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Path A Passenger Cruise Terminal For Durban

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A Passenger Cruise Terminal For Durban



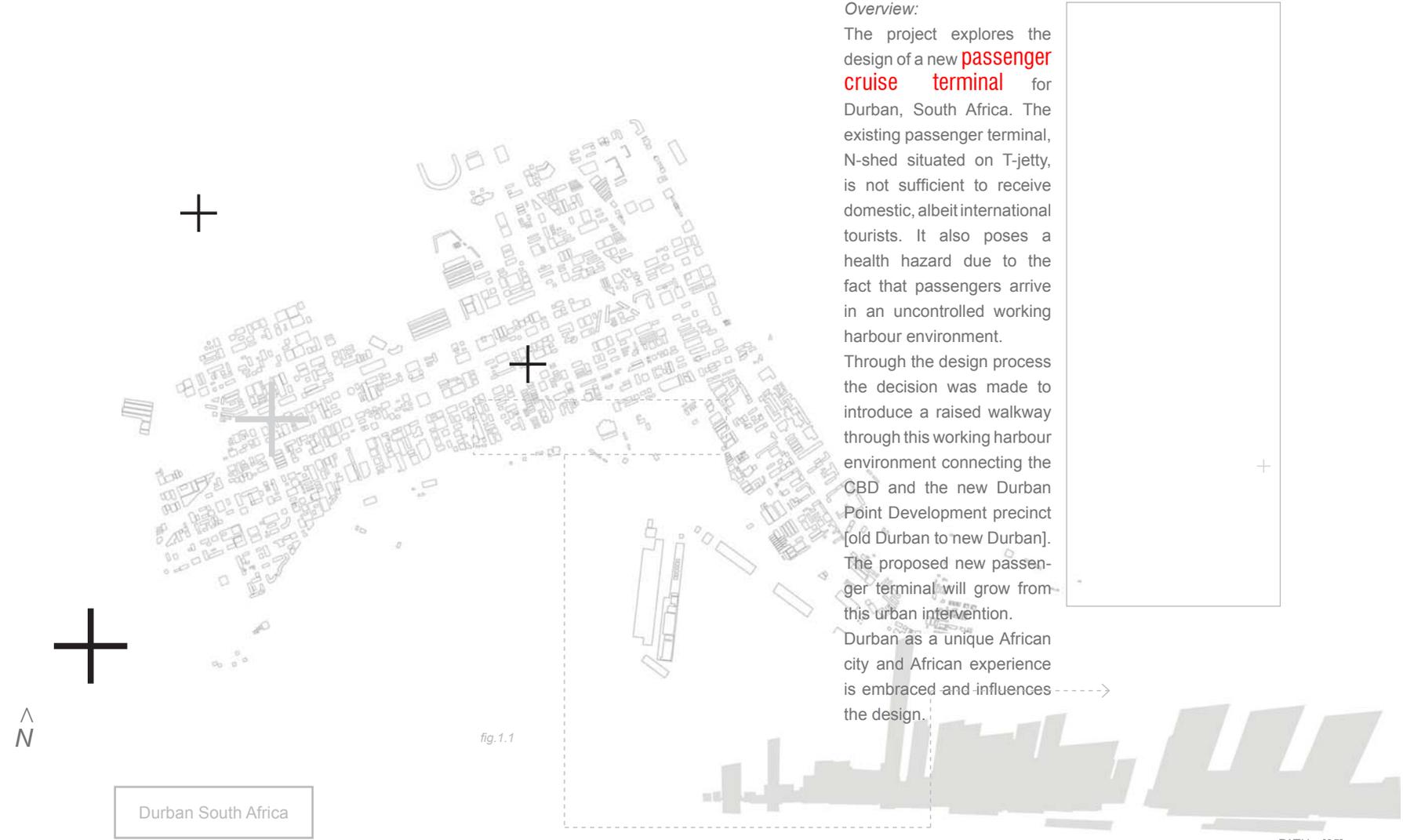
by

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Submitted in fulfilment of part of the requirements for the Degree of Masters in **Architecture** in the Faculty of Engineering, Built Environment and Information Technology, The University of Pretoria, Pretoria, South Africa.

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Mentor: Prof. le Roux



Overview:

The project explores the design of a new **passenger cruise terminal** for Durban, South Africa. The existing passenger terminal, N-shed situated on T-jetty, is not sufficient to receive domestic, albeit international tourists. It also poses a health hazard due to the fact that passengers arrive in an uncontrolled working harbour environment. Through the design process the decision was made to introduce a raised walkway through this working harbour environment connecting the CBD and the new Durban Point Development precinct [old Durban to new Durban]. The proposed new passenger terminal will grow from this urban intervention. Durban as a unique African city and African experience is embraced and influences the design.

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[to my parents]

Context: Durban South Africa

Architecture is about creating an experience for people using buildings. In the case of this project architecture is about creating a unique experience for the cruise ship passenger and the observer. This concept becomes the primary vehicle behind the design process.

There are various methods to explore the world, be it flight, motor vehicle, hitchhiking or a planned package. The passengers of a cruise ship deserve a unique experience, a true experience of Durban South Africa. Durban needs to be marketed within the global arena as the African city it is, not an attempt at imitating Sydney or Dubai. In the same way the citizens of Durban hold the right to be portrayed in a true light, as an African city.

>> Through the architecture the project strives to create this sole experience of exploring Durban.

Durban is a multi-cultural, vibrant city with a rich history. Once one of the greatest wetland systems between Cape Town and Cairo, vegetation flourishes everywhere. The Port is the country's premier gateway, strategically positioned on the eastern seaboard of South Africa, with the container terminal being the primary source of income. "Rotterdam in Africa" [Harber, 2005]. A component of the project strives to explore Durban, to recognise and respond to the unique qualities of the city in Africa and to anticipate the future.

The major problems faced by South Africa as a country at this present time include: HIV/AIDS, low levels of literacy and skills development, unemployment, poverty and

a high crime rate. These challenges set the backdrop for all architectural projects undertaken in South Africa. As does the problem of our cities, their spatial form is characterised by sprawl and fragmentation brought about as a result of changing social and economic forces and the legacy of apartheid. Any project should be a response to these major social and economic challenges. The project should address at least one of these themes, as well as addressing the major brief. Architects have a social responsibility, and therefore the needs of the community should be on their agenda. The idea that architecture needs to be appropriate to the local context and function according to the required brief is no doubt also very important, and should form the basis of all projects.

I feel the project should be approached in terms of time as well as space. In order to be sustainable the building needs to have the ability to transform and evolve accordingly. The original brief may become obsolete within a short period of time. The project needs to be able to change to take on new programs. This theme falls within the greater theme of "green architecture". All buildings need to be sustainable in terms of social, economic and environmental factors. "Green architecture" is very relevant to the world at this time and should be explored.

As Architects have a social responsibility they also have an environmental responsibility. If not more in Africa than anywhere else in the world.

"Africa reflects a veritable web of ecological interactions

in which the opportunities and potentials for diversity in the living system are more dynamically expressed than anywhere else on earth. More plant species, more animal species, more diversity and more total biomass per unit area, with materials moving through the system at an unparalleled rate. This is the environment in which humanity evolved". *Nomico, 2000, ACBD workshop report.*

Architects have been placed in a position where they are able to address environmental problems through appropriate architecture. This opportunity should not be wasted. Buildings and the construction process are major contributors to unsustainable development and energy waste. Projects must adhere to "good practice", while doing so educating and creating awareness within the general public.

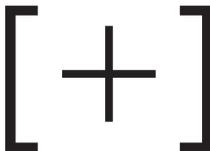
To conclude, architects have a social as well as an environmental responsibility and the major concept is designing an experience for the user. In this case the exploration of Durban as an African city.



fig. 2.1 Battery Bay

Durban South Africa

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N-Shed Passenger Cruise Terminal

N-Shed is presently the passenger cruise terminal situated on T-Jetty within the heart of the harbour. Access is through working areas of the harbour posing a security and danger risk, this being a high priority on the Port Authorities list of things to change.

A Passenger's first experience of Durban is a basic shed structure with very few facilities. Once off the ship, passengers enter a large open space where luggage collected. They proceed through customs, and into the second space of the shed, where family or friends may be waiting on odd plastic garden furniture. This space houses a make-shift market and a basic kiosk. Once through this space passengers exit the building and are confronted by a group of taxi and bus drivers hustling for business. At no point along this journey is the passenger provided with information about Durban and surrounding tourist attractions. A similar process is experienced when boarding a cruise ship, be it local or international.

Friends and family who wish to bid farewell or greet passengers have a very limited experience. A temporary two meter high fence along the wharf prevents any interaction with the passengers on the ship. It is not possible to take photographs due to this same fence. Once in the building, two small port-hole windows offer a very limited view of the cruise ship. Over and above all these barriers, many people are present to watch the arrival and departure of ships. This experience can and needs to be enhanced with consideration to security and safety.



Client

Portnet and eThekweni Municipality have been identified as the principle clients. Portnet have been interested in developing a passenger cruise terminal for a number of years, while the city sees the project as an opportunity to develop an urban catalyst to upgrade the Victoria Embankment precinct and strengthen the link between the harbour and the city.

Client Requirements

Portnet requires a building to receive and dispatch cruise ship passengers, the building must compete with world class standards. The project will need to accommodate arrivals and departure halls, customs facilities, luggage facilities, viewing areas, a restaurant, tourism information desk and public toilets.

Due to the nature of the cruise ship industry, the building will be used intensely for short periods of time, and therefore an additional function will need to be identified. This function will need to occupy the vacuum created when cruise ships are not present, maintaining the human energy within the building. A possible function may be Port Authority offices, an exhibition space, entertainment area or restaurant.

In terms of the city's requirements, an urban intervention that will stimulate development in and around the Victoria Embankment precinct is required. As mentioned the project needs to strengthen the link between the harbour and the city, by reclaiming sectors of the water-edge.

fig.2.2 model of city

The major goals of the project have been identified:

1. Design of a passenger cruise terminal to international standards, that will boost the KwaZulu-Natal tourism industry.
2. Encourage Cruise ship passengers to explore Durban, while offering them the opportunity to experience the City of Durban as a true African City.
3. Aid in the upgrade and development of the Victoria Embankment precinct and consequently Durban city as a whole, through the spatial framework and townscape.
4. Establish links between cruise ship authorities and the rural tourism projects and encourage tourists to not only go to mainstream tourist attractions. By so doing improve the living standards of rural communities.
5. Design a positive experience for cruise ship passengers and viewers that will encourage them to revisit.
6. Design a building and public space that merges with the city and is part of the everyday life of the Durban community, not simply a destination building.
7. Establish a building that emphasises the Genius loci of Durban and Durban's history.
8. Ensure "good practice" is incorporated from the initial concepts of the building, embracing issues of the environment and its protection.
9. Link the project to the proposed transport systems to allow effective accessibility to the intervention.



3.0 Context Analysis



3.1 Introduction

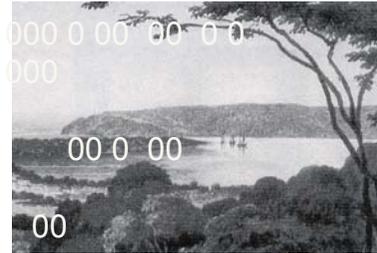


fig. 3.1

Durban has grown from an initial settlement of hunters and frontiersmen, to one of the most important cities in South Africa. Situated on the eastern seaboard, the port has served as the premier gateway to much of the country through-out the history of the country. It played a major role as the gateway for the British during the Anglo-Boer War

and continues to exist as an important hub port for much of Southern Africa. To add to this, the city and surrounding areas, with its sub tropical climate, are major role players within the national and international tourism market. Durban has a rich history, multi-cultural diversity and unique character. This being primarily due to its initial

colonial beginnings and its global position on the Indian ocean with links to Asia, while situated around an African bay and being African in terms of climate, vegetation and people.

1800

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1900

C10 000BC Bay of Natal inhabited by stone age people.

1497 Coast of Natal is sighted by Vasco da Gama on Christmas day, naming it *terra de Natal*.

>>

1497-1800 The only European visitors to Natal between 1497 and 1800 are the crews and passengers of shipwrecked vessels, and no permanent settlements are established.

1826 Farewell commences the building of a fort at The Point

1835 On the 23 June a meeting is held for selecting the site for a new town. The town is named *Durban*, after the governor of the Cape colony.

1838 July - the decision is made to establish Pietermaritzburg Dec- The Battle of Blood River, first British occupation of Natal.

>>

1843 Sir George Napier announces to the Legislative Council of the Cape that the Queen would take the inhabitants of Natal under her protection.

1848 The main body of Trekkers leave Natal. Those that remain are settled in Pietermaritzburg, Weenen and the Klip River and Umvoti districts.

1860 Labourers from India arrive.
1860 The first railway line is built between The Point and the town.

1899 First action of the Anglo-Boer War at Kraaipan.

1902 Vereeniging peace conference, and peace treaty signed.

1970 Pier no. 1 is built due to demand for containerisation.

1976 Pier no.2 is built, the current container terminal.

1510 Portugese settle in Mozambique.

1652 Dutch settle in the Cape.

1823 Two ex-officers of the British Royal Navy, Farewell and King enter Port Natal. As a result of their visit, Farewell decides to establish a trading post at Port Natal.

1837 Piet Retief arrives at Port Natal.

1842 Second British occupation of Natal.

1845 William Bell becomes the first port captain.

1848 5 000 English and Scots arrive in Natal, due to the potato blight and population explosion in England.

1880 Zulu War

1904 Maydon Wharf built.

1960 Ocean Cruise Terminal built.

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3.3 *Historical Context*

Water flowed from the small river, Cato Creek, through the wetland and into the bay. Wildlife flourished, mangrove forests were the habitat of vast amounts of birdlife, antelope and monkeys. Their root systems formed fish nurseries and were home to hundreds of species of molluscs and crustaceans. Fish and crocodiles were in abundance and a jungle environment dominated.

Cato Creek gave birth to the bay, the harbour developed due to the bay and in turn the city grew from the harbour.

The Bay of Natal was first inhabited by Stone Age people who followed the migratory routes of animals from the Drakensberg Mountains. Later there were

various other migrations and the ancestors of the Nguni people arrived and settled around the bay. As recently as 1865 their fish kraals and traps could still be seen in the Lagoon.

Vasco da Gama sighted the Bluff in 1497, naming it *terra de Natal*, because it was on Christ's birthday, or Christ's *natal* day. In later years James Saunders King set out by boat from Cape Town to explore the Zululand coast. He sailed over the sand bar into the Bay of Natal, and built the first settlement. Furthermore he drew up the first chart of the bay. Captain William Bell became the first port captain in 1845 and resided in Signal Station.

The onset of the Zulu War spurred harbour development. The British troops had to land at a single

jetty, forcing most horses to swim from the ships to the beach. Consequently, soon after the war, construction of wharves commenced. The year of 1860 saw the first railway line in South Africa linking the Point to the town. This developed further so goods could be transported to the interior of the country.

Durban played a major role in the Anglo-Boer War. Between 1899 and 1902 it acted as the major gateway for the British into South Africa.

During 1957 to 1962 the passenger cruise terminal was built. The development included a huge reception hall, an extensive pre-cooling plant for fruit, a ten-storey administration block and general cargo sheds on the ground floor. Sanctions, as a result of

apartheid, lead to the last passenger ship to berth in 1977. The Ocean terminal building stood empty for a number of years, until it was converted into the present day Port Authority offices. A mezzanine level was introduced minimizing the large open spaces.

With the lifting of sanctions, the need for a passenger cruise terminal arose. A make-shift tent structure was used for a few months before N-shed on T-jetty was half-heartedly converted to house the processes involved with the arrivals and departure of cruise ships. At present N-shed is being used, although not an adequate structure to receive international and local tourists to Durban. These problems will be discussed in detail at a later stage. [Portnet Museum]



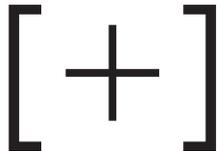
fig.3.2 The Natal one penny stamp symbolising the rule of Queen Victoria



fig.3.3



[landscape]



The line of palms along the esplanade is an icon many people associate with Durban.



3.4 Global Context

Situated on the east coast of South Africa, Durban is well positioned to serve the economic links between South Africa and the Asia Pacific Region.

3.4.1 Durban in the Global Tourism Market

The cruise ship industry is booming. Cruise ships are no more simply for the super rich. Many ports are building new cruise terminals, such as the Prince Rashid in Dubai, the Mayflower in Southampton or Port Kelang in Kuala Lumpur. Small islands in the Caribbean are opening up their harbours to accommodate large cruise ships.

“Themed cruises are becoming very popular, with the emphasis on historic sites and culture, wildlife watching (flying fish, whales, penguins, sharks, dolphins....) or shopping because, depend on it, where there’s a port you’ll find a warm welcome at a mall or a market not far way. There are even wedding, golf, gay pride and gambling cruises.” (Nivison, 2005 p. 10)

3.4.2 Foreign Tourism

Approximately 1.2 million tourists visit KwaZulu-Natal annually, spending approximately R6 500 per visitor. The average length of stay is thirteen nights with

the main source markets being the UK, Germany, USA and Canada, France and Netherlands. The major purpose of visits to KwaZulu-Natal are holiday 69 percent, business 16 percent, visit friends and relatives 11 percent and other 5 percent. (SAT 2004)

3.4.3 Durban Harbour

Situated on the eastern seaboard of Southern Africa, Durban harbour is South Africa’s premier harbour gateway. Projects such as the ‘Millenium Tower’, the port control tower, the widening of the entrance channel, the construction of new deep-water berths at the Point, the conversion of Pier

1 to the container handling and the expansion of the Durban Car Terminal will ensure the Port of Durban remains the busiest port on the African continent. To add to this, Durban Port is an employer to approximately 1 400 people. However another 35 000 people are dependent on the port.

The port covers a land area of 1 854ha, comprising its total land and water area, with a total distance around its shoreline of 21km.

There are 57 berths and 302km of rail track linked to the national rail network, which guarantees the rapid movement of import and export cargo. The port’s major strength is the Durban Container Terminal (DCT) which moves between 80 000 to 90 000 containers per month. This is more than 65 percent of South Africa’s containerised traffic. (The South African Ports Yearbook 2004)

Durban south africa

“Durban is strategically placed as an all-year-round port on the southern Indian Ocean cruise routes and getaway to the major tourist destinations in KwaZulu-Natal province. As such, it is a regular port of call for many leading cruise ships, with some fifty visits annually to the dedicated passenger handling facilities of N-Shed, T-Jetty.” The South African Ports Yearbook 2004

fig.3.4 global location



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fig.3.5 fig.3.6

fig.3.7

fig.3.8

fig.3.9

fig.3.10

fig.3.11

fig.3.12

fig.3.13

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Left to Right: BAT Centre, Durban City Hall, ICC, ICC, Memorial, Nedbank designed by Norman Eaton, Vasco da Gama memorial, Sugar terminal buildings, Yacht mole.

3.6 National Context

Durban has always served as a major gateway to the interior of the country, linking the Reef to the rest of the world. This link is vital for the economics of the country.

Approximately 13.9 million visitors each spending an average of R1 000. The average length of stay is 7.5 nights with the major source markets being other parts of KwaZulu-Natal, Gauteng and the Eastern Cape. The purpose of visits to KwaZulu-Natal includes VRF [visit relatives and friends] 75 percent, Holiday 10 percent, Business 6 percent and other 9 percent.

3.6.1 Domestic Tourism

The annual pilgrimage of tourists from the interior to Durban during the December holidays is a key contribution to the finance of the city.

3.7 Regional Context

3.7.1 The eThekweni Municipal Area

Durban falls within the eThekweni Municipal Area [EMA], within the province of KwaZulu Natal and covers an area of 2 297 square kilometers. While the total of the EMA is only 1.4% of the total area of the province, it contains just over a third of the population of KwaZulu Natal and 60% of its economic activity. Only 35% of the EMA area is predominantly urban in character, with over 80% of its population living in these areas. The majority of the densely populated informal housing is located within this area.

3.7.2 Key challenges

Key challenges facing the city according to the eThekweni Municipality Revised Integrated Development Plan 2003-2005:

- + Low economic growth and unemployment.
- + Poor access to basic household services.
- + High levels of poverty.
- + Low levels of literacy and skills development.
- + Sick and dying population affected by HIV/Aids
- + Exposure to unacceptably high levels of crime and risk.
- + Unsustainable development practices.
- + Ineffective, inefficient, inward-looking local government.

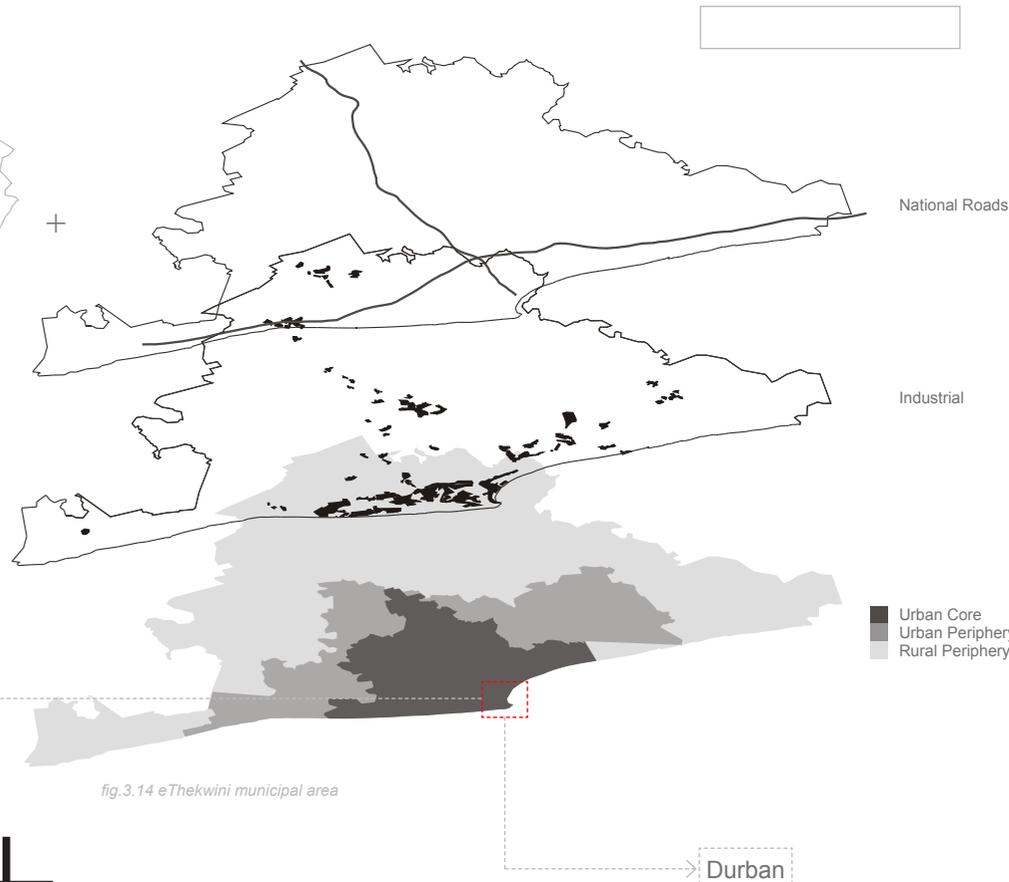


fig.3.14 eThekweni municipal area

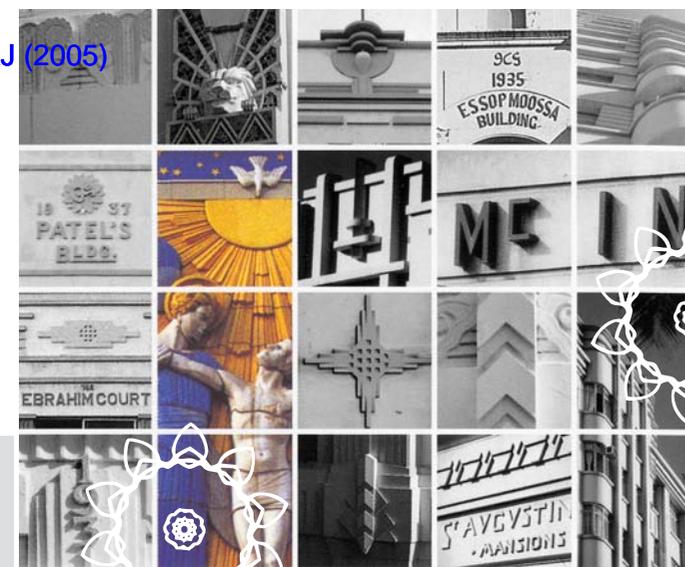


fig.3.15 Art Deco

3.8 Art Deco

The collection of over one hundred Art Deco buildings through-out Durban attaches a unique character to the city. These ornate buildings were add a decorative flourish to the previously conservative colonial town.

“Durban’s architectural response to the Art Deco movement was rich with idiosyncrasies and touches of the region. These were eloquently demonstrated in details and adornments.”
[Art Deco – Durban City Architects Guide]

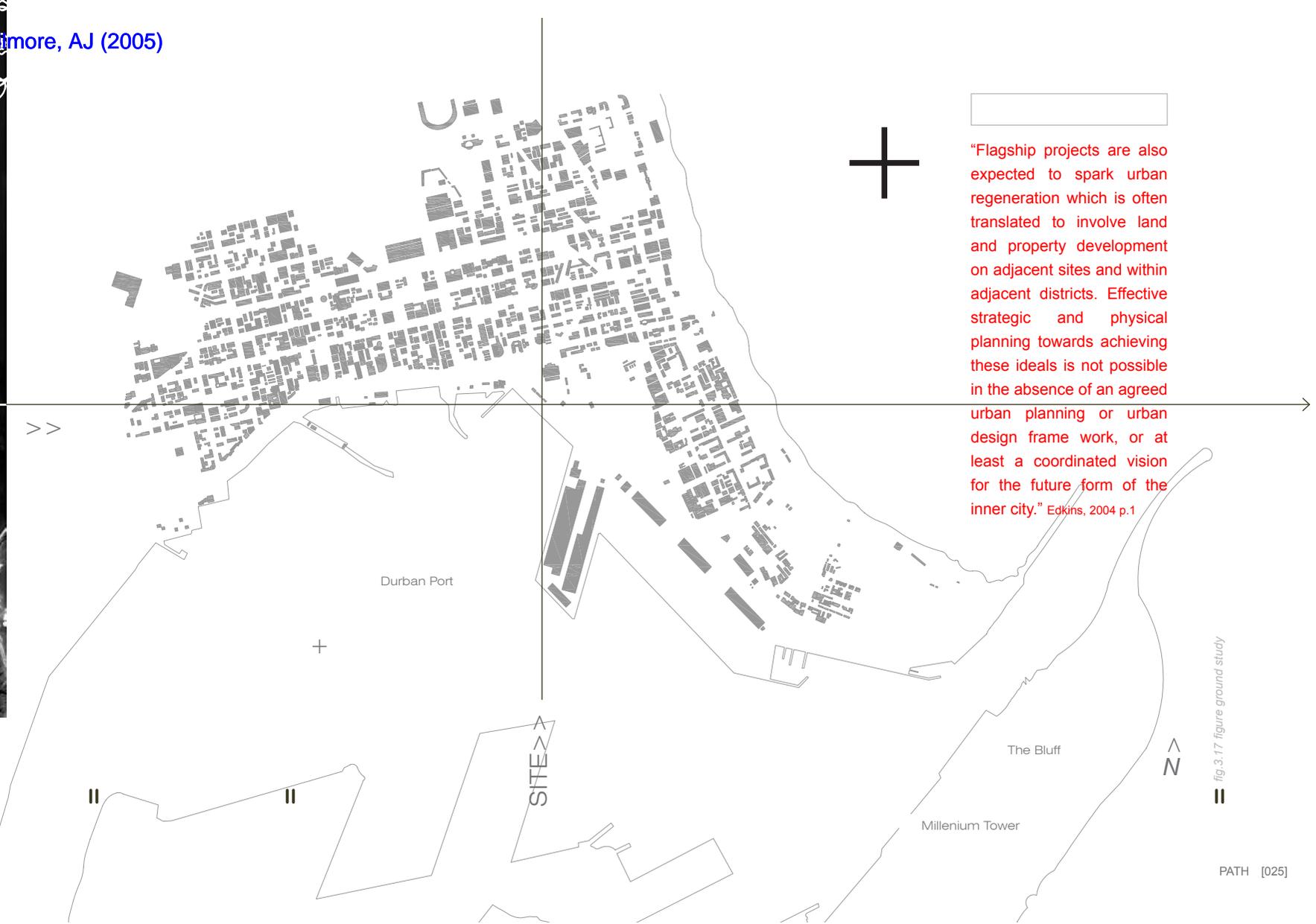


fig.03

University of Pretoria et al – Kromore, AJ (2005)

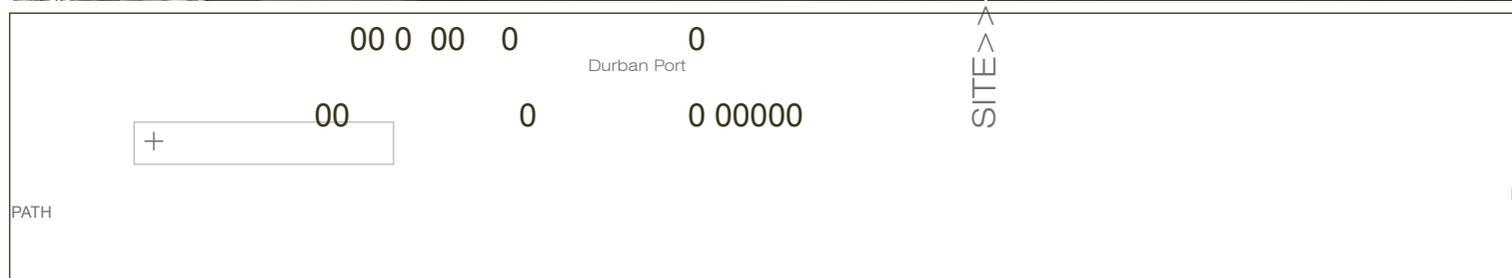


fig.3.16 aerial photo



“Flagship projects are also expected to spark urban regeneration which is often translated to involve land and property development on adjacent sites and within adjacent districts. Effective strategic and physical planning towards achieving these ideals is not possible in the absence of an agreed urban planning or urban design frame work, or at least a coordinated vision for the future form of the inner city.” Edkins, 2004 p.1

fig.3.17 figure ground study



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3.9 City Wide Context

Through the development of a passenger cruise terminal in Durban harbour the project strives to provide a platform through tourism to upgrade the living standards of surrounding communities. The project needs to plug into the proposed urban framework for the Victorian Embankment precinct. The ability of the building to transform and meet future needs becomes an important theme within the project. The building may need to evolve to meet the requirements of such events as the 2010 Soccer World Cup to be held in South Africa and by so doing enhance the opportunities for Durban to accommodate as much of the event as possible.

3.9.1 Urban Decline
 Vision for Durban: To arrest the urban decline of Durban CBD and to ensure its position as the most advanced commercial and port city as well as convention and tourist city in Africa. The Durban CBD is in a process of decline. Business is moving out of the city centre to decentralised office parks such as Westway in Westville, La Lucia Ridge and Umhlanga Rocks. If the situation is not dealt with soon the CBD will degenerate. This phenomenon is not unique to Durban. The CBD of Johannesburg has been abandoned as a commercial centre, and business has relocated to peripheral centres such as Sandton.

In order to address this problem an urban design framework has been drafted. This design framework identifies eight districts, including Kings Park district, Umgeni corridor district, Beachfront district, CBD district, Victoria embankment district and Albert Park district.

3.9.2 Master Plan Proposals
 The master plan proposes the following:
 + A comprehensible structure plan discernible to all people. Through the development of a plan that can be easily understood by the layperson, the scheme can be more easily supported.

+ A land-use plan which recognises cultural and social diversity. Although

the integration of all races is the aim in South Africa, the identification of districts illustrating various cultures is sought.

