



FIGURE 1.1: VIEW ALONG AVENIDA 25 DE SETEMBRO TO THE WEST (DEVENISH, 2011)

# CHAPTER 1\_

## INTRODUCTION

## 1.1 BACKGROUND & RATIONALE

The proposed dissertation is a result of a final year program offered in collaboration and in relationship with the University of Pretoria (Pretoria, South Africa), the University of Eduardo Mondlane (Maputo, Mozambique) and the University of Delft (Delft, Holland).

As an introduction and grounding exercise a week-long workshop was held in Maputo in June and July 2010. During this workshop numerous students from the University of Pretoria worked on a series of studies in the inner city of Maputo (*Baixa*). This was done through a series of various quick-scan methods and documentation (see Appendix B). This was valuable in terms of the initial contributor and place setting towards the final proposed project (Initial Site Investigation June 2010).

During February 2011, a group of five architects and one landscape architect (the author) in collaboration with the other two universities, visited Maputo for further analysis and investigations. All of these students had chosen Maputo as their final year project and study area. The main focus of this exercise was to make use of the opportunity to find a dissertation theme, site and ideas for the future proposal. The two-week in-depth workshop was conducted through group work, analysis, observations, sketching, fieldwork, documentation, research, interviews, presentations and information gathering.

Later in 2011, the same students from the University of Pretoria finalised the site investigation and data gathering by individually recording and

examining their own respective sites. It was during this time that the author had the most success due to a better understanding of the context and problems of Maputo. It was then that the author decided on a relevant site and project theme for his final proposal (*The Framework*, 2011).

During the rest of the year, the project (the entire design intervention) and final proposal was directed from Pretoria, South Africa. The project aimed to address the following: initial conceptual idea, conceptual layout, group framework, design development, theoretical investigation, practical examples, technical resolution, documentation, communication, interviews, detail design, presentations and finally the publication of this document.

Initially, the specific study area and context was fairly unknown and the time and resources limited. The reasons are stated and discussed in Chapter 2. As an initial contributor to the process and being a main driver to the project, the *Four Tracing Concepts in Landscape Architecture* by Christophe Girot were followed rigorously. The concepts include landing, grounding, finding and founding (Girot, 1990: 58-67).

## 1.2 PROBLEM STATEMENT

***How can the problem of flooding in the Maputo Baixa be addressed and utilised through sustainable landscape architecture?***



FIGURE 1.2: LEAF ON AVENIDA 25 DE SETEMBRO (AUTHOR, 2011)

### 1.3 HYPOTHESIS

This dissertation argues that through a number of interventions, the flooding problem in the Maputo *Baixa* can indeed be solved. This is proposed through the implementation of a series of water-holding sites.

Through a network of open urban spaces, consisting of a series of retention dams (water-holding areas), the opportunity also arises to introduce a network of infiltrating greenery into the city. These sites will also provide for social interaction and economic sustainability within the area.

The main focus is on harnessing the negative flooding element, and using it favourably for social, economic and ecological needs. Water could then be harvested and used accordingly for irrigation, households and other purposes before excess water is discharged into the Maputo Bay.

The goal is to change the underdeveloped functions of current open spaces, and to create urban water-holding parks. These sites will then allow for regional upliftment and will serve as much needed urban park space.

It is argued that the most efficient way of transporting water to these sites would be by means of an open channel system. This will be achieved by possible adapting the current parking bays/sidewalks of *Avenida 25 de Setembro*.

A criteria defined in the 2011 UP Student Framework (*The Framework*, 2011), found that

the inner city needs a source of revitalisation, and that this project could possibly serve as valuable contributor towards this goal.

### 1.4 SUB QUESTIONS

- How can a project aid in flood management in the *Baixa*?
- How can the water-holding (diversion) sites allow for possible freshwater reuse and become aesthetically attractive nodes?
- How can the project on city scale, lead to a more sustainable green space development and finally add to social, economic and ecological identity of the city?

