connection + communication
Submitted in fulfillment of part of the requirements for the Degree of Magister in Architecture [Professional] in the Faculty of Engineering, Built Environment + Information Technology, University of Pretoria, South Africa [November 2006]

Student / Author > Blanche Bevan
Mentor / Study Leader > Piet Vosloo
Thank you Meneer Piet Vosloo and the University of Pretoria for all your hours of wisdom and guidance throughout this dissertation.

Thank you to the Property Management Department for the University of South Africa. Your assistance and information with this dissertation is much appreciated.

Thank you EQF for all your help, inspiration and support.

Thank you Hayley, Sarah, Christie, Gabbita, Riana, Riaan, Kristy and my Jakarandia Soccer Team for keeping me going this year!

And last but not least...

Thank you Mum, Dad and James without you none of this would have been possible.
‘Cities’... 'represent an amalgam of complex forms of social organizations and institutions operating over many scales'.  
[Dewar + Uytenboogaardt, 1991:21]  

<table>
<thead>
<tr>
<th><strong>INTRODUCTION 1</strong></th>
<th><strong>BASELINE CRITERIA 5</strong></th>
<th><strong>DRAWINGS 9</strong></th>
<th><strong>ADDENDUM 10</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prologue</td>
<td>Contextual Response</td>
<td>Context</td>
<td>Illustrations</td>
</tr>
<tr>
<td>Strategic Objective</td>
<td>Urban Functions</td>
<td>Urban Threshold</td>
<td>Sources</td>
</tr>
<tr>
<td>Problem Statement</td>
<td>Building Functions</td>
<td>Urban Design</td>
<td>Glossary</td>
</tr>
<tr>
<td>Realities</td>
<td>Programme</td>
<td>Plans</td>
<td></td>
</tr>
<tr>
<td>Precedents</td>
<td>Accommodation Schedule</td>
<td>Ground Floor Plan/</td>
<td></td>
</tr>
<tr>
<td>Design Approach</td>
<td>SBAT Component</td>
<td>Basement [01]/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Basement [02]/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Basement [03]/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>First Floor Plan/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Second Floor Plan/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Third Floor Plan/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Roof Plan/</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Elevations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sections</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Details</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NORMATIVE POSITION 2</strong></th>
<th><strong>PRECEDENT STUDIES 6</strong></th>
<th><strong>TECHNICAL INVESTIGATION 8</strong></th>
<th><strong>0/001</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Contextual</td>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Philosophy</td>
<td>Programmatic</td>
<td>Structuring Systems</td>
<td></td>
</tr>
<tr>
<td>Concepts</td>
<td>Technical Detailing</td>
<td>Design Elements</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
<td>Design Detailing</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CONTEXT STUDY 3</strong></th>
<th><strong>DESIGN DISCOURSE 7</strong></th>
<th><strong>0/002</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Context</td>
<td>Urban Design</td>
<td></td>
</tr>
<tr>
<td>Regional Context</td>
<td>Site Design</td>
<td></td>
</tr>
<tr>
<td>City Context</td>
<td>Environmental Response</td>
<td></td>
</tr>
<tr>
<td>Urban Context</td>
<td>Dynamics Response</td>
<td></td>
</tr>
<tr>
<td>Urban Frame</td>
<td>Programmatic Response</td>
<td></td>
</tr>
<tr>
<td>Arrival Threshold</td>
<td>Conceptual Development</td>
<td></td>
</tr>
<tr>
<td>Site</td>
<td>Design Development</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>THEORETICAL DISCOURSE 4</strong></th>
<th><strong>TECHNICAL INVESTIGATION 8</strong></th>
<th><strong>0/003</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>Urban Design</td>
<td>Structuring Systems</td>
<td></td>
</tr>
<tr>
<td>Architecture</td>
<td>Design Elements</td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>Design Detailing</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

‘public spaces give symbolic content and meaning to the city by providing gathering places, paths, transitions between public and private domains and arenas for discourse and interaction’.  
[Trancik 1986:100]
List of Illustrations:

00/ 001 Pretoria Urban Pattern [Author]
00/ 002 South Pretoria Urban Fabric [Author]
00/ 003 Muckleneuk Urban Fabric + Site [Author]
00/ 004 Ground Floor Plan of the following Design [Author]
0/ 001 Salvokop + South Pretoria looking West from UNISA [Author]
0/ 002 South Entry in to Pretoria + Movement Lines [Author]
"The city is the physical domain for the modern development of the commonality; we have to accept that in physical terms the city is the conjunction of its public spaces". [Bohigas 1999:9]

"Space is the medium of the urban experience"… ‘it provides the sequence between public, semi-public and private domains’. [Trancik 1986:100]

‘Imaginative architecture always lift’s man’s soul to new heights and interesting public buildings give constant pleasure to thousands of people’. [Fassler 1955:32]
1/ 001 South Pretoria + Elandspoort Road looking North [Author]
1/ 002 Pretoria Aerial + Site Location [University of Pretoria Geography Department]
1/ 003 Jacaranda’s In Pretoria [Author]
1/ 004 Union Buildings [Author]
1/ 005 UNISA from the Highway [Author]
1/ 006 Inner City Street Activity [Author]
1/ 007 Tshwane Inner City Programme, Spatial Development Framework Presentation Feb 2006 [Dept. of Public Works + Dept. of Public Service + Admin]
1/ 008 UNISA from top of Mears Street [Author]
1/ 009 View down Mears Street [Author]
1/ 010 View down Mears Street [Author]
1/ 011 Mears Train Station looking North [Author]
1/ 012 Elandspoort Road looking North West [Author]
1/ 013 Elandspoort Road Arrival View [Author]
1/ 014 Junction of Elandspoort Road + Ridge Road [Author]
1/ 015 Junction of Elandspoort Road + Ridge Road looking North East [Author]
1/ 016 Elandspoort Road Outward Bound [Author]
1/ 017 Pretoria Inner City Street Life [Author]
1/ 018 View down Pretler Street from UNISA [Author]
1/ 019 Pretoria Inner City Trade [Author]
1/ 020 Church Street Westwards [Author]
1/ 021 Church Square [Author]
1/ 022 Informal Trade [Author]
1/ 023 Church Square [Author]
1/ 024 University of Pretoria, High Performance Centre [Author]
1/ 025 Federation Square– Ground Level Detail, Melbourne [Author]
1/ 026 UNISA [Author]
1/ 027 Federation Square [Author]
1/ 028 Federation Square, Internal Lobby [Author]
1/ 029 Essence of Architecture Diagram [Author]
1/ 030 Points of Change Diagram [Author]
1/ 031 Threshold Diagram [Author]
1/ 032 Space + Relations [Author]
1/ 033 Pretoria Jacarandas in bloom in October 2006 [Author]
1/ 034 Traffic on M1 + Johannesburg CBD [Author]
1/ 035 Typical Pretoria Street-Scape with Jacaranda’s in bloom [Author]
1/ 036 M1 South heading towards Johannesburg CBD [Author]
1/ 037 M1 Concrete Channel South of Johannesburg CBD near New Town [Author]
INTRODUCTION

Prologue 1.1

Architecture > Present > Connection

Components

City > Urban Environment > Connection

"In nature we never see anything isolated, but everything in connection with something else, which is before it, beside it, under it and over it." - Johann Wolfgang von Goethe

The following dissertation is based in Pretoria, Gauteng, South Africa and is an attempt to correspond with the future proposals of the Tshwane Inner City Development and Regeneration Strategy of Pretoria, the Gautrain Rapid Rail Link Project and the University of South Africa’s [UNISA’s] 10-15 year Development Programme.

According to the Inner City Strategy, Pretoria is to be promoted as the ‘Capital and Cultural City’ of South Africa. ‘To become the leading International African City of excellence that empowers the community to prosper in a safe and healthy environment’.

The Tshwane City Vision

There is current development with the installation of the Gautrain which will function as a high-speed link between Pretoria and Johannesburg by the year 2010 and in preparation for the Soccer World Cup to be held in South Africa. Bosman Station and Hatfield Station will be the two transport interchange points within the Pretoria zone.

- Gautrain Rapid Rail Link Document, Bombela Civil Works Joint Adventure

UNISA is experiencing a changing student profile whereby originally it was intended as a Long Distance Learning Facility however currently it is experiencing a flux of about 6000 students onto campus every day. As a result new development requires the implementation of a new Information Centre and a revised Entrance scheme in order to accommodate the new needs of the students.

- University of South Africa Property Plan 2005-2015, Development Manuel, Executive Summary

Functioning as a Governmental and Education base for South Africa and as the Administrative Capital Pretoria is an important asset to South Africa. The Tshwane Inner City Strategy is following a similar mindset to most cities in South Africa which is to emphasis a re-ownership of our city centers. A move towards centralization and the concentration of investments, infrastructure, facilities and development within the parameters of the inner city.

The general identity of Pretoria and its reputation nationally and internationally is very much in the public eye due to its role as the Administrative Capital for South Africa. As a result Pretoria needs to address this at the same time as evolving as a city in time. Primarily Pretoria is seen as a Governmental and Education base however realizing its qualities as a city comes down to its ability to connect and communicate and function as a city and within a country and global context. It’s environment need to be fully connected to it’s users and fully communicate that which it’s users value in order to enhance the city environment and encourage people to start moving back into our inner city. The enhancement of the general picture relies heavily on the ability to define the edges of the city and to communicate a definite transition into the city at entry points on the periphery of the city. Surveillance and people on the street need to be encouraged to reduce crime and provide a people friendly environment.

‘man dwells when he can orientate himself within and identify himself with an environment or in short, when he experiences the environment as meaningful’. [Norberg-Shultz 1980: 1]
The objective of this dissertation is to investigate the concepts of Connection and Communication within the realm of Architecture through an Urban Design Intervention and a Building Design which will address a major entry point into the city of Pretoria.

The Intention is to structure the threshold of entry via the Elandspoort Road into the CBD [Central Building District] of Pretoria, flanked by UNISA, stitching the Urban Fabric to create a sequence of arrival, and a realm in which elements are truly connected and where there is an opportunity for expression to be communicated. See Chapter 3 for geographical information and diagrams for orientation and location of site within the Pretoria context.

‘I contend that humans will and can be exercised effectively on our cities now, so that the form they take will be true expressions of the highest aspirations of our civilisations’. [Bacon 1957:13]

The Building Design will address the Urban Design Intervention and provide UNISA with a facility specialising in Media and Image. The intention is to combine the areas of education, production and display in order to create opportunity for individuals to: empower themselves through education, use their skills obtained to produce a product and eventually market themselves within the business world through communicating and displaying to the larger public. This sets the foundation for a well connected marketing network within Pretoria, South Africa and eventually the world.

Strategies
> Connection + Communication through Interaction
To define the threshold between movement systems and celebrate it’s existence in order to facilitate interaction.

To allow Pretoria the opportunity to ‘visually’ and ‘audibly’ express itself and promote the idea of a ‘Capital and Cultural City’, creating opportunity for interaction between individuals and the outside world through providing the canvas to express itself in time and a base from which we can work collectively to better connect our society.

> Empowerment through providing opportunity
To provide a facility which individuals can manipulate in order to empower themselves. To provide a facility that directs people into the realm of Media and Image and connects them to markets, thus providing economic opportunity and alleviating ‘poverty’ in alignment with Government initiatives for South Africa and in sync with our current point in digital culture and technology.

‘architecture is the articulation of space so as to produce in the participator a definite space experience in relation to the previous and anticipated space experiences’. [Bacon1957:19]
INTRODUCTION 1/ Problem Statement 1.3/ Urban Design

Problem Statement 1.3/ Urban Design

The existing threshold into the city of Pretoria along Elandsport Road is one which does not take full advantage of its strategic location as a movement interchange with Mears Train Station on the periphery of the city. It is also the realm which should define the edge of the residential area of Muckleneuk and introduce one to the CBD of Pretoria. It should be seen as an important node between UNISA’s Sunnyside Campus and Main Campus and should cater for the students whom currently migrate between campuses every day.

‘architecture represents a means to give man an existential foothold’ - Norberg-Shultz 1980

The location of this project requires a specific and appropriate response to the surrounding context on many levels. An Urban Design Proposal is imperative and needs to harness concepts of connection and communication directly with Functional, Socio-Economic and Infrastructure responses.

Functional Response: as a threshold for access into Pretoria, a display tunnel through which individuals experience as they move into and out of the city, a space to gather, make use of services and facilities and express the core essence of who we are as individuals.

Education and Production Response: as an Educational Student Facility and gathering space linked with UNISA and an Economic Opportunity Producing Facility linked with the CBD of Pretoria.

Social and Cultural Response: as a Display Board/Case and interactive space sitting on a very prominent transport corridor and acting as a buffering form for the adjacent Residential areas [Sunnyside + Muckleneuk].

Building Design

In following with the Urban Design Proposal a building on such a site would need to have multi tasks and comprise components of Education, Production and Communication/Display. The relationships between the building, the users and the multi layered context ultimately hinges on the concepts of connection and communication; how they interact? how they connect? how they inform each other?

Such a facility requires an understanding of functional requirements in order to accommodate the necessary components such as studying/teaching accommodation, production facilities and display venues and surfaces. Other requirements involve the general functioning of the building in relation to services, vertical and horizontal circulation, security and access to the context surrounding the site such as Mears Train Station, Mears Road, Elandsport Road and UNISA.

Constants

Society is both an informer and absorber of our environment. Our current life style is one that is ever changing and evolving and one could see it as being in ‘constant motion’. At present great focus is on rapid change, new innovation to facilitate change and so forth and is heavily affected by the giant “technology”. Our ability to locate ourselves within this fast pace lifestyle is reflective of connections and communications on large scale and through the close interaction with ‘technology’, we form part of the global community and digital culture. We do this through being able to identify and locate ourselves through the definition of ‘where we are at’ which is necessary to differentiate, that from ‘where we are not’.

‘Urban Performance’ can be measured as the creation of opportunity, ‘structural configurations’ generate greater opportunities which enhance living to a greater degree [Dewar + Uyttenboogaardt, 1991:15]
South Africa is termed a ‘medium to lower human developed country’ still bearing the scars of Apartheid which some consider the reason for a low skilled and uneducated population, a high unemployment rate, a relatively high Gini Coefficient reflecting an uneven distribution of income and a relatively low HDI [Human Development Index]. [Todaro + Smith 2003:201]

South Africa has an uneven distribution of income reflected in a ‘Gini Coefficient’ of 0.593. [Mohr 1998:173] This is displayed in the table below comparing the Gini Coefficients of different countries around the world. The Gini Coefficient is a calculation reflecting the difference between people with money and people with out money reflected in the graph below know as the Lorenz Curve. The line of equality is pinpointed with the least deviation at 0 reflecting the best quality of lifestyle and 1 being the furthest deviation as the lowest quality of lifestyle.

<table>
<thead>
<tr>
<th>Country / Group of</th>
<th>Sub-Saharan Africa</th>
<th>East Asia +</th>
<th>Latin America</th>
<th>SC</th>
<th>MNI</th>
<th>Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saharan (1995)</td>
<td>0.3</td>
<td>0.44</td>
<td>Brazil (1998)</td>
<td>0.59</td>
<td>0.775</td>
<td>Australia (1994)</td>
</tr>
<tr>
<td>Kenya (1997)</td>
<td>0.445</td>
<td>0.21</td>
<td>China (2000)</td>
<td>0.57</td>
<td>0.125</td>
<td>Canada (1995)</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.581</td>
<td>0.56</td>
<td>Colombia</td>
<td>0.57</td>
<td>0.245</td>
<td>Germany (2000)</td>
</tr>
<tr>
<td>Zimbabwe (1995)</td>
<td>0.502</td>
<td>0.401</td>
<td>Venezuela</td>
<td>0.40</td>
<td>0.40</td>
<td>United States</td>
</tr>
</tbody>
</table>

Following in the same category of information the HDI [Human Development Index] for South Africa is 0.666 show on the table above according to the United Nations Development Programme. This index is obtained through calculations of Longevity [Life Expectancy at birth], Knowledge [a combination of adult literacy compared to combined gross education] and the level of a ‘decent standard of living [measured by the Gross Domestic Product per capita]. Norway is considered the most developed with an index of 0.956 and very similar to Australia with an index of 0.946 whilst Sierra Leone is considered the least developed with an index of 2.73 and not far off from Zimbabwe with an index of 0.491. South Africa sits somewhat in-between.

Unemployment/ ‘In September 2004 there was an estimated 29.305 million people in South Africa between the ages of 15 and 65 of whom 15.776 million were economically active. Official unemployment among the economically active population is estimated at 28.2%.’[Ballim 2006:6]

‘the major challenge facing society is in the area of job creation’. [Ballim 2005:10]

People/ Job creation is one strategy to reducing the unemployment rate and elevating poverty. However South Africa is also faced with a situation in which the majority of the population is uneducated and has a low level of skill. This then means that Skills Development is a major factor in the South African context to move towards upliftment. Education and training for the adult sector is thus greatly required.

Education however needs to cater to all people and for South Africa this means as the ‘Rainbow Nation’ and catering for an array of cultures, traditions and 11 Official languages. Our reality involves a multi-cultural approach to everything in order to cater for all and provide for all.
The drivers of structural change in South Africa's economy is said to include both supply- and demand-side factors. The change in the consumers spending patterns [demand] and the major driver, 'business process which include restructuring and technological change'. [Ballim 2005:17]

One could conceive our era as a fast pace changing digital society. Technology has enhanced the connection and communication of people around the world with one another. We are able to influence and be influenced globally via technology. Internet, your tool to 'get connected' is just one example of connection and communication between individuals around the world at the click of a button. We have the ability to interact purely within a digital world and digital community.

The high-speed train system between Pretoria and Johannesburg, the 'Gautrain Rapid Rail Link Project' is all ready in progress and looks to involve an investment of R7 billion. The following dissertation will be affected by the Gautrain running through Mears Train Station on to Hatfield Station situated a further along the line. The influx of activity in preparation for the World Cup and eventually the tourists moving into and out of Pretoria, will have a large impact on all thresholds of the city.

'Economic-Socio Factors /

Supply + Demand Factors/

Technology/

Socio Economic

The realm outside the car becomes a very sterile and potentially dangerous space in which pedestrians still need to experience at one or other time. The pedestrian link between UNISA's Sunnyside Campus and it's Main Campus is greatly utilized but does not cater for the students. The proposal for a New Entrance for UNISA is spurred by the changing student profile of UNISA whereby 60% of students are located in Gauteng and an 'estimate of 6000 students visit the campus every day'. [University of South Africa New Entrance Proposal Document] Mears Train Station functions as one of the first stations as one enters Pretoria via the Metro Rail from the South and provides the opportunity for Students to arrive by rail relatively close to campuses.

The following thesis will attempt to find a cohesion between these modes of transport in order to provide a threshold interchange which allows for interaction, connection, communication and efficiency and allows for different modes of transport to coexist. The point of change between modes and how the systems mesh will be investigated.

Providing a threshold into the city and defining an edge creates a legibility in the Urban Fabric. UNISA is a dominate landmark in the landscape and ushers individuals into the city, however the Urban fabric lacks continuity, building up scale towards the CBD of Pretoria.

UNISA lacks finer detail in stitching itself to the finer fabric of Muckleneuk. This is currently under development with the official proposal of a new Information Centre and a new Entrance Face for UNISA onto Elandspoort Road.

Providing a buffer for the residential area of Muckleneuk so as to define the threshold of entry between the city and a community within the city is much needed. The intention is to provide a buffer which holds public spaces and green spaces for the residents to make use of and interact with individuals whom stop to experience the interchange on changing modes of transport before continuing on into the CBD of Pretoria.

‘an axis is perhaps the first human manifestation; it is the means of every human act. The toddling child moves along an axis, the man striving in the tempest of life traces for himself an axis. The Axis is the regulator of architecture’ [Le Corbusier Vers Une Architecture]
INTRODUCTION

1/ Precedents

Spaces to gather and make use of facilities are components of a city. This is the very essence of a transport interchange and should be taken advantage of. The intention is to provide the realm for gathering with the opportunity to engage with informal trade and entertainment in the form of big screen display such as an outdoor theatre.

Complexity of Environment "can be seen to reflect and contribute to the richness of human experience." [Dewar + Uytenboogaardt, 1991:17]

The following dissertation requires the study of a variety of environments, buildings and design approaches. The precedents are expressive of the conditions challenging the building design of this dissertation and set out to reveal the qualities which the final product should reveal. The precedents are divided into themes including Contextual, Urban Context, Programmatic and Technical Detailing. A number of themes is necessary in carrying out the investigation on multiple levels and showing an understanding of design from Urban Scale to human scale to final detail scale.

Pretoria as a city has a specific function servicing South Africa as the Administrative Capital and holds a number of buildings and historical artifacts. This precedent gives depth to the understanding that a place is also tied to a time context. The city fabric reflects a city developing through the ages, which is evident of social trends, architectural innovation, monumental celebration and climatic response through material availability. As a city Pretoria has a number of different Social Gathering spaces, a definite Street Character and Specific Urban Environment.

City Fabric/ Pretoria CBD/ UNISA _ University of South Africa/

Urban Context

Cities share common attributes creating the environment of the city through different approaches to the relationship between man and his 'built' environment. Investigation into the components of an Urban Context, evident in the following dissertation relate to:

Thresholds/ Public Spaces/ Active Pedestrian Edge/

Programmatic

Response to the programmatic requirements of Education, Production and Display and the kind of programmatic response which would be necessary in a facility which holds these components in an area of investigation should include focus on circulation, security, functions and relationships of components within a facility and are all encompassed in buildings such as:

Educational Facilities/Museums/ Centers/

Technical Detailing

Response to Site, Design Parametres and contemporary innovation need to be addressed in relation to technical innovation through the investigation of similar design situations. Our society requires a response to technology in order to be relatable and fully integrated with our digital culture. The power of materials and the advances in surface technology allows for more expression of man's self than ever before and the ability to truly respond to needs through design. The following dissertation requires a response to:

Materiality + Construction/ Form/ Envelope + Glass Louvres/ Surface Display/

‘Architecture consists of solids and voids and the ‘articulation and differentiation of solids and voids produces a fabric of the city which establishes physical sequences and visual orientation between places.’ [Trancik 1986:100]
The following dissertation incorporates an Urban Design scheme which ideally will connect with the city fabric and the overall Urban Design scheme for the city. A humanist approach is taken in catering for the needs of the users, through responding to context, programmatic requirements and movement systems. The approach throughout this dissertation is deeply rooted in an understanding of fitting into the South African Context, Pretoria, and Muckleneuk, on Economic, Social and Environmental levels. Transport is very much a part of the South African lifestyle, but our environments do not celebrate this nor take full advantage of the dynamics of movement. Art in Architecture has the potential to find a footing within the realm of environments edging movement systems, and thus the creating of a building which edges a threshold, is the focus for the following dissertation. The search is thus for order, to order our environments to cater for our needs as people, and to redefine the notion of ‘functionalism’ within the realm of ‘social importance of the visual environment’. [Damaz 1956:35]

‘Imaginative architecture always lifts a man’s soul to new heights and interesting public buildings give constant pleasure to thousands of people. [Fassler 1955:32]

The precinct sits on the periphery of the city and functions as a threshold into the city and connects to multiple movement and social systems. The location of the site requires connection with the context in order to facilitate its function. These are all aspects which need to be considered in order to fully cater for man’s needs.

The approach is that of ‘Centrality’ which involves man at the centre and the understanding of the complex matrix which connects man with his environment. Architecture can be seen as to ‘represent a means to give man an existental foothold’ and involves the ‘concretization of existential space’. [Norberg-Shultz 1980:3]

‘Existential Space’ according to Norberg-Shultz, is that which comprises the ‘basic relationship between man and his environment’. Interaction between these two involves lines of connection which exist on multiple levels and scales. The interpretation of these connections involves the aspect of communication which encompasses, expression and response. This is reflected in the forms of connection, and which is ultimately based on the levels of interaction and experience.

‘through sense of connection with a system greater than himself man achieves aesthetic satisfaction’ [Bacon 1957:15]

The ordering of our environments involves the defining and articulating of spaces and forms. The logic behind sequence involves the breaking down of process and the definition of points such as thresholds, through which one moves. Defining a threshold involves close consideration of form through the response to movement and flow, and space and place. Through formal articulation one can structure the process of experience and create a logical sequence of interaction with the city fabric. Interaction involving the realms of physical and visual interaction through the communication and the interpretation of expression. Surface, form and materiality become the canvas to express and the thread to connect.

‘an expression of philosophical interaction of the forces of mass and space’…‘reflects the relationship between a man and nature and man and the universe’. [Bacon 1957:15]

‘conscious expression of space is essential to the highest expression of architecture’ [Bacon 1957:15]
Technology and our current Digital Culture are directly related to man's existence and thus need to be considered. Movement is geared by the concept of advances of technology and one might see the ability to move and communicate at the same time as eroding our connection to place and thus eliminating the need for order. But our reality needs to keep connected to us in order for our world to make sense. The importance of a transport interchange at this specific location is pertinent to the functioning of the city and through the defining of a place one might be able to reinstall connection to place. The bodily experience at a point of transition at a location involves the interaction with context, the interpretation of edge and the communication of the environment to the individual. Edging defines the space and creates place. Digital Culture relates to media and image and the ability to communicate through the visual realm. Surfaces become information providers on a local scale and radio, television and internet become connectors on a much larger scale.

The process of physical experience involves movement, whereby one moves from one space to another resulting in the ability to compare spaces and thus experience. Orientation involves communication of experience and the understanding of one's environment in time. Architecture has the ability to articulate our environments in order for man to be able to relate and identify with it. This communication allows man to interpret expression and locate value and meaning through experience in interacting with two dimensional surfaces and three dimensional forms. The ordering of form and space dictated by movement creating a sequence along a route which has the potential to accentuate experiences at specific points of importance.

The intention of creating a Centre for Media and Image is greatly a response to our current point in time which is deeply rooted in technology. The building gives the opportunity for current communication tools [Media and Image in digital format], to be incorporated into Architecture. Media and Image can be interpreted as a modern form of art. One level in the flowing dissertation approach is in combining ‘art and architecture’ spoken of by a UNISA Architectural Academic Sabine Marschall discussing the architectural theories of P. Damaz and J. Fassler.

‘Art, for example, can describe a building’s function; it can imbue a space with a spiritual quality; it can visually enlarge a space by creating an illusion; it can confer status; it can demonstrate wealth; it can convert a neutral space into one suited for a particular ritual; it can ascertain claims about a building’s owner or users; it can establish links between cultures or attempt to recover values of the past; in short: art plays a vital role in shaping a building’s identity.’ [Marschall 2003 www.unisa.ac.za/academic journals]

Architecture needs to be the result of a multitude of approaches which take into consideration a multitude of dynamics, factors and possibilities. This it the design approach for the following dissertation in both the Urban Design and in the Building Design. Dynamics, factors and possibilities need to be acknowledged and used to facilitate a truly livable environment which functions as a connected matrix, experienced and a true expression of our present location in time.

‘space does not reflect society, it expresses it and is a fundamental dimension of society, inseparable from the overall process of social organisation and social change’ [Castellias 2004:83]

‘establish volumes of space that are in scale with the needs of the present time and defined by means which are in harmony with modern technology’. [Bacon 1957:16]
'Architecture should be primarily a consequence of the form of the city and of the landscape and should participate in the new configuration of these'.

[Bohigas 1999:12]

'cities' are 'transformed by the interface between electronic communication and physical interaction by the combination of networks and places'.

[Castellas 2004:85]

'Design must respond to the dynamics of social uses in its physical form.

[Trancik 1986:219]

'It is about how places differ without forgetting that they are connected and how they are connected without forgetting that they differ'.

[Mark Mckenzie 2002:401]
List of Illustrations

2/001 Elandspoort Road outward bound view [Author]
2/002 Elandspoort Road Traffic [Author]
2/003 Connection + Communication Diagram [Author]
2/004 Elandspoort Road, Pedestrian Edge [Author]
2/005 Space + Relations [Author]
2/006 Measr Train Station—Metro Rail [Author]
2/007 Elandspoort Road inward bound view [Author]
2/008 Life + Architecture Diagram [Author]
2/009 Space + Relations [Author]
2/010 Life + Architecture Diagram [Author]
2/011 Connection + Communication Diagram [Author]
2/012 Connecting Fabric Diagram [Author]
2/013 Arrival Entrance Diagram [Author]
2/014 South Pretoria City Grid + Movement Lines [Author]
The normative position of the author deals with the philosophical background to decisions made in the course of this project development. The theoretical discourse follows under the themes of Connection and Communication within the realms of Architecture and Urban Design and responds to the philosophical approach to creating environments for people. It is an investigation of the strategic location and the discovery of practical implications and applications of concepts found in literature and precedents appropriate to our current point in time.

If creating environments involves creating them for people then the relationship between humans and their environments becomes very important. Understanding the way people function and interact enables environments to respond accordingly.

