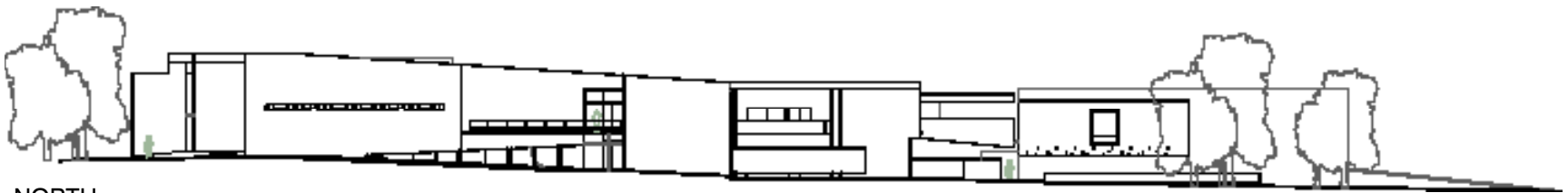
Colour is used in certain areas to accentuate aspects of the design and its functions and to provide clues to individuals with partial sight impairments as to the different spaces of the building. In areas which will house individuals with sensory sensitivities to colour, sounds, smell and even touch, the difference in materials and other interventions will be subtle to create gradual changes between different surfaces, while still maintaining their rich diversity and complexity.

The public and communal nature of the building calls for a high degree of safety in the event of fire. The specifications set by the NBR TT have been followed. Communal areas require a 120 minute fire resistance rating and offices need 60 minutes. Therefore, the concrete work will satisfy this rating, and as previously discussed, the steel members will be coated and thickened to accommodate the safety requirements.

Because the building is spread across the site, the actual design areas and dimensions allow for a higher degree of control over the spaces. An escape route is located every 45 m on straight movement routes and where a change of direction occurs, this distance will not be more than 15 m. Escape routes are clearly indicated and in most cases, because in essence the building only rises two storeys, most escape routes exit onto the ground floor.

All structural steel components will be coated with a thin-film mastic intumescent coating which will provide the adequate protection in the event of fire. The steel members in the design are mostly located on the ground floor, which ensures that appropriate escape routes are available within the required time limits. Further design measures include increasing the size of structural members to improve their fire resistance. Concrete work has a high fire resistance and does not require further treatment.

112



NORTH

product drawings



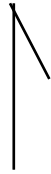
site plan
ground floor
first floor
section 1-1
section 2-2
section 3-3
section 4-4
elevations
details
3D model

