The port, a point of entry:

The design of a new Cruise Liner Terminal at the Point, for Durban.

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DECLARATION

Submitted in fulfilment / partial fulfilment of the requirements for the degree of MASTERS , in the Graduate Programme in ARCHITECTURE , University of KwaZulu-Natal, Durban, South Africa.

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. It is being submitted for the degree of MASTER OF ARCHITECTURE in the Faculty of Humanities, Development and Social Science, University of KwaZulu-Natal, Durban, South Africa. None of the present work has been submitted previously for any degree or examination in any other University.

RICARDO BEXIGA
Student name

08/09/2008
Date

I'd like to thank my parents, for instilling the importance of education in their children and sacrificing so much for us to achieve our goals. A special thank you to my brother, my sisters, and the rest of my family for their loving support and faith in me. I thank the Lord who has blessed me with a great family who are always there for me.

Para minha familia.

"We put thirty spokes together and call it a wheel.
But it is on the space where there is nothing that
the utility of the wheel depends.
We turn clay to make a vessel.
But it is on the space where there is nothing
that the utility of the vessel depends.
We pierce doors and windows to make a house;
and it is on these spaces where there is
nothing that the utility of the house depends.
Therefore, just as we take advantage of what is,
we should recognise the utility of what is not."

Lao Tse

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ABSTRACT

This research examines the complex factors that influence the design of a new cruise liner terminal for Durban. Secondary and primary data collection methods will be used in the research. Secondary data collection forms the majority of the information gathered. This method will focus on precedent and case studies from which conclusions will be drawn and a design brief for the cruise terminal derived.

Cruise liners typically spend periods of less than a week in port, during which time passengers will visit local tourist attractions. Durban's cruise season lasts from mid-November till mid-April. The local cruise industry has seen a steady increase in passenger numbers over the years. This has seen the MSC Melody cruise ship being procured to meet the demands of the industry. As a consequence of this increase the current cruise liner terminal, the N-Shed, has been placed under increasing pressure to provide a world class facility and service experience, expectations which it is ill equipped to deliver.

Through this study key aspects, specific to the cruise liner terminal design, are investigated. These include passenger movement optimisation, response to local conditions, form development, waterfront regeneration and the concept of the terminal as a gateway to the city of Durban. In developing the architecture of the cruise terminal, the understanding of these factors is vital if the designer is to make a meaningful contribution to society though his building. With the cruise liner terminal being a unique building typology, in the context of Durban, an opportunity arises to reconnect the city with its harbour edge.

I would like to acknowledge the following for their assistance in carrying out this research document:

- My supervisors, Alethea Duncan Brown, Professor Walter Peters, Professor Derek Wang and Kevin Bingham for their constant guidance.
- Dave Stromberg from the N.P.A. (National Ports Authority) for his insight on the subject.
- The architectural library staff who are always there to help.
- To my colleagues, especially "the office" thanks for the support and motivation throughout the years.

Note: All figures are by Author unless otherwise acknowledged.

C.B.D. - Central Business District.
M.S.C. - Mediterranean Shipping Company.
N.P.A. - National Ports Authority.
P & O. - Peninsular and Oriental
Q.E.2. - Queen Elizabeth II.

This study will investigate the key components that influence the design of a new cruise liner terminal for Durban. The research will focus on the port as one of Durban's key points of entry and will examine the many roles and influences the terminal will have on the city. Architecturally, the research will seek to explore the varying aspects that make up a cruise liner terminal and how to properly implement them in a meaningful way. A comparative analysis will be undertaken through precedent and case studies to establish an understanding of cruise liner terminals.

The bay is Africa's busiest port and has influenced the city's development greatly since its inception. Throughout its history Durban harbour has always been a largely commercial port, handling mainly container ships and other cargo vessels. Thus development at the harbour has always been aimed at improving aspects such as container capacity rather than other port functionality. As a consequence the harbour has become a highly industrialised zone disconnecting it from the city and creating an environment which has been in decay.

Thirteen years after South Africa's first democratic elections, the economy has been stabilised and has been experiencing a prolonged growth phase which has lifted the profile of the country significantly in the international community. Of particular importance to Durban's economy is the tourism industry. It is in this sector that the local cruise industry can play an important role in strengthening Durban's already flourishing tourist market and simultaneously add vibrancy to the port area through the regeneration such a new facility would induce.

Figure 1_View of the N-Shed terminal building with the Melody cruise ship berthed along side it.

At present, Durban's cruise terminal is housed in the harbour at the N-Shed facility. (See figure 1). This terminal has been found to be inefficient and ineffective in serving as both a cruise terminal and as an important point of entry to the city of Durban. This indicates a need for a facility that will perform as a cruise terminal and at the same time enhance the interface between the harbour and the city.

1.1 Research problem.

Cruise ships, in the early 1900s, were the main mode of transportation, transporting passengers between destinations separated by vast distances. The cruise liner industry has, over the years, transformed from being the main mode of transport to a tourist based industry. This was due to the cruise ship being the only way to travel transcontinentally. In Durban it was the Union Castle mail-boats that transported passengers and cargo in the 1960s. They sailed from Southampton to Durban and arrived every Tuesday morning and departed on the Thursday evening. (Richards. 1963: 194). With the development of better aviation technology during and after World War II, civil aviation began to take over the role as the main mode of transcontinental travel. The convenience and speed of air transport quickly led to the decline of the cruise ship industry with a steady decline in passenger numbers. It wasn't until the latter half of the 20th century that the cruise ship industry began to re-establish itself within a different realm; that of the luxury cruise liner not as a means of transport but as a form of luxurious holiday. This has repositioned the cruise liner within the tourism and recreation sector, rather than its' original intended use for transportation.

A report was carried out, in 2003, by the KwaZulu-Natal Tourism Authority on developing the cruise liner tourism industry in KwaZulu-Natal. In the report, the tourism authority "identified the need to investigate and develop a practical strategy for KwaZulu-Natal to engage the cruise tourism industry more effectively." (Haley Sharpe Southern Africa. 2003: 1). What is interesting to note is that approximately 85% of cruise passengers are 'destination sampling' with intentions of visiting our shores for longer periods. (Haley Sharpe Southern Africa. 2003: 1). Therefore, the cruise liner terminal becomes an important interface for marketing the city to the passengers.

From the report, the following key factors were identified as requiring attention:

- Direct economic gain from cruise tourism.
- Indirect economic gain from cruise tourism.
- Developing KwaZulu-Natal for destination cruises.

(Haley Sharpe Southern Africa. 2003: 21)

Direct economic gain would be generated from cruise passengers on-shore and the provisioning of cruise ships, while indirect gain would come from the marketing of KwaZulu-Natal as a future destination. On average, passengers and crew, from cruise ships, spend between R1 million and R5 million per day per cruise ship port-of-call. (Haley Sharpe Southern Africa. 2003: 2).

The current cruise liner terminal facility is housed within the N-Shed at the harbour. This structure started out as a storage warehouse for cargo and was subsequently adapted to serve as a cruise liner terminal. Therefore the N-Shed Passenger Terminal is a make shift building and was not purposely designed for use as a cruise liner terminal. The N-Shed terminal has undergone some refurbishments in an attempt to better adapt the building for its specific use. These alterations to the building have been superficial and have not been able to make the terminal function better because of its inherent design flaws. The handling of passenger movement as well as public interaction has not been dealt with convincingly. Therefore the existing facilities have not taken into consideration the changes that occurred in the cruise liner industry. This change was the shift from a mainly transport based industry to the present day luxury liner typology. The design of a purpose built cruise liner terminal would facilitate the development of the three factors, mentioned above. Therefore, the imperative for the research lies in the need to design a purpose built cruise liner terminal that will deliver on the expectations of a growing cruise liner related tourism industry.

The building of a new cruise liner terminal at the Point precinct will tie in with the commercial development already underway at the Point. It will facilitate further opportunities to introduce commercial, shopping and entertainment facilities that would form part of the new cruise liner terminal, complementing the development at the Point. By doing this a stronger link to the Durban CBD will be created helping to market the city as a future destination.

In respect of the tourism industry, cruise liners bring with them large numbers of tourists to Durban's shores. The smaller cruise liners carry between 300-500 passengers while the larger liners can carry up to 2000 passengers, thus having a substantial impact on the local tourism industry. With such large numbers of tourists entering Durban through the cruise liner industry, it is vital that we capture this key market group. By developing the terminal as a key gateway to the city, one can better promote Durban as an overall tourist destination.

Durban's cruise season begins in mid November and lasts till mid April. During this period the terminal will be used extensively as cruise ships will be in port, on average, every 3-5 days. What this does present to the brief of the new cruise liner terminal is the issue of sustainability of the facility during the periods where it is not used as a passenger terminal. This will have to be achieved through the incorporation of other commercial amenities within the design to make the terminal functionally sustainable for the whole year rather than just a part of it.

1.2 Key questions.

The key questions are the main issues that need to be dealt with in the design of the cruise liner terminal. These respond to aspects of the design which deal with passenger movement, accommodation requirements as well as technical requirements.

By highlighting these key questions and understanding there requirements the design of the cruise liner terminal can respond more appropriately.

- How can such a building create linkages to other parts of the city?
- What is the accommodation to be included in the proposed new Cruise Liner terminal at the Point, for Durban?
- What are the specific performance/technological requirements needed in such a building in order for it to perform as is needed?
- How can the new cruise liner terminal respond to the civic requirements of the city?
- What is the most appropriate way to handle the passenger process from ship to shore and vice versa?
- Is there other transportation modes that the terminal would need to connect with?
- How does the design deal with the issue of sustainability of the cruise liner terminal?

1.3 Research question/Working hypothesis:

How does architecture encountered at a point of transition, in this case being water to land, become unique in facilitating the requirements needed of such a building typology?

1.4 Aims and objectives of research.

The main design objective is to provide a passenger terminal that will serve as a gateway, not only to the city of Durban but for the rest of SouthAfrica. The terminal should also serve the greater community at large. Reclaiming the harbour's waterfront edge will also be important in the reinvigoration of this part of the city while creating a unique place for people to enjoy. The terminal should respond, contextually, to its harbour surroundings and link with the greater urban framework of the Point area to produce a more coherent building.

Chapter 2: Research methodology.

2.1 Introduction.

The methodology employed in the research process was aimed at facilitating and creating a design programme. By gathering research information that relates directly to cruise liner terminals, the waterfront edge and tourism a fuller understanding of the underlying influences could be discussed. Understanding and analysing this information allows one to make informed design decisions. This section, of the research methodology, therefore presents the processes of information gathering, the study area and setting and the means of data collection techniques and instruments.

In terms of the research that will be carried out for this dissertation the methodology shall comprise of both primary and secondary research. With the limited time frame for the study, qualitative research was used as the method of collecting primary data. Primary research included information gathered through interviews and case studies. Secondary research involved the collection of data through a literature survey and the analysis of the information gathered.

Therefore, the approach of this research is largely qualitative as apposed to quantitative. The data collected, through the primary and secondary research, shall serve to inform a design programme from which the brief shall developed for the design of the cruise liner terminal. This will be to develop an accommodation schedule for the design of a new cruise liner terminal for Durban. From the research gathered and documented a better understanding of the requirements of such a building shall emerge. It is believed that this will positively inform the design programme and produce a well integrated building. One that responds to all the requirements needed to function effectively and influence the greater environment positively.

Figure 2.1_View of QE2 entering Durban harbour showing the Point precinct and Durban CBD in the background. *(http://www.encounter.co.za/gallery/albums/userpics/10001/normal_QE 2_Entering_Durban.jpg, accessed 19-02-2007)*

2.2 Study area and setting.

The Durban harbour falls on a major shipping route to the Far East as well as the West and Europe, it has developed as a port city connecting it to local and international trade and tourist industries (Nunes. 2003: 44). Tourism has played a key role in the economy of Durban but, the importance of expanding the more public interface of the harbour with the city has been neglected. This has allowed the harbour to be a mostly industrialised zone, which is required in terms of the activities that typically occur there. However, there is a lost opportunity in not developing the harbour waterfront edge for public use. Wilson's Wharf and the Yacht Club precinct are seen as the start of the development along the harbour's water edge and the linking of the Durban CBD to the harbour. (See figure 2.2). The development of the public interface along the harbour's water edge could extend to the Point precinct, thus taking advantage of the waterfront edge which has been unutilised. The building of a new cruise liner terminal at the Point precinct will tie in with the commercial development already underway at the Point. (See figure 2.3). Therefore allowing the opportunity to introduce commercial as well as entertainment facilities that would form part of the new cruise liner terminal and exploit the development at the Point. By doing this a stronger link to the Durban CBD would be created.

For the purposes of this study the area that will be studied will be the Durban harbour. Specifically, the Point Development precinct will be the main focus area of the study. The current activities being developed at the Point precinct present the opportunity to strengthen the linkage between the harbour and city.

Figure 2.2_Aerial view of Durban harbour.
(Http://earth.google.com, accessed 5-03-2007)

Figure 2.3_Aerial view of Point precinct.
(Http://earth.google.com, accessed 5-03-2007)

2.3 Research design.

The structure of the research design is broken up into three phases. These are primary research, secondary research and the analysis of the data collected from this research. A qualitative methodology is used in acquiring and analysing the information. The qualitative approach was deemed most affective as it produces information that is not derived from statistical information. This form of methodology uses the interpretation of the information gathered to draw conclusions. Therefore it is noted, by the researcher, that this method of research does not provide absolute answers to a specific problem. However, it enables a better understanding of the conditions influencing the problem.

A review of the relevant literature was conducted firstly in order to familiarise oneself with the subject matter influencing cruise liner terminals. Upon reviewing the relevant literature, interviews with professionals were conducted. These professionals consisted of persons with first hand knowledge of passenger terminals and development within the harbour. These interviews helped in obtaining crucial, present day, information in the context of Durban. Also, the data obtained in the interviews helped inform the final design programme.

2.4 Primary research.

The primary research is aimed at obtaining qualitative information, thus interviews and case studies were used to gather this data. The interviews were semi-structured, tending more towards informal discussions. These interviews provide information that will form the foundation to create a brief for the terminal as well as an accommodation schedule. Any technical and miscellaneous information relevant to the research will also be gathered.

These informal interviews were carried out with persons responsible for the current developments in the port. Persons from the National Ports Authority were contacted in terms of establishing the vision for the new terminal. Protekon provides an in-house organisation for Transnet, specialising in railway, port and inter-modal infrastructure development in South Africa. These interviews were setup to gain relevant and up to date information regarding the port in particular. Dave Stromberg, the director of Port Planning for Transnet Projects at Durban Harbour, was also interviewed. He has worked on the current passenger terminal in use for Durban as well as other port developments in South Africa and abroad.

These interviews were structured to obtain insight on criteria relating to cruise liner terminals such as:

- Past and present plans for the development of a cruise liner terminal for Durban.
- The passenger's circulation through the terminal.
- Schedule of accommodation needed for a cruise liner terminal.
- The integration of the terminal with other port operations and facilities if required.

Wayne Tifflin, of KwaZulu-Natal Tourism, was interviewed to obtain statistical information on the cruise liner industry in Durban. These figures were obtained in order to develop an understanding of the number of people going on cruises and the different ways in which they contribute to the tourism economy of Durban. More so, these figures will help to gauge the overall size and facilities needed for the development of the terminal.

The case studies for the primary research of the dissertation involved the evaluation of the N-Shed passenger terminal and the Ocean terminal, Durban.

A number of site visits to these buildings were organised to evaluate the building in terms of certain criteria. These included: Spatial organisation, use of materials and technology, response to the passenger process, within the terminal, addressing of the waterfront edge and the response of the terminal to the concept of a 'gateway' to the city. Technical data in terms of sizes of certain spaces, mechanical requirements, environmental requirements and building technology will also be interrogated.

2.5 Secondary research.

In terms of the secondary research a literature survey of the relevant information was carried out. Literature relating to development within the harbour and waterfront development was also analysed. This literature survey incorporated precedent studies of cruise liner terminals from around the world. These terminal examples were analysed with the same criteria as the case studies. Studying the precedents one could gauge the elements that make up a cruise liner terminal, current trends involved with the terminals and the different typologies within the field.

The literature review was not merely limited to cruise liner terminals. The concepts and examples of waterfront architecture and interventions were also reviewed. This allowed one to gauge the external factors influencing the design of the terminal building. Again the secondary research done was qualitative where conclusions were drawn from the data analysed by the researcher.

2.6 Conclusions.

Overall the data available for the dissertation was found to be limited. Most of the information was accessed from journals in terms of other examples of cruise liner terminals. This has lead to the researcher having to draw conclusions rather than drawing on an existing body of knowledge on the subject. With the limited information available on the subject it has provided an opportunity to develop and increase the knowledge base of the topic. Therefore the purpose of the dissertation is not only to produce a brief and model for a cruise liner terminal, but also to create a reference for others who are involved in such a project.

The interviews conducted were probably the most beneficial as first hand information was gathered that could not be obtained through a literature review. These helped mostly to inform the brief, technical data and accommodation schedule for the cruise liner terminal. The informal, semi-structured interviews were found to be beneficial in terms of gathering information. The nature of the interviews was such that no formal questionnaire was used. This made the interviewee feel more relaxed which lead to a conversation touching on various topics that were not thought of by myself. Therefore, this style of interviews allowed for broader topics to be discussed.

Chapter 3: Literature review and theoretical framework.

3.1 Literature review.

The main source of literature on cruise liner terminal design for the document comes from dissertations dealing with this specific topic as well as published works in related journals. The literature study briefly looks into the functioning and design of transport terminals, with airports being the main typology. This was found to be relevant to this study as similar circumstances are present within the cruise liner terminal. As a result, the information obtained from the study of airports and other transport terminals will be critically analysed and made relevant in the context of a cruise liner terminal.

By studying these sources a better understanding can be obtained to inform the architectural design process. In so doing, it will become apparent what functional areas the building must include to facilitate the appropriate relationships between spaces. The information gathered from the literature review will be focused on in the following topics:

- Limitations of the literature review.
- The design of terminal buildings.
- The cruise liner terminal as a unique building typology in the context of Durban.

Limitations of the literature review.

From the literature review, certain limitations were able to be identified. These were mainly:

- Public interaction.
- Waterfront edge development.

In most of the examples described in the dissertations that were reviewed, the cruise passenger took priority in the design. This led to the bulk of the emphasis of the design being aimed at the passenger movement process. Although this is a critical issue to be resolved in the design of the cruise liner terminal, cognisance needs to be taken of the cruise season, in Durban, which only lasts between mid November and mid April. This means that the terminal is extensively used for five months of the year after which the public component of the building becomes crucial in sustaining the complex. This is not to say that the passenger process in the terminal should be ignored or subjugated, but rather that a balance is found which will ensure effective use of the facility for the whole year.

A key component in developing the public aspect of the building is the waterfront edge and views from the site. The site can capitalise on its unique setting to draw in the public. This is discussed further in detail in the theoretical framework.

The design of terminal buildings.

According to Edwards, the functional design and architectural design of terminals need to correspond clearly. Furthermore, the passenger terminal has four main functions:

1. It facilitates a change of transport mode.
2. It processes passengers.
3. It provides passenger services of various kinds.
4. It organises and groups passengers into discrete batches ready for their journey.

(Edwards. 1998: 113).

It is important to note that this information relates directly to airports. Therefore one needs to take cognisance that the sheer volume and intensity of use of airport terminals is substantially greater than what one will encounter at a cruise liner terminal.

This is the main difference between the two. Airports have a steady volume of passengers moving within the terminal, while a cruise liner terminal will not have a sudden influx of passengers off the cruise ship and into the terminal. Rather what happens is that cruise passengers will disembark at varying intervals at different times. Therefore one will not have the entire population of a cruise ship within the terminal at one time. This has a substantial bearing on the character and size of the passenger processing areas. These areas have more of a relaxed character to the passenger process as apposed to the hard surfaces in an airport which is needed to deal with large volumes of people. The cruise experience, by its very nature is a relaxed one, and therefore that feeling should be designed into the terminal.

In the case of a cruise liner terminal, the change of transport mode is from land to water and vice versa. Although this is not the only transport interchange that will occur, passengers will also move to buses, taxis and other motor vehicles. Christopher Blow suggests that an interchange should be designed with good sight lines between different modes of transport, to assist way finding and add a sense of interchange experience. (Blow. 2005: 19). Therefore it is important to provide a passenger terminal with the space and clarity of use for circulation, process, secondary services and gathering. (Edwards. 1998: 114).

As discussed above, the processes that passengers go through in a cruise liner terminal is the same as in an airport. On departure, passengers need to check-in, have their baggage handled to be placed onto the ship and move toward a security check point before boarding. On arrival, passengers disembark the cruise ship and pass through immigration before proceeding to reclaim their baggage (See figure 3.1). After which they then move through customs before entering the public domain of the terminal. The only difference in the processes discussed above and that within an airport is the sheer volume, repetition within short cycles and intensity that is experienced.

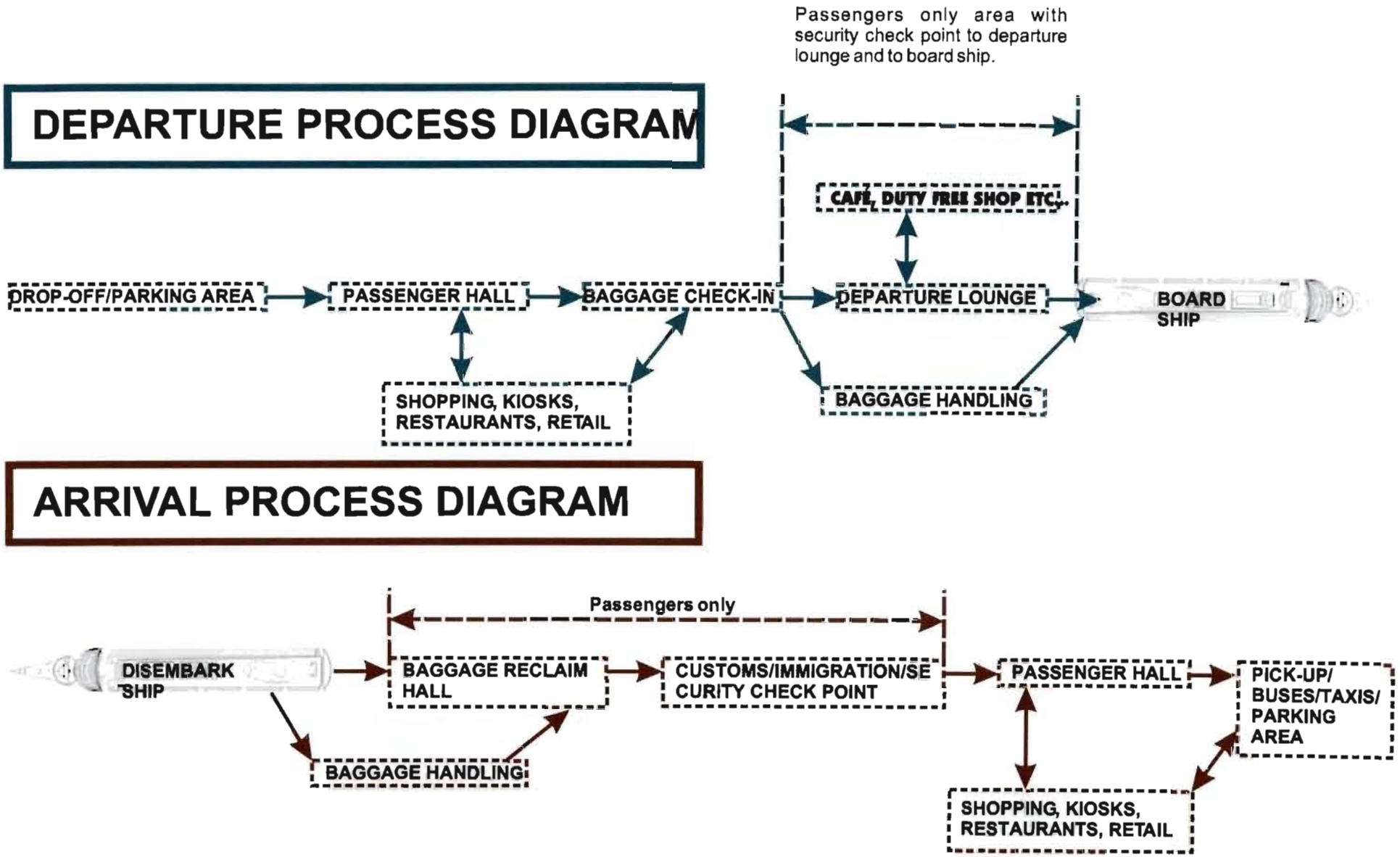


Figure 3.1_Flow diagrams of departure and arrivals process.

Edwards also mentions that another main function of the terminal is to provide services of various kinds to the passengers. These include shopping, toilets, eating, meeting and greeting, business and conference facilities. (Edwards. 1998: 113). In terms of the cruise liner terminal these elements become key in appealing to the public community and not just the cruise passenger.

The cruise liner terminal as a unique building typology in the context of Durban.

In terms of the context of Durban the cruise liner terminal will be a unique building typology. As Edwards suggests, it will be a point of exchange between people both culturally and economically. (Edwards. 1998: 16). The cruise liner terminal should offer a unique setting within which both the public and passenger can experience the "event" of a cruise liner in port. "The architecture of airports reflects the international flavour of modern air travel." (Edwards. 1998: 17). Just as modern day airports seek to find an architectural language from the aviation industry, the cruise liner terminal will also look at maritime imagery to create a common dialogue between the terminal and the cruise ship. The cruise liner terminal should not only borrow from maritime imagery but also look at its surrounding context to create a sense of local identity with the building.

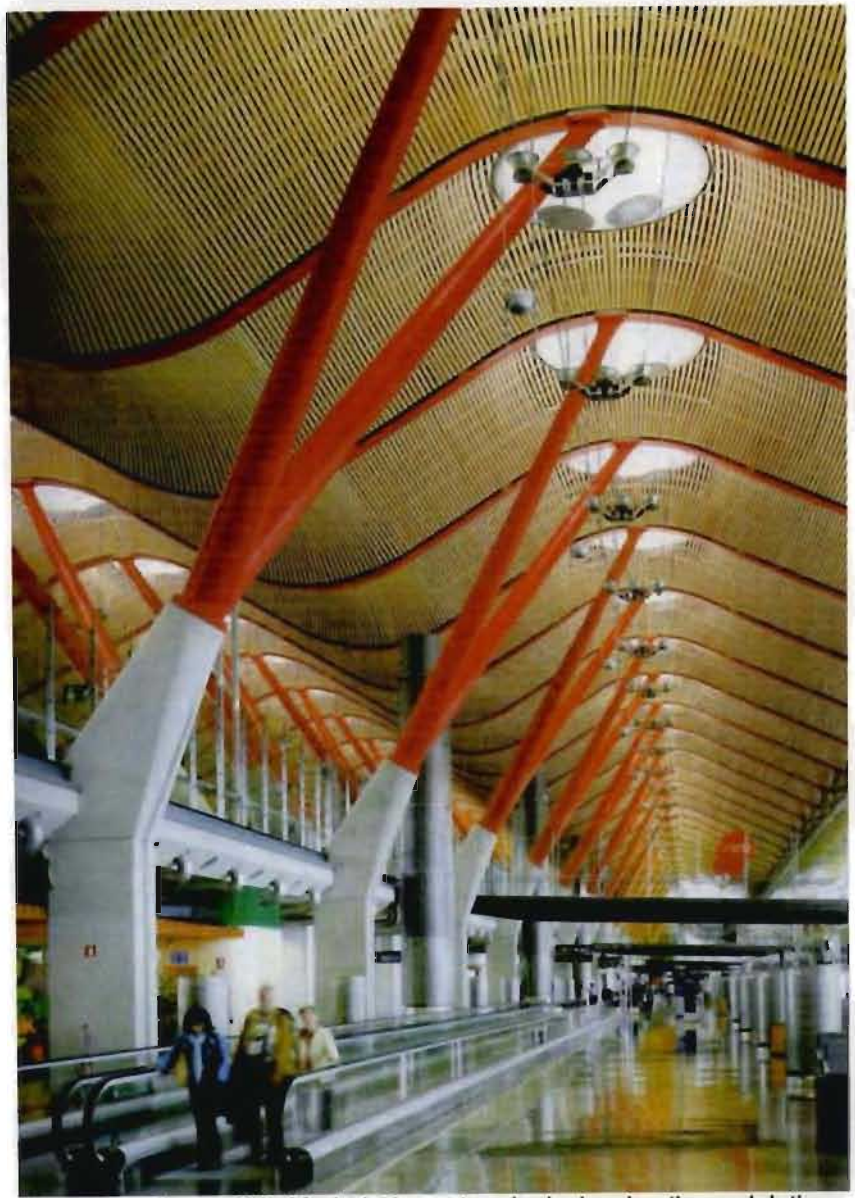


Figure 3.2_View within Madrid Airport terminal, showing the undulating roof form.
(Finch (ed) 2006: 41)

3.2 Theoretical framework.

The theoretical framework serves as a basis for the dissertation, in that it suggests a structure of thinking and analysis for conceptualising the design of the new cruise liner terminal. The theories and concepts used mainly by Christopher Alexander and Herman Hertzberger will be used as a basis for the theoretical framework. The theories and concepts discussed in this chapter will also be used to interrogate and critically analyse the precedent and case studies in chapters four and five. Specific principles relating to transport terminal design as well as architectural design theory and concepts will be outlined and made relevant in the context of a new cruise liner terminal. These topics will be as follows:

- A voluminous architecture.
  - Movement patterns.
  - Waterfront regeneration.
  - The terminal as a gateway to the city.

A voluminous architecture.

"The definition of routes using different sizes or volumes of internal space helps the traveller to know whether a particular corridor or concourse is a major or minor one." (Edwards. 1998: 80). This suggests that the use of a voluminous architecture is appropriate for a terminal building. One could say that the key elements in the design of a transport terminal are the definition of specific spaces in terms of volume and the use of light to express the use of that space. The use of voluminous architecture should coincide with other design principals. According to Edwards, these are space, structure, light and object. (Edwards. 1998: 80). This can be seen in the Madrid airport, designed by Richard Rogers. (See figure 3.2). In that structure the high, undulating roof allows light to enter from above, serving as visual markers of orientation within the building. The undulating roof also corresponds with different spaces in the terminal.

In areas where larger volumes of passengers are moving the roof is higher. The concept of a single, unifying roof structure over the terminal building is one that exploits both volume and light.

The unifying roof would enclose all the different elements within the terminal such as the main concourse, restaurants, shops, banks and offices. By using this concept a hierarchy of the different spaces and elements can be established. Alexander suggests that beyond the elements of a building, each building is defined by certain patterns of relationship among the elements. (Alexander. 1979: 85). This is to say that each element has a different character which needs to be understood by the architect in order to define and shape that element accordingly. Alexander observed that a lower ceiling imparts a sense of intimacy on a space while a high ceiling imparts a more formal sense of space. (Alexander. 1977: 877). A larger ceiling volume would then be used within the main concourse to impart a sense of hierarchy, as this would be the main room of the building. The larger ceiling volume would also acknowledge the higher volume of people moving through the space. Lower ceiling heights would then be used for the utilitarian spaces of the terminal such as banks, offices and restaurants. The play of ceiling levels will add to the legibility of the sequence of spaces within the terminal building.