+ A transport plan which is legible and safe, connecting the major nodes and attractions of Durban CBD.

+ An open space plan which enriches the city for sustainability and attractiveness. Open space should be reserved for recreation and conservation use.

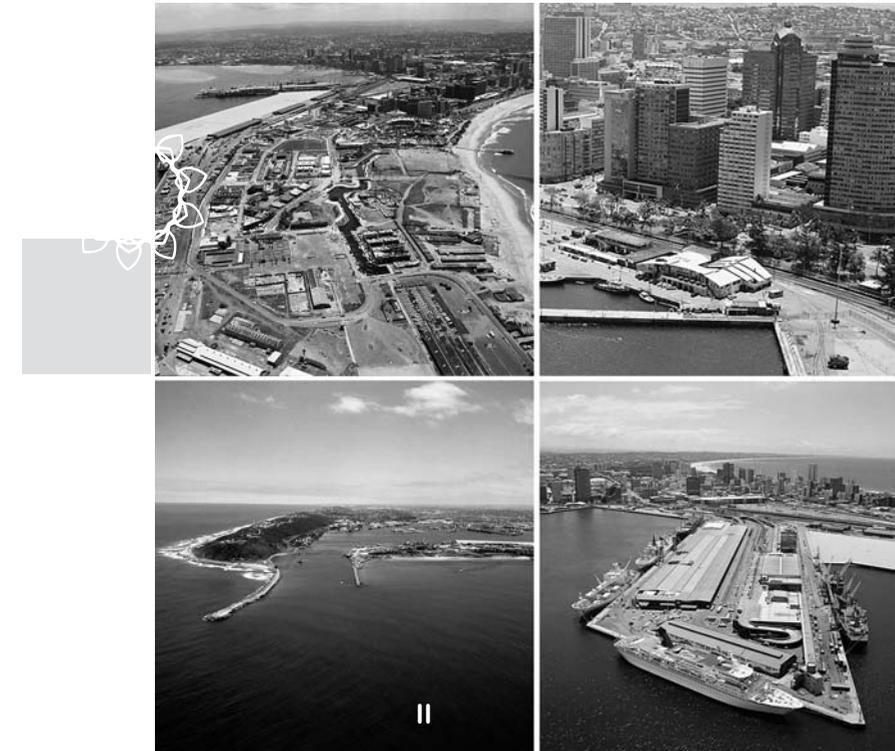
+ **A pedestrian network linking places and spaces of interest. These networks allow pedestrians to explore the cities streets and spaces, and allow accessibility.**

+ Precincts of opportunity and diversity. The uniqueness of districts needs to be emphasised, helping to

identify local interest groups and ownership.
 + A safe city. Safety is a fundamental right to every citizen, and only once citizens feel safe within their own city will tourists feel the same way.
 + A city of accessibility. Through the development of the public transport system the stress on the road system will be calmed.

+ A tourist friendly city. Tourism is a key income generator to Durban and therefore should be valued.

+ A sports and outdoor leisure city capable of staging major international sporting events. Durban can be marketed through the exposure created by such events as the soccer world cup 2010.



18	19
20	21

fig.3.18 Point Development under construction
 fig.3.19 BAT centre and city edge
 fig.3.20 harbour entrance
 fig.3.21 T-jetty

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Fig. 3.22 aerial photograph of site and surrounding landscape



- Albert Park
- Wilson's Wharf Shopping Centre
- Sports Hall
- Entrance
- Yacht Club
- Yacht Moie
- Esplanade Green Space
- Green Space
- Maritime Museum
- Small Craft Harbour
- BAT Centre
- SITE**
- Old Customs House
- Harbour Entrance
- T Jetty

--- railway line
 esplanade road

3.10 Study Area Context

3.10.1 Victoria Embankment Precinct

The proposed development urban design framework for the Victoria Embankment precinct has been adopted to guide the project. The proposed site falls on the periphery of this district. The Victoria Embankment is located within the Durban harbour. It is situated on the north shore of the bay. The precinct is separated into two distinct halves by a double railway line, running in an east west direction, which serves the harbour functions at T-Jetty and The Point. On the northern side of the railway line is The Esplanade, one of the busiest roads in the city. The land use in this area is largely high rise residential, the view of the yacht club changing to high rise commercial as one moves north into the CBD.

On the southern side of the railway line towards the waters edge, one finds the yacht basin, Wilson's Wharf and the small craft harbour. This strip is primarily occupied by various

water-sport organizations as leasehold tenants. The entire area has a degraded appearance and has been earmarked for future development. Access is through a level crossing off Victoria Embankment road, which is at present at its peak operational capacity. Access is being upgraded to handle the proposed development.

"The entire area has a substantial degraded appearance, and reflects the occupational disadvantage the stakeholders are at present confronted with. Public access is fairly restrictive, and movement along the waters edge is severely restricted. There are no public facilities in the entire basin, and no provision is made at present for adequate public participation. Major aspects, such as the waters edges are in an extremely poor condition and remedial work needs to be put in place as a matter of urgency. The area abounds with inappropriate structures and restrictive barriers. The time for a major re-development initiative

has clearly arrived." Urban Design And Development Framework Plan For The Victoria Embankment Yacht Basin – Durban, Presentation 2005.

The proposed site is situated to the east of the small craft harbour at Q-wharf. Bordered on the north by the railway line and The Esplanade, on the northeast by the harbour entrance flyover and to the south the waters edge.

"The harbour (Victoria Embankment precinct) in Durban is its life blood. It represents the commercial reality of the city and is one of the oldest and most important districts for living and relaxation yet is the most underutilized." ICC Durban Arena Urban Design Context

3.10.2 Vision for Victoria Embankment

The Victoria Embankment precinct has the potential to be a key tourist attraction and leisure space within the city due to the possibilities created by the harbour, such as sailing, motor crafts and water-sports. The development

framework for this precinct stresses the need to address working parts of the harbour that impinge on the expansion of the city towards the water edge. Alternative sites for harbour functions should be seriously considered. This will allow for the desired linkage between the city centre and the harbour. The existing railway line has been acknowledged as an obstruction preventing waterfront access, and needs to be dealt with. The possibility for a tourist opportunity, providing people with an entertainment ride should be considered.

3.10.3 Recommendations for Victoria Embankment Precinct

+ The removal of unnecessary barriers, while still considering public safety
 + Views from the city towards The Bluff need to be enhanced. The landscaping of the harbour can be used to achieve this.
 + Proposals for the new marina area and residential areas should be considered. The scale of the project should be appropriate and parking hidden.

- + The removal of harbour activities from the city side of the port should be taken into account.
- + The railway line needs to be addressed and may perhaps be used to transport people.
- + A heritage board walk along the waterfront celebrating its development history from the oldest beach and swimming area through to the development of the heavy industrial port to its new tourist face once again connecting the harbour to the city.
- + Retain and celebrate the legal district with the supreme courts along with the other significant buildings to create a heritage trail that connects back to the city.

ICC Durban Arena Urban Design Context

3.11 Bio-physical context

This topic is guided by Dieter Holm's Manual for Energy Conscious Design Document (Holm 1996)

3.11.1 Climate Zone

Durban falls within a coastal region, characterized by high temperatures and high humidity levels. The daily temperature variation is small. The climate is the closest to an equatorial hot humid climate that is to be found in Southern Africa.



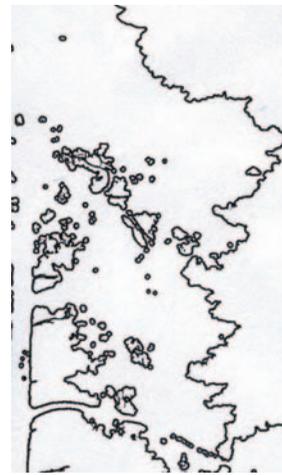
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Temperature
The maximum diurnal variation occurs in June. The average monthly diurnal variation is 9K. Summer temperatures extend approximately 5K above the comfort zone. Winter temperatures are 10K below the comfort zone.

Humidity
The average monthly relative humidity is 70%. These high levels are problematic and need to be designed for.

Wind
Summer winds originate from the south-west and north-east. Winter winds are predominantly south-westerly.

+



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fig.3.23

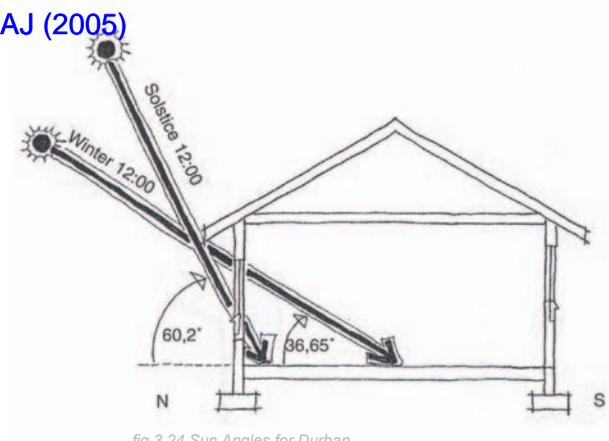


fig.3.24 Sun Angles for Durban

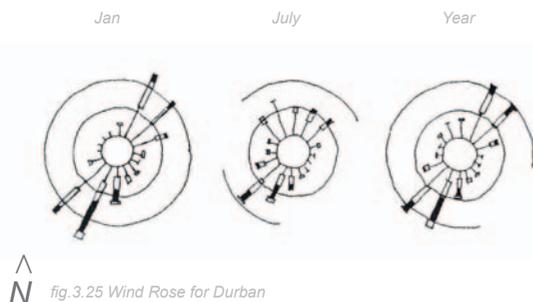


fig.3.25 Wind Rose for Durban

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Plan Form
A narrow plan shape with a single row of rooms allows for effective cross ventilation. The north-south sides being the longest.

Rain Protection
Traditionally buildings in the region are designed with wide verandas around the entire perimeter of the building. This structure shades the exterior walls and protects the outdoor living and circulation spaces from rain.

Solar Control
Summer sun is screened while winter sun is allowed to penetrate into the building.

Ventilation
Through good design natural ventilation can remove excess humidity and provide thermal comfort. Large openings should be provided for maximum penetration of wind.

Materials
Roofs should be reflective to avoid heat gain. The harsh ocean environment should be taken into consideration in terms of material selection. Resistant materials that will not corrode should be specified.

Design Consideration

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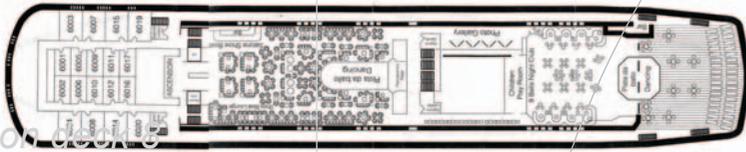
>A



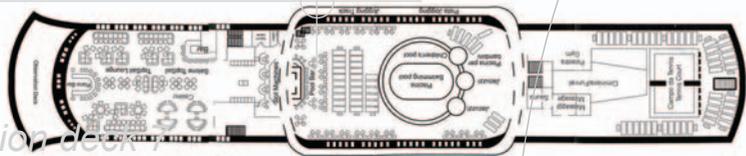
elevation



recreation deck e



recreation deck



>B

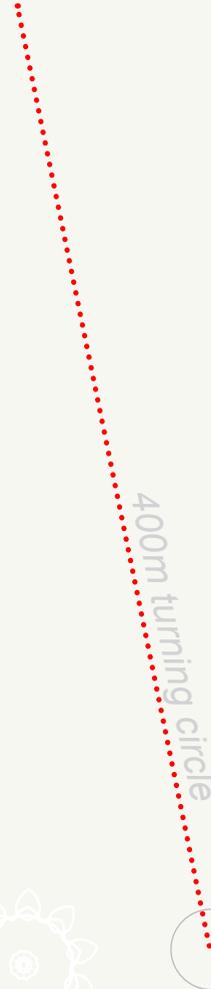
fig.3.26 msc Rhapsody

MSC Rhapsody

- > A Length: 163m
- > B Beam: 22.8m
- > C Draft: 5.82m
- > D Cruising Speed: 18 Knots
- > E Bow Thruster
- > F Two Propellers
- > G Fin Stabilizers
- > H 4 Diesel Motor Engines: 19 HP
- > I Gross Registered Tonnage: 17.095 Tons
- > J Passenger Capacity: 850
- > K Total Cabins: 382
- > L Turning Circle: 400m

The MSC Rhapsody is the scale of a typical cruise ship that the Durban passenger cruise terminal will accommodate. At present the MSC Rhapsody frequents Durban approximately thirty five times a season.

>L



[+]

4.0 Precedent Studies

4.1 *Yokohama International Port Terminal*

Architect: Foreign Office Architects; Farshid Moussavi and Alejandro Zaera Polo.

Client: The City of Yokohama Port and Harbour Bureau Construction Department, Osanbashi Passenger Vessel Terminal Maintenance Subdivision.

Quantity Surveyor: Futaba Quantity Surveyors Co.

Structural Engineer: Structure Design Group.

Date completed: 2002

Yokohama is the second largest city in Japan, rivaling Tokyo as a port. The industrial character of the city makes it an unlikely destination for cruise ships, presently fifty to sixty ships visit annually.

"In contrast to the Sydney Opera House, which dominates its waterfront and has

become an internationally recognized icon, or the Constructivist exuberance of Michael Rotondi's Dragon Promenade in Nagasaki harbour, the Port Terminal is intentionally low-profile, deferring to the floating hotels; from a distance it resembles an earthwork more than a building." [Webb, *Architectural Review*. 213/1271 2002, p.35]

Designed by Foreign Office Architects, the Yokohama Port terminal is an extension of two public parks into the harbour, creating a transitional territory between land and sea. The upper level of the 'landscape' serves as civic space. This public realm provides the residents of Yokohama an escape from the congested city environment, where people can progress along the promenade, sunbathe, picnic and attend festivals.

Designed by Foreign Office Architects, the Yokohama Port terminal is an extension of two public parks into the harbour, creating a transitional territory between land and sea. The upper level of the 'landscape' serves as civic space. This public realm provides the residents of Yokohama an escape from the congested city environment, where people can progress along the promenade, sunbathe, picnic and attend festivals.

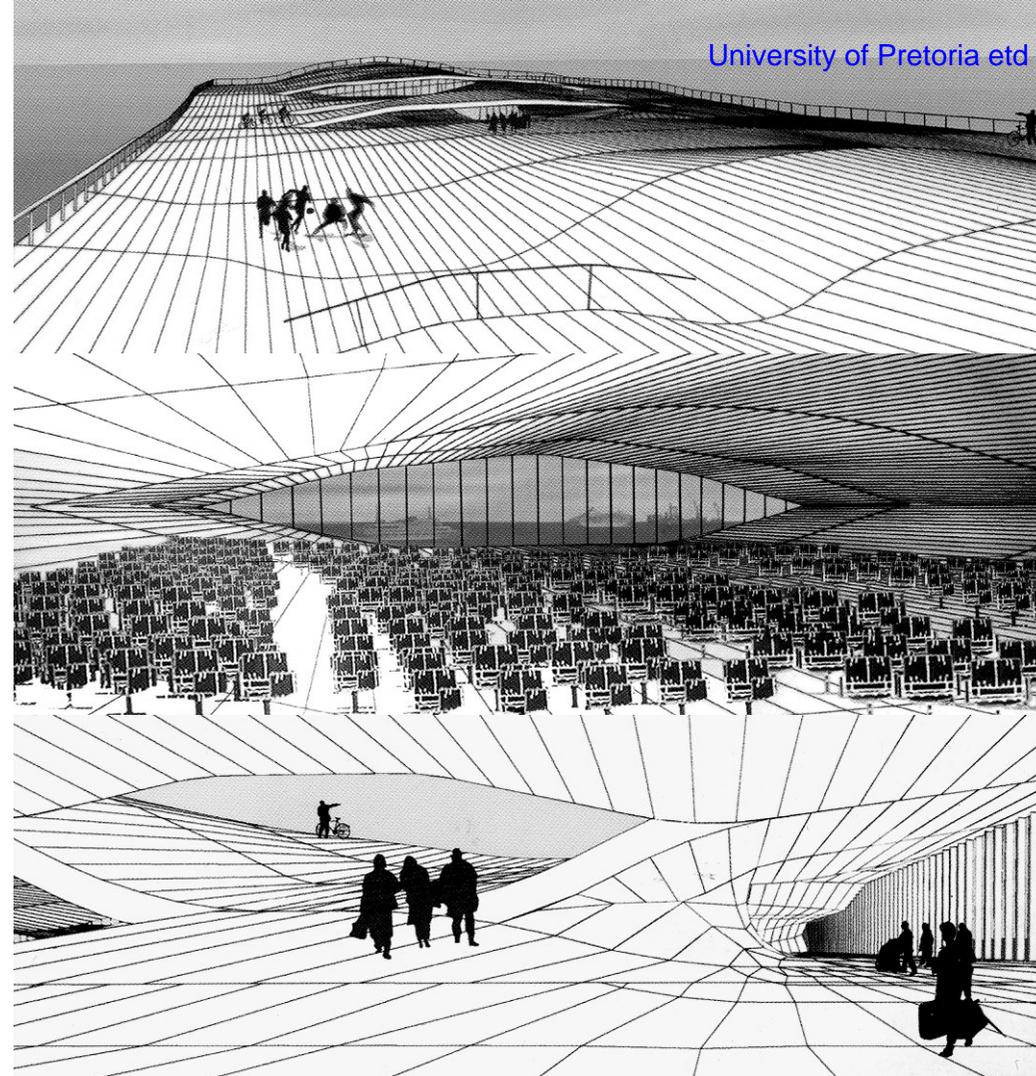


fig. 4.1 foreign office architects: Yokohama international port terminal

In addition to this, the 'landscape' accommodates two exhibition spaces: the arrivals hall and the Osanbashi Hall. These spaces can be used for functions such as markets, expositions and group functions. These additional functions have been included within the project, foreseeing that cruise ship traffic would be insufficient to make full use of the complex.

Essentially the project is a transport building, a place of flux. The design is based, in the architects' accounts, on the dynamics of movement. Moore, *Domus*. 851 (2002), p.67. Provision is made for pedestrian, vehicular and cruise ship passengers. Parking is provided for on the pier level (predominantly for economic reasons), and pedestrians gain access into the arrivals and departure hall from the promenade

level via a ramp. The 450-meter terminal can accommodate four cruise ships simultaneously. Passengers board or disembark their ship through walkways into the customs and immigration area that is separated from the area by movable structures. The intervention has the ability to transform when boats are not present: baggage consoles descend into the floor and immigration consoles disappear generating an adaptable space offering the prospect of a diversity of uses.

The intervention is a hybrid of building and landscape. There are no walls in the traditional sense, floors and ceilings are simply folded to create walls. This blurring of boundaries is present throughout the design, 'the conventional division between levels, and inside and outside, is blurred'. The as-

piration to blur boundaries is yet again evident in the circulation system through the building. In an attempt to avert from the terminal functioning as a gate, for the reason that people bridge international borders continuously. FOA designed a non-orientated space. "Throughout the building the user is presented with choices of left, right, up or down; there are many different ways of moving through it and many intersections of routes taken by passengers and citizens." Moore,

Domus. 851 (2002), p.67 A steel structure has been used to create the landscape, evoking without mimicking the roll of the ocean. Construction techniques adopted from ship construction strengthen the structure links to the site. Sections were prefabricated in shipyards and brought to the site via barge. The structure is well suited to the resistance of earthquakes. The limited material palette includes steel, glazing and solid planks of ipe timber flooring from Brazil.

"Built like a ship, Yokohama's new port terminal is an audacious fusion of architecture and engineering that creates a topographic landscape for public activities." [Webb, *Architectural Review*. 213/1271 2002, p.35]

"The ordinary experience of walking from point A to point B is anything but; FOA's wooden ramps link water earth, traveller and vessel, in an intimate transitional space." [Slaten, *Architecture*. 92/2 2002, p.73]

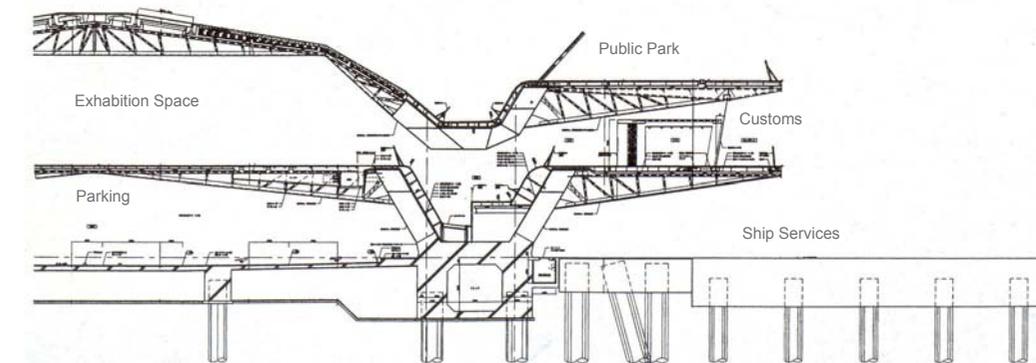


fig. 4.2 portion of cross section

DURBAN

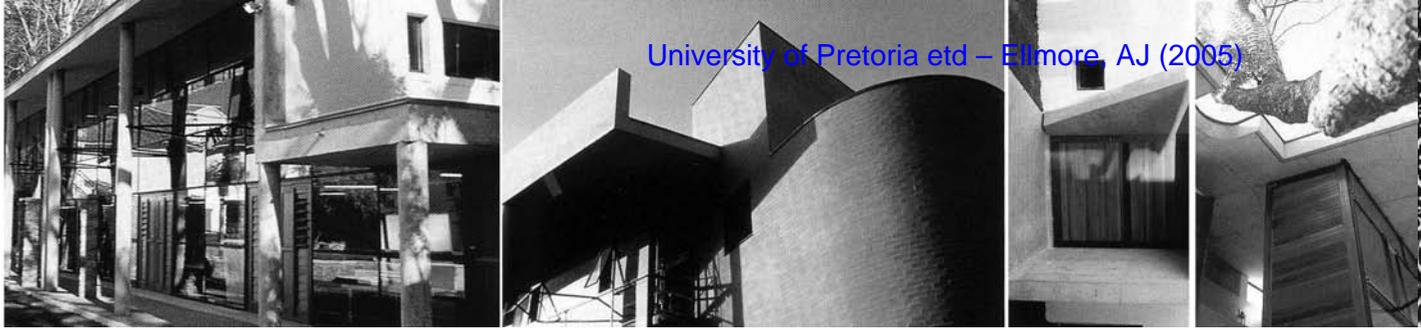


fig.4.3 - 4.6 Electric Ladyland offices

4.3 Electric Ladyland Offices

Architect: OMM Design Workshop
Client: Electric Ladyland Properties
Date completed: 2001

The reason for this precedent study was to analyse a building designed in response to the context of Durban, South Africa.

“The project is sensitive to context, but is also reflective of current international practice” [van Wyk, South African Architect. November/December 2001, p.30]

OMM Design Workshop were briefed to design new office accommodation in Kloof, Durban. The chosen site consists of an existing house and a mature garden.

The building form consists of two existing pavilions and four new pavilion buildings,

arranged in such a manner as to create semi-public and private courtyards. These pavilions are long, narrow, rectangular forms, with large openings on the longer sides allowing for cross ventilation throughout the building. They also alleviate the problem of excessive humidity. Deep overhangs shade the facade reducing solar gain. Timber shutters are also used to shade the building. The trees that have been accommodated within the building, now shade the building, while casting interesting shadows across the building planes. Canvas sun-screens are also used to achieve the same objective.

The building has been designed to accommodate the surrounding landscape, incisions in the slab allow for existing trees to merge with the building. The facades of the building components open to this courtyard. The

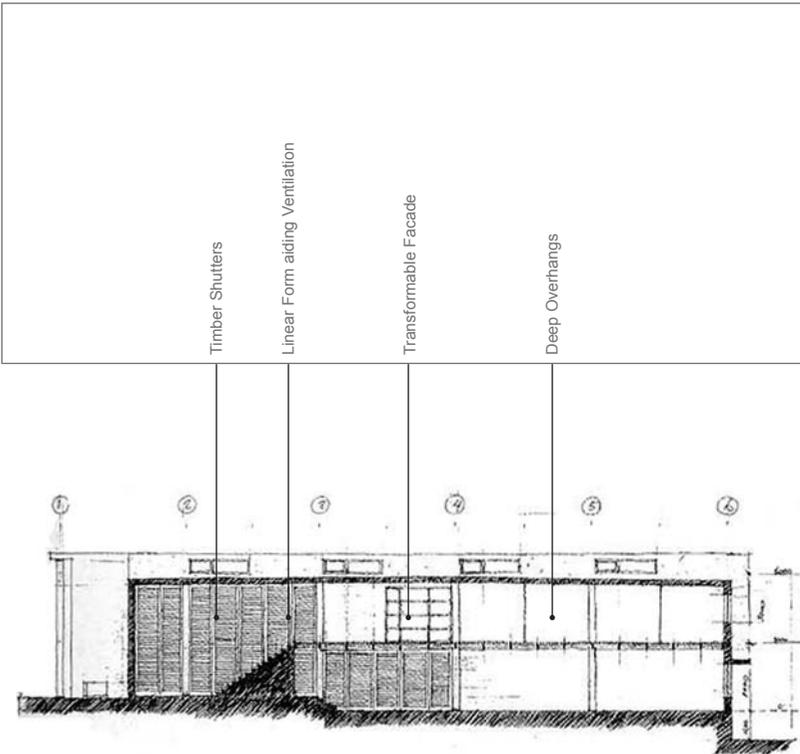
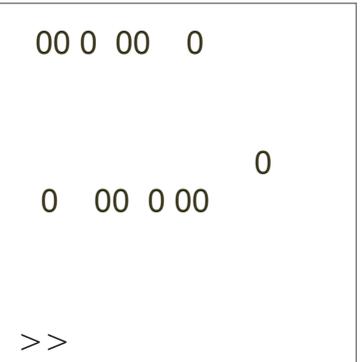


fig.4.7 elevation



boundaries between inside space and outside space are blurred, creating an outside room. This central courtyard also provides a safe environment using “eyes on the street” concept. The slope of the site has again been used to merge the building with the landscape. The natural topography has been carried through into the levels of the building.

Timber shutters and multiple window openings allow for the users to customize their space accordingly. Large doors can be opened creating inside-outside spaces, and permitting climate change into the building. The user becomes further aware of the landscape and the way it transforms i.e. the user is aware when the sun is shining and aware if it is raining.

The project has been criticized for lack of depth of palette of materials. Chiefly concrete, steel glass and brick are the primary materials used. All materials have been used in an honest manner.

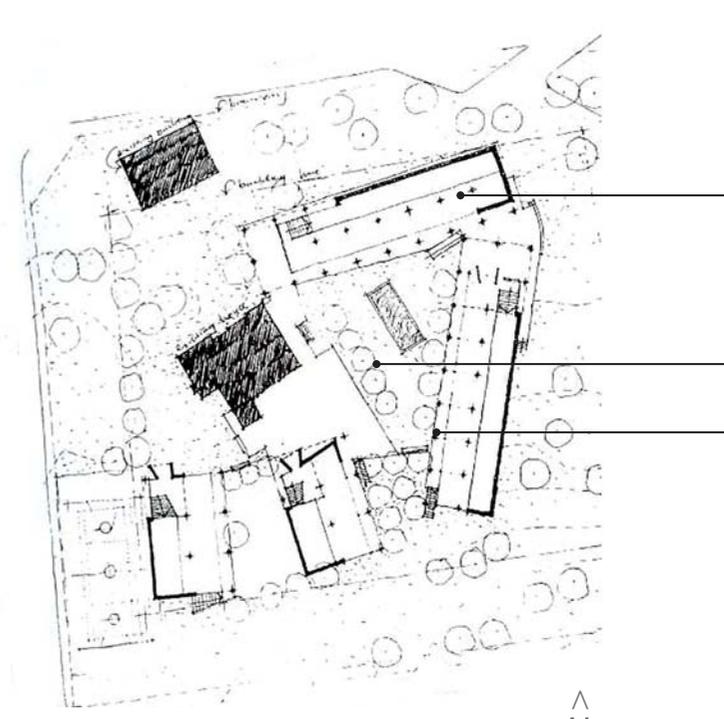


fig.4.8 site plan



4.6 Rereading the City:

Architect: Dagmar Richter
1990

This project proposes the horizontal extension of Los Angeles above a freeway, responding to the linear form. Translucent screens broadcast information to users, and a genealogical library is suspended within the structure, creating an information journey.