"I think therefore I am" the fine words of Descartes. In response we could fathom that "I experience through interaction, interpretation, discovery and leaving traces; therefore I am". If I see you and you see me and I communicate to you that I see you and you communicate to me that you see me, then we both confirm that we exist. The very essence of physicality is the interaction between human and the other and involving philosophy whereby we question the unknown as to whether we exist and how do we if we do exist or not.

If you couldn’t see me and communicate with me then I wouldn’t be there physically with you. How would you know or prove that I existed if there was no trace of me to communicate my existence? Our minds are programmed to question, investigate and prove. Life is about living and living is about experiencing and experiencing involves all of the human senses. The human senses act on multiple scales and require interaction in order to interpret information and communicate the physical environment with which we directly interact with. Physical proof is our only way of being certain of facts, otherwise facts would only be myths. No facts or evidence logically proves nonexistence. One can not explain the circumstances nor be ‘absolutely’ certain without physical proof.

Physical proof is our form of communication of information which we are then able to interact with and interpret. Thus communication through interaction via connection is the basis of all our experiences and is the ultimate components pertinent to fulfilling the desire and search for existence and proof of existence. One experiences through relating oneself to other humans and other objects. "I experience therefore I am". Through interaction and communication with other things, one is made aware of the envelopes between things. Through interacting one builds ones knowledge of one’s self and ones environment and ones location in time and history.

Our location in time is expressive of the impact of technology which is becoming more and more ingrained in our lifestyles. We have the ability to alter our environments and create ‘virtual environments’ which we can perceive to experience. Technology is pushing the boundaries of interaction and creates endless opportunities in connection and communication in cyber space. But relation with our ‘direct environment’ is about confronting our physical location in time and is where architecture has a strong hold. Technology should be used as a tool to enable endless opportunities. It is the ‘real world’ which can not be disregarded which poses as the basis of the following dissertation.

‘workers still need to move their physical bodies to be in the thick of the innovation process, even though their products can often then be instantly sent online to distant markets and users’. [Easterling 2004:19]
The point at which things interact physically is of most importance when considering architecture. The threshold between physical realms is investigated in the following dissertation with respect to connection and communication in design. One can understand in the example of a city that though it is one large system it is composed of multiple systems which overlap and are connected within a matrix. These systems are connected and it is at thresholds that connection and communicate have potential for greatest impact.

‘it is necessary to understand the city not as a global unitary system but as a number of relatively autonomous small systems.’ [Bohigas 1999:9]

The inquiry into the programme of the intervention for one of the ‘thresholds of entry’ into Pretoria is largely driven by the need to address a changing city environment and society. New needs require environments to adapt in order to cater for its users and to enable the city to function to its highest potential. Movement is a major dynamic of our current lifestyle and here in South Africa individuals are inclined to travel large distances every day, in and out of the city, in order to achieve the necessary tasks required in a day’s routine. Movement hinges on the ability to connect locations and modes of transport whilst at the same time communicating the essence of Pretoria to the moving observer. ‘Connection’ and ‘Communication’ become the multilayered concepts which act on physical and psychological levels.

‘the conscious expression of space is essential to the highest expression of architecture’ [Bacon 1957:15]

The architectural investigation for the following dissertation carries through further into the inquiry of the Urban Threshold Frame and continues to express the concepts of ‘Connection’ and ‘Communication’ on a local scale. Such a facility is driven by the necessary responses to the context and the programme of accommodation in order to cater for the people whom will interact with it and ultimately experience it on a physical level.

The Urban Design threshold is on the periphery of the city and is connected by lines of movement. It is an entrance and point of interchange for several modes of transport as well as a hub for various access routes connecting to the surrounding context.

The site in the following dissertation edges the threshold of entry and has the potential to stitch the city fabric to create a logical sequence to the process of arrival into Pretoria along Elandspoort Road. As an edging element of the city it also holds the opportunity for visual communication to passing traffic giving Pretoria the possibility to express itself through media and image as an introduction to the city.

Therefore the ‘locational’ condition for the following dissertation leads to the search for characteristics of connection and communication in architecture.

‘space is given to us as a set of potentials and we exploit these potentials as individuals and collectives in using space’. [Hillier 1996:154]
'Context is the application of idea to place: it gives reality to the idea and is the design response to the particularities of place.' [Dewar + Uyttenboogaard, 1991:15]

<table>
<thead>
<tr>
<th>Global Context 3.1/</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td></td>
</tr>
<tr>
<td>Mining Industry/</td>
<td></td>
</tr>
<tr>
<td>Tourism/</td>
<td></td>
</tr>
<tr>
<td>Transport/</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional Context 3.2/</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauteng</td>
<td></td>
</tr>
<tr>
<td>Johannesburg</td>
<td></td>
</tr>
<tr>
<td>Pretoria</td>
<td></td>
</tr>
<tr>
<td>Vehicular Movement/</td>
<td></td>
</tr>
<tr>
<td>Gautrain/</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City Context 3.3/</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretoria</td>
<td></td>
</tr>
<tr>
<td>City Grid/</td>
<td></td>
</tr>
<tr>
<td>Movement Channels/</td>
<td></td>
</tr>
<tr>
<td>Typography/</td>
<td></td>
</tr>
<tr>
<td>Ecological Corridor/</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Urban Context 3.4/</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muckleneuk</td>
<td></td>
</tr>
<tr>
<td>Mears Train Station</td>
<td></td>
</tr>
<tr>
<td>Elandspoor Road</td>
<td></td>
</tr>
<tr>
<td>UNISA</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Urban Frame 3.5/</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement Lines</td>
<td></td>
</tr>
<tr>
<td>Active Edges</td>
<td></td>
</tr>
<tr>
<td>Building Fabric</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arrival Threshold 3.6/</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elandspoor Road</td>
<td></td>
</tr>
<tr>
<td>Ridge Road</td>
<td></td>
</tr>
<tr>
<td>Mears Train Station</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site 3.7/</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mears Train Station</td>
<td></td>
</tr>
<tr>
<td>Elandspoor Road</td>
<td></td>
</tr>
<tr>
<td>Mears Street</td>
<td></td>
</tr>
<tr>
<td>Berea Street</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Built Fabric/</th>
<th>3/002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Union Buildings</td>
<td></td>
</tr>
<tr>
<td>Museum of Science + Technology</td>
<td></td>
</tr>
<tr>
<td>Bosman Station</td>
<td></td>
</tr>
<tr>
<td>Town Hall</td>
<td></td>
</tr>
<tr>
<td>Church Square</td>
<td></td>
</tr>
</tbody>
</table>
3/001 Pretoria Skyline from Union Buildings [Author]
3/002 Africa / Asia / Europe [Author]
3/003 Construction Laborers [EQF Project Managers at Maponya Mall, Soweto]
3/004 Gauteng Province [Author]
3/005 South Africa Map [Author]
3/006 Africa / Asia / Europe [Author]
3/008 Main Vehicular Transport Network for South Africa [Author]
3/009 Johannesburg Skyline from N1 heading North [Author]
3/010 Pretoria Signpost on N1 on Midrand heading North [Author]
3/011 Johannesburg Skyline + Main Transport form [Author]
3/012 Signage on the M1 towards Johannesburg CBD [Author]
3/013 South Africa Map [Author]
3/014 Provinces in South Africa [Author]
3/015 Gauteng [Author]
3/016 Pretoria + Johannesburg Road Transport Network [Author]
3/017 UNISA from M7 [Author]
3/018 Site Workers [EQF Project Managers at Maponya Mall, Soweto]
3/019 Johannesburg Skyline + M1 [Author]
3/020 Skilled Labour at Work [EQF Project Managers at Maponya Mall, Soweto]
3/021 Pretoria + Johannesburg Relationship Diagram [Author]
3/022 Jacaranda's [Author]
3/023 Pretoria Aerial + Context [University of Pretoria Geography Department]
3/024 Pretoria CBD Movement Lines [Author]
3/025 Road Signage on Midrand heading Northwards [Author]
3/026 Union Buildings [Author]
3/027 Pretoria + Site Location [Author]
3/028 Church Square [Author]
3/029 Pretoria Typographic [Author]
3/030 Tshwane Inner City Programme, Spatial Development Framework Presentation Feb 2006 [Dept. of Public Works + Dept. of Public Service + Admin]
3/031 Union Buildings [Author]
3/032 Pretoria Town Hall [Author]
3/033 UNISA from Groenkloof [Author]
3/034 Museum of Technology [Author]
3/035 Pretoria Train Station [Author]
3/036 UNISA [Author]
3/038 Edging Fabric of Urban Precinct [Author]
3/041 View Down Mears Street [Author]
3/042 South Entrance to Pretoria CBD [Author]
3/043 Elandsport Road Panoramic North-Eastwards [Author]
3/044 Urban Area of Focus [Author]
3/045 Zones of Activity [Author]
3/046 Lines of Movement through Urban Precinct [Author]
3/047 Active Edges of Urban Precinct [Author]
3/048 Edging Fabric of Urban Precinct [Author]
3/049 Elandsport Road outward-bound view [Author]
3/051 Pick-Up-and-Drop-off area on Elandsport Road [Author]
3/052 Elandsport Road viewing South Towards UNISA [Author]
3/053 Elandsport Road Pedestrian Edge [Author]
3/054 Elandsport Road Vehicular Entrance [Author]
3/055 Pedestrian Crossing on Elandsport Road [Author]
3/056 Key Plan [Author]
3/057 Elandsport Road outward-bound view [Author]
3/058 Pick-Up-and-Drop-off area on Elandsport Road [Author]
3/059 Ridge Road + Elandsport Road Junction [Author]
3/060 Elandsport Road Diagram [Author]
3/061 Mears Train Station [Author]
3/062 Mears Train Station platforms [Author]
3/063 Mears Train Station Control Tower [Author]
3/064 Key Plan [Author]
3/065 Mears Train Station [Author]
3/066 Mears Train Station Retaining wall [Author]
3/067 Mears Train Station + North Edging Context [Author]
3/068 Mears Train Station from Willow Road [Author]
3/069 Elandsport Road Panoramic [Author]
3/070 Mears Train Station Pedestrian link to Vehicular Link [Author]
3/071 Mears Street becomes Elandsport Road [Author]
3/072 Key Plan [Author]
3/073 View down Mears Street towards Pretoria CBD [Author]
3/074 Site Elevation Facing onto Mears Street [Author]
3/075 Site viewing South East + Mears Street [Author]
3/076 Site from Berea Street Entry [Author]
3/077 Site Viewing South out towards Mears Train Station [Author]
3/078 Site Panoramic Viewing West to North to Berea Street [Author]
3/079 Key Plan [Author]
South Africa is located on the Southern tip of Africa [3/006 + 3/008] with a population of approximately 44,187,637 people. The distribution of ethnic groups consist of 79% Black African’s, 9.6% Whites, 8.9% Coloured and 2.5% Indian/Asian. [www.cia.gov 2006/10/02] South Africa is termed a ‘Developing Country’ still coming to terms with the suppressive effects of Apartheid resulting in the majority of the population being uneducated and having a low level of skill. Government’s main initiatives are to ‘alleviate poverty’ and ‘create housing’. However a very high unemployment rate of approximately 26.2% [Ballim 2005:6] means a drastic move towards ‘Job Creation’ and ‘Skills Development’ is required to increase the general skills level of the workforce.

History reflects the arrival and clashes between British and Dutch Settlers to South Africa and the native African People. The discovery of diamonds [1867] in Kimberly in the Free State and gold [1886] located in the region now known as Gauteng were and still are, the generators for development in South Africa. The South African History in the last 200 years [3/007] reflects a sequence of events resulting from an influx of foreigners into South Africa causing a mix of cultural conflicts. The largest change for South Africa was the abolishment of Apartheid and a move towards a multi-racial democracy with the election of Nelson Mandela in 1994. It is essentially from this point that South Africa is seen as the ‘Rainbow Nation’ consisting of 11 Official Languages and a culture which attempts to move towards a more integrated existence and individual equality. The main dynamics which dictate South Africa are those of the Mining Industry and Tourism with Transport in the form of Roads and Vehicular Movement being the means to development and growth.

Vehicular movement is the main connection and transport network throughout South Africa shown in 3/008 whereby cities are linked via main roads such as the N1, N3, N4 and N12. South Africa is a country which relies heavily on it’s Road Transport as the main generating dynamic in the movement of people and goods. Vehicular culture is a definite feature in the ‘South African Lifestyle’ whether it be by car, bus or taxi.
Though the smallest geographically sized province in South Africa, Gauteng is reputed as the Economic Hub and main contributor to the GDP [Gross Domestic Product] of South Africa. Estimated as contributing more than 38% towards the GDP of South Africa and 9% of the GDP for the entire African Continent. [www.en.wikipedia.org 2006/10/2006] Gauteng has a population of approximately 8 837 178 people recorded in the Census of 2001 however CSIR estimates a population of 9.5 Million with a growth of 100 000 people per year.

Johannesburg and Pretoria [Tshwane] are the two main cities located within Gauteng with Johannesburg as the ‘Economic Capital’ and Pretoria as the ‘Administrative Capital’. Due to the Mining Industry Johannesburg has developed into the largest Economic generator and now has an array of contributors such as ‘finance, manufacturing, technology and telecommunications’. [www.en.wikipedia.org 2006/10/2006]

Pretoria houses the ‘Governmental Quarters’ located in the ‘Union Buildings, the ‘National Department of Education’ and an array of Education Facilities promoting Gauteng as the Education centre of Learning. Gauteng consists of UNISA [the University of South Africa], University of Pretoria and Tshwane University of Technology along with the University of Witwatersrand, University of Johannesburg, Vaal University of Technology and Medical University of South Africa.

Large numbers of people commute every day from Pretoria to Johannesburg along two main vehicular links, the N1 and the N14 which results in traffic congestion especially along the N1 along Midrand during working hours and peak rush hour 7h00-11h00 and 16h00-18h00. The economic structure is such that Johannesburg holds a lot of economic activity however people are inclined to live in Pretoria and prefer to commute. The implementation of a High Speed Link, the Gautrain between Pretoria and Johannesburg will attempt to change this mentality of vehicular movement and promote public transport.
The Urban Planning of the Jacaranda City [3/022] Pretoria, takes on a grid like pattern running North-South and East-West within two ridges forming the city valley. [3/ 023 + 3/ 024] The North Ridge forms part of the Witwatersberge and Dasspoortrand, and the South Ridge forms part of the Langeberge and Kwaggasrand. Due to this typography the two main entry points into Pretoria from Johannesburg are those from the East from the N1 [3/023] and N4, and from the South via the N14, M18 and R21. This dynamic typography allows for amazing views for the location of important monuments in Pretoria such as the Union Buildings [3/026 + 3/031] viewing over Pretoria on the South side of the North Ridge of the Witwaterberge. An important line of movement for Pretoria is that of Church Street running from East to West which is both a historical and an active movement line. The centre of the CBD can be seen as the is the cutting point at which Church Street and Paul Kruger Street meet creating the historical point Church Square. [3/026] The implementation of Nelson Mandela Avenue as a green corridor movement channel running parallel to the Apies River creates a fast moving link into the city directly from the N14 and services the CBD Centre [3/027]. Elandsport Road distributes visitors towards Sunnyside and Hatfield forming the South and Eastern edge of the CBD.
The Inner City proposal for development [3/030] intends to build on the existing grid of Pretoria with the intention of accentuating the two Axis roads Church Street and Paul Kruger Street with governmental Offices creating ‘Governmental Boulevards.' Emphasis is on connection to landmarks such as the old Union Buildings and the new Freedom Park development by creating visual linkage and physical linkage to Church Square.

As a Historical base Pretoria is known for the Voortrekker Monument, the Union Buildings [3/027 + 3/031] and many Education facilities and museums such as the University of Pretoria, UNISA [3/033 + 3/036], the Museum of Technology [3/034] and the Transvaal Museum. UNISA sits as a prominent landmark located on the Southern Entrance into Pretoria and is visible from the N14 highway approach. Other important features of Pretoria include Bosman Station [3/035], the Town Hall [3/032], and Church Square [3/028] all located in the CBD.
Urban Context 3.4/ Muckleneuk
Elandsport Road
Mears Train Station
Mears Road

Illustrations/
3/037 Elandsport Road Pedestrian Edge [Author]
3/038 Elandsport Road Pick-Up-and-Drop-off area inward-bound [Author]
3/039 UNISA from M7 [Author]
3/040 Aerial + Local Context Diagram [Author]
3/041 View Down Mears Street [Author]
3/042 South Entrance to Pretoria CBD [Author]
3/043 Elandsport Road Panoramic North-Eastwards [Author]
CONTEXT STUDY 3/ Urban Frame 3.5/

THRESHOLD OF ENTRY

CONTEXT

LINES OF MOVEMENT

ACTIVE EDGES

URBAN PRECINCT

EDGING FABRIC

POTENTIAL SITE LOCATIONS

Urban Frame 3.5/
Movement Lines
Active Edges
Building Fabric

Urban Frame 3.5/
Movement Lines
Active Edges
Building Fabric

Urban Frame 3.5/
Movement Lines
Active Edges
Building Fabric

Urban Frame 3.5/
Movement Lines
Active Edges
Building Fabric

BLANCHE BEVAN S25013654

MArch (Prof) Thesis 2006 UNIVERSITY OF PRETORIA, SOUTH AFRICA
CONTEXT STUDY 3/ Arrival Threshold 3.6/

Arrival Threshold 3.6/

UNISA

SOUTH TOWARDS FOUNTAINS CIRCLE

3/055

Pedestrian Crossing on Elandspoort Road

3/056

Key Plan

3/057

Illustrations/ RIDGE R ROAD TO UNISA

3/052 Elandspoort Road viewing South Towards UNISA [Author]

3/053 Elandspoort Road Pedestrian Edge [Author]

3/054 Elandspoort Road Vehicular Entrance [Author]

3/055 Pedestrian Crossing on Elandspoort Road [Author]

3/056 Key Plan [Author]

3/057 Elandspoort Road outward-bound view [Author]

3/058 Pick-Up-and-Drop-off area on Elandspoort Road [Author]

3/059 Ridge Road + Elandspoort Road Junction [Author]

3/060 Elandspoort Road Diagram [Author]
CONTEXT STUDY 3/ Arrival Threshold 3.6/
CONTEXT STUDY 3/ Site 3.7/

- Site 3.7/
  - Mears Train Station Pedestrian link to Vehicular Link
  - Mears Street becomes Elandspoort Road

- Key Plan
- View down Mears Street towards Pretoria CBD
- Site Elevation Facing onto Mears Street

- Illustrations:
  - Elandspoort Road Panoramic
  - Mears Train Station Pedestrian link to Vehicular Link
  - Mears Street becomes Elandspoort Road
  - View down Mears Street towards Pretoria CBD
  - Site Elevation Facing onto Mears Street
### 'Meaningful places are those where life is celebrated, where equity and overlap are achieved in access to the facilities of the city; where there is a balance between constraint and freedom to act; where the common denominator is man on foot; where the necessary simple human needs are accommodated; where community and that necessary sense of belonging can exist freely; and where complexity and therefore secrecy make areas most liveable.' [Nuttall 1993:17]

<table>
<thead>
<tr>
<th><strong>Introduction 4.1</strong>/</th>
<th><strong>Architecture 4.3</strong>/</th>
<th><strong>Technology 4.4</strong>/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existential Space</td>
<td>Space</td>
<td>Cities</td>
</tr>
<tr>
<td>City Systems</td>
<td>Expression/</td>
<td>Logistics Systems</td>
</tr>
<tr>
<td>Urban Design</td>
<td>Character/</td>
<td>Change</td>
</tr>
<tr>
<td>Architecture</td>
<td>Logic/</td>
<td>Social Transformation</td>
</tr>
<tr>
<td>Threshold</td>
<td>Structure/</td>
<td>Spatial Transformation</td>
</tr>
<tr>
<td>Connection</td>
<td>Material Realization/</td>
<td>Digital Society</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td>Communication</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Urban Design 4.2</strong>/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Urban Design</td>
</tr>
<tr>
<td>Access/</td>
</tr>
<tr>
<td>Interaction/</td>
</tr>
<tr>
<td>Urban Performance/</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Function + Form</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency/</td>
</tr>
<tr>
<td>Practicality/</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Movement</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience/</td>
</tr>
<tr>
<td>Physical City/</td>
</tr>
<tr>
<td>Functional City/</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Image + Communication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Greene</td>
</tr>
<tr>
<td>Forty</td>
</tr>
</tbody>
</table>

*architecture is the articulation of space so as to produce in the participator a definite space experience in relation to the previous and anticipated space experiences*. [Bacon 1957:1]
List of Illustrations

4/001 Architecture + Theory + Philosophical Diagram [Author]
4/002 Mind + Body [Author]
4/003 Informal Transport Interchange on Elandspoort Road [Author]
4/004 Space + Relations [Author]
4/005 Archway in Pretoria CBD [Author]
4/006 Polleys Arcade Pretoria CBD [Author]
4/007 Zoning Applied in KM radius around site [Author]
4/008 Centrality Concept [Author]
4/010 Essence of Architecture [Author]
4/011 Visual Capabilities of people [Author]
4/012 Visual Capabilities of People [Author]
4/013 Circulation Edge [Author]
4/014 Mental Perception + Visual Sensation Diagram [Author]
4/015 Experience according to Norberg-Shultz [Author]
4/016 Essence of Architecture [Author]
4/017 Edge Condition [Author]
Architecture can be seen as to 'represent a means to give man an existential foothold' and involves the 'concretion of existential space'. [Norberg-Shultz 1980:3] 'Existential Space' according to Norberg-Shultz, is that which comprises the 'basic relationship between man and his environment'. Edmund Bacon continues this notion in his book 'Design of Cities' where he states that 'an expression of philosophical interaction of the forces of mass and space'...reflects the relationship between man and nature and man and the universe'. [Bacon 1957:16] 'Mass' and 'space' being the basic ingredients of architectural design, just as Trancik declares 'Architecture' to consist of solids and voids and the 'articulation and differentiation of solids and voids produces a fabric of the city which establishes physical sequences and visual orientation between places.' [Trancik 1986:100]

Our universe involves cities and the interaction between Urban and rural landscapes and ourselves. There exists spheres of confluence around masses and it is the points at which different masses come into the proximity of each other, which is of great interest. These are zones of blurring where one environment meshes with another or zones of definite exclusion where one environment blocks off itself from anything else. The thresholds into and out of cities and the points at which man-made [urban] environments end and natural environments begin and visa versa are the edges which man truly experiences and is aware of. This point of threshold stands as a threshold for multiple systems on different scales.

Architecture in it’s purest form can be seen to involve the process of enclosure, creating boundaries and defining one space from another. One can see a boundary as limiting yet is exactly the same as a threshold. A threshold however is invariably seen as an entrance or zone of passage which is un-inhibiting yet definitely a point of introduction for the next space. Movement between spaces makes one physically and visually aware of being on the inside, or outside of one or other space, and thus aware of our location within environments and essentially cities.

The functioning of a city as a system relies on the Urban Design Planning whereby the city is broken down into smaller systems which need to function in conjunction with each other and involve multiple levels of connection and communication. One can compare a city to the functioning of a machine consisting of multiple cogs working together. The more fluid and faster the movement of the machine the more work is achieved and the system requires less energy to keep it in motion. Thus movement becomes an important phenomenon in the functioning of a city and involves the activity of changing place by people and interacting with different elements of the city, such as solids and voids. Humans in the machine of the city are the molecules of oil which are carried by one cog to another and flow through the system and form part of the city fabric.

Edmund Bacon declares that 'in urban design there should be skilful development of architectural energy so that the influence of colour of the buildings radiates outward articulating the whole fabric of the city'. ‘Character of space’ is expressed through rhythm, texture and spirit and the ‘articulation of space’ is expressed through forms, textures, materials, colour and the modulation of light and shade. [Bacon 1957:16]

The Articulation of building edge [threshold] and the spaces it creates is the focus for the following dissertation. Specific attention is paid to connection and communication with the surrounding context and the potential to reinforce this through innovative design in building. Technology is becoming an integral part of our lifestyles and has the potential to affect Architecture. Thus form, materiality and surface can be transformed through innovative design. This gives architecture the possibility to aid man and stimulate man even more than ever before, creating a truly connected and communicative environment which expresses man’s place in time and character with which man can identify with.

'life is a continuous flow of experience; each act or moment of time is preceded by a previous experience and becomes the threshold for the experience'. [Bacon 1957:19]

'establish volumes of space that are in scale with the needs of the present time and defined by means which are in harmony with modern technology'. [Bacon 1957:16]
The strategy towards Urban Design in the following dissertation in the ‘development of architectural energy’ [Bacon 1957:16] is based on the amalgamation of several approaches whereby,

- **Integrated Urban Design** is perceived to aid a city through maximized access, connection and the concentration of activities to aid opportunity within an African context,
- **Urban space** is the essence of the city and the physical domain for the modern development of the commonality, and the combination of
- **Spatial Definition** with figure-ground theory and connective qualities of linkage theory and social responsiveness of the place theory is necessary.

Integrated Urban Design

Consulting the work of Cape Town based South African Urban designers David Dewar and Roeloff Uytenboogaardt in their book “South African Cities: A Manifest for Change”, the concept of Integrated Urban Design is applied to the South African context. Their approach focuses highly on **access** and connection to opportunities, facilities, special places and events of a city. A well connected system which is evenly distributed is recommended with the pedestrian mode of movement seen as the lowest common denominator when interacting with the city environment and thus the starting point of all design. They pose that logically ‘places of greatest interaction in cities’ invariably are ‘places of greatest opportunity’. [Dewar + Uytenboogaardt 1991:17] The provision of opportunity in the South African context is of vital importance in alleviating poverty. Opportunity gives people the chance to obtain work and to support themselves. A far more sustainable form of intervention when dealing with poverty.

Dave Dewar speaks of ‘Urban Performance’ as measurable by the creation of opportunity, and how ‘structural configurations’ such as ‘new hierarchical patterns of agglomeration opportunities’ [City of Cape Town, Municipal Spatial Development Framework 1999] generate greater opportunities which enhance living to a greater degree. [Dewar + Uytenboogaardt 1991:17] The ultimate desire is to create people friendly environments and ‘definite space experiences’. Dewar believes that the ‘complexity of environment’ can reflect and contribute to the richness of human experience and that ‘reflecting cultural expression’ is in ‘the making of environments’.

[Dewar + Uytenboogaardt 1991:17]

The City of Cape Town, Municipal Spatial Development Framework, August 1999 sets out strategies to implement in order to enhance the city of Cape Town. Such strategies include;

- **‘Hierarchical System of Relative Accessibility** which is part of the logical process determined by the ‘balance of potential conflicting dynamics’.
- **The Maximisation of limited Resources** in a practical approach to the realities of South Africa such as Public Transportation Systems [considered the ‘most equitable systems of transport’) which must be able to be accessed and allow the user freedom to ‘switch directions’ to ‘change modes of transport’ as easily and efficiently as possible.
- **Zoning** by dividing the city into zones relative to an ‘accessible hierarchy’ and central points which are located in relation to the distance and time span for an individual to walk from point to point. A maximum distance of 2.5 km’s is devised which is gauged as being appropriate should a person walk at a speed of about 12min’s/km therefore a maximum of 30min’s from point to point.
- **‘Expandable environments’ responding to flow the of people in order to ‘accommodate movement systems’ and the emphasis on ‘special place quality of areas’ is evident through the clustering of facilities and services at specific points. The location of valued facilities is based on the maximisation of high activity areas creating a reinforced Interlinked network and spatial framework which starts to connect on more levels and create definite spaces of place.

‘through sense of connection with a system greater than himself man achieves aesthetic satisfaction’ [Bacon 1957:15]

‘The city is the physical domain for the modern development of the commonality; we have to accept that in physical terms the city is the conjunction of its public spaces’. [Bohigas 1999:9]

Illustrations/  
4/ 007 Zoning Applied in KM radius around site [Author]  
4/ 008 Centrality Concept [Author]
According to Bohigas’s “Ten Points for an Urban Methodology”, Urban theory needs to resolve questions of ‘identity’ and ‘legibility’. [Bohigas 1999:9] Aspects of social identity is seen to relate closely to the environments in which we procreate, and thus public spaces need to respond to a coherence of form, function and image with which we can connect to, relate to and can interpret: ‘space of a collective life must be not a residual space but a planned and meaningful space’. [Bohigas 1999:9]

The ‘city’ provides a ‘language of its own’ where ‘anthropology is embodied in the street, square, garden, monument and city block’. [Bohigas 1999:9] Fragmentation and separation characteristics in urban design is a commonality in our South African city contexts and can be interpreted in the ‘lack of physical and social continuity’ of our city fabric.

The work of the Urban theorist R. Trancik in his book “Finding Lost Space” focuses on the concepts of ‘Spatial Definition’ and the ‘Integrated Approach’ to Urban Design combining ‘Figure-Ground Theory’, ‘Linkage Theory’ and ‘Social Responsiveness’. Trancik speaks of design principles which incorporate ‘Linkage’, ‘Integration, and ‘Specific Place’ to formulate characteristics of surrounding environments. These principles work towards creating the urban experience and a definite space experience. Response to ‘patterns of human activity’ reflects the necessary understanding of a city and locations dynamics in order to acknowledge the implications of intervening. He goes further to guide one to ‘identify primary spatial structure’ and to map visual quality and use these as dictators in design.