114
site plan
scale 1:1000
NORTH

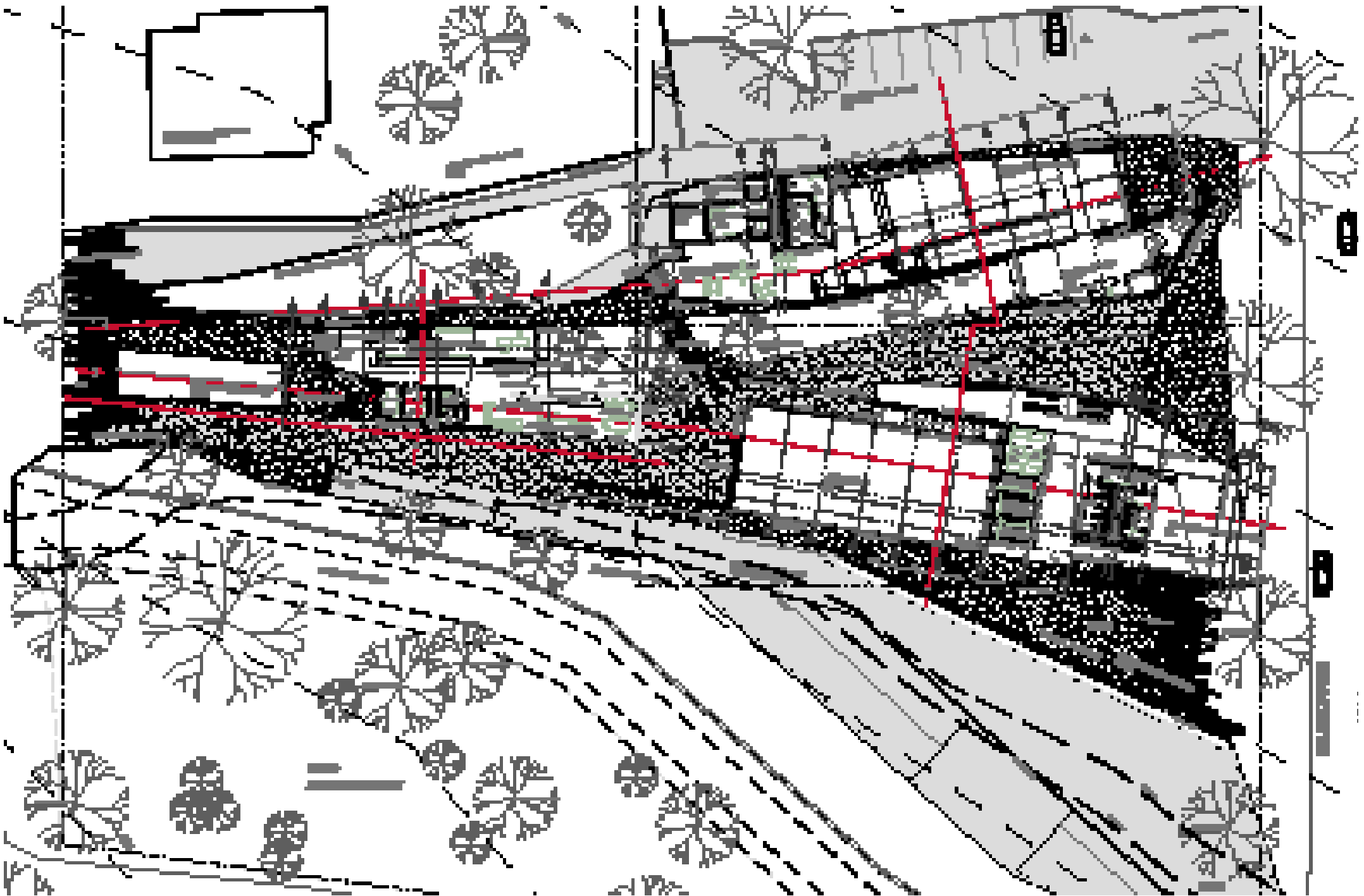



116

NORTH



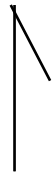
ground floor plan
scale 1:500

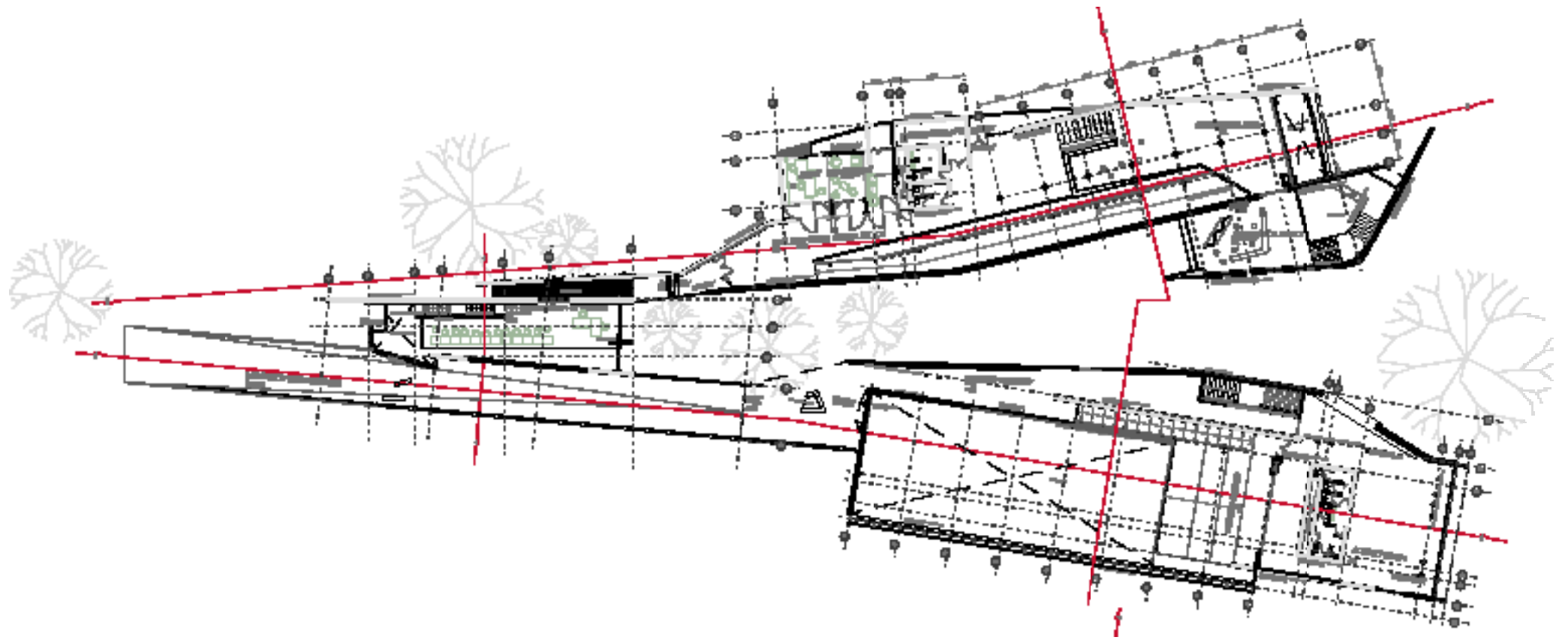


118

first floor plan
scale 1:500

NORTH

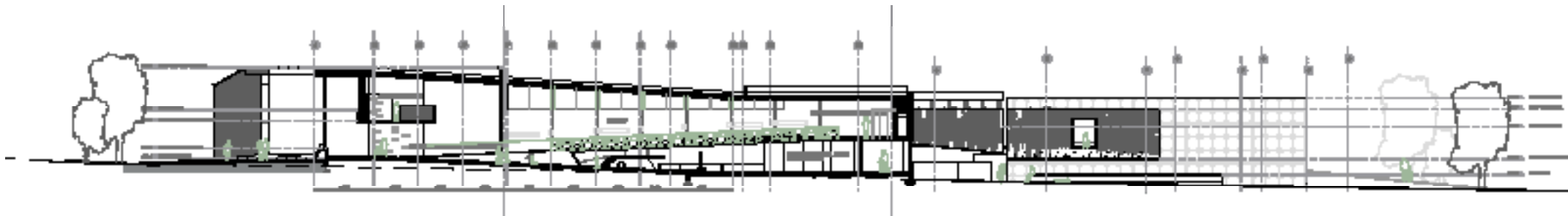




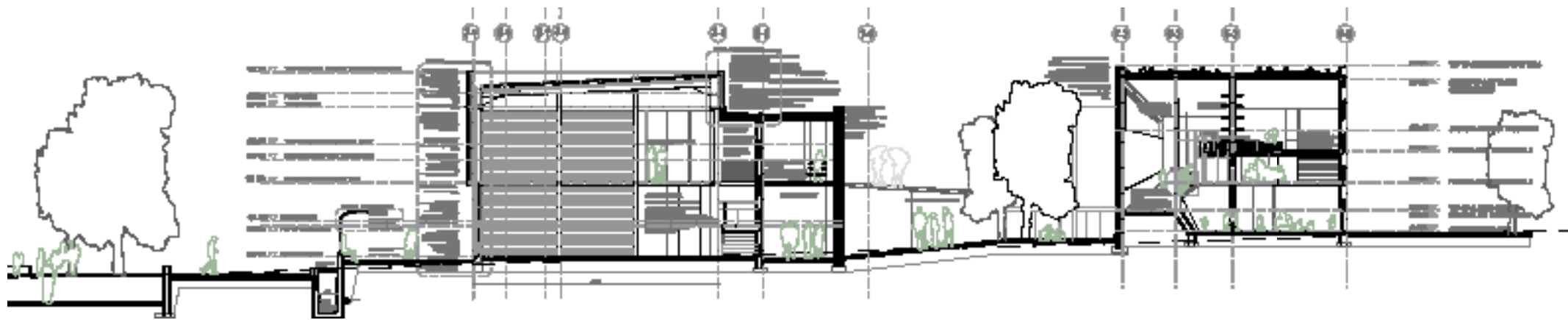
section 1-1
scale 1:200