### 1.5 RESEARCH GOAL

The dissertation investigates the current situation of flooding within the city of Maputo's *Baixa* and finds a way it can be solved. The term given to the project is: urban water-holding park (urban park). The project should become part of a larger system of water-holding sites which main aim is to reduce flooding.

The key word in the dissertation theme, namely revitalisation, forms an integral part to the design approach and is indirectly aimed to encourage future developments. The project should thus act as a catalytic node to which surrounding de-

velopments (new and existing) could "plug into". This meaning, that the landscape intervention should become the primary initiator, which encourages new build fabric around it.

### 1.6 ASSUMPTIONS

- The *Baixa* Student Framework (*The Framework*) would be implemented.
- The proposed city strategy (by author) will be implemented. This consists mainly of the five water-holding sites and the water channel/parking bay system.
- The area of land (for the site) that is considered will be available for purchase or be donated by *CFM (Railway Company Mozambique)*. This company currently owns the plot of land.
- No other flooding intervention will be implemented and no other solution is investigated. The proposed intervention will be designed with this in mind.

### 1.7 STUDY DELIMITATIONS

The author acknowledges that:

- He is not an architect and will only provide concepts and guidelines for the building footprint, height and use.

- He is not a specialist in terrestrial or aquatic ecology and will aim to implement general ecologically sound principles in order to inform his decisions in a systematic design approach.
- He is not a hydraulic engineer in regard to volume quantities and water management properties. These include quality, catchment area, litter-accumulation and removal, channel slopes and water speed. All alterations designed is done through own calculations, research and intuitive response.

Although the author included all of these disciplines into the project, flood control practise is a large concept and the author can't study all the technologies. It can thus be summarized that:

- The author stays within the site boundary.
- The author are not going to be studying whether an alternative intervention (like green roofs) would also work.

- The author are not going to study whether practises like, changing all the hard surfaces is a plausible approach.

It should be remembered that Maputo is a unique Third World city and differs completely from our own major South African or Westernised cities. This for example, should be kept in mind due to the fact that there are no similar cases of any landscape architectural interventions in the city. Basic services that some might accept as a given, are not necessarily available, as the city lacks rubble removal, other basic services and maintenance issues.

Difficulties exist in the consultation process in terms of culture, distance between the countries, language and codes of business conduct. Recognition, understanding and overcoming these barriers was vital to the success of the proposed project. Patrick Nichol describes that there is currently a limited degree of information, experience, expertise and physical resources in Mozambique. These are all contributing factors and need to be addressed in order to empower the people of Mozambique. The lack of basic communication tools such as the internet, digital cameras and so forth currently make effective communications with the city difficult (Nichol, 2007: 1-8).

As an example, students were confronted on a regular basis by police and other security officials while measuring and photographing buildings and measuring street dimensions.

As a second example, it was sometimes difficult to take pictures of public parks and streets with people in it. Many locals (people making use of the *Baixa*), made use of these opportunities to chase students away or discouraged having pictures taken of them. It was interesting to note that these relevant spots ("where no pictures was allowed to be taken"), were identified as the crime or dangerous hot spots.

It should thus be an underlined statement that photographs and other documentation media are encouraged in these public parks and spaces, without interference from anyone. A democratic mind shift is required for these spaces to work and should run independent from political or restrictive institutions.

## 1.8 METHODOLOGY

The dissertation aims to establish guidelines and principles by evaluating the historical and current contextual layers, theory and precedent within the *Baixa*.

Many of the influential factors in the decision-making process were gathered through group work, research and documentation through interviews and expert advice from the *Boukunde Faculty* (Department of Architecture at the University of Pretoria).

Lastly, the *Sustainable Sites Initiative (SSI)* will be introduced to serve as a guideline on the proposed site and act as prerequisite for point allocation (to be discussed in Chapter 3).

All of the factors that have been mentioned are overlaid by the four tracing concepts of Girot (1990) and implemented accordingly.