‘Public spaces give symbolic content and meaning to the city by providing gathering places, paths, transitions between public and private domains and arenas for discourse and interaction’. [Trancik 1986:100]

‘Space is the medium of the urban experience’… it ‘provides the sequence between public, semi-public and private domains’. [Trancik 1986:100]

‘Design must respond to the dynamics of social uses in its physical form’. [Trancik 1986:219]

‘Architecture should be primarily a consequence of the form of the city and of the landscape and should participate in the new configuration of these’. [Bohigas 1999:12]
Architecture 4.3/

‘architecture is the articulation of space so as to produce in the participator a definite space experience in relation to the previous and anticipated space experiences’. [Bacon 1957:1]

Edmund Bacon ascertains that the ‘conscious expression of space is essential to the highest expression of architecture’. [Bacon 1957:15] And according to Adrian Forty the expression of architecture comes down to ‘architecture as the medium of communication’ [Forty 2000:71]. If communication is about interpretation then one can agree that the ‘awareness of space is experience’ which is through the ‘manipulation of mass and space’ according to Walt Whitman, whereby the essence of design is the interrelation between these two to realise space’. [Bacon 1957:15]

The ultimate search is thus for ‘order’, through expressing meaning in a physical sense whereby the relationships between elements or components is represented in order to give man an ‘existential foothold’. Representation becomes a form of communication, legibility and logic through ordering ‘form’ or ‘mass’ and ‘space’ to order experience.

‘life is a continuous flow of experience; each act or moment of time is preceded by a previous experience and becomes the threshold for the experience’. [Bacon 1957:19]

The articulation of anything one could see as the idea of asserting ‘order’ to the natural haphazard arrangement of things. The difference between natural and man altered. Any form of alteration reflects a trace of man’s existence. The ordering of ‘space’ ‘form’ or ‘mass’ and ‘movement’ could be construed as the very essence of architecture. ‘Space’ is ordered through the implementation of ‘hierarchy’ which is interpreted and communicates a value system and aids in ‘creating a sense of place’. [Righini 2000: 14]. In the tectonics of ‘form’ or ‘mass’ order is reflected through the relationships between elements, the expressions of ‘spatial connectedness’ and through the creation of a ‘sense of visuality’. The ordering of ‘movement’ involves ‘levels of interaction’ and as Righini states the ‘dynamic element in spatial composition’ giving importance in experience. The importance of experience is acknowledged as a process when moving through space, through the ‘structuring’ of space to help one experience it and the reflection of relationships between the building and :

- Form and function enabling ‘spatial continuity’ and ‘spatial relationships’
- Movement in ‘orientation in space’
- Technology in the ‘modulation of space’

’space creates the special relation between function and social meaning in buildings’. [Hillier 1984:1]

Thus ‘thresholds’ as ‘introductory spaces’ need to be considered as important as the ‘space’ to which it is complementing, however acknowledge that it is the ‘threshold’ still and not the final destination. Connection and communication of this needs to be incorporated into the articulation of space, form or mass and the patterns of movement with which the building is coming into contact with.

‘the purpose of a building’ is in ‘ordering space’. [Hillier 1984:1]

‘one of the prime purposes of architecture is to heighten the drama of living’ [Bacon 1957:19]
Victor Hugo in his book “Notre Dame of Paris” once said ‘architecture’ can be seen as ‘the great book of mankind, man’s chief form of expression in the various stages of his development, either as force or as intelligence’. [Hugo 1978: 189 in Forty 2000:72]


‘it is through the most intimate experience of our own body and it’s projection into inanimate nature that the aesthetic perception occurs’ [Wolfflin 1886:159]

Adrian Forty speaks of architecture as an expression similar to language and he quotes Fichte Goethe whom adapted the idea of J.G von Herder that ‘language originated in the human capacity for reflection’ to then say that similarly ‘architecture was the outcome of the human will to self expression in plastic form.’ [Forty 2000:76] The idea of form being the reflection of expression and expression being a search for meaning reflecting values.

‘Goethe saw that architecture, like language was not simply a medium of individual expression, but more importantly expressed the entire collective identity of particular people, the Volksgeist’. [Forty 2000:76]

‘For in man is a plastic nature, which at once, when his existence is secure, proves active. As soon as man has nothing to worry him of to make him fear, the demi-god gropes around for matter to breathe his spirit into’. [Herder 1872 : 159 in Forty 2000:76]

Architecture has the ability to articulate our environments in order for man to be able to relate and identify with it. This communication allows man to interpret expression and locate value and meaning through experience, in interacting with two dimensional surfaces and three dimensional forms.

Our current point in time is deeply rooted in technology. The architecture gives the opportunity for further communication both physically [form] and Surface Display with Media and Image in digital format. Media and Image can be interpreted as a modern form of art. ‘Art and Architecture’ spoken of by a UNISA Architectural Academic Sabine Marschall discusses the architectural theories of P. Damaz and J. Fassler.

‘Art, for example, can describe a building’s function; it can imbue a space with a spiritual quality; it can visually enlarge a space by creating an illusion; it can confer status; it can demonstrate wealth; it can convert a neutral space into one suited for a particular ritual; it can ascertain claims about a building’s owner or users; it can establish links between cultures or attempt to recover values of the past; in short: art plays a vital role in shaping a building’s identity.’ [Marschall 2003 www.unisa.ac.za/ academic journals]

Art in Architecture reiterates ‘Architecture’ as an expression and a means to mans ‘Existential Foothold’. Surface aids in articulating space and if art is incorporated into architectural surfaces the spaces are embedded with an even greater energy. Expression is communicated and interpreted in physical form. Art which one moves in and out of but essentially serves a function with Architecture greater than it self.

‘images used in the environment can help maintain existing values as well as create evolutionary change’. [Greene 1976:116]
space creates the special relation between function and social meaning in buildings’  
[hillier 1984:1]

The ‘realisation of space’ involves the articulation of both ‘mass’ or ‘form’ and ‘space’ with careful detail to edge 
and the point at which ‘mass’ and ‘space’ abut with one another. The manipulation or articulation of space some 
might see as the ‘articulation of edge’ whereby the character is established in order to work with space to create 
place. According to Christian Norberg-Shultz ‘a place is a space which has a distinct character’. [Norberg-Shultz 
1980:3]

The theorist Bill Hillier in his book, “The Social Logic of Space”, quotes that architecture involves ‘levels of space’ 
and in essence ‘giving space and form to our material world’. [Hillier 1984:1] This he explains is achieved through 
structuring the system of space and articulating the ‘level of surface that defines space’. The ‘logic’ and ‘structure’ 
of space is derived from ‘social structure’ whereby ‘functional objectives’ important to society at present, 
concerning practically are achieved.

‘The ordering of space in buildings is really about the ordering of relations between people’  
[Hillier 1984:4]

‘functional objectives concern practicality’  
[Hillier 1984:120]

Introducing logic and rationality to the relationships of buildings and components one could see as a search for 
order and pattern. Hierarchy in order allows for ‘spatial orientation’ through logic and coherence. This clarifies 
‘organizational principles’ and ‘facilities’. [Righini 2000:47] This then enables the ‘resolution’ and ‘making of 
spatial composition’ creating meaning which is ‘attached to our experience of space’.

‘architecture needs structure and order’ and the ‘chief requirements for the creation of a comprehensible form 
are logic and coherence’ [Righini 2000:47]

Architecture thus holds the potential to order the ‘sequence of experiences’ through the ‘sequence of spaces’ 
creating a ‘spatial composition’ which expresses the way things are brought together thus introducing a logic 
through the organization of technical issues. Logic at present is located in an approach to design which enables a 
building to function to the best of it’s ability and provide the most efficient environment to aid production. 
Production being the ‘current’ measure of performance and the ‘ultimate goal’ being the maximum product from 
the least input.

‘the purpose of a building’ is in ‘ordering space’.  
[Hillier 1984:1]
The relationship between a building and its function essentially becomes an integral component in design whereby the values held by the users are acknowledged and are responded to through appropriate design in order to create an efficient building according to the users. The form and function are driven by ‘spatial continuity’ and ‘spatial relationships’ required by the users. The form of the building is determined from the function and the form reinforces the function yet at the same time holds the potential to initiate new functions which build off of the original driver.

Programme in a building is a form of order whereby specific activities are catered for with appropriate spaces. The function of a building can be seen as to express the programme to create ‘place’ and thus facilitate the activities. This is achieved through the articulation of form whereby ‘material realization’ is achieved. The direct relation through ‘material preconditions’ is said to affect programming within a building reflected in ‘patterns of movement’ which ultimately results in a ‘material realisation’. [Hillier 1996:154] ‘Material realisation’ directly relating itself to a physical concept whereby ‘physical forms possess a character only because we ourselves possess a body’ [Wolffin 1886:151] Edmund Bacon relates architecture to the idea that ‘character of space’ is expressed through rhythm, texture and spirit and the ‘articulation of space’ is expressed through forms, textures, materials, colour and the modulation of light and shade. [Bacon 1957:16]

These characteristics however are only expressed through a conscious awareness and applied logic based on a set of values derived from a specific culture. According to Karl Friedrich Schinkel architecture should ‘convey cultural meaning on many levels’ and is achieved through, ‘Tectonic, Construction logic and Efficiency of building’. [Frampton 1995:1]

Paul Righini in his book “Thinking Architecturally” speaks of form and function as reflected in the tectonics through the attitude towards ‘spatial composition and structure’. The ‘language of architecture’ in which ‘function’ is seen as a ‘rational pragmatic’ and ‘form’ as ‘aesthetic’ forming the building elements towards ‘visual logic and design’. Different functional activities have different functional requirements. Different spatial requirements have different identities and thus ‘form’ reflects ‘spatial attitude’ through ‘spatial hierarchy’. ‘Ordering ideas’ are seen to have ‘aesthetic value’ which involves giving ‘visuality’ weight through the ability of the composition to communicate and be experienced such as:

- Structure
- Spatial Organization
- Qualitative Aspects of Place
- Spatial Proportion
- Space Enclosing Systems
- Space Defining Systems


‘one of the prime purposes of architecture is to heighten the drama of living’
[Bacon 1957:19]
Architecture 4.3/

‘an axis is perhaps the first human manifestation; it is the means of every human act. The toddling child moves along an axis, the man striving in the tempest of life traces for himself an axis. The Axis is the regulator of architecture’. [Le Corbusier Vers Une Architecture]

Movement


The concept of movement is an important factor dealing with architecture because we as people are not stagnant, we move around and it is the process of movement which initiates experience and ‘movement through space creates a continuity of experiences derived from the nature and form of the spaces through which the movement occurs’ [Bacon 1957:19]

The theorist Bill Hillier in his book “Space is the Machine- A Configurational Theory of Architecture”, speaks of cities as ‘movement economies’ which incorporate a *series of movement systems* and how the design of a system should be directly related to the ‘tempo of movement’. [Hillier 1996:152] The ‘Physical City’ can be seen as ‘buildings linked by space and infrastructure’ and the ‘Functional City’ supports processes of ‘Economic, Social, Cultural and Environmental’ activity. [Hillier 1996:154]

’space is given to us as a set of potentials and we exploit these potentials as individuals and collectives in using space’. [Hillier 1996:154]

‘principle of natural movement’ is reflected in the structure relationship between the urban grid and movement densities [Hillier 1996:154]

Hillier in his article ‘Designing for Context’ relates to movement in cities as ‘patterns of pedestrian and vehicular movement’ reflected in levels of space used in urban areas. The ‘key facts in urban systems are the distributions of activities and land uses that ‘generate’ and ‘attract’ flows between geographic locations’. [Bill Hillier: www.spacesyntax.org : 23/06/2006]

‘Buildings constitute the social organisation of everyday life, as the spatial configuration of space in which we live and move… they represent social organisation as physical configurations of forms and elements that we see’. [Hillier 1996:154]

‘images used in the environment can help maintain existing values as well as create evolutionary change’. [Greene 1976:116]
‘Form’ constitutes a physical presence of expression within space as Bill Hillier speaks of architecture involving ‘levels of space’ and in essence ‘giving space and form to our material world’ through attempting to ‘structure the system of space’ through expression. Space is seen to be affected by the ‘level of surface that defines space’ which creates a ‘level of individual space’. [Hillier 1984:6] ‘Level of surface’ one could interpret as incorporating the ‘articulation of edge’ with which we physically interact with and truly experience. A specific attention to physical tectonics otherwise known as ‘texture’ as Herbe Greene states ‘our responsive recognition of such contrasts make it evident that texture is among the primary vehicles though which we understand the diversity of substances and materials in the world’. [Greene 1976:67]

The articulation of height, form and volume become the variables when dealing tectonically with space. Technology then orders space in the modeling and definition of space through materiality and in the example of ‘scale’ which affects the ‘significance of space’, the ‘positioning of spaces’ and their relation to one another.

‘space creates the special relation between function and social meaning in buildings’. [Hillier 1984:1]

‘Structure as order’ becomes an ‘ordering mechanism’ spoken of by Paul Righini. ‘Structure’ is the result of ‘construction and form’ and ‘resides in form’ such as solid, skeletal or load bearing types. ‘Structural Principles’, ‘Spatial Modulation’, ‘Hierarchy’ are all concepts towards an attitude to space which can be ordered meaningfully. ‘structural order must be given its proper role in ordering spaces’ [Righini 2000:76]

As a ‘structuring idea’ movement can order through activities requiring to be functionally related. The process of movement involves the sequencing of space destinations and movement configuration, organising patterns of spaces as links between destinations and separate movement types. The providence for movement and the acknowledgement of movement patterns brings into play the articulation of edges corresponding to moving individuals and how their needs are catered for through visuality, stimulation, connection and communication.

‘Modernists believed that “Architecture should be the product of logic…. the logic of pure form’ [Righini 2000:40]

The crafting and making of buildings can be seen as a process of detailing with materials and the ‘assemblage of components’. Construction should give possibility to expression of the above three dictators of architecture on a level with which people physically interact and relate to buildings on a human scale.

‘Character of space’ is expressed through rhythm, texture and spirit and the ‘articulation of space’ is expressed through forms, textures, materials, colour and the modulation of light and shade. [Bacon 1957:16]

Technology should embrace the functions that a space requires and communicate a language of architecture which is subtle yet orders the process of experience. Connecting and communicating on multiple levels so that the user fully interacts and experiences architecture and their environment.

‘the ordering of space in buildings is really about the ordering of relations between people’. [Hillier 1984:2]
To be in harmony with modern technology in this day and age requires the acceptance of computer technology into our lives. Computer technology is incorporated into the cars we drive, the way we communicate i.e. Email, internet, the way we learn and the way we live. Communication networks through internet allow global connection at the click of a button and ultimately our city environments which rely on the careful functioning of systems to allow our cities to function efficiently and to handle the movement of People, Goods, Information, Money and Capital.


‘the idea of the city changes as the city changes as we consume new media’ [Easterling 2004:19]

Manuel Castellas follows on from Eastering with “Space of Flows, Space of Places: Materials for a Theory of Urbanism in the Information Age”, in Stephen Graham’s “Reader-Urban Reader Series”, in which he declares that ‘cities are caught up in a complex interplay of space of flows’ as a result of ‘accelerating domains of trans-local and trans-national technological movement and flow’. Castellas’ view is that the ‘changing nature of social movements and social identities’ is evident in the ‘changing geographical structures of cities around the world’. [Castellas 2004:83] Function, form and meaning alters dependent on the ways in which they are produced reflecting the interplay between Spatial Transformation and Social Transformation. Transformations in ‘economic dynamics’ affects ‘urban physical form’ in essence, ‘spatial transformation is a fundamental dimension of the overall process of structural change’.

‘space does not reflect society, it expresses it and is a fundamental dimension of society, inseparable from the overall process of social organisation and social change’. [Castellas 2004:83]

Our current point in time is expressive of a lifestyle altered by technology and especially computer technology. One could term us the Digital Society, the Network Society, the Information Age and conceive of our culture as technologically based. The largest reflector of this is in the realm of communication whereby the internet is providing the opportunity for people to interact. ‘Virtual Space’ is forming a new dimension in which people escape the ‘real world’ to engage in mental stimulation. However we are still concretely transfixed to our real world situation no matter how many hours we spend surfing on the web, imagining we are in paradise. The art is in using technology to aid our real world environment and thus essentially communication and connection. One should take advantage of ‘cities as communication systems’… ‘transformed by the interface between electronic communication and physical interaction by the combination of networks and places’. [Castellas 2004:83] Expression through technology should still be about communication and connection of people and the ‘diversity of expressions of local life, relationships to media culture’ informing a ‘new form of Sociability’ spoken of by Castellas. This is achieved through ‘public spaces’ which initiate ‘social interaction’ and are the ‘communication devices of our society’.

‘Architecture is as much concerned with beauty, style and aesthetics as it is with technology, economics and politics. It is the product of architects, engineers, builders and entrepreneurs; it is used by ordinary people whose voices until recently have rarely been heard’. [Conway + Roenisch 1995:8]
The Design aim is therefore, to reinforce the Urban Frame to express a threshold on the periphery of the city and to concede that it is most definitely connected and needs to be layered with more connection lines and communicate to the city system.

Connection being the means of interaction which enables communication through interpretation. Visual and physical connection are the two main factors of connection in architecture. However connection can also relate to psychological connection through knowledge. Knowledge is facilitated by communication. Communication being the means to expressing man’s ‘existential foothold’ spoken of by Norberg-Shultz. Communication can be in the form of symbolic form, this being the ordering of forms to create hierarchy, reflecting value. Another form of Communication can be seen as that of Art. Art being an expressive example of man’s traces. The intention with the following dissertation is to combine the aspect of Art and Architecture. Surface Display becomes an Artistic Expression and gives structural architectural elements the opportunity to provide that much more. It is the strategic location of the following dissertation which allows for this approach to design.

The aim is to define the threshold of access into the city and to maximize facilities and services at the threshold. This allows for maximum access and opportunity for interaction. This then introduces one to the city and provides the realm of space, making place, and in turn making the city a socially rich, efficient, interactive and economic opportunity providing place, reflective of a new sociability and reflective of our current point in time.

Connection and Communication become the theoretical Concepts for the following dissertation. Connection between objects, people, media and the world on multiple levels through different means of Communication. Communication goes further into locating oneself within our world and within time. Current Architecture needs to set new boundaries and make use of new technologies to achieve new environments. But connection to the whole i.e. the city environment and even the world need to be deeply etched within New Development. This then enables a continuity and sequence connected to the whole which overall is a reflection and expression of a context which relates to the people whom use it.

‘Architecture should be primarily a consequence of the form of the city and of the landscape and should participate in the new configuration of these’. [Bohigas 1999:12]

The aim is to suggest spaces and edge these to allow for activities which can connect and enhance the movement channels which cross the intervention such as;

- **Pedestrian routes**: these require shelter, safety, stop off points and interactive edges for trade, communication through visual stimulation and appropriate physical interventions allowing for maximum efficiency and a stimulating environment within which one can orientate oneself in.

- **Vehicular Movement**: this needs to be uninhibited so as to allow fast access to the CBD however needs to be controlled so as not to impact detrimentally on the surrounding context as a brutal highway. The opportunity to stop and park and change modes of transport is needed along with visual display in order to communicate location to the passer by and to create a definite space experience and visual introduction on arriving into Pretoria.

- **Public Transport**: the Metro Rail and the Gautrain are limited in interaction opportunity due to the dynamics of the technology, however visual interaction is possible whilst in movement and interaction between the transport interchange facility and the context is still possible. Sound, wind and dirt barriers need to be

Architecture consists of solids and voids and the 'articulation and differentiation of solids and voids produces a fabric of the city which establishes physical sequences and visual orientation between places.’ [Trancik 1986:100]
Conclusion 4.5/

Edges can incorporate buildings and will aim to reinforce the Urban Design concepts through creating a fully integrated building which connects with the context through expressing the understanding of the potential that mass holds. Working from a programmatic point of view, education, production and display hold the possibility to communicate and integrate with the city fabric. This holds challenges involving security for the facility and the functioning of a city. The ordering and edging of public spaces and semi-public space area and private areas specifically for the students becomes a design challenge. In this specific location connection to features of the Urban fabric as far as residential areas of Muckleneuk and Sunnyside, Mears Train Station, Elandspoort Road, pedestrian movement routes and UNISA, are all important factors. They need to be responded to through the form of the building, the spaces it edges and creates and the impact it has on these systems.

Levels of interaction involve the interplay of the horizontal and vertical axis thresholds through movement. Movement past and through the threshold. Building involves the method in which each mode of movement is handled with specific attention to experience through visual communication and physical connection. Depth in interaction depends on form, whereby materiality [glass, canvas, solid concrete], rigidity [moveable forms, sliding screens] and surface [wall, roof, floor, ceiling] hold great potential for expression, communication and connection.

Connection and Communication are to be ingrained into the following dissertation in both Urban Design and Building Design. The creating of Thresholds between spaces accentuates spaces and defines spaces to communicate an experiential and architectural language. Surfaces are to be used in both ‘articulating edge’ and in creating stimulating visual edges. Art and Architecture are manifested in an attempt to provide canvases for expression whilst still serving an Architectural and Urban Fabric function.
In a Metaphysical viewpoint, ability to design is one of the most precious qualities bestowed upon mankind. Building design is a very compressive creative activity that encompasses all the dimensions of human endeavour, including humanities, art, sciences, technology and time. [Mathur 2004:128]
List of Illustrations

5/001 UNISA from the M7 [Author]
5/002 Lafarge Cement South Africa Logo [www.concretesociety.co.za or www.lafarge.co.za 02/10/2006]
5/003 Mittal Steel Logo [www.mittal.co.za or www.iscor.co.za 02/10/2006]
5/004 Amsteele Systems [www.amsteelesystems.com 02/10/2006]
5/005 Arrival to site Diagram [Author]
5/006 Spaces + Connections in Building [Author]
5/007 South Pretoria from UNISA [Author]
5/008 UNISA from M7 [Author]
5/009 UNISA from Groenkloof [Author]
5/010 UNISA Landmark [Author]
5/011 UNISA Landmark from N14 off-ramp [Author]
5/012 View down Pretler Street from UNISA [Author]
5/013 Informal Trade [Author]
5/014 Typical Street trade [Author]
5/015 Students passing Site [Author]
5/016 Aerial of South Entry into Pretoria [University of Pretoria Geography Department]
5/017 Arrival to site [Author]
5/018 Movement within Building [Author]
5/019 Spacers + Connection in Building [Author]
5/020 Public Venues [Author]
5/021 Display Surfaces [Author]
5/022 Cartoon [www.cnci.org.za 02/10/2006]
5/023 Tilt-up Construction [www.cnci.org.za 02/10/2006]
5/024 Tilt-up Construction [www.tiltupnews.com 02/10/2006]
5/025 Steel + Concrete Construction [EQF Project Managers at Maponya Mall, Soweto]
5/026 Steel Detail at the University of Pretoria Law Building [Author]
5/027 Steel Louvre System at the Department of Science + Technology [Author]
5/028 Roof Plan of Design [Author]
5/029 CMA Logo [www.cma.org 02/10/2006]
5/030 Lafarge Cement South Africa Logo [www.concretesociety.co.za or www.lafarge.co.za 02/10/2006]
5/031 Holcim South Africa [www.holcim.co.za 02/10/2006]
5/032 Mittal Steel Logo [www.mittal.co.za or www.iscor.co.za 02/10/2006]
5/033 Amsteele Systems [www.amsteelesystems.com 02/10/2006]
5/034 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/035 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/036 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/037 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/038 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/039 Section B-B Through Building + Mears Train Station [Author]
5/040 Section C-C Through Entrance Connecting Access Link [Author]
The proposed precinct for development needs to incorporate aspects of catering for the general community, the students of UNISA, the city residents and the visitors of Pretoria. Essentially Elandspoort Road is an Entry threshold to the CBD on the periphery of the city to the South. Muckleneuk is the residential area located on higher ground viewing the city from the south and edged by the campus’s of UNISA. UNISA Main Campus sits as a landmark on Bourkes Hill and is visible from a long distance as one moves towards Pretoria along the N14 from Johannesburg. Visual connection with UNISA is cut as one enters onto Elandspoort road from Fountain’s Circle resulting in a disorientation of entry into the city. Linkage between UNISA’s main campus and it’s main form of access from Elandspoort Road via Ridge Road is currently under development from the University with a proposed new Entrance and Visitors Centre.

Considering the threshold of entry is used by many visitors to Pretoria it would be appropriate to line the edges of Elandspoort Road with commercial and active use buildings to take advantage of the passing activity and buffer the residential area of Muckleneuk. Currently Elandspoort Road is edged by Residential houses , UNISA student accommodation blocks, undeveloped land and Mears Train Station which appears to be unsafe and underutilized due to it’s unkempt state.

The location of a train station, vehicular access and current pedestrian routes by students moving along Elandspoort Road from UNISA’s Main Campus and Sunny Side campus call for the attention of a transport interchange which already has the infrastructure but is not capitalized on at this convergence of activity. There even exists an informal pick-up-and-drop off area which is mainly used by informal laborers awaiting temporary work from locals whom stop with their utility vehicles to pick up several workers at a time. Access to this economic opportunity hub is possible already but it can be available to many more people if the following precinct is developed to accommodate activity and provide an environment which is truly a place and a threshold where people can meet and gain access to opportunity.

Opportunity or exposure can even be simply visual, as one passes by in a car. A burst of information expressive at a point of entry where scenery is changing from landscape to urban fabric is a prime location. The process of change can be communicated to create a connected sequence of arrival. Display in a strategic location can have maximum impact in the smallest of quantities. Take for example any building, the entrance and display board is positioned for the first few steps of any visitor into the building in order to communicate information required at the precise moment of arrival. Such a facility can be provided along Elandspoort Road and can be incorporated with the University of South Africa in providing a continued canvas from the already expressive monument of UNISA main campus and introducing people to Pretoria. The process of creating an urban fabric which has a closer scale to individuals passing it and really interacting with it to carry them into the CBD of Pretoria.
The proposed Urban functions are those of catering for movement, meeting, interacting and changing direction or modes of transport as shown in illustration 5/016.

Modes of transport common to the following precinct include pedestrian[ ], vehicular[ ], bus and taxi. Essentially Elandsport Road and Mears Street predominantly cater for vehicular movement occurring haphazardly along side. The stream of traffic entering off of the N14, R21 and M18 is initially slowed down by Fountains Circle and a traffic light intersection between Elandsport Road becoming Mears Street and Ridge Road, providing a pedestrian crossing. Elandsport Road also has an informal open area of land, used as a pick-up-and-drop-off area for outward bound traffic however is not catered for nor designated as legal stopping point for traffic. Development in conjunction with the Gautrain will be the closing of Willow Road and the extension of Ridge Road [ ] across Elandsport Road to provide for traffic to turn off of Elandsport Road towards the CBD.

The three categories of users are those of business commuters moving into and out of the city by car, students moving to and from UNISA’s Upper Campus and Sunnyside Campus, residents of Muckleneuk moving towards work in the business areas of Pretoria and temporary job seeking individuals arriving by train from further afield.

Students are essentially commuting by foot or minibus taxi along Elandsport Road and the UNISA movement Axis along Preller Street running North South between campuses. Vehicular movement is that of visitors to Pretoria predominantly whom require a medium speed link into the CBD of Pretoria via Sunnyside. The sequence of movement for train users whom make use of Mears Train station seems to be that of the arrival of temporary job seeking individuals to the precinct whom frequent the Elandsport Road’s pick-up-and-drop-off area until picked up by an employee driving out of Pretoria.

Elandsport Road does not hold itself as a grand meeting place due to it’s nature which is dominated by a fast moving stream of traffic into the city. To attempt to hinder this movement is not the intention at all with the following dissertation. To provide a purely pedestrian environment would be ideal but re-routing traffic does not solve a social problem which requires the integration of people to create a dynamic complex city which is what real urban life should be about. The intention is to define distinct channels of activity and encourage the interaction between activities to happen within thresholds between channels. To the South of Elandsport Road there does exist a green space with trees which create a green buffer for the residents of Muckleneuk. Residents refrain from using it due to it’s great exposure to traffic i.e. visitors to Pretoria [Total strangers] but the students do use it as a stopping and shady point on route. The ideal location for meeting places are those where people change modes of transport i.e. latching off of Mears Train Station. An attempt to locate social spaces which are connected to the context and in a sense informs buildings as much as they are informed by it would be appropriate. Allowing for opportunities such as interaction caters for a distinct city living quality which emphasises the advantages of a city.
The proposed facility needs to accommodate aspects which facilitate the building as a venue for education, the production of media and image and the display of media and image through audio visual venues, display screens and gallery spaces.