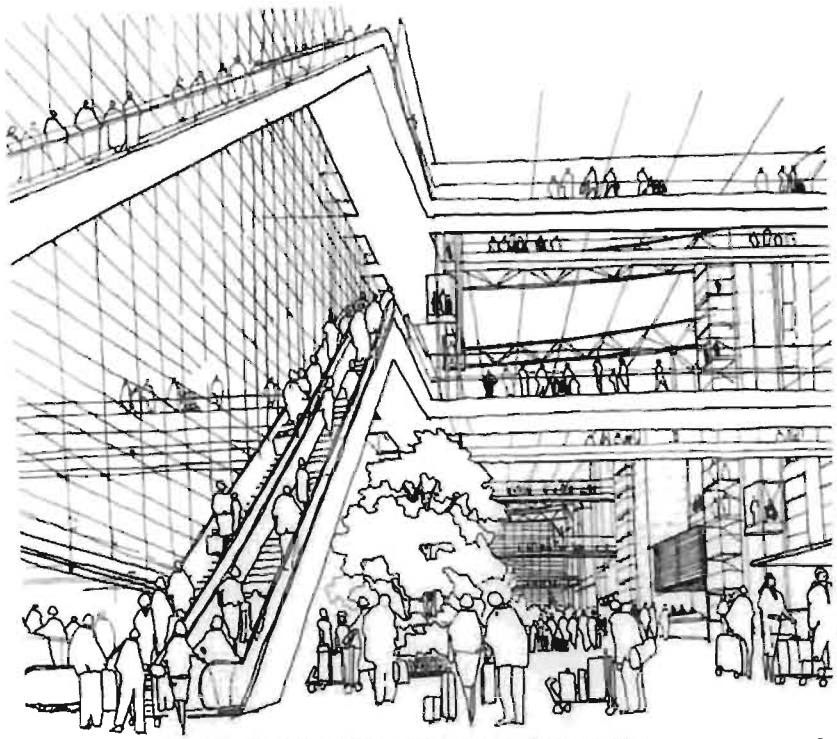


Figure 3.3_ An early sketch of Kansai Airport, Japan, showing the use of volume and light in the structuring of movement patterns.
(Edwards. 1998: 84)

Movement patterns.

Due to the nature of transport terminals in general, large volumes of passengers need to be handled and guided through the terminal building. Therefore the legibility of the main terminal concourse and circulation routes should be read effortlessly. (See figure 3.3). The architect firstly needs to be aware of the prevailing movement patterns, how they are generated, where they lead and what influences they have on the overall design of the terminal.

Figure 3.4_ View of Hamburg Airport, Germany, showing major and minor routes.
(Edwards. 1998: 83)

Hertzberger points out that "the first consideration of decisive importance in designing a space is what that space is intended for and what not, and consequently what the proper size, is to be." (Hertzberger. 1991: 190). Edwards emphasizes that: "Terminals should use architectural means to distinguish between major and minor routes." (Edwards. 1998: 83). Therefore the architect needs to use architectural devices, such as roof form and light, to increase the legibility of moving through the terminal. (See figure 3.4).

Another important consideration is to determine who the users of the building will be. In terms of the design of the cruise liner terminal, it is not only cruise passengers using the building but also the community at large. Therefore this opens other critical avenues of thought for the design in terms of catering for both users. Hertzberger goes further to say that: "different activities and uses require different spatial dimensions." (Hertzberger. 1991: 190). This principle of specific design process is further supplemented by Alexander in terms of understanding specific patterns of events. (Alexander. 1979: 55). If one does not fully understand the specific requirements and prevailing patterns on the design the building will tend to loose its identity through ambiguous sizes and relationships of spaces. In terms of the design of the cruise liner terminal, there are two main users of the building: the cruise passenger and the public visitor. The passenger will have a certain process to go through before boarding such as checking in and getting their baggage on the ship. The public visitor, however, is most likely at the venue to experience the event of a docked cruise liner or meeting and greeting passengers. By recognising both user requirements the design of the building will become more legible to both.

Christopher Alexander describes a simple rule of growth as: "Every building must create coherent and well-shaped public space next to it." (Alexander. 1987: 66).

What Christopher Alexander means by this rule is that both the physical building and space around it must act systemically. A building cannot be thought of in isolation without considering its' impact on the environment around it, and the effect that the immediate environment has on the building. The concept of 'the coherent whole', points towards critical thinking at an urban scale. Architecture cannot be confined merely to the designing of buildings but also a consideration for the affect that the buildings have in shaping the spaces around them. In terms of the cruise liner terminal the waterfront edge becomes the important urban consideration of the design.

Waterfront regeneration.

"People have a fundamental yearning for great bodies of water. But the very movement of the people toward the water can also destroy the water." (Alexander. 1977: 136). Breen and Rigby also recognise that the urban waterfront phenomenon is due to the public's desire to be near a body of water (Breen and Rigby. 1994: 18). This tells us that when creating an intervention near any body of water, great care needs to be taken in preserving the water's edge. Since the development of the new cruise liner terminal is a waterfront intervention, one needs to understand the human and environmental complexities that are involved. By recognising that the design of the cruise liner terminal is a waterfront intervention, one can better respond to the context.

In terms of the regeneration of waterfronts, a variety of aspects need to be considered when proposing an intervention. According to Breen and Rigby these aspects include economic, social and environmental issues (Breen and Rigby. 1994: 15). In terms of the three factors mentioned, economic determinants are almost always the driving forces behind any development not least waterfront developments.

Given the prevalent economic motives behind such developments, designing cruise liner terminals must therefore incorporate specifically relevant and economically viable amenities. This will be important in making the new cruise liner terminal sustainable throughout the year. The social factors influencing waterfront regeneration are primarily concerned with creating meaningful and relevant spaces for people. The way in which this translates into the design of the new cruise liner terminal is that the terminal will become a point of interaction for people.

The terminal will also be representative of its context and it is therefore important to bring a sense of socio-cultural relevance to the design. Waterfront developments around the world incorporate amenities such as shops, cafés, restaurants and civic facilities so that the attractiveness of being close to a body of water is further increased. The environmental impact of waterfront developments can either be a positive or negative influence. By using waterfronts in a positive regeneration scheme, the cleaning up of bodies of water can take place. (Breen and Rigby. 1994: 17).

Figure 3.5_ View of the Wilson's Wharf restaurant and entertainment complex.

An example of a waterfront regeneration scheme is the Wilson's Wharf on Victoria Embankment.(see figure 3.5). Here the designers have taken advantage of the affinity that people have for water. Restaurants, shops and a theatre line the water's edge, to create a unique atmosphere for people. From this example it can be seen that the waterfront dynamic can be, and should be, exploited in the design of the new cruise liner terminal. As can be seen this would enhance the overall experience of the cruise passenger as well as the local visitor.

The terminal as a gateway to the city.

With the cruise liner terminal being located near the harbour mouth, it becomes a highly visible point of reference and serves as a point of entry.

Figure 3.6_ Exterior view of Nagasaki Port Terminal.
(Teramatsu. 1996: 135)

The terminal therefore serves as a gateway to the city and should reflect the current situation of its context. Most international cruise passengers are 'location sampling' with the intention of returning for another longer holiday, this makes the concept of the terminal as a gateway pivotal. Therefore the terminal will be the first point of contact with the city and therefore must capture the interest of the cruise passenger.

As a landmark, the terminal can be designed to capture the character of the city. In most cases landmark buildings carry with them the label of being an icon. Strong sculptural forms are used to create a unique building that would make it easily identifiable as a cruise liner terminal. An example of this can be seen at the Nagasaki Port Terminal Building. (See figure 3.6). Located on the Nagasaki Bay the terminal acts as the 'urban gate' both to and from the islands. (Teramatsu. 1996: 134). The building form uses bold geometrical elements to distinguish itself from the surrounding buildings thereby becoming a landmark. The design of the building should therefore serve as a subtext of the local culture and surroundings, making it a landmark.

4.1 Introduction.

The precedent studies chosen for this study are all international examples as few examples are present within South Africa. It is noted by the researcher that by choosing international examples there is a lack of local context. However, by studying these examples, important aspects of a cruise liner terminal can be analysed and applied within the regional context of Durban.

In this chapter the precedent studies will be analysed under certain criteria. These will include; how the spatial and circulation systems are organised, the effective response to the environment, passenger process, waterfront edge and public interaction. Another important aspect that will be analysed is the concept of the terminal as a gateway to the city. Therefore the purpose of this chapter is to gain an understanding of the elements that make up a cruise liner terminal. By evaluating the different precedent examples one is able to draw conclusions. These will help inform the development of a design programme for a cruise liner terminal for the Port of Durban.

4.1 Yokohama International Port Terminal, Japan.

Architects: Foreign Office Architects. (Farshid Moussavi and Alejandro Zaera-Polo)

Completed: 2002

"Built like a ship, Yokohama's new port terminal is an audacious fusion of architecture and engineering that creates a topographical landscape for public activities." (Davey. 2003: 27). An international competition which was held in June 1994, out of the 664 final entries Foreign Office Architects emerged as the eventual winners. The brief was to design a new passenger terminal and a mix of civic facilities within one building. (Blow. 2005: 157). From this brief it became apparent that the important aspects of the building would entail the ability of the terminal to act as an important gateway to Yokohama city and its' effectiveness to interact with the public.

Architects Farshid Moussavi and Alejandro Zaera-Polo based the driving concepts of the terminal on people movement, public interaction and passenger processes. One of the main concepts behind the design of the terminal is the notion of origami architecture. (Sullivan. 2003: 69). This can be seen through the use of folded planes which make up the structure of the terminal. (See figure 4.1). What this concept does is to give the building a cultural anchor through the use of local imagery.

Completed in early 2002, the Yokohama Port Terminal, measuring some 400 meters in length, is ideally positioned within the Yokohama harbour. Catering for approximately 53 000 passengers per year, Yokohama's new passenger terminal is designed to accommodate four ships at a time. The terminal itself is built on the Osanabashi pier, a pier dating back to 1894. With the terminal being built on this pier it becomes an important extension of the city thus strengthening its' connection with the harbour waterfront. (See figure 4.2).

Figure 4.1_Internal view showing the folded roof structure.
(Davey. 2003: 35)

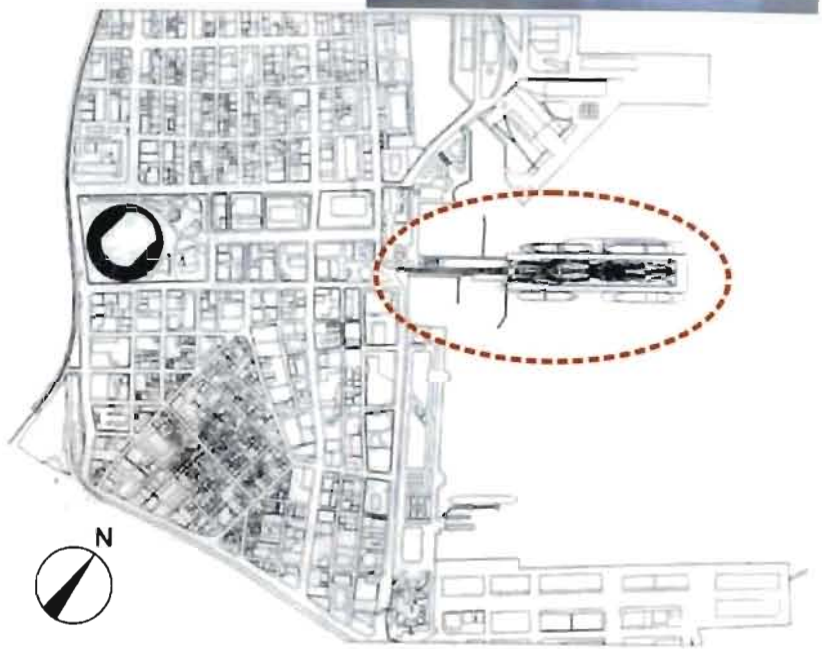


Figure 4.2_ Location plan of Yokohama port terminal, circled in red, showing the building's relationship to the city.
(Davey. 2003: 31)

It is this connection with the city that brings people to the terminal thus giving the building the opportunity to engage with the public. This is done throughout the building by incorporating specific design devices such as textures, form and legibility. The roof of the terminal is designed as a public plaza, a place to escape to from the city as well as a viewing area from which to experience the event of a docked cruise liner. (See figure 4.3). The undulating roof form is taken from the concept of origami architecture. Hardwood timber from Brazil clads the roof giving it a soft texture for human interaction. This increases the effectiveness of the building to draw the public to this new finger of the city. An amphitheatre is located on the roof of the terminal for public use. Whether the amphitheatre is successful or not for its' intended use can not be seen. The provision of such a space shows the level of engagement the building is attempting to make with the public.

Figure 4.3_ Image showing the undulating roof of the terminal.
(Davey. 2003: 28)

In terms of the spatial organisation of the terminal the architects set out to integrate the flow of passengers with those of the public gathering spaces. At first this idea of integrating both passenger and visitor seems to be the incorrect decision to make. However, at the Yokohama Terminal, ramps are used to connect the different levels which allow the borders between enclosed space, decks and roof to be blurred. People move around the terminal passing from one area to another in a seamless, flowing connection. The linear form together with the warped planes of structural steel in the terminal imparts directionality on the user throughout the building. Movement through the terminal is based on a series of circulation loops in order to create a more dynamic experience of the spaces rather than a static one. These paths tend to branch off giving different options to the user on which path to take. Visitors to the terminal can drive into the 1st floor parking area to access the arrivals and departures hall or they can access these areas from the roof top ramps. Again this complements the blurring of borders concept by allowing people to filter into the building from different levels. Passengers disembark their cruise liners through walkways into customs and immigration areas in the arrivals hall.

Figure 4.4_Ground floor parking level plan.
(Sullivan. 2003: 73)

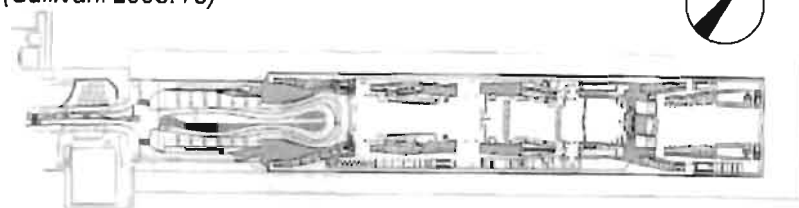


Figure 4.5_First floor terminal level plan.
(Sullivan. 2003: 73)

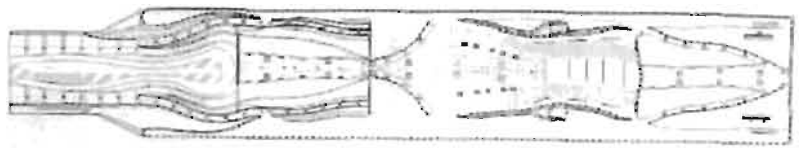


Figure 4.6_Roof/park level plan.
(Sullivan. 2003: 73)

Here the public is separated from the arrivals hall by means of moveable barriers. (See figure 4.7). This system of separation is a necessity due to the large volumes of space and people within the building which have been left free of traditional walls that would have otherwise separated these areas.

Anticipating that cruise ship traffic would be insufficient to keep the terminal fully occupied, the infrastructure was designed to accommodate markets, expositions and group activities. The cavernous hall can be divided to accommodate these functions by means of moveable barriers, creating a differentiated structure within the building.

The consistent use of steel, glass and timber in all aspects of the structure lets the building read as one coherent whole. (See figure 4.8). The self supporting steel structure is treated like origami, not only for aesthetic appeal but also to aid in its' structural strength. (See figure 4.9). Borders between building envelope and structure are blurred by the folding of different planes to create one form. These elements rise and fold at different levels to form pathways, decks and public spaces for interaction. Contrasts are also an interesting dynamic that occur within the building; especially between heavy and light. The heaviness of the steel structure is contrasted by the soft timber textures on the cladding. Dark ceilings are made more dramatic by the penetration of daylight at the ends of the halls as well as from the sides.

Figure 4.7_Internal view of arrivals hall. *(Sullivan. 2003: 72)*

Figure 4.8_Image showing use of timber and steel on the roof of the terminal. *(Davey. 2003: 30)*

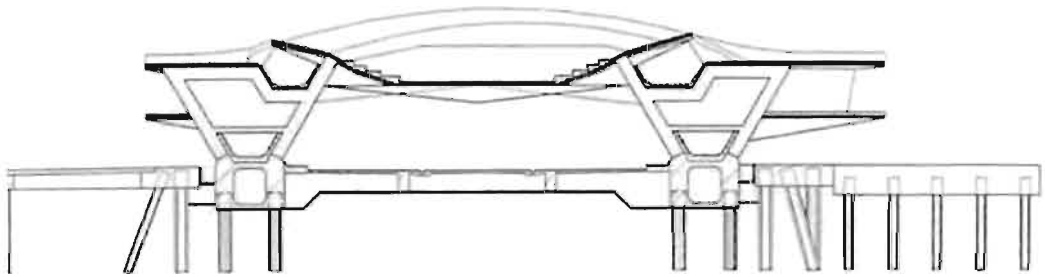


Figure 4.9_Cross section through terminal showing self supporting steel structure and amphitheatre above. *(Sullivan. 2003: 73)*

Through the use of these design tools an architectural richness is added to the terminal.

Conclusion

As a gateway to and linkage with the city, the terminal offers a spectacular setting for the docking of cruise liners. Overall the spatial organisation of the building allows for a multitude of uses in conjunction with a passenger terminal, making the terminal a multi-functional building. Although the circulation is designed to seamlessly integrate all levels of the building one could argue that it decreases the legibility of the terminal building. In terms of the buildings' response to the site and its surroundings it attempts to capture the spirit of the place. A dialogue between the terminal and the cruise liners is created through the use of nautical architecture in the design. (See figure 4.10). Views of the bay, the city and Mount Fuji in the distance create a visual link to the surroundings giving the building a sense of place. The extension of the city into the harbour waterfront is beneficial in creating a new area for public use.

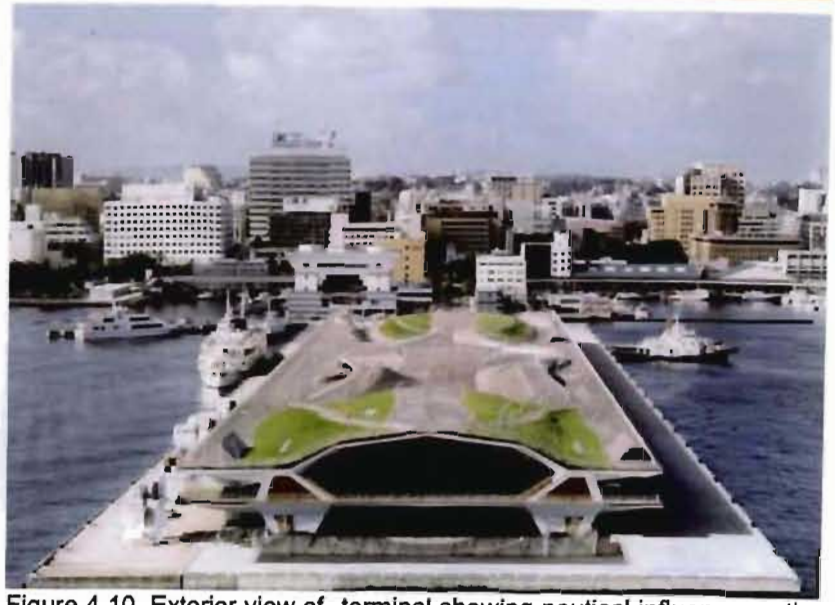


Figure 4.10_Exterior view of terminal showing nautical influence on the architecture of the building.
(Davey. 2003: 26)

Figure 4.11_Image showing roof top amphitheatre in use.
(Sullivan. 2003: 67)

4.2 Sydney Overseas Passenger Terminal, Australia.

Architects: Lawrence Nield and Partners

Completed: 1988

Figure 4.12_Location plan of Sydney passenger terminal, circled in red, showing position of terminal within the Sydney Cove area.
(Blow. 2005: 159)

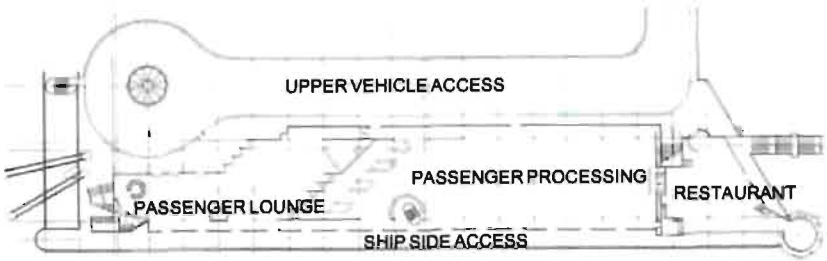


Figure 4.13_Arrivals and departures upper level plan.
(Herath. 1988: 85)

Designed as a catalyst for a greater harbour waterfront intervention, the Sydney passenger terminal is successful in capturing the public's interest in the cruise liner industry. Located at Sydney Cove, within the Circular Quay area of Sydney harbour, the terminal enjoys good linkages to other modes of transport. (See figure 4.12). Completed in 1988 the terminal itself replaces a building dating back to the 1960s but still retains some of the existing structure within the new design. (Blow. 2005: 158). Lawrence Nield and Partners were commissioned to carry out a study within the area and determine the implications of shortening the existing terminal building. The findings of the report determined that the existing building could be shortened by 30% which presented the opportunity of creating visual connections to the Sydney Opera House and the rest of the bay area to the east. What is interesting to note is that even by shortening the existing building, the terminal can handle 2000 passengers per hour.

In respect at rehabilitating the waterfront edge the terminal has created a place of retreat where people can enjoy the interaction with the water's edge. Public amenities such as restaurants, shops and convention halls have made the area more appealing to the user. As a gateway to the city, the passenger enjoys a procession of visual links from the terminal building towards the surrounding harbour area. By doing this the passenger is allowed to immediately orientate themselves within their new surroundings.

The spatial organisation of the terminal is contained within a long, linear form. With the change in the cruise liner industry from mere transport to act as luxury cruises, the existing building had to adapt to this shift in the industry. Split into two levels, the passenger process areas occur on the upper floor (see figure 4.13)

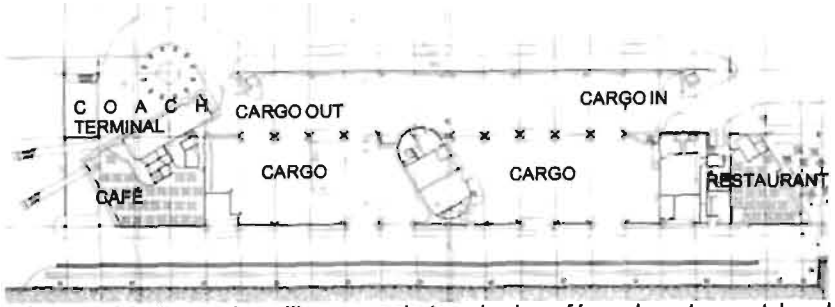


Figure 4.14_Cargo handling, coach terminal, café and restaurant level plan.
(Herath. 1988: 84)

Figure 4.15_View of east facade facing the bay with Sydney harbour bridge in the background.
(Blow. 2005: 160)

Figure 4.16_View of steel tower with the Sydney Opera house in the background.
(Herath. 1988: 82)

while the cargo handling is located at ground level. (See figure 4.14). Also added to the ground floor level was a restaurant, café and tourist coach terminal. By adding these facilities, extra dimension is given to the terminal. This in the end helps draw people to the terminal and creates a new public realm for the city. With the tourist coach terminal being positioned at the south end of the terminal, another modal interchange is created. Passengers use gangways to embark and disembark the cruise liner, leaving the ground floor free for other users. A raised vehicle roadway allows access to the upper floor, where passengers go through the necessary check-in procedures and customs area. This allows for better pedestrian access at ground floor level on land side. By allowing for this area the overall urban design scheme is strengthened, in that there is a strong permeability of spaces all around the waterfront.

The predominant materials used at the Sydney passenger terminal are glass, steel and concrete. The steel structure is exposed all round the building and is treated as a very light weight exoskeleton. Glass is then used to enclose the building from the outside elements. Structural steel towers (see figure 4.16) at the north and south ends of the terminal create interesting architectural features that talk to the surrounding buildings. (Herath. 1988: 84). "The architectural language 'deconstructs' and 'reconstructs' the original building while using steel, glass and round balconies to produce a dialogue with the naval architecture of the ships." (Herath. 1988: 84). In terms of the buildings' environmental response there are no visible attempts at any forms of energy saving strategies. It is assumed that air-conditioning is deployed to keep the internal environment of the building at a comfortable temperature. With the terminal being orientated east west one can imagine that the heat gain in the building is substantial.

Conclusion

Sydney passenger terminal's success lies in it's response to the harbour waterfront and public integration. As a gateway to Sydney the terminal allows one to experience a series of vistas to the harbour and surrounding landmarks. The building does not exist in isolation and therefore responds to the external influences placed on it. Pedestrian access is good and public amenities draw people to the terminal. By separating the passengers and the cargo areas vertically a clear legibility is created allowing the visitor to navigate through the terminal. Creating a dialogue with the cruise liner through the use of materials and architectural elements gives the terminal a solid sense of place. An element such as the use of steel, which draws on the industrial harbour image, gives the terminal a sense of place. The steel tower at the end of the terminal (see figure 4.17) acts as an urban marker as well as helping to terminate the end of the building. These architectural elements could be used to help inform the design of the new Cruise Liner Terminal for Durban.

Figure 4.17_North elevation of terminal showing elevated roadway & steel tower.
(Herath. 1988: 82)

4.3 Venice Harbour Passenger Terminal, Italy.

Architects: Ugo Camerino

Completed: 2002

Located within the old harbour precinct of Venice, the new passenger terminal (see figure 4.18) was planned to provide a multi-functional building within the role of a passenger terminal. Designed by Ugo Camerino, the terminal formed part of an intervention to revitalise the old harbour precinct and was finished in 2002. The brief to the architect was to allow for a building that would serve the passenger as well as the local ship owners in the harbour. Compounded with that aspect of the brief the terminal also needed to address the normal requirements of a maritime passenger terminal. Aspects such as addressing the harbour waterfront, legible spatial organisation, passenger and public interaction needed to be catered for. Further to that, the concept of the terminal as a gateway to the city was also an important requirement.

The accommodation is contained within a long, linear, rectangular building. Baggage, passenger and the public areas are organised on three levels; a ground floor, mezzanine level and first floor. (See figures 4.19 & 4.20). The arrivals hall is allocated on the mezzanine level while the departures hall is on the first floor. As in other examples of passenger terminals the separation of outgoing and incoming passengers, vertically, seems to work quite effectively. By doing this one eliminates the need to separate these passengers horizontally within a large hall. This could lead to confusion and a loss of legibility within the terminal building. At the Venice harbour passenger terminal mobile screens are used to adapt the spaces according to the varying numbers of passengers. (Dalco. 2003: 20). Circulation is done through external corridors. These act in orientating the visitor while also being used as viewing decks. Provided within the terminal are shops, restaurants and stores. This allows the terminal to cater for the public who are visiting the building to enjoy the waterfront edge.

Figure 4.18_View of wharf side elevation.
(Dalco. 2003: 24)

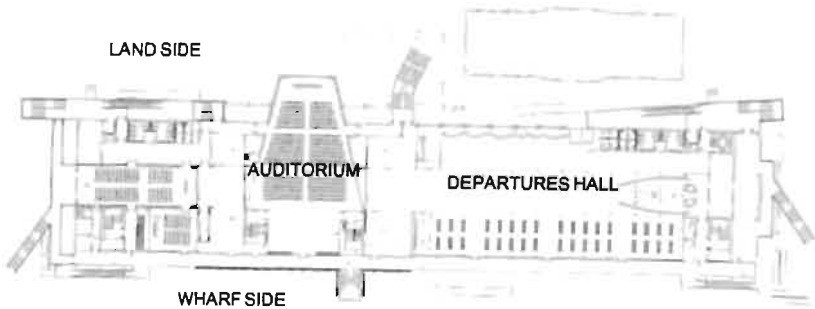


Figure 4.19_First floor plan showing departures hall and auditorium.
(Dalco. 2003: 26)

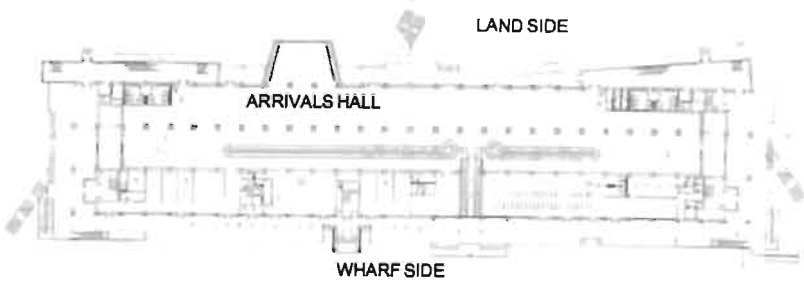


Figure 4.20_Mezzanine floor plan showing arrivals hall.
(Dalco. 2003: 26)

From the information gathered it appears that passengers board the ships from wharf level rather than elevated gangways. This unfortunately diminishes the permeability of the space for the public. A large auditorium is also located within the building. This space was allowed for by the architect as it was hoped that the terminal would also produce other forms of income when not in use as a passenger terminal. Offices for the cruise terminal and some of the harbour administration workers are accommodated within the so that the building is always in use.

Conclusion

Through the consistent use of steel and glass in the building, the terminal is read as one coherent whole. Strong nautical forms are used to celebrate the event of a cruise liner in the harbour. A tall tower along the wharf side elevation evokes the image of a cruise liner's control bridge. (See figure 4.22). Again, as in other examples, the use of nautical imagery is deployed to create a dialogue between the ship and the building. Steel sun screens and overhangs are used to shade the wharf side elevation but it still appears that the building's internal environment is maintained through air-conditioning. With the building being low in profile it allows the arriving passenger a view towards the city. This strengthens the position of the building as a gateway to the city as one can see the Venice skyline in the background.

Figure 4.22_Exterior view of terminal showing tower. *(Dalco. 2003: 23)*

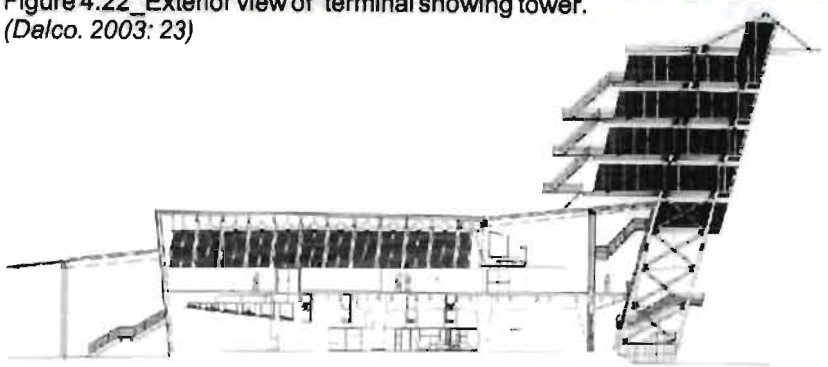


Figure 4.23_Cross section trhough terminal showing departures and arrivals hall. *(Dalco. 2003: 27)*

Figure 4.21_View along walkway on the exterior of the terminal. *(Dalco. 2003: 22)*

4.4 Vancouver Passenger Terminal, Canada.

Architects: Zeidler Roberts Partnership in collaboration with Downs Archambault, Musson Cattell and Partners

Completed: 1986

Figure 4.24_Aerail view of Vancouver's Canada Place passenger terminal. *(Davey. 1987: 85)*

"The trouble with most dockland architecture is that it does not recognize the water." (Davey. 1987: 82). Vancouver's Canada Place passenger terminal extends itself right into the harbour and draws on inspiration from the dynamic cruise liners that enter port. (See figure 4.24).

Vancouver is the busiest harbour in Canada and the largest port closest to Alaska therefore it has become the port of call for most cruise liners in the area. Designed by the architectural firm Zeidler Roberts Partnership in collaboration with Downs Archambault, Musson Cattell and Partners the terminal has become an icon associated with Vancouver. Acting as a catalyst for development in the area, the 1986 Expo brought a worldwide audience to Vancouver. From this Expo, Canada Place was built as a mixed-use complex to cater for the requirements of the various expositions. The complex itself includes the terminal, the Vancouver Convention and Exhibition Centre, Pan Pacific Hotel and IMAX Theatre.