***section 2-2 and section 3-3
scale 1:500***

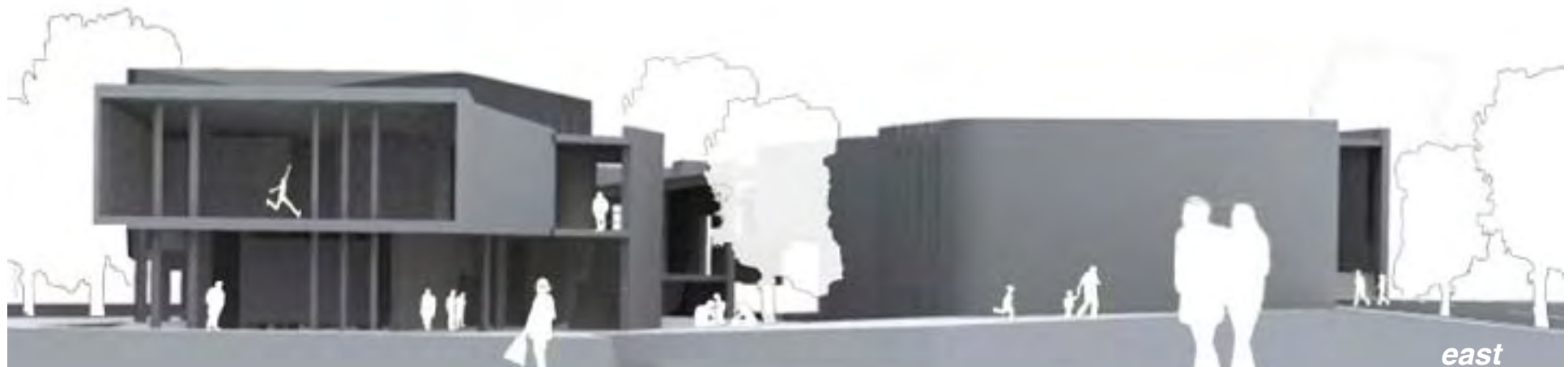


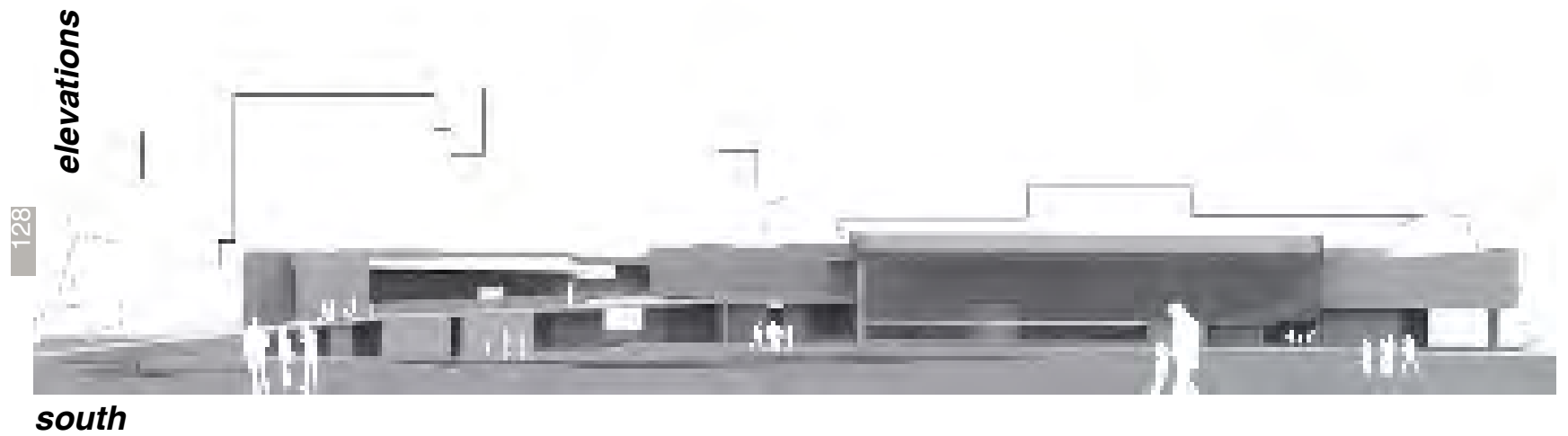
section 4-4
scale 1:300



elevations



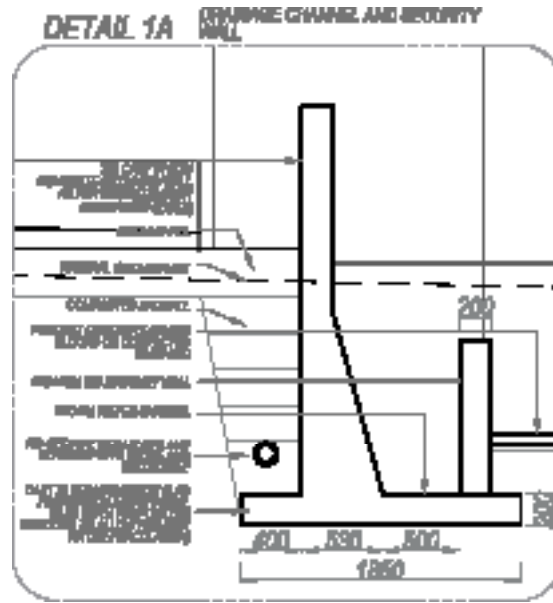




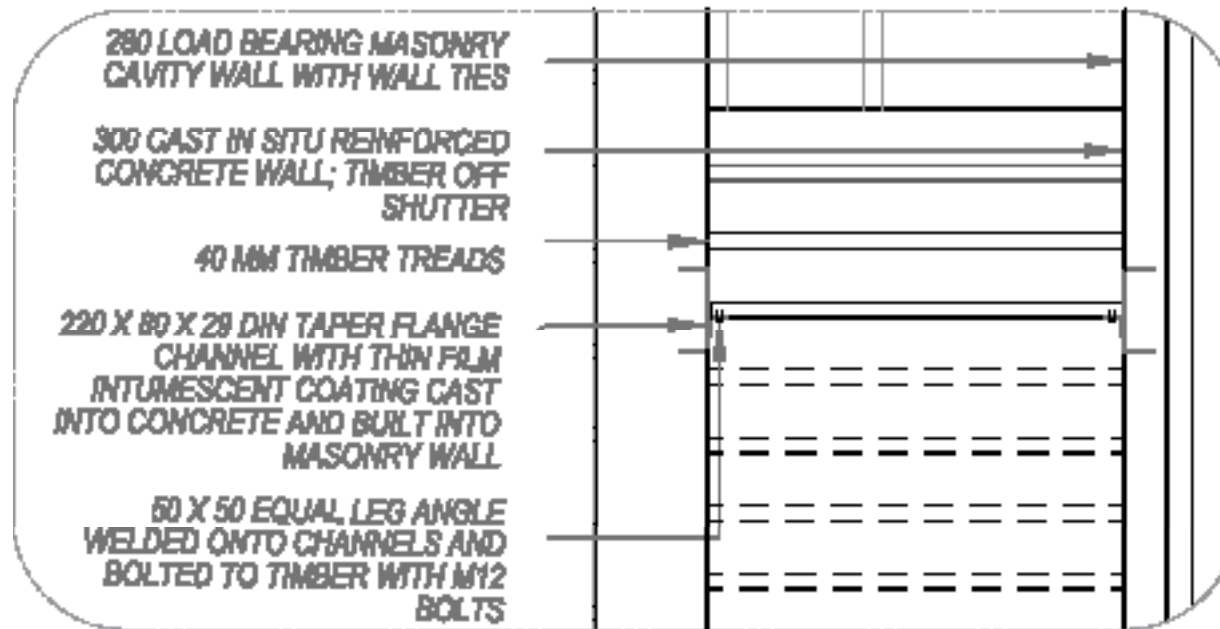


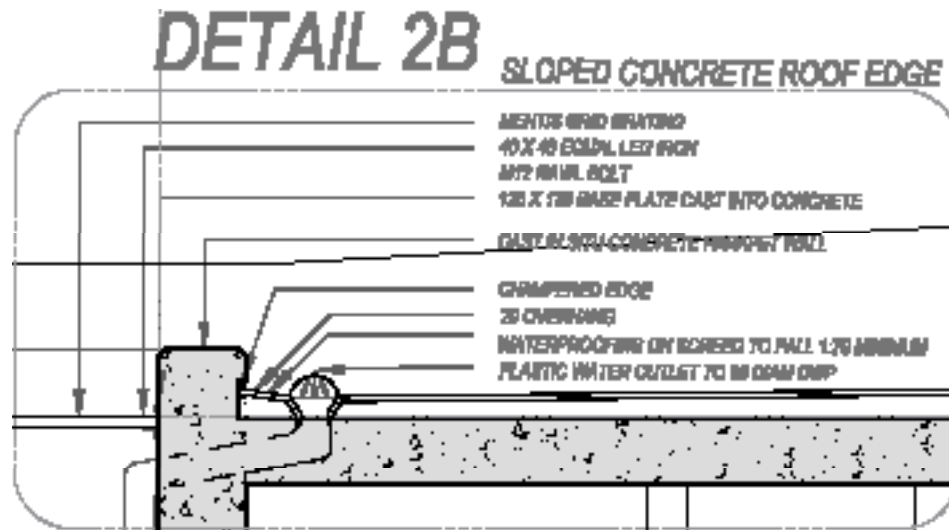
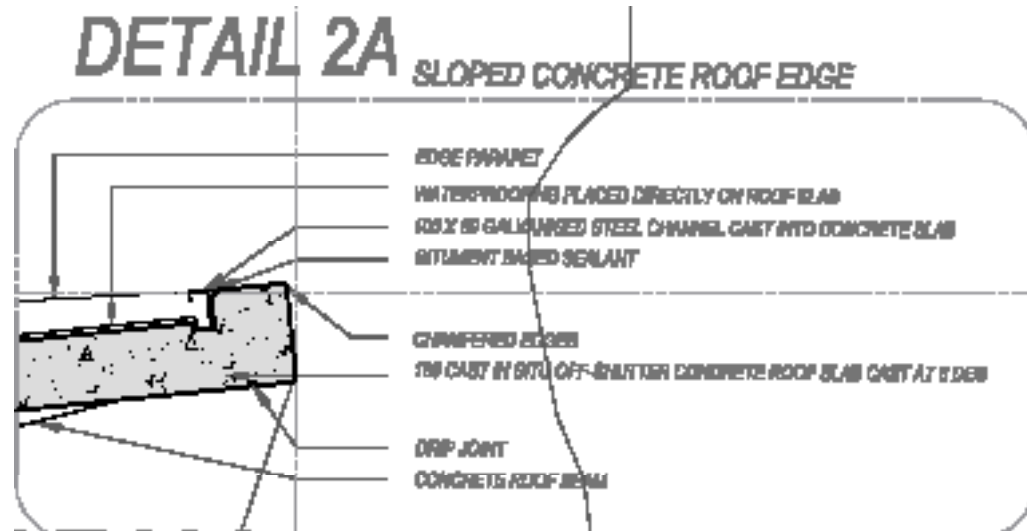
north