“For Richter, the city is a media-related text, altered by its producers and users alike; the city is a geographical map, at once the ‘skin’ of a territory and a representation. The city is both the condensation of traces from the past and their dissolution in the electronic fluidity of different forms of circulation.”
[Migayrou, 2000, p. 396]

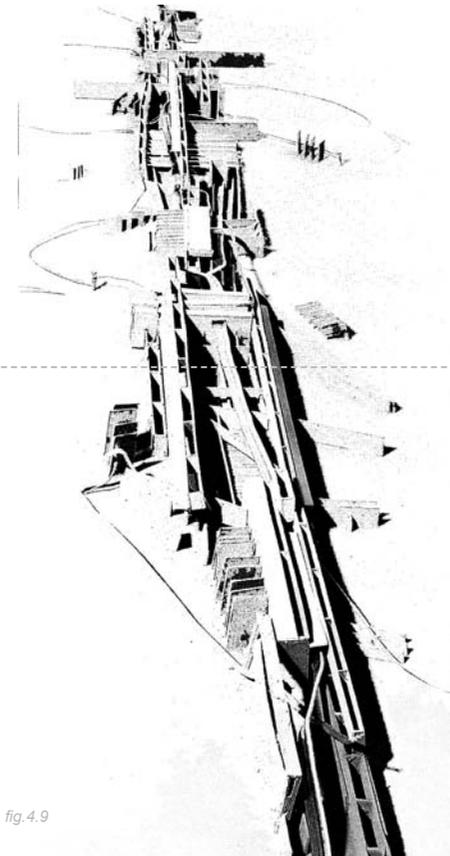


fig. 4.9

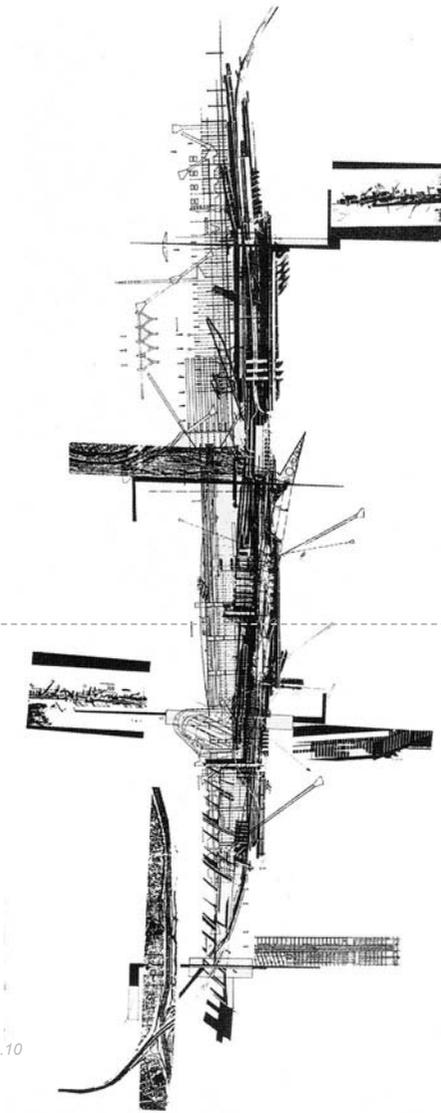


fig. 4.10

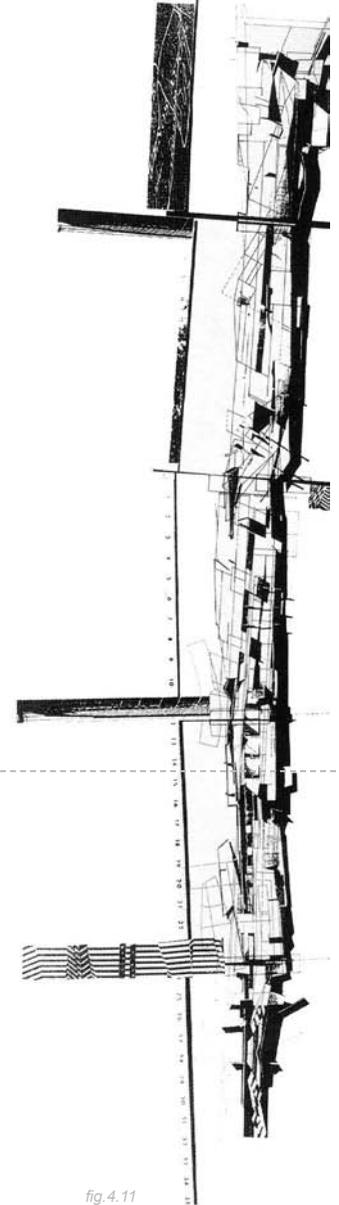


fig. 4.11

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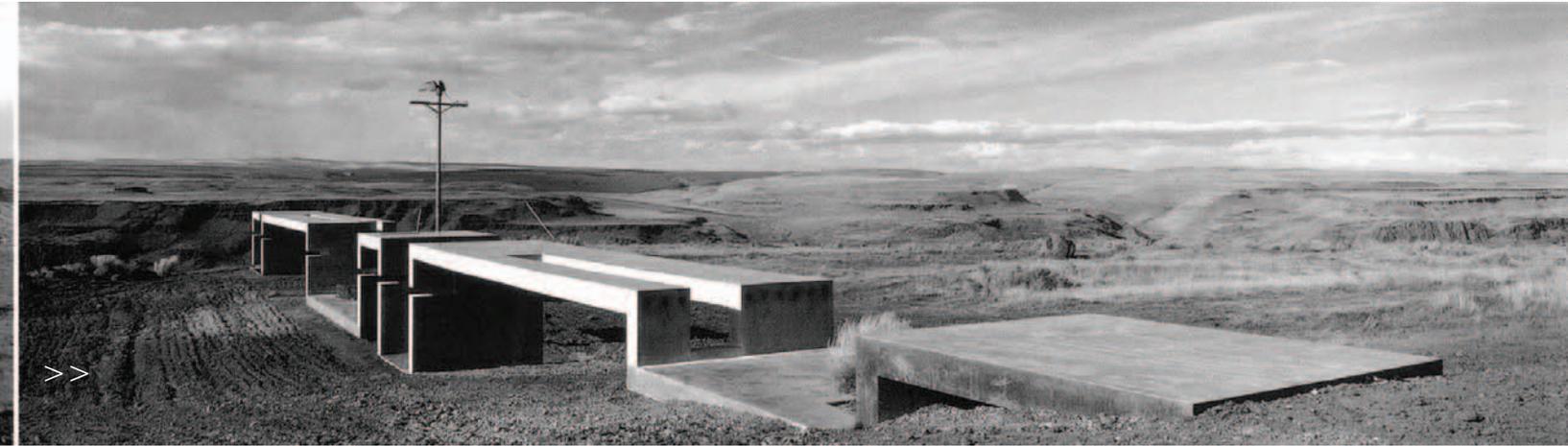
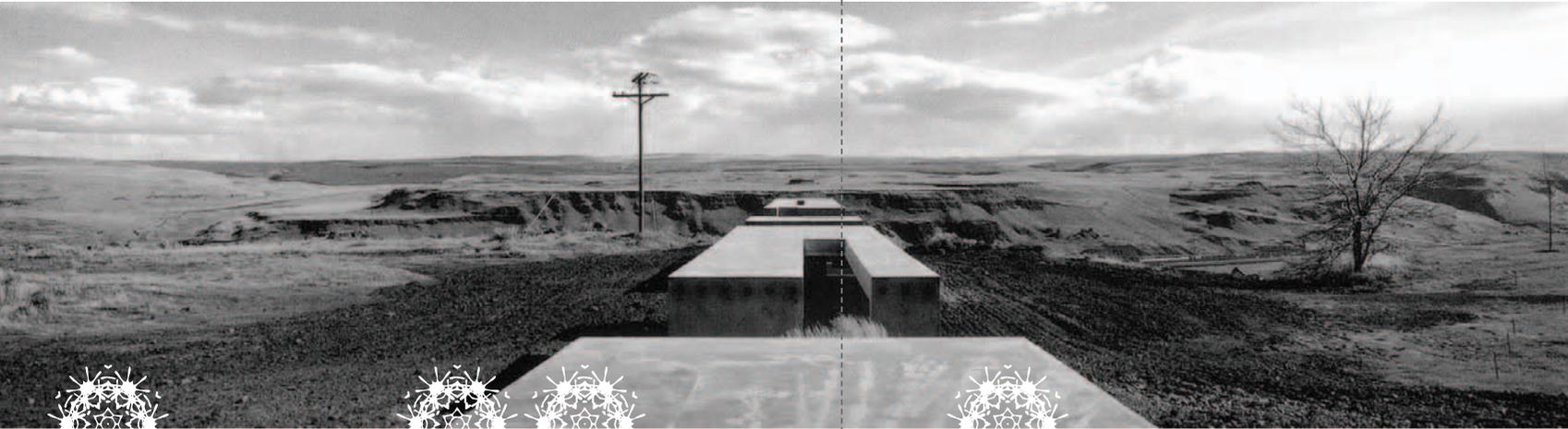


fig.4.12

fig.4.13

4.6 Maryhill Nature Outlook:

Architect: Allied Works Architecture

“It makes a place in a vast plain, yet does not enclose anything. It is only the merest hint of the difference that architecture can make in and on the land.” [Betsky, 2002, p. 162]

The Maryhill Nature Outlook is an investigation into man-

made and natural edges, the project makes use of lines humans create in nature. The 450-meter concrete structure provides a viewing platform and seating, while directing attention to the surrounding vista. Appearing to penetrate out of the slope the intervention merges with the landscape, blurring the boundary between man-

The form of the structure does not communicate the function, creating a sense of curiosity.



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4.2 Perugia's Via dell'Acquedotto

A retired thirteenth-century aqueduct that has found a new lease of life as an elevated pedestrian walk. "Built in 1286 by Fra Bevignato, a Sylvestrian monk and expert in hydraulics, it is not much of an antique as Italian monuments go." (Rudofsky, 1964, p.189)

The walkway is 215-meter long, crosses a gully at rooftop height. Below are gardens and a few minor streets. The viaduct connects the town to the University on the neighbouring hill. With the official declaration of the aqueduct as a viaduct in 1812, a parapet wall was added, providing pedestrians with safety and comfort.



fig. 4.14



fig. 4.15



fig. 4.16

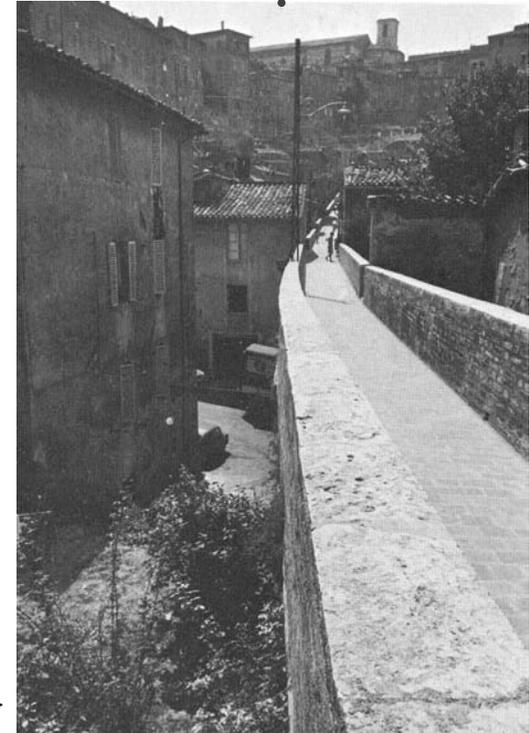
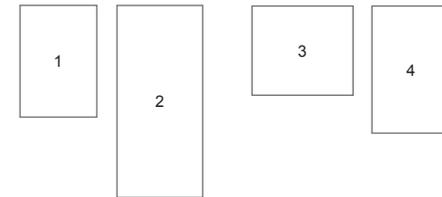


fig. 4.17



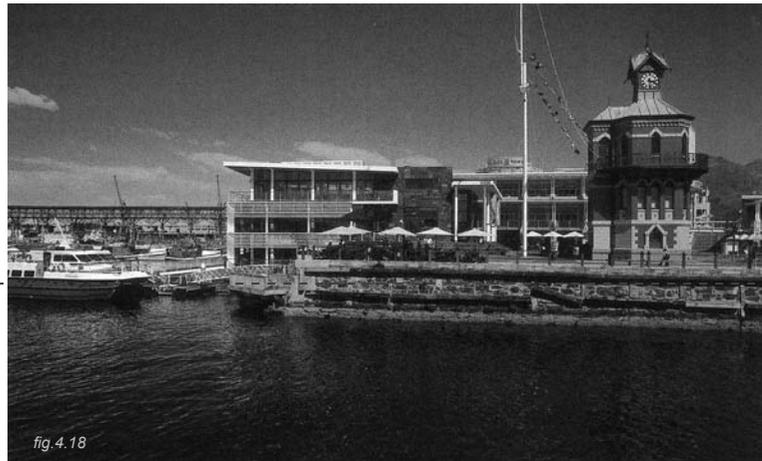


fig.4.18

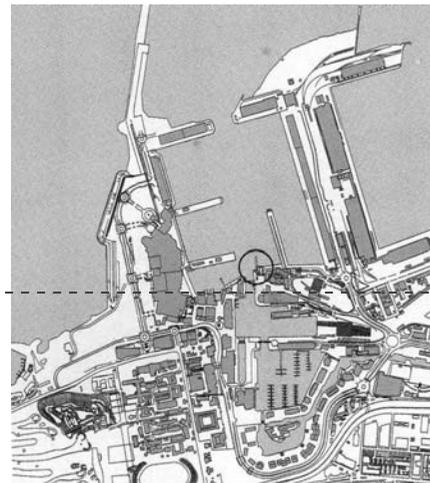


fig.4.19

Development Impact.
The site falls within the V&A Clock Tower Precinct, A historic district. The majority of the buildings within this historic district are “Victorian” in style. “From the beginning it was felt that the design should not imitate the “Victorian” style of the surrounding context. The building is thus contemporary, as we believe all buildings should speak of their time and place.” [le Grange, South African Architect. March/April 2002, p.32]

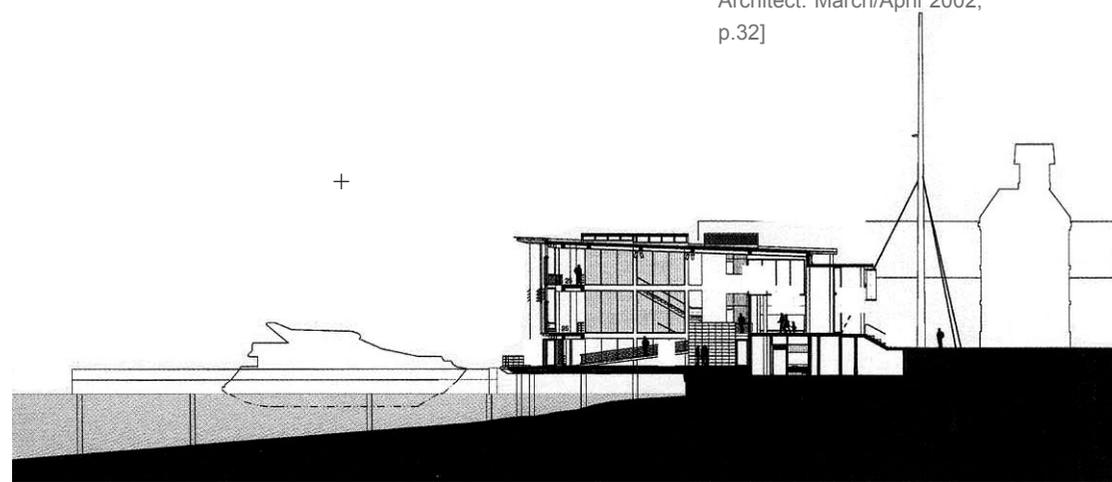


fig.4.20

4.4 Robben Island Ferry Terminal Building:

Architect: Lucien le Grange Architects and Urban Planners (Pty) Ltd
Date: 2002

The idea of this precedent is to understand the function of a building as a gateway, connecting land to water.

The Robben Island Ferry Terminal is a gateway between the mainland and Robben Island. Situated within the ‘Island’ Clock Tower precinct.

The brief was to address the utilitarian functions as well as addressing the question of the memory of Robben Island. The accommodation schedule was to include an embarkation point from the V&A Waterfront to Robben Island. The building also had to provide for visitors who were unable to visit the island. To achieve this exhibition spaces were used. A 150 seat auditorium, 120 seat restaurant operating at two levels, offices and boardrooms for RIM are

also to be provided.

Transparency.

The transparent building allows for views to the surrounding harbour, to the former prisoners embarkation point and to the harbour mouth to be maintained. These transparent facades have been layered to deal with sun penetration.

The building as a transitional space.

The building serves as a gateway chiefly between land and sea. However also as a

place of memory, preparing visitors for the island. A starting point for the journey to the Robben Island Museum. Materials common on the island are used within the design.

Movement through the building.

The primary movement involves gaining access to the ferry. This is achieved through a series of gangways that are intended to induce a feeling of uneasiness. Movement is

through a series of different spaces.

The Building as a boat to Robben Island.

The building becomes a reference to the vessels transporting prisoners to the island, as well as a reference to the V&A Waterfront and its maritime context. The building also becomes a container of information. (historic, archival, exhibition material)

4.7 CJ Lim:

CJ Lim is a director at the Bartlett School of Architecture and the Bartlett Architecture Research Lab. His literature highlights the impact of the environment on architecture rather than architecture on the environment. "Is it possible for buildings to learn from organic systems? And can the banal interactions of flora and fauna in the domestic flat be scaled up into hybrids of growing edifices and engineered gardens of gargantuan size?" [Lim, 2004]

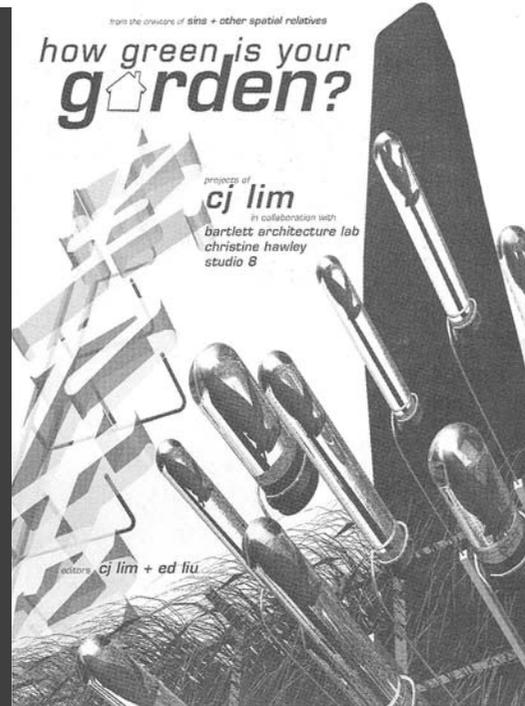


fig. 4.21

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fig. 4.22

4.8 Joris Laarman

A product designer from the Netherlands. Produces works of art from mundane functional objects.

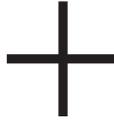
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fig. 4.23



fig. 4.24



4.9 Eleanor Rennie:

"Her thesis project, a printing works, is constructed of sharp, splinter-like fragments that are flung like shrapnel across the site and deep, almost archaeological, undercrofts are scored into the ground. The result: an intense interweaving of brooding volumes, densely packed spaces, clouds of propeller turbines, and the wiry trajectories of ink-supply lines." [Tabor, Architectural Design, p. 76]

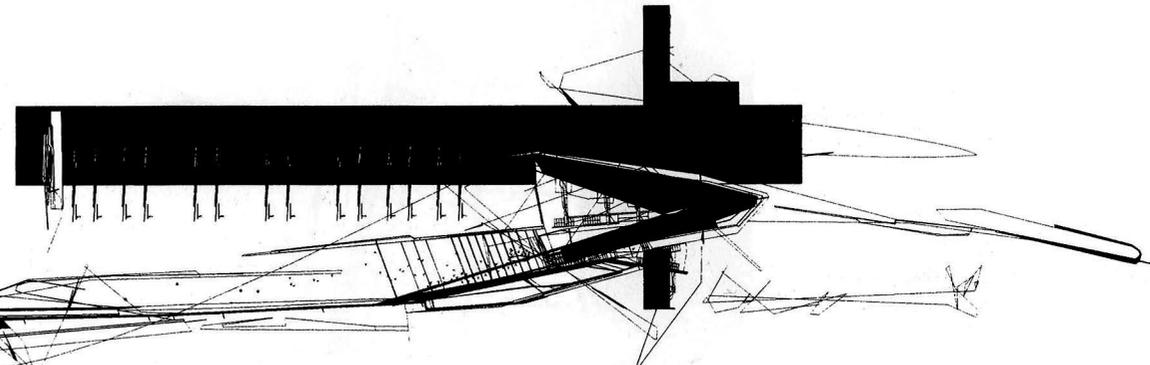


fig.4.25

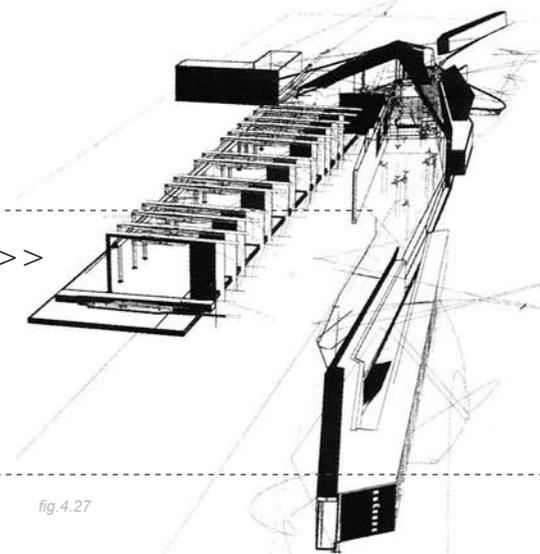
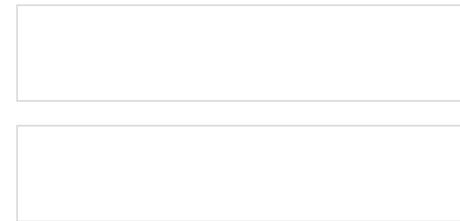


fig.4.27



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5.0 Baseline

5.1 INTRODUCTION

Designers have been placed in a position of great responsibility. The construction industry is one of the largest consumers of material and energy and produces large quantities of waste and is therefore a major contributor to the problem our planet faces in terms of the irreversible damage being done to our ecosystem. Designers are in a position to help reduce this damage through sustainable design decisions.

This baseline study is a guideline, to explain the design process prior to conceptualizing. The Sustainable Building Assessment Tool (SBAT) has been used to aid this target setting process.



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fig. 5.1

5.2 SOCIAL ISSUES

5.2.1 Occupant Comfort

Ventilation

The use of natural ventilation wherever it is possible, otherwise the use of assisted natural ventilated systems, which should be energy efficient and reliable. Due to the high humidity of Durban sufficient ventilation is extremely important to provide a comfortable environment to work or relax in.

Thermal Comfort

Thermal mass to be used to maintain a constant temperature and ensure correct thermal comfort for occupants. Due to the extreme hot, humid climate of Durban, the use of air-conditioning may be unavoidable in sections of the building. By reducing the size of these areas to be as small as possible and insulating them, energy usage can be

reduced. Planting can also be employed to regulate internal temperatures.

Connection between indoor and outdoor

Due to the favourable climate, outdoor rooms should be created incorporating the natural environment. The boundary between building and the landscape should be blurred, emphasising the connection and dependence of man on nature in Durban. The building becomes an extension of the landscape.

The building should be welcoming, encouraging visitors to enter and view the ships or wave passengers farewell. This should be achieved through transparency of building skin, allowing visibility into the building. Interaction between the cruise ship and the building is important. Passengers on the ship should be able to see the public on the viewing platforms and walkway.

5.2.2 Inclusive Environments

Transport

The building should link easily to existing transport facilities. Provision is made for bus and taxi parking. A circular route allows for easy drop-off and collection of passengers.

Connection should be provided to Durban's proposed people mover. The people mover would connect the Point Development, the Beach Fronts and the CBD. Connection to this would allow passengers, who are visiting for the day, to move between the major nodes of the city with ease. A link to the airport will be provided by taxis.

Circulation

The building should be designed in such a manner as to allow for simple movement from the cruise ship to the city or in the opposite direction. The

building acts as a gateway to the city. These routes should be well indicated using clear and simple signage and other methods, such as floor surface. A well defined entrance is important so that first time visitors are aware of where to enter the building. A separate entrance for deliveries needs to be provided.

A ramp with fall of 1 in 12 will be required to allow wheelchair access and for passengers with luggage. This ramp should become a major element within the building design.

5.2.3 Access to Facilities

Facilities should be provided for the dropping off and collection of passengers by the public, the cruise-ship crew, and the public who wish to view the cruise ship or wave farewell to passengers. Provision for informal trade can be provided along the walkway

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where the public using the walkway on a daily basis could buy daily goods.

doors can be moved to suit the requirements for the space.

5.2.5 Education, Health and Safety

Education

Information boards can be provided along the walkway providing the public with information about the history of Durban, the cultures of Durban and environmental issues, such as information about the mangroves. These information boards can create awareness about our present environmental challenges. Information screens could also provide users with daily news.

Safety and security

The existing security gate can be used to monitor vehicular access to the site. The walkway will be well lit and security sourced from the local community. The building must comply with all health and safety requirements.

Banking

ATM to be provided within a 3km radius of the building

Social spaces

Spaces to be provided for informal and formal social interaction between occupants. A space where passengers will meet their friends or family who have come to collect them or wish them farewell. Seating should be provided in these spaces.

Amenity

Easy access to refreshment facilities including ablution facilities for all users of the building.

Restaurants

The terminal program will provide for a restaurant and the walkway will provide for smaller kiosks and eateries.

Communications

The crew from the ship need access to public telephones.

5.2.4 Participation and control

Environmental Control

Users of the building must have reasonable control over their environmental conditions. People using the restaurant can choose between the air-conditioned space with less view, or the naturally ventilated area with a view. The large pivot

Local Community

Spaces should be shared or made available to the public. Spaces should be provided where Durban citizens can view the departure or arrival of cruise ships. The luggage and customs hall can double as a art gallery or space for public meetings.

fig.5.2

5.3 Economic Issues

5.3.6 Local Economy

Local craftsmen and contractors

Local artisans from the neighbouring BAT Centre to be used to create the mosaics and artwork within the building. Creating the sense that the building belongs to the Durban public. The majority of the construction to be carried out by local contractors from Durban. Upliftment of the local community through employment and skills training. Materials and products specified should be manufactured or sourced from the Durban region.

5.3.7 Efficiency Of Use

Occupancy

Due to the seasonal properties of the cruise ship environment. The customs and luggage hall should have a secondary

function such as an art gallery or exhibition space. The building also provides a landscape where the people can escape the city and view their city and harbour.

5.3.8 Adaptability and Flexibility

Vertical Dimension

Structural dimension of floor to the underside of the slab above should be a minimum of 3m. The added vertical dimensions also aids cross-ventilation.

Structure

The structure should be placed in such a way as to allow for large open spaces that can be adapted to suit various requirements or uses.

5.3.9 Capital Costs

The project is a joint venture between the City of Durban

and The National Port's Authority. The capital costs can therefore be shared. The building is designed to fit into the existing infrastructure, such as the transport system. The project utilizes a brownfield site, currently used as the car exporting terminal, which has now been outgrown.

5.3.10 Ongoing Costs

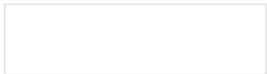
Maintenance

Specification to be in such a way as to allow for low maintenance or low cost maintenance. Due to the harsh coastal climate materials need to be selected that are appropriate and treated accordingly. Details must be constructed in such a manner that they can be easily replaced. The concrete frame structure requires minimal maintenance. Hard-wearing surfaces should be used

that are easy to clean.

Stainless steel should be used due its high resistance to corrosion in the harsh coastal environment.





5.4 *Environmental Issues*

5.4.1 *Water*

-Storm water runoff reduced by using pervious or absorbent surfaces to maximise the replenishment of ground water. Run-off to be collected and directed toward the wetland and mangroves.

-Water usage to be kept to a minimum by using water efficient devices. Dual flush water closets and aerated shower heads should be used.

-Indigenous plants with low water requirements should be specified to minimize the amount of water required for irrigation.

-Promote water saving awareness in the building.

5.4.2 *Energy*

Transport / Location

The building needs to connect seamlessly to the existing public transport system.

Provision needs to be made for public transport such as buses and taxis. The idea of a new people mover for Durban should also be investigated, and how provision for such an intervention can be incorporated into the design.

Passive Environmental Control

The design should respond to the micro-climate of the site through basic passive control systems. Appropriate orientation, shading devices and passive systems should be employed. However, due to the extreme hot and humid conditions Durban can experience in summer, air-conditioning will be unavoidable. The design of the shade devices will need to take into account the views from the building and be designed in such a way to allow vision out from the building.

Ventilation

The building shall be divided into a naturally ventilated zone and a air-conditioned zone. Both zones will need to be dealt with differently: the naturally ventilated zone will need to open to the outside to allow air to move through the area. While the air-conditioned zone will need to be insulated to retain the cool air within the zone.

The location of the site is favourable for natural cross ventilation, on the water's edge there are few buildings to obstruct the prevailing winds. The building should be designed in such a way to make use of these prevailing winds.

The air-conditioned areas are to be kept to the minimum possible - not only because of the increased energy usage but also

because the defensive insulating skin which "creates a barrier to the exterior and the connection to climate is lost. Secondly, a further consequence of this is to separate the visitors from the place they have come to experience, clearly defeating the purpose of the building." [Hyde, 2000, p. 9]

Renewable Energy

"South Africa has one of the highest solar resources in the world. The total solar potential across southern Africa amounts to 360 GW, which is almost ten times Eskom's current electricity output" [Giesen, 2002, p. 42]. This renewable resource must be exploited. Lighting and kiosks along the walkway should make use of solar energy to heat water and convert solar energy directly into electrical energy with photovoltaic cells.

5.4.3 *Waste Recycling*

A policy and management system needs to be put in place for all inorganic waste to be sorted, stored and disposed of to recycling plants within the area.

Construction waste to be minimized through careful management of the construction process and practices. Design limits wastage by designing to comply with modular dimensions of materials.

5.4.4 *Site*

Brownfield Site

The project is to be located on a brownfield site currently being used as the car terminal. The car terminal has presently outgrown this site and this project suggests it be moved to the proposed dug out harbour located near the Durban

international airport.

The aim is to create an urban infrastructure that successfully integrates into the existing urban fabric.

Landscape

Celebrating Landscape is a theme that runs throughout the project. The project strives to make the public aware of their surroundings and the genius loci of Durban. Information is provided concerning the history of Durban and its cultures. Mangroves and a wetland will be developed in Cato Creek.

Indigenous plants should be used throughout the project. The vegetation walls should be planted with creepers that require low maintenance. Trees planted in the main axis to the public parking should have a large canopy to emphasise them as an extension of the building,

and create similar shadows as the skylights would. The roof garden should be planted with indigenous grasses characteristic of the coastal bushveld-grassland biome such as Ngongoni Bristlegrass, *Aristida junciformis*, *Eragrostis spp.* and *Sporobolus spp.*

Granite Crush can be used in places of low traffic as a ground covering, enforcing the sculptural effect of the building if viewed from above on a cruise ship. This granite crush will be obtained from local quarries that export granite from the harbour.

5.4.5 *Materials*

Due to the harsh climate of the site, the resistant properties of materials is an important consideration when dealing with material selection. The materials

selected need to be hard-wearing, requiring low maintenance. Components need to be designed in such a way that replacement can be easily achieved.

According to Hyde, 2000, p. 51 "in the selection of materials there are two areas of interest, the energy used to produce materials and the impact of the materials on the health of occupants."

The ecological impact of materials must be assessed to inform the choice of materials. The following should be considered:

-Materials must be sourced from renewable resources.
-Materials and components used must have a low embodied energy. These include locally made and sourced timber, concrete, stainless steel and timber

doors. The use of local materials will reduce the amount of fuel used for transport and reinvest money in the local community.

-Modular dimensions of material to be used to reduce embodied energy and waste.

-Materials must be chosen with long term benefits (e.g. stainless steel). Materials that require higher maintenance, should be perceived as a social project, providing employment to local workers.

-Materials and finishes used should not have adverse effects on the health of occupants.

Contextual Influence

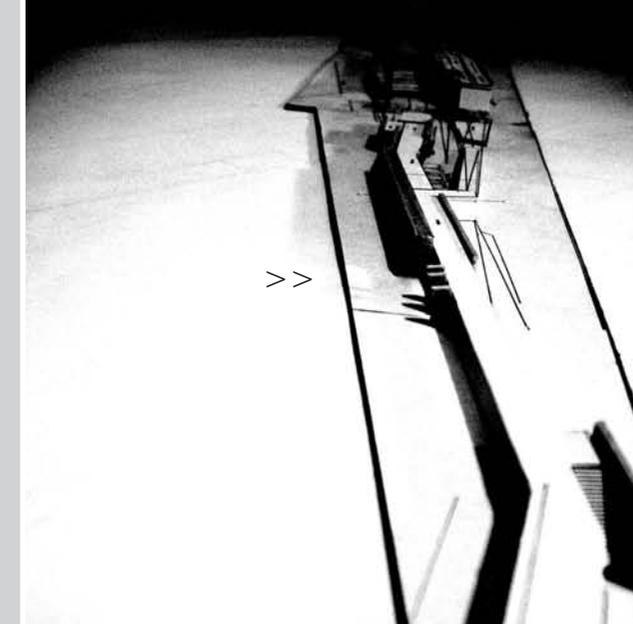
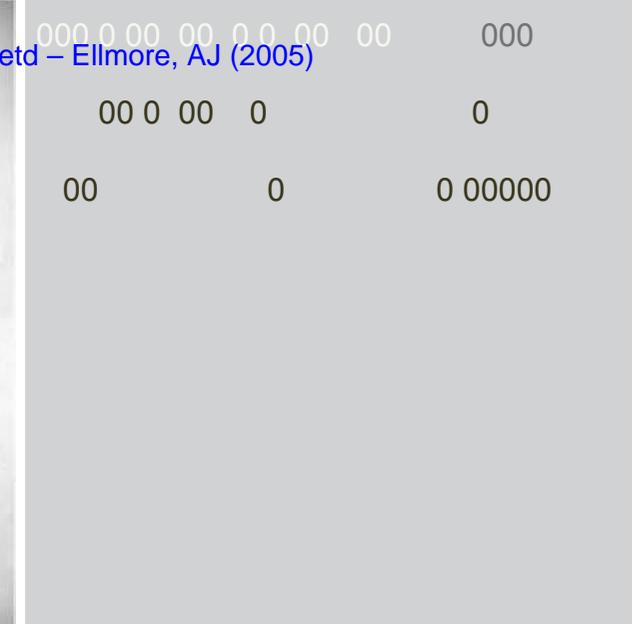
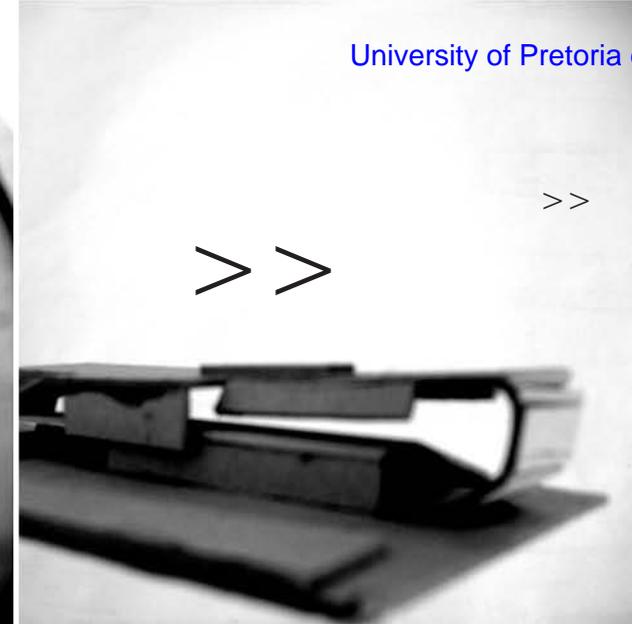
Through a study of Durban architecture, it has been identified that sunscreens play a major role throughout most buildings in the city. Through the use of perforated concrete facades

reference has been made to the sunscreens on Norman Eaton's Nedbank building.