The functioning of an educational facility revolves around the circulation of students whom make use of various components of the building such as lecture venues, workshops, library facilities, internet/media zones and various services which need to accommodate large numbers of users. Relief spaces or social spaces need to allow students to congregate and gather before entering into venues so as to encourage the concept of working inside and relaxing outside. Thresholds become important zones of activity and enable the defining of space in order to differentiate between inside and outside. The sequence of engagement with the building is expressed in the diagrams below. 5/ 018 [A] Indicates student movement patterns and access to the building. 5/ 019 [B] Indicates the movement of students within the building. 5/ 020 [C] Indicates the spaces connected to education venues providing relief spaces, gathering spaces and ultimately access to the outside.

Production

The functioning of a basic production base for media and image should allow the opportunity for students currently studying to interact with the business world and to obtain direct practical experience. This could be envisaged in the form of a small radio broadcasting venue or recording studios complemented by necessary office space required for general advertising studios. Such products could be that of advertising billboards, poster displays or radio/music releases. The intention would be provide a starting opportunity into the field of media and image.

Display Venues

The functioning of a display venue can be seen as expressing the outcomes of such an education, and production facility so as to provide a canvas of communication to the city context and passing traffic. ‘Display’ one can see as being a form of entertainment. Media and image allows for different forms of display such as cinema entertainment, external screen display, gallery display cases, outdoor theatres at night and the opportunity for projection onto surfaces or simply within space. 5/ 021 [A] Locates venues for entertainment and 5/ 022 [B] reveals opportunities for display surfaces as a result of responding to the context.

Display Screens

Technology is the generator of innovation and allows for various experiences. Environments which can grasp and play with the changing forms of technology hold the opportunity to stimulate people and incorporate more of a virtual experience deeply grounded in a real world. The need to escape would not be necessary because technology is able to enhance our real environments.
The intention is to provide a building which doubles up on its facilities in order to cater for both Education and Commercial purposes whilst being clustered together around the concepts of ‘media’ and ‘image’. These themes are the drivers to cater for the present students of UNISA as well as to communicate with individuals passing by and to encompass the undeniable truth that digital culture and technology is very much a part of our lives. The strategic location of the facility further supports the opportunity for optimising edges for display to transport corridors as individuals move into and out of the city every day. Change and fast change is a dynamic of our current culture. Screen display allows for this as opposed to sculpture or art work. Indeed as the inner city thrives and people stop commuting such great distances as they do now, the function of the building starts to become more of a canvas of orientation and communication for individuals visiting the city, so as to provide an introduction to the city. As society changes, activities and lifestyles change and thus environments should accommodate for this.

The experience of architecture should not simply involve only the physical movement into a building. Ideally with this project the experience of architecture can in fact be that of just passing it. Whereby a building becomes more than just a form but a canvas which can express architectural elements and thus allows passer bys to understand the building, it’s functions, the activities which are held within it and allow for connection with the users whom inhabit the building. Legibility from form needs to guide a visitor to the area and then eventually the building.

Order

The process of arrival for a visitor needs to be structured in order to provide a logical process of physically interacting with the building. The distinct location of the entrance helps obtain the necessary guidance to the different parts of the rest of the building. Facilities which will have large numbers of new visitors need to be able to communicate their layout simply. Communication through tectonics and scale provides the architectural language which both users and passing individuals can understand through experience. The definitions of a threshold emphasise the transition from one space to another and communicates a process of experience.

Threshold

Vertical Connection deals with sunlight, sky and openness to the environment and in part the process of defining the difference between inside and outside. The process of creating enclosure and safety from the elements. Horizontal connection seems deeply rooted in the connection of inside to outside through transparent materials such as windows. Vertical connection however is still deeply affected by gravity whereby roofs are invariably solid and define the inside from the outside by providing the closure aspect to architecture.

Education

The application of courtyards allows for the congregation of students outside and in the sun before they disperse into venues and facilities clustered around the courtyards. There is a direct interaction with the outside within the courtyards allowing for a more public interaction for social activities. This is then very different to the internal environment of a lecture venue which needs to be able to be completely shut off from the external world so as to minimise distraction. The threshold between these two spaces then needs to be in some way different to each of these spaces yet hold traces to each in order to structure the transition from one to the other.
Due to the nature of the building consisting of multiple functions the locations for adequate space and necessary facilities is dictated by basic recommendations according to “Neufert’s Architects Data” and “SABS Standards”. The guides are based on activities which can be catered for within a certain space and is calculated as appropriate for services required to support the specific activities. A mixed array of functions for the building will enable a more sustainable environment which will cater for a large range of people and a variety of needs at the same time as capitalizing on facilities which can be shared by both categories of function. Loose fitting design also favours future alterations or changes in use which can still be accommodated. The basic needs are centred around Education and Commercial Entertainment / Office Spaces and Services required to support these.

**Education**

The following facility will focus on adult education accommodating lecture venues and workshop studios according to SABS 0400-1990 Occupancy / Building Classification terming the facility a Class A3 as a “Place of Instruction” and B3 as a “Low Risk commercial service”. [SABS 0400-1990: 34]. For these activities the required square meters of space per person[m²/p] and is considered to vary between 5m²/p for Class A3 activities and 15m²/p for Class B3 activities. Facilities such as Libraries, internet access and other facilities are then based according to the necessary requirements to support the total m² of all education/ lecture venues and numbers of students which need to be serviced. Library’s are Class C2 “Museum” requiring 20m²/p in order to function as required.

**Commercial**

Audio Visual Venues such as cinemas need to accommodate sufficient space to allow comfort for patrons for up to 2 hours of entertainment and necessary relief space from internal venues. This category of activity is Class A2 “Theatrical and Indoor Sport”. Display Venues in the form of Galleries are tied between Class C1 “Exhibition Hall” and C2 “Museum” requiring 10-20m²/p. Cafés are termed as “Entertainment and Public assembly” Class A1 and require 1m²/p. Sufficient kitchen and staff areas need to be accommodated approximately 45-60% of the Café, to support the size of a restaurant which in turn is dictated by the allowance of space per customer. Office space Class G1 “Offices” as a production producing venue require 15m²/p to allow for activities to occur such as meetings, desk work and studios.

Toilets catering for the above mentioned classes categorised in Table 7 of SABS 0400-1990 Part P ‘Drainage’ S on page 127 are a basic calculation for the number of users between 1000 and 500 people = 0.15WCs [including urinals] needed per person and 0.08 washbasins per person. 8 Disabled toilets have been provided with necessary ramps and lifts to facilitate access throughout the building for disabled people.

The provision of parking as Class J4 Occupancy category for such a facility is required and is calculated according to square meter’s of activity depending on use within the building. There is potential for public transport and pedestrian access to reduce the need for parking which is the preferred mode of arrival and it is highly possible due to the strategic location of the site combined with the proposal to upgrade the surrounding context to accommodate secondary transport systems. However, it is still necessary however to provide for parking which is determined by category of activity. Education based facilities require 6 bays per 100m² and commercial activity requires 4-6 Bays of Parking per 100m².

Other services include the provision of sufficient vertical circulation in the form of lifts and stair cases and fire escapes for buildings consisting of more than three floors and more than 10m in height. Regulations for Fire Escapes Routes include “the travel distance measured to the nearest access door shall not be more than 45m”. [SABS Standards 0400-1990:181] All escape routes must have a minimum width of 1.1m, with headroom of 2m and 2.4m for room height. [SABS Standards 0400-1990:184] Lift Shafts require fire resistance “of not less than the requirements for structural stability…subject to a maximum requirement of 120 minutes” fire resistance time. [SABS Standards 0400-1990:196] See Chapter 5/ on further Fire Resistance considerations.
Accommodation Schedule 5.5/

The table below reflects the breakdown of floor area and numbers of users within the facility according to use. The total floor area for the building is calculated at just under 6000m² not including basements with just under 800 users including staff.

<table>
<thead>
<tr>
<th>TOTAL SCHEDULE OF ACCOMMODATION</th>
<th>CENTRE FOR MEDIA + IMAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO ACCOMMODATE</td>
<td>BLANCHE BEVAN</td>
</tr>
<tr>
<td></td>
<td>m². total.</td>
</tr>
<tr>
<td>51% EDUCATION</td>
<td></td>
</tr>
<tr>
<td>GROUND</td>
<td>853</td>
</tr>
<tr>
<td>FIRST</td>
<td>853</td>
</tr>
<tr>
<td>SECOND</td>
<td>853</td>
</tr>
<tr>
<td>THIRD</td>
<td>426</td>
</tr>
<tr>
<td></td>
<td><strong>2985</strong></td>
</tr>
<tr>
<td>19% COMMERCIAL</td>
<td></td>
</tr>
<tr>
<td>GROUND</td>
<td>478</td>
</tr>
<tr>
<td>FIRST</td>
<td>313</td>
</tr>
<tr>
<td>SECOND</td>
<td>120</td>
</tr>
<tr>
<td>THIRD</td>
<td>207</td>
</tr>
<tr>
<td></td>
<td><strong>1118</strong></td>
</tr>
<tr>
<td>30% SERVICES</td>
<td></td>
</tr>
<tr>
<td>[admin + toilets]</td>
<td></td>
</tr>
<tr>
<td>GROUND</td>
<td>482</td>
</tr>
<tr>
<td>FIRST</td>
<td>482</td>
</tr>
<tr>
<td>SECOND</td>
<td>482</td>
</tr>
<tr>
<td>THIRD</td>
<td>344</td>
</tr>
<tr>
<td></td>
<td><strong>1790</strong></td>
</tr>
<tr>
<td>TOTAL</td>
<td>5893</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PARKING</th>
<th>m². bays.</th>
<th>bays.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUCATION</td>
<td>2985 @ 5 bays per 100 m²</td>
<td>150 @ 6 bays per 100 m²</td>
</tr>
<tr>
<td>COMMERCIAL / OFFICES</td>
<td>1118 @ 5 bays per 100 m²</td>
<td>56 @ 6 bays per 100 m²</td>
</tr>
<tr>
<td>SERVICES</td>
<td>910 @ 3 bays per 100 m²</td>
<td>27 @ 4 bays per 100 m²</td>
</tr>
<tr>
<td></td>
<td>min. 223 max. 283</td>
<td></td>
</tr>
<tr>
<td>people.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDUCATION</td>
<td>354</td>
<td>min. 233 / 777 = 0.299 bays per person</td>
</tr>
<tr>
<td>COMMERCIAL / OFFICES</td>
<td>342</td>
<td>777/233 = 3.33 people per bay</td>
</tr>
<tr>
<td>SERVICES [admin + staff]</td>
<td>81</td>
<td>max. 283 / 777 = 0.364 bays per person</td>
</tr>
<tr>
<td></td>
<td>777/283 = 2.74 people per bay</td>
<td></td>
</tr>
</tbody>
</table>

Provided for

<table>
<thead>
<tr>
<th>levels.</th>
<th>m². bays. m². per. bay</th>
<th>parking</th>
<th>circulation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASEMENT</td>
<td>1 3996 79 12.5 987.5</td>
<td>3008.5 &quot;includes 9 Paraplegic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 3996 79 12.5 987.5</td>
<td>3008.5 &quot;includes 9 Paraplegic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 3996 78 12.5 975</td>
<td>3021 &quot;includes 9 Paraplegic</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>11988 236 total provided 236 / 777 = 0.303 bays per person</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>or 777/236 = 3.29 people per bay</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BLANCHE BEVAN S25013654  MArch (Prof) Thesis 2006 UNIVERSITY OF PRETORIA, SOUTH AFRICA
The table below reflects the breakdown of floor area and numbers of users within the facility on the Ground Floor.

<table>
<thead>
<tr>
<th>Education Venue</th>
<th>No.</th>
<th>Sets</th>
<th>m²</th>
<th>No. of Users</th>
<th>No. of Staff</th>
<th>m²/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Workshop</strong></td>
<td>A</td>
<td>95</td>
<td>9</td>
<td>7</td>
<td>1</td>
<td>9.06</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>55</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>7.8</td>
</tr>
<tr>
<td><strong>Classroom</strong></td>
<td>A</td>
<td>74</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>52</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Recording Studio</strong></td>
<td>167</td>
<td>5</td>
<td>167</td>
<td>5</td>
<td>33.4</td>
<td></td>
</tr>
<tr>
<td><strong>Media Library</strong></td>
<td>224</td>
<td>40</td>
<td>4</td>
<td>6</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td><strong>Display Space</strong></td>
<td>A</td>
<td>153</td>
<td>15</td>
<td>1</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>38</td>
<td>3</td>
<td>1</td>
<td>12.8</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>853</td>
<td>100</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Commercial Venue</th>
<th>No.</th>
<th>Sets</th>
<th>m²</th>
<th>No. of Users</th>
<th>No. of Staff</th>
<th>m²/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cinema</strong></td>
<td>A</td>
<td>174</td>
<td>111</td>
<td>3</td>
<td>*includes 2 paraplegic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>174</td>
<td>111</td>
<td>3</td>
<td>*includes 2 paraplegic</td>
<td></td>
</tr>
<tr>
<td><strong>Café</strong></td>
<td></td>
<td>65</td>
<td>48</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Kitchen</strong></td>
<td></td>
<td>65</td>
<td>48</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>478</td>
<td>270</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Services Venue</th>
<th>wc</th>
<th>urinals</th>
<th>wb</th>
<th>m²/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toilets</strong></td>
<td>46</td>
<td>6</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Type 1</td>
<td>35</td>
<td>6</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Type 2</td>
<td>88</td>
<td>10</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Type 3</td>
<td>40</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Type 4</td>
<td>28</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Ground Floor Toilets</strong></td>
<td>237</td>
<td>34</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td><strong>Admin</strong></td>
<td></td>
<td>no. of staff</td>
<td>m²/Person</td>
<td></td>
</tr>
<tr>
<td>Type 1</td>
<td>53</td>
<td>1</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td>122</td>
<td>3</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td>70</td>
<td>1</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td><strong>Ground Floor Admin</strong></td>
<td>245</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>482</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td><strong>Final Total</strong></td>
<td></td>
<td>1813</td>
<td>408</td>
<td>29</td>
</tr>
</tbody>
</table>
The table below reflects the breakdown of floor area and numbers of users within the facility on the First Floor.

<table>
<thead>
<tr>
<th>First Floor</th>
<th>Education</th>
<th>no.</th>
<th>sets.</th>
<th>m²</th>
<th>m²/indiv.</th>
<th>no. of users</th>
<th>no. of staff</th>
<th>m²/person.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workshop A</td>
<td>90</td>
<td>7</td>
<td>1</td>
<td>9.06</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>55</td>
<td>6</td>
<td>1</td>
<td>7.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom A</td>
<td>74</td>
<td>12</td>
<td>1</td>
<td>5.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>52</td>
<td>12</td>
<td>1</td>
<td>5.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recording Studio</td>
<td>167</td>
<td>5</td>
<td></td>
<td>33.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 x studio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Print + Copy</td>
<td>224</td>
<td>40</td>
<td>4</td>
<td>5.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display Space A</td>
<td>153</td>
<td>15</td>
<td>10.2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>38</td>
<td>3</td>
<td>12.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>853</td>
<td>100</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projector Room A</td>
<td>21</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>21</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Café</td>
<td>65</td>
<td>48</td>
<td>2</td>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitchen</td>
<td>65</td>
<td>7</td>
<td>9.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offices</td>
<td>105</td>
<td>8</td>
<td>13.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>277</td>
<td>56</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>wc</td>
<td>urinals</td>
<td>wb</td>
<td></td>
</tr>
<tr>
<td>Toilets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 1</td>
<td>46</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 2</td>
<td>35</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 3</td>
<td>88</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 4</td>
<td>40</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 5</td>
<td>28</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>FIRST FLOOR TOTAL</td>
<td>237</td>
<td>34</td>
<td>21</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 1</td>
<td>53</td>
<td>1</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 2</td>
<td>122</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Type 3</td>
<td>70</td>
<td>1</td>
<td>70</td>
</tr>
<tr>
<td>FIRST FLOOR TOTAL</td>
<td>245</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>482</td>
<td></td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Total</td>
<td>759</td>
<td>56</td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The table below reflects the breakdown of floor area and numbers of users within the facility on the Second Floor.

<table>
<thead>
<tr>
<th>SECOND FLOOR</th>
<th>venue.</th>
<th>no. of sets.</th>
<th>m², indiv.</th>
<th>no. of staff</th>
<th>m²/</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDUCATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WORKSHOP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>90</td>
<td>7</td>
<td>1</td>
<td>9.06</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>55</td>
<td>6</td>
<td>1</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>CLASSROOM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>74</td>
<td>12</td>
<td>1</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>52</td>
<td>12</td>
<td>1</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>RECORDING</td>
<td>167</td>
<td>5</td>
<td></td>
<td>33.4</td>
<td></td>
</tr>
<tr>
<td>1 x studio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 x meeting room</td>
<td>224</td>
<td>40</td>
<td>4</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>INTERNET ZONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISPLAY SPACE</td>
<td>A</td>
<td>153</td>
<td>15</td>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>38</td>
<td>3</td>
<td>12.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STUDY CENTRE</td>
<td>129</td>
<td>10</td>
<td>4</td>
<td>9.21</td>
<td></td>
</tr>
</tbody>
</table>

| TOTAL        | 982    | 110         | 12         | 98.87        |

| COMMERCIAL   |        |              |            |              |
| OFFICES      | 105    | 8            |            | 13.1         |

| TOTAL        | 105    | 8            |            |              |

| SERVICES     | wc     | urinals     | wb         |              |
| TOLIETS      |        |             |            |              |
| Type 1       | 46     | 6           | 10         | 4            |
| Type 2       | 35     | 6           | 3          | 4            |
| Type 3       | 88     | 10          | 5          | 8            |
| Type 4       | 40     | 6           | 3          | 4            |
| Type 5       | 28     | 6           | 0          | 4            |
| SECOND FLOOR | 237    | 34          | 21         | 24           |

| ADMIN        | no. of staff | m²/ |              |              |
| Type 1       | 53         | 1   | 53            |
| Type 2       | 122        | 3   | 40            |
| Type 3       | 70         | 1   | 70            |

| SECOND FLOOR | 245    |              |              |              |

| TOTAL        | 482    | 5            |              |              |

| FINAL TOTAL  | 625    | 11           | 5            |              |
The table below reflects the breakdown of floor area and numbers of users within the facility on the Third Floor.

<table>
<thead>
<tr>
<th>THIRD FLOOR PLAN</th>
<th>EDUCATION</th>
<th>venue.</th>
<th>no. set</th>
<th>m².</th>
<th>m²/</th>
<th>no. of</th>
<th>no. of staff</th>
<th>m²/person.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORKSHOP</td>
<td>A</td>
<td>90</td>
<td>7</td>
<td>1</td>
<td>9.06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>55</td>
<td>6</td>
<td>1</td>
<td>7.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CLASSROOM</td>
<td>A</td>
<td>74</td>
<td>12</td>
<td>1</td>
<td>5.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>52</td>
<td>12</td>
<td>1</td>
<td>5.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RECORDING STUDIO</td>
<td></td>
<td>167</td>
<td>5</td>
<td></td>
<td>33.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 x studio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 x meeting room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDUATION OFFICES</td>
<td></td>
<td>224</td>
<td>12</td>
<td></td>
<td>18.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>662</td>
<td>54</td>
<td>4</td>
<td>79.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL</td>
<td>OFFICES</td>
<td>105</td>
<td>8</td>
<td></td>
<td>13.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>105</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SERVICES</td>
<td>wc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOILET</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 1</td>
<td></td>
<td>46</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td></td>
<td>35</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td></td>
<td>88</td>
<td>10</td>
<td>5</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 4</td>
<td></td>
<td>40</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 5</td>
<td></td>
<td>28</td>
<td>6</td>
<td>0</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THIRD FLOOR</td>
<td></td>
<td>169</td>
<td>22</td>
<td>18</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADMIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 1</td>
<td></td>
<td>53</td>
<td></td>
<td>1</td>
<td>53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2</td>
<td></td>
<td>122</td>
<td></td>
<td>3</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 3</td>
<td></td>
<td>70</td>
<td></td>
<td>1</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THIRD FLOOR</td>
<td></td>
<td>175</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>344</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FINAL TOTAL</td>
<td></td>
<td>449</td>
<td>8</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The intention is to provide a facility which empowers people through education and the opportunity to interact with media and image in our technological culture. The provision of venues in which the general public can interact and view media and image initiates an interest and thus a need for further display and ultimately a market which is closely in tune with its context and people.

As a facility in tune with current trends and especially technology a high tech approach to construction and materials needs to be adopted with the use of new building skills, new advances in materials requiring less materials and technical mechanisms which reduce running costs and future maintenance.

The use of materials which can be assembled as large components helps with the potential to reuse materials. The following project sets out to use Tilt-Up Construction creating large concrete walls which can be dismantled, relocated and reused. Steel elements yield a similar opportunity for reuse as does glass, making up the three main materials in the following dissertation. The intention of Tilt-Up construction enables a fast rate of construction with a high level of precision requiring minimal skill, yet requiring high class mechanical equipment such as cranes to erect the concrete elements. Due to the location of the project, transport of machinery is not a huge set back and the opportunities which are provided by building in a city should be made use of to create a high class quality building which can yield a better building performance in the long run.

Walls and primary supporting columns are to be predominantly made of concrete with Tilt-Up construction, floors are to made of Post Tensioned concrete, roofing and light secondary supporting elements are to made of steel and glass, to be used with steel louvres for edges of the building requiring transparent aspects and obtaining maximum visual attention.

Power supply is to be predominantly electricity based to provide for Large Screen display with the potential for Nano Technology incorporating highly advanced surfaces. Water Supply is to be general municipal supply to the building. Rain water collection to be incorporated into the building through drainage pipes located in the structure holding water in large tanks edging the back of building, to service building landscaping and edging Urban Agricultural Land located along the edge of the building. All steel and High tech mechanical devices will need maintenance but the use of concrete and self cleaning glass will reduce the need for complete building maintenance over time.

The approach is to incorporate new technological advances in design, building assembly and material requirements. Minimal skill requiring construction yielding maximum performance and quality is sort after in the following dissertation. Ideally one strives for a facility which yields a high level of occupant comfort, maximum interaction between occupant and context and a high quality of display.

The intention is to accommodate as much interaction between occupants and the surrounding context through visual and physical means where possible in relation to the requirements of the Programme. The provision for surfaces of the building which become more than just surfaces but canvases for display becomes an expressive aspect of the building. Steel louvres are designed to cater as shading devices but also as screen surfaces joined together to create a large display screen.

Movement into and around the building is a feature necessary considering the location the building within a highly active movement network. Functionality and simple legible layout is necessary for a very public building which will service a large variety of people often just visiting the building for short stays versus students using the building everyday.

The use of load bearing concrete structures will serve as the primary supporting systems with steel elements functioning as secondary supporting systems, for transparent components of the building requiring glass. The intention is to use Louvre glass panels rather than large sheets of glass to enable easy maintenance.
Unfinished Concrete Tilt-Up Panels requiring minimal maintenance with pre-determined cut outs for window and door installations require easily trained and minimal skilled labour. The reduction in scaffolding and form works ensures a form of construction requiring less equipment. Cranes will be necessary to erect the panels with sufficient cable work to prop the concrete components until all components are in place.

Steel in the form of Roofing is to be supported by Steel Systems directing loads to the primary concrete load bearing walls and columns and steel louvres are to be designed to create mechanically driven shading devices with display quality surfaces.

Glass louvre panels and safety glass for glass balustrades are to be used throughout the building in conjunction with steel elements to hold the glass in place.

The calculation of the water footprint involves the 'total volume of fresh water that is used to produce the foods and services consumed by individuals expressed in terms of volume of water use per year'. The 'nations water footprint is the total water used to produce goods and services consumed by the inhabitants of the nation'. [www.waterfoorprint.org]

With this in mind looking at the total population of South Africa being 44 187 637 people [www.cia.gov 2006/10/02] the Average Water footprint of South Africa equals 931 m³/capita/year and the Global Average Water Footprint equals 1243 m³/capita/year [www.waterfoorprint.org].

Systems to reduce water consumption can be placed within this facility such as two flush toilets, grey water systems and filtering systems. The collection of rain water to be used on surrounding landscaping is a standard approach incorporated in the building.
SBAT Components 5.6/ Building Performance

- **Environmental/ Water**
  - The intention is to incorporate rainwater collection from all roofing surfaces with downpipes located in the structure of the building to carry water to water tanks. Water is then to be collected and stored in tanks to serve landscaping and a proposed Urban Agricultural Edge.
  - Deep soil planting for trees located in courtyards has been taken into consideration in relation to basements to allow for maximum planting.
  - The proposal for an Urban Agricultural Edge along the back walls of the site property are in place to cater for the local residents as communal agricultural gardens providing a green edge and social corridor to the back of the building which is to be used by the local residents as communal agricultural gardens.

- **Energy**
  - The building design is formulated from the needs of the occupants which need to be accommodated in order to keep a high level of occupancy comfort and to make use of all orientation qualities which are ideal for certain activities.
  - Cross ventilation is emphasized through smaller, skinner spaces with openings on either side of the room to create air flow. The placement of pivoting panels and louvre systems are used in the following dissertation to allow users to alter their environment should they require more air circulation or less.
  - Social spaces are located on the northern edge to take full advantage of the Southern Hemisphere situation where one can obtain direct sunlight. Shading devices on the north are also in place to accommodate the harsh sun in summer.
  - Southern Edges are predominantly saved for services or activities requiring indirect light such as Library’s and Computer rooms.
  - Steel louvre shading devices are to be installed on both East and West Facades to reduce low angled winter sun penetration and to reduce the need for air conditioning in Summer by providing shading to the building façade.
  - Light and ventilation shafts are designed to service basements.

- **Site**
  - Site needs to respond and cater for surrounding context to initiate maximum use of the area and facilities such as transport routes already functioning.

- **Waste**
  - Well ventilated refuge storage is provided in the basement for city municipal services to collect.

- **Sewage**
  - Ventilation and service ducts are in place to allow for sufficient functioning of building toilets and the removal of sewage to the local municipal sewer line.
Local Economy + Use > The use of Local Economy is to reduce the distance for sourcing materials and components. The location of the Project in Pretoria yields a great potential for a variety of materials, skills, and availability of materials. Essentially the use of local is South African materials, contractors will be the intention to further encourage development within South Africa through providing employment and supporting a Proudly South African Economy.

Proudly South African > Companies such as Tilttech-Tilt Up Technologies (Pty) Ltd can be used for Tilt-Up Construction in conjunction with Lafarge, PPC, Holcim, CMA [Concrete Manufacturing Association] as concrete suppliers. Post Tensioned concrete floors can be produced by the same concrete companies but companies such as Amsteele Systems or Amalgamated Steele Systems or VSL Systems (SA) Pty, Ltd are needed for steel components and the technical skills required to produce post-tensioned slabs. All steel elements such as roofing, I-Beams, C-Section Purlins can be provided by Mittal Steel South Africa or Highveld Steel Vanadium.

City > The city environment has its advantages and should be used in the following project. The use of local companies, local materials and the local work force, ensures lower transportation costs as transport networks are in place and in close proximity to the site and fast construction. A variety of skills and building methods are also available but essentially due to the building methods adopted requiring low skilled labor, and labour force required opens up the opportunity for employment to a larger field of people. The potential for materials to arrive by rail is very possible with the following location making use of Mears Train Station.

Flexible Layout > Flexible building elements ensures the potential for changing environments both in the form of moving walls or making use of shading devices. Removable elements ensure later relocation for elements if required.

Time > The following facility is intended as an Adult Education facility with components which can function on a 24hr basis. Public Spaces and components can function from 8h00 in the morning to 23h00 at night. Cinema and display venues will predominantly be used at night owing to social entertainment patterns and lighting quality required for outdoor display. Education components will predominantly be used from 8h00 to 17h00 however Library, Internet, Media zones need to be accessible 24hrs.

Management of Spaces > The location of public spaces along the edge of the building allows for guaranteed interaction with passing movement and catering for this with display, seating and shading. The location of easy access yet controlled points is provided with sufficient relief spaces acting as semi-public spaces for education facilities in the form of open courtyards. There is a logical sequence of arrival with necessary administration points to guide visitors, with a clear circulation strip located on the front of the facade. The intention is the express the functions of the building to the outside world and define spaces with thresholds to emphasize the experience of moving from one space to another. The providence of vertical circulation in the form of steel stairs, ramps and lifts are provided evenly throughout the building allowing for a fluid moving environment still catering for disabled people.
Material > Minimal waste and equipment is needed with the construction methods allocated for the following dissertation. Such methods allow for:
> minimal hazards and cleaner site environment reducing contamination of site due to construction methods
> efficient, fast and smooth erection of building due to simple materials and construction methods

Adaptability + Flexibility > The use of steel roofing allows for flexible change and movement of sheeting whilst bolted to steel elements. This ensures the potential for reuse and relocation of all roofing elements. The intention is to use standard components with bolt connections rather than welded connections where possible.