The materials used for the building are mainly steel and glass where these form an intricate fenestration design. This attention to the exterior gives the building a lightweight feel in contrast to the tall, imposing hotel behind the terminal. Teflon-coated fabric is used to roof the terminal complex and further emphasises the lightness of the building. The tensile roof is also a direct reference to the sails found on ships of yesteryear. This again creates a dialogue with the cruise liner, as seen in the past examples. (Davey. 1987: 82). A diffused light quality is allowed to penetrate through the tensile roof structure. This responds to the local climate where the light quality is generally poor therefore cutting down on the need to artificially light the interior of the terminal.

Figure 4.25_Ground floor exhibition hall plan.
(Vidal. 1994: 39)

Figure 4.26_First floor convention facilities plan.
(Vidal. 1994: 39)

Figure 4.27_Second floor passenger terminal plan.
(Vidal. 1994: 39)

Figure 4.28_View of terminal with the city of Vancouver in the background.
(Http://www.igougo.com/travelcontent/JournalEntryActivity.aspx?BusinessCardID=13993&Mode=2, accessed 15-02-2007)

An interesting tension is created by the scale of the terminal being higher than the cruise liners themselves. Here the terminal assumes prominence over the cruise liner.

Planning wise, arrivals and departures occur on the same level instead of being separated vertically. What have been separated vertically are the cruise liner terminal facilities, the exhibition spaces and the convention hall. The terminal facilities are located on the top floor level with passengers accessing the cruise liner through elevated gangways, while the exhibition spaces are situated at ground level. (See figures 4.25, 4.26 & 4.27). In terms of addressing the public interface an elevated walkway allows visitors to explore the length of the cruise ship. Therefore allowing the visitor to get close enough to the ship to experience its true size.

Conclusion

The positive aspects of the Vancouver passenger terminal are its public interface with the cruise liner and the nautical, architectural language that is employed. What detracts from the scheme is how the accommodation is organised. By having both arrivals and departures on one level the legibility of the space is now determined by physical divisions rather than appropriate architectural devices to define the two passenger processes of arrival and departure. The terminal expands out in a long linear form from the city and therefore becomes an important extension of Vancouver. As gateway to the city, the terminal's iconic status is immediately associated with Vancouver.

4.5 Southampton Mayflower Passenger Terminal, England.

Architects: Jonathan Manser

Completed: 2002

With air travel taking over trans-Atlantic crossings from the cruise liner in the 1960s activity declined drastically in this sector. Today the cruise liner has re-established itself within the tourist industry and has seen a steady growth over the past few years. P&O, a maritime shipping company, decided to invest in a cruise liner terminal to take advantage of this trend in the market. Cruise liners arrive and depart every other day and there are approximately 1000 passengers and 4000 items of luggage that need to be processed. Instead of constructing a brand new terminal building P&O decided to refurbish an existing building. Jonathan Manser of the Manser Practice was commissioned to design the refurbishments. The approach of refurbishing an existing building has seen the Mayflower terminal occupying the existing Shed 106 at the harbour. Manser's approach with a limited budget, compared to most passenger terminals, and imposed design restrictions developed an imaginative way of celebrating the transition from water to land. (Baillieu. 2003: 38).

Shed 106 dates back to the 1930s and was a typical steel clad storage warehouse. Refurbishments to the existing structure included the removal, upgrading and restoration of certain elements within the shed. A floor that sloped between platform and quay was levelled to allow for easier access to the ship. The existing steel structure was given a face lift with a new coat of silver paint. Roof lights and the existing timber roof structure were restored. Manser's best alteration to the existing structure was to remove the street side screen wall and construct a new road access for pick-up and drop-off (see figure 4.29) under the existing roof. (Baillieu. 2003: 43). By doing these changes the building started to develop itself into a passenger terminal.

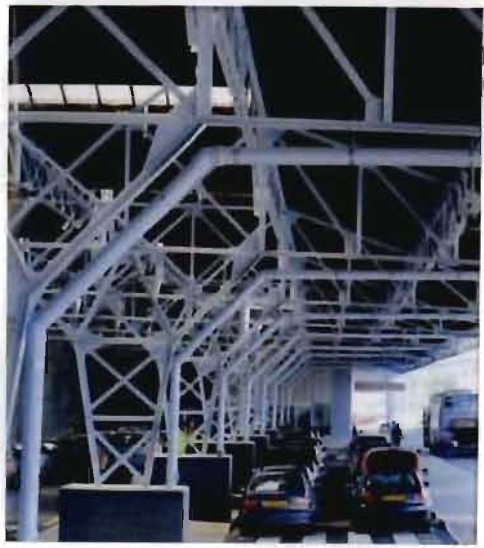


Figure 4.29_View of covered pick-up and drop-off area.
(Baillui. 2003: 39)

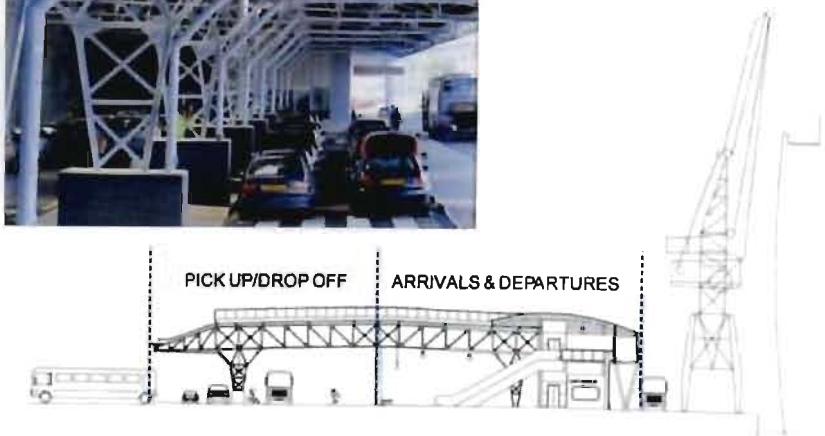


Figure 4.30_Cross section through terminal showing layering system of terminal.
(Baillui. 2003: 44)

Figure 4.31_Exterior view of elevated walkway leading to boarding gangway.
(Baillui. 2003: 40)

Accommodation in the building and its organisation had to be adapted to suit the existing structure. The Mayflower terminal is divided lengthways into baggage hall, covered pick-up and drop-off roads. (See figure 4.33). From the drop-off area baggage is passed straight through to the baggage hall for security check. From this point on the passenger is free from any bulky luggage and is able to more easily through the terminal. Adepartures hall is located at the south east end of the terminal, adjacent to the check-in counters. An escalator takes the passenger to an elevated walkway were they will board the ship via an elevated gangway. Arriving passengers also use the same gangway but they descend by escalator to the ground floor of the terminal towards the arrivals hall. (Blow. 2005: 154). Here an interesting system of separation of passengers occurs. Departing and arriving passengers are divided at ground floor.

This horizontal division tends to cause a loss of legibility however, here at the Mayflower terminal it seems to work quite effectively. This is due to the vertical separation that occurs when boarding and disembarking a ship. An interesting point to note is the lack of commercial activity in the terminal such as shops, restaurants and congress facilities. This is "because P&O wants its customers to start spending on board." (Baillieu. 2003: 44).

Conclusion

The Mayflower terminal is purely about the passenger process of boarding and disembarking the cruise liner. (See figure 4.34). Very little is offered for other visitors to the building to enjoy. One can only assume that this was a conscious decision. Therefore there is little public interaction occurring and the terminal does not live up to its full potential as a gateway to the city. Having said that, where the terminal is very successful is in its ability to enhance the experience of the passenger when boarding or arriving from a cruise. The terminal is a neat and effective machine adapted from an existing building to operate as a passenger terminal.

Figure 4.32_Internal view of departures lounge.
(Baillui. 2003: 40)

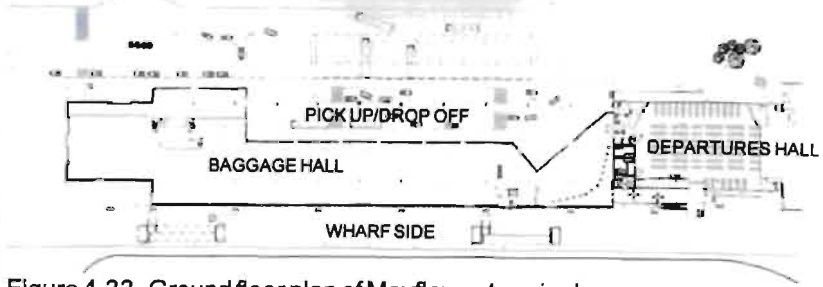


Figure 4.33_Ground floor plan of Mayflower terminal.
(Blow. 2005: 155)

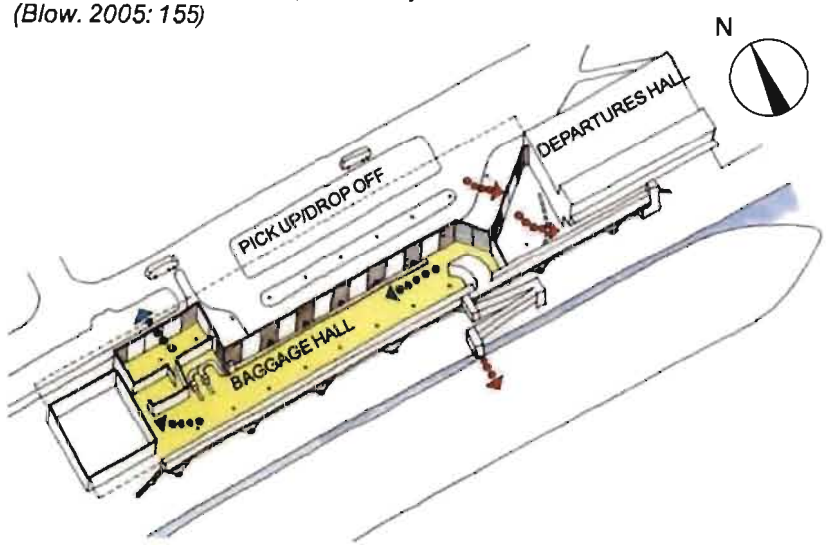


Figure 4.34_Cut away 3-D image showing passenger process within the building.
(Baillui. 2003: 44)

4.6 Conclusions and Comparisons.

Spatial and accommodation organisation.

From the examples analysed in this chapter it seems that the most effective way of organising the accommodation is within a linear form. This allows directionality to be imparted on the user and aids in the overall legibility of the terminal. Although this tends to increase the distance needed to travel by the passenger to certain areas within the terminal.

What can be seen in the above examples of cruise liner terminals in this chapter is that they do not operate in isolation. They all tend to have some entertainment and civic facilities attached to them. An example of this can be seen at the Yokohama passenger terminal where the internal hall can be used as a convention space. (See figure 4.35). By adding entertainment facilities the terminal is given extra appeal and functionality for the visitor.

Response to the passenger process.

In terms of the separation of arrivals and departure area, some terminals split them vertically while others divide them horizontally on one floor. (See figures 4.36 & 4.37). It seems that by splitting the two vertically the terminal is made more legible. The exception to this observation is at the Mayflower terminal where passengers are only split vertically on boarding or disembarking. Boarding or disembarking passengers tend to use elevated walkways which leave the wharf side ground level clear for other activities. The use of ramps has also been explored in organising circulation within a terminal. This occurs at the Yokohama terminal and allows for the different levels to be accessed easily.

Figure 4.35_Internal view of departures hall.
(Sullivan. 2003: 71)

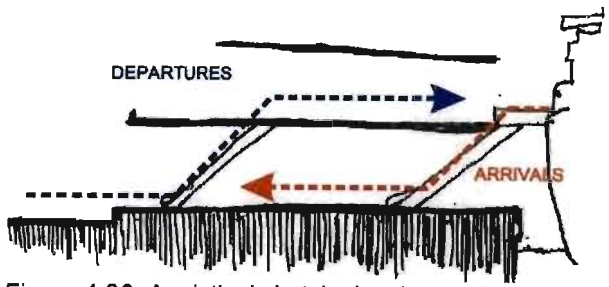


Figure 4.36_Analytical sketch showing vertical separation of arrivals and departures area.

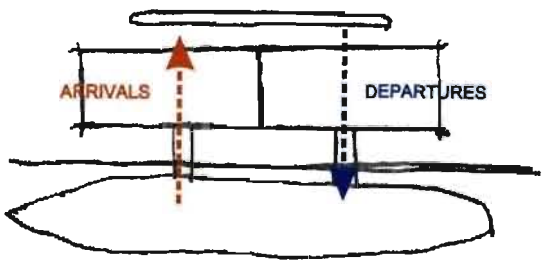


Figure 4.37_Analytical sketch showing horizontal separation of arrivals and departures area.

Resolution of form.

From the studies made in this chapter, there seams to be a tension created between the scale of the cruise liner and the terminal building. There are two ways in which this tension has been responded to. Firstly the cruise liner is given priority over the terminal as can be seen at the Mayflower terminal. (See figure 4.38). Secondly the terminal is given more importance over the cruise liner as in the Vancouver terminal. (See figure 4.39).

The main materials used in the terminal are steel, concrete and glass. This palette of materials is in keeping with that of the cruise liner. Together with the use of nautical architectural elements, a dialogue is created between the ship and the building. By doing this one can see that the terminal acquires a sense of place along the waterfront. What has been done quite effectively is the use of timber at the Yokohama terminal. This gives a soft surface to touch, which is more user friendly, in contrast to the structural steel used. What is important to note is that the consistent use of materials through out the design of the terminal creates a more coherent structure.

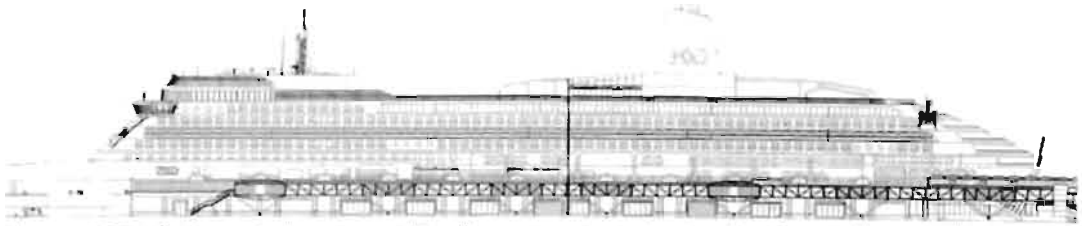


Figure 4.38_North east elevation of Mayflower terminal showing the liner taking priority over the terminal.
(Baillui. 2003: 42,43)

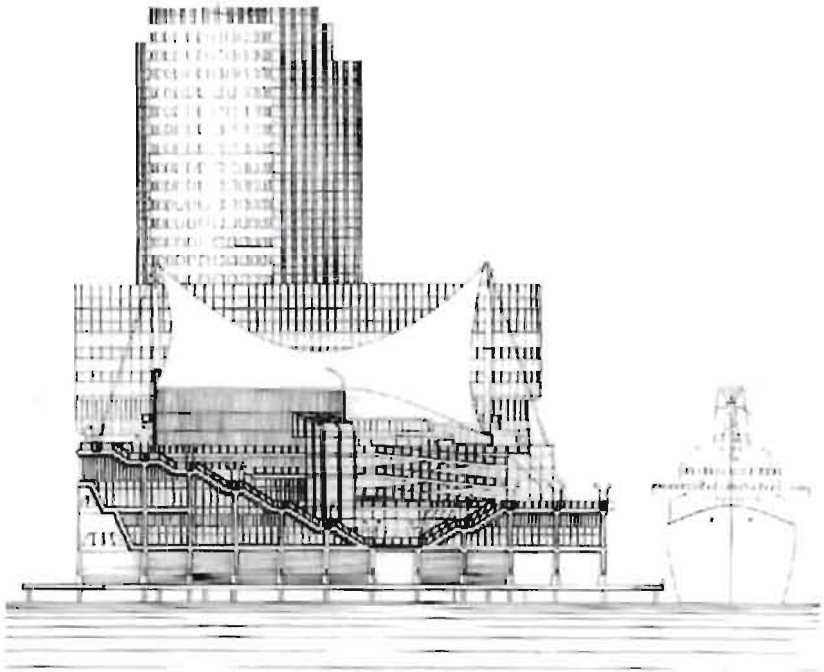


Figure 4.39_North east elevation of Vancouver terminal showing the terminal taking priority over the liner.
(Davey. 1987: 83)

Response to site and climate.

In terms of the climate most terminals studied in this chapter showed no signs at responding to orientation. The Venice harbour passenger terminal did however use some solar shading screens and overhangs to minimize heat gain. Yokohama terminal used massive structural overhangs to shade glazed openings to minimize heat gain as well.

Regarding the site, it can be seen that the concept of the terminal being a gateway to the city is an important one. Visual links to the city around the harbour and terminal building are critical. Not only does it allow the passengers to orientate themselves but it also strengthens the link between the city and its harbour waterfront. The terminal should become an extension of the city as is the case at the Sydney passenger terminal. (See figure 4.40).

Figure 4.40_Analytical sketch showing horizontal separation of arrivals and departures area. *(Herath. 1988: 81)*

5.1 Introduction.

Two local case studies were chosen for this chapter: The Ocean Terminal Building, Durban and the N-Shed Passenger Terminal, Durban. The reason for selecting these examples is that first hand information could be collected through site visits and interviews with persons working at the harbour. This led to a better understanding of the complex nature of a cruise liner terminal.

The criteria under which these examples will be analysed under are similar to those used for the precedent studies. Spatial organisation, circulation systems, response to the passenger process and site analysis will be discussed in terms of their successful implementation in the building. This will serve to inform the accommodation schedule that will follow.

The Ocean Terminal Building has undergone refurbishments which has turned the building into an administrative building. Therefore this case study will be analysed from its point of genesis to its current use. It is important to note that even though the building is no longer a passenger terminal it is beneficial to understand the influences that brought about this change. The other case study to be analysed is the N-Shed Passenger Terminal, Durban. It is currently used as the passenger terminal for boarding and disembarking cruise liners in Durban. By analyzing the current model in use, patterns of passenger process and the relationship of the different spaces in the terminal will emerge. From this, positive and negative aspects will help inform the design of a new cruise liner terminal.

5.2 Ocean Terminal Building, Durban.

Architects: Michael S. Zakrewski & Partners
Completed: 1962/63
Conversion of building by: Protekon Projects
Completed: 1993

Situated on the main pier, off the Stanger Street entrance to the harbour, the Ocean Terminal Building is a large multi-use harbour complex. (See figure 5.1). Completed in 1962 the project cost an estimated six million rand and was considered to be the largest project of its time in South Africa. Constructed mainly of off-shutter concrete the unmistakable Brazilia-style complex was representative of its era. (Wale. 1993: 6). Characteristic of the Brazilia-style was the use of brise-soleil as a means of solar protection. This can be seen on the exterior of the administration block. (see figure 5.3).

The Ocean Terminal Building was designed to serve a multitude of purposes. Facilities for the storage of cargo, pre-cooling chambers for fruit, a passenger terminal and an administrative block where allocated for in the brief. In essence, the facility became the heart of the harbour. The different services were housed into three levels: (See figure 5.2) cargo handling happened at quay level, pre-cooling chambers were directly above that and the passenger terminal facilities were situated on the third level. (Richards. 1963: 194). The administrative block was housed separately in a 12 storey block immediately adjacent the terminal. (See figure 5.3). Today the Ocean Terminal Building has been refurbished and now accommodates only administrative offices. For the purpose of this case study the main area of interest will be the passenger terminal facilities (See figure 5.4 & 5.5) within the complex. It will be analysed in terms of its originally proposed use and how it came to be an administrative facility.

Figure 5.1_Aerail photo showing the position of the Ocean Terminal Building on T-Jetty. Photo shows the terminal under construction in 1962. *(Wale. 1962: 2)*

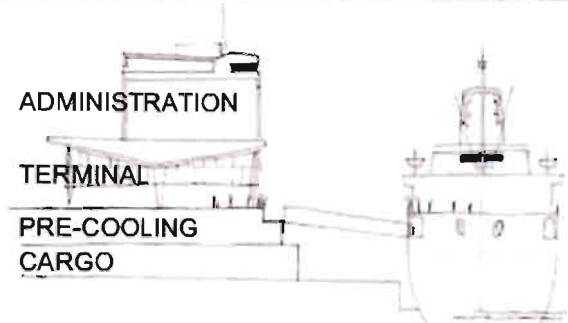


Figure 5.2_Section showing the three levels of the facility with the administration block in the background. *(Richards. 1963: 194)*

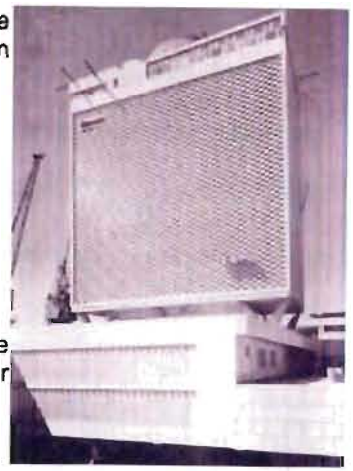


Figure 5.3_Exterior image of the administration block with the solar protected northern face of the building. *(Wale. 1962: 3)*

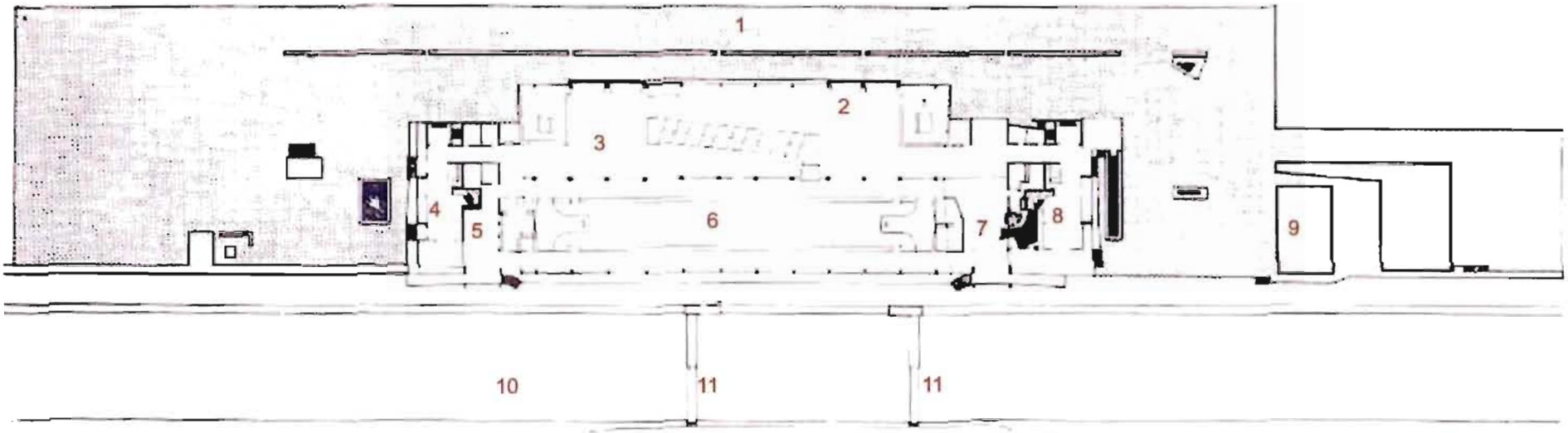


Figure 5.4_Terminal facility plan.
(Richards. 1963: 195)

Key:

1. Roof deck parking area
2. European entrance hall
3. Non-European entrance hall
4. Non-European restaurant
5. Non-European arrival gate
6. Customs & baggage area
7. European arrival gate
8. European restaurant
9. Administration block
10. Quay below
11. Telescopic gangways

Figure 5.5_Upper terminal facility plan.
(Richards. 1963: 195)

Key:

1. Double volume of main terminal area.
2. Non-European kitchen
3. Non-European dining room
4. European kitchen
5. European dining room

A maximum number of 700 disembarking passengers were allowed for in the original design. With the terminal being designed and built in the 1960s, Apartheid ideology had a direct influence on the spatial organisation of the terminal. European and non-European passenger facilities were separated with each having their own entrances. (Richards. 1963: 196). The entrance hall and customs area were housed in a dramatic double volume area allowing light and views from within the space. Baggage was handled through tunnels to lower levels of the building and then placed aboard the ship. (Richards. 1963: 196). This meant that passengers and baggage did not mix allowing for a more pleasant experience of the terminal. Access to the ships was through elevated telescopic gangways. These left the quay side below free for the loading and unloading of cargo. Restaurants, cafés, ablutions and some administrative offices were housed to the north and south of the terminal level. These served the European and non-European sections. Access to the terminal is by an elevated road way. This is still in operation today and works extremely effectively in that it separates the visitor from the harbour operations below.

Steel reinforced concrete was the main material used in the construction and is contrasted by the use of large glazed sections. The glazing allowed for views back towards the city thus strengthening the linkage with the harbour. The concrete was used in sculptural V-shaped columns to support the heavy concrete roof. (See figure 5.6). The form created by the terminal building resembled that of the ships docked next to it, therefore creating a dialogue between the two. Pedestrian walkways were positioned on the quay side of the terminal allowing visitors to engage with the process of boarding and disembarking. The terminal is separated from the waterfront edge which was necessitated by the fact that railway lines ran at quay level. However, the passenger terminal facility still creates a strong visual link with its surroundings that make up for this separation. As a gateway to the city the building allowed for an easy transition from ship to shore.

Figure 5.6_Image showing the reinforced concrete V-columns and concrete roof under construction in 1962.
(Wale. 1962: 5)

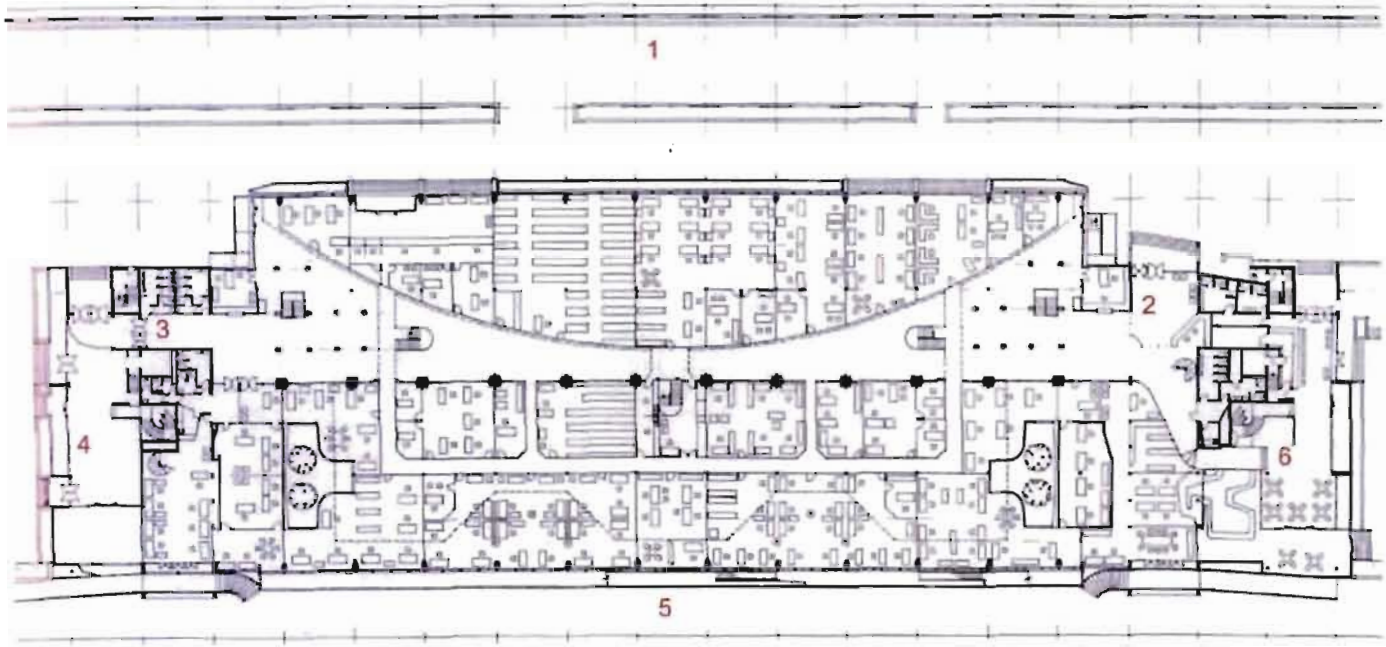
Figure 5.7_Aerial view of the East facade of the Ocean Terminal Building, Durban.
(Wale. 1993: 6)

Further to that, the strong sculptural forms, visual links and dialogue between ship and terminal create experiential sequences of spaces.

When the Ocean Terminal project was conceptualised the Union Castle mail-boats were in operation. They sailed from Southampton to Durban and arrived every Tuesday morning and departed on the Thursday evening. (Richards. 1963: 194). The Union Castle mail-boats carried with them cargo as well as export fruit weighing up to 4000 tons. Passengers from overseas also utilised these vessels as their main mode of transport. Therefore with the regular arrival of these vessels in port a need arose for a building to handle the cargo and passengers. However, upon completion of the project the terminal was rendered obsolete. This was due to the development of air travel which took over sea travel as the main mode of transport. With air travel being substantially faster and cheaper, people naturally opted to utilise this form of transportation. The Union Castle mail-boats decreased their visits to Durban over time till they stopped altogether. With the decline of this service, the Ocean Terminal building became virtually disused. (Wale. 1993: 6).

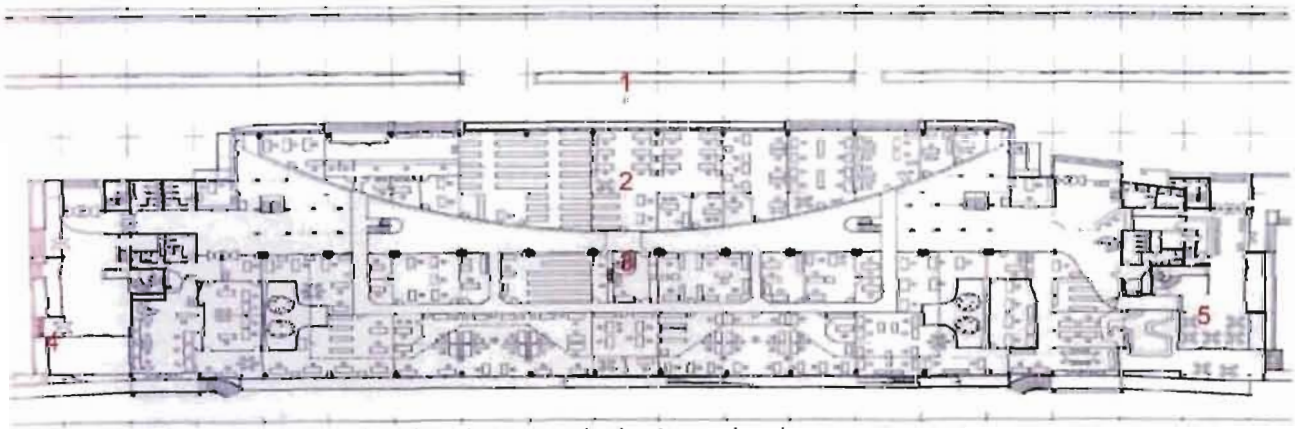
"The commercialisation of Transnet, and the creation of Portnet as a separate business unit, provided the stimulous for change. (Wale. 1993: 6). With the change a need arouse to house the staff within one building. Protekon, a firm of architects and engineers involved in development within the harbour and other transport infrastructure, were commissioned for the renovation. A total of 5500 m² of office space to house 300 staff members was required. These were provided within the main double volume space where the customs and baggage areas used to be. (See figures 5.9 & 5.10). A mezzanine level was added in the double volume to obtain the required amount of office space. A mixture of cellular and open plan offices were accommodated on the two floors. The integrity of the existing structure remains with only minor changes to some of the external glazing.