The contrast between the existing harsh texture of the harbour and the new layer of the walkway and cruise terminal intervention should be emphasised. Material selection will play a large role in achieving this.

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6.0 Design Development



University of Pretoria etd - Ellmore, AJ (2005)

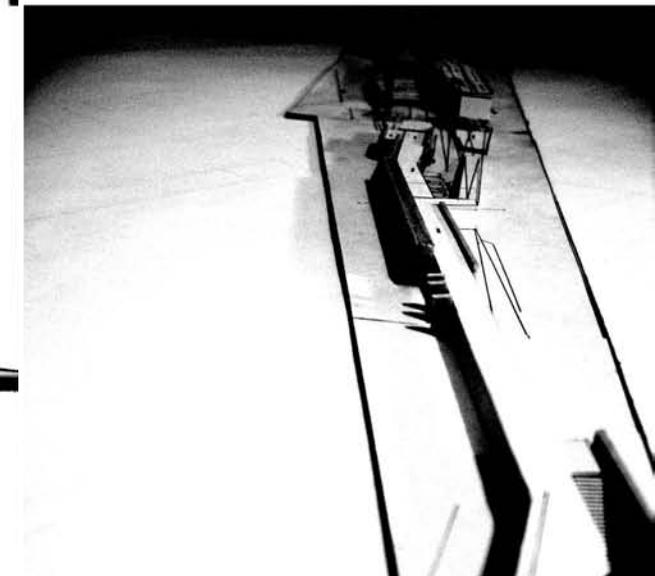
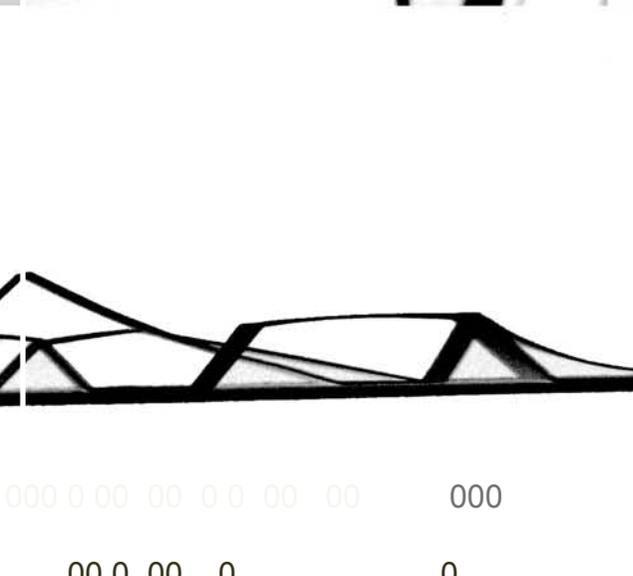
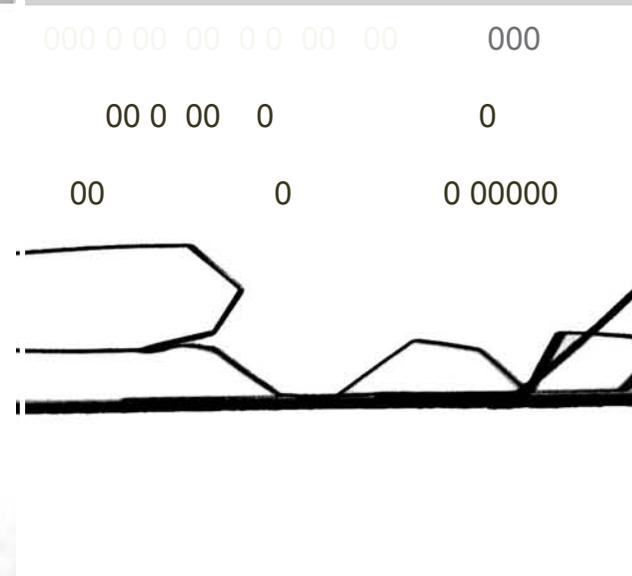
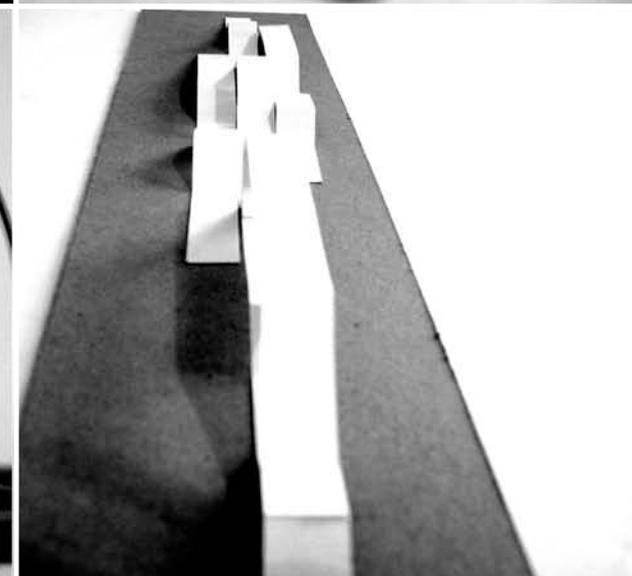
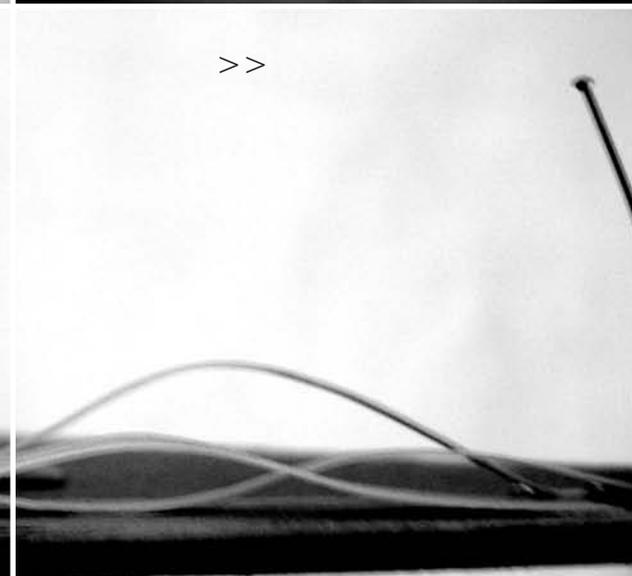
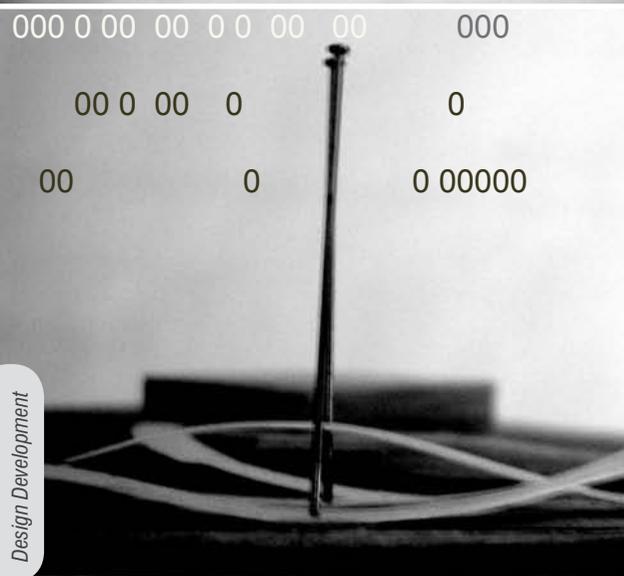
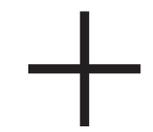


fig.6.1 - 6.4 view of concept model

fig.6.5 - 6.7 view of concept model

Design Development

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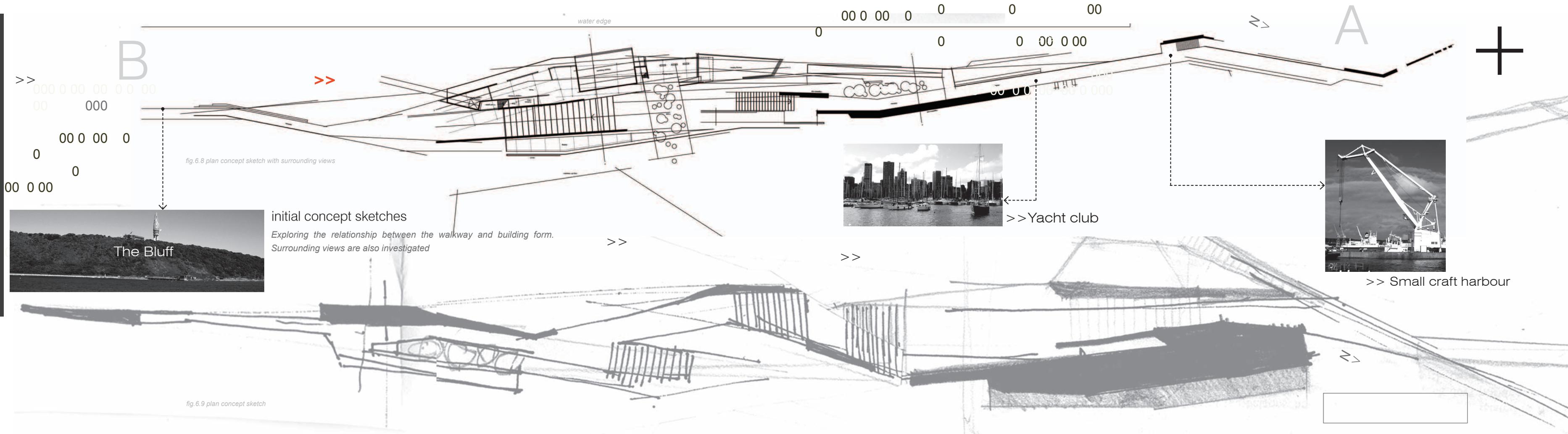
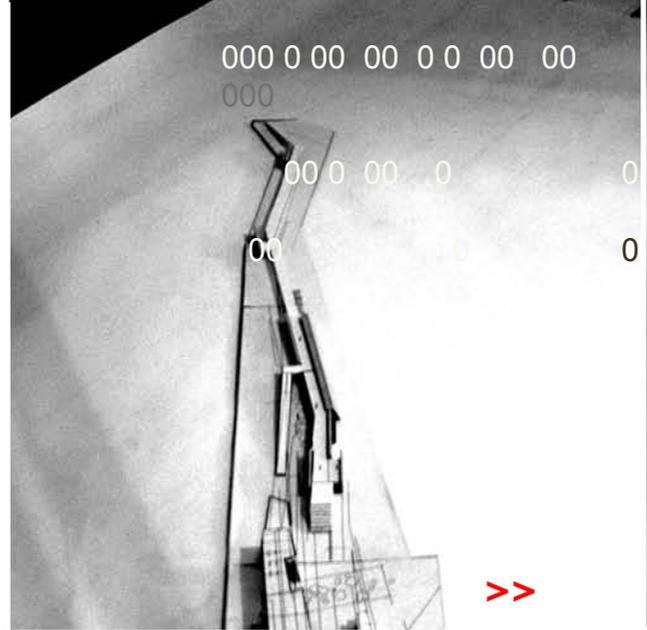


fig. 6.8 plan concept sketch with surrounding views

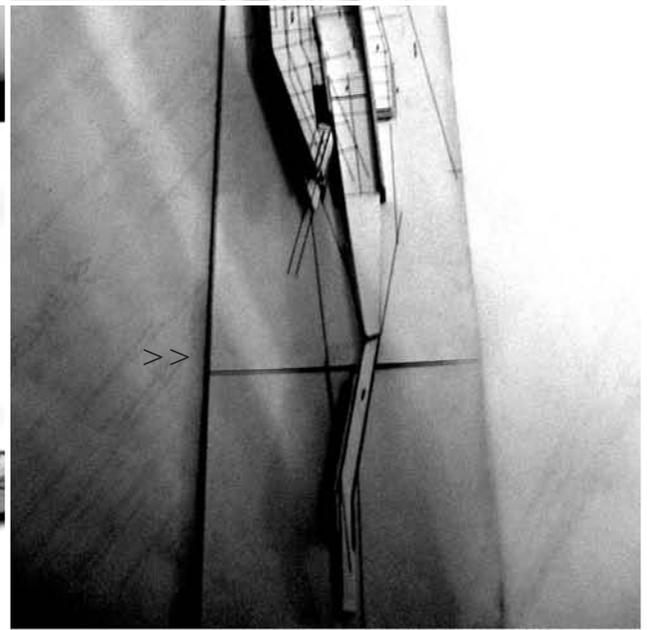
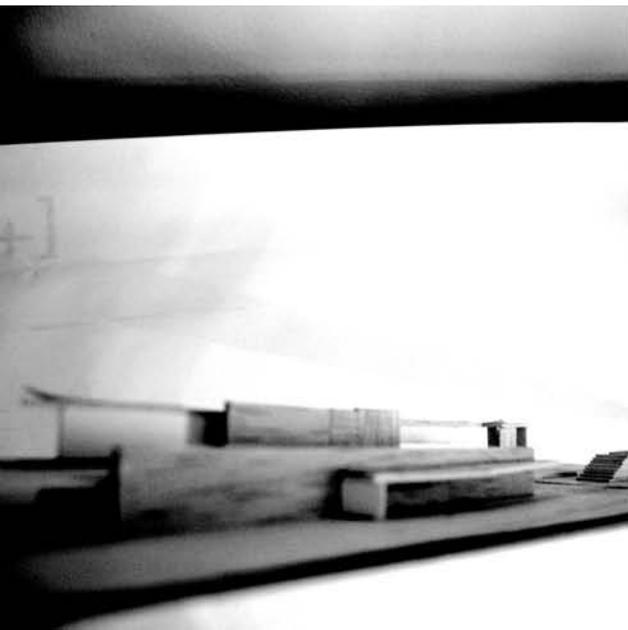
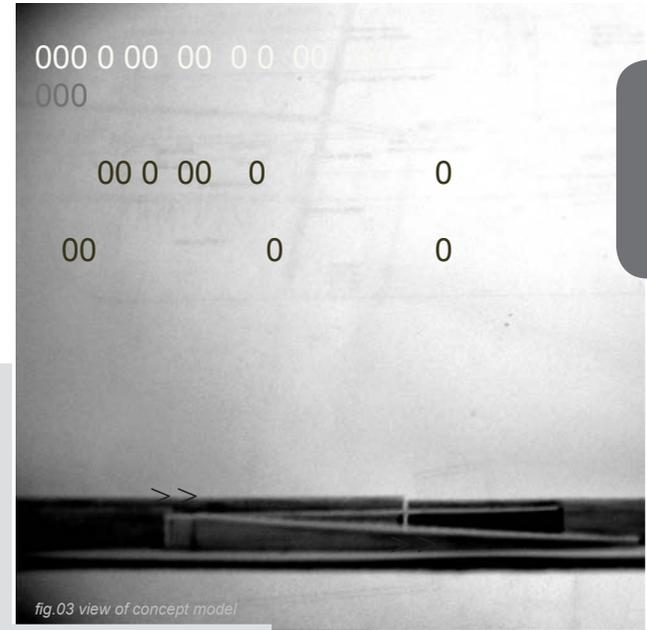
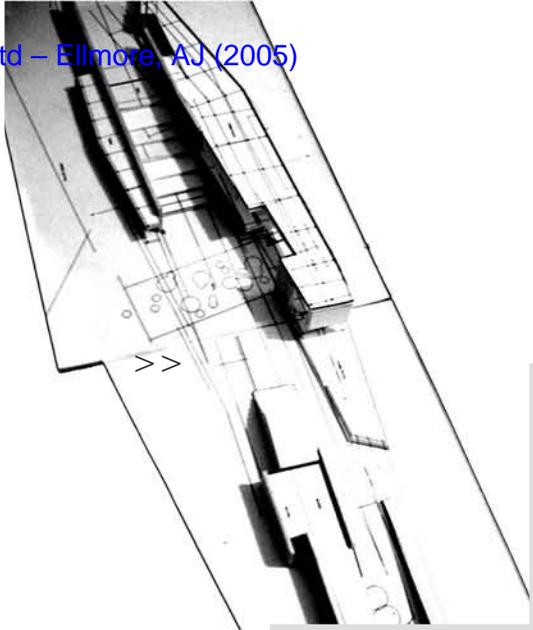
initial concept sketches
Exploring the relationship between the walkway and building form.
Surrounding views are also investigated

fig. 6.9 plan concept sketch





University of Pretoria etd – Ellmore, AJ (2005)



"If man-made places are at all related to their environment, their ought to exist a meaningful correspondence between natural conditions and settlement morphology. The basic problem to be solved by a settlement is how to gather the surrounding landscape." Norberg-Schultz

fig.5.10 - 5.12 view of concept model

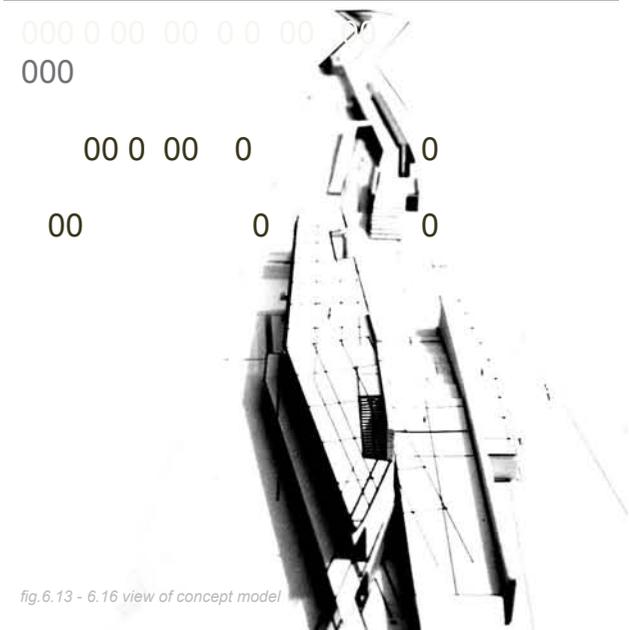
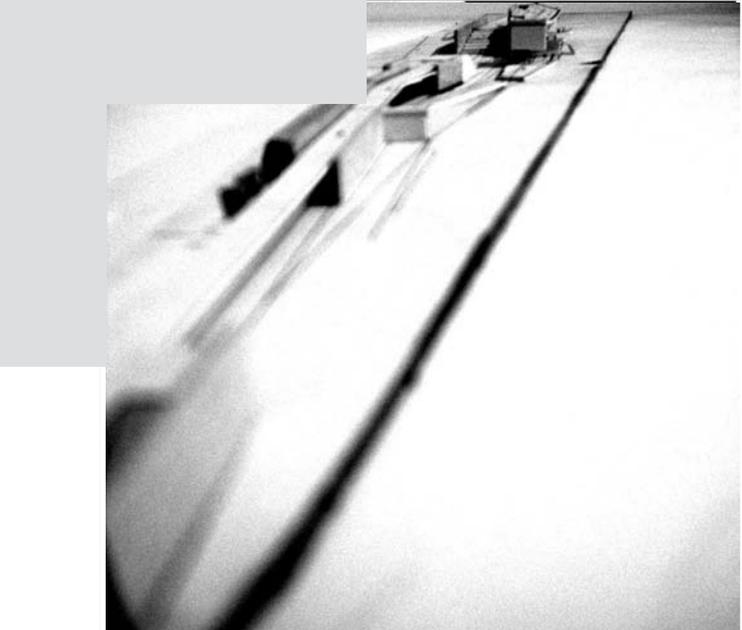
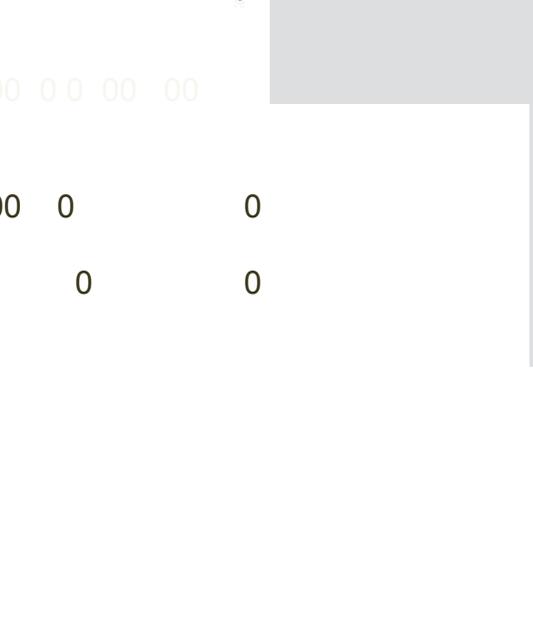


fig.6.13 - 6.16 view of concept model

Connections

The project strives to bridge of their city. The margins separate islands or forces. The most obvious being the program of the intervention, to connect land and sea and by so doing linking Durban to the global community through tourism. The building, as a transport hub, physically connects it to the major nodes within the city.

Durban harbour is the lungs of the city, an area restricted visually as well as physically from the public by high fences and walls. The proposed walkway through the working harbour defies these boundaries, encouraging the public to experience the harbour that is vital to the economy

The margins between working and public realm are blurred. In the same vein, a connection is created between two poles of the city. That is the new Point Development framework and the traditional CBD of the city. This traditional CBD centrally located within the city is characterized by medium income residential and commercial activity. The Point development is primarily high income residential units and commercial zones. A connection is created between new and old Durban, economic classes, cultural groups and communities.

The Building as a Gateway

An experience needs to be created for visitors to Durban. The building welcomes passengers and introduces them to the city, providing them with an idea of what to expect of the city, its people and landscape. A unique experience is created. The building is to be seen as morphed with the city. The emphasis placed on the city and therefore not on the building. Additionally this concept aids the problem in difference of scale between the cruise liner and the building. The building is perceived not, as a single entity in the harbour, but as an urban intervention interwoven within the urban fabric. What makes a building or landscape inviting and welcoming? The use of semi-transparent materials and layering allows visibility into the spaces. The entrance is large and emphasised, the boundary between interior and exterior is vague, with no distinct edge. Individuals are encouraged to enter the building without even being aware they are doing so. The transparency of the building acknowledges its position on the waters edge, further enforcing the concept to make the public aware of their surrounding environment.

Transformability

The project needs to adapt to the change in size of cruise liners and the influence these "moving buildings" have on the site. Natural cycles such as seasons, tidal cycles and diurnal cycles are emphasised due to the connection of the building to the exterior and the nature of the working harbour is made visible and the user becomes more connected to their surroundings and city.

This theme is closely related to that of the use of landscape

to create a continually transforming environment that is constantly changing, allowing for an interesting and refreshing experience. The idea is carried through into the façade design, the pivot doors on the north western façade can be moved resulting in an ever-changing façade. The walkway placed through the harbour provides a spine for future development. Programs can be "clipped" onto the spine or "grow" from it. This is in line with the city's development

plans to reclaim the waters edge from the harbour. This allows for an interesting aesthetic where nodes will grow along the spine where required, mimicking a living organism. The site of the terminal is visible from many points within the city, making the city aware when a cruise liner is in port. Citizens have the opportunity to become more involved with the experience, and this routine will become a component of the life of the city.



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fig. 6.18 view of concept model exploring landscape

Handscape

“to dwell between heaven and earth means to settle in the multifarious in-between, that is, to concretise the general situation as a man-made place....a study of man-made place therefore ought to have a natural basis: it should take the relationship to the natural environment as its point of departure.”

Norberg-Schultz

>>

The project celebrates terra firma, primarily due to the nature of the program. After three days out at sea, land is welcome. In addition to this, the public are drawn out of the city into the landscape to experience their environment.

Durban has a distinctive landscape, which is integrated within the life of the city. Vegetation emerges from cracks in pavements and buildings. This character of Durban can be made evident through the intervention. There is less of an attempt to control nature. Vegetation is encouraged to grow from the walls and slabs, recognizing this character of Durban and making it evident to visitors.

Through the manipulation of the landscape, a relationship is created with the land around the structure. The changes in direction along

the walkway aim to focus the user on certain views in their surroundings, such as The Bluff, the Millennium Tower and the city skyline. Information is provided to the user about their immediate landscape, creating a connection between the user and their landscape. By doing so the project attempts to enforce the idea of how humans are dependent on nature and how our lives are interwoven with nature.



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"This we know.
All things are connected
like the blood
which unites one family..."

Whatever befalls the earth,
befalls the sons and daughters of the earth;
Man did not weave the web of life;
he is merely a strand in it.
Whatever he does to the web,
he does to himself."

TED PERRY

inspired by Chief Seattle

By providing information about the history of Durban and the surrounds, the relationship to the landscape is able to develop to one of not only space but also of time.

As Betsky (2002) states in his book: *Landscrapers: Buildings With The Land*. "Site-Specific work means to reveal the nature of its location in time and space, the history of its making, the hand of its maker, and the cultural assumptions that maker and viewer bring to an experience of the work. The result is something that is neither object or field. The work creates an environment, but is also an object (or set of objects) in its own right. It offers an alternative landscape that is critical of, or merely makes us aware of, what we have left behind once we are in a position to experience the site-specific piece."

>>

"These landscrapers give us back the land and architecture. By making us aware of the ground we inhabit, we can regain a sense of the reality of place in a culture that is more and more dependent on the abstraction engendered by the mass production of real and virtual spaces, instant communication, and digital manipulation."

Betsky, 2002 p. 192

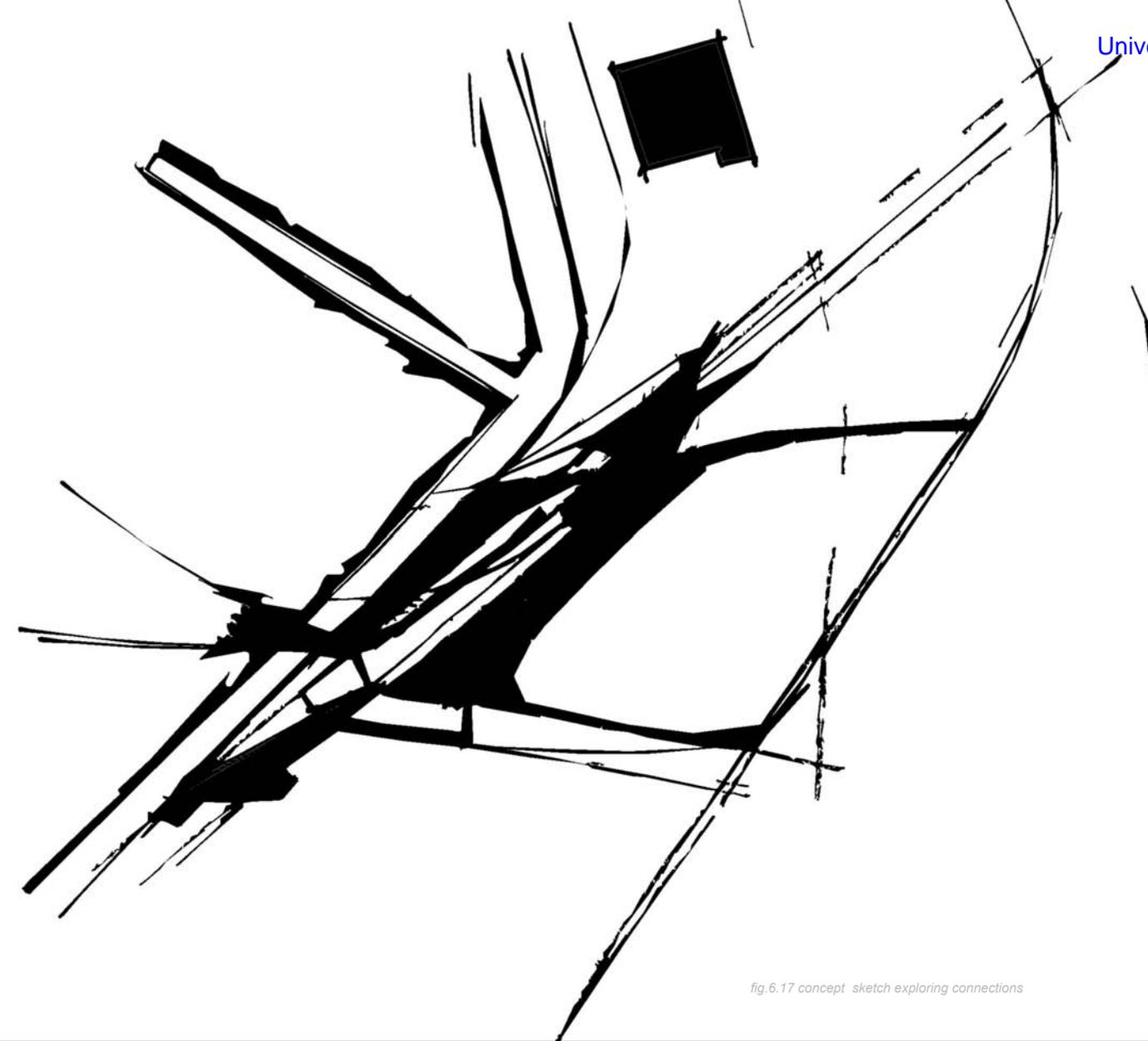


fig.6.17 concept sketch exploring connections

Layering

The contrast between the harsh, rough texture of the working harbour and that of the new landscape placed above it makes evident how brownfield sites can be transformed, and the evolution of the city. The landscape created does not strive to be a pristine natural park. The environment created is an honest response to its context in a working harbour. The layering of the new intervention over the existing creates an interesting play on texture and acknowledges the history of the site. The linear fragments of the walkway mimics the railway-lines on site, creating a sense of familiarity between the layers.

This concept of layering developed from the site, is carried through into the use of

materials used to construct the building as well as generate the facades. Viewed from a distance the separate elements of the building appear to overlap, creating a layering effect. Materials are layered, such as timber battens placed as screens in front of glazing. The use of creepers and other vegetation adds to this a natural layer.