details
scale 1:50

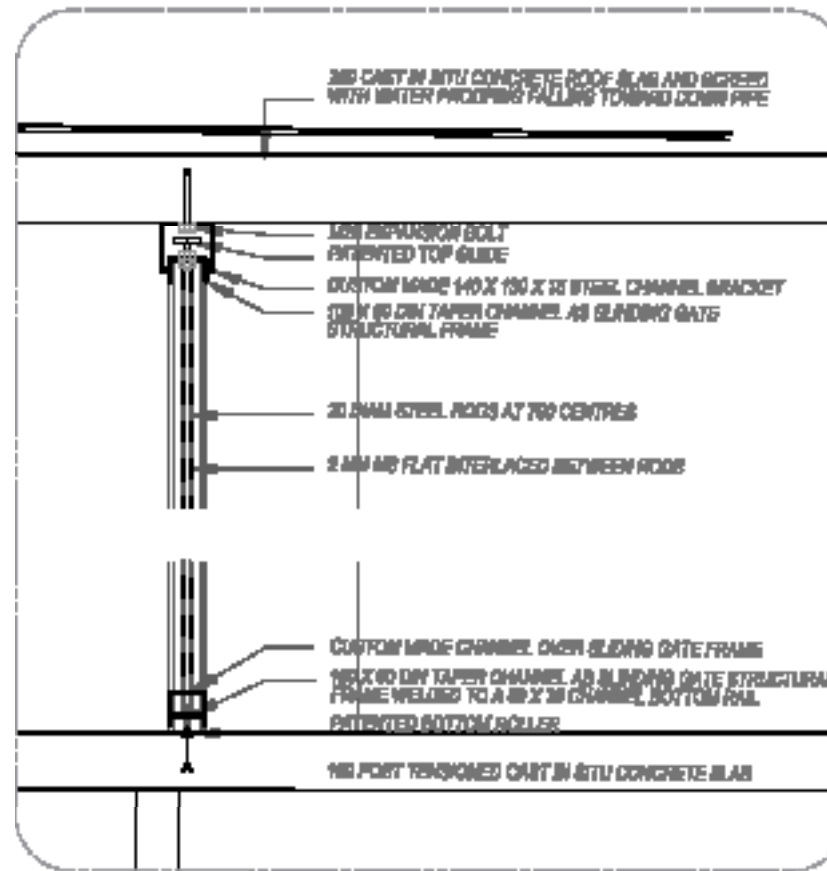


DETAIL 1B TIMBER STAIRCASE

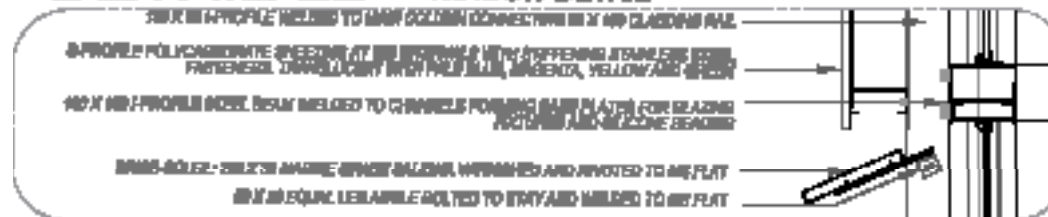




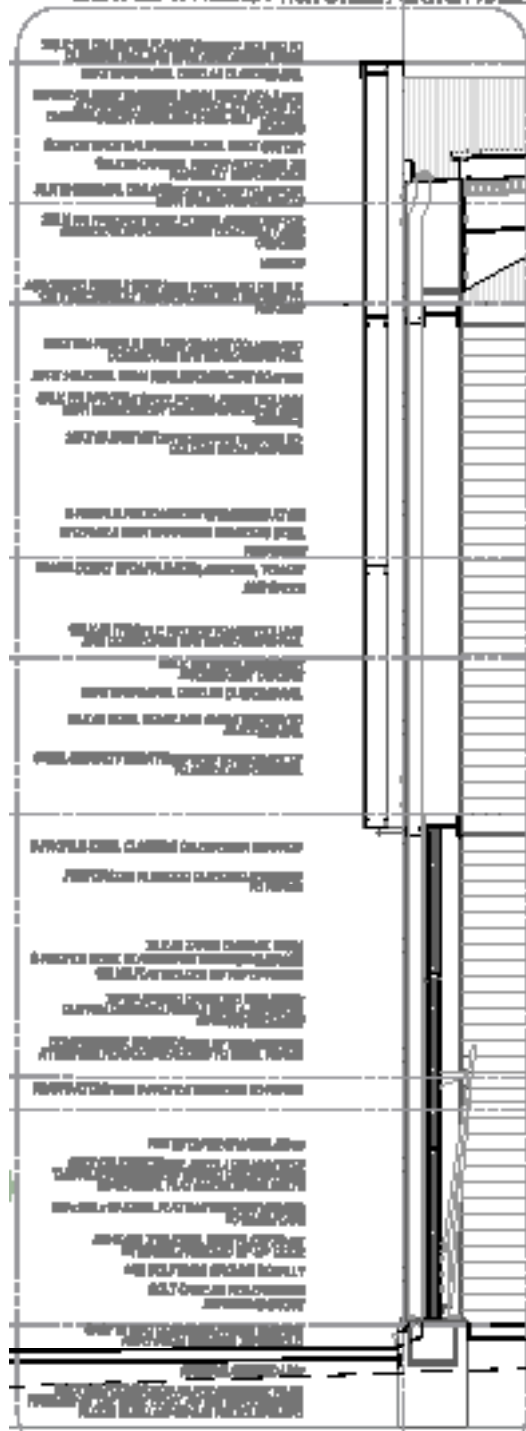
DETAIL 2C SLIDING GATE



DETAIL 2D BRISE - SOLEL AND WINDOW DETAIL

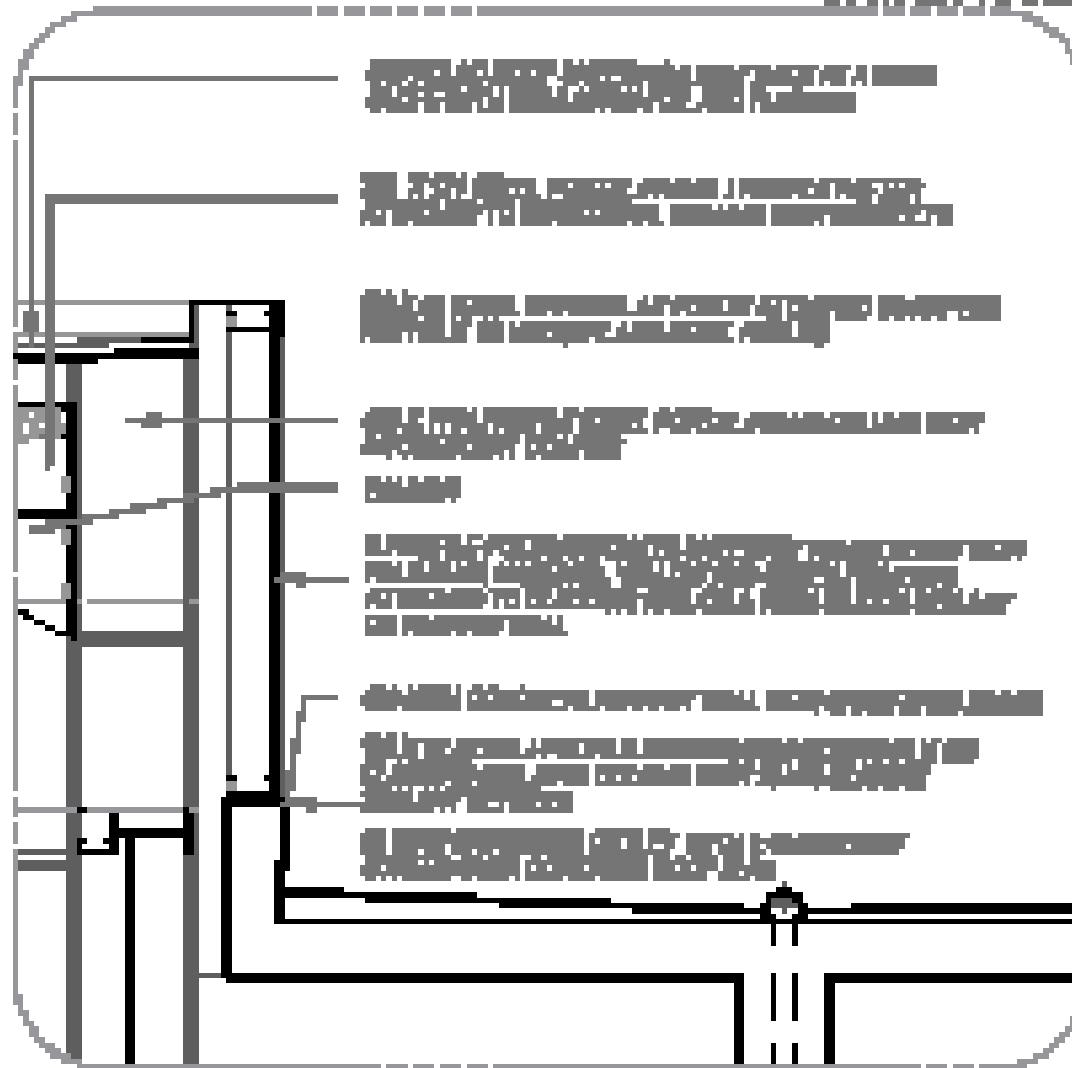


DETAIL 4A MONO PITCH STEEL PORTAL FRAME

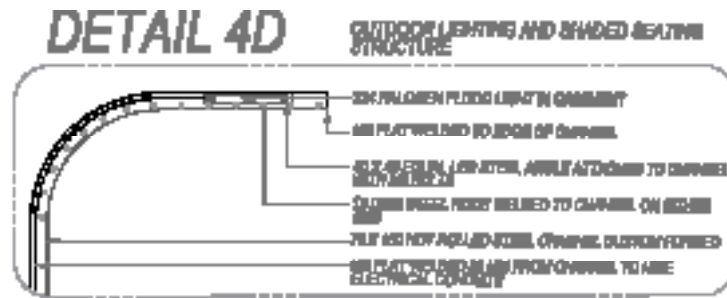


*detailed cross section
scale 1: 50*

DETAIL 4E MONO PITCH STEEL PORTAL FRAME

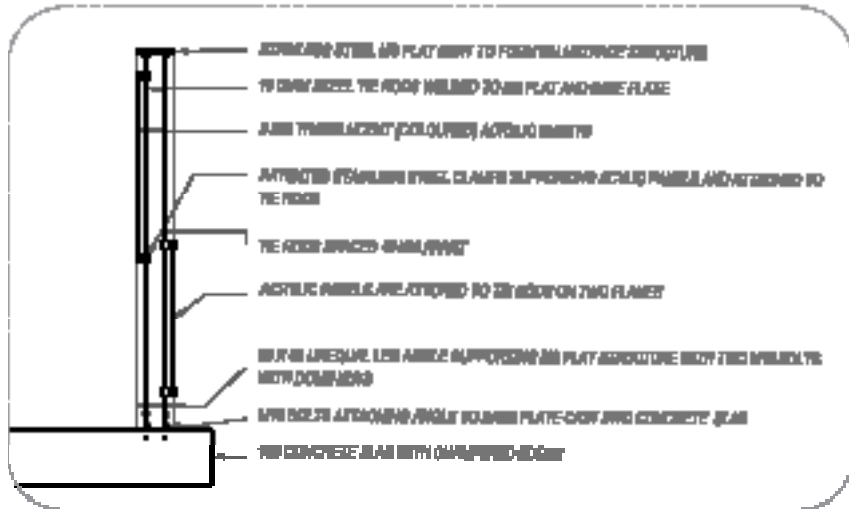


details
scale 1:20

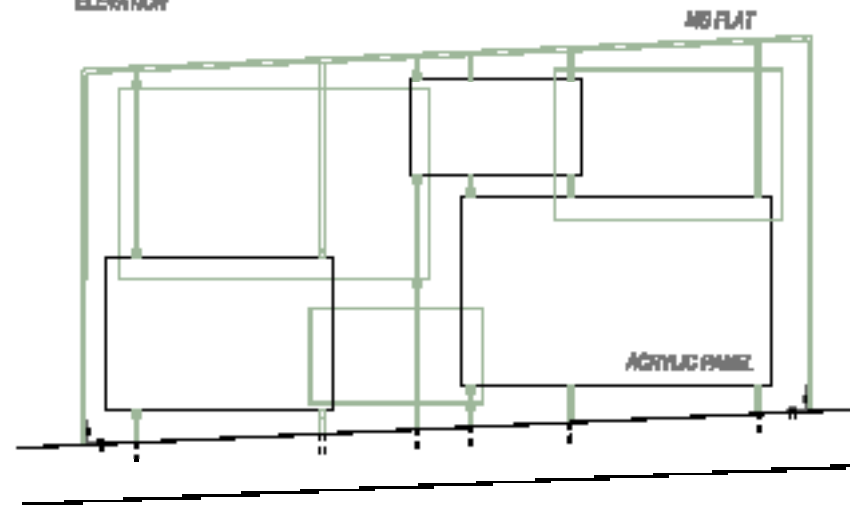


DETAIL 4B

TRANSLUCENT PERFORMED ACYLIC PANEL, BALUSTRADE

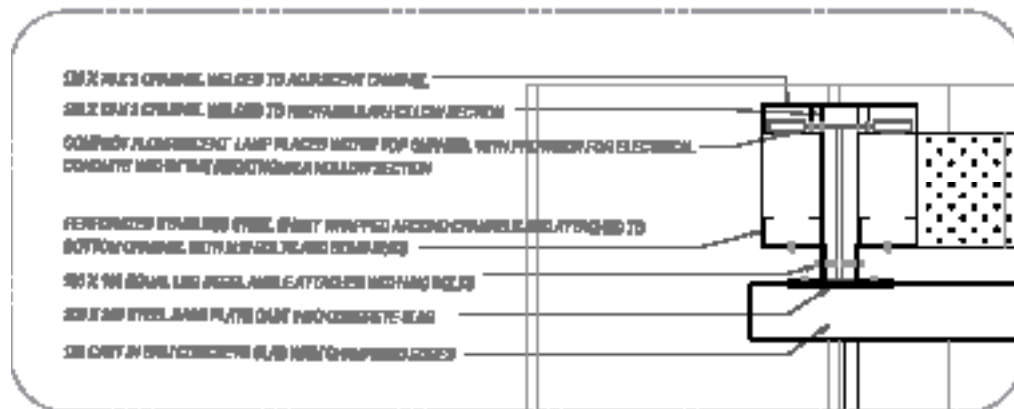


ELEVATION



DETAIL 4C

PERFORATED STAINLESS STEEL, BALUSTRADE / HEATING WALL



*masonry specification and steel portal frame
scale 1:20*

STRUCTURE
CLAY BRICKS TO SABS 207

FACE BRICKS
CLASS 1
WATER ABSORPTION LIMIT: 12%
MOISTURE EXPANSION LIMIT: 0.04%
WORK SIZE: 230 X 108 X 76 (IMPERIAL)
NELL 039

MORTAR
PORTLAND CEMENT TO SABS 471
GRADE FINEST SAND TO SABS 480 FROM THE SAME SOURCE THROUGHOUT CONSTRUCTION
LIME FOR BEDDING MORTAR ACCORDING TO SABS 488 (PREPARED MORTAR MAY ONLY BE USED WITH APPROVAL)
CLASS 2: 1:1:6 FOR GENERAL WORK (SABS)

MIXING
SAND AND LIME TO BE MIXED DRY ON A CLEAN SURFACE AND WATER TO BE ADDED AND ALLOWED TO REST FOR 24 HOURS WITH CEMENT USING A MECHANICAL MIXER. ADD WATER TO THE REQUIRED PLASTICITY.
USE WITHIN 2 HOURS OF MIXING

METAL WALL TO SABS 20:
BUTTERFLY WALL TIES USED IN ALL CAVITY WALLS

STORAGE
UNLOAD CAREFULLY, PREVENT CHIPPING OR SPREADING AND STACK ON A LEVEL AREA.
PROTECT CEMENT FROM MOISTURE AND USE IN ORDER OF DELIVERY WITHIN 3 WEEKS.
PROTECT SAND FROM CONTAMINATION WITH FOREIGN MATERIAL

BOND
AS FAR AS POSSIBLE USE FULL BRICK BOND EXCEPT BOND UNLESS OTHERWISE SPECIFIED
TIES TO BE USED AT BRICK CENTRES WHEN TIES ARE TO CONCRETE WORK USING 40 MM SHORT WALL
TIE CAVITY WALLS AT 3M CENTRES ON EVERY THIRD COURSE

LAYING
LAY BRICKS ON A BED OF MORTAR AND FILL ALL JOINTS FULL
CONSTRUCT CORNERS ACCURATELY AND CHECK HEIGHTS (BETWEEN COURSES)
USE AN APPROPRIATE MACHINE TO CUT BRICKS
WET CLAY BRICKS 24 HOURS BEFORE LAYING