Figure 5.8_Exterior view of the Ocean Terminal Building with the conference facility entrance on the left and main entrance to the office areas on the right.
(Wale. 1993: 6)



Key:
1. Roof deck parking area
2. Main entrance
3. Staff entrance
4. Restaurant
5. Viewing area
6. Conference room

Figure 5.9_New office plan at terminal entrance level.
(Wale. 1993: 8)



Key:
1. West mezzanine
2. Bridge linking two mezzanine areas
3. East mezzanine
4. Restaurant
5. Conference facility

Figure 5.10_New mezzanine office plan above terminal entrance level.
(Wale. 1993: 8)

Conclusion

In terms of the building's original use as a passenger terminal it served as an important gateway to the city. Passengers were seamlessly connected to the city via an elevated road way (See figure 5.11) which allowed the terminal building to become an extension of the city. The legibility of the terminal facility works well due to the large volume of open floor space in the passenger hall. The double volume allows the passenger to orientate himself through visual links to the city and around the harbour. Poor East-West orientation of the complex was dictated by the T-Jetty site, leading to substantial heat gain and glare in the terminal. Unfortunately no provision is made for pedestrians walking around the complex. A better response to pedestrian access can be seen in the Yokohama Port terminal in the precedent studies. This is due to the separation of pedestrians and vehicles which leads to better legibility of the exterior spaces of the terminal. At the Ocean Terminal building in Durban, the pedestrians have to use the elevated roadway which becomes dangerous and also decreases the overall public interaction with the building. The use of concrete was appropriate due to the hostile corrosive environment of the harbour. By treating the concrete structure in a sculptural manner a lightweight structure is achieved thereby decreasing the amount of material used. This use of concrete is interesting to note in comparison to the use of steel in other terminal buildings. One such example is the Sydney Overseas Passenger Terminal where steel is used to achieve a light weight structure and invoke nautical imagery. Similarly at the Ocean Terminal building, Durban, concrete is sculptured to achieve a lighter appearance and the overall form of the building also mimics that of the ships that berth along side it.

Unfortunately the demise of the Union Castle mail-boats brought an end to the terminal prematurely. With the restructuring and commercialisation of Transnet the building became an office block. It was not until the cruise liner industry developed its own niche in the tourism sector that the need for a terminal building arose once again.

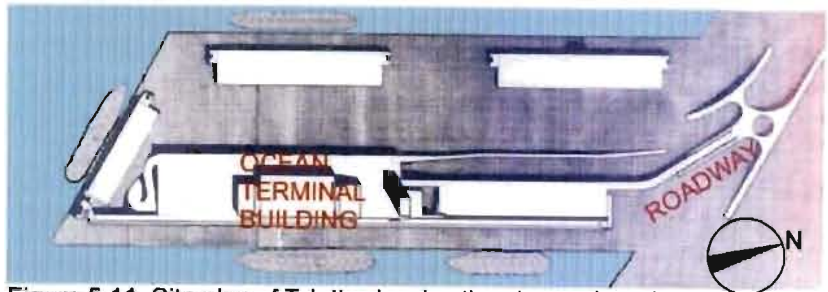


Figure 5.11_Site plan of T-Jetty showing the elevated roadway leading to the Ocean Terminal Building.
(Richards. 1963: 194)

Figure 5.12_Interior view of bridge linking the east and west mezzanine office areas.
(Wale. 1993: 7)

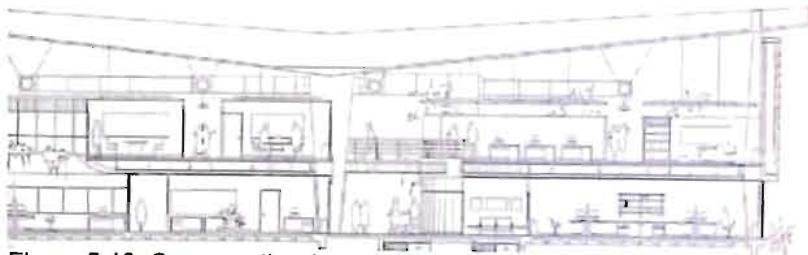


Figure 5.13_Cross section through Ocean Terminal Building showing new office areas.
(Stromberg. 1989: 13)

5.3 N-Shed Passenger Terminal, Durban.

Architects: Protekon Projects

Completed: 1993

"Responding to a challenge from the Port Manager, we converted a battered old cargo shed into a festive multi-use building..." (Johnson. 1995: 7). Originally a cargo shed the N-Shed Passenger terminal shares its location with the Ocean Terminal Building on T-Jetty. (See figure 5.14). With the refurbishment of the existing Ocean Terminal Building into offices a facility to handle cruise liner passengers was no longer available. Some of the refurbishments included the addition of mosaic tiles to the entrance interior, new air conditioning system and new roof structure (Nunes. 2003: 55). Therefore the N-Shed is a make shift building and was not purposely designed for use as a cruise liner terminal.

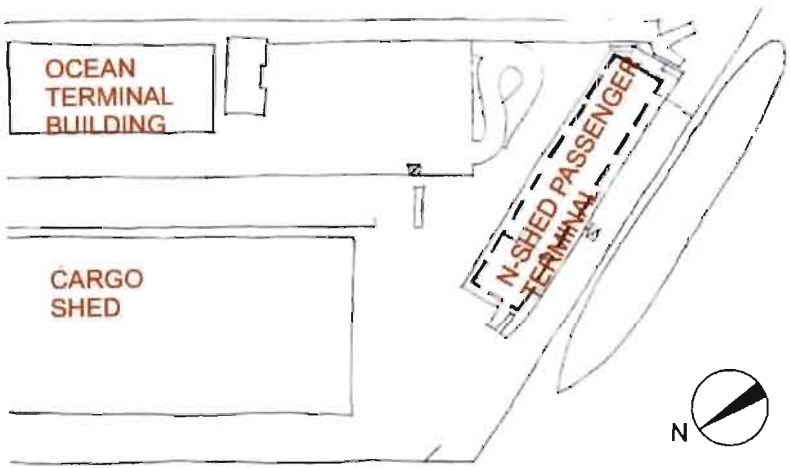


Figure 5.14_Site plan showing position of N-Shed Passenger Terminal in relation to the Ocean Terminal Building.
(Protekon. 1993: 4)

Figure 5.15_View of the Melody cruise liner docked at the N-Shed Passenger Terminal.

The refurbishing of the N-Shed took place in late 1993, on a modest budget, and sought to achieve a cost effective solution to providing a passenger terminal. Some of the important factors that influenced the conversion of the N-Shed were:

- "Flexibility of the facility. The ability to adapt to the various sizes of vessels and frequency of visits.
- Safety and efficiency with regard to movement of general public, passengers and official vehicles.
- Maximised accessibility to allow the people of Durban to enjoy the visits of the ocean liners.
- Minimised cost through utilisation of existing infrastructure and opportunities.
- And finally maximised public-relations benefit to the Port of Durban."

(Protekon. 1993: 1)

These factors, in theory, should lead to a successful scheme. However, upon visiting the facility and witnessing the Melody cruise ship docked (See figure 5.15)

Figure 5.16_View of the general public, passengers and vehicles mixing at ground level.

Figure 5.17_Photo showing the fencing used to restrict access to certain areas.

in December 2006, it became apparent that the current building and systems in place do not work as effectively as they were planned for. The root of the problem lies in the fact that the building is a make-shift adaptation for a complex number of design problems. These set of problems were identified in the scheme but a successful intervention was made more difficult with the existing restrictions around the site of the N-Shed. By utilising an existing infrastructure the overall cost was minimised but certain sacrifices to the scheme had to be made which diminished the success of the terminal.

The N-Shed passenger terminal is a flexible facility that can accommodate vessels of varying size. This is due to the terminal being used as cargo shed in the past which required it to adapt to various size vessels. Movement of the general public, passengers and vehicles all mix together outside the terminal. (See Figure 5.16). People and vehicles mix at the parking lot and wharf edge, in front of the building, because people wait outside before boarding the cruise ship. This creates an unsafe environment and has decreased the overall efficiency of the building. Although the maximising of public-relations with the harbour was one of the major factors in the project little is done to encourage interaction with the terminal and cruise liner. Due to existing restrictions on the site fencing is used to control access to certain areas around the building and near the ship. (See figure 5.17). As in the Sydney Overseas Passenger Terminal, pedestrian movement is allowed to interact with the berthed cruise liner. Here the architecture creates the framework for controlling the movement of people as apposed to physical barriers. The circulation of people and vehicles lead to an eligible environment. Cars and buses have to loop back around in order to access certain areas. (See figure 5.18).

Maximised accessibility of the terminal was not achieved in the scheme. As the N-Shed is an existing structure, originally used for cargo, there was no need to create a linkage with the city of Durban.

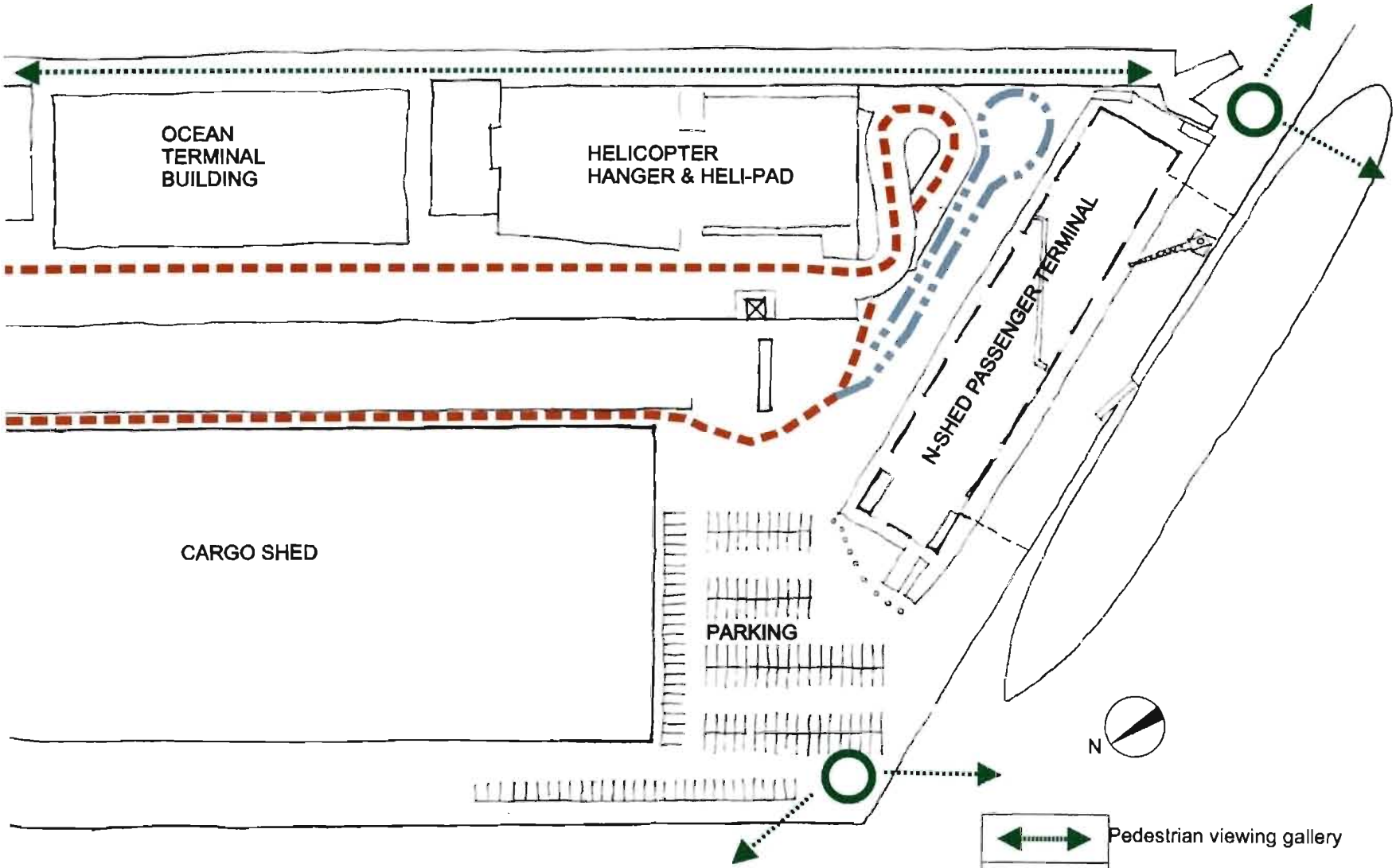


Figure 5.18_Site plan showing circulation of vehicles, buses and pedestrians.
(Protekon. 1993: 2)

Figure 5.19_Photo showing marquee structure erected when passengers are boarding.

Figure 5.20_View from within the terminal showing the public concourse area.

The N-Shed terminal is buried deep within the harbour making it difficult to access thus destroying any possible linkage that the terminal could have with the city. Therefore the idea of the cruise liner terminal as a gateway to the city is not present within the current building. Another significant problem at the N-Shed is the lack of public space and facilities for the local residents of Durban. In this regard the National Ports Authority has failed to capitalize on the interest that the local residents show when ever a cruise ship enters the harbour. Commercial enterprises developed in conjunction with a new cruise liner terminal, incorporating entertainment facilities such as shopping and restaurants could create a unique attraction for local residents to enjoy.

The N-Shed Passenger terminal itself is a single storey, long linear form building. Arrivals and departures occur on one level but the process of arriving and departing seldom happen on the same day. Therefore the typology of separating arrivals and departures vertically was not needed. Planning of the internal spaces is broken down into three zones: public hall, passenger check-in hall and baggage handling. (See figure 5.21). The public hall has very little to offer in terms of amenities. A small number of kiosks are catered for therefore not allowing the terminal building to capitalize on a captive audience. When inside the building there are no visual links with the outside. Unlike the Mayflower Terminal in Southampton where one always has a view to the exterior, passengers have few opportunities to orientate themselves. People tend to move in and out the public hall as there is little seating available thus adding to the congestion in the outside areas. Physical barriers are used to separate the passenger check-in area from the public hall. In this area passengers check their baggage in and proceed to boarding. Baggage is handled manually and then placed in the respective cabins onboard the cruise liner. Boarding the cruise liner is from wharf level and is made into a low-key affair. A temporary marquee structure is erected to emphasize the entrance. (See figure 5.19). Although this is an attempt to create a festive atmosphere to the boarding process one feels that this could have been handled better.

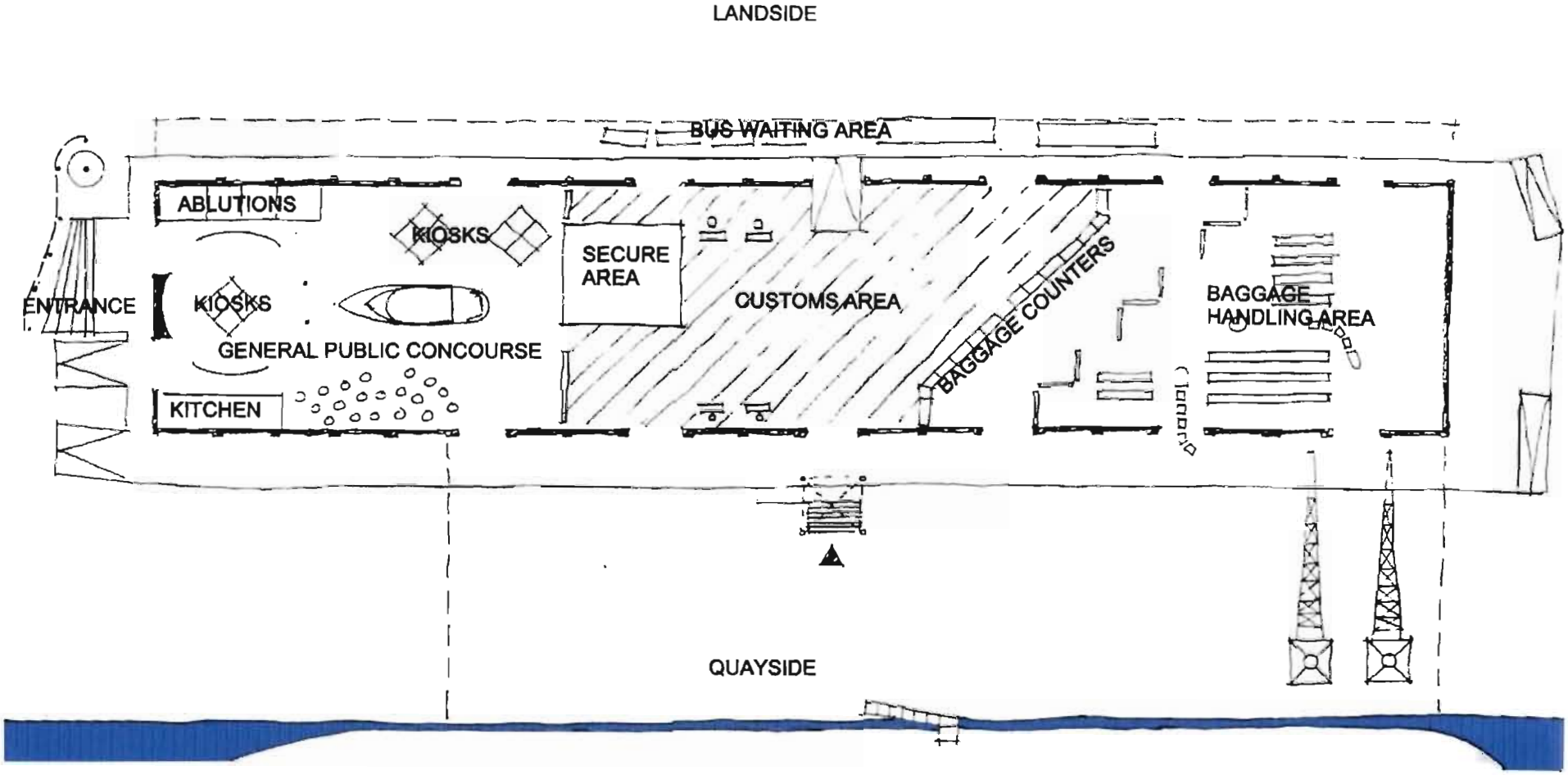


Figure 5.21_Floor plan of N-Shed Passenger Terminal.
(Protekon. 1993: 6)

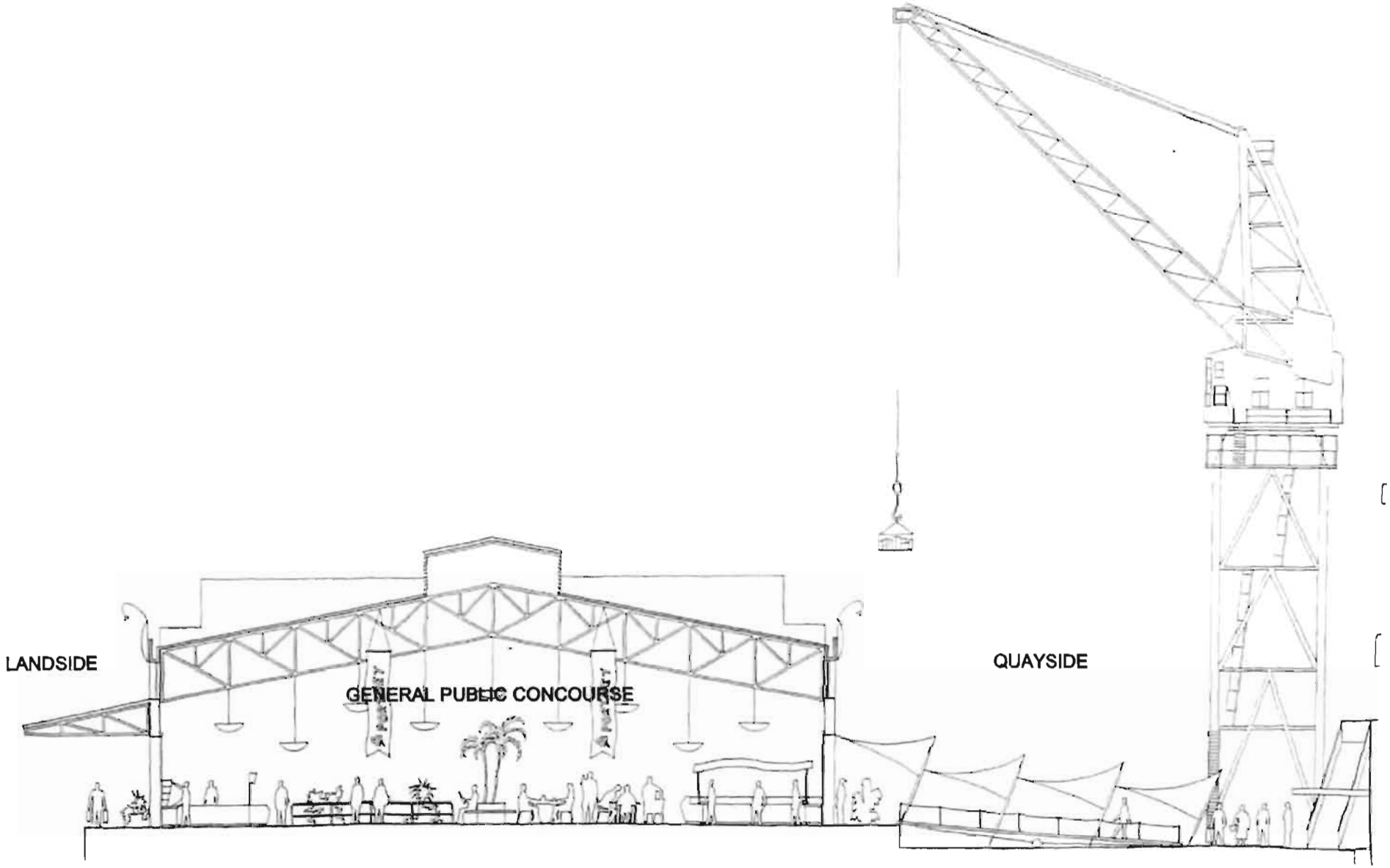


Figure 5.22_Cross section through N-Shed Passenger Terminal
(Protekon. 1993: cover page)

Figure 5.23_Exterior photo showing main entrance on the north side of the terminal.

The use of elevated gangways, as seen in some of the precedent studies, would have created a more ideal situation. Separating the passenger from the wharf level would allow for other activities to occur below.

Conclusion

One positive aspect of the current scheme is that a low cost facility was achieved by doing little more than adding a new coat of paint. However, with the scheme being purely economically driven, key design factors of the building were not convincingly catered for. These alterations to the building have been superficial and have not been able to make the terminal function better as a cruise liner terminal. The separation of people and vehicles is not dealt with properly leading to a chaotic state at wharf level. Amore successful conversion of a shed into a terminal building can be seen in the Mayflower Southampton Terminal. At the N-Shed terminal a clear legibility of both exterior and interior spaces is not present. As a gateway to the city the terminal fails in capturing its sense of place in Durban and communicating it to the passenger.

5.4 Conclusions and Comparisons.

Spatial and accommodation organisation.

In the case studies above, as well as in the precedent studies in the previous chapter, the organisation of the movement of cruise liner passengers is within a linear form. This is true for both the Ocean Terminal and N-Shed terminal in Durban. Passengers and baggage are separated with physical barriers on the same level.

An interesting aspect to note is that both of the case studies operated in isolation as apposed to the examples discussed in the precedent studies. Entertainment and civic facilities have not been attached to the terminal but rather basic amenities have been catered for. This occurrence, in particular to the Ocean Terminal Durban, can be attributed to the era in which it was built.

Response to the passenger process.

In the Ocean Terminal Building example elevated gangways were used for boarding and disembarking. This allowed people to move freely at wharf level and also allowed the public to view the ship from a walkway that was separated from the gangway. In contrast, the N-Shed Terminal has wharf level access to the ship which requires the physical separation of areas.

Resolution of form.

The use of sculptured concrete in the Ocean Terminal Building has created a form that invokes a nautical imagery. Being built in the 1960s, pre-cooling and cargo facilities below the terminal plaza generated the scale of the building which took preference over the cruise liner. The N-Shed terminal, being an existing structure, had little opportunity to explore this tension in scale between the ship and terminal in the design.

Figure 5.24_Aerial view of Ocean Terminal Building complex.

Response to site and climate.

With both terminals discussed in the case studies, being positioned deep within the harbour makes access to them difficult. Of the two case studies the Ocean Terminal Building responds more effectively as a gateway to the city. Visual links to the city are made possible from the terminal's elevated position. In terms of the response to Durban's climate, the N-Shed's long linear form allows some cross ventilation to occur. The Ocean Terminal Building however, is air-conditioned with no opportunity for cross ventilation. With its East-West orientation being dictated by the site, solar protection becomes more difficult. Heat gain to the building is increased and the roof overhangs are not substantial enough to shade some of the exterior glazing.

Chapter 6: New Cruise Liner Terminal development.

6.1 Introduction.

This chapter will deal with the approach to designing the new cruise liner terminal in terms of deriving a brief. Design objectives will be discussed in terms of the driving design concepts. Aspects such as passenger movement through the terminal and how they will be handled in the design will be analysed. Another aspect that will be dealt with is the waterfront context within which the terminal is situated and how the design will respond to this context. The conceptual frameworks and contextual issues regarding the design of the cruise terminal will be outlined. A schedule of accommodation will be formulated showing the main components making up the terminal. By formulating these components a better understanding of the requirements for the terminal will be facilitated. The brief derivation, schedule of accommodation and brief have been informed by interviews with persons involved in Port planning and Transnet. Precedent and case studies have also been used to inform the schedule of accommodation.

6.2 Brief derivation

The client.

For the purpose of this project, the client is the National Ports Authority. (N.P.A). The N.P.A.'s focus over the years has been on cargo handling in Durban harbour. With the local cruise market experiencing an increased interest, the N.P.A. has acknowledged the need for a new world class passenger terminal. Linking with the Point Development, the A-berth site has been earmarked by the port authority as the site of choice for the new terminal. By doing this the N.P.A will increase the public's awareness of the port and its importance to the economy.

Funding and revenue generators.

As the N.P.A is a parastatal organisation, direct funding for the project will come from the Port Authority. The N.P.A. is also interested in developing the commercial aspect of the terminal thereby producing revenue from the facility on a sustainable basis. These commercial aspects will take the form of retail outlets, restaurants, entertainment and civic amenities.

Users.

The main function of the terminal is to facilitate the berthing of cruise liners, in the port of Durban. Therefore, the main users of the terminal will be the cruise operators such as M.S.C. and Starlight Cruises as well as the passengers. As the commercial opportunity of the site will be developed the local public and visitors to Durban will also be using the terminal. When not in use by cruise liners the Port Authority will use A-berth as a lay-bye for other vessels carrying cargo. From this the terminal needs to be a legible gateway to the city of Durban, allowing for the ease of passenger flow through the terminal. The commercial environment should be developed as a unique environment at the harbour's water edge to attract the local residents and visitors of Durban.

Environmental requirements.

Due to the nature of the terminal, large volumes of passengers will pass through the complex at a given time. Environmentally, the terminal needs to respond to these passengers in terms of providing a comfortable area for the passenger moving to and from the ship. Therefore day lighting, ventilation and orientation become key factors in the success of the building. As there are large numbers of passengers moving through the terminal, the volume of spaces need to be high enough to give the feeling of spaciousness. The terminal also needs to respond to the harsh, humid and corrosive environment that exists at the harbour.

Construction system and materials.

The construction system should allow for the adaptation of the building to new influences that will affect it over the years. A modular frame and infill type of construction would allow for flexibility and ease of construction. Due to the harsh corrosive environment of the harbour, materials such as steel would need to be protected through zinc galvanizing. Materials such as aluminium and concrete would perform well in the harsh environment.

Site requirements.

As the intended use of the building is as a cruise liner terminal, a given set of requirements are in place. The building needs to be sited in the harbour were the size of the site allows for the berthing of cruise liners and the water is also deep enough to allow for the berthing. Pedestrian access as well vehicle access to the site will be important in linking the terminal with the city and its surroundings. Good orientation allowing for south light to be used would be ideal in the design of the terminal.

Design objectives.

The main design objective is to provide a passenger terminal that will serve as a gateway, not only to the city of Durban but for the rest of South Africa. Reclaiming the harbour's waterfront edge will also be important in creating a unique place for people to enjoy. The terminal should respond, contextually, to its harbour surroundings and link with the greater urban framework of the point area to produce a more coherent building. Other aspects that will be explored in the design of the terminal are:

- Through the study of both local and international precedents a cross fertilisation of ideas can assist in achieving an architecture that is relevant to the local context.

- The terminal is a multi-functional and multi-cultural building reflecting the current local environment.
- The terminal serves as a gateway to the city and therefore should reflect the architectural language of its place.

6.3 The brief.

The terminal:
Cruise liners typically spend periods of less than a week in Durban, during which time passengers will visit tourist attractions in Durban and around KwaZulu-Natal. The primary objective for this development is to provide a world class cruise liner terminal facility for Durban. The principal function of the terminal will be to provide safe, secure and controlled facilities for the embarkation and disembarkation of passengers whilst also providing berthing and servicing facilities to cruise vessels. The docking of the largest cruise liners is to be provided for in the scheme.

Durban cruise industry:
Durban's cruise season typically lasts between mid-November to mid-April, of the following year. Therefore, the cruise terminal should meet the requirements of vessels operating seasonally from Durban (MSC Melody etc.) as well as for vessels calling at Durban on various world cruises eg. Queen Elizabeth II. Cruise vessels will call on Durban some 40 times during the cruise season, carrying around 1500 passengers each time.

The site:
A-berth, sited at the end of Mahatma Gandhi Road, was selected by the Port Authority as being the preferred location for the facility.

Cognisance must be taken of the port entrance channel widening project, due to be in construction for the next three years. There is no requirement to provide for any freight handling activities at A-B berths; however the berths may be used as lay-bye berths for other vessels when not required by cruise liners.

Context:

As Durban harbour is primarily a working harbour, consideration should be given to the interaction of the terminal with the harbour. Positioned in the Point Development precinct, the facility will tie into and draw from historical and current developments occurring in the area.

Concepts:

The goal of the project is to create a unique building that will embody the multi-cultural background of Durban. In terms of the passenger, the cruise liner terminal is the first impression they get of a city. It is at this point of transition, from water to land, that creates a lasting impression on the passenger and is very likely the deciding factor whether the passenger comes ashore or not and whether a further visit is contemplated or not. Therefore, the terminal is a very important gateway to the city of Durban and should draw the passenger to our shores. The rehabilitation of the harbour's waterfront edge should also be maximized to its full potential. The terminal will not only serve the passengers aboard the cruise ship but will also promote a more public interaction with the harbour's waterfront edge. This will serve to better increase the public awareness of the activities at the port and develop a unique destination for the local residents of Durban to enjoy.

Facilities:

The major facilities to be catered for are that of the passengers moving from ship to shore, or vice versa. Tourist information and accompanying services are essential in the scheme.

The building of a new cruise liner terminal at the Point precinct will tie in with the commercial development already underway at the Point. Introducing commercial facilities at the new cruise liner terminal will further exploit the development at the Point. Entertainment and retail facilities should form part of the terminal to realize the full economic potential of the site. As the terminal will be within the view of the city, and in close proximity to the Point development, it is essential that these two developments complement each other. Not only will this create strong visual linkages to the city but it will also strengthen the terminal appeal for commercial opportunities.

Terminal facilities will include telescopic and quayside vessel access, a passenger hall for baggage handling and processing, a public meet and greet area, a tourist information area, customs and security facilities, a baggage handling system, parking, toilets, restaurants, car hire, telecoms, shops and retail outlets.

Accommodation schedule.

The accommodation schedule has been derived from in-depth interviews with people working at Durban harbour and the design of passenger terminals. International as well as local precedent and case studies were also used in determining the appropriate schedule of accommodation for the project.

7.1 Introduction.

Due to the nature of the design project, site selection is restricted to the Durban harbour region. The majority of the activity in the port is focused on handling cargo, making it a working harbour. Most of the sites have been allocated for the berthing of cargo ships.

The three sites which will be analysed are: (See figure 7.1)

1) The Maritime Museum site.
2) R-Berth site.
3) A-Berth site.