Fire > Evenly distributed fire escapes, connected to all basements are in place throughout the building according to SABS 0400-1990 Part T Regulations. Concrete Tilt-Up panels ensure maximum fire safety conditions depending on thickness of the panels. With a thickness of 300mm which is desired thickness for all panels, fire resistance can be calculated as more than 4hrs [www.tilt-up.org 02/10/2006] and well within SABS requirements in part TT2.1 [SABS 0400-1990:159]

Costs > Concrete Tilt-Up Panels ‘require very little maintenance as power floated surfaces do not require plastering and exterior surfaces can be left unpainted’. [www.cnci.org.za 02/10/2006] This reduces the need for later servicing and labour costs.

Security is combated through the use of visual surveillance with transparent edges of the building to maximize connection between occupants and the surrounding context. The circulation strip along the front of the façade though visible is raised to create a semi-public environment only accessible by the public at the entrance of the building via controlled admin points.

The Current Urban Frame consists of a number of movement networks which converge at the location for the following dissertation. The intention is to build on this and use the current dynamics of the area to provide for this activity and create a more people friendly environment. The site motions for making use of the local facilities such as Mears Train Station, Elandspoort Road and the pedestrian Link between UNISA’s Main Campus and Sunnyside Campus. The use of existing infrastructure and response to this to upgrade facilities to generate more activity provides a sustainable approach whereby any form of capital invested into the area will automatically yield an outcome and have direct effect creating an exponential progressing outcome.
Occupant Comfort > The intention is to provide an interactive building both on a physical and visual level. Connection to the outside aids in orientation and has health benefits. Access to ventilation, sunshine and the ability to control the amount of interaction all aids to occupant comfort. Mechanical steel louvres are to act as shading devices at the same time as providing display surfaces to the inside and to the outside of the building. The intention of the entrance / connecting access link is to provide an environment which allows for the public to access the highest point of the building and view out of the building ye still need to move through administration controlled zones to pass into other points of the building. The design of the building also takes into consideration the visual approach towards the building along Elandspoort Road and Mears Street and the access link to Mears Train Station which needs to be made very visible. Sounds and wind barriers are to be placed alongside the train station to buffer the Gautrain which will not stop at Mears Train Station but will pass by at relatively fast speeds. Sound Control and Dirt control are definitely factors which need to be considered in such an environment and need to be accommodated in appropriate materials considering the situation for cleaning and maintenance by surrounding buildings.

Inclusive Environments > Access to the building is possible by foot or by vehicle and is supported by the Urban Design Proposal for the area to accommodate a transport interchange. The building faces onto Mears Street and Elandspoort Road and has a physical and visual connection with all movement networks. Social spaces are located on the periphery of the building and inform the form of the building so as to create a building which incorporates social dynamics of the site.

Access to Facilities > The building is located along a threshold into the city and functions as a defining edge to the arrival entrance into Pretoria. The intention is to cater for the already existing movement networks and create a building which is fully integrated into the context providing services, stimulation and usable features such as seating, shading and orientation. Access to Mears train Station and UNISA’s Campus’s are of utmost importance as these are the main pedestrian movement poles to which people are moving back and forth from.

Participation + Control > Environmental Control in the form of Steel Louvre Systems located on East and West Facades are in place to move mechanically depending on light conditions. Cross ventilation is possible through interactive elements such as glass louvre windows and pivot doors and louvres. The creation of transparent edges and louvres allows for participation of occupants with the outside context in the form of visual interaction.

Education, Health + Safety > The provision of adult education in the form of Media and Image allows for a society to keep up to date with the advances in our culture. Technology is the means to truly be connected and able to communicate with the local context, regional, national, international and global context at this point in time.
### Precedent Studies 6/

#### Contextual
South Africa, Pretoria:
- Administrative Capital
- Governmental Base
- Educational Base
- Museums
- Historical

UNISA _ University of South Africa

#### Urban Context 6.2/
Threshold
Australia, Melbourne:
- Melbourne Gateway

Active Pedestrian Edge
Scotland, Edinburgh:
- Scottish Parliament

Public Space
Australia, Melbourne:
- Federation Square

---

#### Programmatic 6.3/
Education Facilities
South Africa, Pretoria:
- University of Pretoria, Law Building

Japan, Fukui:
- Fukui Prefectural Library

South Africa, Pretoria:
- CSIR _ Department of Science + Technology

---

#### Technical Detailing 6.4/
Materiality + Construction
South Africa, Pretoria:
- University of Pretoria, High Performance Centre
- University of Pretoria, Law Building
- Equifin Offices on Lynnwood Road
- CSIR _ Department of Science + Technology

Form
Germany, Leipzig:
- Leipzig BMW Plant

Surface + Glass
Australia, Melbourne:
- Australian Centre for the Moving Image

Apartheid Museum
South Africa, Johannesburg:

Public Space
Australia, Melbourne:
- Federation Square

Maropeng Visitor Center
South Africa, Cradle of Humankind:

Surface Display
USA, Chicago:
- Millennium Park + Crown Fountain

---

"Precedent is used in all disciplines as a guide or as a justification for a particular line of thinking or course of action, or for a particular decision"

[Righini 2000: 178]
<table>
<thead>
<tr>
<th>Illustration Number</th>
<th>Description</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>6/001</td>
<td>Pretoria CBD</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/002</td>
<td>Union Buildings</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/003</td>
<td>Federation Square Lobby</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/004</td>
<td>Federation Square</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/005</td>
<td>University Of Pretoria High Performance Centre</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/006</td>
<td>University Of Pretoria Law Building</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/007</td>
<td>Apartheid Museum</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/008</td>
<td>UNISA</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/009</td>
<td>Scottish Parliament</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/010</td>
<td>BMW Plant</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/011</td>
<td>Fukui Library</td>
<td>[Author]</td>
</tr>
<tr>
<td>6/012</td>
<td>Maropeng Visitors Centre</td>
<td>[Author]</td>
</tr>
</tbody>
</table>
List of Illustrations

6.1/001 Pretoria CBD [Author]
6.1/002 Union Buildings [Author]
6.1/003 UNISA [Author]
6.1/004 Jacaranda's of Pretoria [Author]
6.1/005 Tshwane Inner City Programme, Spatial Development Framework Presentation Feb 2006
       [Dept. of Public Works + Dept. of Public Service + Admin]
6.1/006 Museum of Technology [Author]
6.1/007 Museum of Technology Conc. Façade [Author]
6.1/008 Dept. of Trade + Industry [Author]
6.1/009 DTI Street Edge [Author]
6.1/010 Inner city street life [Author]
6.1/011 Transvaal Museum [Author]
6.1/012 Inner city street covering [Author]
6.1/013 Trade in the CBD [Author]
6.1/014 Union Buildings [Author]
6.1/015 Town Hall [Author]
6.1/016 Bosman [Pretoria] Train Station [Author]
6.1/017 UNISA Landmark [Author]
6.1/018 Church Square [Author]
6.1/019 Cantilevering Edge [Author]
6.1/020 UNISA: Ceramic Tiles [Author]
6.1/021 UNISA: Grand Scale [Author]
6.1/022 UNISA: Linearity [Author]
6.1/023 UNISA: Entrance [Author]
6.1/024 UNISA: Materiality [Author]
6.1/025 UNISA: Wall Cladding [Author]
6.1/026 UNISA: Rubbish bin [Author]
6.1/027 UNISA: Entrance [Author]
6.1/028 UNISA: Conc. Roof [Author]
6.1/029 UNISA: Conc. Roof [Author]
6.1/030 UNISA: from Groenkloof [Author]
6.1/031 UNISA: Conc. Band balustrades [Author]
6.1/032 UNISA: from the M7 [Author]
6.1/033 UNISA: from M7 [Author]
The following Precedents are set out as a visual reference reflecting an array of architectural influences which have been drawn on in the following dissertation.

Due to the nature of Architecture, incorporating a variety of factors which need to be accommodated within a design, the precedents for the following dissertation have been divided into categories appropriate to their qualities and features focused on.

A response to the location of any project requires an analysis of dynamics and especially Architectural Language. Architectural Language being the character and approach to ‘space and place’ making, climate response, materials used and construction methods specific to a context and point in time.

Pretoria is predominantly a Governmental and Educational base. This said, the buildings which can be found invariably function as landmarks for Pretoria and monuments and historical features for Pretoria as well as for South Africa. The Union Buildings and Voortrekker Monument can be seen as the gem stones of Pretoria from a political point of view. UNISA [University of South Africa] and the University of Pretoria are seen as the Education symbols of Pretoria. Church Street and Paul Kruger Street are seen as the main historical axis for Pretoria crossing at the main Public Space for the CBD Church Square.

The above mentioned buildings and features of Pretoria are visually displayed further in this dissertation. The intention is to reflect an understanding of a context before implementing new development.
The following dissertation is located within Muckleneuk within the vicinity of UNISA and Freedom Park. The context of Pretoria forms a precedent for all new development. Architectural qualities specific to Pretoria need to be understood, appreciated and responded to. This approach incorporates acknowledging street edge relationships evident in illustrations 6/011 to 6/013 with canopy cover, façade detailing, material pallets and general space making. A response such as this attempts to integrate new development into the context and to provide a facility with which the people of Pretoria can associate with. All the following precedents are appropriate specifically towards the following dissertation as they reflect qualities from urban design to technical detailing which need to be incorporated in the final design and reflect the type of architecture which would be appropriate.
UNISA sits as a prominent Landmark on the Southern Entry point into the city of Pretoria on the Southern Ridge of Pretoria. As a large Education Facility it has a certain monumentality about it and accentuates this through the form which sits boldly and views out over Pretoria as shown in 6/018, 6/20, 6/032 and 6/033. UNISA responds to the typography with bands of ceramic clad walling acting like contour lines. The building is comprised of a number of levels staggering up Bourke’s Hill. UNISA is just one building which expresses a certain ‘Pretoria character’ and earthy materiality and palette shown in these illustrations. The UNISA building acts as an Icon, for both Pretoria and for the University of South Africa.
List of Illustrations

6.2/001 Pretoria CBD [Author]
6.2/002 Federation Square Lobby [Author]
6.2/003 Federation Square [Author]
6.2/004 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Edilia, Tokyo, Japan]
6.2/009 Melbourne Gateway: Plan Sketch [Author]
6.2/010 Melbourne Gateway: Plan Sketch [Author]
6.2/012 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Edilia, Tokyo, Japan]
6.2/013 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Edilia, Tokyo, Japan]
6.2/015 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Edilia, Tokyo, Japan]
6.2/016 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Edilia, Tokyo, Japan]
6.2/018 Federation Square: Façade [Author]
6.2/019 Federation Square: Surrounding Context [Author]
6.2/020 Federation Square: Bar on Square [Author]
6.2/021 Federation Square: Café on Square [Author]
6.2/022 Federation Square: Façade + Public Seating [Author]
6.2/023 Federation Square: ACMI Entrance + Pedestrian Access [Author]
6.2/024 Federation Square: Connection to Surrounding Context [Author]
6.2/025 Federation Square: Main Gathering space [Author]
6.2/026 Federation Square: Surrounding Context [Author]
6.2/027 Federation Square: Flinders Station [Author]
6.2/028 Federation Square: Yarra River [Author]
6.2/029 Federation Square: Public Seating + Pedestrian Environment [Author]
6.2/030 Federation Square: Connection to outside through Glass Shell Lattice [Author]
6.2/031 Federation Square: Glass + Steel Lattice Shell Skin [Author]
6.2/032 Federation Square: Façade Detail [Author]
The following dissertation sits on the periphery of the CBD of Pretoria. The environment is a transition threshold moving into Urban Fabric with multiple modes of transport access. Thus precedents appropriate are those of an Urban setting dealing with city features such as Public Spaces and Pedestrian Active Edges and the integration of these with City Fabric.

The location on an entry point into the city deals with ‘Threshold’ qualities requiring and understanding of design when dealing with approaching from a distance, sequence in approach and simple communication using bold form. The Melbourne Gateway is an example of using architectural forms to express and celebrate a gateway into the Urban Environment.

Pedestrian Activity is a quality which can be promoted within the city environment. Street edges in the following dissertation need to provide for pedestrian activity. The Scottish parliament provides an integrated design with a covered edge with seating and visual connection to the surrounding context.

Public Spaces can be features within a city and should be promoted to provide space for interaction, amusement and leisure. Gathering spaces, meeting spaces and interactive spaces are the core experience spaces of the city. Federation Square in Melbourne was designed to give the people of Melbourne a place to gather within the city. It’s location is nestled amongst the Urban Fabric and responds to the surrounding buildings. Facilities, museums, galleries and café’s are clustered around the social space. Transport systems are in close proximity such as Flinders Train Station. Green space such as the river walk along the Yara river are also connected to the space. This active environment promotes a social and interactive lifestyle for the people of Melbourne and creates a symbolic gesture of gathering.
The Melbourne Gateway is a gateway into the city of Melbourne, located along a freeway and train link heading into Melbourne. This gateway [6/005] creates an introduction for visitors to the city and makes a statement in declaring the entrance into the city. The symbolic concept of creating a gate in a wall, is used with a yellow boom like structure, large red stick elements creating a wall through which one passes and a yellow smooth flowing wall channels one towards the gate as a sound tube/barrier to the surrounding residential area. [6/007-010] The placement of a large yellow beam leaning over the movement channel aims to express technological innovation and emphasize a boom element which people have to move under.

This is just one concept of creating a threshold on the periphery of the city to make people aware of moving from one area to another. The approach is one of making a bold statement which is clear and able to be put across in a few seconds as people speed past into the city. The colourful and bold forms edge the movement channel creating a defined threshold which is narrowed towards an ‘opening in the wall’. [Bill Corker [Partner at Dental Corker Marshall www.abc.net.au 12/10/2006] This approach is intended as the emphasis for Elandspoort Road is a more subtle manner with Urban Fabric clipping off of the channeling forms.
The Scottish Parliament Precinct is approximately 30 000m² with an array of facilities including the Debating Chamber with Parliamentary Facilities, Public facilities, a Media Tower and Finance Offices. This precinct is located in Edinburgh's Old Town and Heritage site opposite the Royal Holyrood Palace. This new development located in a deep historical context and providing a mixed use precinct with clustered facilities is definitely the kind of environment which can be envisaged in the following dissertation. Pedestrian Activity is catered for and technology is embraced. The Street edge is of main interest for this dissertation with direct interaction with the passing traffic, concrete seating and a concrete and timber street covering proving for street activity.
Federation Square was intended to give Melbourne a social gathering space and icon for Melbourne like Sydney Harbor Bridge and Sydney Opera House are for Sydney. This environment brings together a mix of cultural facilities and attractions such as the Australian Centre for the Moving Image, The Australian Racing Museum and Hall of Fame [honoring the Melbourne Horse Racing Cup held every year], the National Design Centre and visitor centre for Melbourne. There are also supporting services such as restaurants, cafes and bars to create an entertainment area. The concept involves clustering facilities and activities in one location to create a real destination and place of activity. This precinct is located within the city with Flinders Train Station located just down the road and the Yara River running next to it. This mix of dynamics is exactly the feel that the Elandspoort Road threshold could envisage allowing for interaction and the opportunity for people to gather as a city and enjoy large screen display. Places of gathering with the opportunity to view large display screens is very much needed in preparation for the Soccer World cup in 2010 if the intention is to involve the whole nation and get everyone watching the Soccer.
Urban Context 6.2/
Public Spaces
Australia, Melbourne:
Federation Square
Architect: LAB Architecture Studio in Ass. With Bates Smart
Category: Public space
Accommodation Schedule:
Open paved space
National Exhibition Facilities
Broadcasting Facilities
Shops
Commercial Spaces
Open air theatre for 150000 people
Design Features:
Paved open space
Large screen display
Clustering of facilities

Links:
www.federationsquare.com.au
http://en.wikipedia.org
Illustrations:
6.2/018 Federation Square: Façade [Author]
6.2/019 Federation Square: Surrounding Context [Author]
6.2/020 Federation Square: Bar on Square [Author]
6.2/021 Federation Square: Café on Square [Author]
6.2/022 Federation Square: Façade + Public Seating [Author]
6.2/023 Federation Square: ACM Entrance + Pedestrian Access [Author]
6.2/024 Federation Square: Connection to Surrounding Context [Author]
6.2/025 Federation Square: Main Gathering space [Author]
6.2/026 Federation Square: Surrounding Context [Author]
6.2/027 Federation Square: Flinders Station [Author]
6.2/028 Federation Square: Yara River [Author]
6.2/029 Federation Square: Public Seating + Pedestrian Environment [Author]
6.2/030 Federation Square: Connection to outside through Glass Shell Lattice [Author]
6.2/031 Federation Square: Glass + Steel Lattice Shell Skin [Author]
6.2/032 Federation Square: Façade Detail [Author]
The following Precedents are all facilities which exude the same functions as the following dissertation. Clear ordering of Space and the articulation of Movement are characteristics found in these Precedents. The approach to design is dictated by Educational or Display [Gallery] Programmes. These have greatly informed the design approach of the following dissertation. Similar function buildings are appropriate in using as precedents and are intended as a visual reference to the type of atmosphere and quality appropriate in the following dissertation.

Programme features such as Courtyards, Circulation Strips and defined spaces are all reflected in the following precedents. Expression of Programme is evident in each of the precedents through Design and especially Technical Detailing. A few of the following precedents are analysed in closer detail where the Programme and the functions of the buildings are greatly expressed through form, materials and structure under Technical Detailing 6.4/, reflecting design carried through to detail.

**Precedent Studies 6/ Programmatic 6.3/**

**Programmatic 6.3/ Education Facilities**
- South Africa, Pretoria: University of Pretoria, Law Building/
- Japan, Fukui: Fukui Prefectural Library/
- South Africa, Pretoria: CSIR _Department of Science + Technology/
- Australia, Melbourne: Australian Centre for the Moving Image

**Museums**
- South Africa, Johannesburg: Apartheid Museum/
- South Africa, Cradle of Humankind: Maropeng Visitor Center
<table>
<thead>
<tr>
<th>Illustration Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3/001</td>
<td>Uni. Of Pretoria Law Building [Author]</td>
</tr>
<tr>
<td>6.3/002</td>
<td>Apartheid Museum [Author]</td>
</tr>
<tr>
<td>6.3/003</td>
<td>Fukui Library [Author]</td>
</tr>
<tr>
<td>6.3/004</td>
<td>Maropeng Visitors Centre [Author]</td>
</tr>
<tr>
<td>6.3/005</td>
<td>Uni. Of Pretoria Law Building: Elevation [Author]</td>
</tr>
<tr>
<td>6.3/013</td>
<td>Uni. Of Pretoria Law Building: Roofing Detail [Author]</td>
</tr>
<tr>
<td>6.3/017</td>
<td>Uni. Of Pretoria Law Building: Back Entrance [Author]</td>
</tr>
<tr>
<td>6.3/021</td>
<td>Uni. Of Pretoria Law Building: Roofing as expressive element covering Circulation Strip [Author]</td>
</tr>
<tr>
<td>6.3/022</td>
<td>Uni. Of Pretoria Law Building: University Avenue Façade [Author]</td>
</tr>
<tr>
<td>6.3/023</td>
<td>Uni. Of Pretoria Law Building: Front Entrance [Author]</td>
</tr>
<tr>
<td>6.3/024</td>
<td>Fukui Library: Building [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]</td>
</tr>
<tr>
<td>6.3/025</td>
<td>Fukui Library: Connection to Outside from inside [<a href="http://www.maki-and-associates.co.jp">www.maki-and-associates.co.jp</a> 12/10/2006]</td>
</tr>
<tr>
<td>6.3/026</td>
<td>Fukui Library: Plans [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]</td>
</tr>
<tr>
<td>6.3/027</td>
<td>Fukui Library: Courtyard [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]</td>
</tr>
<tr>
<td>6.3/028</td>
<td>Fukui Library: Drawings [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]</td>
</tr>
<tr>
<td>6.3/029</td>
<td>Dept. of Science + Technology: Plan Sketch [Author]</td>
</tr>
<tr>
<td>6.3/030</td>
<td>Dept. of Science + Technology: Entrance [Author]</td>
</tr>
<tr>
<td>6.3/031</td>
<td>Dept. of Science + Technology: Façade Detail [Author]</td>
</tr>
<tr>
<td>6.3/032</td>
<td>Dept. of Science + Technology: Glass Curtain Wall [Author]</td>
</tr>
<tr>
<td>6.3/033</td>
<td>Dept. of Science + Technology: Glass Detailing [Author]</td>
</tr>
<tr>
<td>6.3/034</td>
<td>Dept. of Science + Technology: Steel Stair [Author]</td>
</tr>
<tr>
<td>6.3/035</td>
<td>Dept. of Science + Technology: Louvre System [Author]</td>
</tr>
<tr>
<td>6.3/036</td>
<td>Dept. of Science + Technology: Circulation Sketch [Author]</td>
</tr>
<tr>
<td>6.3/037</td>
<td>Dept. of Science + Technology: Balconies [Author]</td>
</tr>
<tr>
<td>6.3/038</td>
<td>Dept. of Science + Technology: West Elevation [Author]</td>
</tr>
<tr>
<td>6.3/039</td>
<td>Dept. of Science + Technology: East Elevation [Author]</td>
</tr>
<tr>
<td>6.3/040</td>
<td>Dept. of Science + Technology: West Façade with Auditorium + Library [Author]</td>
</tr>
<tr>
<td>6.3/041</td>
<td>Dept. of Science + Technology: Shadow Lines [Author]</td>
</tr>
<tr>
<td>6.3/042</td>
<td>Dept. of Science + Technology: Basement entry [Author]</td>
</tr>
<tr>
<td>6.3/043</td>
<td>Australian Centre for the Moving Image: Lobby [Author]</td>
</tr>
<tr>
<td>6.3/044</td>
<td>Australian Centre for the Moving Image: Glass Door in Lattice [Author]</td>
</tr>
<tr>
<td>6.3/045</td>
<td>Australian Centre for the Moving Image: Glass Door in Lattice [Author]</td>
</tr>
</tbody>
</table>
The form of the building is derived from the function as an education facility. It has a number of components clipping onto a circulation strip, providing maximum access efficiently to lecture venues, with gathering spaces in the form of courtyards to accommodate students between lectures. The building faces onto a pedestrian avenue and locates its library with large windows to create a visual connection between people inside and those passing by. The circulation strip plays with the concept of inside-outside space and connects vertically through external stairways. Though the building is located on the University Campus the building plays with the idea of opening up onto internal courtyards so as to provide a safer and security controlled environment.

The management of student movement is an expressive quality in the above building and poses as inspiration in the following dissertation through spaces created and connection between inside and outside. The scale of the project and programme base is very similar to the following dissertation and poses a typical example for an educational facility.
Programmatic 6.3/ Education Facility

South Africa, Pretoria: University of Pretoria Law Building
Architects: Kruger Roos

Category: University Campus Building

Accommodation Schedule:
Lecture Venues
Large Auditorium
Library
Study Centre
Lecture Offices

Design Features:
Circulation Strip
Courtyards
Efficiency in Access
Visually Interactive Library Edge

Illustrations:
6.3/013 Uni. Of Pretoria Law Building: Roofing Detail [Author]
6.3/017 Uni. Of Pretoria Law Building: Back Entrance [Author]
6.3/021 Uni. Of Pretoria Law Building: Roofing as expressive element covering Circulation Strip [Author]
6.3/022 Uni. Of Pretoria Law Building: University Avenue Façade [Author]
6.3/023 Uni. Of Pretoria Law Building: Front Entrance [Author]
The Fukui Prefectural Library holds spaces ideal for educational activities with an understanding of connecting the inside with the outside. There is a definite appreciation of the environment with emphasis on glass curtain walls and courtyards to allow for interaction. The following dissertation intends to make use of courtyards to accommodate students between lectures to allow them the opportunity to interact with the outside when having a break. Light quality requirements are also similar for library space, study areas and computer venues. Essentially the programme of accommodating activities is the driver in the project to provide a high level of occupant comfort considering the activities held inside.
The above building consists of office space, research facilities and services all connected via a 4 storey west facing enclosed space protected by a mechanical steel louvre system. This building manages the same design challenges in the following dissertation with circulation issues, security of the facility which still trying to connect with the outside and the location of specific spaces in relation to orientation. The site is located on the periphery of the city on a ridge and looks out over Pretoria with a large west facing edge capturing views. There is a strong attempt to connect the inside with the outside through visual connection with the use of mass glass curtain walling.
The above building is the first of its kind dedicated to the "moving image in all its forms" [http://en.wikipedia.org 12/10/2006] and is a major influence on the following dissertation. The building consists of a number of spaces, venues and exhibition / museum halls and sets the brief for the following dissertation. The treatment of specific activities is very relevant however the response to media and image is slightly different. The ACMI [Australian Centre for the Moving Image] building is more of a house for the moving image rather than a surface to display on expressive of the content. Surface detail and technical assembly is still a big component in the design and poses as inspiration with catering for connection between inside and outside within a city context. Glass and steel is used in a shell lattice façade and expresses an approach to transparent edges needed in the following dissertation.

**Design Features:**
- Glass + Steel Lattice Shell Cladding
- Main Exhibition underground
- Disconnected visually from Federation Square

**Accommodation Schedule:**
- Display and Exhibition Spaces
- Interactive Zone
- Cinema Theatres
- Sound Pods
- Recording Studios
- Archives for Media Clips

**Links:**
- www.federationsquare.com.au
- www.acmi.com.au

**Illustrations:**
- 6.3/043 Australian Centre for the Moving Image: Lobby [Author]
- 6.3/044 Australian Centre for the Moving Image: Glass Detail [Author]
- 6.3/044 Australian Centre for the Moving Image: Glass Door in Lattice [Author]
- 6.3/044 Australian Centre for the Moving Image: BMW Theatre Venue [Author]
- 6.3/047 Australian Centre for the Moving Image: Steel Detailing [Author]
- 6.3/048 Australian Centre for the Moving Image: Internal Space [Author]
- 6.3/049 Australian Centre for the Moving Image: Triple Volume Entrance [Author]
- 6.3/050 Australian Centre for the Moving Image: Distorted Glass Exit [Author]
- 6.3/054 Australian Centre for the Moving Image: Glass Balustrade [Author]
The Apartheid Museum is predominantly a display facility centred around the History of Race Discrimination with specific reflection on South African history. The layout of the building directs visitors through it and makes use of internal and external display. The brief includes a display ramp, display venues, an outdoor theatre and a reflection box. The Concrete box shown in illustration 6/068 plays with different size openings and light reflecting off water as in illustrations 6/061, 062, and 063. The design of the building plays with the visitors emotions and controls levels of interaction with the outside through sizes of openings and materials used. Concrete is a very powerful raw material in this building and shows a true honesty to the material. This approach to materiality is the concept behind the following dissertation.

**Design Features:**
- Starch and sterile texture
- Raw Concrete
- Linear Elements
- Continuous Route through Facility
- Constant Reflection
- Connection to Context

**Illustrations:**
- Apartheid Museum: Conc. Columns [Author]
- Apartheid Museum: Sketch Plan [Author]
- Apartheid Museum: Ramp of Reflection [Author]
- Apartheid Museum: Conc. Columns + Reflection pool [Author]
- Apartheid Museum: Brick Wall [Author]
- Apartheid Museum: Concrete. Box [Author]
- Apartheid Museum: Reflection pool [Author]
- Apartheid Museum: Reflection from low window [Author]
- Apartheid Museum: Reflection [Author]
- Apartheid Museum: Conc. Form [Author]
- Apartheid Museum: Conc. Column [Author]
- Apartheid Museum: Reflection pool [Author]
- Apartheid Museum: Reflection ramp [Author]
- Apartheid Museum: External View of Conc. Box with low windows [Author]
- Apartheid Museum: External Display Ramp [Author]
Maropeng Visitors Centre is very much a display gallery with a defined linear form and climax point mound nestled into the landscape. The concept of display being an internal activity is expressed with a large portion of the building sitting under ground. Circulation is a major aspect of the building carrying people from a start to a finish. Control of visitors is very easy due to the lack of connection to the outside. With such a layout and the simple legibility it is ideal considering security for such a building. Clear, linear and structured form is expressed and needs to be the guiding order for a public/entertainment high visitor venue. Structure plays a very important role in the ordering of movement. Materials such as concrete are used to reinforce this.
Maropeng Visitors Centre

South Africa, Cradle of Humankind, Gauteng

Architects: GAPP Architects

Category: Historical + Scientific

Accommodation Schedule:
- Display and Exhibition Spaces
- Interactive Zone

Design Features:
- Nestled into Landscape
- Underground Exhibition
- Circular mound Tower
- Concrete Fins creating tower
- Linear Circulation Route

Programmatic 6.3/
Museums

South Africa, Cradle of Humankind:
Maropeng Visitors Centre/

Nestled into Landscape
Concrete Fins
Linear Circulation Route

Illustrations:
- 6.3/084 Maropeng Visitors Centre: Internal Circulation [Author]
- 6.3/085 Maropeng Visitors Centre: Restaurant overlooking view [Author]
- 6.3/086 Maropeng Visitors Centre: Length of Gallery underground [Author]
- 6.3/087 Maropeng Visitors Centre: End of Gallery Surfacing [Author]
- 6.3/088 Maropeng Visitors Centre: Base of Mound [Author]
- 6.3/089 Maropeng Visitors Centre: End of Gallery Wall + Circulation [Author]
- 6.3/090 Maropeng Visitors Centre: Gallery Wall [Author]
- 6.3/091 Maropeng Visitors Centre: Internal Circulation Route [Author]
- 6.3/092 Maropeng Visitors Centre: Connection to Landscape [Author]
- 6.3/093 Maropeng Visitors Centre: Internal Structure [Author]
- 6.3/094 Maropeng Visitors Centre: Sketch Plan [Author]
An understanding of expressive approaches to design using materials and construction methods is the intention of the following precedents. Essentially the Materials used in the following buildings are appropriate to the following dissertation. The methods in which materials are connected is of great interest and requires an understanding of the capabilities of materials and the potentials they hold.