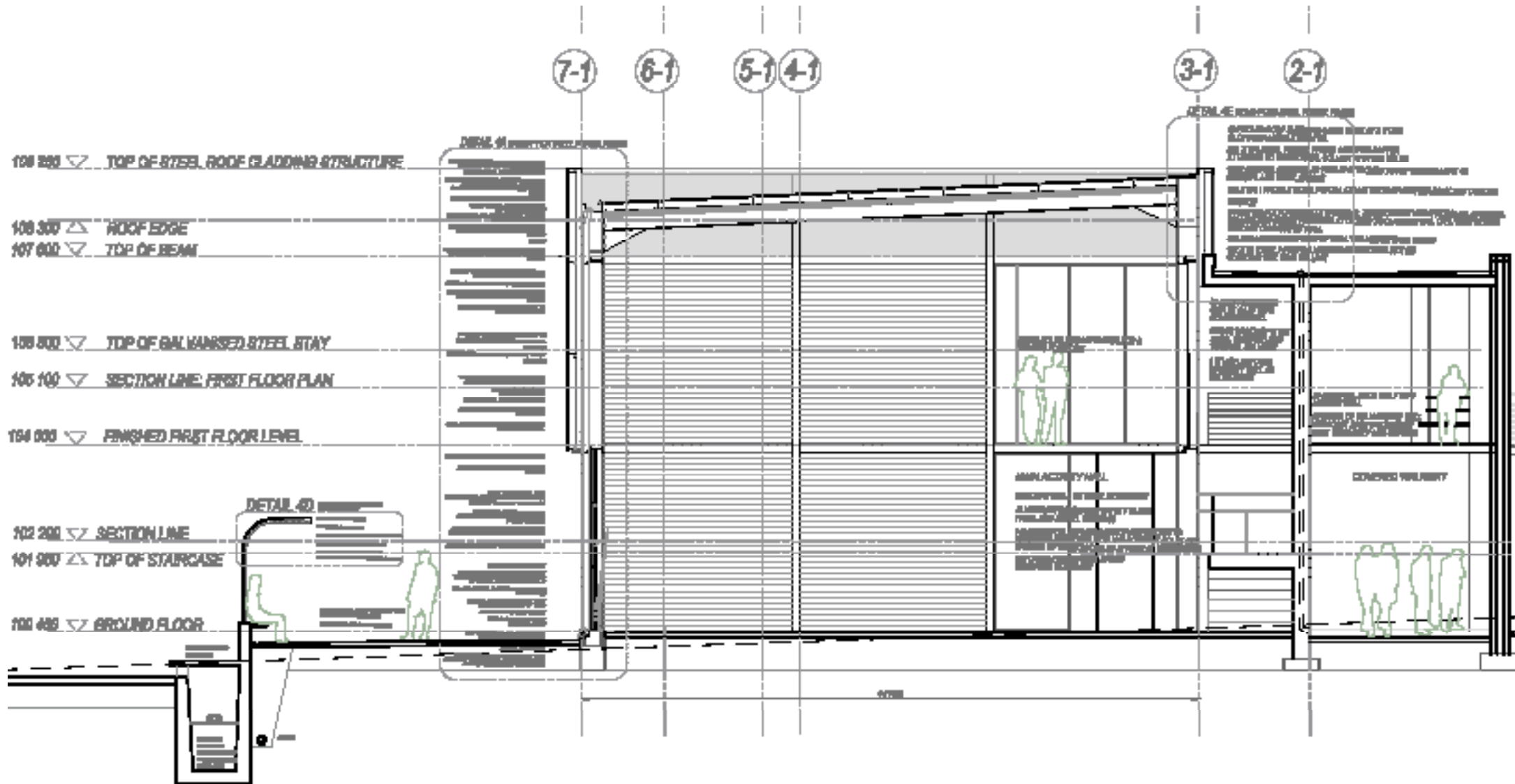
JOINTS
FINISH JOINTS FLUSH UNLESS OTHERWISE SPECIFIED

CLEANING
KEEP FACE BRICK WORK CLEAN
DO NOT USE OIL AS A PANK. DO NOT CLEAN UNIFORM WITH HYDROCHLORIC OR SULPHURIC ACID

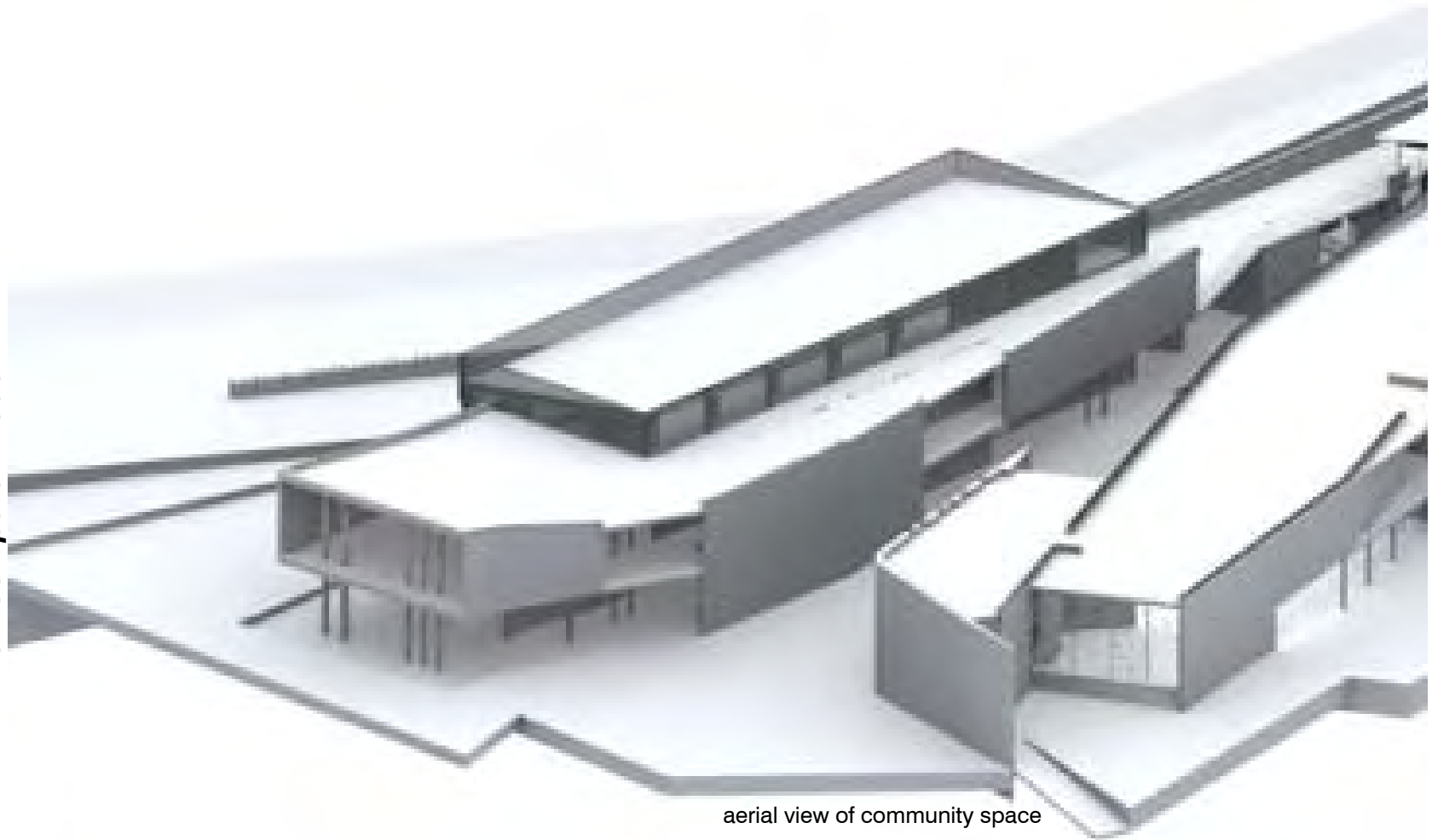
SOOTING
DO NOT USE DAMAGED BRICKS. KEEP TO THE SAME COLOR THROUGHOUT

CAVITY WALLS
FINISH WITH CLEAN JOINT WALLS WITH 3.2MM BUTTERFLY WALL TIES PER ROOM
EMBED TIES IN BRICK MORTAR JOINTS AND 60 CLEARLY FROM THE INTERNAL WALL

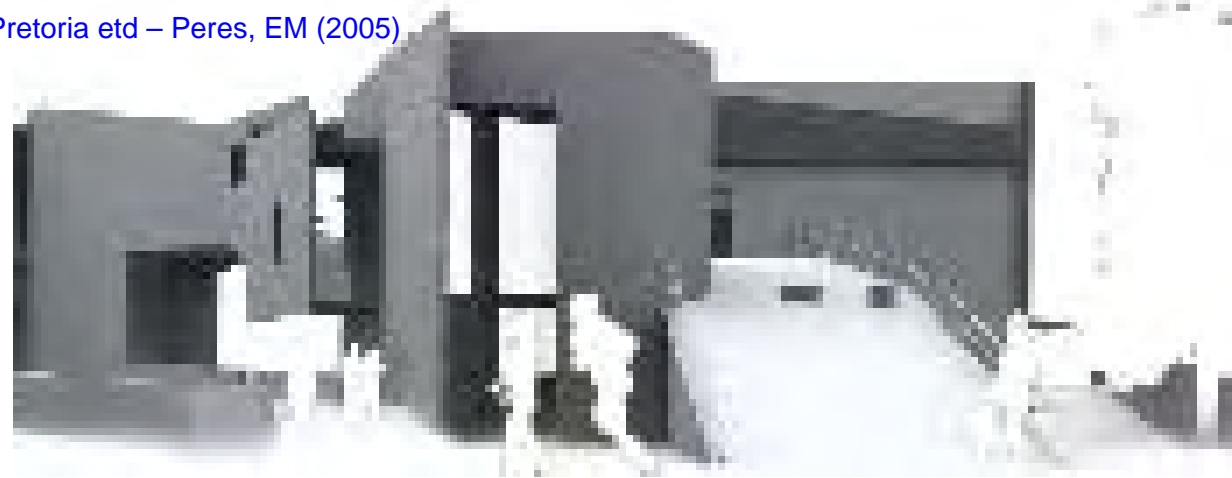
MOVEMENT JOINTS
FORMED USING 20MM IMPREGNATED SOFT BOARD
FILL THE FOREMOST PART OF THE JOINT WITH SILICONE (UNLESS OTHERWISE SPECIFIED)