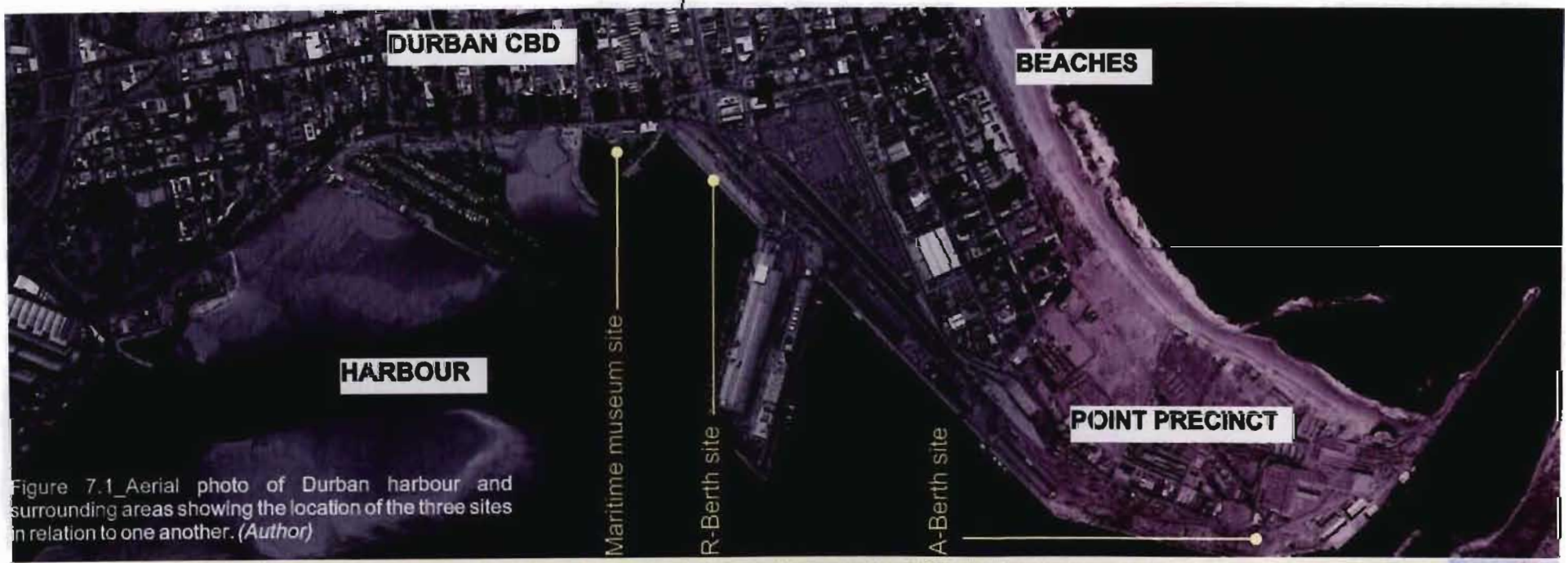


Figure 7.1_Aerial photo of Durban harbour and surrounding areas showing the location of the three sites in relation to one another. *(Author)*

These sites will be analysed under certain criteria in order to establish its appropriateness for the development of the cruise terminal. Each criterion is used to examine how the site responds to specific requirements needed for the cruise liner terminal. These criteria are:

- Context
- Linkages to the city/Access
- Waterfront edge opportunities
- Restrictions
- Overall assessment

Context: The location of the site in relation to the harbour and the city will be discussed. Aspects influencing the site such as orientation and views will be analysed to ascertain what affect they will have on the terminal.

Linkages to the city/Access: This criterion will establish how well located the site is in its ability to create a strong linkage to the city. Pedestrian access as well vehicle access to the site will be evaluated. The ease of access to the site will also be related back to how access can strengthen the linkages to the city. The issue of overall legibility of the site to the public will be explored.

Waterfront edge opportunities: Developing the waterfront edge of the site, as well as around it, would strengthen the overall design intervention. Opportunities for entertainment, commercial and public activities occurring at the water's edge shall be explored. By creating a place for people to enjoy at the waterfront edge the terminal can function as a multi-functional complex. As part of a larger urban fabric the terminal will need to relate to its surrounding context. This could be done by linking and continuing exiting waterfront edges.

Restrictions: Restrictions on the site affecting the development of the cruise liner terminal will be studied under this criterion. Aspects such as berthing dimensions on the quay side will be looked at to determine if it is possible for cruise liners to utilize the site. Access restrictions, surrounding buildings and environment are other aspects that could create restrictions on the site.

Overall assessment: An overall assessment of the site is discussed by drawing conclusions from the criteria investigated above. A decision is made whether to use the site for the cruise liner terminal, based on how effectively the site responds to the criteria.

7.2 Maritime Museum site.

Context: Located on the northern half of the harbour, the Maritime Museum site is situated adjacent to the Victoria Embankment. (See figure 7.2). The site is a continuation of the successful Wilson's Wharf and Yacht Mariner developments. Views of the entire working harbour, looking south, as well as the bottom edge of the Durban CBD along Victoria Embankment can be enjoyed from the site. With the site being orientated north south, good quality light from the south can be used in the design of the building. As the site is closely located to the bottom edge of the Durban CBD along Victoria Embankment, the tall buildings can provide some protection from the north sun.

Linkages to the city/Access: The Maritime Museum site is ideally positioned along Victoria Embankment. This allows for immediate visual links with the city upon arriving in port. A cruise liner terminal on this site would be visible by passengers arriving at the building on their way to boarding a cruise liner. Therefore linking with the city would be facilitated by the overall legibility created from visual links. Vehicle access to the site would be from the main harbour entrance off Stanger Street. Tour buses and taxis, servicing the passengers, would also enjoy the close proximity of the site to the city. Pedestrian access could be re-established by opening the tunnel running under the railway tracks. (See figure 7.3).

Waterfront edge opportunities: As the site is currently being used as a maritime museum an opportunity lies in the integration of the museum with the cruise liner terminal. Coupled with the Bat Centre to the east of the site, this waterfront edge could be revived to create a unique place along the Victoria Embankment. The already established Wilson's Wharf and Yacht Mariner waterfront would be extended up to this site and strengthened.

Restrictions: In this instance the waterfront edge opportunities are also the major restrictions of the site. As the Maritime Museum is currently occupying the site, a reorganizing of spaces and vessels would need to occur in order for the development of a cruise terminal to happen. Added to this, existing pier and jetty structures would need to be demolished to allow for the cruise liners to berth. (See figure 7.3). Another obstacle to overcome would be the deepening of the water at the site which would mean that the quay side wall would need to be re-established as well. By doing this cruise liners would be able to utilize the berth.

Overall assessment: In terms of location the Maritime Museum site is ideally positioned to link with the city and allow for easy access. The opportunity of incorporating the Maritime Museum with the terminal, as well as other commercial activities, would add an extra dimension to the complex. Based purely on that, this site would probably be the most favourable site for the development of a cruise terminal. However, in order to make the site available for the construction of a cruise terminal a large amount of capital would need to be spent. Existing conditions at the site do not allow for the berthing of cruise liners due to the shallow waters and small quay side berth facility. Therefore the cost of building would be vastly increased thereby putting this site at a disadvantage for selection.

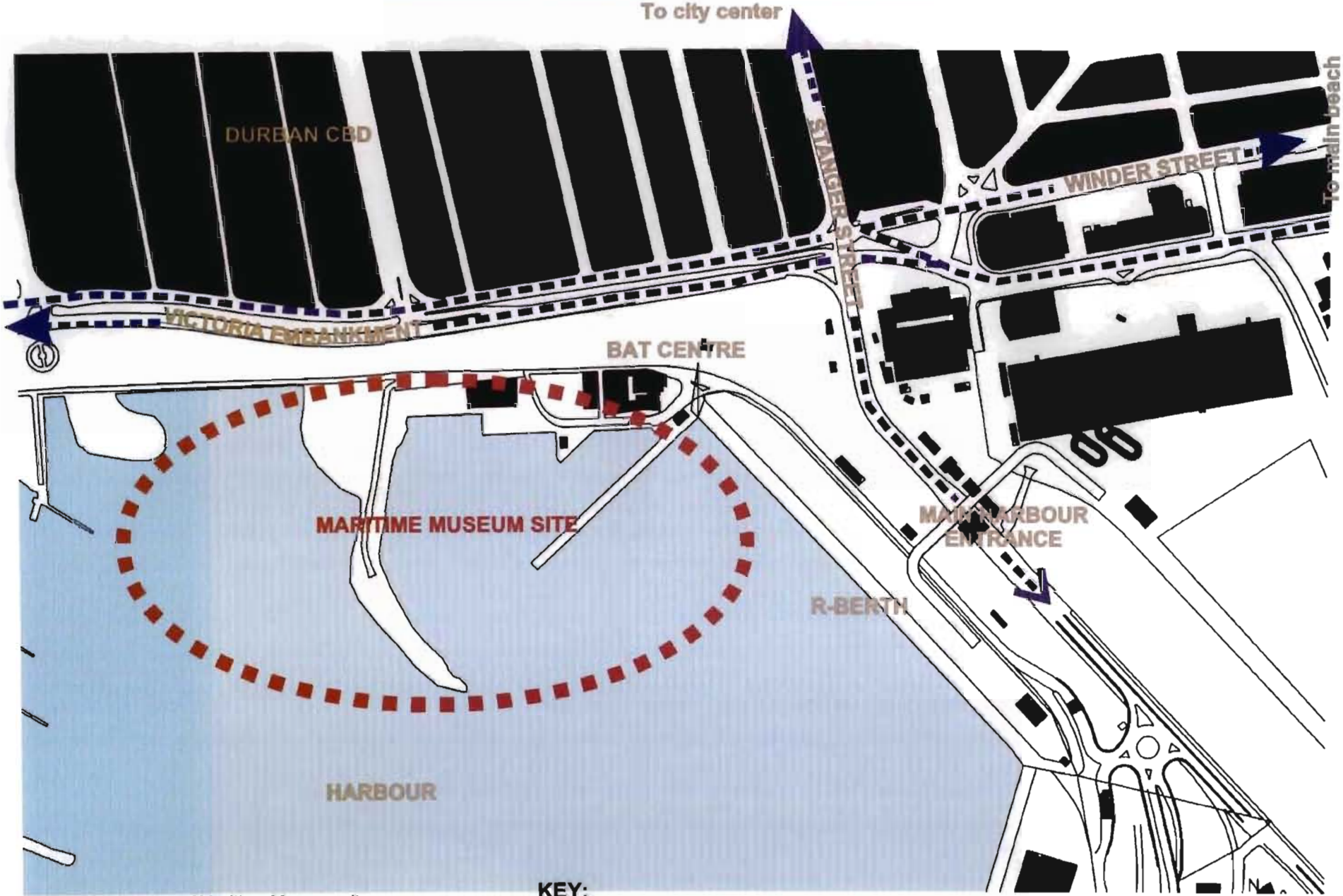


Figure 7.2_Site plan of Maritime Museum site

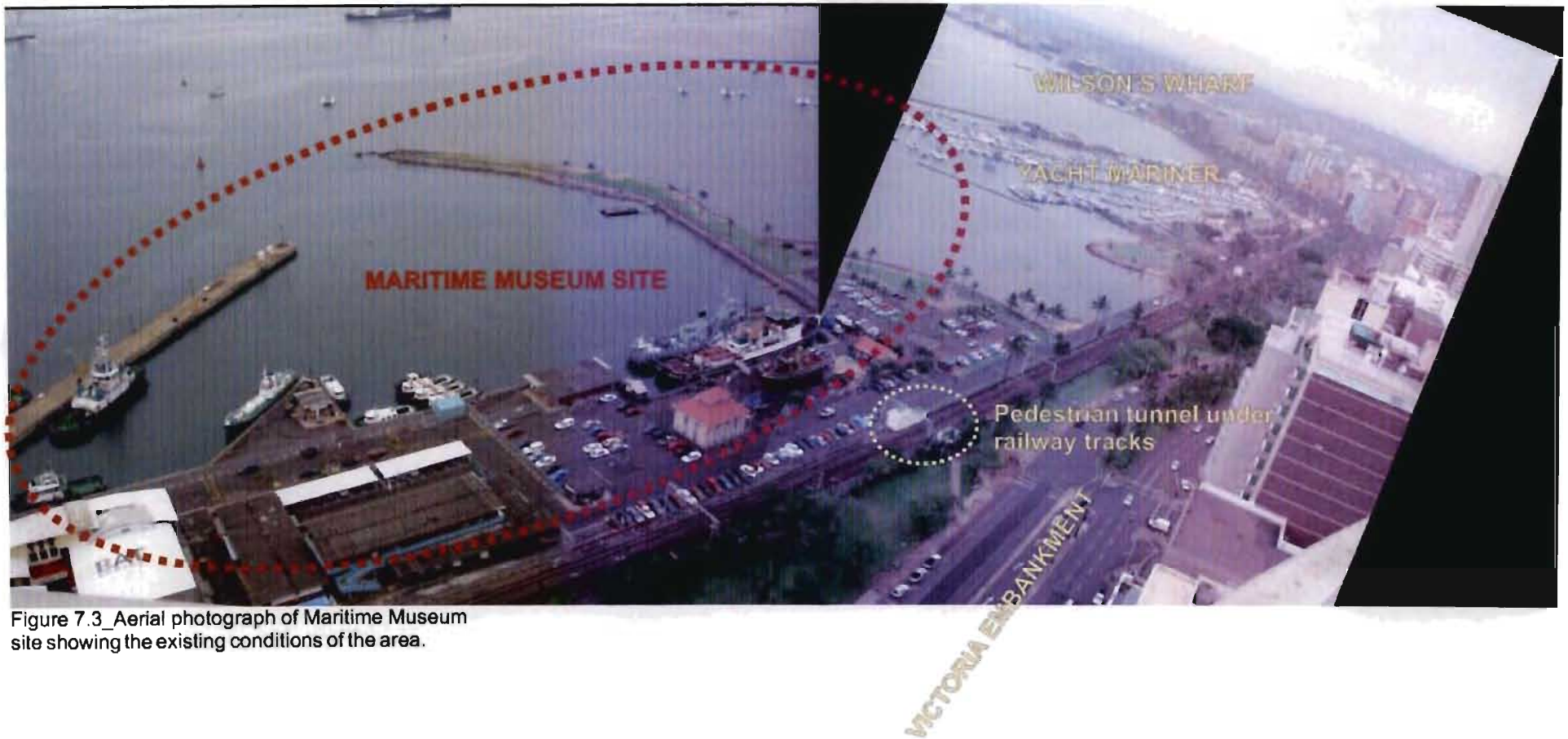


Figure 7.3_Aerial photograph of Maritime Museum site showing the existing conditions of the area.

7.3 R-Berth site.

Context: Positioned south-west of the main harbour entrance off Stanger Street, the R-Berth site has similar strengths to the Maritime Museum site. (See figure 7.4). The site is orientated north-east allowing for relatively good control of sunlight and heat gain to the terminal. R-Berth is conveniently sited relative to the city and is also adjacent to the small craft harbour. This site enjoys a close relation to the Victoria Embankment allowing for visual links. Views of the harbour, looking south, and north towards the city CBD are possible from the site.

Linkages to the city/Access: Due to the close proximity of the site to the main harbour entrance and Victoria Embankment, vehicle access is good. (See figure 7.5). There is a further opportunity to develop a separate access from Victoria Embankment to the R-Berth site. This would further strengthen the close linkage of the site to the city. Pedestrian access to the site would be problematic due to the heavy vehicle traffic in the area. Passengers arriving at the site, to board a cruise liner, would be able to see the terminal. Similarly passengers arriving in port from a cruise would be able to view the terminal in its context of the harbour and city in the background. This leads to a legible site where people can orientate themselves.

Waterfront edge opportunities: The waterfront edge at R-Berth would be the ending piece of the waterfront edge along Victoria Embankment. As in the Maritime Museum site, R-Berth would have a close relationship with the Bat Centre creating an extra quality to the waterfront edge in the area. Coupled with commercial and entertainment facilities in the terminal, it would rejuvenate the waterfront edge.

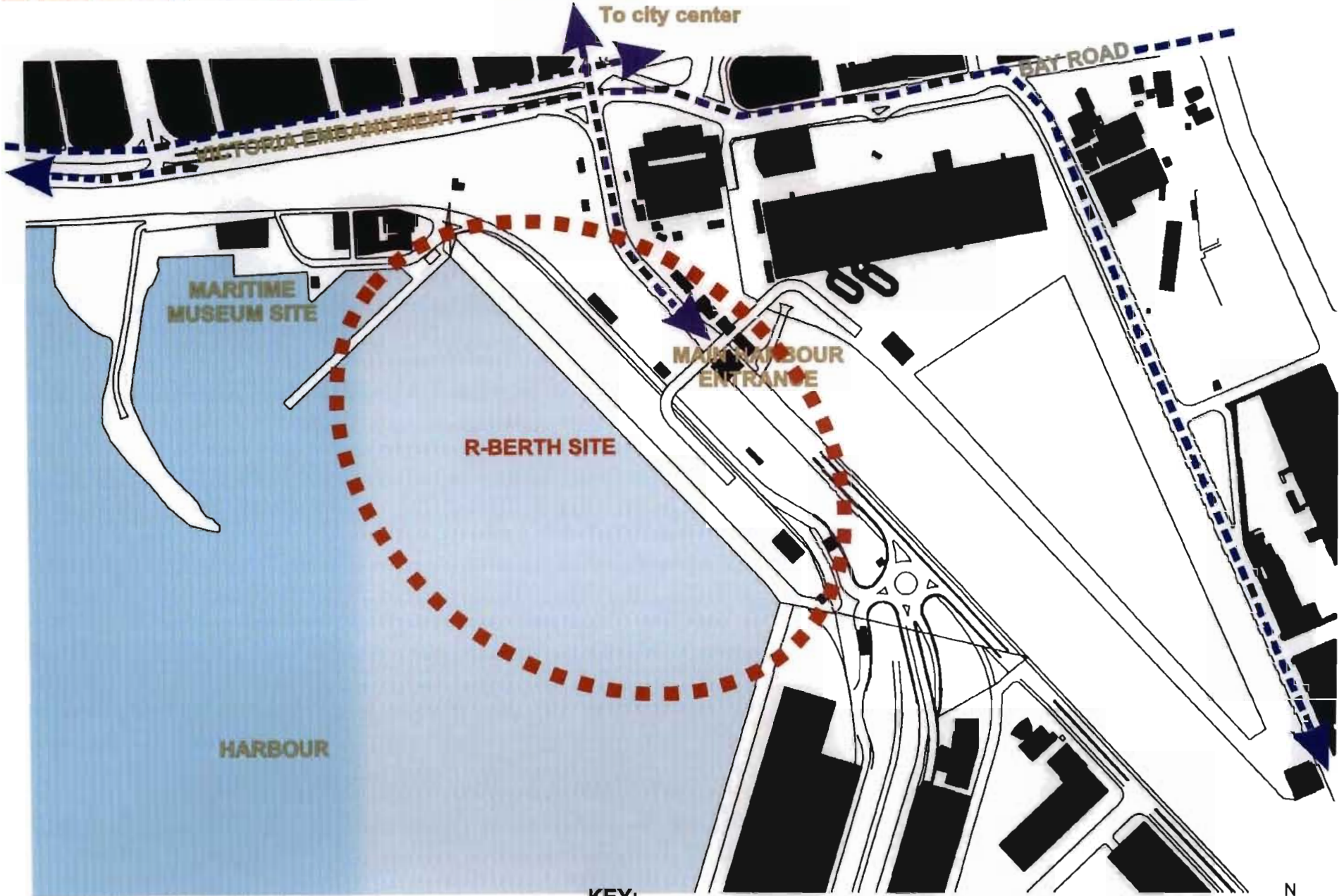


Figure 7.4_Site plan of R-Berth site.

Figure 7.5_Aerial photograph of R-Berth site showing its position in relation to the main harbour entrance.

Restrictions: "R-Berth is 183m long and 10.9m deep." (Nunes 2003: 60). These dimensions are fine for the berthing of smaller cruise liners but are not sufficient for the larger vessels. Therefore, the deepening and widening of the berth would be required to allow for larger cruise liners. The site is bounded by railway tracks and roads, diminishing the overall size for development on R-Berth.

Overall assessment: R-Berth site has good potential for developing a cruise terminal. This is due to its good accessibility and close relation to the city. However, for the development of a cruise terminal to be accommodated the, quay side wall would need to be lengthened and the berth made deeper and such projects would add significant cost to the overall project. Further to that, the site is located inside the working harbour. This means that passengers would have to pass through the busy activities of the harbour to access the terminal which is not ideal.

7.4 A-Berth site.

Context: Located at the end of Point Road, A-Berth is currently used as a working berth for the loading and unloading of cargo. (See figure 7.6). Being situated at the mouth of the entrance to the harbour, the terminal would be clearly visible when entering port. Clear views of the city skyline and harbour, looking northwards, is possible from the site. "A-Berth is 288m long and 11.7m deep." (Nunes 2003: 62). This makes the site ideal, in terms of dimensions, for the berthing of cruise liners. Orientation of the site is north-east which allows for the controlling of solar heat gain.

Linkages to the city/Access: One disadvantage of A-Berth is that it is removed from the city. However, direct vehicle access to the city is possible from Point Road. Pedestrian access to the site could be easily incorporated by allowing people to filter into A-Berth off Point Road. Linkages to the city are minimized but there is a strong relationship with the Point Development Precinct and A-Berth. Strong visual links to the terminal can be made from approaching the site off Point Road.

Waterfront edge opportunities: With the widening of the harbour mouth, currently under way, the existing entertainment waterfront edge will be lost. (See figure 7.7). An opportunity lies in re-establishing this edge within the context of the cruise terminal waterfront. This would create a unique destination that would relate back to the Point Development precinct.

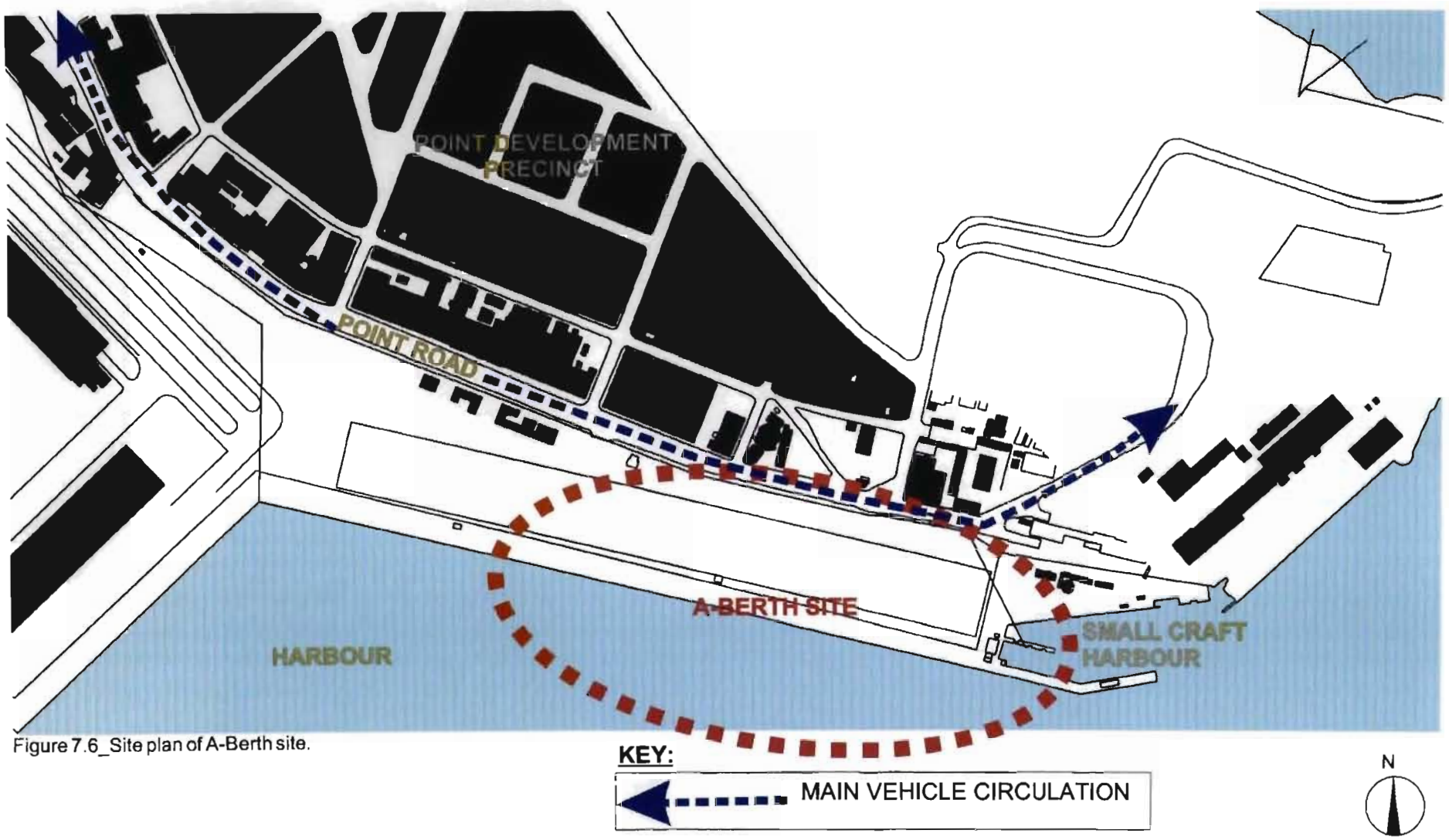


Figure 7.6_Site plan of A-Berth site.

Figure 7.7_Aerial photograph of A-Berth site showing the harbour mouth entrance.
(Http://earth.google.com, accessed 29-03-2007)

Restrictions: There seem to be no serious restrictions on the site that would affect the development of a cruise liner terminal. A-berth does not clash with any existing structures therefore little capital investment is needed to prepare the site for the construction of a terminal. One possible restriction would be the widening of the harbour mouth. This process would need to be taken into account as building work could affect the development of the cruise liner terminal.

Overall assessment: A-berth has been ear-marked as the site of choice, by the National Ports Authority, for the development of a cruise terminal. The site is well positioned in relation to transport infrastructure allowing for easy access and increased legibility of the site. Being closely related to the Point Development Precinct, opportunities for commercial and entertainment facilities could be incorporated into the terminal. No serious restrictions can be seen on the site and the linkages with the city can be maximized in the design of the terminal itself through the use of materials, proper orientation, height for better views and visible links to the point development and city.

7.5 Selected site.

A-Berth

By analysing the three sites above using the same criteria, each site obtains a scorecard that is comparable and objective. This allows the site to be interrogated robustly in terms of how it would respond to the development of the proposed structure. From the analysis done above the A-Berth site is seen as the best site for the development. This is due mainly to its close relationship to Mahatma Gandhi Road which allows the site to link with the city. There is potential for public waterfront edge development at the site to re-establish the edge being lost from the widening of the harbour mouth. A-Berth is also the only site large enough for the berthing of cruise liners without having to deepen waters or lengthen quaysides. In terms of visual legibility of the site, A-Berth allows views of the harbour and city giving better orientation to the passenger.

This chapter is a review of data gathered throughout this research and thus suggests an appropriate architectural response for the design of the new Cruise Liner Terminal at the Point for Durban.
The research carried out in this document has shown that the main aspects to consider in the design of the cruise liner terminal are:

- Movement and circulation in the terminal building.
- Linkages with surrounding area and the terminal as a gateway to the city.
- Waterfront regeneration.
- The resolution of form through technology and materials used.

Precedent and case studies, discussed in chapters number and number, show that these aspects are the considerations that inform the design of the cruise liner terminal.

Movement and circulation in the terminal building.
As discussed in chapters four and five, movement and circulation of persons have been organised in linear form buildings. This arrangement in most examples is such that you enter the building, move to the end of that building and you either leave in a cruise ship or return back along your own path. Consequently, large walking distances are created within these terminal buildings giving the impression that the true nature of the problem of passenger movement was not fully understood. Hertzberger suggests that "the first consideration of decisive importance in designing a space is what that space is intended for and what not, and consequently what the proper size, is to be." (Hertzberger. 1991: 190). By understanding the overriding forces present within the design problem a more convincing solution can be found. As a consequence of this understanding a more legible system of passenger movement and circulation can be implemented.

Within the terminal, horizontal circulation is best planned in straight lines for ease of orientation of passengers in locating the different facilities inside the terminal. The combining of lifts, stairs and escalators for vertical circulation can be seen in most examples discussed in this research. Escalators are able to move large volumes of people efficiently while stairs serve as a backup in the event that the escalators require maintenance or in the eventuality of power failures. The provision of lifts is essential in catering for the disabled.

Linkages and the terminal as a gateway to the city.

The cruise terminal is essentially a gateway for passengers moving into Durban. As a result of this the building becomes a landmark in that it captures the character of the city and is instantly associated with its surroundings. Linkages to the city, both physical and visual, become important factors of consideration in that they help passengers with orientating themselves in their new environment. As the cruise terminal is a point of interchange, easy access to other modes of transport need to be considered. Therefore the selection of a site should allow for passengers to use other modes of transport, once off the cruise vessel, to link with the city.

Waterfront regeneration.

As the harbour is a largely industrialised zone, the true potential of the waterfront edge has been lost. This has also created a barrier between the city and the harbour. Therefore by providing public amenities for both passengers and the local community the once lost urban edge can be re-activated. It is also important to note that the building is not just a terminal facility but should also be seen as a uniquely local destination for residents of the city and its immediate surroundings. By creating a facility that does this the issue of sustainability of the terminal can be resolved more convincingly.

The resolution of form through technology and materials used.

It tends to be the case that in most examples explored in this research a nautical imagery is echoed in the form of the building. This is done through the use of form and materials. As a result of this an interesting dialogue is created between the building and the cruise vessel. The materials used should be kept to a limited palette so that a more coherent structure is produced. What is also interesting to note is the tension created between the scale of the cruise ship and the terminal building.

The concept of a voluminous architecture and a single unifying roof structure for the terminal design has been discussed in the research. This allows one to manipulate the different spaces within the terminal in terms of volume and light. Alexander suggests that light gives people a sense of being welcomed within a space. (Alexander 1977: 645). This idea is appropriate in designing the main passenger hall where the highest concentration of people will occur.

On an architectural level by considering the factors discussed above, a unique response can be achieved, in the context of Durban, in facilitating the transition from water to land.

Appendix A: Selected precedent and case studies accommodation sizes.

This appendix includes the approximate sizes of accommodation of selected precedent and case studies analysed in the document. These buildings were selected because they handle approximately the same number of people that the new cruise liner terminal would need to handle which is 1500 passengers. The number of passengers that the selected buildings handle range from 700-2000 passengers. The buildings that were selected are:

- Southampton Mayflower Passenger Terminal, England.
- Sydney Overseas Passenger Terminal, Australia.
- Venice Harbour Passenger Terminal, Italy.
- Ocean Terminal Building, Durban.
- N-Shed Passenger Terminal, Durban.

The reason for measuring the sizes of accommodation in these buildings is that it gives an idea from which to gauge the sizes of accommodation for the new cruise liner terminal.

PRECEDENT AND CASE STUDIES ACCOMMODATION SIZES

Southampton Mayflower Passenger Terminal, England. (Handles +- 1000 passengers & +- 4000 items of baggage)

ACCOMMODATION	AREA (sq m)	Qty	TOTAL AREA	NOTES:
Check-in	676	1	676	14 check-in counters. Approx. 0.7 sq.m per passenger.
Departure hall	1170	1	1170	Approx. 1.2 sq.m per passenger.
Baggage hall	3158	1	3158	Approx. 3.2 sq.m per passenger. Use manual system of handling baggage.
Customs	200	1	200	8 security counters. Approx. 0.2 sq.m per passenger.
Arrivals hall	353	1	353	Approx. 0.4 sq.m per passenger.
		TOTAL AREA (sq m):	11250	Terminal is a refurbishment of an existing shed. Accommodation listed above is the most relevant from the terminal. Other accommodation was not added to spread sheet, such as toilets, offices, etc. Therefore the total area shown is not the sum of the listed accommodation.