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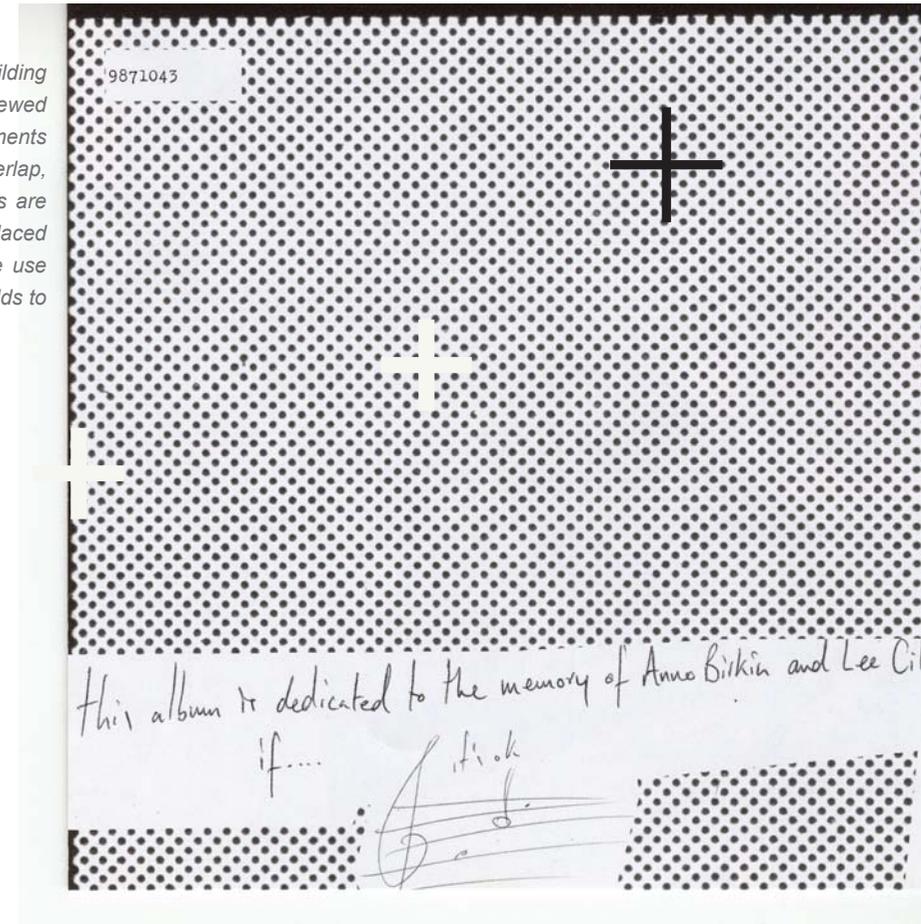
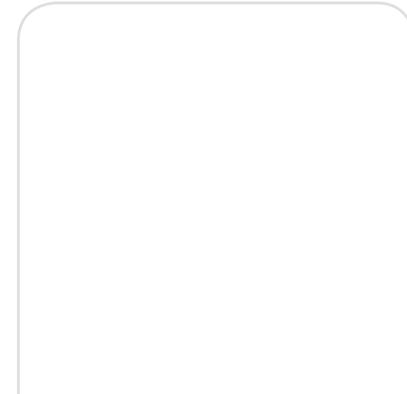


fig.6.21 layering

Cruise ships

In his book "Towards a New Architecture", Le Corbusier uses the ocean liner as an example of the "new spirit".

"The steamship is the first stage in the realization of a world organised according to the new spirit." (Le Corbusier, 1986, p.103)

Le Corbusier views the cruise liner as the future of architecture. An architecture making use of new technology, and void of unnecessary decoration and custom.

"Architects live and move within the narrow limits of academic acquirements and in ignorance of new ways of building, and they are quite willing that their conceptions should remain at doves kissing one another. But our daring and masterly constructors of steamships produce palaces in comparison with which cathedrals are tiny things, and they throw them on the sea!" (Le Corbusier, 1986, p.92)

He emphasises the use of good proportions; new architectural forms; freedom from the "styles" that stifle us; good contrast between the solids and voids; powerful masses and slender elements.

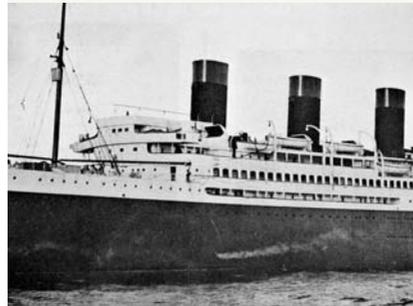


fig. 6.22 the liner "France"

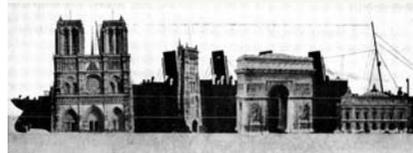
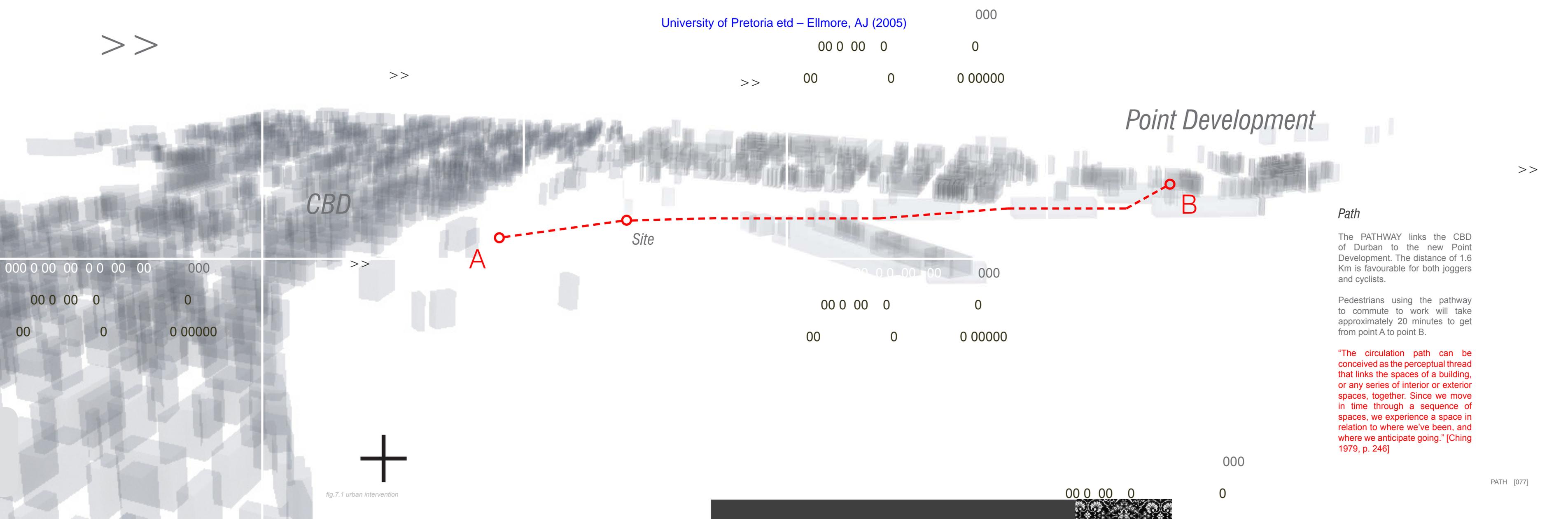


fig. 6.23 the cunarder "Aquitania" compared with various buildings

[+]

^{7.0} Design Proposal



CBD

Point Development

A

Site

B

Path

The PATHWAY links the CBD of Durban to the new Point Development. The distance of 1.6 Km is favourable for both joggers and cyclists.

Pedestrians using the pathway to commute to work will take approximately 20 minutes to get from point A to point B.

“The circulation path can be conceived as the perceptual thread that links the spaces of a building, or any series of interior or exterior spaces, together. Since we move in time through a sequence of spaces, we experience a space in relation to where we’ve been, and where we anticipate going.” [Ching 1979, p. 246]

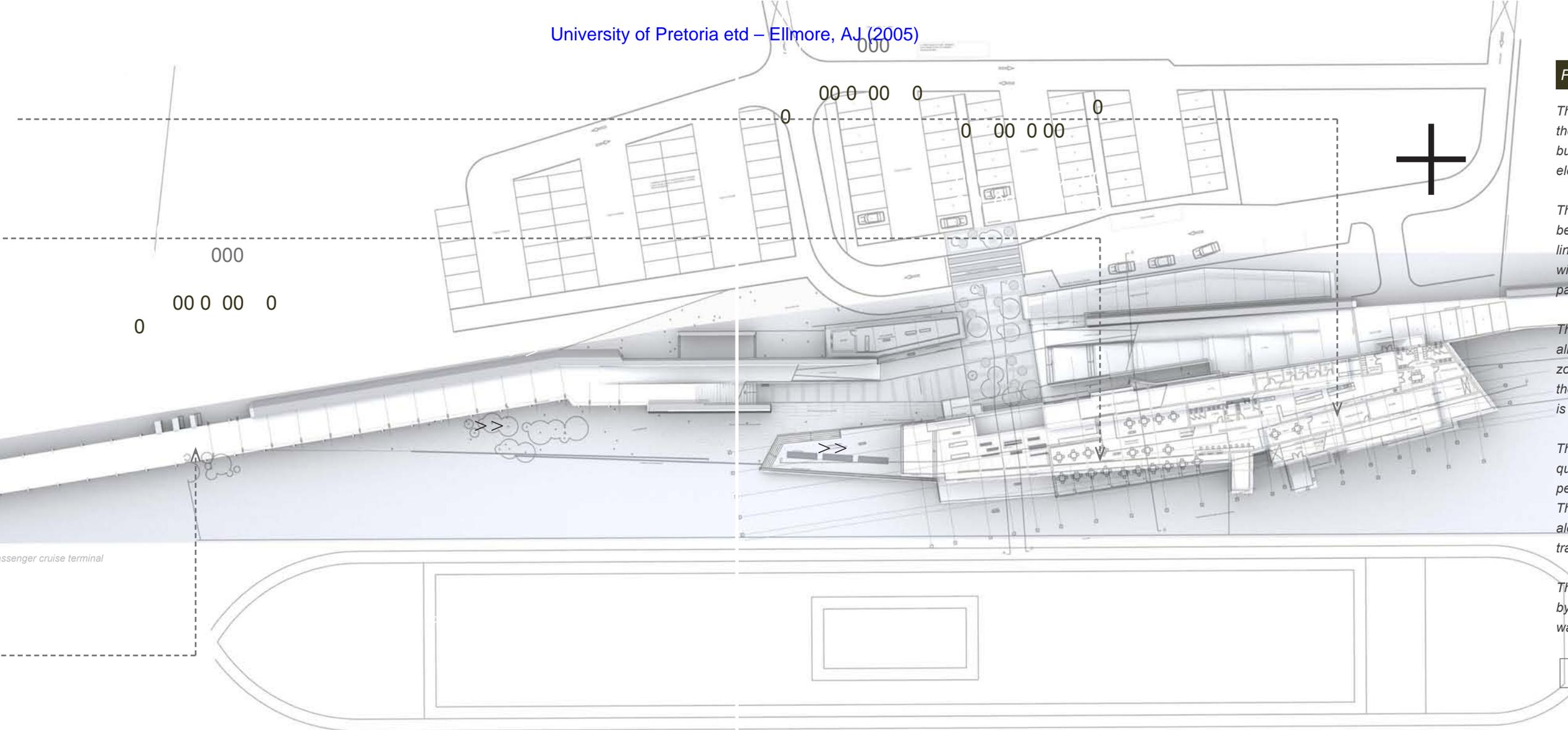


fig.7.1 urban intervention

Accommodation

- >A **Passenger Cruise Terminal Facilities:**
Foyer, Customs facilities, Luggage facilities, Public toilets, Waiting area, Trolley storage, Viewing platforms
- >B **Restaurant:**
Outside and inside seating, Kitchen, Public toilets, Cold rooms and storage, Kitchen office, Staff toilets & showers, Staff room, Recycle sorting area, garbage storage
- >C **Waiting Shelter**
- >D **Parking**
Parking bays, 2 disabled parking bays, Delivery zone, Bus Parking, Taxi queue, Staff parking
- >E **Exhibition Space**
Store, Exhibition space
- >F **Information Centre**
Office, Store, Display shelving, Information counter
- >G **Harbour Facilities**
Office, Store, Luggage sorting area, Luggage Lift
- >H **Durban people mover terminal [future intervention]**
- >I **Walkway through harbour**

fig.7.2 plan of passenger cruise terminal



Parking and Drop-off

The public parking is designed as an extension of the building, as to complement the design of the building if viewed from a cruise liner. [i.e. from an elevated position]

The public parking is separated into two, one half being permanent paved parking, the other simply lines painted on the existing harbour asphalt, that will be used during larger functions when additional parking is required.

The vehicular circulation is designed in such a way allowing drivers to drive past the drop-off / collection zone before entering the parking area. This allows the driver to check if the person they are collecting is already waiting, not requiring them to park.

The waiting shelter is located in front of the taxi queue. This provides shade and a landmark where people can meet.

The linear shape allows people waiting to stand along side one another with a view of the oncoming traffic.

The shelter is constructed of wattle latte supported by a stainless steel frame, connected to the spine wall.

Entrance Foyer

The foyer is open and exposed, allowing for natural ventilation. Large pivot doors can be moved to provide sun shading when required. When not required these doors can be opened to enhance the view.

Concrete benches are provided for in the foyer, which serves as the waiting area for the public. The balcony and viewing platform adjacent to the foyer allows people to move out of the building and view the cruise ship. The floor slab of the foyer is cantilevered over the harbour asphalt to create the effect that it is floating.



fig. 7.3 elevated north western view of building



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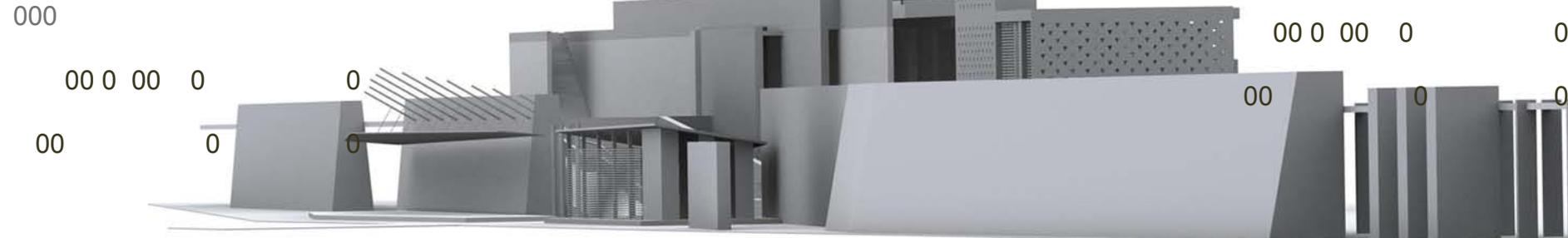


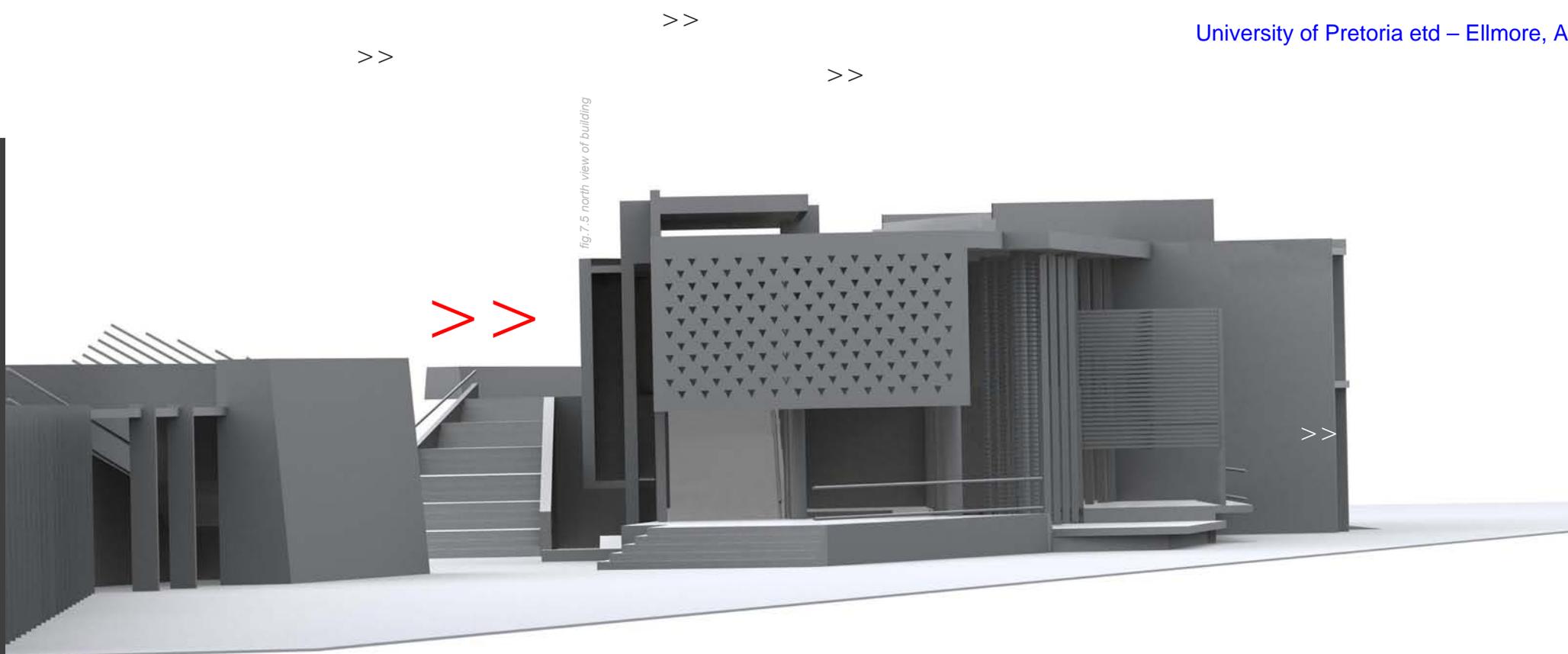
fig. 7.4 north elevation

Ramps

Ramps are placed at all level changes. This allows for easy movement of people with luggage trolleys and wheelchairs. All ramps have a maximum fall of 1 in 12, and a slip resistant surface, allowing for easy use by people in wheelchairs. Railings are provided on all ramps and stairs.

Ramps along the walkway, provide an easier route for cyclists.

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Restaurant

The restaurant provides forty external seats and seventy internal seats. The internal seating is again divided into an air-conditioned area and a natural ventilated area. Allowing the customer to decide according to weather condition or time of day. The sunscreens on the restaurant façade are positioned at right angles to the façade to block the sun, however still allowing a view [see technical chapter]

The restaurant is positioned to allow for a view of the entrance ramp, allowing people waiting for passengers to use the restaurant and watch the ramp for passengers to arrive. The linear form of the restaurant enables a larger number of tables to have a view of the harbour.

Traffic Calming

The pathway along the main axis toward the parking area is maintained at a constant height over the road, slowing traffic. Vehicle users are made to realize that they have entered a pedestrian dominant zone. The road is narrow, reducing the speed of vehicles. Different surfaces can also be used to reduce speeds and increase driver awareness.

Signage

Signage needs to be incorporated into the design. Simple, easy to read signs provide information to tourists and first time visitors.

Exhibition Space

Due to the seasonal nature of cruise

ships, the customs hall doubles as an exhibition space or art gallery. For this reason a store room is provided for storage of the gallery equipment. Large South African artworks could be displayed on the walls up the main ramp. This would serve as an appropriate introduction to passengers arriving in Durban. The restaurant has a service door to the customs hall allowing this space to be served in the situation of a large function.

Durban People Mover Terminal

Provision has been made for a link to the proposed people-mover for Durban. It is possible that this people-mover will operate on the existing railway lines. A location

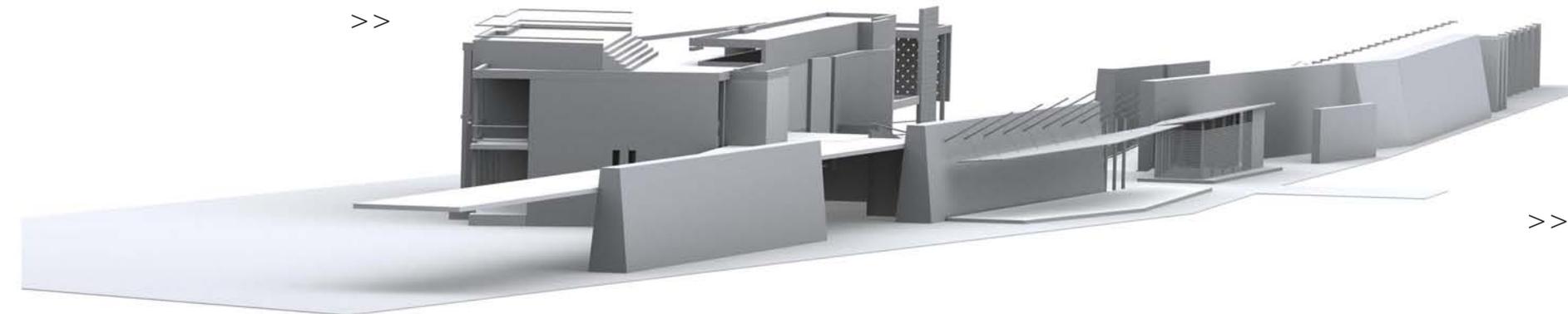
has been proposed for this people mover at the end of the main axis running from the building toward the public parking. This would allow for easy movement of tourists around the city, linking the major nodes of the city.

Lift

The lift allows disabled passengers to access the customs hall easily once disembarking the cruise ship. The controls inside and outside must be accessible to people in wheelchairs – 1.15m above the floor level.

The internal dimensions of the car are 2000x1400mm with an entrance width of 1100, and a capacity of 17 people.

fig.7.6 elevated south east view



Entrance

The main entrance of the building is emphasised primarily due to its scale and its positioning. Situated on the main axis leading from the public parking, it will be easily found by first time visitors to the building. The entrance to the building is recessed. According to Ching, "Recessed entrances also provide shelter and receive a portion of the exterior space into the realm of the building." [Ching, 1979, p. 257]

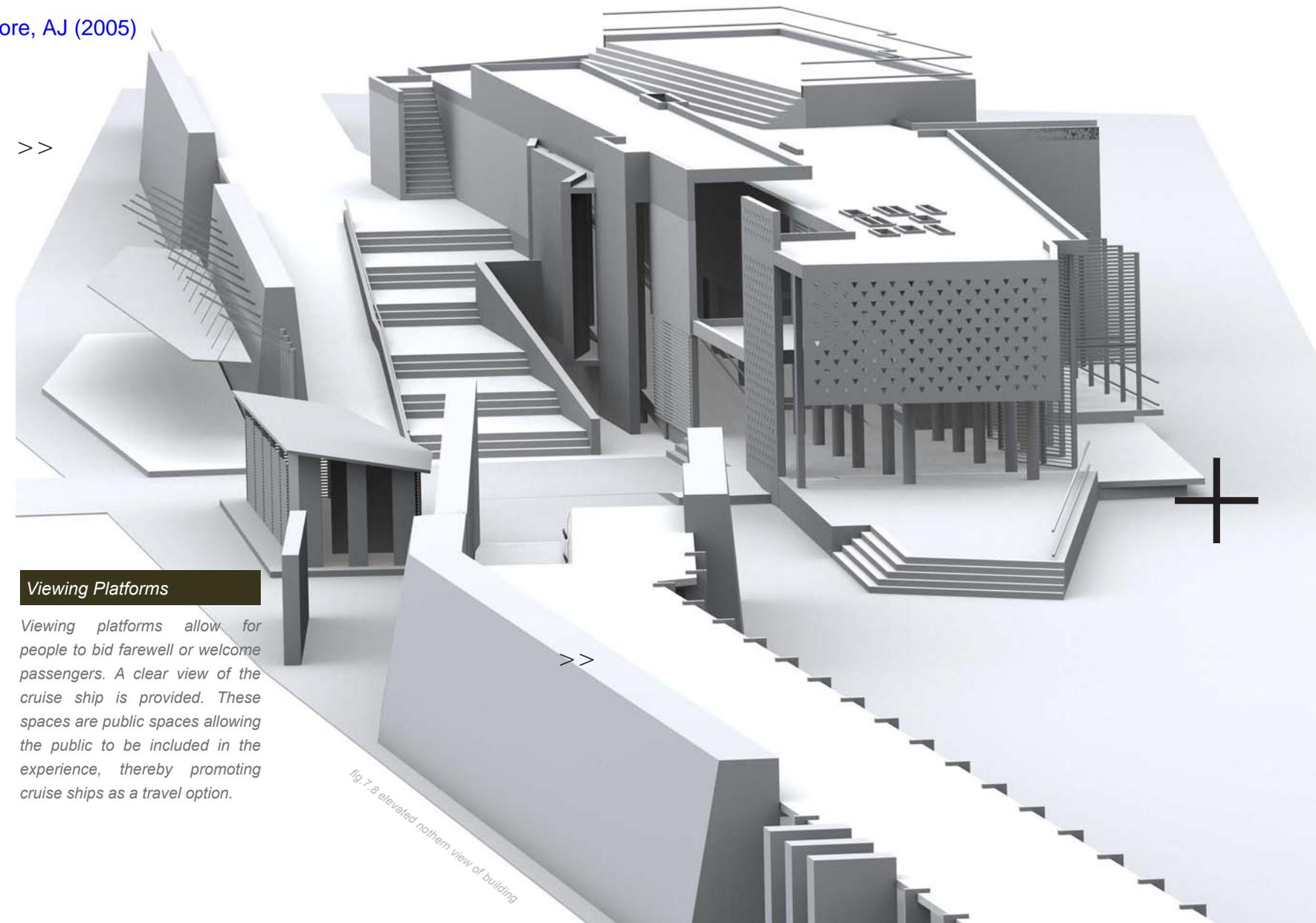
This enforces the concept of merging the building with the surrounding landscape. Due to the nature and position of the entrance, when entering the user has a view through the building towards the cruise liner when in port. Creating the idea that one is entering the ship. If a ship is not in port, the user has a view out across the harbour, again linking the users with their surroundings.

Tourist Information Centre

The information centre is located along the walkway, encouraging the general public, not only the cruise ship passengers, to make use of the facility. Information will be provided about Durban and its surrounding tourist attractions. A range of tourist related services will be provided. The linear building opens up completely to encourage people to enter.



fig.7.7 primary entrance



Viewing Platforms

Viewing platforms allow for people to bid farewell or welcome passengers. A clear view of the cruise ship is provided. These spaces are public spaces allowing the public to be included in the experience, thereby promoting cruise ships as a travel option.

fig.7.8 elevated northern view of building

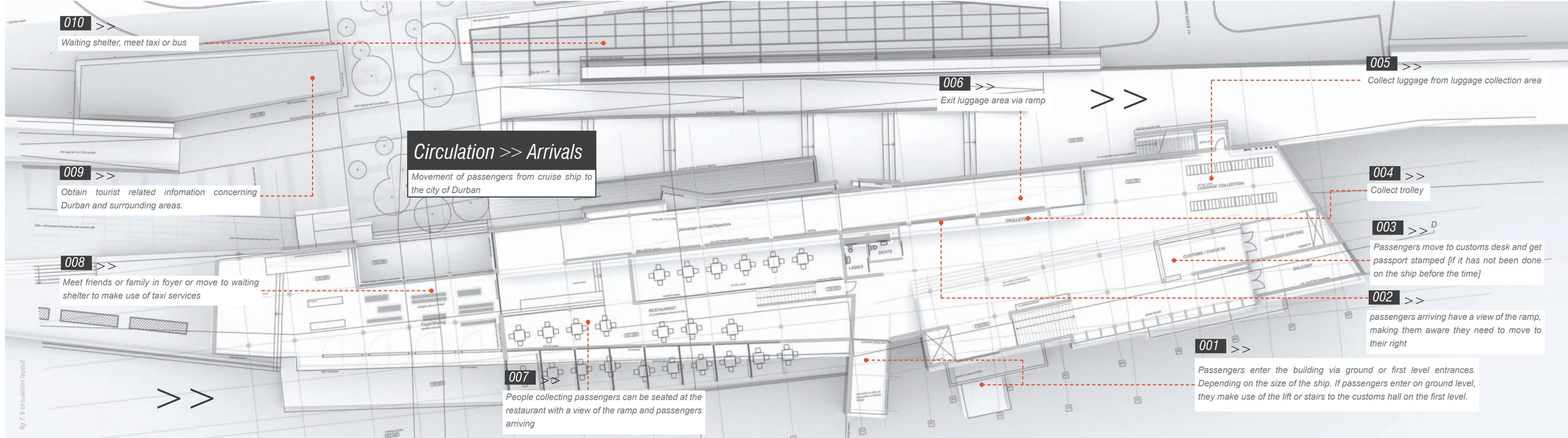
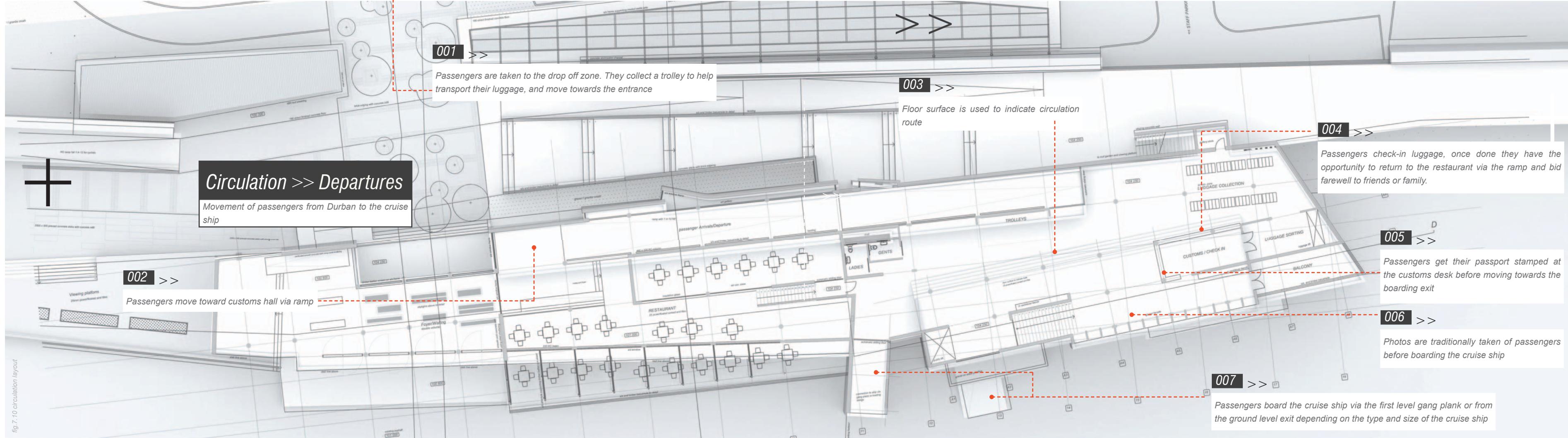


fig.7.9 circulation layout



Circulation >> Departures
 Movement of passengers from Durban to the cruise ship

001 >>
 Passengers are taken to the drop off zone. They collect a trolley to help transport their luggage, and move towards the entrance

003 >>
 Floor surface is used to indicate circulation route

004 >>
 Passengers check-in luggage, once done they have the opportunity to return to the restaurant via the ramp and bid farewell to friends or family.