The study will be based on quantitative and qualitative research. This type of study requires sound and critical technical evaluation along with a subjective approach to human needs in regard to movement patterns, material choice and other relevant design decisions. Figure 1.3 illustrates

the Girot-inspired design process, while the table pictured in Figure 1.4, indicates a nonlinear process research methodology will be applied. These are:

- Qualitative research deals with descriptions; data that can be observed but not measured; colours, textures, smells, tastes, appearance, beauty, and so forth.
- Quantitative research deals with numbers; data which can be measured; length, height, area, volume, weight, speed, time, temperature, humidity, sound levels, cost, members, ages, and so forth. (Roberts, 2011).
- Intuitive research deals with the author's feelings that poses to be true, even without conscious reasoning; instinctive (Google Dictionary, 2011).

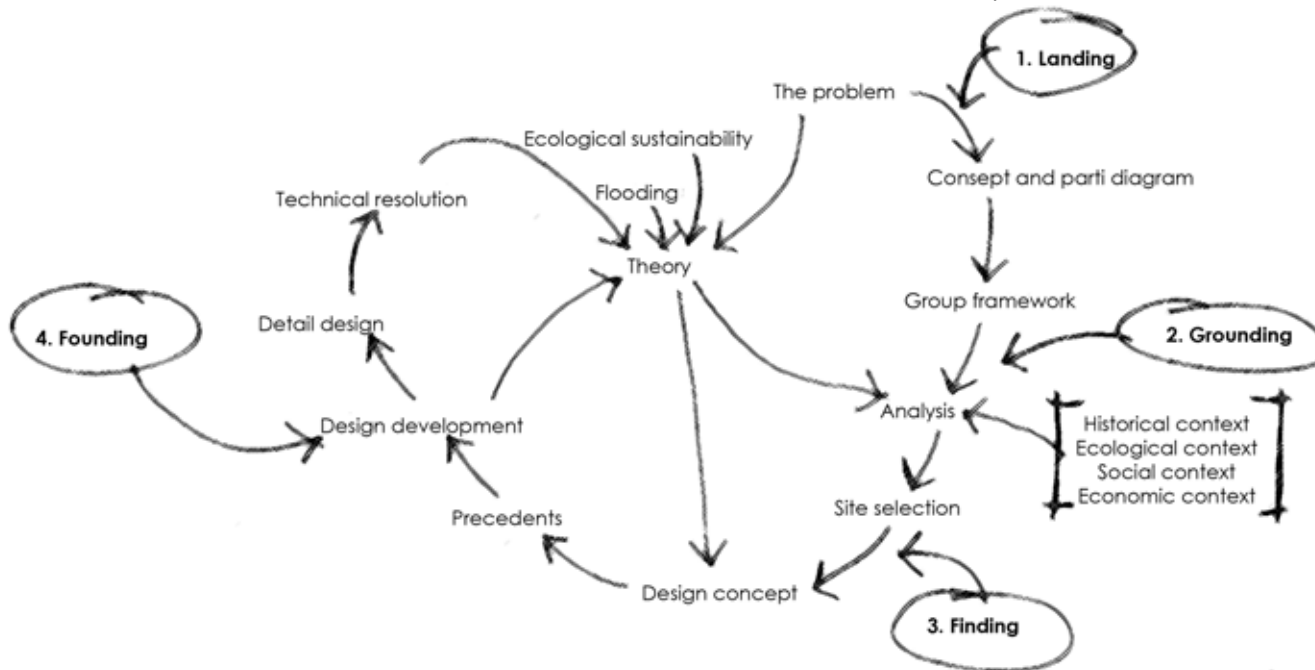


FIGURE 1.3: DESIGN PROCESS TO BE FOLLOWED (AUTHOR, 2011)

- Data types ranged from all sources used and added to decision making.

## 1.9 CONCLUSION

In summary, all the decisions made are based on the current conditions and context of the *Maputo Baixa*. Many of the decisions made have been generated through discussions within the student group, analysing The Framework done by the UP students (*The Framework*) and an intuitive response by the author.