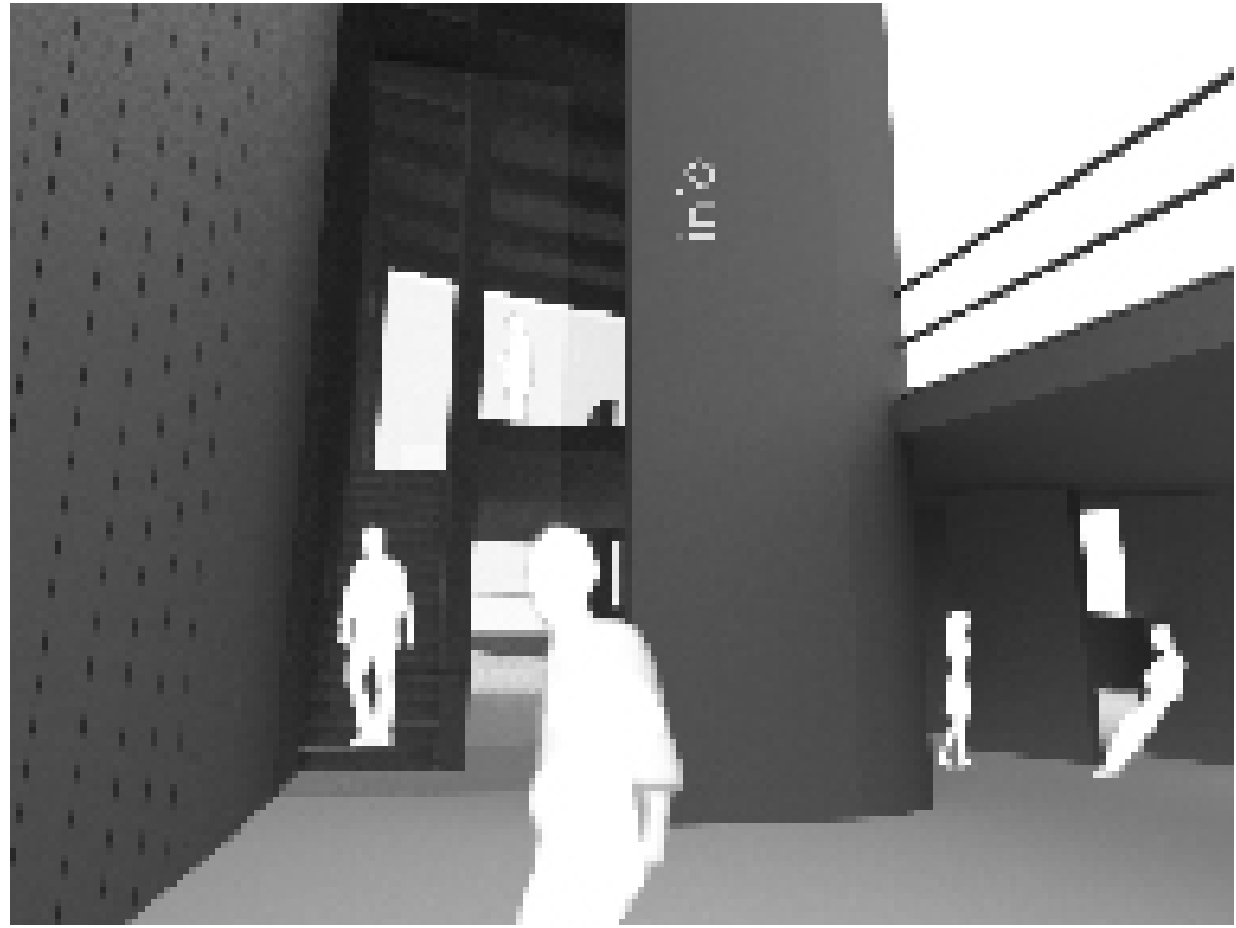
3D computer model



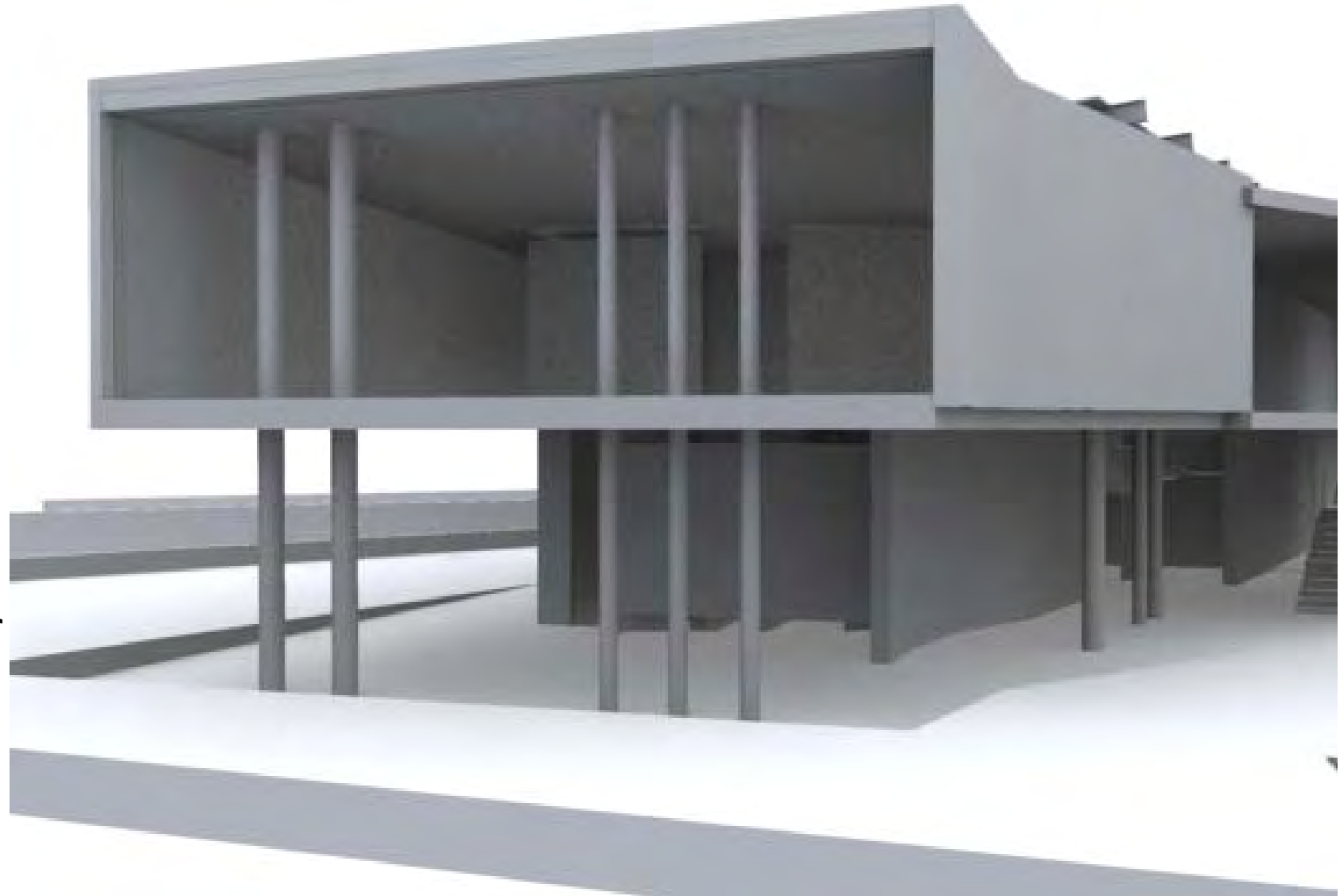
aerial view of community space



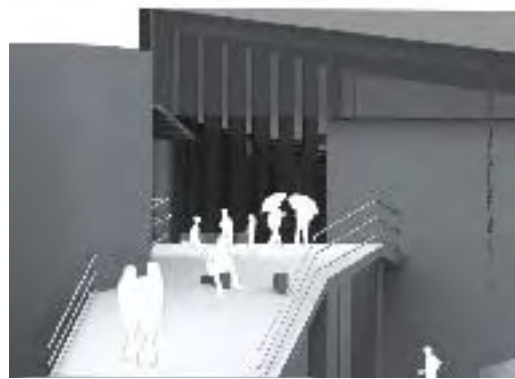
outdoor ramp and information node



3D computer model



informal trade area and activity hall above



ramped walkway



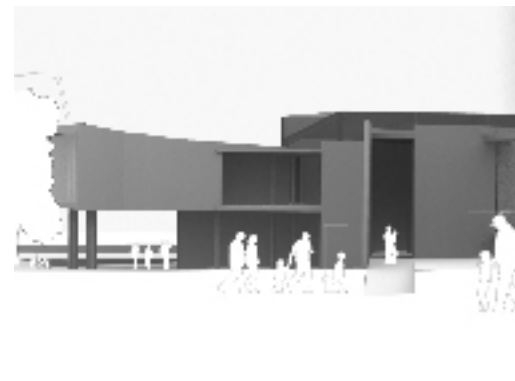
informal trade area

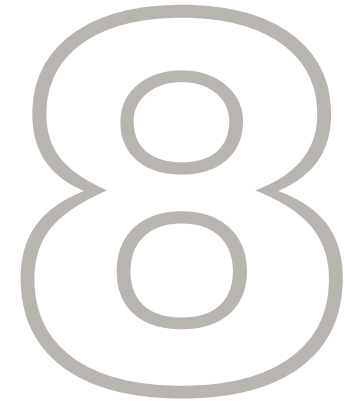


promenade



movement route





conclusion

The decline in the quality of architecture, has resulted in built environments which adversely affect users. This dissertation has investigated how architectural space affects people, and how through design, peoples' well-being can be improved within sensory-rich environments.

The design proposal is based on a search for an architectural solution which offers opportunities for the exploration and personalisation of space. The senses are stimulated in response to a diversity of materials and juxta-positions. Perceptions are challenged by the design, which does not conform entirely to traditional built forms. The design emerges from the programme and is easily adapted to ensure its usefulness.

Lives unfold within buildings; and it has been shown that buildings affect people profoundly. Architecture's powerful effect on humans and consequently society, makes it much more than just a building, it becomes a fundamental part of life.



addendum

design influences

***surface architecture >manipulations**

+forum 2004_herzog + de meuron

+yokohama terminal_foreign office architects

+maritime youth house_plot

***programme**

casa da musica_OMA

***local**

faraday precinct_albonico + sack

frameworks

accommodation schedule

list of abbreviations and terms

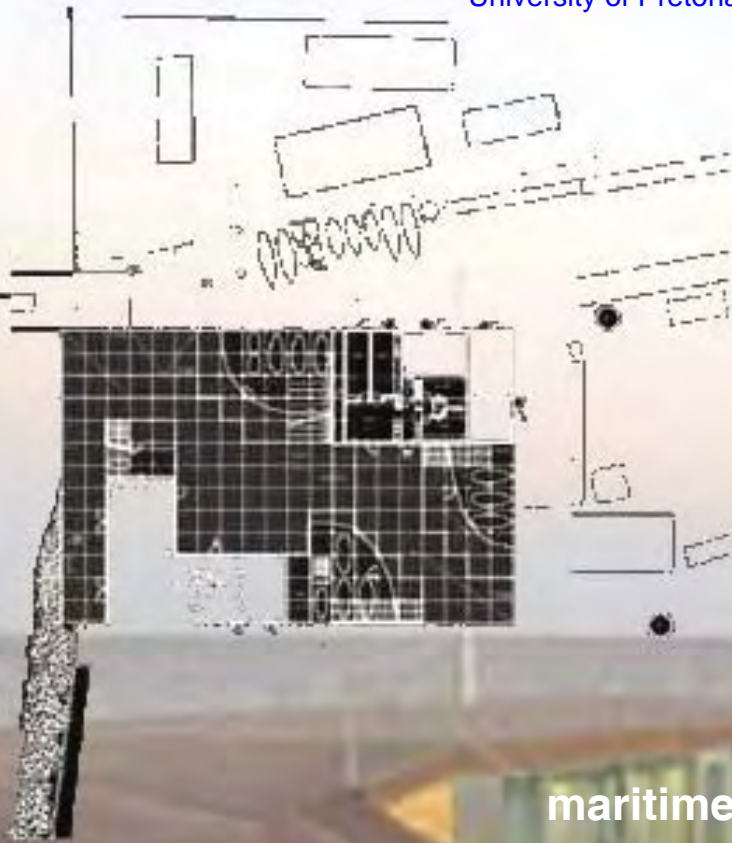
The overall sensory stimulation in the Forum urges the public to move through the building, and while so doing, to touch the blue sponge like texture of the walls; to peer through the openings in the slab with views to the sky; to look at the surrounding context of the Forum through its sheltered interior; or to stare at one's own distorted reflection on the mirrored ceiling of the slab. The success of the Forum as an urban landscape with strong forms contrasted by 'slack' space as well as a high emphasis on experiential value through the use of materials is seen as a valuable precedent for this project.

Public space in and around the forum consists of three levels in the sloping terrain. Below the floating slab, the public is encouraged to move freely across the site and subsequently through the building. It becomes a backdrop in which the public may use spaces as they wish. Exploring surface and structure. In essence, the area extends itself into the surrounds and becomes a vast park which creates an unlimited artificial urban landscape.

The approach towards the building plays with visual imagery and the floating blue slab seems to be cut into the sky where mirrored glazing reflects it. The effect on the senses is profoundly stimulating and the building begins to emerge from the terrain to show case its different aspects. The games that light plays with the building are most impressive. Although the exterior spaces are dark, the shafts of light and views to the sky at certain points encourage the exploration of the spaces. Movement through the site is promoted by the different levels on the terrain leading the individual through and beneath the building.

Illus. 80: Barcelona Forum, showing its form, plans and details [Digitally enhanced image sourced from architectural Review no. 216. 2004]





maritime youth house_PLOT copenhagen

Designed to house two diverse programs, that of a youth centre and a sailing club, the site accommodates both functions by manipulating the landscape. The manipulated geometries in the artificial landscape comprising the deck provides shelter for boats and play areas for children, thereby catering for the needs set by the program.

Constrained by a small budget, the most successful aspect of the design is the multiplicity of the spaces created by the lifted deck, as well as the vertical cross programming. There are two houses within the deck, one housing the youth centre and the other, the workshop for the sailing club. The spaces between these two facilities flow into and out of each other, creating boundless spaces with limitless opportunities for exploration.

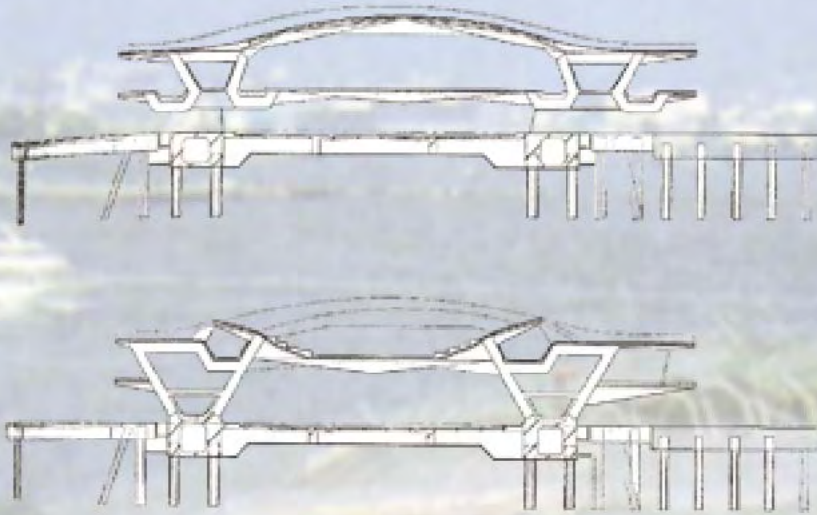
Forming part of an urban renewal program over a brownfield site, the transformation of the site into a useful environment creates a successful extension of the landscape, albeit an artificial one. Materials used in the design reflect the varied functions of the building. Wooden outdoor decks are contrasted with white and grey concrete within the houses so as to emphasise the dominance of the outdoor spaces.

The dual program and accommodation of functions within one structure is used as an example of cross-programming. The design does not delimit the types of uses and encourages various interactions and interpretations, while still serving the required functions.



Illus. 81: Plot youth centre manipulates landscape as shown in the photos and plan [Digitally enhanced image sourced from architectural Review no. 249:2004]





yokohama terminal forreign office architects

Open architecture is the architecture of public space, with undefined interior and exterior spaces and merged boundaries. The Yokohama terminal translates technology into a space for social interaction. Locals and tourists mingle in a setting which extends into the surrounding parks and harbour. The resultant civic space becomes a foyer for the city, a melange of promenades, parks, halls, etc.

A new architectural expression is considered by a fresh generation of architects to be one architecture as a supreme object of cultural, artistic and social significance. The terminal represents a place of flux, in which boundaries between interior and exterior spaces dissolve; as do architectural conventions.

The building's monumentality is evident in its approach to function within the society and its unique and extraordinary

form. However, the building is intended to be experienced as a series of sequences rather than as a single iconic object. The networks of sequences provide a variety of choices relating to the use of spaces. Movement is not defined and the building becomes a non-orientated space which integrates itself with the city.