002 >>
 Passengers move toward customs hall via ramp

005 >>
 Passengers get their passport stamped at the customs desk before moving towards the boarding exit

006 >>
 Photos are traditionally taken of passengers before boarding the cruise ship

007 >>
 Passengers board the cruise ship via the first level gang plank or from the ground level exit depending on the type and size of the cruise ship

fig. 7.10 circulation layout

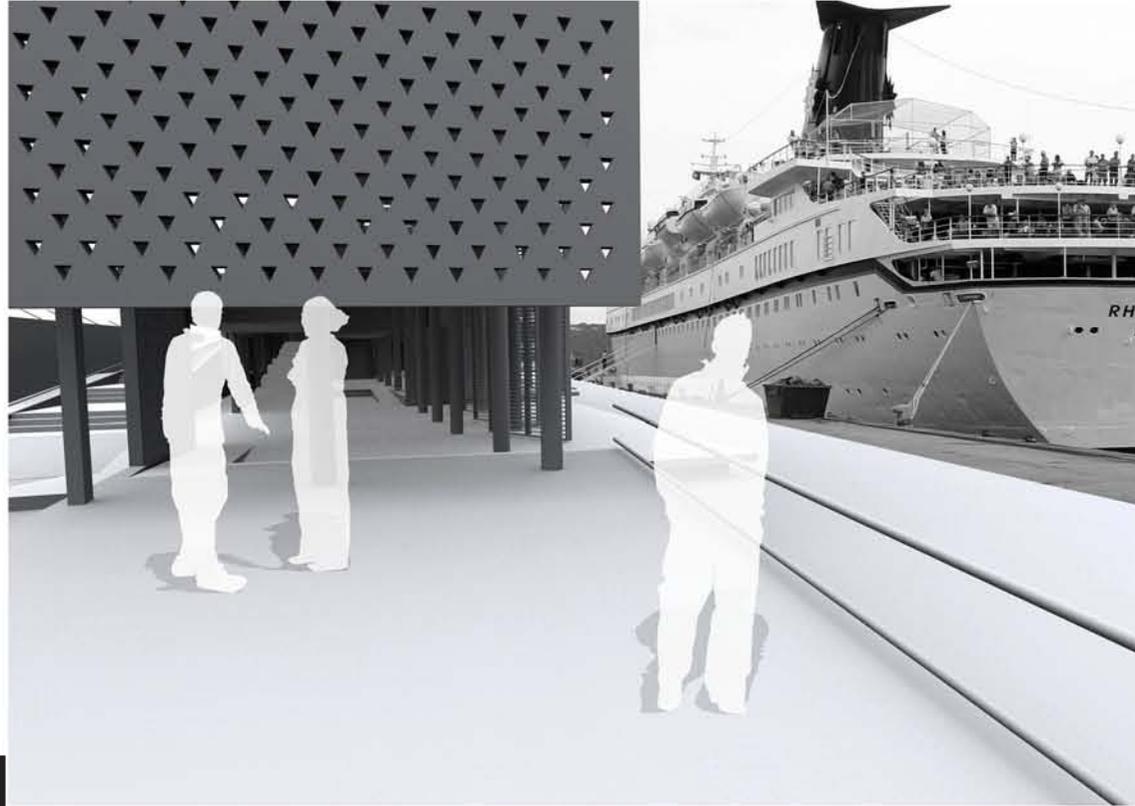
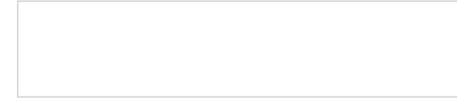


fig.7.11 viewing platform



fig.7.12 circulation ramp

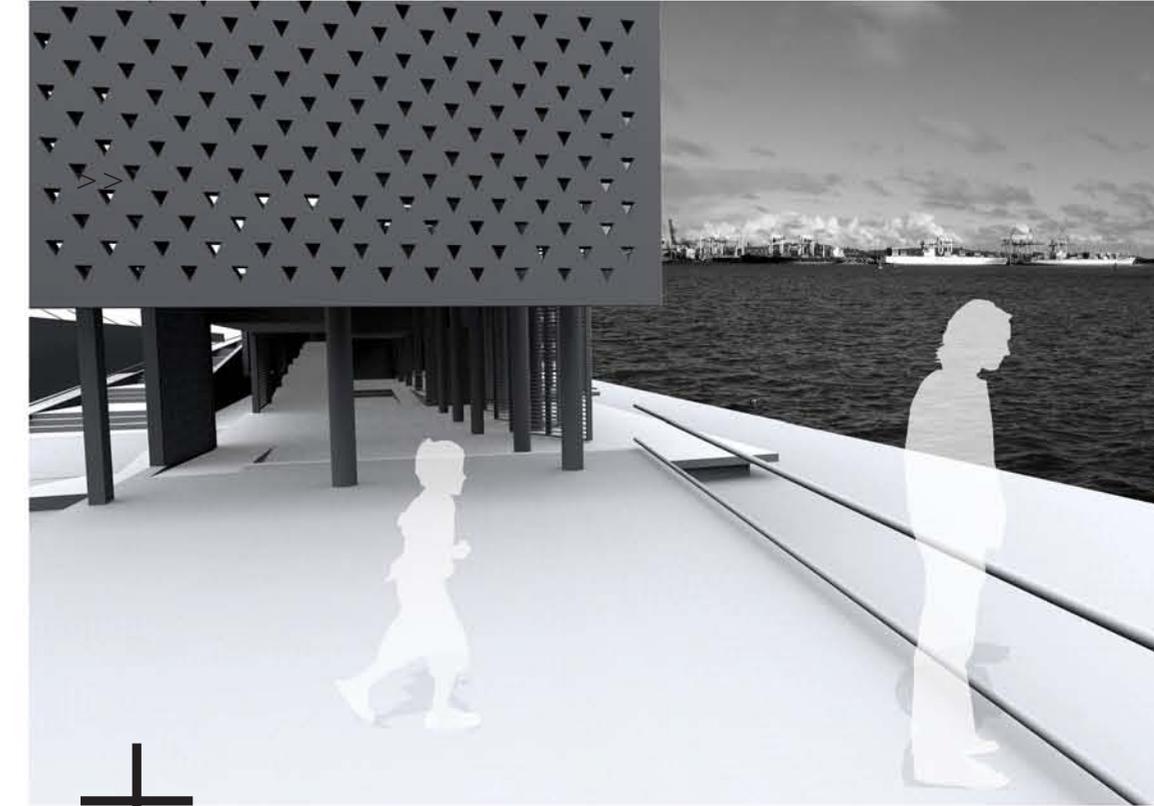


fig.7.13 viewing platform

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fig.7.14 foyer

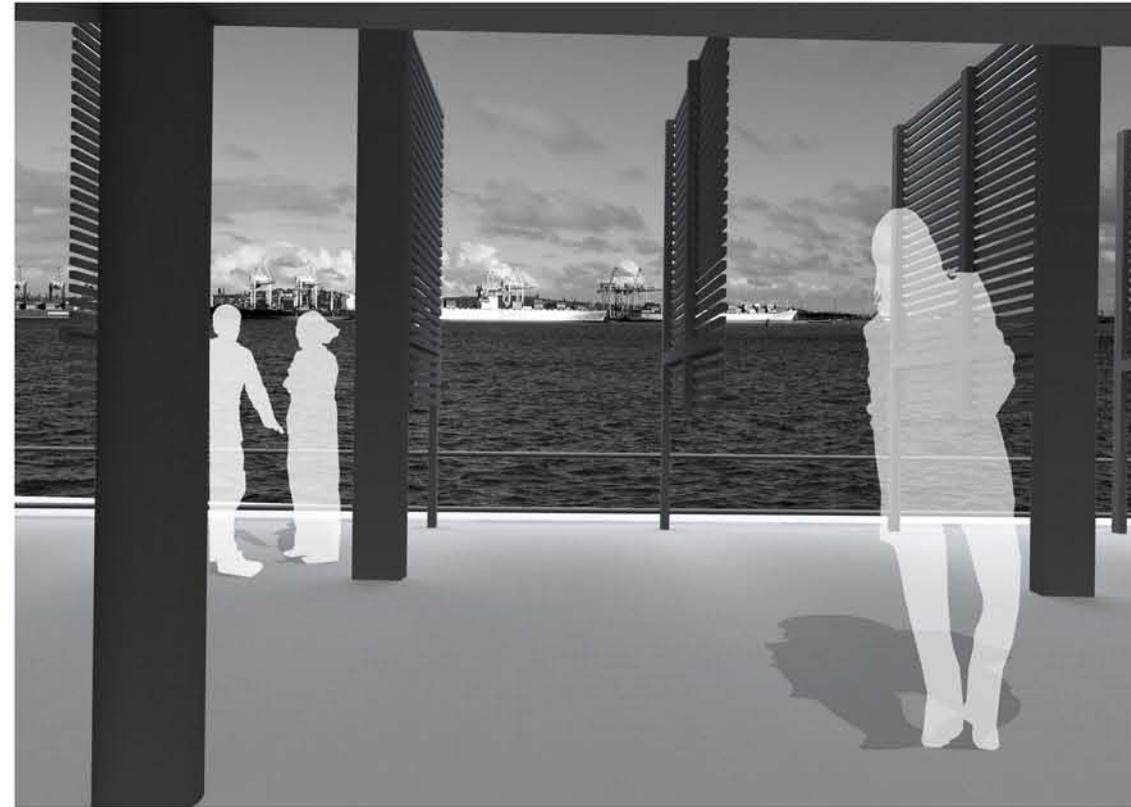


fig.7.15 restaurant view

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fig.7.16 entrance



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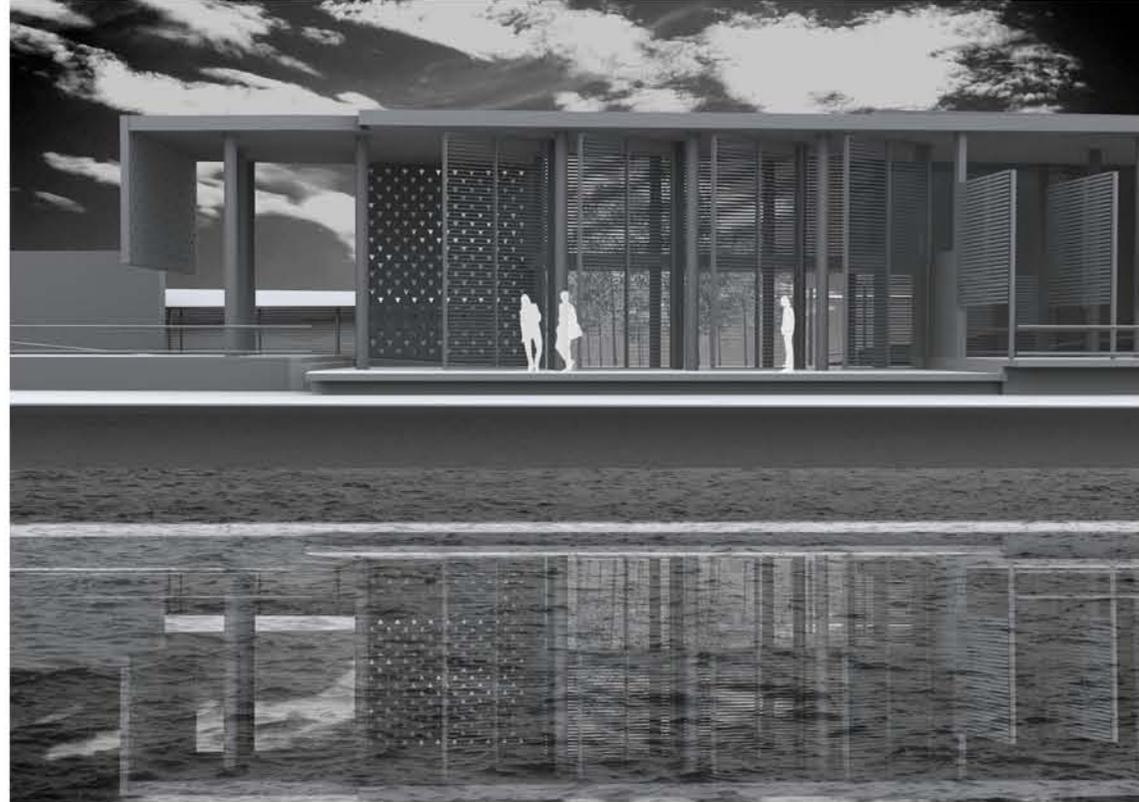


fig.7.17 north-west elevation

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fig.7.18 circulation ramp

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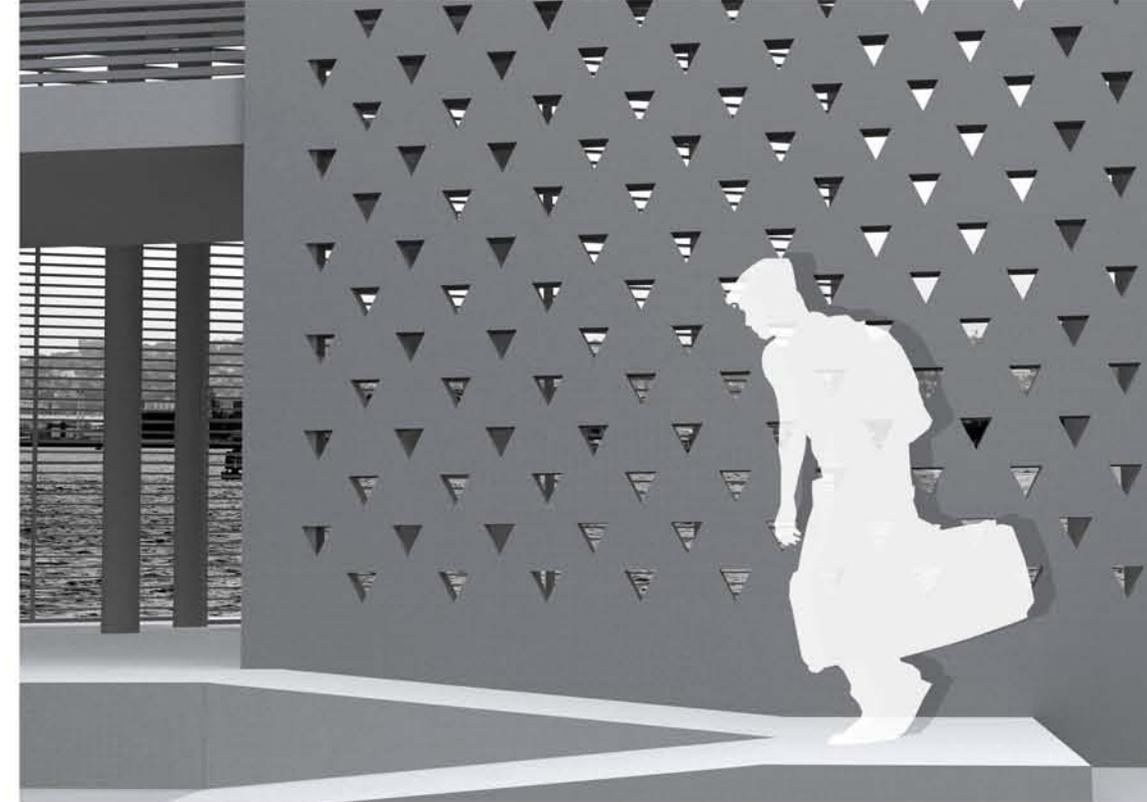


fig.7.19 entrance

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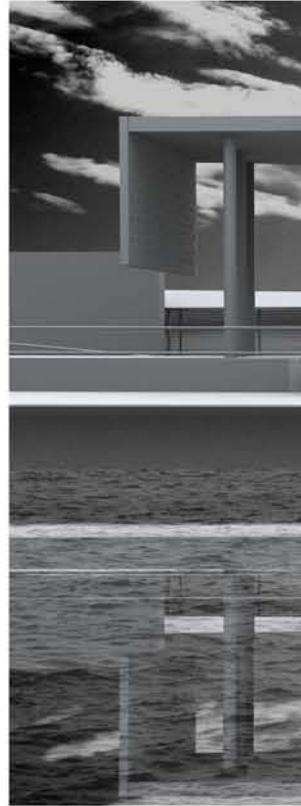
fig.7.20 external ramp and stairs



fig.7.21 pivot doors



fig.7.22 view from public parking



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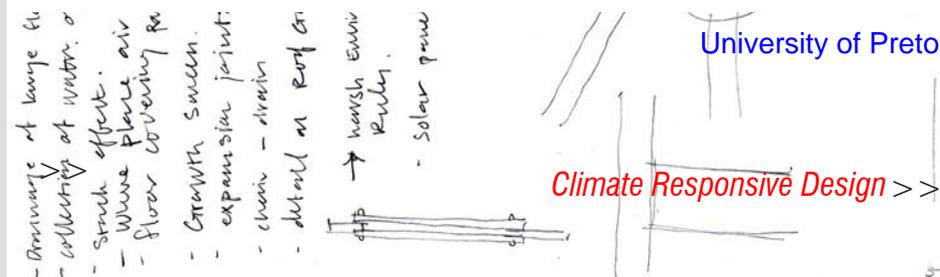
8.0 Technical Study

7.1 Introduction

The following text is supplementary to the set of drawings, to motivate decisions made on a technical level. The chapter aims to deal with the most important technical issues raised through the design process.

Considering that the construction industry is the largest consumer of materials, designers need to make decisions that do not impact adversely on the environment. Designers are in the position to make the public aware of the situation and lead by example, through the use of appropriate materials.

The hot, humid climate experienced in Durban, as discussed in the context chapter, requires a climate based design process where climate response concepts are a major generator of the architecture.



Climate Responsive Design >

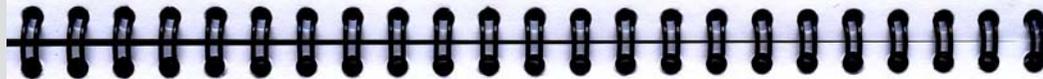
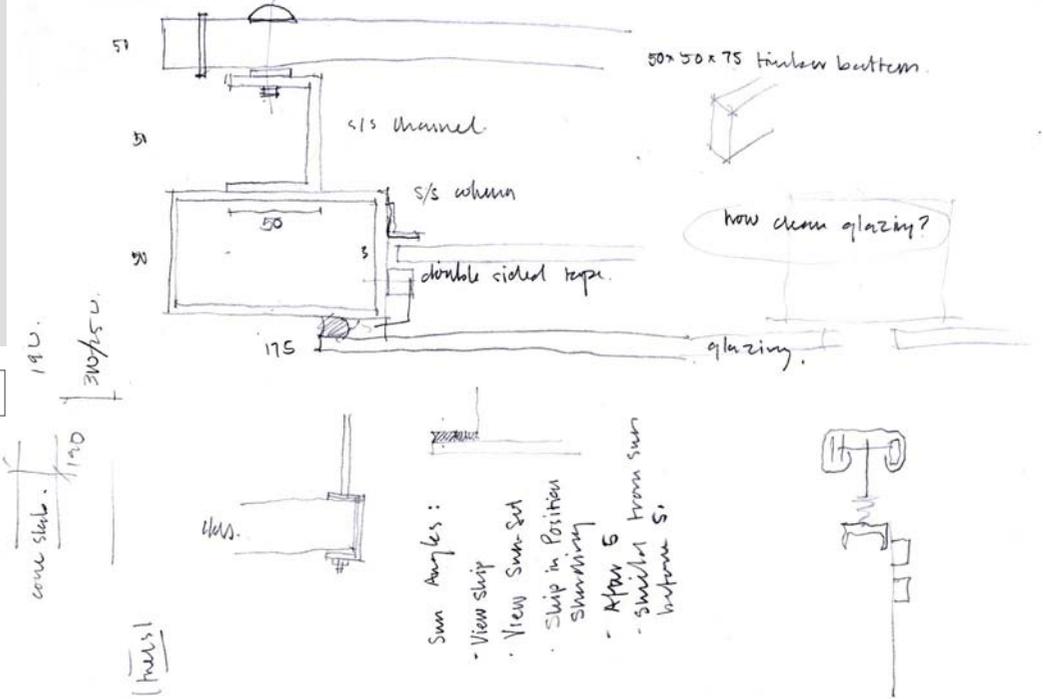


fig.8.1 detail design



Orientation

The building is aligned to the water edge and ship edge allowing for movement between the two. The result is that the longer facades are exposed to north-east and the south-west.

An advantage of the orientation of the building is that it receives the prevailing summer and winter winds along its longer facades aiding natural ventilation. The situation of the building on the waters edge increases its exposure to these winds as there are no obstructions to block the wind as would be experienced in a city block.

Form

The narrow plan shape allows for effective cross-ventilation due to the natural wind direction. The South Western façade can be opened to allow air movement through the building. The narrow plan also allows for high levels of natural light, avoiding dark areas that encourage mould growth. Natural light decreases the dependency on electric lights which have an adverse effect on the internal heating of the building and energy consumption.

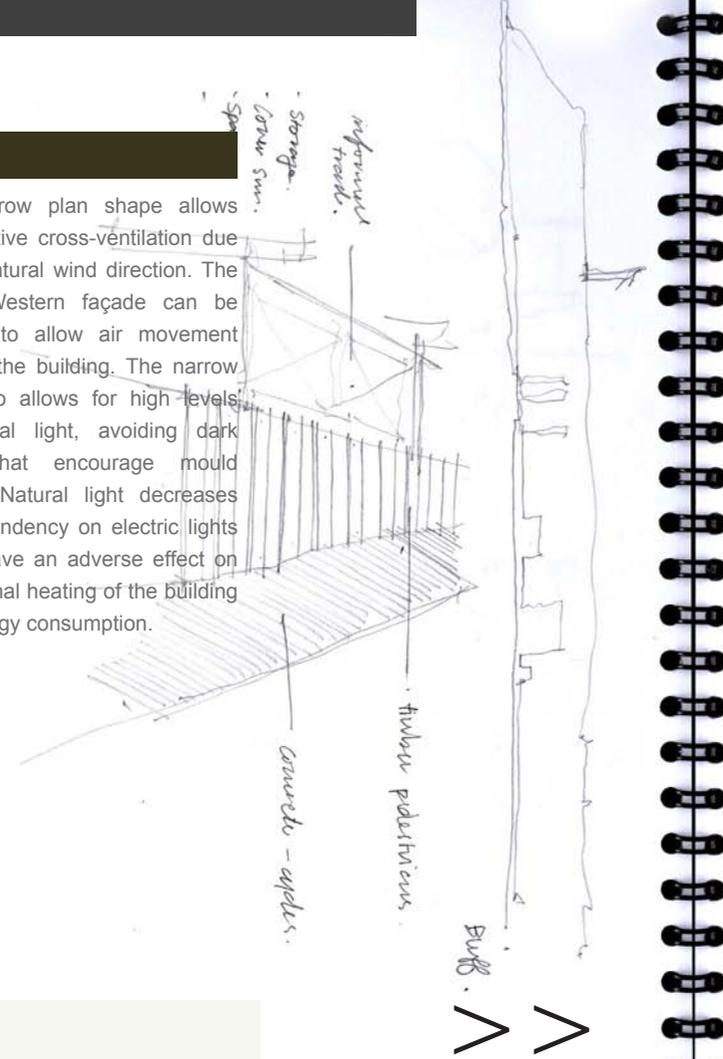
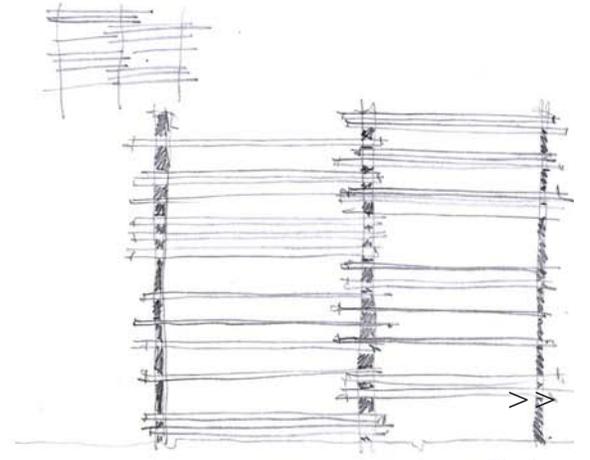
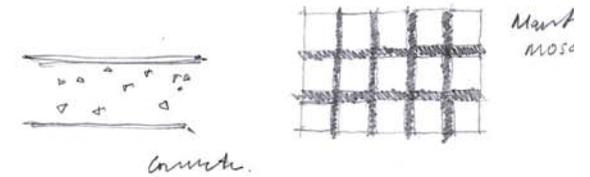
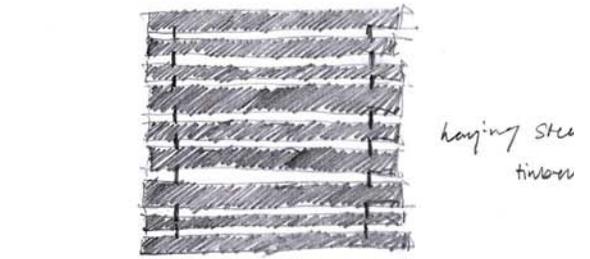


fig.8.2 detail design



skin design



Structure

The primary structure of the building is a reinforced concrete structure, consisting of columns and beams. This structure is stiffened by slabs, the lift shaft and service cores. This creates a skeletal structure allowing flexibility to the skin that can be modified to accommodate varying internal functional conditions and exterior environmental conditions.

A secondary structure of stainless steel is used on the east and west facades to support the timber batten skin. This structure clips onto the primary structure. A light stainless steel structure is also used to construct the waiting shelter.

The walkway is constructed of concrete columns and load-bearing concrete walls supporting timber beams and battens. These timber beams are placed within openings in the concrete and packed with mortar.

Skin

Saligna timber battens are used throughout the building as a skin, allowing air movement and vision through it. The timber batten screens are used predominantly to screen the building from sun on the eastern and western facades.

Concrete walls with perforations also allow for air movement and visibility.

These semi-transparent skins promote visibility into adjacent spaces, emphasising the circulation routes through the building by making them visible from many spaces.

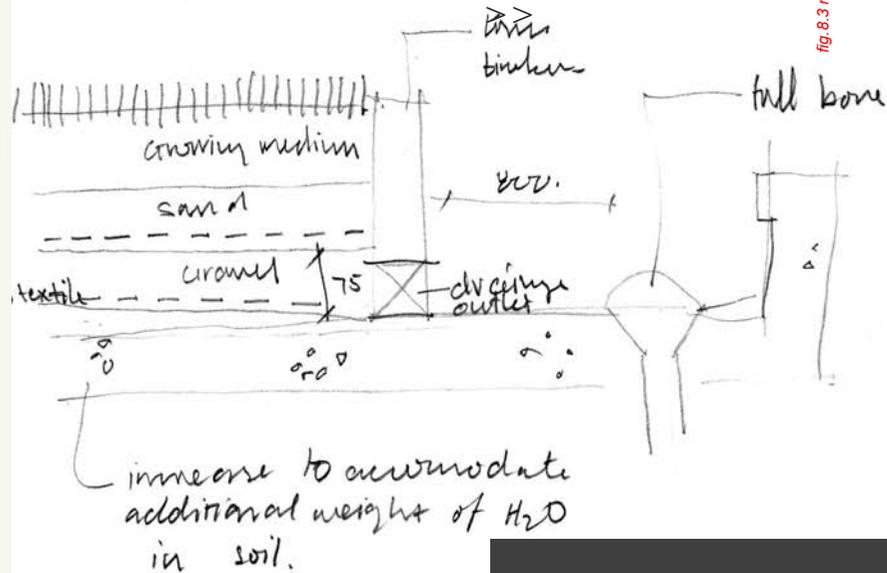
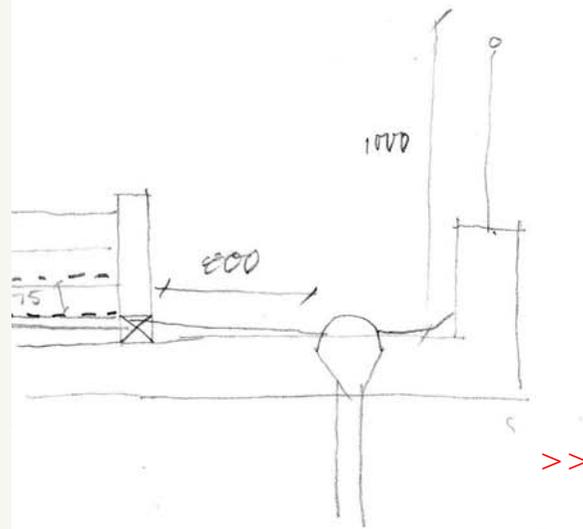
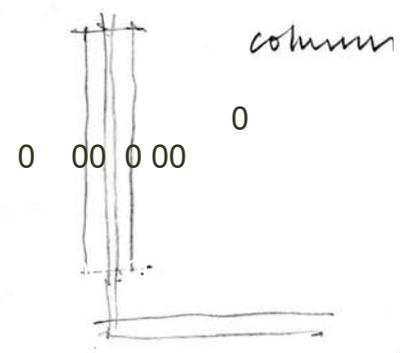


fig. 8.3 roof garden



- floor finish



- Dividers.
- wings
able
to
suck
away

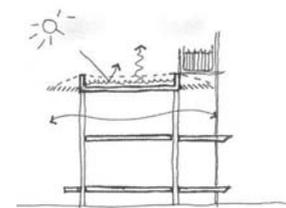


fig. 8.4 roof garden

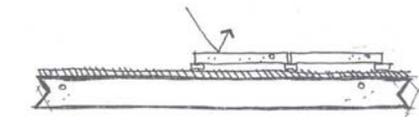


fig. 8.5 accessible roof

Roof Design

The primary function of the roof is to protect against precipitation and solar gain. A flat concrete roof is proposed to facilitate pedestrian traffic and viewing platforms.

Due to the scale of the cruise ships the building and surrounding landscape will often be viewed from above. A roof garden is therefore introduced. The roof garden has the added advantage of providing a massive material to insulate the building. The high specific heat of the earth means that it will act as an insulator, and remain at the lower levels of air temperature thus keeping the roof cool. (Hyde, 2000, p. 147)

To provide for a level, accessible viewing platform concrete tiles on plastic spacers placed on the concrete roof slab are used. By placing insulation above the waterproof membrane an inverted roof is created. The insulating layer protects the waterproofing layer and also reduces heat gain to the slab. The light colour of the concrete tiles and slab will also reflect the sunlight.

Ventilation

Buildings in Durban require good ventilation due to the high humidity levels. The building makes use of a combination of both passive and mechanical ventilation methods. The zones that have no contribution from the external environment are called active zones and require air-conditioning and mechanical ventilation. The aim of the design is to make the passive zones as large as possible and to reduce the number of active zones, and by so doing, conserve energy.

Passive Ventilation

According to Hyde [2000, p.74] the design factors affecting ventilation are as follows:

- Reduction of plan depth and increase openness of section to facilitate cross-flow and vertical flow of air.
- Optimum orientation of rooms to the prevailing breeze and the linkage between leeward and windward side to utilize pressure differences.
- Maximize the skin opacity through the number of openings.
- Reduction of internal obstructions.
- Site selection and building situation to increase exposure to airflow effects.

The width of the building is 12m, allowing for effective cross ventilation. Planes, at right-angles to the flow of air, have been punctured to allow air movement through them. The use of high ceilings also promotes cross-ventilation.

Mechanical Ventilation

Mechanical ventilation requires an insulating, defensive skin to reduce energy consumption and retain the cool air. This skin of large amounts of mass and solar glass create a barrier to the exterior and the connection to the natural climate is lost. A further consequence of this is that the visitor is separated from the place they have come to experience, clearly defeating the purpose of the building (Hyde 2000, p. 9)

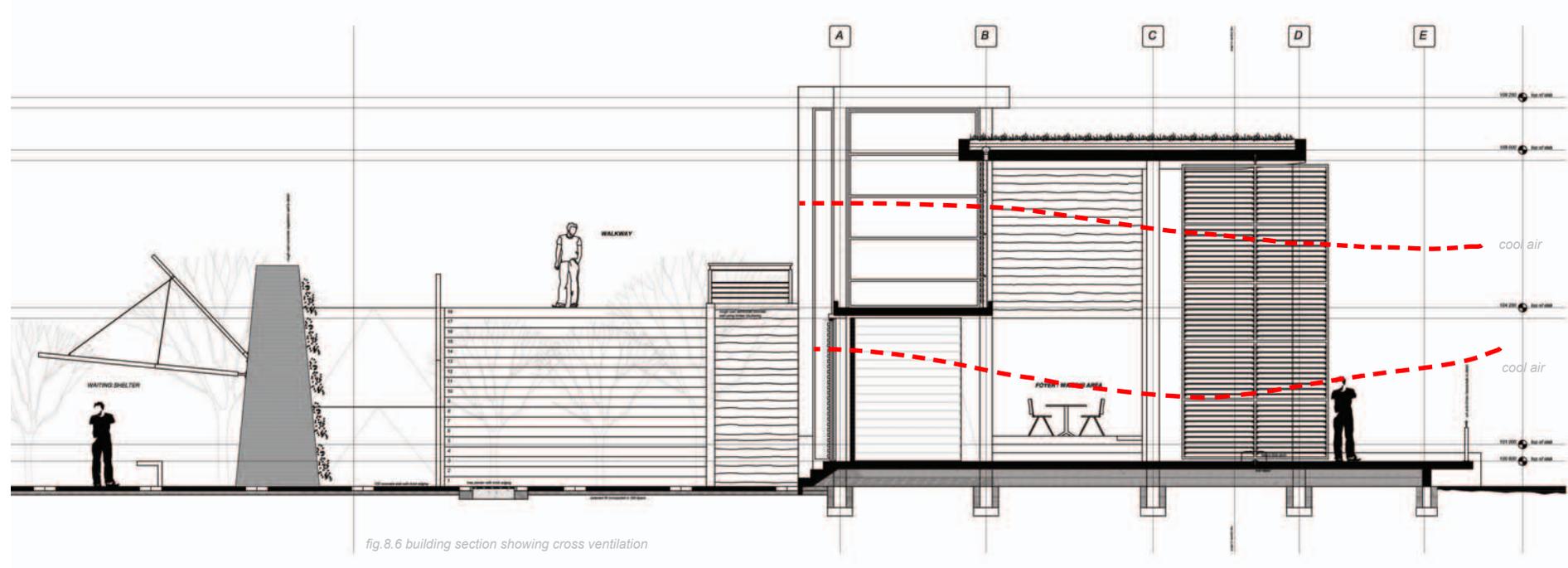
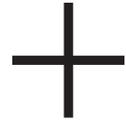
The kitchen will be mechanically ventilated, and an extractor will take the heat out the building.