Sydney Overseas Passenger Terminal, Australia. (Handles 2000 passengers per hour)

ACCOMMODATION	AREA (sq m)	Qty	TOTAL AREA	NOTES:
Passenger processing	1660	1	1660	Approx. 0.83 sq.m per passenger. Area has customs check point within. It is assumed that this is the main public circulation area. Passengers check-in, pass there luggage onto baggage handling below & move on to the passenger lounge.
Passenger lounge	731	1	731	Approx. 0.4 sq.m per passenger.
Cargo hall/handling	3324	1	3324	Approx. 1.7 sq.m per passenger. Area is used for both cargo & baggage handling. This would account for the large allocation of space. Area is located on the ground floor under the main passenger facilities.
Grnd floor restaurant	430	1	430	Approx. 132 persons seating. Approx 3.25 sq.m per passenger.
Grnd floor café	283	1	283	Approx. 116 persons seating. Approx 2.4 sq.m per passenger.
		APPROX TOTAL AREA (sq m):	4664	Terminal is a refurbishment of an existing terminal. Accommodation listed above is the most relevant from the terminal. Other accommodation was not added to spread sheet, such as toilets, offices, etc. Therefore the total area shown is not the sum of the listed accommodation.

Venice Harbour Passenger Terminal, Italy. (Handles approx 1442 passengers)				
ACCOMMODATION	**AREA (sq m)**	**Qty**	**TOTAL AREA**	**NOTES:**
Arrivals area	2694	1	2694	Approx. 1.9 sq.m per passenger. Houses baggage carousels & customs.
Departures hall	1898	1	1898	Approx. 1.3 sq.m per passenger. Houses check-in counters.
Commercial space	30	9	270	Smaller type of commercial space on ground floor. Letteble space.
Commercial spaces	60	3	180	Larger type of commercial space on first floor. Letteble space.
Commercial spaces	16	2	32	Smaller type of commercial space on first floor. Letteble space.
Ground floor café	177	1	177	Including kitchen area.
First floor café	228	1	228	Including kitchen area.
Grnd floor restaurant	446	1	446	Approx. 144 persons seating. Approx 3.1 sq.m per passenger. Area includes kitchen

APPROX TOTAL AREA (sq m): 10976

Terminal has administration functions such as offices, an audltorium & meeting rooms that were not put into spread sheet. Accommodation listed above is the most relevant from the terminal. Other accommodation was not added to spread sheet, such as toilets, offices, etc. Therefore the total area shown is not the sum of the listed accommodation.

Ocean Terminal Building, Durban. (Handled approx 700 disembarking passengers)				
ACCOMMODATION	**AREA (sq m)**	**Qty**	**TOTAL AREA**	**NOTES:**
Passenger hall	936	1	936	Approx. 1.34 sq.m per passenger.
Customs	434	1	434	Approx. 0.62 sq.m per passenger.
Restaurant	130	2	260	Including kitchen area.
Third floor bar area	26	1	26	
Kiosks	7	12	84	Positioned within main passenger hall.

APPROX TOTAL AREA OF TERMINAL FACILITY (sq m): 2511

APPROX TOTAL AREA OF TERMINAL COMPLEX (sq m): 14226

Note that the terminal was completed in 1962. Accommodation listed above is the most relevant from the terminal. Other accommodation was not added to spread sheet, such as toilets, offices, etc. Therefore the total area shown is not the sum of the listed accommodation. Terminal divived into three floors therefore, approximate total area includes all floors.

ACCOMMODATION	AREA (sq m)	Qty	TOTAL AREA	NOTES:
General public concourse	857	1	857	Approx. 0.6 sq.m per passenger. Houses ablutions, kiosks & a kitchen for catering purposes.
Customs area	913	1	913	Approx. 0.6 sq.m per passenger. Houses baggage check-in counters & is final area before boarding ship.
Baggage handling	956	1	956	Approx. 0.64 sq.m per passenger.
				Terminal is a refurbishment of an existing terminal. Accommodation listed above is the most relevant from the terminal. Other accommodation was not added to spread sheet, such as toilets, offices, etc. Therefore the total area shown is not the sum of the listed accommodation.
	APPROX TOTAL AREA (sq m)	2726		

Appendix B: Schedule of accommodation.

This appendix includes the schedule of accommodation for the design of the new cruise terminal. Size requirements of the different space functions were determined through the analysis of the precedent and case studies.

NEW CRUISE LINER TERMINAL SCHEDULE OF ACCOMMODATION

CRUISE TERMINAL (1500 PASSENGERS)

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Passenger Hall-Ground floor	Passenger hall is the primary public circulation space feeding into the other zones of the terminal.	Allow access to check-in area, public amenities, etc. Maximum day lighting to create pleasant environment. Highly legible space with allocation of area for seating.	1287	1	1287
Passenger Hall-First floor	Passenger hall is the primary public circulation space feeding into the other zones of the terminal.	Allow access to check-in area, public amenities, etc. Maximum day lighting to create pleasant environment. Highly legible space with allocation of area for seating.	990	1	990
Information Counters-Ground floor	Information counter used for general information of terminal.	Needs to be highly visible to the passenger for easy access as the passenger arrives in the main passenger hall.	27	1	27
		Ticket information stations.	N/A	4	N/A
Information Counter-First floor	Information counter used for general information of terminal.	Needs to be highly visible to the passenger for easy access as the passenger arrives in the main passenger hall.	54	1	54
		Ticket information stations.	N/A	7	N/A
Ticket & Baggage check-in area	Area for passenger check-in and baggage check-in.	Needs adequate queuing area. Direct link with passenger hall.	243	1	243
		Check-in counters	N/A	8	N/A
Arrivals/ Departure hall	Restricted access to area for passengers only. Area to house baggage carousels for baggage reclaim & trolley store area.	Needs adequate waiting area for passengers. Direct link to boarding gates which allows access to elevated gangway.	508	1	508

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Security, immigration/emigration & customs check point area	Security check point zone passing from passenger hall to departure lounge.	Needs adequate queuing area. Direct link to departure lounge. Security scanners & immigration/emigration desks.	93	1	93
		Security & immigration/emigration counters.	N/A	3	N/A
Arrivals/ Departure Lounge shop	General shop for selling refreshments, curios, books etc...	Only accessed from arrivals/departure lounge.	40	1	40
Baggage handling area	Service area for the moving of baggage from terminal to cruise ship.	Requires adequate space for large volumes of baggage. Area needs to be flexible for the people & vehicles working in the space. Should have access to baggage reclaim area.	300	1	300
Public ablutions-Ground floor	Toilets for use by the public.	Natural light & ventilation.	59	1	59
		Female: WCs	N/A	4	N/A
		Female: WHBs	N/A	3	N/A
		Male: WCs	N/A	3	N/A
		Male: Urinals	N/A	3	N/A
		Male: WHBs	N/A	3	N/A
		Paraplegic toilet	N/A	1	N/A
Public ablutions	Toilets for use by the public.	Natural light & ventilation.	82	1	82
		Female: WCs	N/A	5	N/A
		Female: WHBs	N/A	5	N/A
		Male: WCs	N/A	4	N/A
		Male: Urinals	N/A	5	N/A
		Male: WHBs	N/A	4	N/A
		Paraplegic toilet	N/A	1	N/A
Banking facility	Area for withdrawing money.	Needs to be a highly visible & secure area. Easy access of the facility by the public.	26	1	26
Car rental facility	Area for hiring rental cars.	Highly visible to the public. Positioned within the passenger hall.	30	1	30

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Travel & tourism info/bookings	Area for getting information on travelling and tourism.	Highly visible to the public. Positioned within the passenger hall.	30	1	30
Terminal café seating area	Café housed within main terminal building. Allow for views of cruise ship, harbour & city	Environment needs to be comfortable in terms of lighting & ventilation.	120	1	120
Terminal café kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to café and bar.	60	1	60
CRUISE TERMINAL: ADMINISTRATION					
Terminal manager	Office	Private area housed within administration zone of terminal. Environment needs to be comfortable in terms of lighting & ventilation.	12	1	12
Assistant terminal manager	Office	Private area housed within administration zone of terminal. Environment needs to be comfortable in terms of lighting & ventilation.	12	1	12
Secretary	Office	Private area housed within administration zone of terminal. Environment needs to be comfortable in terms of lighting & ventilation.	10	1	10
Kitchen	Area used for the preparation of food, beverages etc.	Facility should have link to staff lounge.	8	1	8
Staff lounge	Area for permanent & temporary staff members. Used for informal meetings, lunch, etc.	Environment needs to be comfortable in terms of lighting & ventilation.	140	1	140
Storage room	Storage of goods, cleaners equipment, documentation etc.	Room needs to be lockable with easy access for terminal administration staff.	10	1	10

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Boardroom/ Meeting room	Area for permanent & temporary staff members. Used for formal meetings.	Environment needs to be comfortable in terms of lighting & ventilation.	30	1	30
CRUISE TERMINAL: SERVICES					
Plant room	Plant room for air conditioning unit, electrical power supply & meters for terminal building.	Room needs to have secure & easy access for maintenance work. Position away from public.	50	1	50
Refuse area	Storage of refuse from building.	Area needs to have secure & easy access for refuse collection. Position away from public.	15	1	15
RETAIL					
Container flea market area	Informal stall for the selling of local arts & crafts.	Needs to be highly visible. Should be movable container pods. Link to passenger hall & entertainment area.	233	1	233
		Number of movable container pods.	N/A	9	N/A
Shops	Lettable space for the selling of local arts & crafts, books, etc.	Needs to be highly visible to the public. Link to passenger hall & entertainment area.	67	4	268
			118	2	236
Kiosks	Lettable smaller store space for the selling of local arts & crafts, books, etc.	Needs to be highly visible to the public. Link to passenger hall & entertainment area.	42	3	126
			21	2	42
			14	4	56
			45	1	45
ENTERTAINMENT					
Waterfront Restaurant seating area(indoor)	Restaurant should have spill out seating onto the public plaza area and have access to the waterfront edge. Provide unique environment for socializing & dining.	Environment needs to be comfortable in terms of lighting & ventilation. Allow for outdoor and indoor seating.	401	1	401

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Waterfront restaurant Kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to restaurant and bar. Should also include an office for restaurant manager.	100	1	100
Public ablutions-Ground floor	Toilets for use by the public.	Natural light & ventilation.	65	1	65
		Female: WCs	N/A	5	N/A
		Female: WHBs	N/A	4	N/A
		Male: WCs	N/A	4	N/A
		Male: Urinals	N/A	4	N/A
		Male: WHBs	N/A	6	N/A
		Paraplegic toilet	N/A	1	N/A
First floor restaurant seating area(indoor & outdoor)	Restaurant should have outdoor and indoor seating over looking the public plaza area and waterfront. Provide unique environment for socializing & dining.	Environment needs to be comfortable in terms of lighting & ventilation. Allow for outdoor and indoor seating.	401	1	401
First floor restaurant Kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to restaurant and bar. Should also include an office for restaurant manager.	100	1	100
Public ablutions-First floor	Toilets for use by the public.	Natural light & ventilation.	65	1	65
		Female: WCs	N/A	5	N/A
		Female: WHBs	N/A	4	N/A
		Male: WCs	N/A	4	N/A
		Male: Urinals	N/A	4	N/A
		Male: WHBs	N/A	6	N/A
		Paraplegic toilet	N/A	1	N/A
First floor café seating area(indoor)	Café should have views over looking the public plaza area, waterfront and the Point area. Provide unique environment for socializing & dining.	Environment needs to be comfortable in terms of lighting & ventilation. Allow for outdoor and indoor seating.	264	1	264

First floor café Kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to restaurant and bar. Should also include an office for restaurant manager.	100	1	100

TOTAL NET AREA (sq m):	6738
Add 13% for circulation	876
TOTAL AREA (sq m):	7614

PARKING BAYS	
TYPE	**Qty**
Public/Staff	182
Paraplegic	3
TOTAL PARKING BAYS:	185

DESIGN REPORT

The port, a point of entry:

The design of a new Cruise Liner Terminal at the Point, for Durban.

Ricardo Bexiga

CONTENTS:

CONTENTS

Design Report:

Note: All figures are by Author unless otherwise acknowledged.

Figure 1_View of the Melody cruise ship berthed along side the N-Shed terminal building.

The proposed new design of a Cruise Liner Terminal at the Point sets to create a building that meets with the current and changing cruise industry in Durban. This design has been informed by the findings of the research component that has established a basis for the decisions made during the design process.

Through the research it has been found that cruise liners typically spend periods of less than a week in port, during which time passengers will visit local tourist attractions. Durban's cruise season lasts from mid-November till mid-April. The local cruise industry has seen a steady increase in passenger numbers over the years. This has seen the MSC Melody cruise ship (see figure1) being procured to meet the demands of the industry.

The design of the new Cruise Liner Terminal focuses on key aspects which are: passenger movement optimisation, response to local conditions, form development, waterfront regeneration and the concept of the terminal as a gateway to the city of Durban. Further to this is the impact the building has on its immediate context in terms of the larger urban fabric. It therefore becomes crucial that the building presents itself as an important urban generator for the Point area.

Figure 2_View of Durban CBD from the N-Shed terminal building.

Figure 3_National Ports Authority corporate logo. (Http://www.transnet.co.za)

Figure 4_View of the Mediterranean Shipping Company corporate logo.

The client.

The client is the National Ports Authority. (N.P.A). The N.P.A.'s focus over the years has been on cargo handling in Durban harbour. With the local cruise market experiencing an increased interest, the N.P.A. has acknowledged the need for a new world class passenger terminal.

Funding and revenue generators.

As the N.P.A is a parastatal organisation, direct funding for the project will come from the Port Authority. Funding would also come from cruise operators in Durban as they would have an interest in the use of the building.

Users.

The main function of the terminal is to facilitate the berthing of cruise liners, in the port of Durban. Therefore, the main users of the terminal will be the cruise operators such as M.S.C. and Starlight Cruises and most importantly the passengers. As the commercial opportunity of the site will be developed the local public and visitors to Durban will also be using the terminal. The commercial environment should be developed as a unique environment at the harbour's water edge to attract the local residents and visitors of Durban.

Site requirements.

As the intended use of the building is as a cruise liner terminal, a given set of requirements are in place. The building needs to be sited in the harbour were the size of the site allows for the berthing of cruise liners and the water is also deep enough to allow for the berthing of the vessels. Pedestrian access as well as vehicle access to the site will be important in linking the terminal with the city and its surroundings.

The brief:

The terminal:

Whilst cruise liners are berthed at port passengers will visit tourist attractions in Durban and around KwaZulu-Natal. The primary objective for this development is to provide a world class cruise liner terminal facility for Durban. The principal function of the terminal will be to provide safe, secure and controlled facilities for the embarkation and disembarkation of passengers whilst also providing berthing and servicing facilities to cruise vessels. The docking of the largest cruise liners is to be provided for in the scheme.

Durban cruise industry:

The cruise terminal should meet the requirements of vessels operating seasonally from Durban (MSC Melody etc.) as well as for vessels calling at Durban on various world cruises eg. Queen Elizabeth II and the World. Cruise vessels will call on Durban some 40 times during the cruise season, carrying around 1500 passengers each time.

Context:

As Durban harbour is primarily a working harbour, consideration should be given to the interaction of the terminal with the harbour. Positioned in the Point Development precinct, the facility will tie into and draw from historical and current developments occurring in the area.

Concepts:

The goal of the project is to create a unique building that will embody the multi-cultural background of Durban. In terms of the passenger, the cruise liner terminal is the first impression they get of the city.

It is at this point of transition, from water to land, that creates a lasting impression on the passenger and is very likely the deciding factor whether the passenger comes ashore or not and whether a further visit is contemplated or not. Therefore, the terminal is a very important gateway to the city of Durban and should draw the passenger to our shores. The rehabilitation of the harbour's waterfront edge should also be maximized to its full potential. The terminal will not only serve the passengers aboard the cruise ship but will also promote a more public interaction with the harbour's waterfront edge. This will serve to better increase the public awareness of the activities at the port and develop a unique destination for the local residents of Durban to enjoy.

Facilities:

The major facilities to be catered for are that of the passengers moving from ship to shore, and vice versa. Tourist information and accompanying services are essential in the scheme. The building of a new cruise liner terminal at the Point precinct will tie in with the commercial development already underway at the Point. Introducing commercial facilities at the new cruise liner terminal will further exploit the development at the Point. Entertainment and retail facilities should form part of the terminal to realise the full economic potential of the site. As the terminal will be within view of the city, and in close proximity to the Point development, it is essential that these two developments complement each other. Not only will this create strong visual linkages to the city but it will also strengthen the terminal appeal for commercial opportunities.

Terminal facilities will include telescopic and quayside vessel access, a passenger hall for baggage handling and processing, a public meet and greet area, a tourist information area, customs and security facilities, a baggage handling system, parking, toilets, restaurants, car hire, telecoms, shops and retail outlets.

Schedule of accommodation:

The schedule of accommodation for the design of the new Cruise Liner Terminal has been derived from the precedent and case studies conducted during the research.

NEW CRUISE LINER TERMINAL SCHEDULE OF ACCOMMODATION

CRUISE TERMINAL (1500 PASSENGERS)

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Passenger Hall-Ground floor	Passenger hall is the primary public circulation space feeding into the other zones of the terminal.	Allow access to check-in area, public amenities, etc. Maximum day lighting to create pleasant environment. Highly legible space with allocation of area for seating.	1287	1	1287
Passenger Hall-First floor	Passenger hall is the primary public circulation space feeding into the other zones of the terminal.	Allow access to check-in area, public amenities, etc. Maximum day lighting to create pleasant environment. Highly legible space with allocation of area for seating.	990	1	990
Information Counters-Ground floor	Information counter used for general information of terminal.	Needs to be highly visible to the passenger for easy access as the passenger arrives in the main passenger hall.	27	1	27
		Ticket information stations.	N/A	4	N/A
Information Counter-First floor	Information counter used for general information of terminal.	Needs to be highly visible to the passenger for easy access as the passenger arrives in the main passenger hall.	54	1	54
		Ticket information stations.	N/A	7	N/A
Ticket & Baggage check-in area	Area for passenger check-in and baggage check-in.	Needs adequate queuing area. Direct link with passenger hall.	243	1	243
		Check-in counters	N/A	8	N/A
Arrivals/ Departure hall	Restricted access to area for passengers only. Area to house baggage carousels for baggage reclaim & trolley store area.	Needs adequate waiting area for passengers. Direct link to boarding gates which allows access to elevated gangway.	508	1	508

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Security, immigration/emigration & customs check point area	Security check point zone passing from passenger hall to departure lounge.	Needs adequate queuing area. Direct link to departure lounge. Security scanners & immigration/emigration desks.	93	1	93
		Security & immigration/emigration counters.	N/A	3	N/A
Arrivals/ Departure Lounge shop	General shop for selling refreshments, curios, books etc...	Only accessed from arrivals/departure lounge.	40	1	40
Baggage handling area	Service area for the moving of baggage from terminal to cruise ship.	Requires adequate space for large volumes of baggage. Area needs to be flexible for the people & vehicles working in the space. Should have access to baggage reclaim area.	300	1	300
Public ablutions-Ground floor	Toilets for use by the public.	Natural light & ventilation.	59	1	59
		Female: WCs	N/A	4	N/A
		Female: WHBs	N/A	3	N/A
		Male: WCs	N/A	3	N/A
		Male: Urinals	N/A	3	N/A
		Male: WHBs	N/A	3	N/A
		Paraplegic toilet	N/A	1	N/A
Public ablutions	Toilets for use by the public.	Natural light & ventilation.	82	1	82
		Female: WCs	N/A	5	N/A
		Female: WHBs	N/A	5	N/A
		Male: WCs	N/A	4	N/A
		Male: Urinals	N/A	5	N/A
		Male: WHBs	N/A	4	N/A
		Paraplegic toilet	N/A	1	N/A
Banking facility	Area for withdrawing money.	Needs to be a highly visible & secure area. Easy access of the facility by the public.	26	1	26
Car rental facility	Area for hiring rental cars.	Highly visible to the public. Positioned within the passenger hall.	30	1	30

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Travel & tourism info/bookings	Area for getting information on travelling and tourism.	Highly visible to the public. Positioned within the passenger hall.	30	1	30
Terminal café seating area	Café housed within main terminal building. Allow for views of cruise ship, harbour & city	Environment needs to be comfortable in terms of lighting & ventilation.	120	1	120
Terminal café kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to café and bar.	60	1	60
CRUISE TERMINAL: ADMINISTRATION					
Terminal manager	Office	Private area housed within administration zone of terminal. Environment needs to be comfortable in terms of lighting & ventilation.	12	1	12
Assistant terminal manager	Office	Private area housed within administration zone of terminal. Environment needs to be comfortable in terms of lighting & ventilation.	12	1	12
Secretary	Office	Private area housed within administration zone of terminal. Environment needs to be comfortable in terms of lighting & ventilation.	10	1	10
Kitchen	Area used for the preparation of food, beverages etc.	Facility should have link to staff lounge.	8	1	8
Staff lounge	Area for permanent & temporary staff members. Used for informal meetings, lunch, etc.	Environment needs to be comfortable in terms of lighting & ventilation.	140	1	140
Storage room	Storage of goods, cleaners equipment, documentation etc.	Room needs to be lockable with easy access for terminal administration staff.	10	1	10

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Boardroom/ Meeting room	Area for permanent & temporary staff members. Used for formal meetings.	Environment needs to be comfortable in terms of lighting & ventilation.	30	1	30
CRUISE TERMINAL: SERVICES					
Plant room	Plant room for air conditioning unit, electrical power supply & meters for terminal building.	Room needs to have secure & easy access for maintenance work. Position away from public.	50	1	50
Refuse area	Storage of refuse from building.	Area needs to have secure & easy access for refuse collection. Position away from public.	15	1	15
RETAIL					
Container flea market area	Informal stall for the selling of local arts & crafts.	Needs to be highly visible. Should be movable container pods. Link to passenger hall & entertainment area.	233	1	233
		Number of movable container pods.	N/A	9	N/A
Shops	Lettable space for the selling of local arts & crafts, books, etc.	Needs to be highly visible to the public. Link to passenger hall & entertainment area.	67	4	268
			118	2	236
Kiosks	Lettable smaller store space for the selling of local arts & crafts, books, etc.	Needs to be highly visible to the public. Link to passenger hall & entertainment area.	42	3	126
			21	2	42
			14	4	56
			45	1	45
ENTERTAINMENT					
Waterfront Restaurant seating area(indoor)	Restaurant should have spill out seating onto the public plaza area and have access to the waterfront edge. Provide unique environment for socializing & dining.	Environment needs to be comfortable in terms of lighting & ventilation. Allow for outdoor and indoor seating.	401	1	401

ACCOMMODATION	DESCRIPTION	GENERAL REQUIREMENTS	AREA (sq m)	Qty	TOTAL AREA
Waterfront restaurant Kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to restaurant and bar. Should also include an office for restaurant manager.	100	1	100
Public ablutions-Ground floor	Toilets for use by the public.	Natural light & ventilation.	65	1	65
		Female: WCs	N/A	5	N/A
		Female: WHBs	N/A	4	N/A
		Male: WCs	N/A	4	N/A
		Male: Urinals	N/A	4	N/A
		Male: WHBs	N/A	6	N/A
		Parapleqic toilet	N/A	1	N/A
First floor restaurant seating area(indoor & outdoor)	Restaurant should have outdoor and indoor seating over looking the public plaza area and waterfront. Provide unique environment for socializing & dining.	Environment needs to be comfortable in terms of lighting & ventilation. Allow for outdoor and indoor seating.	401	1	401
First floor restaurant Kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to restaurant and bar. Should also include an office for restaurant manager.	100	1	100
Public ablutions-First floor	Toilets for use by the public.	Natural light & ventilation.	65	1	65
		Female: WCs	N/A	5	N/A
		Female: WHBs	N/A	4	N/A
		Male: WCs	N/A	4	N/A
		Male: Urinals	N/A	4	N/A
		Male: WHBs	N/A	6	N/A
		Parapleqic toilet	N/A	1	N/A
First floor café seating area(indoor)	Café should have views over looking the public plaza area, waterfront and the Point area. Provide unique environment for socializing & dining.	Environment needs to be comfortable in terms of lighting & ventilation. Allow for outdoor and indoor seating.	264	1	264

First floor café Kitchen & bar	Area used for the preparation of food, beverages etc.	Facility should have link to restaurant and bar. Should also include an office for restaurant manager.	100	1	100

TOTAL NET AREA (sq m):	6738
Add 13% for circulation	876
TOTAL AREA (sq m):	7614

PARKING BAYS	
TYPE	**Qty**
Public/Staff	182
Paraplegic	3

TOTAL PARKING BAYS:	185

Site selection

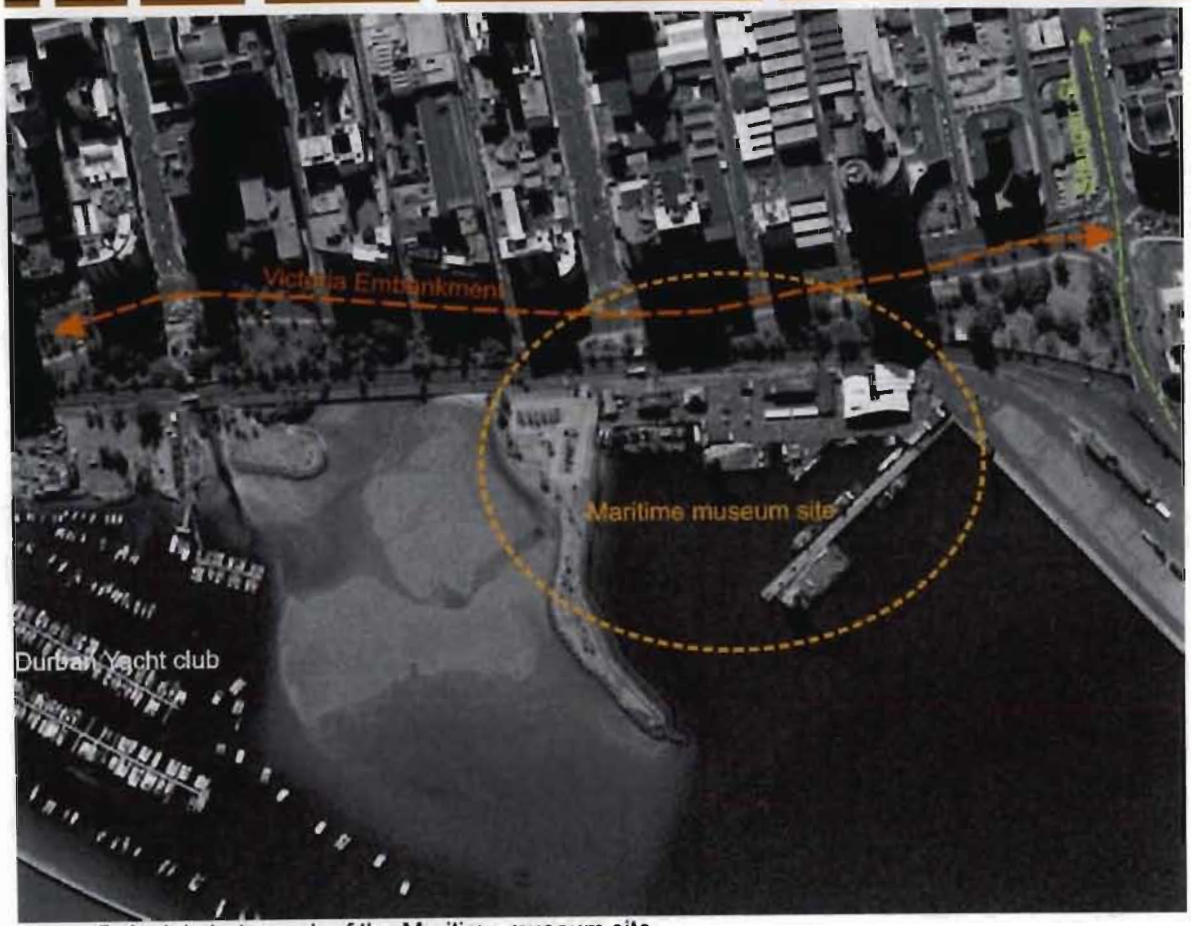


Figure 5_Aerial photograph of the Maritime museum site.
(Http://www.durban.gov.za)

Site selection was restricted to the harbour and therefore three sites were short listed as possible sites for the development of the new Cruise Liner Terminal. These were:

1) The Maritime Museum site.
2) R-Berth site.
3) A-Berth site.

The three sites where compared against each other according to certain criteria in order to gauge which site was more suitable for the development. The criterion that was used was:

- Location.
- Linkage to city.
- Waterfront edge opportunities.
- Accessibility.
- Views.

With the criterion listed above each site is analysed in terms of its context and surroundings.

N

The Maritime museum site					
Points	1	2	3	4	5
Location			●		
Linkage to city				●	
Waterfront edge opportunities				●	
Accessibly		●			
Views				●	

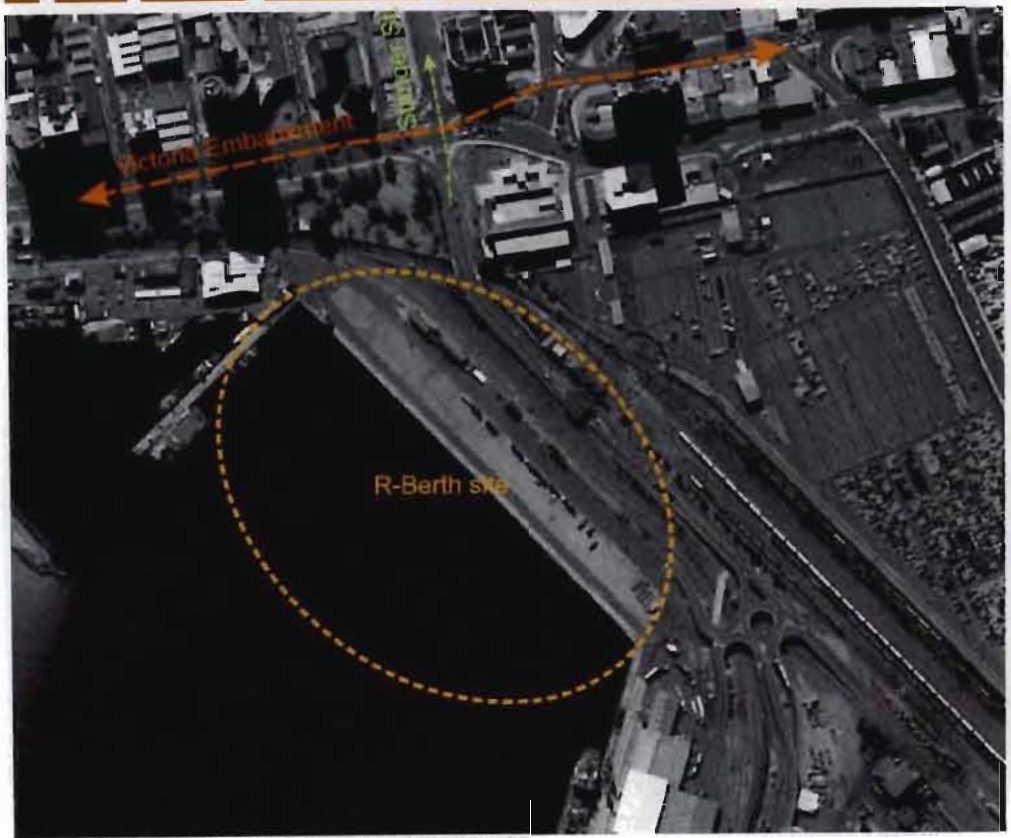


Figure 6_Aerial photograph of the R-Berth site.
(Http://www.durban.gov.za)

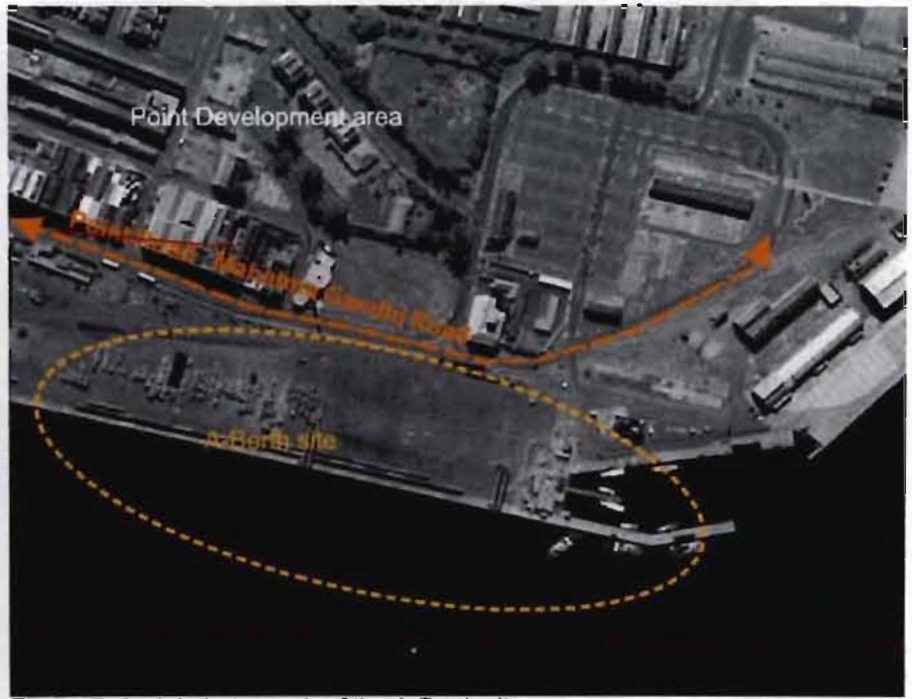


Figure 7_Aerial photograph of the A-Berth site.
(Http://www.durban.gov.za)

R-Berth site					
Points	1	2	3	4	5
Location		●			
Linkage to city			●		
Waterfront edge opportunities				●	
Accessibly		●			
Views				●	

A-Berth site (chosen site)					
Points	1	2	3	4	5
Location				●	
Linkage to city			●		
Waterfront edge opportunities					●
Accessibly					●
Views					●

N

Overall assessment of chosen site A-Berth:

A-berth (see figure 8) has been ear-marked as the site of choice, by the National Ports Authority, for the development of a cruise terminal. The A-Berth site is seen as the best site for the development. This is due mainly to its close relationship to Mahatma Gandhi Road which allows the site to link with the city. There is potential for public waterfront edge development at the site to re-establish the edge being lost from the widening of the harbour mouth. A-Berth is also the only site large enough for the berthing of cruise liners without having to deepen waters or lengthen quaysides. In terms of visual legibility of the site, A-Berth allows views of the harbour and city giving better orientation to the passenger.