The building's qualities are experienced only once users begin to move and purposelessly wander through the spaces, discovering the opportunities contained within them. The tectonic qualities of a structure based on folded steel result in a building which is transformed into an urban landscape sensitive to the context of the harbour. Exploration of movement in its ordinary and functional form becomes anything but. Building as movement and as experience in a built landscape has been taken from this design to influence the proposed building.

Illus. 82: Yokohama terminal [Digitally enhanced image sourced from Domus no. 851. 2004]



casa da musica_ OMA oporto

The transparency of the building is emphasised by free-flowing spaces and interruptions. The core of the building consists of the “music box” around which all the other spaces wrap. This plywood box is unlike any other auditorium in that it is glazed on one side, thereby further increasing its transparency; here listening occurs through the eyes.

Fusing the monumental with the civic, OMA continues to search for a new architectural typology within a form that loops and merges into different spaces, each with its own surrealist qualities. From the dramatic glass entrance which further breaks the urban front, to the views over the city, the building never ceases to explore new solutions to old problems. The main public areas encircle the auditorium and may be used for a variety of functions simultaneously. Furthermore, the interior spaces open up to the exterior so that passers-by are able to view the activities inside. The building’s transparency is thereby extended.

The quality of materials and variety of spatial experiences embedded in the design offer not only the appropriate setting for the musical function of the building, but also promote a range of cross-programming possibilities within the surrounding areas.

Illus. 83: Casa da musica create form by wrapping programme and eanalyses traditional spaces [Digitally enhanced image sourced from Architectural Review no. 223, 2004]

programme_de-programme + re-programme

The Faraday Precinct was designed to accommodate a strong transport industry, as well as African healing services. Due to its high historical value, the precinct maintains its importance within the urban setting as a gateway to the city for rural commuters and job seekers. Tasked with finding public-sector interventions for the framework, the team identified and honed in on the main site activities: transport interchanges and informal trade.

The design has been developed to reflect the diversity of these two programs. The bus and taxi rank has been designed to “reflect the excitement, and dynamism associated with movement” [SA Digest 2004: 32] [Illus. 01/02]. Nearly two years later, the taxi rank remains empty, not due to a decrease in taxis, but rather to a lack of interest. This project

shows that it is at best difficult to prescribe conditions to the informal market. Taxis prefer to station themselves underneath the adjacent M1 highway like they used to [Illus. 03/05]. This project shows that it is at best difficult to prescribe conditions to the informal market.

The traditional healing centre caters for both private and public, and temporary and permanent activities, by providing various halls and rooms placed in such a way that functions are juxtaposed to highlight the diverse uses housed on site. An example can be taken from the internal muti centre which is camouflaged on the street front by conventional trade [Illus.04]. The design adopts the language of the context, and acts as a reminder of the past and present.

faraday precinct

Albonico & Sack with MMA
Johannesburg



Illus. 85: Faraday Precinct. Images show some spaces within the area are still not used [Digitally enhanced image sourced from Architectural Digest South Africa 2004]

Illus. 86 on facing page. Informal activities occurring throughout Tshwane.





informal city activities

Informal urban structures are characterised by their impermanence. Their flexibility and adaptability to different locations means that minimal infrastructure is necessary; in fact, the most important factor affecting them is location. Sidewalks and building edges are therefore characteristically utilised and building entrances or garages become entrepreneurial hubs. These trade activities cater for and rely almost entirely on the movement of pedestrians. Understanding these principles of flexibility, impermanence and movement is essential to inform a sound design for informal facilities.

pretoria inner city_ integrated spatial development program [ISDF]

The ISDF places a strong emphasis on the interaction of the public realm in urban activities as well as connecting urban elements to upgraded natural features. Ultimately, the aim is to develop a sustainable city with a strong identity within a legible urban structure.

The proposed site falls within the Sunnyside proper precinct and borders Sunnyside East. Both of these areas are to develop dense residential areas next to Walkerspruit. The green chain of the Walkerspruit is to form part of the city’s wide open space systems, offering opportunities for recreation and urban agriculture. These open spaces are described as high activity nodes and their accessibility has to be improved. Overall improvement of the legibility, linkage and physical continuity of the spaces has to be achieved.

Applicable framework requirements for the site

Well defined urban structure	Multifunctional green open space system	Improve clarity of urban order
		Create visual linkages
		Differentiate between public and private realm
Enhance natural features	Re-establish natural open areas	Structure the interface between urban and open space by increasing access and recreational opportunities
		Protect and develop natural boundaries, edges and seams
Improve mobility and accessibility	Support pedestrian environments	Increase civic development and awareness
		Integrate public transport systems
Enable sustainable economic development	Adapt to change and growth	Ensure short walking distances and mixed uses
		Create a legible, integrated and accessible road system
Create areas with unique identities	Enhance unique characteristics	Provide a flexible and wide range of income-generating opportunities
		Strengthen character through labelling and boundary definition
		Promote functional and aesthetic connections between buildings

the nelson mandela development framework

The Mandela Development Corridor (MDC), along Nelson Mandela Drive, creates a buffer of urban regeneration between the inner city and the higher density residential districts of Arcadia and Sunnyside. Emphasis is placed on movement systems and flexible, mixed use development with safe and secure public spaces. These provide infrastructure to act as catalysts for urban renewal and a local district network.

The Apies River and Walkerspruit precincts are dealt with in the 1999 ‘Apies River Urban Design Framework’. The Culverts can become positive spaces if their edges are activated and managed to allow for proper access along them with night lighting. Mixed-use building types with limited vehicular access should front onto the river edge.

Applicable framework requirements for the site

Public open space	Active Edges	Clearly distinguish between public and private
	Perimeter blocks	Define boundaries
Local district squares	Streets	Engage with greater city environment
	Parks	Place small parks throughout every local district
	Large parks and open spaces	Create larger green areas for the residents to use as public recreational areas
	Small squares	Establish a public square as focal point and to house a variety of public functions linked by a well-identified route within walking distance
Apies river and Walkerspruit culvert	Active edges, proper access and good night lighting.	smaller squares occur at small wasted land between buildings or at pedestrian intersections
		Mixed-use buildings should front onto the river edge
Verticality	Spatial framework	Improve management and security of vehicular access along edges
		Provide mixed amenities: accessibility and legibility of a public building and shared infrastructure
		Encourage interaction between people; provide flexibility and variety for the client and the end users.

tshwane inner city development and regeneration strategy

The Tshwane Inner City Development and Regeneration Strategy aims to focus public budget expenditure on specific projects and catalytic developments, thereby creating strong stimuli for private-sector investment using an integrated, multi-disciplinary approach. The proposed interventions will integrate physical, economic and social spheres which deal with certain strategic interventions that are proposed in the Inner City.

The Sunnyside area falls within several of these strategic interventions which include:

+The cultural circle, which aims to map all characteristics of the area to be marketed as a tourist attraction.

+The capital precinct: The government headquarters are placed within the Inner City as the heart of the Capital City. Elements of the Capital Precinct include:

- An axis of expression
- A monumental grid
- Framing grid (Welcoming Boulevards)
- People's squares
- Governmental Clusters
- Strategic or landmark sites
- Anchors (Church Square, Union Buildings)
- Capital junctions

The intersection of the Apies River, Walkerspruit, Nelson Mandela Drive and Church Street has been identified as a landmark for catalytic development for the inner city. The rivers provide settings for quality environments that can inform the design of the development. Further feasibility studies are being conducted into the possibility of widening the streams and providing ponds alongside them.

Movement in the city has been analysed according to three areas:

Inter-city movement: Gautrain and the inner city, Gautrain station, Standard Rail, access from Ben Schoeman highway

Intra-city movement: [workers, residents] Taxi's and Buses, Standard Rail, Road Re-alignments

Local Movement: Pedestrians/cycling, dedicated transport system

Urban forestry is considered an important aspect of inner city regeneration in that it is proposed that trees be used as a significant structuring element to define spaces aesthetically and functionally, to create rhythm and legibility along boulevards, and to integrate nature and built form.

Accommodation schedule in accordance with SABS 9400-1990 and SABS 0114, Part 1-1973

public domain landscaped interstitial surfaces	communal space, outdoor-gathering area, informal trade A: 10p/1m ² SABS 0400 1990 DD2 no opening > 0,0m ² if any balcony (1 m h) link to Walcottius Park focus on public accessibility passive surveillance safety and security
foyer/ areas for informal trade	20m ² events, gathering, exhibitors, display space A: 11p/1m ² SABS 0400 1990 CO7 table 2 maximum 3,5 kpa disabled accessibility: SABS 0400 1990 Part 5 applicable to all areas general fire resistance: 80 min general escape route: SABS 0400 1990 Part 1 40Lux SABS 0114, Part 1-1973 seals flexible, transparent and robust space movement and accidental outlook accessibility friends
coloring and kiosks	50m ² A: 11p/1m ² 20 Male: 1WC, 2 Urinals, 2 HWB Female: 3WC, 2 HWB mens and landscape accessibility
private domain kiosk area	work area: 35m ² cold store: 5m ² dry store: 3m ² Goods entry and waste storage: 3m ² ea SABS 0400 1990 CO7 table 2 ventilation: 17,5 l/s JP fire provision: SABS 9400 1990 Part 1/21 refuse disposal: SABS 9420 1990 Part U 20 lux SABS 0114, Part 1-1973 proximity to exterior spaces and activity (as shared infrastructure) proximity to street extra fees given to the homeless
semi-private domain craft-workshop area	120m ² work and hand work, sewing and craft, products 92 (1p/15m ²) 30 Male: 1WC, 2 Urinals, 2 HWB Female: 3WC, 2 HWB fire provision: SABS 0400 1990 Part 1/10 40Lux SABS 0114, Part 1-1973 Robustness of structure and materials flexibility and accessibility passive climate control to minimise overhead costs natural lighting interface for commercial activity
children's playscape	100m ² minimum A: 11p/1m ² SABS 0400 1990 DD2 safety and security access and link to coloring create ramp and outdoor space

private domain
semi-private domain
public domain
foyer/ areas for informal trade
ground area