Air-Conditioning

The harbour office, wine cellar, staff room and kitchen office will all be cooled using separate split air-conditioning units. This allows for each room to be controlled separately allowing individual control. The upper level of the restaurant has a layer of glazing to insulate the space, and retain the cool air from the air-conditioner. Automatic sliding doors are also provided between air-con and non-air-con zones, to retain the cool air. Both this upper restaurant level and the customs and luggage hall will be air-conditioned using two separate plants that will be situated on the roof slab above. These plants will be hidden using timber batten screens as they need to be ventilated.

The air-conditioning plants cooling the customs hall will be on an economy cycle, saving energy. When the air being released out of the plant is cooler than the external air temperature it will be directed through the lower level of the restaurant to cool it. This will work well in the evenings, pre-cooling the surfaces for the morning.

The building was analysed using a computer program, the results indicated that by using natural ventilation in the lower restaurant areas the maximum temperature, on the maximum temperature day with the maximum volume of people in the restaurant would be 28°C. This is seen as acceptable [Kohler, 2005]





Floor Surfaces

Granite floor tiles, finished to have a non-slip surface are used in internal public spaces. Floor surfaces are used to indicate the important movement routes through the building. Routes for passengers boarding or disembarking a ship are indicated using a change in the composition and geometry of the tiles.

Concrete with brick trim is used for high traffic external spaces. Granite crush will be used in spaces with less traffic flow. Pre-cast concrete slabs placed in the gravel will allow for easier movement.

Harsh Coastal Environment

The harsh coastal environment has a large influence on the material palette. As mentioned concrete, timber and stainless steel are used due to their high resistance properties. The use of these materials needs to be in such a way as to allow for easy maintenance and replacement of components. Details should be so designed as to prevent the collection of water, that would otherwise cause rusting.

Inclusive Environment

The building allows for access to people in wheel chairs. Ramps allow for movement through the building and a disabled persons WC is provided. Provision has been made for a travelator to be installed at a later stage if required. A lift is also provided.

Transformability

The different size of cruise ships results in diverse requirements in the building. Entrances need to be provided on the dock level for smaller ships, as well as an entrance on first floor to accommodate a gang-plank or a loading bridge similar to those used at an airport.

The scale of the ships can be likened to moving architecture, and the project needs to allow for the situation when a ship is in dock and when one is not.



Cruise ship environment

Due to the buildings function

At present the ships that frequent Durban are smaller ships that accommodate approximately 700 passengers including crew. The largest ships can accommodate up to 3 000 passengers, however these ships do not visit Durban often, only every four or five years. When these ships do dock it is highly unlikely that all passengers will disembark the ship, small groups of passengers will disembark to go on organised tours at different times [Beukes, 2005]. At present the decision has therefore been made to design the terminal to cater for the smaller ships, as it would not be feasible to design the building to cater for 3 000 passengers that may visit every four years. It will however be possible to accommodate larger ships due to the nature in which passengers disembark or board the ship. Passengers are provided with coloured stickers and disembark in groups of 40 people. Groups simply have to wait their turn, and can continue relaxing on the ship until their group is called. Once the luggage is off it usually takes approximately an hour to disembark 700 passengers [Beukes, 2005].

The difference in size of the cruise ships results in diverse requirements in the building. Passengers may need to enter the building from dock level or they may enter the building on first level. Two entrances have therefore been provided.

In terms of site selection the major requirement is space for a turning circle of 400m

Service Requirements:

The major requirement is for sufficient space along-side the ship to allow access for a truck to deliver food and beverages to the ship and to remove waste and luggage from the ship. This space is also required to fasten the ship to the dock.

Path

The walkway provides an alternative means of transport for people living in the CBD and working at the Point Development or vice-versa. It also provides a safe route for cyclists, joggers and walkers, with views of the city, harbour and The Bluff. With a one way distance of 1.6km it is an appropriate distance for pedestrians.

A spine for future development along the waterfront is developed. Functions can be “clipped” on or can “grow off” the walkway structure. This is in line with the city’s plans to reclaim the waters edge and future plans to relocate the harbour.

The journey from point A to point B becomes a journey where the user is provided with information about their context. Information boards provide information on the history and cultures of Durban. The history of Durban could be provided in timeline format starting at the Da Gama Clock, the first person to arrive at Durban by ship. Information is provided about the Mangroves and environment issues, creating awareness. The walkway is routed in such a way as to emphasise the surrounding views of the harbour, the city and The Bluff.

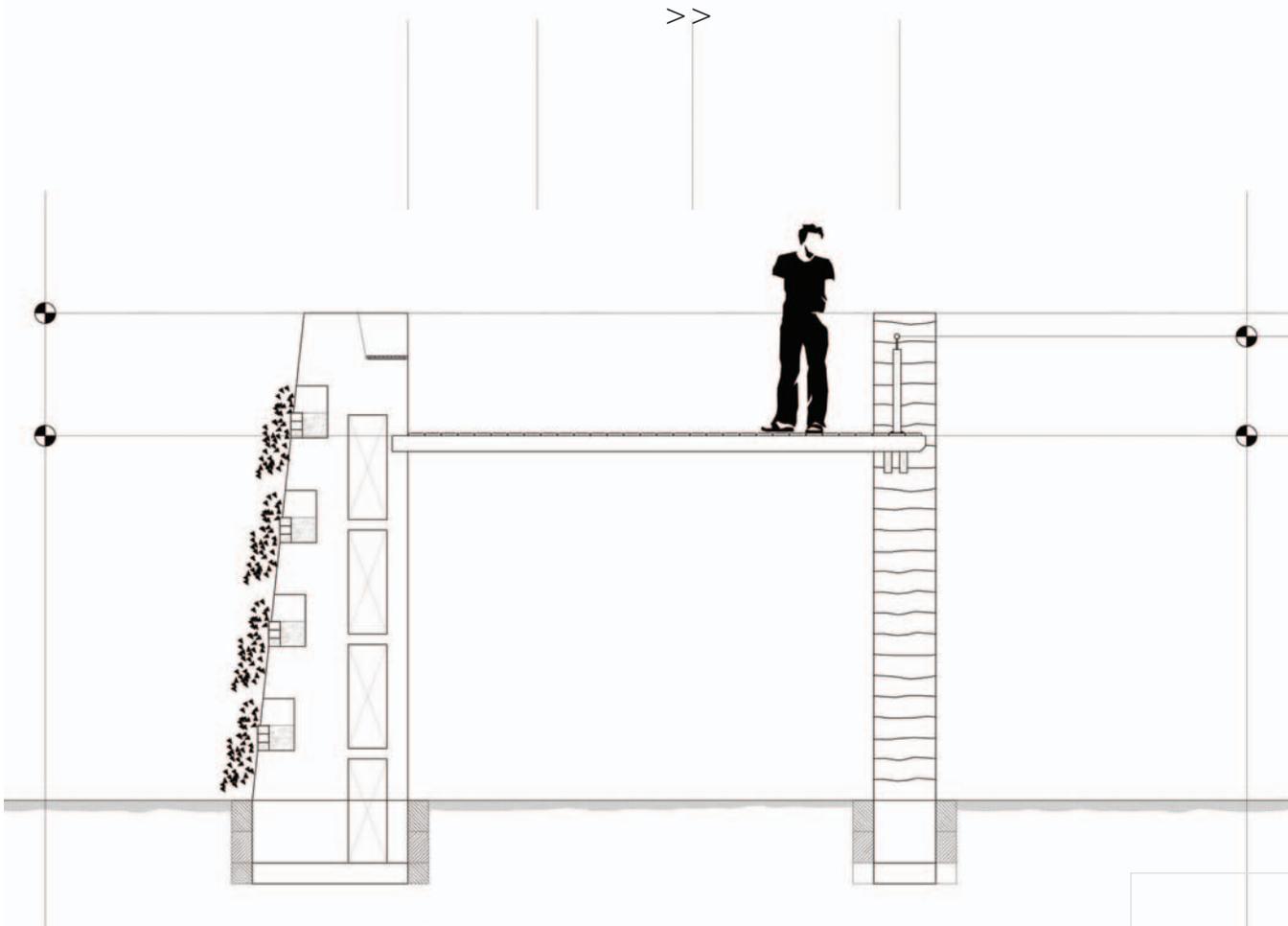


fig.8.7 section through walkway

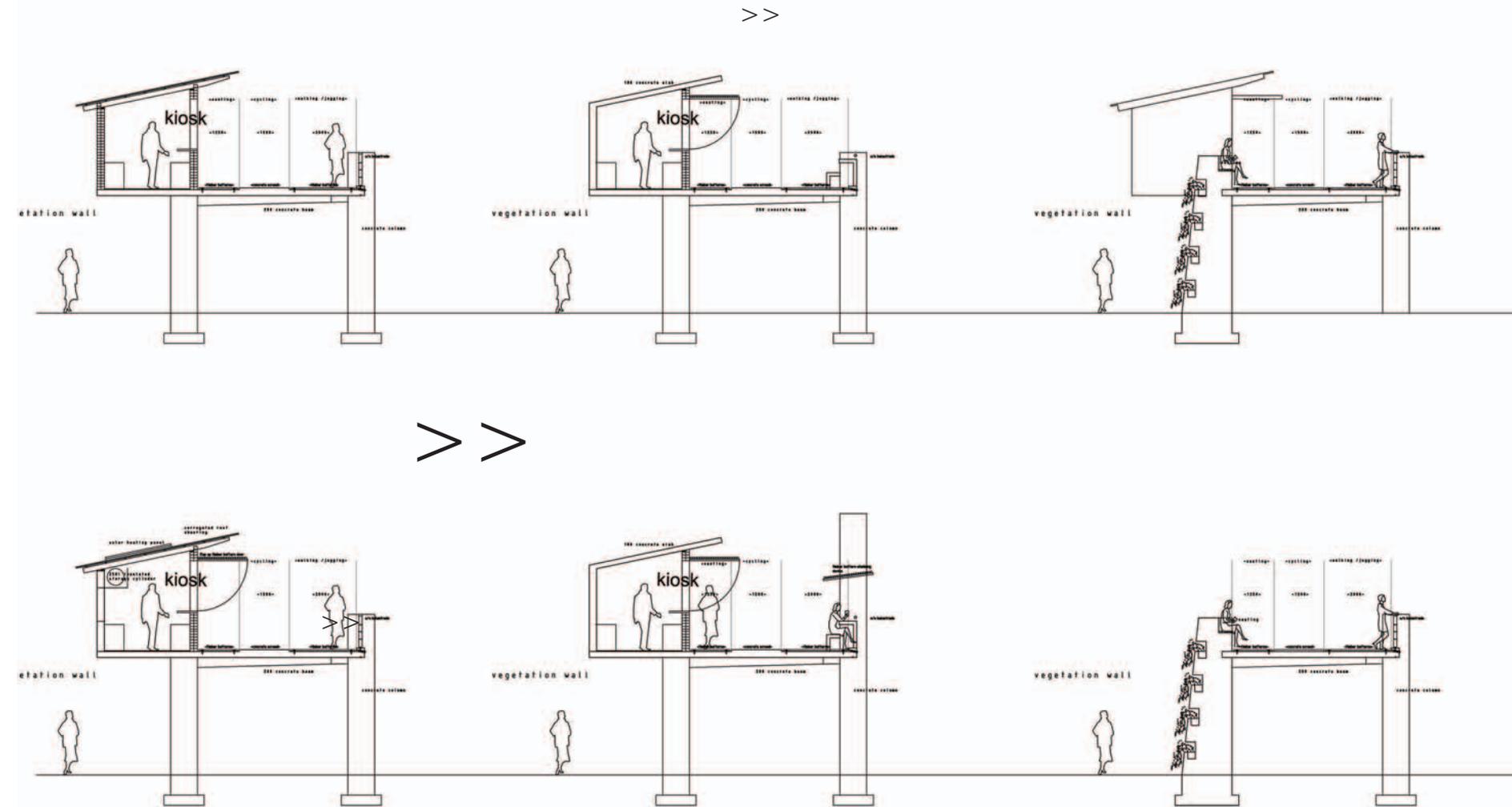


fig.8.8 design sections through walkway



fig.8.9

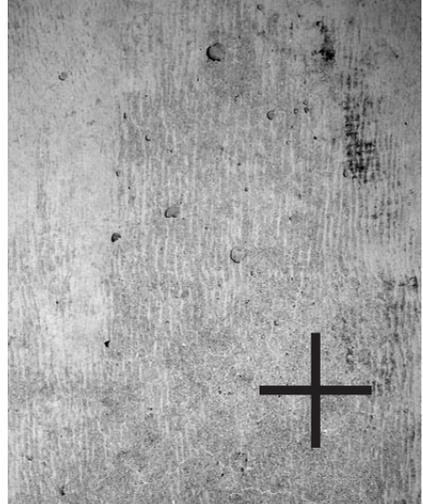


fig.8.10



fig.8.11

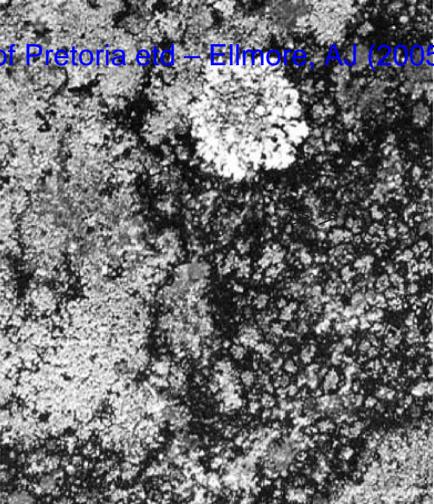


fig.8.12

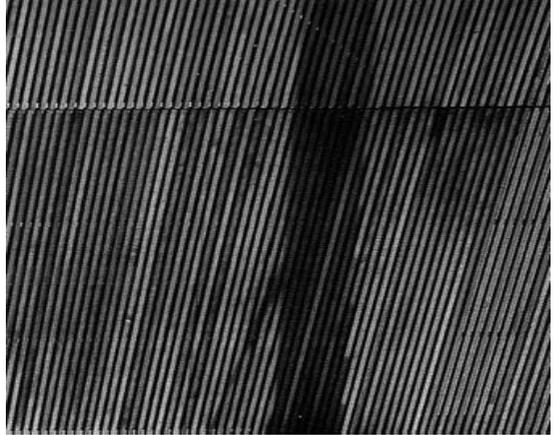


fig.8.13



fig.8.14



Timber

Timber is traditionally associated with marine environments due to its resistant properties once treated. The use of timber once again refers back to the landscape and surrounding environment of Durban and a link between man and the natural environment. Saligna, a softwood, which is medium red to dark red in colour, with a straight and even grain is to be predominately used.

Signa timber battens are used to create sun screens, as well as the pivot doors. These battens are supported using a stainless steel frame. The battens are to be treated accordingly.

Timber is used for the construction of the walkway. If due to future demands the construction can be dismantled and recycled as building material or burned as fuel.

Mosaic

Mosaics are used as internal decoration. Green mosaics are to be used to refer to the landscape. Artisans from the neighbouring BAT Centre are to be employed, providing a sense of identity to the building and involving the community to instill the idea that the building belongs to the Durban public.

Stainless Steel

Due to the harsh coastal environment, grade 320 stainless steel is to be used through-out the project. This decision is based on the long term benefits of this material in a marine environment.

Granite Crush

Durban Harbour exports vast quantities of granite blocks. Granite crush from the quarries can be transported with these granite blocks. This crush shall be used as an external floor covering. As mentioned the project will be viewed from above when aboard a cruise ship, therefore the overall landscape becomes important. The granite crush will complete the sculptural effect of the walkway.



Concrete

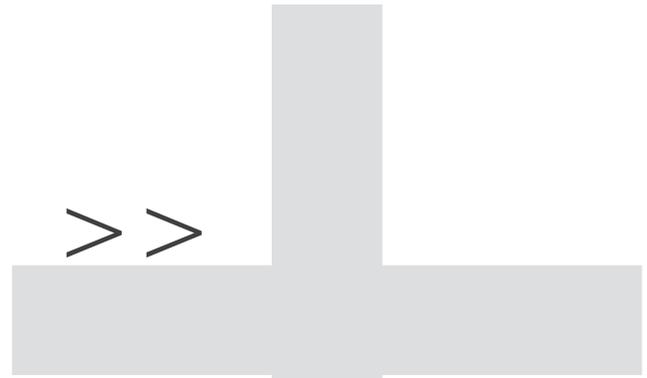
Concrete is the material used for both the structure and solid envelope construction. All concrete will be off-shutter, with finishes varying from smooth to rough. Steel shuttering will be used to create the smooth surface, while timber shuttering will be used to create the rough finish. The timber shuttering will be burnt with a blow torch first to enhance the timber grain into the concrete finish. The timber grain in the concrete will refer back to the natural landscape and environment of Durban.

The direct finished concrete floors, which are power floated and smoothed with a steel trowel before setting.

A white concrete mix will be used throughout the project, this will enforce the contrast between the existing harsh harbour environment and the new spine layer placed on it.

Glazing

Standard float glass is used in the passive ventilated zones. However the glazing in the air-conditioned zones will use an insulating glass, to retain the cool air within the space. All glazing to be installed according to Part N of the SABS 0400.



materials

Fire

The guidelines for fire management as dictated by The National Building Regulations [Part T of SABS 0400]

- Life safety and provision for escape.
- Minimize the spread of fire both within the structure itself as well as from building to building.
- Provision for structural stability within a prescribed time.
- Detection and prevention of the spread of smoke and heat.
- Provision for detection devices, control and extinguishing equipment.
- Limiting the destruction of property.

Escape routes will not exceed 15m in one direction. The total length of the escape route plus the emergency route to a safe point outside the building does not exceed 45m. Fire hose reels are supplied at intervals of 30m.

Fire detection equipment should form part of the 'building management system'. A sprinkler system will be installed in the ramp area, and smoke detectors in all rooms. The building is a smoke-free building therefore smokers will need to make use of external spaces.

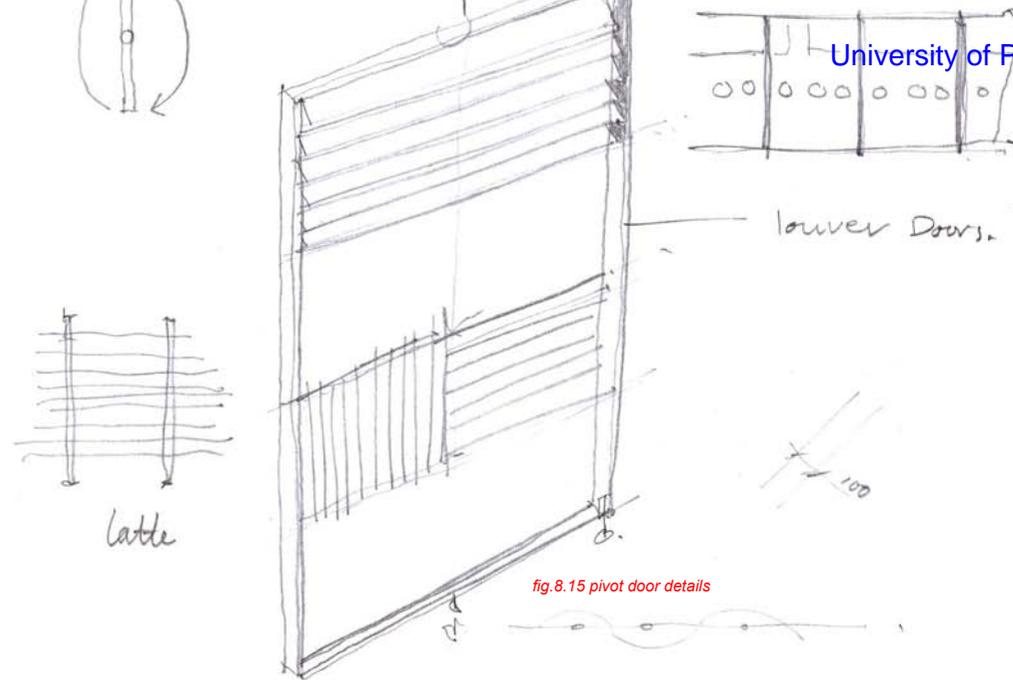


fig. 8.15 pivot door details

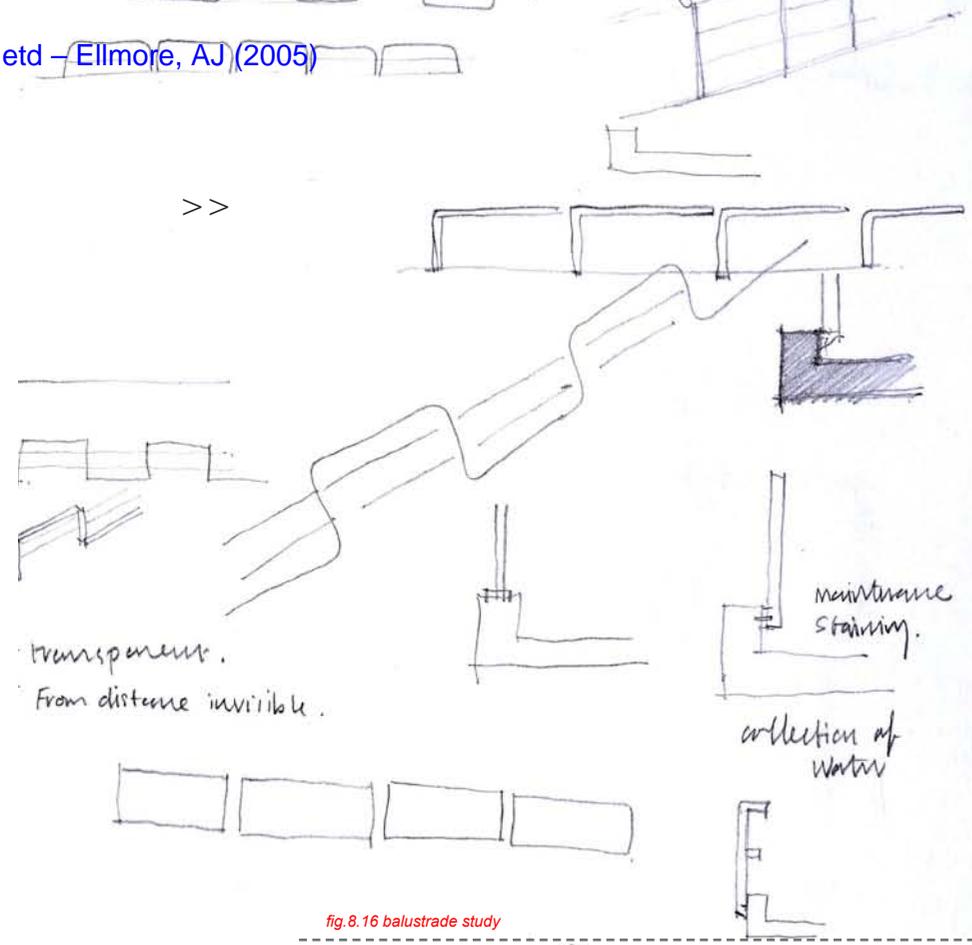
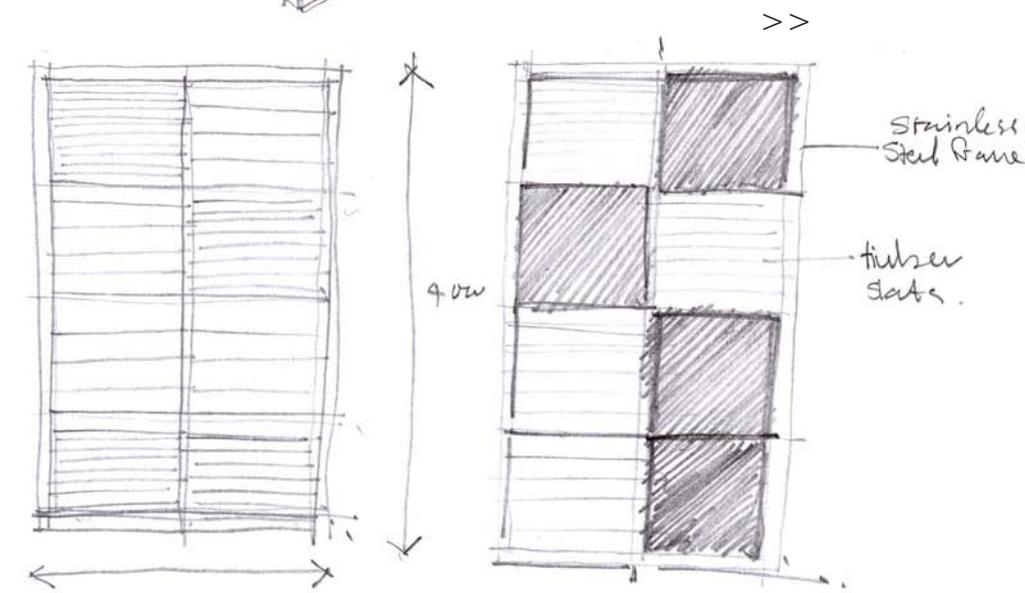
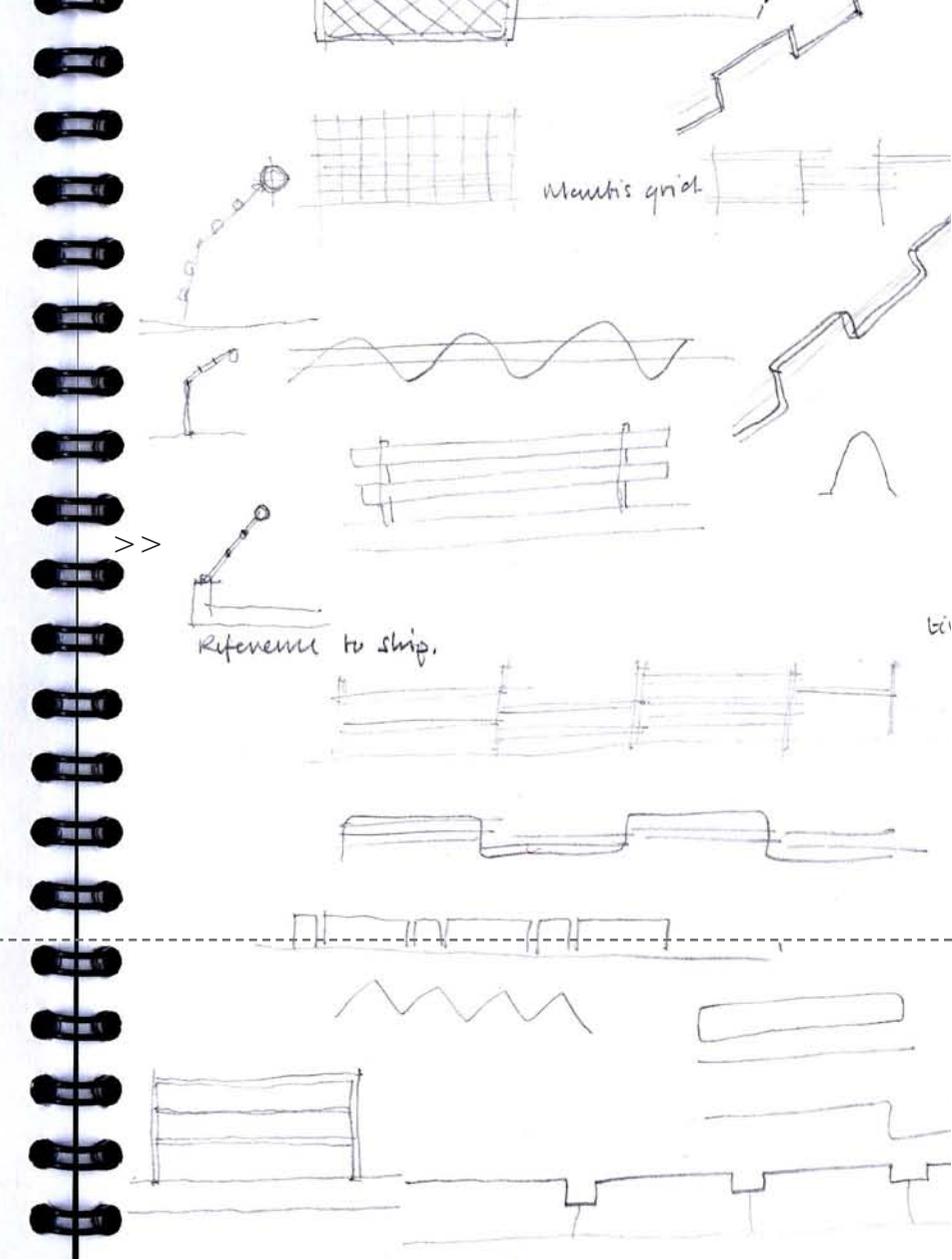


fig. 8.16 balustrade study



Lighting

The presence of the building and the pathway through the harbour at night can be enforced through lighting. Due to the darkness of the bay at night, the contrast of the illuminated walkway will be striking. Lighting will be provided at intervals along the pathway, providing security. Viewed from a cruise liner at night these lights will emphasise the link of the cruise terminal to the urban fabric of the city. These light poles at intervals should have their own solar power source, and should be designed in such a way as to provide shading during the day. These light structures could be read as trees within the landscape.

This provides a public space that can be used through-out the day and night.