Figure 8_A-Berth site.

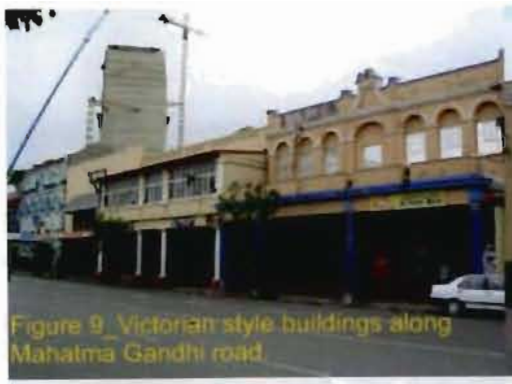


Figure 9_Victorian style buildings along Mahatma Gandhi road


Figure 10_Old warehouses along Mahatma Gandhi road


Figure 11_Old warehouses directly opposite A-Berth site


Figure 18_Timeball tower


Figure 12_New Point Precinct development with a canal waterfront


Figure 13_New residential and commercial developments at the Point


Figure 14_Renovated Edwardian style houses at the Point


Figure 15_Restored Signal station building opposite the A-Berth site


Figure 16_Delapidated building to be restored for commercial use


Figure 17_Union period style building along Mahatma Gandhi road


Figure 19_Durban's Millennium tower

The theoretical basis for the design is derived from key principles that are needed in a cruise liner terminal to function appropriately for the large volumes of users and its context. These principles are as follows:

- A voluminous architecture.
- Movement patterns.
- Waterfront regeneration.
- The terminal as a gateway to the city.

A voluminous architecture.

Voluminous architecture is appropriate for a terminal building in that it allows a large volume of users to feel comfortable within a large space. "The definition of routes using different sizes or volumes of internal space helps the traveller to know whether a particular corridor or concourse is a major or minor one." (Edwards. 1998: 80). Whilst the use of volume is important to define particular spaces, light and ventilation is an important tool in maximising the legibility of the space.(see to figure 20)

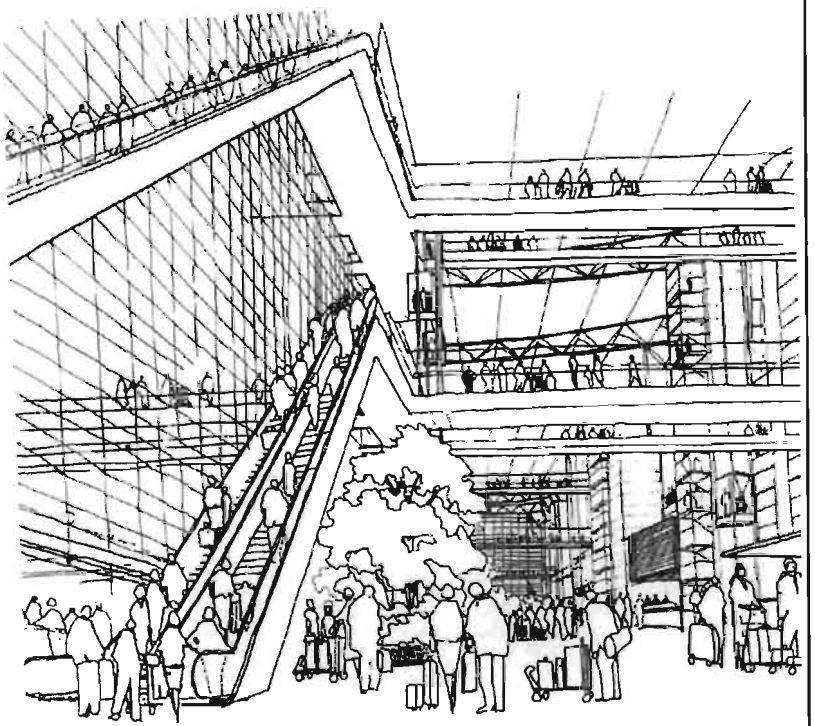


Figure 20_ An early sketch of Kansai Airport, Japan, showing the use of volume and light in the structuring of movement patterns.
(Edwards. 1998: 84)

Movement patterns.

The design of the Cruise Liner Terminal is based on the articulation of the passenger route. This point is further emphasised by Hertzberger pointing out that "the first consideration of decisive importance in designing a space is what that space is intended for and what not, and consequently what the proper size, is to be." (Hertzberger. 1991: 190). Therefore the use of architectural devices, such as roof form and light, are used to increase the legibility of the passenger route through the building.

Waterfront regeneration.

Due to the nature of the building function the Cruise Liner Terminal is situated in the harbour and thus water becomes a key component in the design. Breen and Rigby recognise that the urban waterfront phenomenon is due to the public's desire to be near a body of water (Breen and Rigby. 1994: 18). This tells us that when creating an intervention near any body of water, great care needs to be taken in preserving the water's edge. This also suggests the desire for people to utilise a waterfront edge and thus the design takes full advantage of the water's edge and views. Further to that, economic determinants are almost always the driving forces behind any development not least waterfront developments. Given the prevalent economic motives behind such developments, designing cruise liner terminals must therefore incorporate specifically relevant and economically viable amenities. This will be important in making the new cruise liner terminal sustainable throughout the year.

The terminal as a gateway to the city.

Being positioned on A-Berth the Cruise Liner Terminal serves as a point of reference as the building will be visible from the harbour mouth as the ship enters port. As a landmark, the terminal is designed to capture the character of the city and the function of the building itself. In most cases landmark buildings carry with them the label of being an icon. This is strengthened in the design through the use of strong sculptural forms to create a unique building that would be identifiable as the Durban Cruise Liner Terminal.

Urban design concept

The design of the building intends to enhance and compliment the urban design framework of the Point development area. This is done on the macro level of urban design by integrating the A-Berth site into the existing urban grid of the area.(see figure 21). A-Berth is divided into three subsequent sites which are generated by extending the urban grid to the waterfront edge. This allows the precinct to be developed as a coherent whole rather than the site becoming an island in the city. Therefore it is not only the new Cruise Liner Terminal that is developed in the area but rather commercial activities and public amenities that tie in and supplement the Cruise Liner Terminal. This is done by establishing a public park at the termination of Mahatma Ghandi road to allow for public use and to open up access to the waterfront edge.

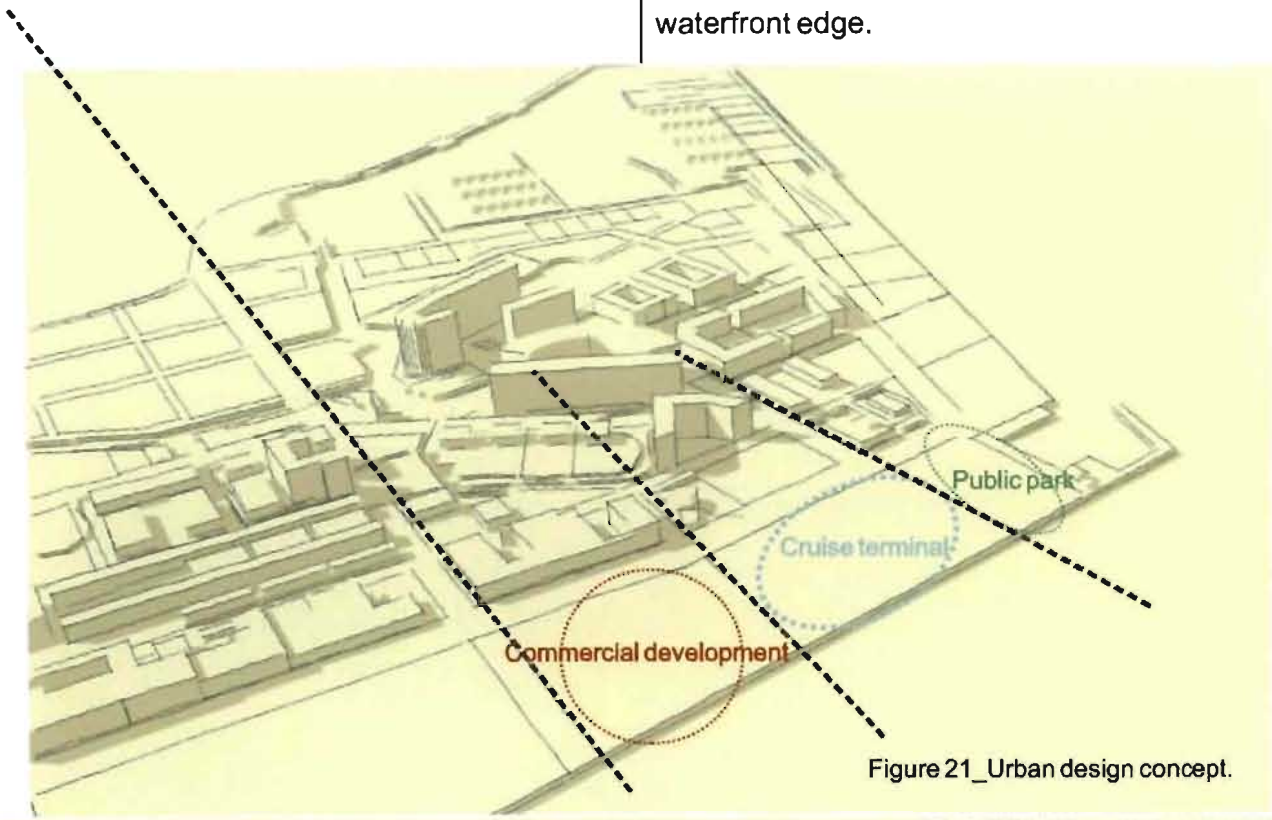


Figure 21_Urban design concept.

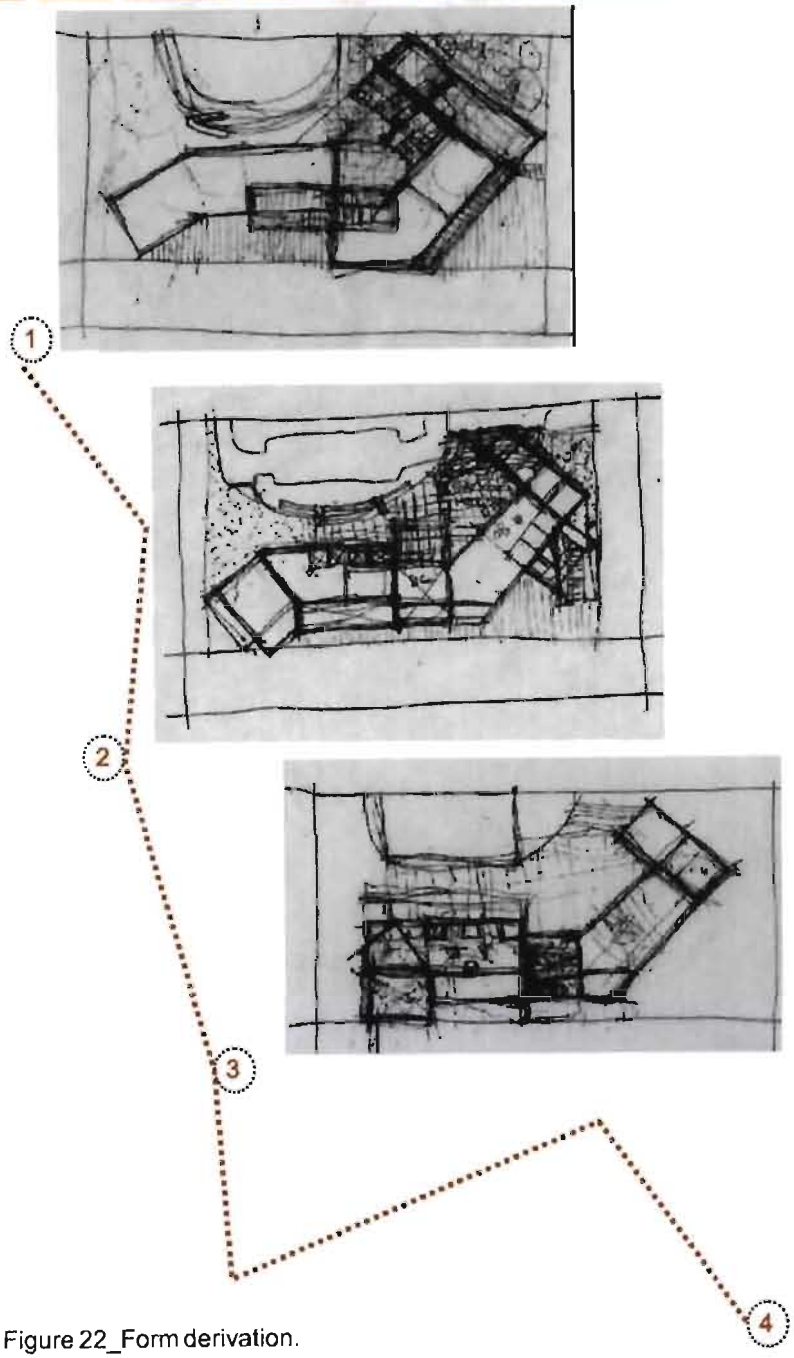
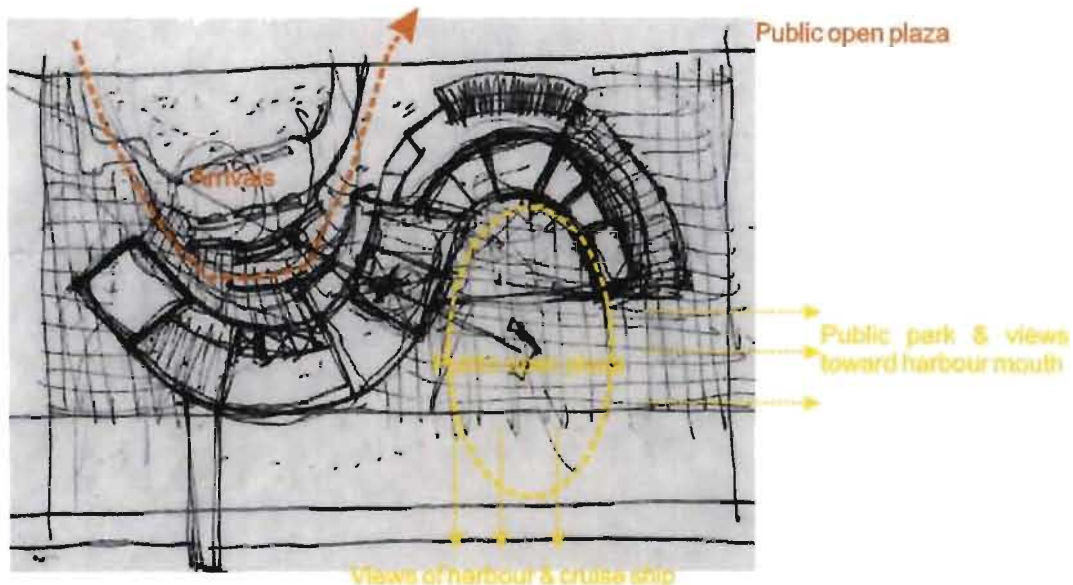


Figure 22_Form derivation.

Form derivation and building design concepts

The form of the building is derived from the intention of defining two distinctive spaces.(see figure 22). These are the announcement of arrivals to the building and the framing of a public open plaza with views of the harbour, city, and cruise liner. The arrivals section of the building is set back from the road edge purposefully to minimise the impact of the scale of the building against the pavement edge. Further to that it is this section of the building that connects directly to the cruise liners. The public open plaza, which is framed by the building form and also opens out towards the public park, is set back from the water's edge. This is to minimise the angle of repose and lesson the impact of the sheer scale of the cruise liner. Water is brought into the space to strength the connection with the harbour. With the public open plaza opening out towards the public park people are able to watch the cruise liners enter and leave the harbour. It also increases the view that the person has of the city and the immediate surroundings. Through this the connection of the building with the cruise liner and city is strengthened.



Another consideration that was taken when designing the building is being able to use the large terminal spaces for other functions when not in use by cruise liners. These uses could be conventions or other functions requiring large spaces. The setting of the terminal and the public amenities would make this a unique setting for such functions.

The roof form of the building draws its inspiration from the nautical image, in particular that of ship building technology. (see figures 23 & 24). This creates the dialogue between the cruise liner and terminal which is essential for the buildings contextual response.

Figure 23_View of a hull of a ship under construction.
(http://www.gregbrownasb.com)

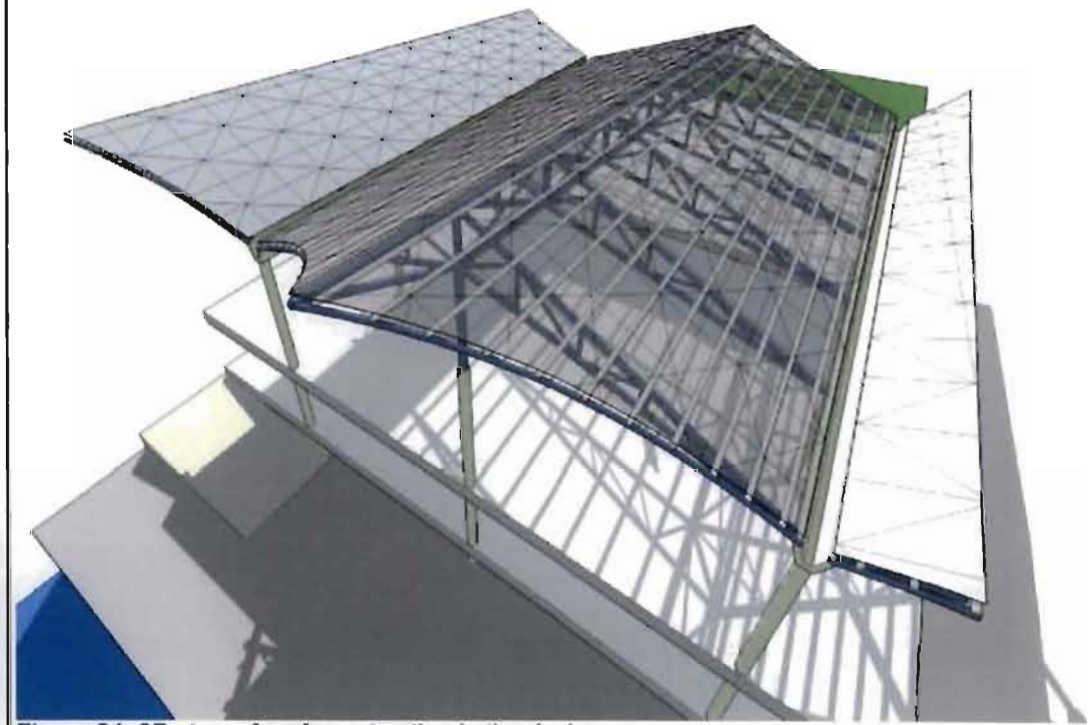


Figure 24_3D view of roof construction in the design.

Figure 25_Image showing the use of flat aluminium roof panel sheets in the EMP building to deal with the curved forms of the building. (Bruce. 2000: 29)

Structural system and materials used

- A concrete column and beam frame is used as the structural system for the building. This allows for the building envelope to be independent of the structure thus giving more freedom of articulation of the building skin According to the orientation.
- Due to the large spans that are required the roof is constructed of steel with flat aluminium roof panel sheets to take up the curvature of the roof form. (see figure 25). The roof structure consists of a main girder truss that is 2000mm deep and secondary rafter trusses coming off of that.
- The palette of materials used through out the building consists mainly of steel, aluminium, glass, brick, and timber. Therefore by keeping a constant palette of materials a coherent architectural expression and language is maintained.

Parking

- Parking is provided in a semi-basement level below the building providing access to the building from below. The reason for a semi-basement is to minimise the affect of the water table on the structure as well as creating a plinth to raise the building above the busy quay level.
- The semi-basement is naturally ventilated through louvered openings on the south and west edges of the building.

Services

- Electrical plant rooms are supplied in the basement.
- Air-conditioning units are installed in ceiling voids and ventilated out through louvers.
- Air-conditioning ducts, roof structure, lighting and some electrical trunking are exposed in the building.

Waste

Waste is collected and disposed of from the basement level.

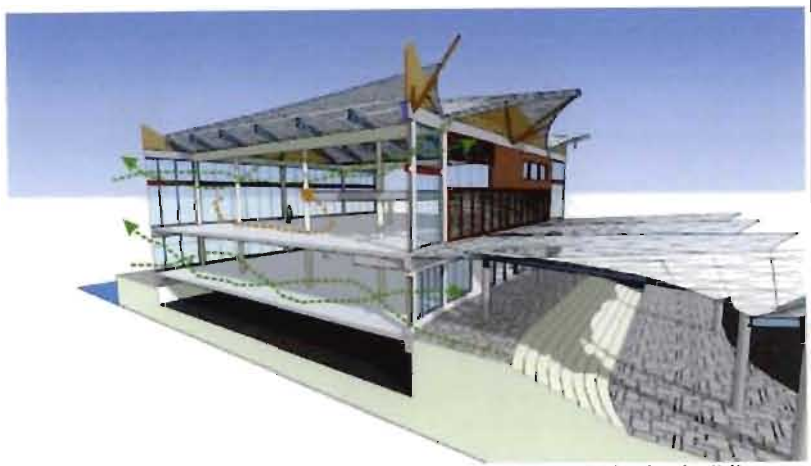


Figure 26_Image showing air movement patterns within the building.

Orientation

- The general orientation of the building is north-east/south-west.
- Office areas have been placed along the north edge of the building.
- In terms of the placement of the various functions in building the harbour facing façade has been kept clear to allow for views. This has pushed functions such as retail, stores, administration and kitchen facilities to the northern edge.

Lighting

- The southern façade of the building is extensively glazed thus allowing natural lighting to penetrate the deep floor plates.
- The roof form is such that it is at its highest point on the south face to meet the scale of the cruise liner thus also allowing a greater area for letting light to penetrate.
- The large overhangs of the roof protect the glazing from direct sunlight and over exposure of the façade.
- Louvers are used through out the building façade where necessary to minimise solar heat gain to the spaces.

Ventilation

- High level openable glazed sections are used to exhaust hot air from the large spaces. (see figure 26)
- Air-conditioning is used to keep the internal temperatures comfortable during the extremely hot and humid summer months in Durban where little air movement is present.

Circulation and access

- Circulation within the terminal is organised in a linear progression from arrival to departure allowing access to the public entertainment section of the building.
- This circulation route is centrally placed in the building with functions lining the route on either side with views to the harbour allowing the passenger to orientate themselves.
- Ramps and escalators allow access to all levels in and around the building.
- Lifts are provided for direct access to the first floor.

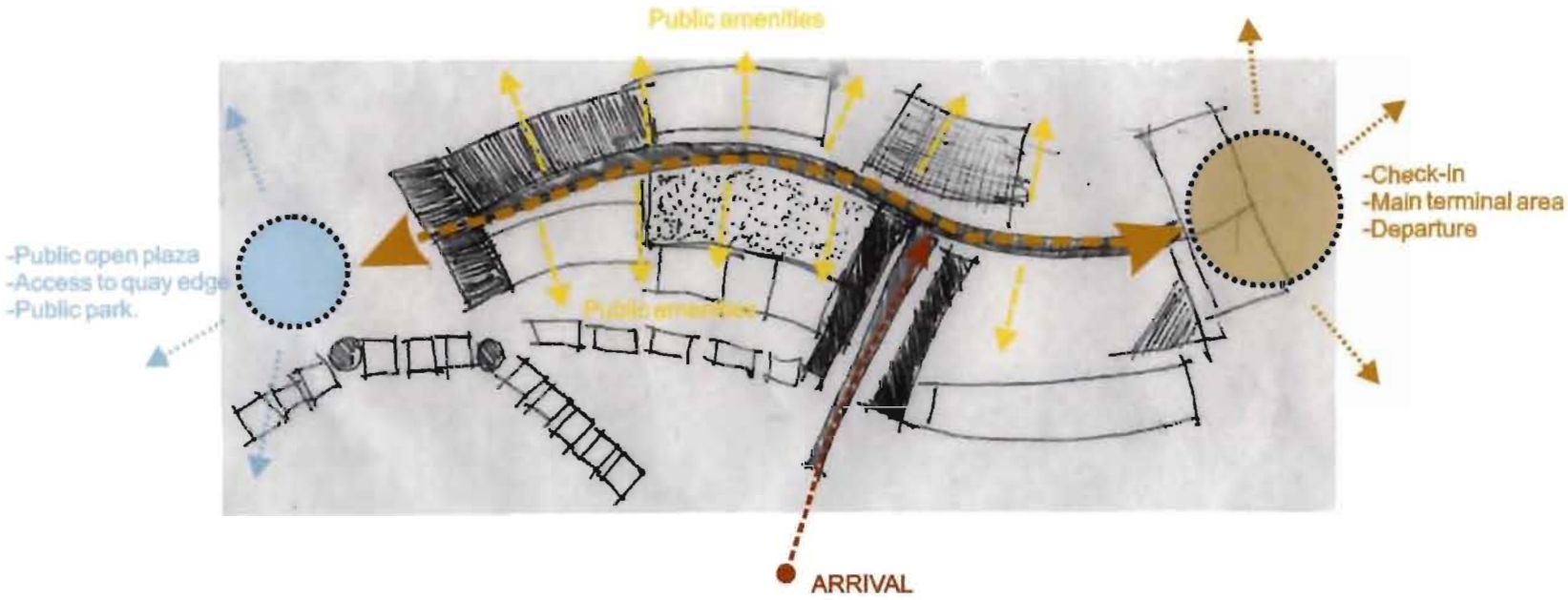


Figure 27_Image showing early diagrammatic circulation concept.

- The design of the new Cruise Liner Terminal has focussed on arrival, circulation, interaction and connection.
- The key principles of voluminous architecture, movement patterns, waterfront regeneration and the terminal as a gateway to the city are used as the main programming elements of the terminal.
- The architectural language of the building is derived from the nautical image to create a dialogue between the building and the terminal.
- By using the form of the building two distinctive spaces are created to frame the arrivals section and to define the public open plaza with views of the harbour, city, and cruise liner.
- The urban planning ties in with the existing urban framework of the Point area and the development of A-Berth as a precinct strengthens this relationship.
- The public park serves as a termination of Mahatma Ghandi road and can also be used for outdoor public functions as well as allowing access to the waterfront edge.

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- BREEN, A and RIGBY, D. 1994. *Waterfronts. Cities Reclaim their Edge*. U.S.A: McGraw-Hill Inc.
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- EDWARDS, B. 1998. *The Modern Terminal. New Approaches to Airport Architecture*. London: E & FN Spon.
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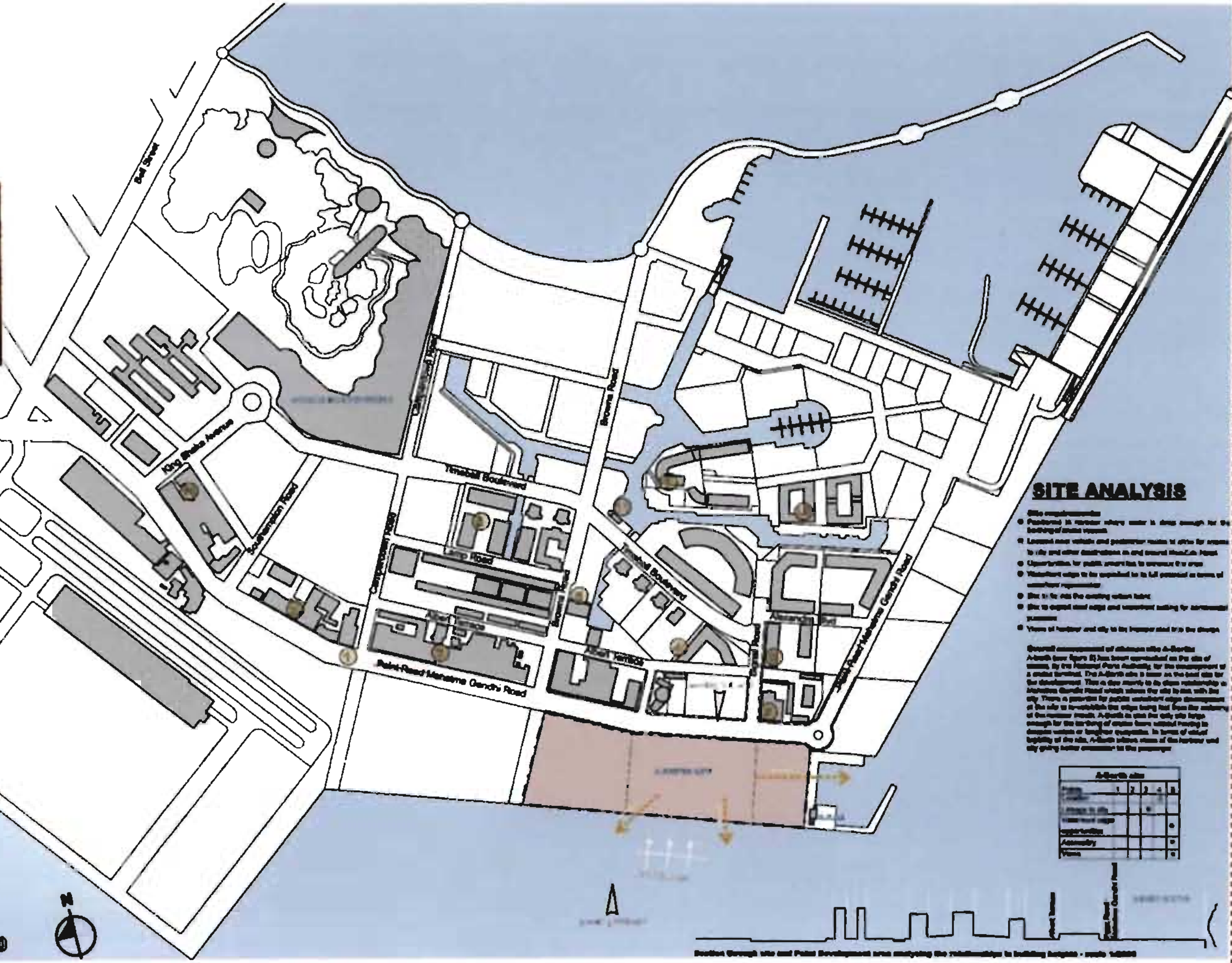
- http://www.gregbrownasb.com (accessed on 12-12-2007)
- http://www.transnet.co.za(accessed on 10-03-2008)

Design drawings & physical model photographs

Design drawings & physical model photographs

AERIAL OF DURBAN



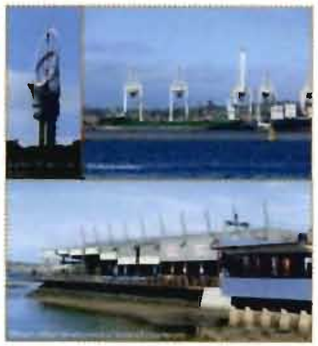
LOCALITY PLAN 1:2000

SITE ANALYSIS

URBAN MAPPING

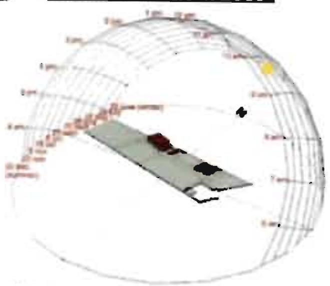
URBAN MASSING MODEL

DURBAN POINT WATERFRONT DEVELOPMENT AND URBAN DESIGN



WIND ROSE GRAPH

SUN PATH OVER SITE



the port, a point of entry: the design of a **NEW CRUISE LINER TERMINAL** at the point, for durban.