Within this Precedent Category approaches to Technical Detailing have been divided into Detailing situations dependent on the Precedents most expressive qualities.

The Connection between Concrete and Steel and Steel and Glass is essentially the basis for Materiality and Construction. This also reflects a contextual material palette, construction qualities, material finishes and current material trends used in South Africa.

Form reflects the expressive potential of concrete as a solid, single element and strong dividing element. The following dissertation makes use of solid dividing walls and attempts to use the brutality of concrete but in an elegant and sleek approach. The intention of dividing walls is to define space and to emphasise threshold in carrying through the theoretical approach in the following dissertation.

Due to the nature of the following dissertation attempting to connect to the outside world through visual connection, Transparent Surfaces with Steel and glass essentially become the materials which can allow for this. Surface treatment and detailing require great attention. The Australian Centre for the Moving Image uses steel as a structuring system with a glass shell lattice. This reflects a very appropriate precedent however creates a chaotic complicated façade with a specific individual character. The following dissertation attempts a simple character with a sleek, straight lined approach similar to Aurora Place. Aurora Place by Renzo Piano reflects a highly sophisticated Technical Detailing approach. Once again Surface plays a great roll in the design and glass and steel are the main materials. Louvre Systems used in Aurora Place serve as a visual example for the Louvre Screens in the following dissertation.

Surface Treatment in the form of Display, is further reflected in the Precedent of Crown Fountain at the Chicago Millennium Park. Art is combined with Architecture and serves as amusement and visual stimulation for the general public within a public space. The approach in the following dissertation is to incorporate the idea of ‘Art and Architecture’ further. The intention is not to create large bill boards, but rather changing display screens which function as screening and shading devices for the following dissertation building. Art essentially serves a greater function and creates a stimulation building façade with multiple functions.

‘by comparing two distinct architectural systems, we look further at the idea of structure as an ordering mechanism’ [Righini 2000:61]
The above building is a reflection of the material approach to the following dissertation. The mix of glass, steel and concrete is a typically modern material palette and requires specific connections in the form of steel to glass and steel to concrete. The relationships of materials and the forms these materials are capable of producing is embraced in the High Performance Building. The idea of a high quality building is expressed in the construction and materiality of the building and this approach is to be that of the following dissertation. Programme and brief are also similar in catering for students and the requirement of activity specific spaces such as the suspended auditorium. The auditorium in this specific building has show one approach to dealing with the immense mass which often disrupts a context and creates a very dull environment on the periphery.
This modern building makes use of Concrete columns, steel trusses and steel roofing and has influenced the design and materiality of the following dissertation. Due to the similar programmes, approaches to space treatments have been adopted and echoed throughout the dissertation design. The circulation strip is an important feature in the design and has been carefully detailed. The following dissertation is envisaged to express a similar approach and consists similar aspects such as an expressive roof, connections to the exterior, a free flowing ground floor and a defined circulation strip. The sleek detailing and quality of the building is also the undertone to which the following dissertation strives for to express a technologically advanced building with quality spaces to experience.

Design Features:
- Circulation Strip
- Courtyards
- Visually Interactive Library Edge
- Light Roof Structure over circulation
- Steel Externalized Vertical Circulation
- Internal / External Environment

Illustrations:
- Uni. Of Pretoria Law Building: Conc. Facade [Author]
- Uni. Of Pretoria Law Building: Truss Sketch [Author]
- Uni. Of Pretoria Law Building: Auditorium Raking [Author]
- Uni. Of Pretoria Law Building: Steel Balustrade Detail [Author]
- Uni. Of Pretoria Law Building: Round Steel Stair Detail [Author]
- Uni. Of Pretoria Law Building: Glass Circulation [Author]
- Uni. Of Pretoria Law Building: Glass Connection [Author]
- Uni. Of Pretoria Law Building: Steel Roofing Detail [Author]
- Uni. Of Pretoria Law Building: Steel I-Beam Detail [Author]
The technical detailing reflected in the above building is comprised of steel and glass connections and steel and concrete connections. These are the two main situations of material connection in the following dissertation and required research in detailing with this challenge. The materials seen here are the same materials as in the following dissertation and reflect the same characteristics in truth to material. The above building applies a very controlled and sleek method of joining materials especially in the details as reflected in illustration 6.4/034 + 035. Concrete fins [6.4/038, 037, 041] meet perpendicularly to glass eaves and are joined using steel angles. [6.4/040, 041 + 049] The building expresses an ordered proportioning of shapes and forms reflected in the façades. [6.4/042, 045 and 047] Eaves are treated with utmost care to encourage connection to the outside and pose as yet another connection situation applied in the following dissertation. [6.4/040]
The above precedent is expressive of steel louvre systems and glass and steel façade treatment incorporated in the following dissertation.

Mechanical louvre systems are to be used in the Centre for Media and Image as shading devices and as screen display. Glass curtain walling is to be used as a wind barrier and as a material which still allows for connection to the outside as reflected in illustration 6/196 and 197. The materials in the above precedent are pushed to the limits and enable the types of spaces produced. The main space is a 4 storey atrium with 2 glass curtain walls to allow connection to the outside and a steel louvre system on the western glass façade, needed for sun control.
This precedent is expressive of the qualities which concrete possesses. Concrete walls / structural elements are dominating forms in the Leipzig BMW Plant and set out to accommodate a long skinny building. The needs of the brief as a vehicular assembly plant involve the spanning of great distances and defining of particular movement channels for both the plant and the office space required in the building. The expressive forms of the concrete serve as inspiration for grand dominating dividing elements in the following dissertation. Large scale defining elements initiate the notion of boldly defining space to make place. Zaha Hadid uses the great mass of concrete in a very smooth and grand gesture expressing it’s capabilities and true advancement in technology of the material.
The general façade of Federation Square involves a steel cladding system. This is made use of steel meshes and glass infill to create a lattice shell skin to the building. Steel is used as the supporting material for transparent edges as shown in the illustrations on this page. Steel is bolted to steel with fixed glass panels set in place within steel frames. This precedent is an example of creating transparent edges using steel and glass. Connection to the outside is possible whilst one is still very much aware of being within the building. The defining of edge is very evident with an almost double skin layer creating the façade. Thresholds are celebrated in the form of creating an archway rather than a ground surface that changes level or material. The cladding systems stop on the First floor and hang over the ground floor edges of the building. Illustration 6.4/072 shows how the cladding systems hang over the set back emphasizing the ground plane and providing access to the building on ground level.

The steel structure in certain parts is brought down to the ground level creating a shell / wall system. Illustration 6.4/073, 074, 077 + 078 seems like a solid glass and steel façade however there is a sliding door in the centre of the wall on ground level to allow physical access. The lattice steel structure allows for a complete glass surface with molded surface.
Though Aurora Place is a skyscraper its connection to the outside is amazing. Renzo Piano made use of Glass louvre systems [6.4/ 088, 096-101] shown on the opposite page for semi-enclosed balconies. These are all mechanically controlled and allows for access to ventilation. Balconies are not normally found in skyscrapers due to great wind forces experienced at high levels.

Aurora Place is expressive of technology available and is detailed appropriately. Ceramic ‘fit’ glass [6.4/ 085 + 087] creates the skin of the building and modulates transparency. Steel and glass is predominantly used with Post Tensioned Concrete. Materials, Surface and Edge conditions in the following precedent express one example of combining these features and relates directly with the following dissertation. These are the basic drivers in the following dissertation.
Aurora Place

Australia, Sydney:

Architect: Renzo Piano

Category: Offices + Residential

Accommodation Schedule:
- Offices
- Meeting Rooms
- Up market Residential Apartments
- Café

Design Features:
- Balconies
- Glass Louvre Systems
- Glass Surfaces

Technical Detailing 6.4/
Surface Display
Australia, Sydney:
Aurora Place

BLANCHE BEVAN S25013654 MArch (Prof) Thesis 2006 UNIVERSITY OF PRETORIA, SOUTH AFRICA
The Crown Fountain in Millennium Park is the perfect example of large scale screen display within a public space. The following dissertation will attempt to incorporate large screen display such as this precedent when dealing with the building envelope. With technology the envelope of the building holds great potential in catering not only for structural stability but for expression too. The form of expression in the following dissertation is in communication. Steel Louvre Systems are to function as shading devices with an LED [6.4/209] layer of Nano technologically Advanced Glass layer located on the surface of each louvre. When the louvres are all lying flat the surface becomes a complete screen display. The Crown Foundation display screen consists of glass bricks [6.4/112] with an LED screen placed behind within a steel structure. [6.4/0108] Water is also incorporated into this form and is pumped out of it like a fountain into a shallow pond. [6.4/116 + 117]
MILLENIUM PARK_ CROWN FOUNTAIN

USA, Chicago: Millennium Park, Crown Fountain
Artist: Jaume Plensa
Architects: Krueck + Sexton Architects
Category: City Centre Public Space + Fountain
Accommodation Schedule: Open paved space
Visual Display Forms with Water Features

Design Features:
Interactive Display Screens

Water is pumped up from an underground reservoir and sent to tanks, which release the water over all four sides of each tower.

LED screen is positioned behind the glass brick exterior.

Illustrations:
www.milleniumpark.org
www.milleniumpark.net
www.archidose.org

Links:
www.milleniumpark.org
www.milleniumpark.net
www.archidose.org
‘Architecture provides the environment for our lives. Buildings are not just places of physical shelter, but places in which our social rituals are enacted,’ and ‘the meaning of buildings evolves and becomes established by experience and we in turn read our experience into buildings.’ [Conway + Roenisch 1995:23]

‘Design is a process of engaging with a problem or set of problems, whereby a proposal for resolving the problems is formulated’ Righini [2000:165]
The following dissertation involves a number of design phases, starting on a contextual level and gradually zooming into the site whilst exploring programmatic and design aspects appropriate to the following site.

The initial stages of design require an understanding of the different levels of systems which function within and form part of a city. The Elandspoort Road threshold for Pretoria is a point of convergence in one place for many different features. These features rely heavily on the strategic location at which they converge however lack cohesion and interaction between each other. These include different modes of transport, and local facilities creating the urban fabric. The proposal for the following dissertation is based on the existing dynamics of the area which have formed over time. Consideration in connecting these features and providing an environment which fully accommodates the city visitors, locals and students walking along Elandspoort Road are the main drivers. The strategic location holds great potential to accommodate facilities and services which can support and generate activity from the active movement of people either by foot, car, train, bus or taxi. The defining of an active hub on the periphery of the CBD is possible and some what already exists yet in a disconnected form. The CBD is the main hub of activity for the city yet needs a series of smaller hubs located on the periphery like beads on a necklace as shown in illustration 7/009. These then feed the city system and to enable a more efficient spread of facilities supporting activity throughout the city. The typography as shown in the contextual model illustrations 7/010 to 12 shows the location of Elandspoort Road edging a ridge and leading down to the CBD. This relationship needs to be kept in mind and visual connection along the whole route becomes an important feature in the design. The below illustrations show the area dynamics, the threshold parameters and movement lines, active edges and urban fabric.
The proposal includes the incorporation of:

- a proper train station
- bus terminals, taxi rank
- safe pick-up-and-drop off areas for temporary laborers
- gathering spaces
- a pedestrian friendly environment with shading
- stimulating and active edges
- refreshment shops,
- 24-hour facilities
- necessary services to service the Muckleneuk and UNISA residents and accommodate UNISA Campus functions.
Muckleneuk is located along Klapper Kop and Bourkes Hill forming part of the Bronberge and Langeberge known as the South ridge. This protects the Pretoria CBD bowl and creates an entrance into the city viewing onto it. The below section[7/027] faces South showing the height of the site above the CBD ground level and the location of the South Entrance.

The Elandspoort Road threshold as the Urban Design Proposal in the following dissertation runs along the 1345m to 1335m contour lines, thus a change of level of approximately 10m from the start of Elandspoort Road to the corner of Mears Street and Walker Street. The site has a level change along the Eastern face of approximately 2.5 meters with a gradient of 1:20.

Access to Mears Train Station form Elandspoort Road runs along the South Eastern edge of the site and requires a 5.5m level change from road level to platform access enabling the train line to have a sufficient 6.5m clearance to run under Elandspoort Road.

Pedestrian patterns of movement are those of students moving from UNISA Sunny Side Campus to UNISA Main Campus along Mears Street and Preller Street [Main Axis University Route]. [7/028]

Vehicular movement is predominantly fed by the N14, R21 and M81as an entrance into the city from Johannesburg and consists of the mass of commuters into and out of the city from Johannesburg and Centurion. Muckleneuk is a residential area and does not have retail or commercial activity to support the local residents, resulting in the need to travel to areas such as Sunnyside to do basic food shopping.

Mears Train Station is a Metro rail station and lies along the rail line linking Pretoria to Germiston. It carries individuals from the South of Pretoria to the two predominate stations of Pretoria Bosman Station in the CBD and to Hatfield Station continuing on to Mamelodi. The Gautrain once in place will run along the same train line linked to Johannesburg. It will sit within the Railway Reserve of the Metro Rail Line and run parallel to the Metro Rail. The Gautrain will only stop at Bosman Station and Hatfield station and will only pass through Mears Train Station in the following dissertation precinct.
Pretoria has a geographical location of 25°44' South Latitude and 28°12' East Latitude and is typically part of sunny South Africa. It is considered a relatively lush and moderate location notorious for its greenery and beautiful purple Jacarandas which bloom in September / October. Harsh conditions are not experienced in Pretoria climatically, winters are dry and cool and summers are warm and sunny with occasional afternoon showers. The greatest issues are great exposure to sun, low angle winter sun angles and the need for shade in summer. Winters are cool and maximization on direct sunlight during winter months improves occupancy comfort.

### Environmental Response 7.3

#### Sun Angles

- **Summer**
  - Sunshine Max. 80%
  - ALT. = 85° [Dec. 22]
- **Winter**
  - Sunshine Min. 67%
  - ALT. = 40° [June 22]
- **Average Monthly**
  - Humidity Aprox. 59%

#### Temperature

- **Summer**
  - Average. 22.5˚ C
- **Winter**
  - Average. 11.3˚ C

#### Rainfall

- **Average. Precipitation**
  - 750 mm

#### Wind

- **North-East Direction**

#### Vegetation

- **Jacarandas**

#### Soil Conditions

- **Shale**

#### Orientation

#### Light Impacts on Design

- Sun Path / Shadow Mask

---

**Illustrations**

- 027 Section running East to West showing City Typography + Site location [Author]
- 028 Diagram of city bowl + ridges [Author]
- 029 Site + Movement Lines [Author]
- 030 Pretoria South Entry [Author]
- 031 Diagrams of site factors [Author]
- 032 Sections running North South showing site located on Bourke's hill [Author]
- 033 Section through Elandsdooit Road + Mears Train Station [Author]
- 034 Orientation + Light Impacts on Design [Author]
- 035 Table of Sun Angle Information for Pretoria [Szokolay : 20]
- 036 Pretoria Skyline [Author]
- 037 Jacarandas [Author]
- 038 Vertical Sun Angle Diagram [Szokolay : 20]
- 039 Altitude + Azimuth Diagram [Szokolay : 20]
- 040 Sun Dial to work out Sun angles [Szokolay : 20]
- 041 Shadow Lines [Szokolay : 20]
The following dissertation requires a definite response to movement patterns, orientation and visual interaction. The design approach looks to integrate new development with the existing dynamics of the site in order to fit into the context and to set up the process of arrival into the Pretoria CBD via Elandspoort Road and Mears Street.

**Visual Access**

The Eastern and Southern Elevations hold great potential for visual connection between passers-by and the people inside the building. Surfaces of the building need to be considered from a visual access opportunity as well as an enclosing element for the building.

**Physical Access + Movement**

Mears Train Station located at the South Western point of the site motions for the building to step back, away from the road to provide the platforms with more light and to open up the existing train stopping area. Currently the station, is dark, dirty and unsafe. It lacks surveillance over the station due to too many trees and the station is cut off from rest of the context. Buildings which surround the station need to support 24 hour activities which can view onto the station and provide facilities which commuters can use after or before work on their way to their destination.

**Social Spaces**

UNISA students commuting along Elandspoort Road need to be given the opportunity to sit and gather along their route so as to create a more on-the-street presence and a place where individuals can recreate. There are a lot of student residences and apartment blocks in the area and along Mears Street which need social spaces located in close proximity, which is currently lacking in the present neighborhood. Mears Train Station also beckons for a social space which commuters can feed into as they move into and out of the station.

Such a point can be created by forming a confluence of activity where train and pedestrian commuters meet on Mears Street. A proposed pedestrian access link will run East-West connecting with the main UNISA axis route which runs North-South parallel with Mears Street along Preller Street. The location of an entrance to the following dissertation building would ideally open up onto this proposed pedestrian link and incorporate this into the building design.

**Relationships**

The creation of realms of privacy are about defining spaces and defining their thresholds so as to determine inside from outside. Not all spaces can be public and complete privacy for spaces needs to be controlled so as to not create a segregated environment. Active Edges are ideal for public spaces and private spaces are best located at centers or away from activity. Security and enclosure are the reasons for defining space, however, the following intervention will play with the different levels of interaction to define space and thresholds.
The nature of education requires a defined ordering of activities and the separation of private spaces to learn in with minimal distractions. Semi-public social spaces are needed for medium to large numbers of students around the surrounding context as shown in the diagrams 7/051 to 054. The placement of defining elements such as walls can be used to form internal private spaces and open courtyards to accommodate external gathering activities.

A variety of spaces allows for a facility to be balanced and to provide opportunities to work/study productively or relax and take a break. Education also requires a certain array of facilities shown in the diagram 7/055.

Facilities/services which need to be accommodated include spaces for library, internet/computer access, eating areas, toilets and clear circulation to accommodate mass movement of students. Display galleries and commercial venues require simple and easy access to viewing venues. Supporting facilities such as cafés and public open space located on the periphery of the building need to be clustered around venues to prolong the stay of visitors and to build up the notion of a destination with multiple activities.

Due to the customer profile being mainly first-off visitors access into and out of the building needs to be clear and legible through simple design strategies such as scale which enables a form of communication to the general visitor.

Defining Elements

Social Spaces + Edges

Circulation for both programmes is an important governing factor in the design and coupled with the location of the site certain programmatic responses can be teamed up with Dynamic and Environmental Responses to create a fully integrated design. Edges located on a movement network should attempt to control programmatic active activities along dynamic site active edges. In the case of the following dissertation the circulation component of the building is located along the Mears Street edge to allow for visual connection between passers-by and people moving within the building. For security reasons though the circulation is raised from the street level to prohibit physical access between the public street and the semi-public circulation. East West is intended as a completely public route with access points into the buildings north and south zones clipping off of this. The idea is also to allow the general public the opportunity to inhabit the building with access to upper levels yet solely to the connecting component. If one wishes to access further into the building thresholds need to be crossed which are carefully controlled by admin gates. Vertical Circulation incorporates a even spread of mechanical lift cores and open air louver both sides to allow access on basement levels from one side and then access to circulation strips on upper floors and the building. Access is from Rose Street Berea Street and at the basement requirements involve sufficient parking space according to the activities held by the building but essentially manoeuvrability of vehicles, ventilation and light.

Basement requirements involve sufficient parking space according to the activities held by the building but essentially manoeuvrability of vehicles, ventilation and light.
'design is a process of engaging with a problem or set of problems, whereby a proposal for resolving the problem is formulated' Righini [2000:165]

A response to Contextual, Environmental, Dynamics and Programmatic factors are the basis of the following dissertation. Connection and Communication are taken as important concepts and from the essence of the following facility to reflect a responsive approach.

These concepts are explored and expressed in the building through an attempt to integrate construction and design on multiple levels. The general functioning of the building needs to express these concepts even down to the details which stand at the ultimate point of connection between elements. The careful choice in materials, structuring systems and building elements is determined by the attempt to strive towards a sophisticated and technologically advanced building which is expressive of it’s place in time. Media and Image are components of our digital and technological culture and are going to be houses in this facility. Thus the building needs to reflect this and can be done my making use of digital surfaces and technologically smart materials. The characteristics of sleek, simple, straight and clear lined surfaces are to be echoed throughout the design to fully express a digitally smart building. This can be interpreted through a number of ordering principles, these being:-

Illustrations:
- Building Edge Response [Author]
- Conceptual Design [Author]
- Development Axo. [Author]
- Development of Circulation Movement in Building [Author]
- Conceptual Model [Author]
- Conceptual Plan [Author]
- Design Development [Author]
- Conceptual Forms [Author]
- Visual Concepts [Author]
The defining of clear spaces to accentuate place, thresholds and order requires solid forms such as walls. Courtyards consisting of a defined nesting qualities with the option to view out defines a difference between being within the courtyard and being beyond it. Defined spaces emphasise the difference between spaces and thus connection, which is communicated physically and visually through materials.

The concept of a threshold is that which is before or after something and thus should be communicated through level changes, material changes, change in scale and difference in light qualities. These are all approaches essentially attempting to make a physical change to ones experience and define one space from another through a distinct character embedded in each space.

The intention of circulation routes are to set an order to access and thus process of experience. The idea of creating a space which though open and interactive still has a character of it’s own and quality of experience different to those spaces connected to it.

Visual Connection from inside to outside and outside to inside enables a truly connected form of architecture which glass allows for in the expression of communication through connection. Thus bridging the gap whereby architecture is essentially about forming enclosure yet only on a physical level. Technology is able to allow for visual connection whilst still providing enclosure. Its surroundings even more. A wall no longer needs to only function as a wall it can do so much more.

Advances in technology and especially display can enable building elements to become more than structuring forms but surfaces for display. The building envelope has the potential to display and communicate with surroundings even more. A wall no longer needs to function just as structuring element, or enclosing element but as a surface for display.

The above Architectural Aspects are explored further in Design Development in a 3 Dimensional form with the use of models. The Models are displayed in sequence from the beginning stages of design. These start with responding to context and creating an Urban Design, Conceptual, Programmatic and Form Proposals.
Design Development 7.7

Models

Context Model 1:1000

Urban Design Model 1:1000

Illustrations

7/075 Context Model 1:1000
Showing Muckleneuk [Author]

7/076 Urban Design Model 1:1000 of Proposal for Threshold Development + Site [Author]

7/077 Urban Design Model 1:1000 of Proposal for Threshold Development + Site [Author]
MODELS

7/078

7/079

7/080

Conceptual Designs 1:800

Design Development 7.7/

Illustrations/

7/078 Conceptual Design Model A 1:800
7/079 Conceptual Design Model B 1:800
7/080 Conceptual Design Model B 1:800
MODELS

Design Development 7.7/
Programme Extrusion 1:250
Form + Programme Model 1:450

Illustrations/
7/081 Programme Extrusion Model Showing Courtyards + Circulation 1:250
7/082 Formalisation of Design Model 1:450 with focus on Programme + Conceptual Approach
7/083 Formalisation of Design Model 1:450 with focus on Programme + Conceptual Approach
7/084 Formalisation of Design Model 1:450 with focus on Programme + Conceptual Approach
'We experience buildings in terms of their form, their structure, their aesthetic and how we and others use them. This constitutes the reality of our physical experience, but buildings not only have existence in reality, they also have a metaphorical existence. They express meaning and give certain messages, just as the way we dress or furnish out homes gives people a certain message about us.' [Conway + Roenisch 1995:22]

'Architecture is the masterly, correct and magnificent play of masses seen in light' - Le Corbusier

... 'an emotional and aesthetic experience' [Conway + Roenisch 1995:9]
Materials 8.1

The materials allocated for the following dissertation come from a palette responding to:

- current trends in South Africa and around the world
- local materials available
- Local skills available determining the appropriate construction methods, and
- Materials which are technologically advanced and incorporate innovation such as post tensioning, reinforcing, nanotechnology and smart surfaces.

Tectonics

Solids Elements/

All solid and robust elements forming the structure and dividing walls are to be constructed from concrete. Tilt-up construction is to be used for main walls. Pre-cast concrete columns are to be constructed in a controlled environment to ensure a high quality finish.

Light Elements/

Floating and expressive roofs are to be constructed in steel and supported steel trusses on concrete columns. All steel elements are to be bolted and be as slender as is engineeringly possible. The light quality and a minimal materiality is to be expressive of our technologically advanced society which strives to reduce things to their simplest forms and stretch their capabilities to achieve efficiency. Visual connection between spaces or from inside to outside are to be achieve though the use of glass elements such as windows or glass curtain walling. Advance materials such as smart glass gives glass even more potential as a material to be able to change qualities from transparent to opaque with the switch of a button or the stimulation of a light sensor. Nanotechnology is to be incorporated into the building to further expresses the advances of materials and surfaces, to reduce general maintenance and to provide new and exciting environments.

Concrete

Structural Concrete/

All structural concrete is to comply with SABS standards regarding the ‘design of the structural system’ SABS 0160 and structural concrete SABS 0100. The scale of this project requires a large number of basements and medium to large spaces and surfaces. Concrete seems the most appropriate material to use. Reinforcing allows for stronger concrete requiring less mass.

Cement/

Any local reputable cement supplier may be used either PPC Cement, Holcim Cement or Lafarge Cement with. If ready-mix concrete is to be used it must comply with SABS 878 and the supplier is to be responsible for the quality of the material. Cement for ‘Concrete floors must be type CEM 1 to comply with SABS ENV 197-1’. [Wegelin1998-8]

Foundations/

Soil conditions for the location of this facility in Pretoria call for Pad Foundations. These are to be reinforced 400mm thick concrete to carry the concrete elements mentioned above to below the last basement level. The basement is to be using a tanking construction system with a reinforced concrete retaining wall with weep holes at 1/m² and secured with rock anchors to engineering specifications. Special attention must be paid to material, density and placing of concrete to render it inherently waterproof’. [Wegelin 2005: 1.28] This form of construction requires; a drainage layer sloping to a sump, with a damp-proof membrane of 0.5mm polyolefin placed just under the floor slab[Wegelin 2005: 1.28] The damp proof sheeting must be laid on smooth surfaces and joined by lapping and solvent welding. The basement floor is to be laid with concrete blocks or geopipes in a herringbone pattern to fall towards sumps covered with a removable steel grating grill. Sumps are to be evenly distributed along the basement to catch no more than 400㎡ of floor area. Refer to drawing for details.
All surface beds are to be reinforced 200mm thick or cast according to engineers specifications, with a 75mm screed. ‘Isolation joints’ must be created with soft material like ‘polystyrene or soft board’. [Wegelin 2005:2.10] Structural Expansion joints are also required for the following building and need to be detailed according to Engineer requirements. The positions of these are shown on page 121 further in this chapter. Due to Columns being 1200 x300mm thick, expansion joints can only be cut running North-South through columns and East-West cutting through slabs. Expansion Joints running North-South cut columns to 600 x 300 mm thick dimensions. East-West Expansion Joints are to cut through slabs only with extra re-enforcing cast into the edges of the slabs.

Lift core shafts are to be constructed out of concrete too and will extend 2800mm below the last basement level to accommodate a shaft pit for lift engineering requirements. A Plant room will be located on the roof for each lift core with sufficient access to perform maintenance.

Post-tensioned Flat slabs are to be 20-30 MPa cast according to engineers detail specifications to a thickness of 200mm with steel reinforcing to comply with SBAS 1024 requirements. In considering the nature of the basements in the following dissertation and the nature of post-tensioned concrete sufficient manoeuvrability space needs to be catered for when tensioning the slab. The intention is to provide ventilation shafts which run along the external perimeter of the basement. [8/ 028] This allows for tensioning of the slab at the same time as catering for design providing light and ventilation to the basements. Details of this are shown in the drawings. For more construction information see www.sapta.co.za or www.amsteelesystems.com.

Precast environment controlled concrete has the potential to be of highest quality in finish and precision in concrete production. The intention is to assemble the building using Tilt-Up Construction with pre-cast 300 mm thick concrete wall elements and 1200mm or 1500mm x 300mm thick concrete columns. The building elements produced are an attempt to maximize quality finish and minimize material required through incorporating technological advances in building construction. Tilt-up construction is relatively new to South Africa but is ideal considering our low skill level workforce. The quality of off shutter concrete for South Africa is relatively low in comparison to countries such as Germany and Switzerland and holds high risk failure due to uncontrolled environments in which the concrete is set. Shuttering and high quality finishes require a high skilled workforce.