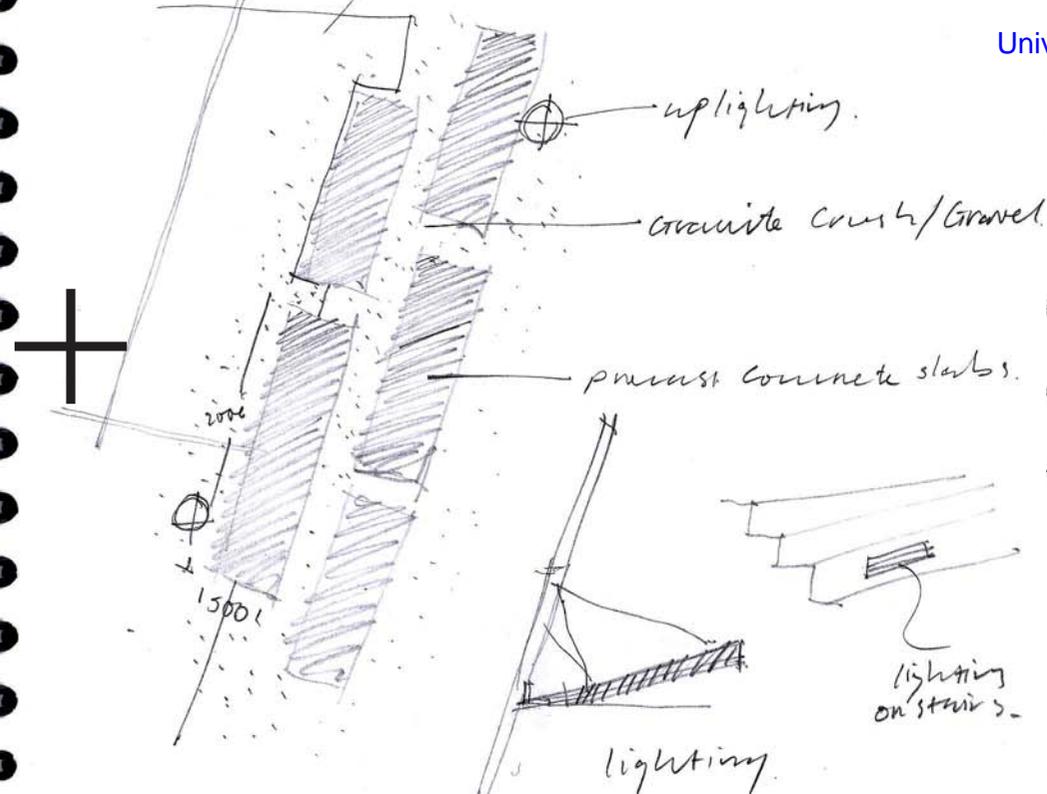


fig. 8.17 external floor surfaces and lighting

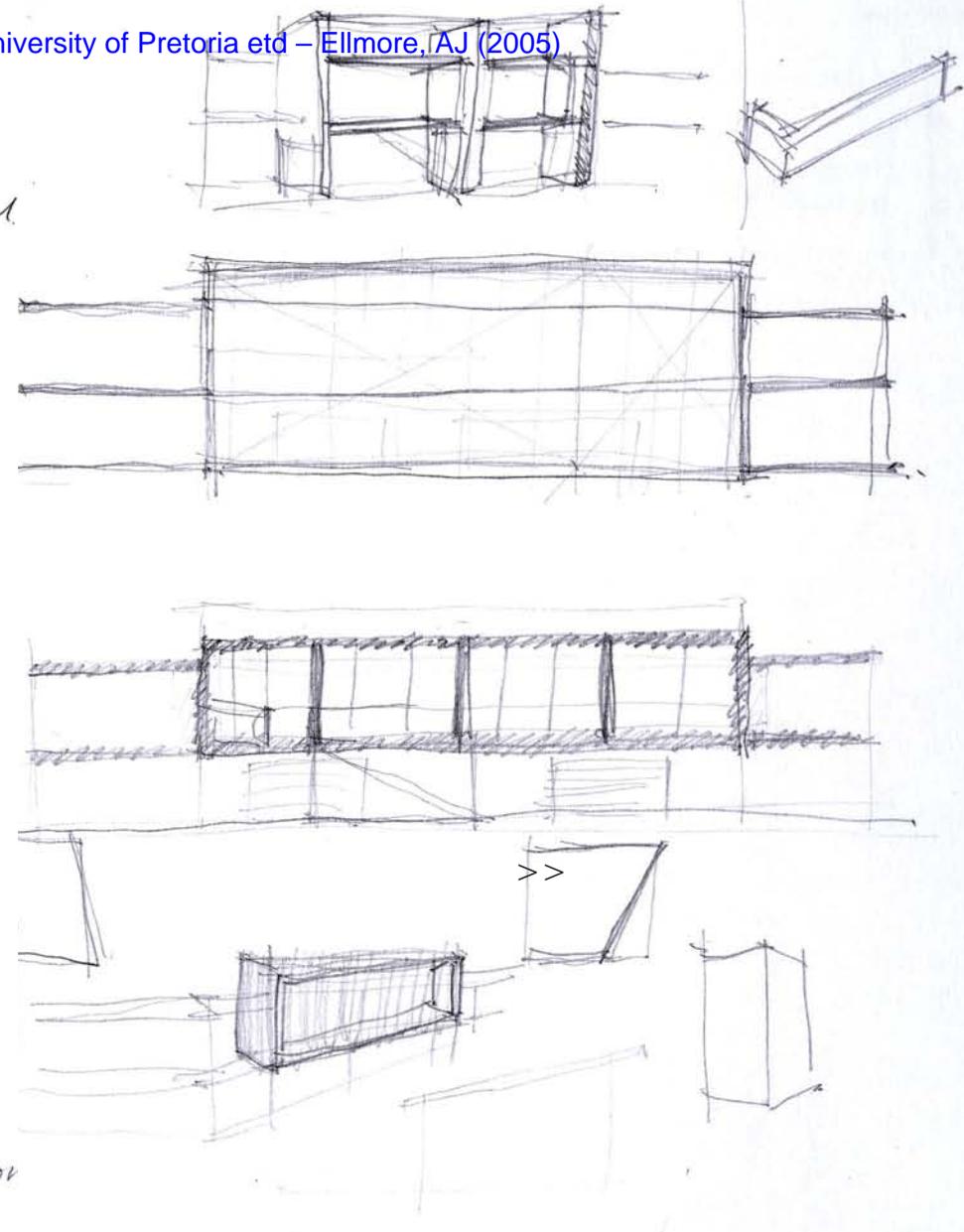
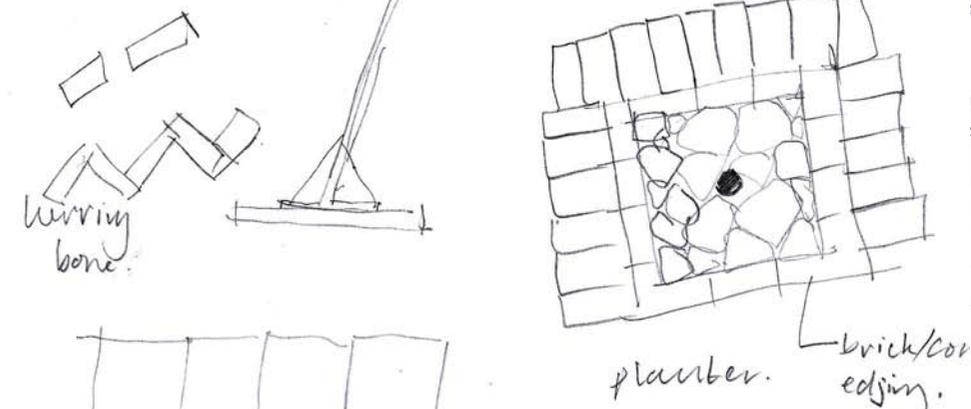
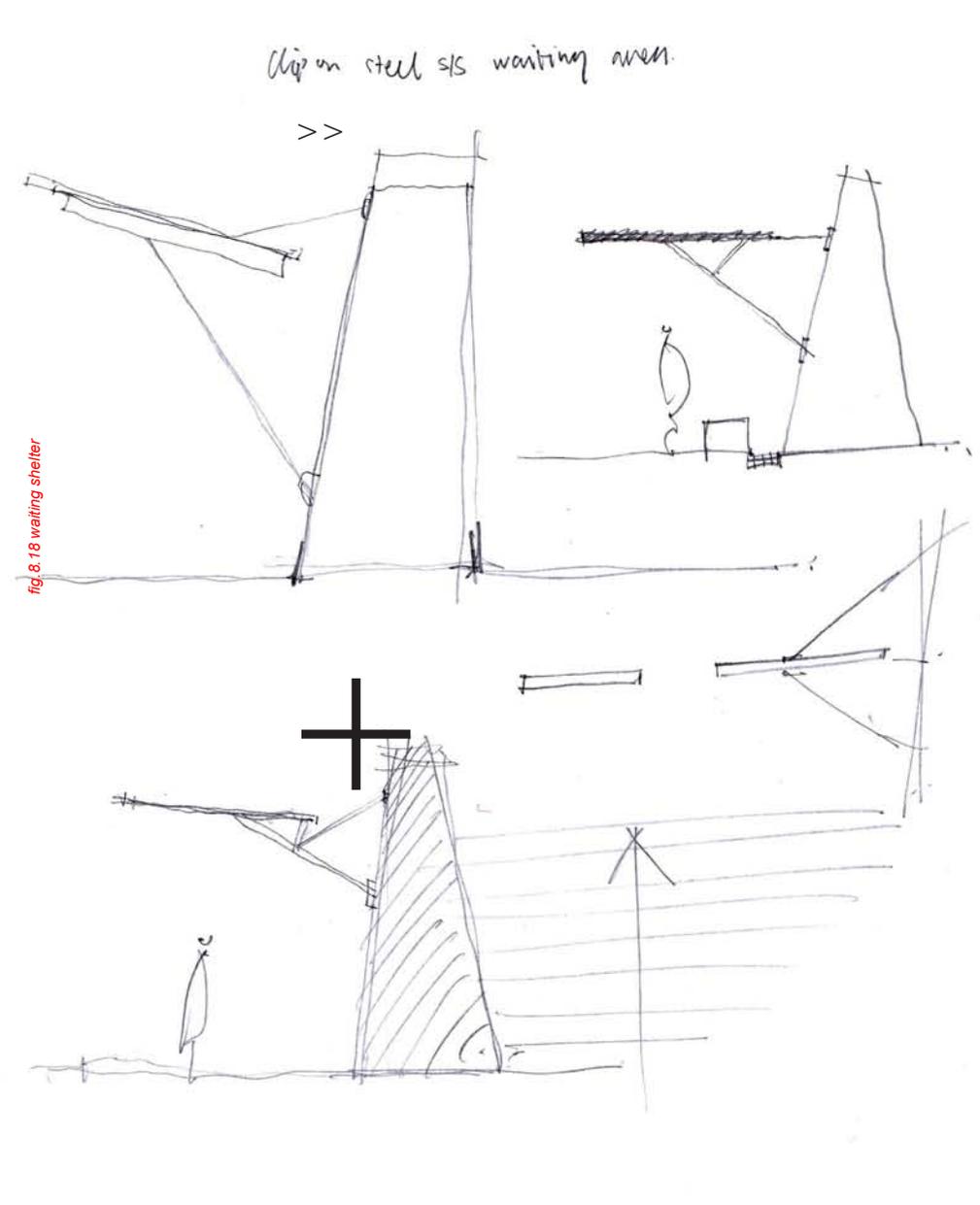


fig. 8.18 waiting shelter



Mangroves and wetland

Cato Creek, the river that created the Bay of Natal, is presently concreted over making it invisible to the general public. The design proposes the river be opened up and an artificial wetland and mangrove forest be built. Mangroves flourished in the area when early settlers arrived.

factors involved are the flooding depth, duration and frequency. A specialist would have to be involved to design an appropriate artificial system using water from Cato Creek after it has been through an artificial wetland.

Suggested mangroves are: Durban Bay mangrove; black mangrove; white mangrove and the red mangrove.

Mangroves provide a nursery area for aquatic organisms and a refuge for a variety of bird species. Other advantages include: stabilizing shorelines; reducing wave and wind energy; supporting coastal fisheries; medicinal products and eco-tourism. People making use of the walkway would be provided with information concerning the mangroves making people aware of their surroundings.

Although limited information is available concerning the rehabilitation of mangrove forests, the basic requirements have been identified as tidal change. The

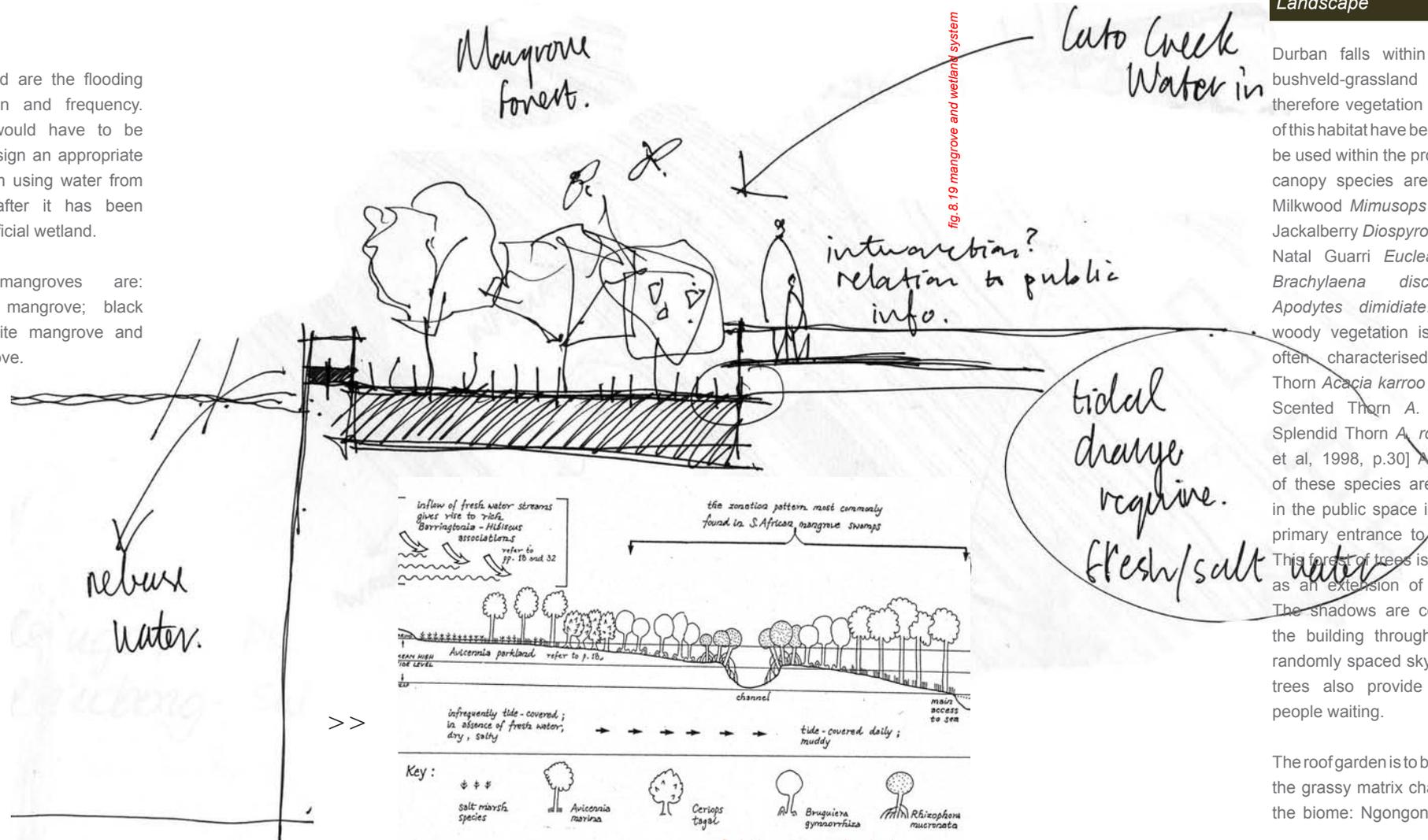
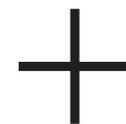


fig. 8.20 mangrove and wetland system

Landscape

Durban falls within the coastal bushveld-grassland biome, therefore vegetation characteristic of this habitat have been selected to be used within the project. "Typical canopy species are: Coast Red Milkwood *Mimusops caffra*, Dune Jackalberry *Diospyros rotundifolia*, Natal Guarri *Euclea natalensis*, *Brachylaena discolor* and *Apodytes dimidiata*. Secondary woody vegetation is patchy and often characterised by Sweet Thorn *Acacia karroo* together with Scented Thorn *A. nilotica* and Splendid Thorn *A. robusta*." [Low et al, 1998, p.30] A combination of these species are to be used in the public space in front of the primary entrance to the building. This forest of trees is to be viewed as an extension of the building. The shadows are continued into the building through the use of randomly spaced skylights. These trees also provide shading for people waiting.

The roof garden is to be planted with the grassy matrix characteristic of the biome: Ngongoni Bristlegrass

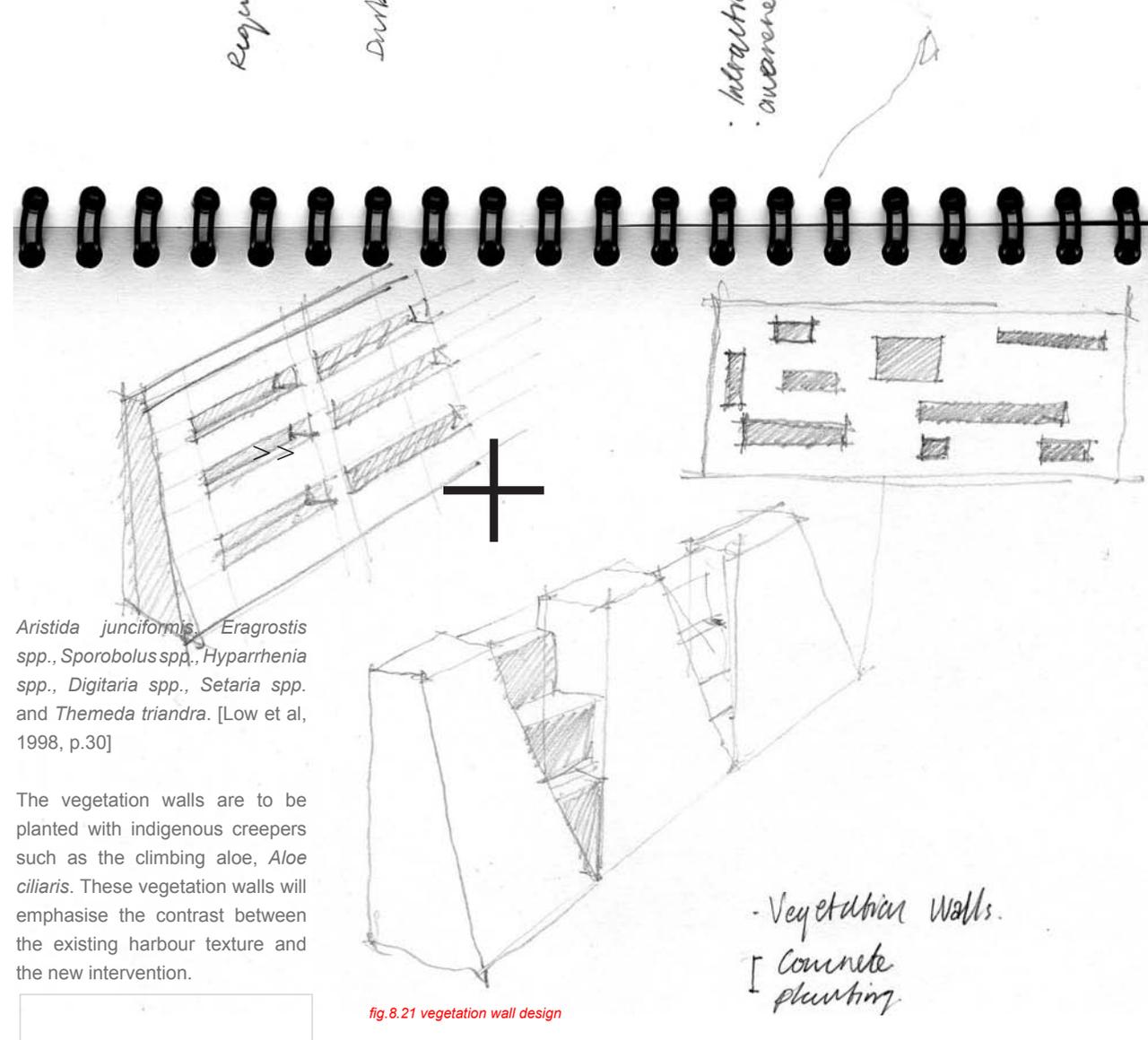


fig. 8.21 vegetation wall design

Sunscreens

The sunscreens on the south western façade have been designed to shade the glazing preventing solar heat gain, while still allowing a view of the harbour from the restaurant. These screens are constructed of a stainless steel structure supporting timber battens. It is important to note that when a cruise liner is in port the building will be shaded completely.

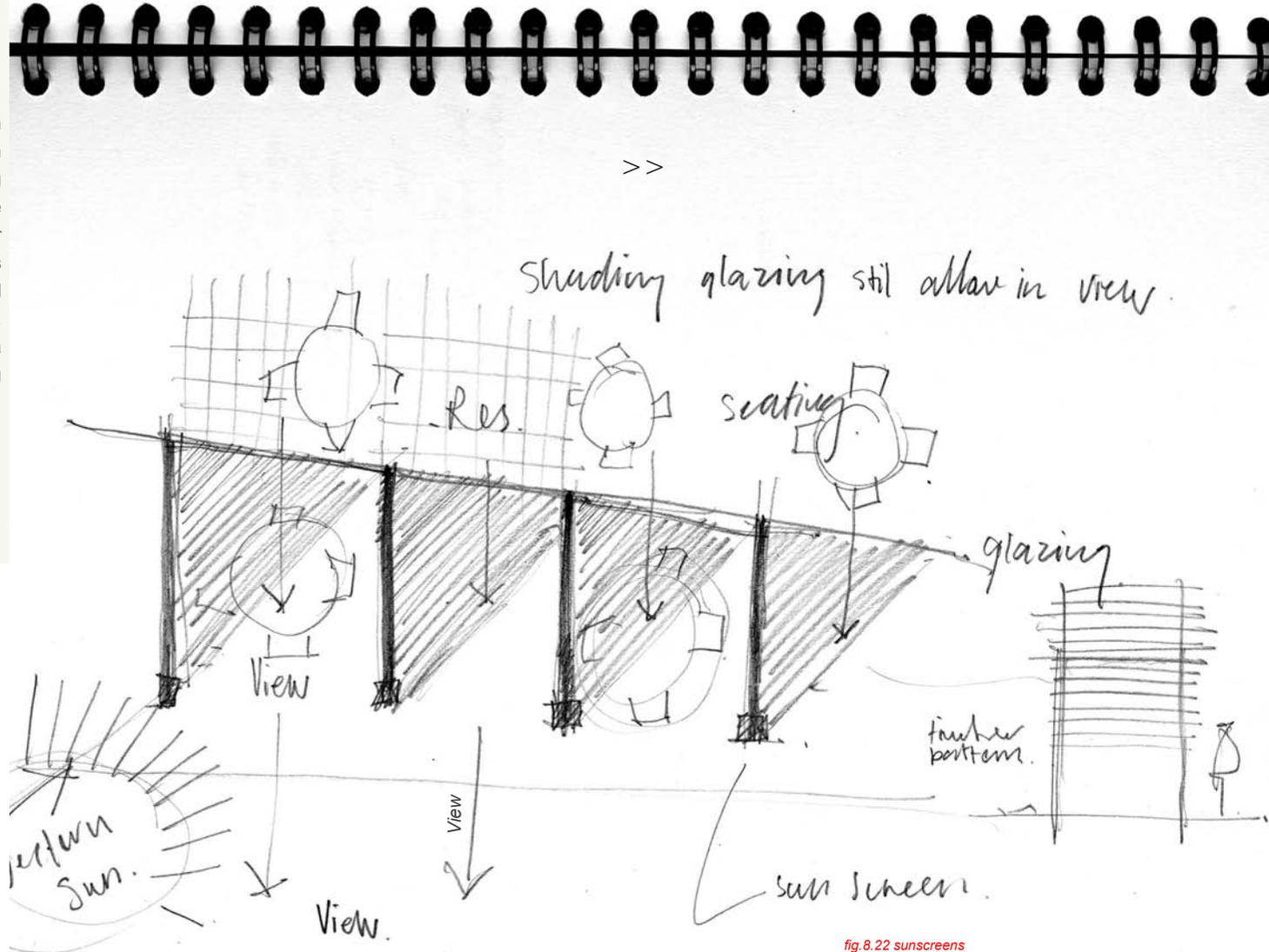


fig. 8.22 sunscreens

[+]

^{9.0} Technical Drawings

Addendum A



suggested connection points of walkway to the Point Development [interview wood: 29 July 2005]

Addendum B

CRUISE LINER SCHEDULE 2004 - 2005									
AGENT	MSC	BARWIL	GULF SHIPPING	KING & SONS	KING & SONS	KING & SONS	ISS-VOIGT	JOHN T RENNIE	
TEL. NO.	360-7911	304-8666	305-2156	302-4767	302-4767	302-4767	207-1451	328-0401	
CRUISE LINER	RHAPSODY	THE WORLD	MINERVA II	PACIFIC PRINCESS	ROYAL PRINCESS	DELPHIN RENAISSANCE	ROYAL STAR	ASTOR	
MONTH	DATE	DAY	TIME						
OCT '04	23	SAT				08h00-18h00			
NOV '04	26	FRI	08h00-16h00						
	28	SUN	08h00-13h00						
DEC '04	01	WED	07h00-16h00						
	03	FRI							
	06	MON							
	09	THU	07h00-16h00						
	10	FRI							
	11	SAT	08h00-13h00						
	13	MON				07h00-18h00			
	14	TUE	08h00-13h00				08h00-18h00		
	15	SAT	07h00-13h00	08h00-					
	19	SUN		-23h59					
	20	MON							
	21	TUE	07h00-15h00						
	23	THU				07h00-18h00			
	27	MON	08h00-12h00						
JAN '05	03	MON							
	05	WED				06h00-18h00			
	06	THU	09h00-16h00						
	08	SAT		12h00-					
	09	SUN		-18h00					
	10	MON	07h00-15h00						
	14	FRI	07h00-13h00						
	17	MON	07h00-16h00					08h00-23h00	
	21	FRI	07h00-13h00						
	24	MON	07h00-15h00						
	28	FRI	07h00-16h00						
	30	SUN	08h00-13h00				07h00-16h00		

AGENT	MSC	JOHN T RENNIE	ISS-VOIGT	ISS-VOIGT	KING & SONS	KING & SONS	BARWIL		
TEL. NO.	360-7911	328-0401	207-1451	207-1451	302-7467	302-7467	304-8666		
CRUISE LINER	RHAPSODY	PRINSENDAM	ALBATROS	ROYAL STAR	MAXIM GORKIY	SAGE ROSE	SILVER WIND		
MONTH	DATE	DAY	TIME						
FEB '05	05	SAT	07h00-16h00						
	07	MON	08h00-16h00		07h00-				
	08	TUE							
	09	WED			-13h00				
	11	FRI	07h00-13h00						
	12	SAT				07h00-16h00			
	13	SUN							
	14	MON	07h00-15h00						
	18	FRI	07h00-13h00						
	21	MON	07h00-16h00						
	28	MON	07h00-15h00						
MAR '05	04	FRI	07h00-13h00						
	06	SUN					08h00-23h00		
	07	MON	07h00-16h00						
	11	FRI	07h00-13h00						
	14	MON	07h00-15h00						
	18	FRI	07h00-13h00						
	20	SUN					08h00-23h00		
	21	MON	07h00-16h00						
	25	FRI	07h00-13h00						
	28	MON	07h00-16h00						
APR '05	01	FRI	07h00-16h00						
	02	SAT				07h00-22h00			
	03	SUN	08h00-16h00				06h00-23h59		
	11	THU		06h00-17h00					

Illustrations

Fig. 1.1 Durban CBD - author

Fig. 2.1 Battery bay. Southwood, 2005. *Elle Decoration*, South Africa Autumn 2005, Urban Issue, No. 36
 Fig. 2.2 model of Durban - author

Fig. 3.1 The bay, Bluff and Point from Berea, by West, 1859. Kearney, 2002.
 Fig. 3.2 The Natal one penny stamp. Kearney, 2002.
 Fig. 3.3 Palm. Verster, 1985.
 Fig. 3.4 global location - author
 Fig. 3.5 BAT centre - author
 Fig. 3.6 Durban city hall - author
 Fig. 3.7 ICC - author
 Fig. 3.8 ICC - author
 Fig. 3.9 Memorial - author
 Fig. 3.10 Nedbank building designed by Norman Eaton - author
 Fig. 3.11 Vasco da Gama clock - author
 Fig. 3.12 sugar terminal buildings - author
 Fig. 3.13 yacht - author
 Fig. 3.14 eThekweni municipal area - author
 Fig. 3.15 Art Deco - City Architects, Architecture & Buildings Department, eThekweni Municipality, 2004
 Fig. 3.16 aerial photograph of Durban CBD - eThekweni Municipality
 Fig. 3.17 figure ground study - author
 Fig. 3.18 point development under construction - National Ports' Authority
 Fig. 3.19 BAT centre and city edge - National Ports' Authority
 Fig. 3.20 harbour entrance – National Ports' Authority
 Fig. 3.21 T-jetty – National Ports Authority
 Fig. 3.22 aerial photograph of site and surrounding landscape – eThekweni Municipality
 Fig. 3.23 Ceramic tiles, student project. Franzen, 2004.
 Fig. 3.24 sun angles for Durban. Holm, 1996.
 Fig. 3.25 wind rose for Durban. Holm, 1996.
 Fig. 3.26 MSC Rhapsody – passenger accommodation plan supplement

Fig. 4.1 Foreign Office Architects: Yokohama International Port Terminal. Brayer et al, 2001.
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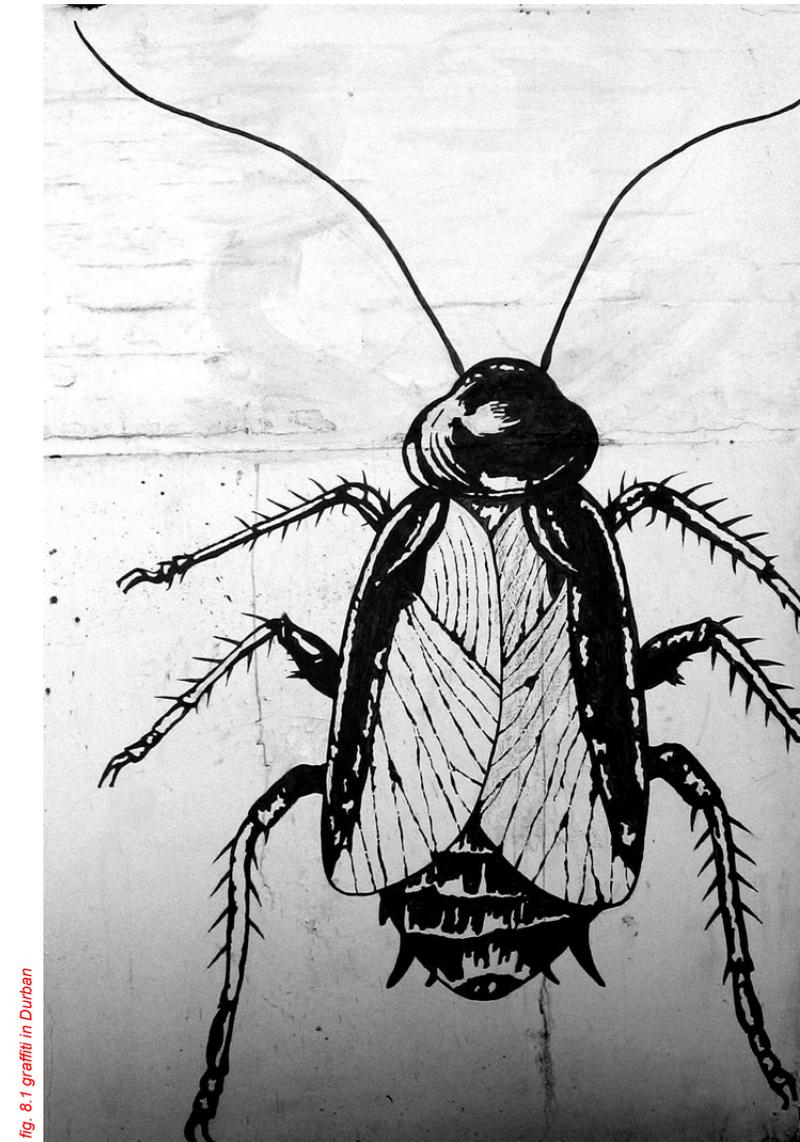


fig. 8.1 graffiti in Durban

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