Common space, outdoor-gathering area, informal trade children's playscape craft-workshop area coloring and kiosks	children's playscape craft-workshop area coloring and kiosks
informal trade 100m ² minimum A: 11p/1m ² SABS 0400 1990 DD2 safety and security access and link to coloring create ramp and outdoor space	informal trade 100m ² minimum A: 11p/1m ² SABS 0400 1990 DD2 safety and security access and link to coloring create ramp and outdoor space
work area: 35m ² cold store: 5m ² dry store: 3m ² Goods entry and waste storage: 3m ² ea SABS 0400 1990 CO7 table 2 ventilation: 17,5 l/s JP fire provision: SABS 9400 1990 Part 1/21 refuse disposal: SABS 9420 1990 Part U 20 lux SABS 0114, Part 1-1973 proximity to exterior spaces and activity (as shared infrastructure) proximity to street extra fees given to the homeless	work area: 35m ² cold store: 5m ² dry store: 3m ² Goods entry and waste storage: 3m ² ea SABS 0400 1990 CO7 table 2 ventilation: 17,5 l/s JP fire provision: SABS 9400 1990 Part 1/21 refuse disposal: SABS 9420 1990 Part U 20 lux SABS 0114, Part 1-1973 proximity to exterior spaces and activity (as shared infrastructure) proximity to street extra fees given to the homeless
120m ² work and hand work, sewing and craft, products 92 (1p/15m ²) 30 Male: 1WC, 2 Urinals, 2 HWB Female: 3WC, 2 HWB fire provision: SABS 0400 1990 Part 1/10 40Lux SABS 0114, Part 1-1973 Robustness of structure and materials flexibility and accessibility passive climate control to minimise overhead costs natural lighting interface for commercial activity	craft-workshop area 120m ² work and hand work, sewing and craft, products 92 (1p/15m ²) 30 Male: 1WC, 2 Urinals, 2 HWB Female: 3WC, 2 HWB fire provision: SABS 0400 1990 Part 1/10 40Lux SABS 0114, Part 1-1973 Robustness of structure and materials flexibility and accessibility passive climate control to minimise overhead costs natural lighting interface for commercial activity
100m ² minimum A: 11p/1m ² SABS 0400 1990 DD2 safety and security access and link to coloring create ramp and outdoor space	children's playscape 100m ² minimum A: 11p/1m ² SABS 0400 1990 DD2 safety and security access and link to coloring create ramp and outdoor space

information node (reading room)	125m ² notice board, internet and telephone facilities, reading room A2 (1p / 15m ²) 10 1 WC, 1 HVB shared SABS 0400 1990: CO7 table 2 ventilation: 8.5 l/s p.p fire prevention: SABS 0400 1990 part TT2F proximity to the public domain flexibility of space security and wellness accessibility
lighting requirements considerations and objectives	
acoustic requirements considerations and objectives	
accessibility	
centre for creative development	
recreation space: Exploratorium	
area	205m ² daylight, minimum areas for children
proposed uses	afternoon meetings; community services for adults
occupant type	A3 (1p / 5m ²), G1 (1p / 15m ²)
population	20 (day), 30 (night)
amenities	Male: 1 WCs, 2 Urinals, 2 HVB's Female: 3 WCs, 3 HVB's
forms and standards	SABS 0400 1990: CO7 table 2 fire prevention: SABS 0400 1990 part TT2F ventilation: 7.5 l/s p.p
lighting requirements	400-500 lux SABS 0114, Part 1-1073
considerations and objectives	adequate natural and artificial lighting sufficient ventilation flexible sub-divisible spaces acoustic and optimum noise levels private visual lines accessibility
main activity hall	
area	400m ²
proposed uses	planning, private space, performance, meetings, functions
occupant type	A2 (1p / 1m ²)
population	200
amenities (shared)	Male: 4 WCs, 7 Urinals, 6 HVB Female: 10 WCs, 11 W/D G SABS 1400 1990: CO7 table 2
forms and standards	ventilation: 3.0 l/s p.p 250 lux SABS 0114, Part 1-1073
lighting requirements	flexibility and acceptability of space acoustics
considerations and objectives	convenient to the rest of the building and outdoors adjustable seating acoustic accessibility
smaller activity hall	
area	250m ²
occupant type	A2 (1p / 1m ²)
population	65
amenities (shared)	Male: 1 WCs, 2 Urinals, 3 HVB's Female: 3 WCs, 2 HVB's, 3 S/W's
forms and standards	population 18-130, 0.8m ² p.p at x12m ² ventilation: 2.5 l/s p.p 4251 minimum headroom
lighting requirements	adequate ventilation 250 lux estimated
considerations and objectives	lighting and visual link from outside length to breadth ratio accessibility and flexibility of use acoustic performance
office space	
area	225m ²
proposed uses	administration of centre and workshops
occupant type	G1 (1p / 15m ²)
population	15
amenities	Male: 1 WC, 1 HVB Female: 1 WC, 1 HVB
forms and standards	SABS 0400 1990: CO7 table 2 ventilation: 5.0 l/s p.p access to escape routes
lighting requirements	500 lux SABS 0114; Part 1-1073
considerations and objectives	diffused natural lighting and ventilation flexible sub-divisible space accessibility

cognition: noun [mass noun]
the mental **action or process** of *acquiring knowledge* and understanding through **thought, experience and the senses**.
[Oxford English Dictionary definition]

The Santiago Theory by Maturana and Varela involves more than the simple view of the action of thinking. It **involves perception, emotion and action** – the entire process of life. In the human realm this includes language, conceptual thinking, and all other attributes of human consciousness.
[Capra p170]

the mind becomes a process – the process of cognition, which is identified with the process of life. The brain is therefore the structure through which this process operates.

Mind=process
Brain=structure

[Capra p171]

Tshwane refers to the Metropolitan city of Tshwane, the capital of South Africa

Pretoria refers to the CBD of Tshwane

CBD - Central Business District

references

10

- ar+d Prizewinner. 2004. "Plot in the Landscape", *Architectural Review*, no. 249/ 1281: 67-89
- BAIRD, G. 1971. Alvar Aalto. New York: Simon and Schuster, 43.
- BREBNER, J. 1982. *Environmental Psychology in Building Design*. Essex: Applied Science Publishers.
- CAPRA, F. 1996. *The Web of Life*. London: Flamingo
- CAPITOL CONSORTIUM. 199. *Pretoria Inner City Integrated Spatial Development Framework*. Part 2, Vol. 4. Pretoria City Council
- CHUNNETT FOURIE. 1997. *Report on the January 1996 Flood in Pretoria*. Department of the City Engineer. City council of Pretoria.
- DERRIDA, J. 1993. *Aporias*. California: Stanford University Press
- DE SOLÀ-MORALES, I. 1987. "The Origins of Modern Eclecticism: the theories of Architecture in early nineteenth century France", *Perspecta*, Vol 23: 120-131
- DONALDSON, M. 1978. *Children's Minds*. Glasgow: Fontana/ Collins.
- FEHRMAN, KR & FEHRMAN C. 2004. *Colour: The secret influence*. 2nd edition. New Jersey: Pearson Education
- FLETCHER, B. 1975. *A history of architecture*. 18th edition. London: The Athlone Press
- GALLAGHER, W. 1993. *The power of place: how our surroundings shape our thoughts, emotions and actions*. New York: Poseidon Press.
- GALLAGHER, W. 1999. "How Spaces affect people", *Architectural Record*, no.187/2: 74-81.
- JORDAAN,G.J. 1987. *An Urban Design Strategy for Placemaking in City Centres*. Johannesburg Publishers: (s.n.)
- KOOLHAAS, R. 1995. *S M L XL*. New York: The Monticelli Press
- LAURIE, A. 1990. *Not in front of the GROWN-UPS*. London: Cardinal.
- MAHNKE. F & MAHNKE. R. 1987. *Colour and light in Man-made environments*. New York: Van Nostrand Reinhold.
- MOORE, G. 1987. "The Physical environment and cognitive development in child-care centres"; published in Weinstein, C. & David, T. (eds.). 1987. *Spaces for children: the built environment and child development*. New York: Plenum Press, 41-72.
- MOORE, R. 2002. "Point of departure", *Domus*, no. 851: 64-75
- MOORE, R. 2002. "The world of Herzog", *Domus*, no. 844: 44-47
- MOTLOCH, J.L. 1991. *Introduction to Landscape Design*. New York: Van Nostrand Reinhold
- NORWICH. J.J. 1979. *Great Architecture of the World*. London: Mitchell Beazley Publishers.
- OLDS, A. 1987. "Designing settings for infants and toddlers"; published in Weinstein, C. & David, T. (eds.). 1987. *Spaces for children: the built environment and child development*. New York: Plenum Press, 117-138.

- PALLASMAA, J. 2001. "Hapticity and time: notes on fragile architecture", *Architectural Review*, no. 207/1239: 78-84.
- PALLASMAA, J. 2001. "Our image culture and its misguided ideas about freedom", *Architectural Record*, no.189/2: 51-52.
- PRESCOTT, E. 1987. "The environment as organiser of intent in child-care settings"; published in Weinstein, C. & David, T. (eds.). 1987. *Spaces for children: the built environment and child development*. New York: Plenum Press, 73-88.
- SHAW, G. 1987. "Designing playgrounds for able and disabled children"; published in Weinstein, C. & David, T. (eds.). 1987. *Spaces for children: the built environment and child development*. New York: Plenum Press, 187-212.
- SLATIN, P & SULLIVAN, C. 2003. "Open Architecture", no. 92/2: 68-73.
- SMITH, E.E ET AL. 2003. *Atkinson and Hilgard's Introduction to Psychology*. Thomson Wadsworth: Belmont.
- SRK CONSULTING & MMM CONSULTING. 2002. *Integrated stormwater Management plan and prioritisation of upgrading projects along the Walkerspruit*. Greater Tshwane metropolitan municipality.
- STONE, T. 1998. *Tony Stone Images: twist*. Johannesburg: Getty Images.
2004. "Blue Lagoon", *The Architectural Review*, no.216: 56-63.
2004. Mandela Development Framework. Urban Solutions
2005. Tshwane Inner City Development and Regeneration Strategy. Tshwane City Council
- TAYLOR, M.C.1992. *Disfiguring: Art, architecture, religion*. Chicago: The University of Chicago Press.
- VAN RENSBURG, R. 2003. "The poetics of light in architecture: light as architectural form", in *Image and Text*, no.10. Pretoria: University of Pretoria.
- WEINSTEIN, C. & DAVID, T. (eds.). 1987. *Spaces for children: the built environment and child development*. New York: Plenum Press.
- WEINSTEIN, C. 1987. "Designing preschool classrooms to support development"; published in Weinstein, C. & David, T. (eds.). 1987. *Spaces for children: the built environment and child development*. New York: Plenum Press, 117-138.
- WOLFE, M & RIVLIN, L. 1987. "The institutions in children's lives"; published in Weinstein, C. & David, T. (eds.). 1987. *Spaces for children: the built environment and child development*. New York: Plenum Press, 89-116.

Interviews:

KOKOT, S. 2005-06-06. The effect of built environments on neurodevelopment, sensory perception and stimulus overload. Educational Psychologist: UNISA; certified practitioner of the Handle Institute and Director of Radford House.

PHATUDI, MS. 2005-02-21. Introduction to Early Childhood Development. Head of Department of Early Childhood Development, University of Pretoria.

SCHOEMAN, JB. 2005-02-17. Introduction to psychology. Professor at Department of Psychology, University of Pretoria.

VAN STADEN, F. 2005-02-18. Introduction to Environmental Psychology. Head of Department of Psychology, University of South Africa.

VAN VUUREN, G. 2005-06-08. Walkerspruit Development and Infrastructural Requirements. Senior Engineer: Stormwater and Flood Management. City of Tshwane.

3d Model:
Colin Sackett

my dear partner in crime, nicola, merci beaucoup pour tout!
my office partners, markus and albert ... you “oaks” made studio worth it
my dearest friend, mary-anne ... for the stunning encouragement
jessica ... for always making me smile
jenny ... now we can FINALLY make to movies!
christiaan ... thank for your friendship and support
colin ... thanks guy, for your 3D wizardry
cecilia, deborah, johan and gavin ... for the eDt
karlien ... for making sense of this chaos!
rudolf ... thank you so much for your *amazing* mentorship ... i’ve learned so much!
gus ... i’ll never forget the violin d’ ange
andre ... for the housing congress experience
dorota, irene, clayton ... for sticking around
rina ... dankie vir alles en vir die wonderlike vriendskap deur die jare.
to jade ... for the sisterly stuff
para a emilia, alvaro, michou, irene, manuela, an-
dre, e o resto da minha maravilhosa familia ... pela heranca
e a honra que recebi dos meus antepassados e sobre tudo ...
para os meus pais ... sem voces, nada disto era possivel! obrigadissimo!
HAEC OLIM MEMINISSE JUVABIT