Tilt up [8/ 018] construction ensures a faster rate of production essentially and relatively controlled final product. Tilt-up panels can be cast on site and tilted into place. This eliminates transportation costs for precast elements and scaffolding and formwork needed for off shutter concrete.

Precast elements must comply with SABS 1200 GE 1984 and be ‘stored separately on their designed end bearing surfaces in the position they will adopt when built in. Cure for at least 10 days.’ [Wegelin 1998:15]

All concrete edges are to be chamfered edges to obtain a neat finish.

Most concrete elements are to covered by roofing and will not suffer from direct rain damage however due to concrete being a very absorbent and easily stained material all concrete wall surfaces need to be protected. Drip joints are to be made deep enough in all under edge conditions. All Fair-face concrete is to be treated with a Nanotec Product, Nanoprotect CS. This is a hydrophobic Impregnation for concrete or stone to stop water penetrating the materiel. For further information see www.nanotec.com.au.

Concrete roofs are to be to engineers detail according to SABS 794. These are to be treated with Nanotec protect CS or according to Engineer’s Specification with waterproofing to comply with SABS requirements. Aggregate for fair-face concrete must be chosen with care and must be checked by principle agent and architect as to resistance to weathering if exposed. Aggregate used must comply with SABS 1083 standards.
Steel Construction is to be used as a secondary supporting system and in the support of steel roofing, steel louvres and glass for balustrades and curtain walling. Steel is to be used as a connecting material between concrete and glass and concrete and steel. All primary elements are to be hot-rolled H and I profiles and must be to grade 300W to comply with SABS 1431. “Steel tubes are to comply with SABS 657 part 1 of type, coating, grade, size and wall thickness.” [Wegelin 1998:59]

All steel elements are to comply with SABS fire resistance requirements and engineering specifications. All steel is to be finished in intumescent paint which creates an insulating foam during a fire. A coating of 1mm gives a fire protection of 60 minutes. [Wegelin: 2005:3.5] Steel structure geometry and sizing is to be in accordance with SANS 10160 for loads and SANS 10162 for steel structure.

M20 size bolts, Class 8.8 and Class 8 Nuts are to be used in all on-site fixing which must comply with SABS 1700 requirements. Class 8.8 bolts have a tensile strength of 800MPa and a yields strength of 0.8 of 800 = 640 MPa” [Wegelin 2005:3.3] and allow for high-strength friction. Where high-strength friction bolts are required by engineer these must comply with SABS 1282 in strength and grade. A minimum of one thread and a maximum of 25mm of bolt must protrude above the nut. Bolt connections are to include connections between structural elements including: angle cleat, end plate, base plate and fin plate. Grouting is to be applied under base plates once structure has been aligned, levelled, plumbed and braced.

Steel is to be used in staircases with steel treads in vertical circulation and general floor changes. A mono-pitched steel roof over the connecting access link in the building is to be supported by steel trusses which will carry the load to concrete columns. The roofing system incorporates steel IBR roof sheeting on Steel Purlins to engineering specifications on Steel I-Beams with C-Section closers. Refer to drawings for details. The use of Steel Angles and Steel Hollow tubes will formulate the kit of parts for both the roof structure and balustrades of the building.

All metal work concerning window, door and louvre frames are to comply with SABS 727. Tilt-up doors are to be used for all workshop venues and are to be made of pressed mild steel with a balanced counterweight as specified by the manufacturer. Doors will be as follows: ‘a 0.8mm mild steel door pressed to troughed pattern, reinforced at the back with 1.2mm mild steel braces and channel surround, all welded together.’ [Wegelin 1998:62] Doors to be painted with one coat of zinc phosphate primer to comply with SABS 1319. Channels are to be bolted to door jambs of door openings in concrete tilt-up panels.

Steel louvres systems will run along the visually active edges of the building with display being incorporated into the design whereby the louvres become a display surface. Nanotechnology and LED’s are to be placed on the surface of each individual louvre to form the large screen display. The relationship between steel and glass is such that wherever glass is required to create transparent edges, steel needs to support the glass either in the form of clipping panels of glass along the edges to steel elements. The concept of clipping glass allows for less movement of glass and the steel structure being expressed as a supporting material. Louvres are to be both steel and glass within galvanized steel frames to comply with SABS-CKS 413. The mechanism is to be operated by a remote control system. Glass louvres are to be 115mm wide with long edges polished. Adjustable louvre frames are to be fitted after the fixed window frame has been painted, with stainless steel plated brass dome-head screws.

On completion ‘the steelwork contractor must provide a completion certificate stating that all connections are completed and the steelwork has been erected in accordance with the specification and contract requirements.’ [Wegelin: 1998:60]
The intention of glass is to allow for visual connection between people inside the building and the outside environment. With the South Facing connecting entrance access, Glass louvres are to be incorporated with steel louvres. The intention is to provide a fully adjustable façade composed of two skins. The interior skin is to be glass louvres and the exterior skin is to be steel louvre screens to act as a large screen and as a wind shield.

Laminated safety Glass is to be used for all balustrades, to be side mounted or recessed when connecting to concrete. www.coverfg.co.za shows an array of frameless glass possibilities to be incorporated in the following facility. Laminated safety glass must comply with SABS 1263 part 1, 2 or 3. The intention is to reduce the amount of steel needed to surround the glass with ‘Cover Frameless Glass’. Stronger engineered glass requires less framing. Polycarbonated and acrylic sheeting can be used instead of glass. Sealants that can be used include polysulphide to comply with SABS 110 [part 2]. Silicone to comply with SABS 1305 or Polyurethane to comply with SABS 1077.

Safety Glass/

Where the roof meets with supporting structure the idea of a glass band enables a visual connection with the sky and city skyline. Glass panel louvre windows are used to emphasize connection points along the buildings elevation between thresholds creating a complete glass slot with no balustrades or disrupting features. The intention is to use glass panels in a steel supporting system to emphasize complete visual connection along the circulation strips along Mears Street and Elandspoort Road

Eaves/

Interactive and display elements such as large screens will incorporate a mixture of screen projection and surface display. LED’s shown in illustration 8/033 can be used as strips of lighting placed on each individual louvre as used in the Crown Fountain Display Towers. LED’s can be inserted into the louvre skin and covered with a protective glass or plastic layer.

Nanotechnology is also to be incorporated into surfaces throughout the building. Nanotechnology is a science concerned with the control of matter at an atom and molecular level. With molecular technology we can make smart materials which are able to change their properties in relation to surroundings as well as by instruction by people. Products of Nanomolecular controlled matter include; smart materials, nanopowders, carbon nanotechnologies and molecular electronics. Imagine surfaces that clean themselves, or surfaces that can read our identity and eliminate keys. Surfaces have the power to generate and give opportunities to so many things. Pilkington Active Glass was used in the Glass House for the Houses of the future competition www.housesofthefuture.com in 2004 in Sydney Australia. This type of glass uses ‘Nanotechnology with a ‘transparent exterior coating that uses the forces of nature—natural ultra violet and rain—to keep the glass free of any organic dirt.’ [www.housesofthefuture.com.au 13/10/2006] The glass is laminated to provide safety, reduce noise and control fading. For further information refer to Chapter 10/ for sources including:

- www.pilkington.com.au
- www.nano.uts.edu.au/nanohouse
- www.nano.csiro.au
- www.myretsu.com
- www.v-lool.com
- www.archidose.org 13/10/2006
- www.mittal.co.za or www.iscor.co.za 02/10/2006
- www.nano.csiro.au
- www.myretsu.com
- www.v-lool.com
- www.coverfg.co.za
- www.pilkington.com.au
TECHNICAL INVESTIGATION 8/ Structuring Systems 8.2/

All structural concrete is to comply with SABS standards regarding the ‘design of the structural system’ SABS 0160 and structural concrete SABS 0100 and constructed to engineering detail specifications.

Tilt-Up construction allows for a controlled form of concrete casting at a very fast rate of production in comparison to off-shutter [8/050 + 8/051] concrete production. ([www.tilttech.co.za](http://www.tilttech.co.za) 02/10/2006) Tilt-up construction allows for jobsite prefabrication and involves the casting of walls in a horizontal position using the building slab as a flat surface to cast onto. This building method allows for a relatively low skilled workforce to be used in producing the product with a high quality finish. Quality finish in South Africa is difficult to produce because it requires specialized expertise and highly skilled workmen which is not readily available. A reinforcing steel cage as shown in 8/054 is created onto which concrete is poured. The step-by-step casting process is shown in order in the illustrations 8/062 to 8/066 and in the sketches 8/045 to 8/048. After casting, the walls are then tilted to a vertical position and held in place by steel cables whilst the adjoining walls, slabs and roof are cast and tilted into place. Once all the elements are in place the final connection of each of the concrete elements is possible.

Tilt-Up Construction is promoted as a relatively low skill requiring construction, with no need for formwork or scaffolding. The end product requires minimum maintenance, has a high level of fire resistance and allows for flexibility in removal of walls or for relocation. For further information refer to Chapter 10 ‘Sources’ including:

- [www.tiltupnews.com](http://www.tiltupnews.com)
- [www.tilttech.co.za](http://www.tilttech.co.za)

Tilt-up construction is to be built in conjunction with Post-tensioned concrete slab construction. Connections between these two building methods and built elements needs to be handled with care. Contraction joints must be spayed around columns where the slab and column connect alternatively ‘isolation joints’ must be created with soft material like ‘polystyrene or soft board’. ([Wegelie 2005:2,10]) All insulation joints are to be designed for points at which Tilt-Up panels and slabs abut with slabs. Expansion joints are also required for the following building and need to be detailed according to Engineer requirements.

8/045 8/046 8/047 8/048

8/049

8/050 8/051

8/052 8/053

8/054 8/055 8/056 8/057 8/058 8/059

BLANCHE BEVAN S25013654

MArch (Prof) Thesis 2006 UNIVERSITY OF PRETORIA, SOUTH AFRICA

112
Post-Tensioned Concrete Flat slabs are to be constructed by specialised Contractors such as Amsteele Systems. This Construction method is used to reduce the thickness of the concrete slab and the need for coffering. All concrete slabs are to be 20-30 MPa concrete with Unbonded Monostrand steel tendons in the concrete, creating a post tensioned system. The building character is to be expressed throughout the building with sleek, straight, flush, unpainted or covered, fair-face surfaces. The intention is to create defined straight lines of surface. All concrete floors are to be abraded with a grinder for a smooth surface three days after casting or to specified detailing.

The intention is to make use of a suspended concrete floor enabling larger spans with thinner floors, controlled definitions, speed of construction and economy of material use and handling. [www.SAPTA.co.za 02/10/2006]

Ground anchoring is the technique to be used with CCL Anchorage type S9 reinforcement. All live-end anchorage is to be correctly protected against corrosion and according to manufacturers specifications.

Post Tensioned concrete slabs require sufficient space for the tensioning of the slab once the concrete has been poured. From ground to third floor the casting of slabs is not a problem however in the two basements sufficient room needs to be provided for the process of tensioning. The proposed method for construction would be to cast the lowest level of the basement with a 200mm thick reinforced concrete surface bed on top of well compacted soil, with a waterproofing system to engineering specification on 400mm thick reinforced pad foundations column footings.

The retaining walls are to be Cavity construction with masonry walls ad the internal leaf with 1500mm x 300mm reinforced columns acting as piers sitting perpendicular to the retaining wall. The basement post tensioned slabs are to be terminated with concrete uprights to protect cars from falling into the perimeter edge spacing allocated for post tensioning and providing later ventilation and lighting to the basements. Refer to drawings on slab detailing and foundation wall condition connection. For further information on Post-Tensioned slabs refer to Chaprt 10/ Sources including:

- www.sapta.co.za
- www.amsteelesystems.com
Steel construction is to function as a secondary supporting system within the following building with concrete load bearing columns and tilt-up panel walls being the primary supporting system. The intention is to express connections with the use of prefabricated steel profiles bolted into place on site.

All structural steel is to be drawn and detailed according to SAIC [South African Institute of Steel Construction] standards.

All steel is to be sourced from South African Steel producers such as Mittal Steel formerly known as Iscor Steel or Highveld Vanadium Steel.

All primary elements are to be hot-rolled H and I profiles and must be to grade 300W to comply with SABS 1431. 'Steel tubes are to comply with SABS 657 part 1 of type, coating, grade, size and wall thickness.' [Wegelin 1998:59] All structural steel design, slender ratios and profiles are to be according to Engineers specifications and need to comply with SABS 14713 and SANS 10160 for loads and SANS 10162 for steel structure. Structural steel needs to comply with SABS 1200H or 1200A and SABS 0162. [Wegelin: 1998:59] All surfaces must be primed by brushing and blast cleaning according to SABS 064 and painted two coats zinc phosphate primer to comply with SABS 1319. Galvanising of steel needs to comply with SABS 1319.

Roofing is to comprise of Steel I-Beams as supporting elements for most roof systems. Steel Pitched Trusses are to be used for the Main Connecting Entrance Access. Steel C-section purlins are to be used in conjunction with Steel Cleats and to create a haunch connection. Steel IBR profile roof sheeting is to be used fixed with hook bolts and spaced no more than 1.5 meters with a 6° pitch.

Such elements include:
- I-Beams
- H-Sections
- Square Hollow Tubes
- L-Angles
- C-Sections
- Pitched Trusses
- Cleats

Such elements include; I-Beams, H-Sections, Square Hollow Tubes, L-Angles, C-Sections, Pitched Trusses, Cleats.
The Connecting Access Link is accessible on Ground Level and is to clip together the Northern and Southern parts of the building. Steel stairs are to connect levels in a cross-bracing pattern connecting floors. The concrete columns are used as the connecting base for landings similar to illustration 8/ 094 in the University of Pretoria, High Performance Centre.

The South Edge of the Access Link is highly visible from Elandspoort Road and will incorporate a Steel Louvre Display System.
The Circulation edge is located on the Eastern edge of the building facing onto Mears Street. Shading and display is required along this edge. This is responded to with the location of a concrete strip access route with cut outs to accentuate it as a threshold connecting spaces and to create a semi shading device. Steel Louvre screens are inserted between columns on the Façade facing Mears Street. Each individual Louvre is lined with a Nano technologically advanced material in bedded glass with electrical power connected to allow for screen display. LED’s can be used creating individual screens on each louvre. The intention is to create a changing display screen similar to the Screen Display’s used in the Crown Fountain at Chicago’s Millennium Park. This precedent can be found in Chapter 6. Glass and steel balustrades are to be attached to the concrete slabs between columns and uprights are to be spaced between 1200 to 1500mm centers. Refer to Details 02, 03 and 04 for further detailing information.
The following facility supports four venues for audiovisual display; two are Outdoor Theaters essentially to be used at night and two are internal cinemas which can be used during the day or night. Each require:

- raking of the floor to elevate viewers
- sound absorptive materials clad to all internal services for internal venues
- acoustic appropriate ceilings and
- necessary power supply for audio and lighting requirements
All courtyards are to allow for deep soil planting for trees and vegetation. All circulation is to be paved with storm water collection systems. Water troughs with steel grill covers are located at all thresholds into and out of venues and spaces.

900 Deep and 500mm high Concrete seating is provided for students to use between lectures The courtyards are connected to the circulation strip running along the Eastern edge of the building. This provides a semi-public environment which allows for visual connection between people in the courtyards and pedestrians passing along Mears Street.
STEEL CONNECTIONS

Steel Gutter
Steel IBR Roof Sheeting
Steel C Section Purlin + Cleat
Steel I Beam
100mm Dia. Pipe
Fixing plate
Steel Grill + plate over threshold
152 x 152 x 10mm steel square hollow tube
780 x 1500 x 5mm glass louvers in steel window system
steel l-shaped angle
70 x 70 x 5mm thick
steel i-beam
254 x 146 x 10 mm
300 x 1200 conc. column
steel channel
203 x 90 x 10 mm
200mm post tensioned conc. roof to fall on purlins with steel cleats to engineers detail
steel ibr roof sheeting with closer
m20 grade 8.8 bolts
The basements are to be constructed with concrete retaining walls secured with Rock Anchors to Engineering specifications or using Concrete Columns as sufficient supporting piers. A Cavity system for drainage is to be used with concrete blocks raising the floor slab and allowing drainage to sumps with steel grill covers. The layering system has: a 200mm thick reinforced concrete slab; on a Dorken Dimple sheeting waterproofing system; laid on top of 230 x 230 x 460mm Concrete Blocks; laid on a 75mm screed with a slope towards a sump. All column foundations are to be reinforced pad foundations doubled up to carry the load of column pairs. These are to be cast 3000 x 2400 x 400mm thick and according to Engineering specifications.

Due to the scale of the following building four Structural Expansion Joints (H·H·H·H) are required. These are shown in the Diagram Plan 8/142. Where Expansion Joints occur running East to West through Slabs, creating an equal distance of 600mm cantilevering edge from the nearest Column, extra reinforcing within Concrete Slabs is to be used. Where Expansion Joints run North to South, these are to cut through columns 1200 x 300. Columns are to be cut down the centre line to 600 x 300mm.
'architecture is a discipline that requires one to communicate using visual images' [Righini 2000:193]

<table>
<thead>
<tr>
<th>Context 9.1/</th>
<th>124</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Threshold 9.2/</td>
<td>125</td>
</tr>
<tr>
<td>Urban Design 9.3/</td>
<td>126</td>
</tr>
<tr>
<td>Plans 9.4/</td>
<td>127</td>
</tr>
<tr>
<td>Ground Floor Plan</td>
<td>128</td>
</tr>
<tr>
<td>Basement [01]</td>
<td>129</td>
</tr>
<tr>
<td>Basement [02]</td>
<td>130</td>
</tr>
<tr>
<td>Basement [03]</td>
<td>131</td>
</tr>
<tr>
<td>First Floor Plan</td>
<td>132</td>
</tr>
<tr>
<td>Second Floor Plan</td>
<td>133</td>
</tr>
<tr>
<td>Third Floor Plan</td>
<td>134</td>
</tr>
<tr>
<td>Roof Plan</td>
<td>135</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sections 9.6/</th>
<th>139</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section A-A/ North to South Long</td>
<td>140</td>
</tr>
<tr>
<td>Section B-B/ East to West + Rail line</td>
<td>141</td>
</tr>
<tr>
<td>Section C-C/ Connecting Access Link</td>
<td>142</td>
</tr>
<tr>
<td>Section D-D/ Audio Visual + Outdoor Theatres Venues</td>
<td>143</td>
</tr>
<tr>
<td>Section E-E/ Typical Courtyard</td>
<td>144</td>
</tr>
<tr>
<td>Section F-F/ North to South through Audio-Visual + Outdoor Theater Venues</td>
<td>145</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Details 9.7/</th>
<th>146</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detail 01 Basement + Foundations Retaining Wall Conditions</td>
<td>147</td>
</tr>
<tr>
<td>Detail 02 Display Screen Louvres</td>
<td>148</td>
</tr>
<tr>
<td>Detail 03 Courtyards Circulation Edge</td>
<td>149</td>
</tr>
<tr>
<td>Detail 04 Balustrade</td>
<td>150</td>
</tr>
<tr>
<td>Detail 05 Eaves + Gutter</td>
<td>151</td>
</tr>
<tr>
<td>Detail 06 Roofing + Drainage</td>
<td>152</td>
</tr>
</tbody>
</table>
UNIVERSITY OF PRETORIA

ETD - BEVAN, B J

DETAILED

SECTION E-E

1:100

1:750

1:20

CIRCULATING EDGE

1:100

1:100

2680

2680

100MM DRUM, DRAINAGE PIPE IN CONTACT COLUMN

100MM DRUM, DRAINAGE PIPE IN CONTACT COLUMN

BOLTED TO METAL CAP OVEN

254 X 146 X 10 MM I-BEAM

STEEL CHANNEL

203 X 90 X 10 MM

MAX WATER LEVEL CAPACITY

INSTALLATION LAYER

1100 X 200MM DEEP STEEL GUTTER ON ANGLE

ON PURFLING WITH STEEL CLEATS TO ENGINEERS DETAIL

STEEL I-BR ROOF SHEETING WITH CLOSER
ADDENDUM 10/ Illustrations 10.1/

Illustrations 10.1/
FRONT PAGES 00/
  00/ 001 Pretoria Urban Pattern [Author]
  00/ 002 South Pretoria Urban Fabric [Author]
  00/ 003 Muckleneuk Urban Fabric + Site [Author]
  00/ 004 Ground Floor Plan of the following Design [Author]

CONTENTS 0/
  0/ 001 Salvokop + South Pretoria looking West from UNISA [Author]
  0/ 002 South Entry in to Pretoria + Movement Lines [Author]

INTRODUCTION 1/
  1/ 001 South Pretoria + Elandspospo Road looking North [Author]
  1/ 002 Pretoria Aerial + Site Location [University of Pretoria Geography Department]
  1/ 003 Jacarandas s In Pretoria [Author]
  1/ 004 Union Buildings [Author]
  1/ 005 UNISA from the Highway [Author]
  1/ 006 Inner City Street Activity [Author]
  1/ 007 Tshwane Inner City Programme, Spatial Development Framework Presentation Feb 2006 [Dept. of Public Works + Dept. of Public Service + Admin]
  1/ 008 UNISA from top of Mears Street [Author]
  1/ 009 View down Mears Street [Author]
  1/ 010 View down Mears Street [Author]
  1/ 011 Mears Train Station looking North [Author]
  1/ 012 Elandspospo Road looking North West [Author]
  1/ 013 Elandspospo Road Arrival View [Author]
  1/ 014 Junction of Elandspospo Road + Ridge Road [Author]
  1/ 015 Junction of Elandspospo Road + Ridge Road looking North East [Author]
  1/ 016 Elandspospo Road Outward Bound [Author]
  1/ 017 Pretoria Inner City Street Life [Author]
  1/ 018 View down Preller Street from UNISA [Author]
  1/ 019 Pretoria Inner City Trade [Author]
  1/ 020 Church Street Westwards [Author]
  1/ 021 Church Square [Author]
  1/ 022 Informal Trade [Author]
  1/ 023 Church Square [Author]
  1/ 024 University of Pretoria, High Performance Centre [Author]
  1/ 025 Federation Square– Ground Level Detail, Melbourne [Author]
  1/ 026 UNISA [Author]
  1/ 027 Federation Square [Author]
  1/ 028 Federation Square, Internal Lobby [Author]
  1/ 029 Essence of Architecture Diagram [Author]
  1/ 030 Points of Change Diagram [Author]
  1/ 031 Threshold Diagram [Author]
  1/ 032 Space + Relations [Author]
  1/ 033 Pretoria Jacarandas in bloom in October 2006 [Author]
  1/ 034 Traffic on M1 + Johannesburg CBD [Author]
  1/ 035 Typical Pretoria Street-Scape with Jacaranda’s in bloom [Author]
  1/ 036 M1 South heading towards Johannesburg CBD [Author]
  1/ 037 M1 Concrete Channel South of Johannesburg CBD near New Town [Author]

ADDENDUM 10/
Illustrations 10.1/
CONTENTS 0/
INTRODUCTION 1/
NORMATIVE POSITION 2/
CONTEXT STUDY 3/
THEORETICAL DISCOURSE 4/
BASELINE CRITERIA 5/
PRECEDENT STUDIES 6/
DESIGN DISCOURSE 7/
TECHNICAL INVESTIGATION 8/
DRAWINGS 9/
ADDENDUM 10/
Illustrations 10.1/

CONTEXT STUDY 3/

3/031 Union Buildings [Author]
3/032 Pretoria Town Hall [Author]
3/033 UNISA from Groenkloof [Author]
3/034 Museum of Technology [Author]
3/035 Pretoria Train Station [Author]
3/036 UNISA [Author]
3/037 Elandspoort Road Pedestrian Edge [Author]
3/038 Elandspoort Road Pick-Up-and-Drop-off area inward-bound [Author]
3/039 UNISA from M7 [Author]
3/040 Aerial + Local Context Diagram [Author]
3/041 View Down Mears Street [Author]
3/042 South Entrance to Pretoria CBD [Author]
3/043 Elandspoort Road Panoramic North-Eastwards [Author]
3/044 Urban Area of Focus [Author]
3/045 Zones of Activity [Author]
3/046 Lines of Movement through Urban Precinct [Author]
3/047 Active Edges of Urban Precinct [Author]
3/048 Edging Fabric of Urban Precinct [Author]
3/049 South Entrance to Pretoria [Author]
3/050 Elandspoort Road outward bound view [Author]
3/051 Pick-Up-and-Drop-off area on Elandspoort Road [Author]
3/052 Elandspoort Road viewing South Towards UNISA [Author]
3/053 Elandspoort Road Pedestrian Edge [Author]
3/054 Elandspoort Road Vehicular Entrance [Author]
3/055 Pedestrian Crossing on Elandspoort Road [Author]
3/056 Key Plan [Author]
3/057 Elandspoort Road outward-bound view [Author]
3/058 Pick-Up-and-Drop-off area on Elandspoort Road [Author]
3/059 Ridge Road + Elandspoort Road Junction [Author]
3/060 Elandspoort Road Diagram [Author]
3/061 Mears Train Station [Author]
3/062 Mears Train Station platforms [Author]
3/063 Mears Train Station Control Tower [Author]
3/064 Key Plan [Author]
3/065 Mears Train Station [Author]
3/066 Mears Train Station Retaining wall [Author]
3/067 Mears Train Station + North Edging Context [Author]
3/068 Mears Train Station from Willow Road [Author]
3/069 Elandspoort Road Panoramic [Author]
3/070 Mears Train Station Pedestrian link to Vehicular Link [Author]
3/071 Mears Street becomes Elandspoort Road [Author]
3/072 Key Plan [Author]
3/073 View down Mears Street towards Pretoria CBD [Author]
3/074 Site Elevation Facing onto Mears Street [Author]
ADDENDUM 10/ Illustrations 10.1/

Illustrations 10.1/

CONTEXT STUDY 3/
3/075 Site viewing South East + Mears Street [Author]
3/076 Site from Berea Street Entry [Author]
3/077 Site Viewing South out towards Mears Train Station
3/078 Site Panoramic Viewing West to North to Berea Street [Author]
3/079 Key Plan [Author]

THEORETICAL DISCOURSE 4/
4/001 Architecture + Theory + Philosophical Diagram [Author]
4/002 Mind + Body [Author]
4/003 Informal Transport Interchange on Elandspoort Road [Author]
4/004 Space + Relations [Author]
4/005 Archway in Pretoria CBD [Author]
4/006 Polleys Arcade Prertrial CBD [Author]
4/007 Zoning Applied in KM radius around site [Author]
4/008 Centrality Concept [Author]
4/010 Essence of Architecture [Author]
4/011 Visual Capabilities of people [Author]
4/012 Visual Capabilities of People [Author]
4/013 Circulation Edge [Author]
4/014 Mind + Body [Author]
4/015 Experience according to Norberg-Shultz [Author]
4/016 Essence of Architecture [Author]
4/017 Edge Condition [Author]

08/11/2005
ADDENDUM 10/ Illustrations 10.1/

Illustrations 10.1/

BASELINE CRITERIA 5/
5/ 001 UNISA from the M7 [Author]
5/ 002 Lafarge Cement South Africa Logo [www.concretesociety.co.za or www.lafarge.co.za 02/10/2006]
5/ 003 Mittal Steel Logo [www.mittal.co.za or www.iscor.co.za 02/10/2006]
5/ 004 Amsteele Systems [www.amsteelesystems.com 02/10/2006]
5/ 005 Arrival to site Diagram [Author]
5/ 006 Spaces + Connections in Building [Author]
5/ 007 South Pretoria from UNISA [Author]
5/ 008 UNISA from M7 [Author]
5/ 009 UNISA from Groenkloof [Author]
5/ 010 UNISA Landmark [Author]
5/ 011 UNISA Landmark from N14 off-ramp [Author]
5/ 012 View down Preller Street from UNISA [Author]
5/ 013 Informal Trade [Author]
5/ 014 Typical Street trade [Author]
5/ 015 Pedestrians [Author]
5/ 016 Students passing Site [Author]
5/ 017 Aerial of South Entry into Pretoria [University of Pretoria Geography Department]
5/ 018 Arrival to site [Author]
5/ 019 Movement within Building [Author]
5/ 020 Spaces + Connection in Building [Author]
5/ 021 Public Venues [Author]
5/ 022 Display Surfaces [Author]
5/ 023 Cartoon [www.cncii.org.za 02/10/2006]
5/ 024 Tilt-up Construction [www.cncii.org.za 02/10/2006]
5/ 025 Tilt-up Construction [www.tiltupnews.com 02/10/2006]
5/ 026 Steel + Concrete Construction [EQF Project Managers at Maponya Mall, Soweto]
5/ 027 Steel Detail at the University of Pretoria Law Building [Author]
5/ 028 Steel Louvre System at the Department of Science + Technology [Author]
5/ 029 Roof Plan of Design [Author]
5/ 030 CMA Logo [www.cma.org 02/10/2006]
5/ 031 Lafarge Cement South Africa Logo [www.concretesociety.co.za or www.lafarge.co.za 02/10/2006]
5/ 032 Holcim South Africa [www.holcim.co.za 02/10/2006]
5/ 033 Mittal Steel Logo [www.mittal.co.za or www.iscor.co.za 02/10/2006]
5/ 034 Amsteele Systems [www.amsteelesystems.com 02/10/2006]
5/ 035 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/ 036 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/ 037 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/ 038 Construction Workers [EQF Project Managers at Maponya Mall, Soweto]
5/ 039 Section B-B Through Building + Mears Train Station [Author]
5/ 040 Section C-C Through Entrance Connecting Access Link [Author]
Illustrations 10.1/ Illustrations 10.1/ Illustrations 10.1/ Illustrations 10.1/