PROJECT INFORMATION

CLIENT:

For the purpose of this project, the client shall be the National Ports Authority. (N.P.A). The N.P.A.'s focus over the years has been on cargo handling in Durban harbour. With the local cruise market seeing an increased interest, the N.P.A. has acknowledged the need for a new world class passenger terminal. Linking with the Point Development, the A-berth site has been earmarked by the port authority as the site of choice for the new terminal. By doing this the N.P.A will increase the public's awareness of the port and it's importance to the economy of Durban.

DESIGN OBJECTIVES:

The main design objective is to provide a passenger terminal that will serve as a gateway, not only to the city of Durban but for the rest of South Africa. Reclaiming the harbour's waterfront edge will also be important in create a unique place for people to enjoy.

- The terminal should respond, contextually, to its harbour surroundings and link with the greater urban framework of the point area to produce a more coherent building
- The terminal is a multi functional and multi-cultural building reflecting the current local environment.
- The terminal serves as a gateway to the city and therefore should reflect the architectural language of its place.
- Waterfront edge regeneration is encouraged to enhance the connection with water in the building
- Visual and physical links to the city is vital in the design.
- Meaningful public amenities. like public open spaces, should be created to attract people to the building.

THE TERMINAL:

Cruise liners typically spend periods of less than a week in Durban, during which time passengers will visit tourist attractions in Durban and around KwaZulu-Natal. The primary objective for this development is to provide a world class cruise liner terminal facility for Durban. The principal function of the terminal will be to provide safe, secure and controlled facilities for the embarkation and disembarkation of passengers whilst also providing berthing and servicing facilities to cruise vessels.

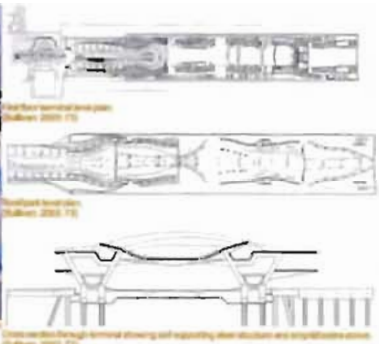
DURBAN'S CRUISE INDUSTRY:

Durban's cruise season typically lasts between mid-November to mid-April, of the following year. Therefore, the cruise terminal should meet the requirements of vessels operating seasonally from Durban (MSC Melody etc.) as well as for vessels calling at Durban on various world cruises eg Queen Elizabeth II. Cruise vessels will call on Durban some 40 times during the cruise season, carrying around 1500 passengers each time.

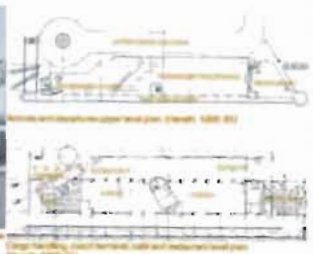
ANALYTICAL & QUALITATIVE PRECEDENT

Yokohama International Port Terminal, Japan.
Architects: Foreign Office Architects. (Farshid Moussavi & Alejandro Zaera-Polo)





Sydney Overseas Passenger Terminal, Australia.
Architects: Lawrence Nield and Partners.


Vancouver Passenger Terminal, Canada.
Architects: Zeidler Roberts Partnership in collaboration with Downs Archambault, Musson Cattell and Partners.

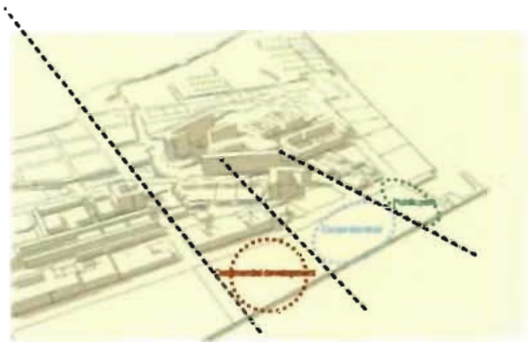

Venice Harbour Passenger Terminal, Italy.
Architects: Ligo Camerino.


CONCLUSIONS OF PRECEDENT:

From the examples shown above it seems that the most effective way of organizing the accommodation is within a linear form. This allows directionality to be imparted on the user and aids in the overall legibility of the terminal, in terms of the separation of arrivals and departure areas, some terminals split them vertically while others divide them horizontally on one floor. It seems that by splitting the two vertically the terminal is made more legible. The exception to this observation is at the Mayflower terminal where passengers are only split vertically on boarding or disembarking. Regarding the site, it can be seen that the concept of the terminal being a gateway to the city is an important one. Visual links to the city around the harbour and terminal building are critical. Not only does it allow the passengers to orientate themselves but it also strengthens the link between the city and the harbour waterfront. The terminal should become an extension of the city as is the case at the Sydney passenger terminal.

CONCEPTUAL DEVELOPMENT

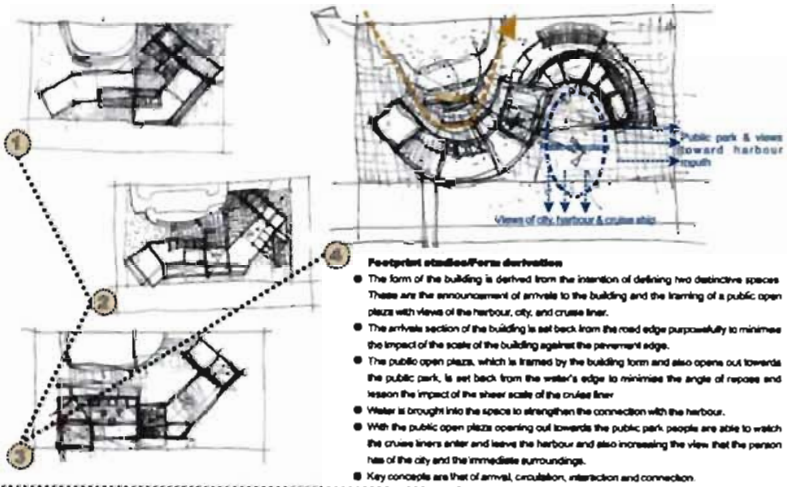
URBAN DESIGN CONCEPT



Urban design concept

- The design of the building intends to enhance and compliment the urban design framework of the Point development area.
- A-Berth site is integrated into the existing urban grid of the area.
- A-Berth is divided into three subsequent sites which are generated by extending the urban grid to the waterfront edge.
- This allows the precinct to be developed as a coherent whole rather than the site becoming an island in the city.
- Commercial activities and public amenities are developed to be into and supplement the Cruise Liner Terminal.
- This is done by establishing a public park at the termination of Mahatma Gandhi road to allow for public use and to open up access to the waterfront edge.

FOOTPRINT STUDIES/FORM DERIVATION

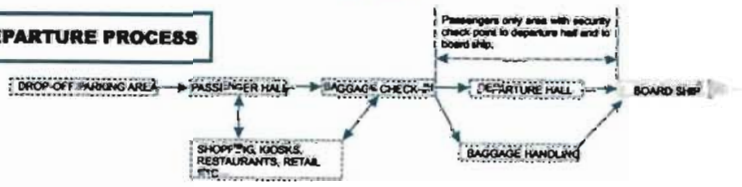


Footprint studies/Form derivation

- The form of the building is derived from the intention of defining two distinctive spaces. These are the announcement of arrivals to the building and the framing of a public open plaza with views of the harbour, city, and cruise liner.
- The arrivals section of the building is set back from the road edge purposefully to minimise the impact of the scale of the building against the pavement edge.
- The public open plaza, which is framed by the building form and also opens out towards the public park, is set back from the water's edge to minimise the angle of repose and lessen the impact of the sheer scale of the cruise liner.
- Water is brought into the space to strengthen the connection with the harbour.
- With the public open plaza opening out towards the public park people are able to watch the cruise liners enter and leave the harbour and also increasing the view that the person has of the city and the immediate surroundings.
- Key concepts are that of arrival, circulation, interaction and connection.

CIRCULATION & PROCESSES

DEPARTURE PROCESS



ARRIVAL PROCESS DIAGRAM

ANALYTICAL IMAGERY


Hull construction technology


Roof form based upon the aerodynamic principles to create a dialogue with the cruise vessel.


Use of flat aluminium roof sheeting to mimic the curvature of the roof form.

the port, a point of entry: the design of a **NEW CRUISE LINER TERMINAL** at the point, for durban.

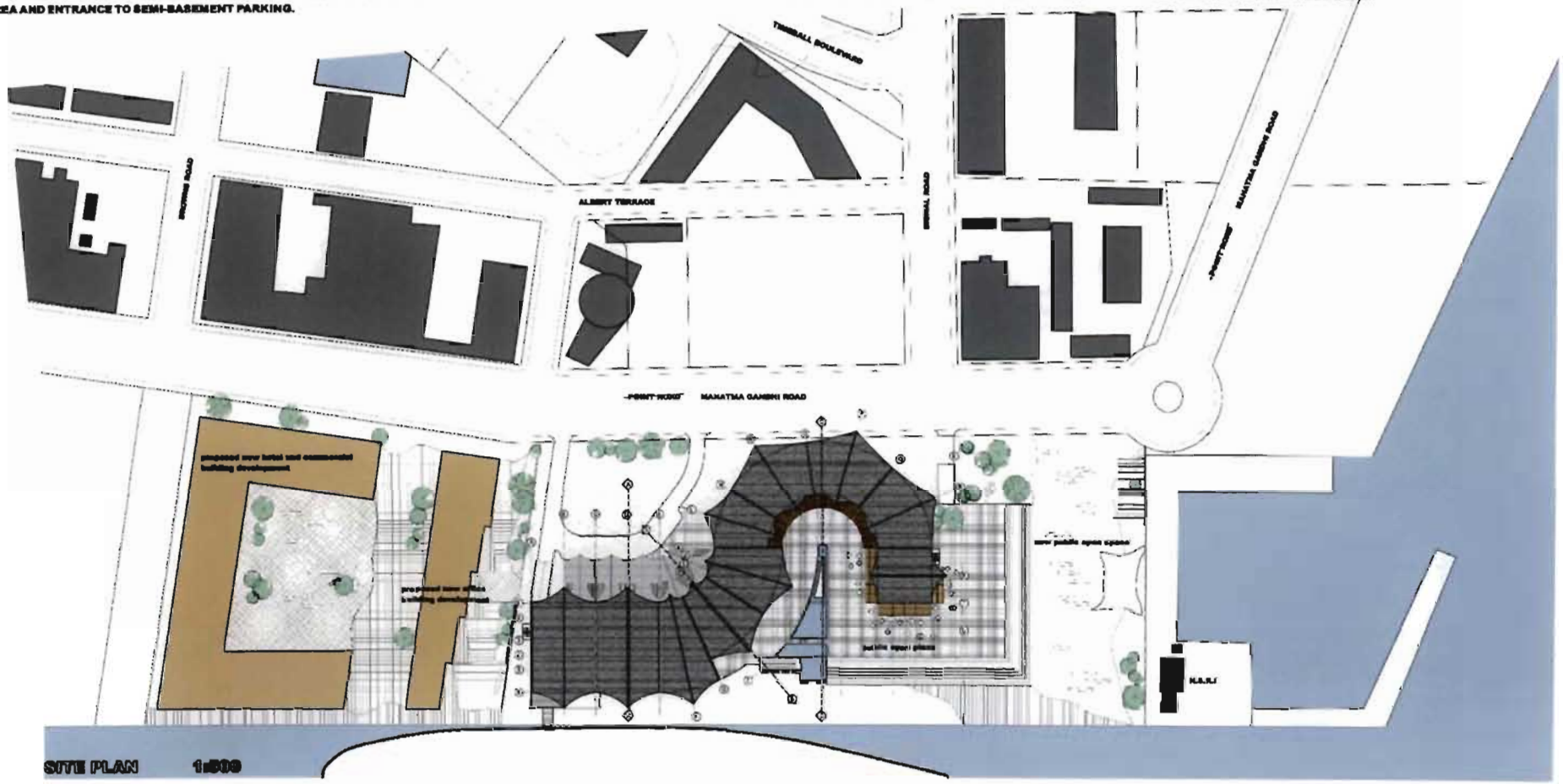
DESIGN PRIMER

RICARDO BEXIGA 2008

AERIAL VIEW OF CRUISE LINER TERMINAL FROM POINT ROAD SIDE SHOWING COVERED DROP OFF AREA AND ENTRANCE TO SEMI-BASEMENT PARKING.

AERIAL VIEW OF CRUISE LINER TERMINAL SHOWING THE DEVELOPMENT OF THE A-BERTH SITE.

VIEW OF TERMINAL FROM CRUISE SHIP.



SITE PLAN 1:500

N

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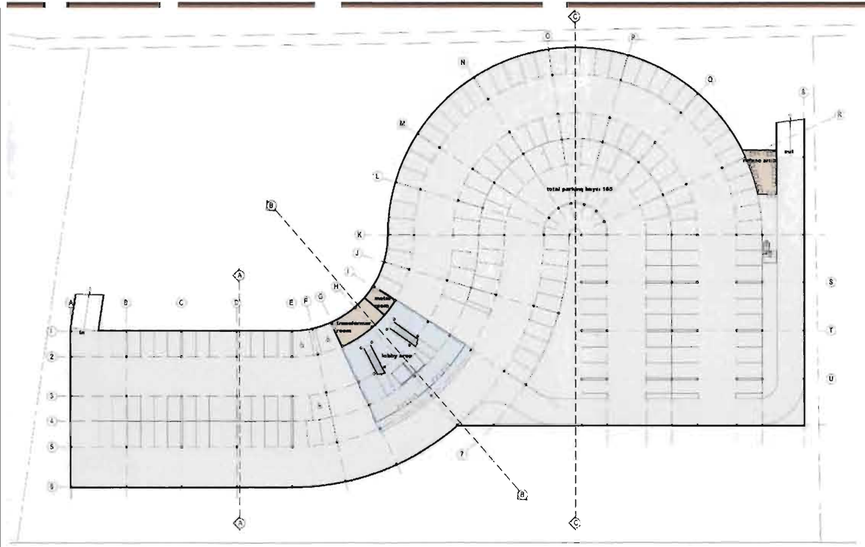
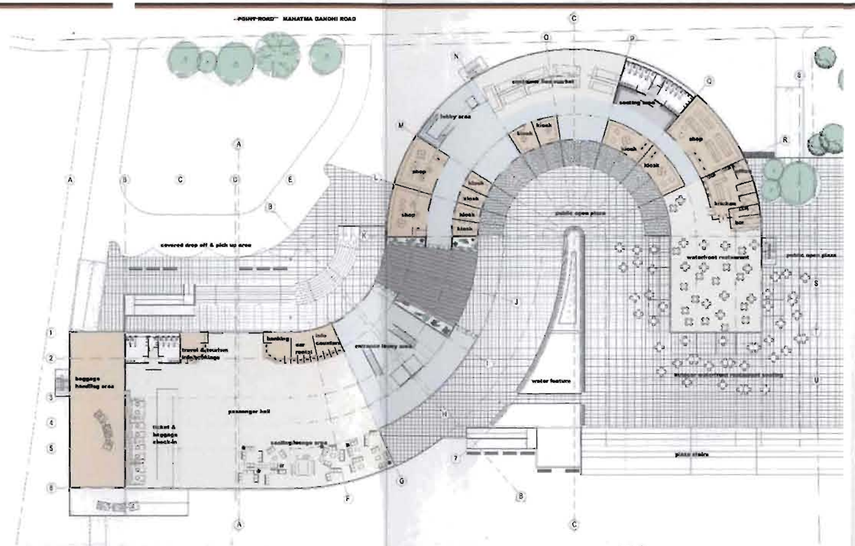
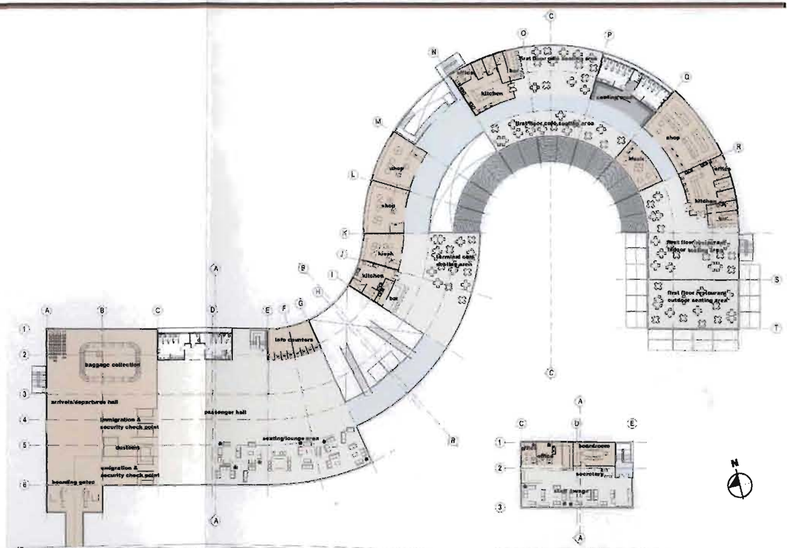


SEMI-BASEMENT PARKING PLAN 1:200

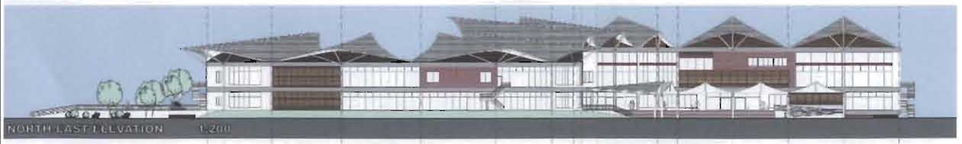


GROUND FLOOR PLAN 1:200

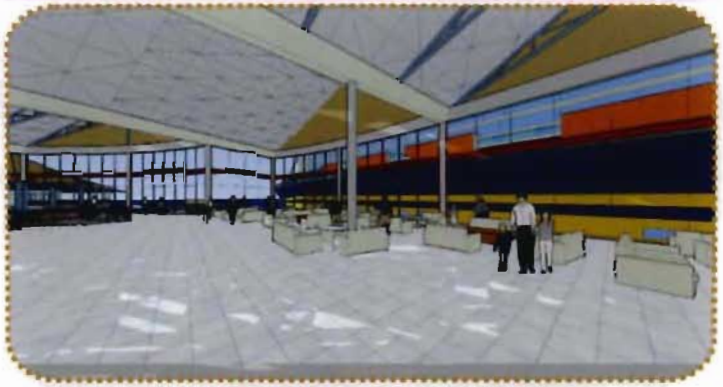


FIRST FLOOR PLAN 1:200

MEZZANINE ADMIN FLOOR PLAN 1:200



EXPLODED 3D VIEW SHOWING THE STRUCTURAL SYSTEM OF THE TERMINAL.



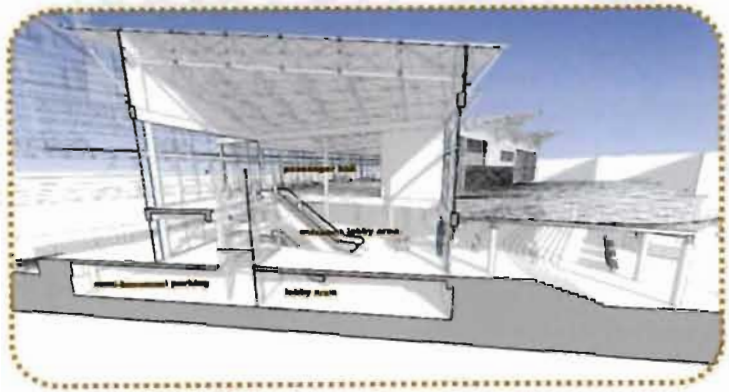
INTERIOR VIEW OF FIRST FLOOR PASSENGER HALL SEATING/LOUNGE AREA.

VIEW APPROACHING THE PUBLIC OPEN PLAZA AREA.

SECTION A-A 1:100

VIEW APPROACHING THE DROP OFF AREA.

INTERIOR VIEW OF ENTRANCE LOBBY AREA FROM THE FIRST FLOOR PASSENGER HALL.



SECTIONAL PERSPECTIVE B-B

AERIAL VIEW OF CRUISE LINER TERMINAL FROM HARBOUR MOUTH SIDE.

SECTION B-B 1:100

the port, a point of entry: the design of a **NEW CRUISE LINER TERMINAL** at the point, for durban.

SECTION B-B

RICARDO BEXIGA 2008

AERIAL VIEW OF PUBLIC OPEN PLAZA AREA SHOWING OUTDOOR RESTAURANT SEATING AREA AND WATER FEATURE.

VIEW FROM PUBLIC OPEN PLAZA AREA LOOKING OUT TOWARDS BERTHED CRUISE SHIP.

AERIAL VIEW OF NEW PUBLIC OPEN SPACE.

VIEW LOOKING BACK AT CRUISE LINER TERMINAL FROM QUAY LEVEL.

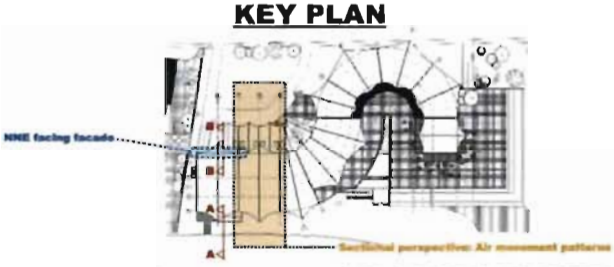
SECTION C-C 1:100

the port, a point of entry: the design of a **NEW CRUISE LINER TERMINAL** at the point, for durban.

SECTION C - C

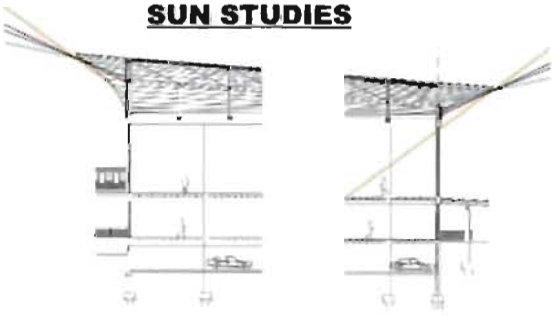
RICARDO BEXIGA 2008

KEY PLAN



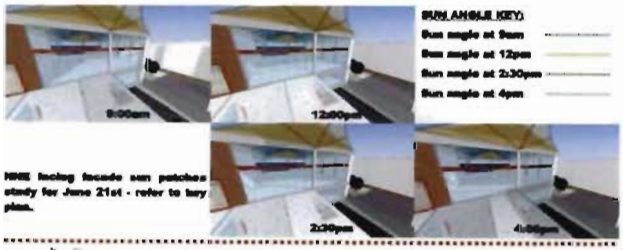
SUN STUDIES

WINTER SOLSTICE



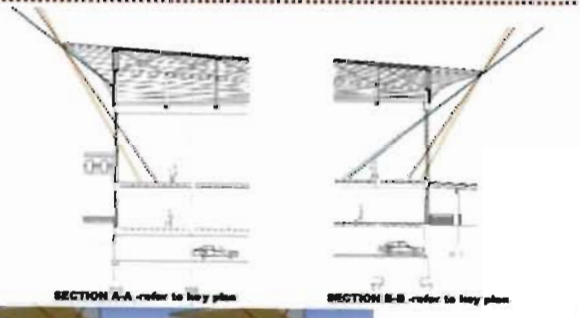
SECTION A-A -refer to key plan

SECTION B-B -refer to key plan



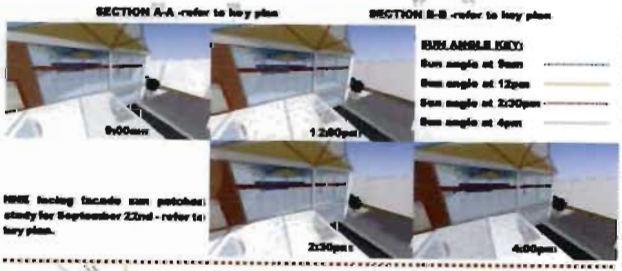
NNE facing facade sun patches study for June 21st - refer to key plan.

EQUINOX



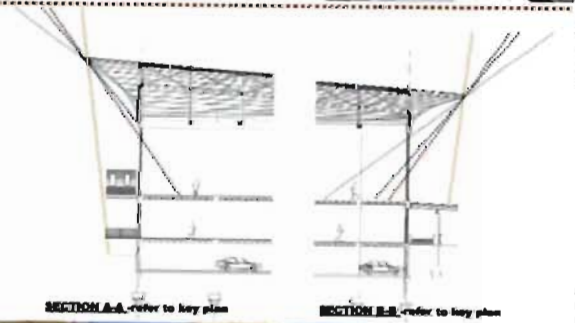
SECTION A-A -refer to key plan

SECTION B-B -refer to key plan



NNE facing facade sun patches study for September 22nd - refer to key plan.

SUMMER SOLSTICE



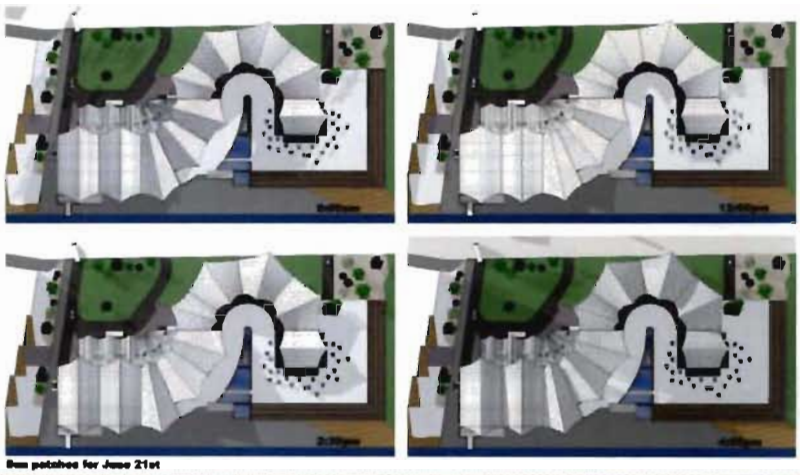
SECTION A-A -refer to key plan

SECTION B-B -refer to key plan

NNE facing facade sun patches study for December 22nd - refer to key plan.

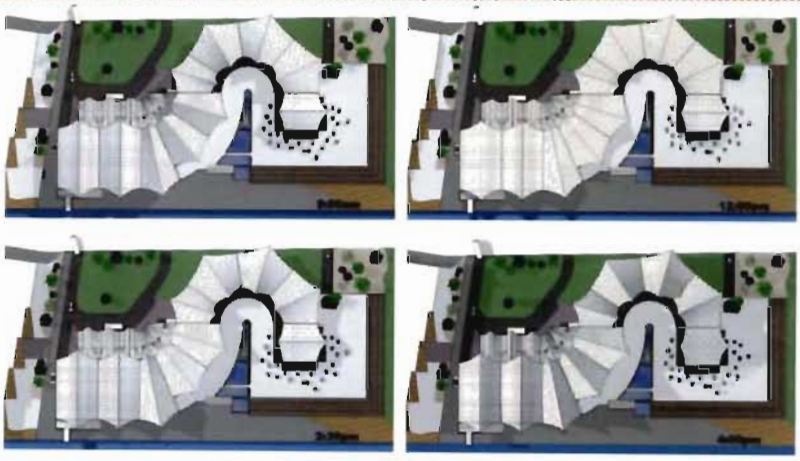
PUBLIC OPEN PLAZA SUN PATCHES STUDY

WINTER SOLSTICE



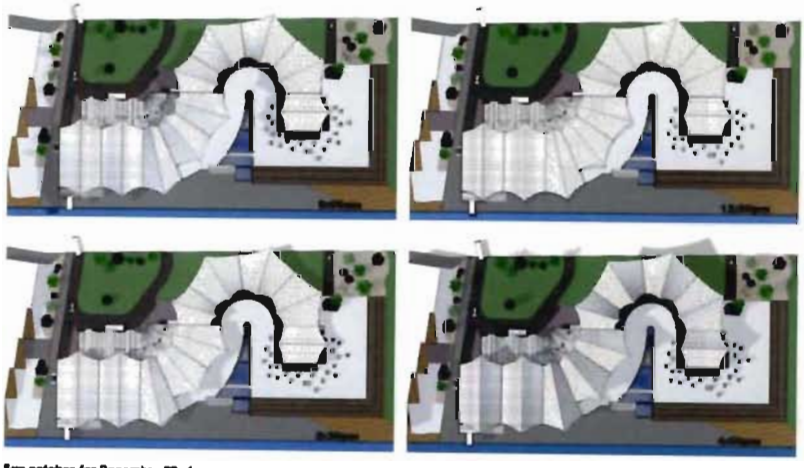
Sun patches for June 21st

EQUINOX



Sun patches for September 22nd

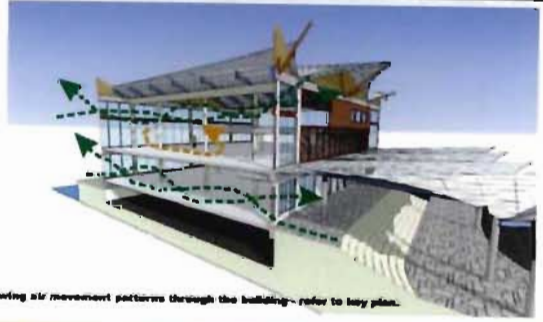
SUMMER SOLSTICE



Sun patches for December 22nd

N

AIR MOVEMENT PATTERNS WITHIN THE BUILDING



Sectional perspective showing air movement patterns through the building - refer to key plan.

the port, a point of entry: the design of a **NEW CRUISE LINER TERMINAL** at the point, for durban.

SOLAR AND ENVIRONMENTAL STUDIES

RICARDO BEXIGA 2008

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