PRECEDENT STUDIES 6/
6/ 001 Pretoria CBD [Author]
6/ 002 Union Buildings [Author]
6/ 003 Federation Square Lobby [Author]
6/ 004 Federation Square [Author]
6/ 006 Uni. Of Pretoria High Performance Centre [Author]
6/ 007 Uni. Of Pretoria Law Building [Author]
6/ 008 Apartheid Museum [Author]
6/ 009 UNISA [Author]
6/ 009 Scottish Parliament [Author]
6/ 010 BMW Plant [Author]
6/ 011 Fukui Library [Author]
6/ 012 Mampang Visitors Centre [Author]
6.1/ 001 Pretoria CBD [Author]
6.1/ 002 Union Buildings [Author]
6.1/ 003 UNISA [Author]
6.1/ 004 Jacaranda's of Pretoria [Author]
6.1/ 005 Tshwane Inner City Programme, Spatial Development Framework Presentation Feb 2006 [Dept. of Public Works + Dept. of Public Service + Admin]
6.1/ 006 Museum of Technology Conc. Façade [Author]
6.1/ 009 Dept. of Trade + Industry: Entrance [Author]
6.1/ 010 Dept. of Trade + Industry: Street Edge [Author]
6.1/ 011 Inner city street life [Author]
6.1/ 012 Transvaal Museum [Author]
6.1/ 013 Inner city street covering [Author]
6.1/ 014 Trade in the CBD [Author]
6.1/ 015 Union Buildings [Author]
6.1/ 016 Town Hall [Author]
6.1/ 017 Bosman [Pretoria] Train Station [Author]
6.1/ 018 UNISA Landmark [Author]
6.1/ 019 Church Square [Author]
6.1/ 020 UNISA Cantilevering Edge [Author]
6.1/ 021 UNISA: Ceramic Tiles [Author]
6.1/ 022 UNISA: Linearity [Author]
6.1/ 023 UNISA: Grand Scale [Author]
6.1/ 024 UNISA: Entrance [Author]
6.1/ 025 UNISA: Materiality [Author]
6.1/ 026 UNISA: Wall Cladding [Author]
6.1/ 027 UNISA: Rubbish bin [Author]
6.1/ 028 UNISA: Conc. Roof [Author]
6.1/ 029 UNISA: Entrance [Author]
6.1/ 030 UNISA: from Groenkloof [Author]
6.1/ 031 UNISA: Conc. Band balustrades [Author]
6.1/ 032 UNISA: from the M7 [Author]
6.1/ 033 UNISA: from M7 [Author]

ADDENDUM 10/ Illustrations 10.1/ Illustrations 10.1/ Illustrations 10.1/ Illustrations 10.1/

ADDENDUM 10/ Illustrations 10.1/ Illustrations 10.1/ Illustrations 10.1/ Illustrations 10.1/

Illustrations 10.1/

PRECEDENT STUDIES 6/
6.2/ 001 Pretoria CBD [Author]
6.2/ 002 Federation Square Lobby [Author]
6.2/ 003 Federation Square [Author]
6.2/ 004 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Editia, Tokyo, Japan]
6.2/ 009 Melbourne Gateway: Plan Sketch [Author]
6.2/ 010 Melbourne Gateway: Plan Sketch [Author]
6.2/ 012 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Editia, Tokyo, Japan]
6.2/ 013 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Editia, Tokyo, Japan]
6.2/ 015 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Editia, Tokyo, Japan]
6.2/ 016 Scottish Parliament Pedestrian Edge [GA DOCUMENT 86, July 2005; Ada Editia, Tokyo, Japan]
6.2/ 018 Federation Square: Façade [Author]
6.2/ 019 Federation Square: Surrounding Context [Author]
6.2/ 020 Federation Square: Bar on Square [Author]
6.2/ 021 Federation Square: Café on Square [Author]
6.2/ 022 Federation Square: Façade + Public Seating [Author]
6.2/ 023 Federation Square: ACMI Entrance + Pedestrian Access [Author]
6.2/ 024 Federation Square: Connection to Surrounding Context [Author]
6.2/ 025 Federation Square: Main Gathering space [Author]
6.2/ 026 Federation Square: Surrounding Context [Author]
6.2/ 027 Federation Square: Flinders Station [Author]
6.2/ 028 Federation Square: Yara River [Author]
6.2/ 029 Federation Square: Public Seating + Pedestrian Environment [Author]
6.2/ 030 Federation Square: Connection to outside through Glass Shell Lattice [Author]
6.2/ 031 Federation Square: Glass + Steel Lattice Shell Skin [Author]
6.2/ 032 Federation Square: Façade Detail [Author]
6.3/ 001 Uni. Of Pretoria Law Building [Author]
6.3/ 002 Apartheid Museum [Author]
6.3/ 003 Fukui Library [Author]
6.3/ 004 Maropeng Visitors Centre [Author]
6.3/ 005 Uni. Of Pretoria Law Building: Elevation [Author]
6.3/ 013 Uni. Of Pretoria Law Building: Roofing Detail [Author]
ILLUSTRATIONS 10.1

PRECEDENT STUDIES 6/

6.3/017 Uni. Of Pretoria Law Building: Back Entrance [Author]
6.3/021 Uni. Of Pretoria Law Building: University Avenue Façade [Author]
6.3/022 Uni. Of Pretoria Law Building: Roofing as expressive element covering Circulation Strip [Author]
6.3/023 Uni. Of Pretoria Law Building: University Avenue Façade [Author]
6.3/024 Uni. Of Pretoria Law Building: Front Entrance [Author]
6.3/025 Fukui Library: Building [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]
6.3/026 Fukui Library: Plans [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]
6.3/027 Fukui Library: Courtyard [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]
6.3/028 Fukui Library: Drawings [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]
6.3/029 Dept. of Science + Technology: Plan Sketch [Author]
6.3/030 Dept. of Science + Technology: Entrance [Author]
6.3/031 Dept. of Science + Technology: Façade Detail [Author]
6.3/032 Dept. of Science + Technology: Glass Curtain Wall [Author]
6.3/033 Dept. of Science + Technology: Glass Detailing [Author]
6.3/034 Dept. of Science + Technology: Steel Stair [Author]
6.3/035 Dept. of Science + Technology: Louvre System [Author]
6.3/036 Dept. of Science + Technology: Circulation Sketch [Author]
6.3/037 Dept. of Science + Technology: Balconies [Author]
6.3/038 Dept. of Science + Technology: West Elevation [Author]
6.3/039 Dept. of Science + Technology: East Elevation [Author]
6.3/040 Dept. of Science + Technology: West Façade with Auditorium + Library [Author]
6.3/041 Dept. of Science + Technology: Shadow Lines [Author]
6.3/042 Dept. of Science + Technology: Basement entry [Author]
6.3/043 Australian Centre for the Moving Image: Lobby [Author]
6.3/044 Australian Centre for the Moving Image: Glass Detail [Author]
6.3/045 Australian Centre for the Moving Image: Glass Door in Lattice [Author]
6.3/046 Australian Centre for the Moving Image: BMW Theatre Venue [Author]
6.3/047 Australian Centre for the Moving Image: Steel Detailing [Author]
6.3/048 Australian Centre for the Moving Image: Internal Space [Author]
6.3/049 Australian Centre for the Moving Image: Triple Volume Entrance [Author]
6.3/050 Australian Centre for the Moving Image: Distorted Glass Exit [Author]
6.3/051 Australian Centre for the Moving Image: Glass Balustrade [Author]
6.3/052 Australian Centre for the Moving Image: Lattice Shell [Author]
6.3/053 Australian Centre for the Moving Image: Lattice Shell [Author]
6.3/054 Australian Centre for the Moving Image: Steel Frame [Author]
6.3/055 Apartheid Museum: Conc. Columns [Author]
6.3/056 Apartheid Museum: Sketch Plan [Author]
6.3/057 Apartheid Museum: Ramp of Reflection [Author]
6.3/058 Apartheid Museum: Conc. Columns + Reflection pool [Author]
6.3/059 Apartheid Museum: Brick Wall [Author]
6.3/060 Apartheid Museum: Conc. Box [Author]
ILLUSTRATIONS 10.1

PRECEDENT STUDIES 6/

6.3/061 Apartheid Museum: Reflections from low window [Author]
6.3/062 Apartheid Museum: Reflections on Conc. Forms [Author]
6.3/063 Apartheid Museum: Reflection pool on Conc. Forms [Author]
6.3/064 Apartheid Museum: Reflection pool on Conc. Column [Author]
6.3/065 Apartheid Museum: Reflection ramp [Author]

6.3/066 Apartheid Museum: Conc. Forms [Author]
6.3/067 Apartheid Museum: Conc. Column [Author]
6.3/068 Apartheid Museum: Conc. Column [Author]

6.3/069 Apartheid Museum: External View of Conc. Box with low windows [Author]
6.3/070 Apartheid Museum: External Display Ramp [Author]

6.3/071 Maropeng Visitors Centre: Logo [Author]
6.3/072 Maropeng Visitors Centre: Sketch of Building [Author]
6.3/073 Maropeng Visitors Centre: Structural Fins [Author]
6.3/074 Maropeng Visitors Centre: Internal Space [Author]
6.3/075 Maropeng Visitors Centre: Skylight [Author]
6.3/076 Maropeng Visitors Centre: Internal Space [Author]
6.3/077 Maropeng Visitors Centre: Internal Space [Author]

6.3/078 Maropeng Visitors Centre: Off-Shutter Conc. Wall [Author]
6.3/079 Maropeng Visitors Centre: Conc. Columns as a gateway [Author]
6.3/080 Maropeng Visitors Centre: External View of museum [Author]

6.3/081 Maropeng Visitors Centre: External View of building [Author]
6.3/082 Maropeng Visitors Centre: Surrounding Landscape [Author]
6.3/083 Maropeng Visitors Centre: Sketch Section [Author]
6.3/084 Maropeng Visitors Centre: Internal Circulation [Author]

6.3/085 Maropeng Visitors Centre: Restaurant over looking view [Author]
6.3/086 Maropeng Visitors Centre: Length of Gallery underground [Author]

6.3/087 Maropeng Visitors Centre: End of Gallery Surfacing [Author]
6.3/088 Maropeng Visitors Centre: Base of Mound [Author]
6.3/089 Maropeng Visitors Centre: End of Gallery Wall + Circulation [Author]

6.3/090 Maropeng Visitors Centre: Gallery Wall [Author]
6.3/091 Maropeng Visitors Centre: Internal Circulation Route [Author]
6.3/092 Maropeng Visitors Centre: Connection to Landscape [Author]
6.3/093 Maropeng Visitors Centre: Internal Structure [Author]
6.3/094 Maropeng Visitors Centre: Sketch Plan [Author]

6.4/001 Uni. Of Pretoria Law Building [Author]
6.4/002 Australian Centre for the Moving Image: Lattice Shell [Author]
6.4/003 Equilin Offices: Roof + Glass Connection at Corner [Author]
6.4/004 Dept. of Science + Technology: External Steel Louvre [Author]
6.4/005 Uni. Of Pretoria High Performance Centre: Concrete Stair [Author]
6.4/006 Uni. Of Pretoria High Performance Centre: Concrete Stair [Author]
6.4/007 Uni. Of Pretoria High Performance Centre: Sketch [Author]
6.4/008 Uni. Of Pretoria High Performance Centre: Conc. Palette [Author]

6.4/009 Uni. Of Pretoria High Performance Centre: Concrete + Glass [Author]
6.4/010 Uni. Of Pretoria High Performance Centre: Glass Stair [Author]
6.4/011 Uni. Of Pretoria High Performance Centre: Ordered Form [Author]
6.4/012 Uni. Of Pretoria High Performance Centre: Concrete Stair [Author]
6.4/013 Uni. Of Pretoria High Performance Centre: Steel [Author]
Illustrations 10.1/

PRECEDENT STUDIES 0/

6.4/ 061 Dept. of Science + Technology: South Façade [Author]
6.4/ 062 Dept. of Science + Technology: Mechanical Steel Louvre System on West Façade [Author]
6.4/ 063 Dept. of Science + Technology: Internal Space with Glass Façade + Skylight [Author]
6.4/ 064 BMW Plant: Internal Space [GA DOCUMENT 86; July 2005; Ada Editia, Tokyo, Japan]
6.4/ 065 BMW Plant: Internal Space [GA DOCUMENT 86; July 2005; Ada Editia, Tokyo, Japan]
6.4/ 066 BMW Plant: Concrete Forms [GA DOCUMENT 86; July 2005; Ada Editia, Tokyo, Japan]
6.4/ 067 BMW Plant: Internal Circulation [GA DOCUMENT 86; July 2005; Ada Editia, Tokyo, Japan]
6.4/ 068 BMW Plant: Ramps [GA DOCUMENT 86; July 2005; Ada Editia, Tokyo, Japan]
6.4/ 069 BMW Plant: Drawings [GA DOCUMENT 86; July 2005; Ada Editia, Tokyo, Japan]

6.4/ 070 BMW Plant: Lattice Shell [Author]
6.4/ 071 Australian Centre for the Moving Image: Lattice Shell [Author]
6.4/ 072 Australian Centre for the Moving Image: Steel Detailing [Author]
6.4/ 073 Australian Centre for the Moving Image: Lattice Shell [Author]
6.4/ 074 Australian Centre for the Moving Image: Steel Detailing [Author]
6.4/ 075 Australian Centre for the Moving Image: Lattice Shell [Author]
6.4/ 076 Australian Centre for the Moving Image: Steel Frame [Author]
6.4/ 077 Australian Centre for the Moving Image: Lattice Shell [Author]
6.4/ 078 Australian Centre for the Moving Image: Steel Frame [Author]
6.4/ 079 Australian Centre for the Moving Image: Lattice Shell [Author]

6.4/ 080 Aurora Place: From Botanical Gardens [Author]
6.4/ 081 Aurora Place: Photo of Logo [Author]
6.4/ 082 Aurora Place: Pinnacle [Author]
6.4/ 083 Aurora Place: Residential Balconies [Author]
6.4/ 084 Aurora Place: From Street Level [Author]
6.4/ 085 Aurora Place: Base of Aurora [Author]
6.4/ 086 Aurora Place: Residential + Office Towers [Author]
6.4/ 087 Aurora Place: Glass Skin Envelope [Author]
6.4/ 088 Aurora Place: Materials [Author]
6.4/ 089 Aurora Place: Sydney City Skyline with Aurora Place + the Sydney Opera House [http://www.rpbw.com/Aug 2004]
6.4/ 090 Aurora Place: Balustrade [Author]
6.4/ 091 Aurora Place: Louvre Window Detail [Author]
6.4/ 094 Aurora Place: Residential Edge [Author]
6.4/ 095 Aurora Place: in city context [Author]
6.4/ 096 Aurora Place: Louvre Windows [Author]
6.4/ 097 Aurora Place: Connection to outside context of Sydney including Sydney Opera House [Author]
6.4/ 098 Aurora Place: Glass louvre system [Author]
6.4/ 099 Aurora Place: Louvre Window Section [http://www.rpbw.com/Aug 2004]
6.4/ 100 Aurora Place: Louvre Window [Author]
6.4/ 101 Aurora Place: Office Tower Enclosed Balconies + louvres [Author]
6.4/ 102 Aurora Place: Fitted Glass Skin [Author]
6.4/ 103 Aurora Place: Glass Ceiling over public eating place on ground floor with visual connection to context [Author]
6.4/ 104 Millennium Park: Display and Water [www.milleniumpark.net13/10/2006]
6.4/ 106 Millennium Park: [www.milleniumpark.net13/10/2006]
6.4/ 107 Millennium Park: [www.archidose.org 13/10/2006]
ADDENDUM 10/ Illustrations 10.1/

Illustrations 10.1/
7/ 083 Formalising of Design Model 1:450 with focus on Programme + Conceptual Approach [Author]
7/ 084 Working Model 1:200 towards final Product [Author]

TECHNICAL INVESTIGATION 8/ 
8/ 001 Apartheid Museum: Concrete Columns [Author]
8/ 002 Dept. of Science + Technology: Steel Louvre System [Author]
8/ 003 Equifin Offices on Lynnwood Road: Concrete, Steel + Glass Connections [Author]
8/ 004 Uni. of Pretoria Law Building: Roof + Glass Connection [Author]
8/ 005 Uni. of Pretoria Law Building: Steel Roof [Author]
8/ 006 Circulation Sketch [Author]
8/ 007 Seating Detail [Author]
8/ 008 Circulation Edge Details [Author]
8/ 009 Conc. Circulation Levels [Author]
8/ 010 Steel Construction [EQF Project Managers at Maponya Mall]
8/ 011 Circulation Plan + Sections [Author]
8/ 012 Cartoon [www.cnci.org.za 02/10/2006]
8/ 013 Conc. Columns as defining elements [Author]
8/ 014 Maropeng Visitors Centre: Off-shutter concrete wall [Author]
8/ 015 Conc. Circulation Plan [Author]
8/ 016 Uni. Of Pretoria High Performance Centre: Conc. Stairs [Author]
8/ 017 Threshold Diagram [Author]
8/ 018 Museum of Technology: Conc. façade [Author]
8/ 020 Apartheid Museum: Concrete Columns [Author]
8/ 022 Cavity Construction for Basement Retaining Wall Conditions [Wegelin 2005:1.29]
8/ 023 Conc. Circulation Levels [Author]
8/ 024 Tilt-up construction: Conc. Layed on site [EQF Project Managers at Maponya Mall, Soweto]
8/ 025 Lafarge Cement South Africa Logo [www.concretesociety.co.za or www.lafarge.co.za 02/10/2006]
8/ 026 Holcim Cement South Africa [www.holcim.co.za 02/10/2006]
8/ 027 Amsteele Systems [www.amsteelesystems.com 02/10/2006]
8/ 028 Basement Diagram showing ventilation shafts + space for tensioning slabs [Author]
8/ 029 Uni. Of Pretoria Law Building: Circulation Strip + Glass detail [Author]
8/ 030 Mittal Steel Logo [www.mittal.co.za or www.iscor.co.za 02/10/2006]
8/ 031 Uni. Of Pretoria Law Building: Circulation Strip Roof Detail [Author]
8/ 032 Equifin Offices: Steel Detailing [Author]
8/ 033 Equifin Offices: Roof + Glass Connections [Author]
8/ 034 Equifin Offices: Steel Detailing [Author]
8/ 035 Uni. Of Pretoria Law Building: Steel Stair Detail [Author]
8/ 036 Dept. of Science + Technology: West façade Louvre System [Author]
8/ 037 Dept. of Science + Technology: West façade Louvre System [Author]
8/ 038 Australian Centre for the Moving Image: Entrance [Author]
8/ 040 Concrete Column + Steel Louvre System [Author]
8/ 041 Circulation Edge Sketch [Author]
8/ 042 Seating Detail [Author]
8/ 043 Display Edge [Author]
8/ 044 Connection to Sky [Author]
8/ 045 Step 1: Concrete is poured to form Tilt-Up panel [www.tiltupnews.com 02/10/2006]
Illustrations 10.1/

TECHNICAL INVESTIGATION

8/046 Step 2: Tilt-Up panels are tilted into position using a crane. [www.tiltupnews.com 02/10/2006]
8/047 Step 3: Tilt-Up panels are tilted into position and held in place with steel. [www.tiltupnews.com 02/10/2006]
8/048 Step 4: All Tilt-Up panels are set in place and connected. [www.tiltupnews.com 02/10/2006]

8/049 Tilt-tech Technologies Logo. [www.tilttech.co.za 02/10/2006]

8/050 Off Shutter Concrete pouring. [EQF Project Managers, at Maponya Mall]
8/051 Off Shutter Concrete construction. [EQF Project Managers, at Maponya Mall]

8/052 Tilt-up panel lifted into place. [www.tiltupnews.com 02/10/2006]
8/053 Tilt-up panel reinforcing cage. [EQF Project Managers, at Maponya Mall]

8/054 Tilt-up construction: concrete being poured on site. [EQF Project Managers, at Maponya Mall]
8/055 Tilt-up construction: Settings Process. [EQF Project Managers, at Maponya Mall]

8/056 South African Construction Worker. [EQF Project Managers, at Maponya Mall]

8/057 Off Shutter Concrete construction. [EQF Project Managers, at Maponya Mall]
8/058 Conc. Floor slab construction. [EQF Project Managers, at Maponya Mall]

8/059 Steel Reinfocement Cages. [EQF Project Managers, at Maponya Mall]
8/060 Conc. Columns. [EQF Project Managers, at Maponya Mall]

8/061 Site Equipment. [EQF Project Managers, at Maponya Mall]
8/062 Basement Foundation Detail. [Author]

8/063 Steel + Concrete Construction. [EQF Project Managers, at Maponya Mall]
8/064 Off Shutter Concrete pouring. [EQF Project Managers, at Maponya Mall]

8/065 Conc. Roof slab construction. [EQF Project Managers, at Maponya Mall]
8/066 Site Equipment. [EQF Project Managers, at Maponya Mall]

8/067 Basement Section Sketch. [Author]
8/068 SAPTA Logo. [www.sapta.co.za 02/10/2006]

8/069 Steel Tendons for Post-Tensioning slab. [www.amsteelesystems.com 02/10/2006]
8/070 Construction Workers. [EQF Project Managers, at Maponya Mall]

8/071 Site Equipment. [EQF Project Managers, at Maponya Mall]
8/072 Amsteele Systems. [www.amsteelesystems.com 02/10/2006]
8/073 Stab Arrangements. [www.amsteelesystems.com 02/10/2006]

8/074 Construction Workers + Steel Purlins on site. [EQF Project Managers, at Maponya Mall]
8/075 Steel Connection. [EQF Project Managers, at Maponya Mall]
8/076 Steel + Concrete System. [EQF Project Managers, at Maponya Mall]

8/077 EQF Project Managers, at Maponya Mall. [EQF Project Managers, at Maponya Mall]
8/078 I-beams and haunch connections ready for roofing system. [EQF Project Managers, at Maponya Mall]

8/079 Reinforced Conc. Columns. [EQF Project Managers, at Maponya Mall]
8/080 SAPTA Logo. [www.sapta.co.za 02/10/2006]

8/081 Steel Profiles [SAIC Manuel1994: 2.4]
8/083 Steel Cleat Detail. [EQF Project Managers, at Maponya Mall]
8/084 Mittal Steel Logo. [www.mittal.co.za or www.iscor.co.za 02/10/2006]

8/086 Scaffolding + Construction Workers. [EQF Project Managers, at Maponya Mall]
8/087 Roofing System showing Insulation layer. [EQF Project Managers, at Maponya Mall]
8/088 Steel + Conc. Construction. [EQF Project Managers, at Maponya Mall]

8/089 Steel Roofing System with Purlins in place. [EQF Project Managers, at Maponya Mall]
8/090 Construction Workers. [EQF Project Managers, at Maponya Mall]

8/091 IBR Roof Sheeting Profile + hook bolts [Wegelin 2005: 5.13]
8/092 Access Link Plan. [Author]

8/093 University of Pretoria Law Building: Vertical Circulation. [Author]
ADDENDUM 10/ Illustrations 10.1/

Illustrations 10.1/

TECHNICAL INVESTIGATION 8

8/ 094 University of Pretoria High Performance Centre: Vertical Circulation Glass box [Author]
8/ 095 University of Pretoria High Performance Centre: Concrete Stairs [Author]
8/ 096 Roofing Sketch [Author]
8/ 097 Steel Stair in Access Link [Author]
8/ 098 Vertical Circulation [Author]
8/ 099 Entrance Sketch [Author]
8/ 100 Section C-C [Author]
8/ 101 Detail of Circulation Edge [Author]
8/ 102 Roof plan of circulation edge [Author]
8/ 103 Concrete Circulation Edge [Author]
8/ 104 Circulation Edge + Screens [Author]
8/ 105 Display Edge [Author]
8/ 106 Concrete Seat [Author]
8/ 107 Concrete Edge Detail [Author]
8/ 108 Concrete Seating [Author]
8/ 109 Circulation Conceptual Sketch [Author]
8/ 110 Sketch Section D-D [Author]
8/ 111 Ground Floor Plan of Circulation Edge [Author]
8/ 112 Design Development [Author]
8/ 113 Design Development [Author]
8/ 114 Section C-C [Author]
8/ 115 Conceptual Diagram [Author]
8/ 116 Courtyards + Circulation Edge [Author]
8/ 117 Design Development [Author]
8/ 118 Plan + Courtyards [Author]
8/ 119 Section A-A through Courtyards [Author]
8/ 120 Fukui Library [GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan]
8/ 121 Design Development of courtyards [Author]
8/ 122 3D Sketch Development [Author]
8/ 123 Design Development of courtyards [Author]
8/ 124 Steel + Glass detail sketch [Author]
8/ 125 Gutter Detail [Author]
8/ 126 Gutter Detail [Author]
8/ 127 Department of Science + Technology: Glass Facade [Author]
8/ 128 Federation Square: Steel + Glass shell [Author]
8/ 129 Federation Square: Entrance Atrium [Author]
8/ 130 Roof Plan Sketch [Author]
8/ 131 Concrete, Steel + Glass detail sketch [Author]
8/ 132 Steel + Roof Detail [Author]
8/ 133 Drainage Detail [Author]
8/ 134 3D Sketch of level changes [Author]
8/ 135 Level Change Section [Author]
8/ 136 Retaining wall + tanking [Author]
8/ 137 Section B-B through Basements [Author]
8/ 138 Column + Concrete Seating [Author]
8/ 139 3D of Column + Pad Foundation [Author]
8/ 140 Plan of Pad Foundation [Author]
8/ 141 Basement Sketch [Author]
Sources 10.2/


10.2/ City of Cape Town, “Municipal Spatial Development Framework”, August 1999


10.2/ GA DOCUMENT 75, Oct 2003; Ada Editia, Tokyo, Japan

10.2/ GA DOCUMENT 86, July 2005; Ada Editia, Tokyo, Japan

10.2/ Gautrain Rapid Rail Link Document, Bombela Civil Works Joint Adventure, “Horizontal Plan + Longitudinal Profile km 600 000 to km 600 700”, HHO Africa Infrastructure Engineers + Ingerop


10.2/ Giedion, S, 1958. “Architecture you and me- The diary of development”, Harvard University Press, Massachusetts, USA


ADDENDUM 10/ Sources 10.2/


10.2/ Szokolay “Solar Geometry” + Environment Notes from the University of Cape Town BAS 5


10.2/ Tshwane Inner City Development and Regeneration Strategy, 2005


10.2/ University of South Africa Property Plan 2005-2015, Development Manuel, Executive Summary
Sources 10.2/


10.2/ Zevi, Bruno 1957. “Architecture as Space- How to Look at Architecture”, Congress Catalog, USA

Material Websites 10.2/

Concrete
• www.concretesociety.co.za
• www.cma.org
• www.holcim.co.za
• www.lafarge.co.za
• www.ppc.co.za
• www.cncc.org.za/structural_concrete
• www.tiltupnews.com
• www.tilttech.co.za
• www.sapta.co.za

Steel
• www.mittal.co.za or www.iscor.co.za
• www.amsteelesystems.com

Glass
• www.pilkington.com.au
• www.nano.uts.edu.au/nanohouse
• www.nano.csiro.au
• www.myretsu.com
• www.v-lool.com
• www.coverfg.co.za
The defining of clear spaces to accentuate place, thresholds and order requires solid forms such as walls. Courtyards consisting of a defined nesting qualities with the option to view out defines a difference between being within the courtyard and being beyond it. Defined spaces emphasise the difference between spaces and thus connection, which is communicated physically and visually through materials.

**Thresholds**

The concept of a threshold is that which is before or after something and thus should be communicated through level changes, material changes, change in scale and difference in light qualities. These are all approaches essentially attempting to make a physical change to ones experience and define one space from another through a distinct character embedded in each space.

**Circulation Strips**

The intention of circulation routes sets an order to access and thus process of experience. The idea of creating a space which though open and interactive still has a character of it’s own and quality of experience different to those spaces connected to it.

**Transparent Edges**

Visual Connection from inside to outside and outside to inside enables a truly connected form of architecture which glass allows for in the expression of communication through connection. Thus bridging the gap whereby architecture is essentially about forming enclosure yet only on a physical level. Technology is able to allow for visual connection whilst still providing enclosure. Its surroundings even more. A wall no longer needs to only function as a wall it can do so much more.

**Display Surfaces**

Advances in technology and especially display can enable building elements to become more than structuring forms but surfaces for display. The building envelope has the potential to display and communicate with