Due to the problematic issues like mismanagement, lack of the maintenance and general low-per-capita income of local inhabitants, it is not possible to cover all social and environmental problems. Although the *Baixa* lacks in many of these categories, it offers many valuable attributes to this kind of intervention being a vibrant modern African city, rich with colonial and war histories; a unique climate and topography; and some interesting approaches to materials, styles and detail.

	Data type	Data type	Data type
<b>Research type</b>			
Quantitative research		Site & context analysis	
Qualitative research	Theoretical investigation	Site & context analysis	Precedent studies
Intuitive research		Site & context analysis	
Data type	Published documents and journals	Published documents, observations, measurements.	Observations, interviews, published documents

FIGURE 1.4: RESEARCH METHODOLOGY TABLE (AUTHOR, 2011)



FIGURE 2.1: DRY DOCK, MAPUTO HARBOUR (DEVENISH, 2011)  
26

# CHAPTER 2\_

## CURRENT KNOWLEDGE: FRAMEWORK SUMMARY





FIGURE 2.2: MAPUTO CENTRAL MARKET (MAOCHA, 2011)



FIGURE 2.3: STUDY AREA & MAPUTO LOCATION IN AFRICA (AUTHOR, 2011)

## 2.1 LANDING

Girot's first trace concept is *landing*. *Landing* is the first act of site acknowledgement and marks the beginning of the odyssey. It describes the specific moment when the designer still knows nothing about a place and yet is prepared to embark on a lengthy process of discovery. It therefore invokes the passage from the unknown to the known, from the vastness of the outside world to the more exact boundaries of a specific project:

- It thus requires a particular state of mind where intuitions and impressions prevail, where one feels before one thinks, where one moves across and stalks around before seeking full disclosure and understanding. It must induce a sense of complete displacement and outsidership to be really

effective.

- It also refers to the moment when a designer reacts to the difference between his or her preconceived idea of a place, and the reality that appears during the first steps of a visit. Often, one comes to a site with a set of ready-formed impressions and opinions. Nothing is allowed to remain obvious or neutral to the designer; rather everything is apprehended with wonderment and curiosity, with subjective and interpretative eyes.
- It also refutes the idea of where nothing can be learned or retained from the given site and where everything can be resolved by detached conceptual thinking. Every detail counts. The state of landing plays a vital role in the genesis of design. Initial



FIGURE 2.4: STUDY AREA (AUTHOR, 2011)



FIGURE 2.5: MAPUTO (PERS-ANDERS PETERSSON/GETTY, N.D.)

landing provokes impressions and insights that often last through the entire design process.

- Finally, it represents a sense of entry and is therefore personal. It escapes methodology and is almost always the result of chance. It is a living manifestation of the experiential potential of a site and thus has potent spatial and psychological effects on the subsequent thinking through the design project (Girof, 1990: 61).

## 2.2 INTRODUCTION FROM RESEARCH

The world's population is estimated at about 6.6 billion people. An indication by the United Nations shows that about 3 billion people live in urban areas (UNCHS, 2007). This is in comparison with studies done in the 1950s, where 66% of the world's population lived in the countryside (World Bank, 2000), (IMF, 2006).

Currently, it is estimated that by 2030 about 61% of the world's total population will be living in cities. In addition it was found that the world's popu-



FIGURE 2.6: LAGOS, NIGERIA (MENDEL, N.D.)

lation will increase, with the largest percentage increase being in low- and middle-income countries like Mozambique (Peters , 2000:2), (UNFPA, 2007).

At the 2002 *Johannesburg's World Summit on Sustainable Development* (WSSD) all governments were called on to address the overwhelming challenge of providing basic urban services to the teeming people in slums where the quality of life is appalling.

While continents such as Europe and the Americas have stabilised their population growth and economy to a large extent, most countries in Africa have not been able to deliver on their promises of alleviating the precarious state of living environments within their countries (UNHABITAT, 2003), (Daramola & Ibem, 2010).

The commission for Africa is quoted: "Africa is not a driver of climate change, but a victim" (Commission for Africa, 2005).

Flooding has been identified as one of the major factors preventing Africa's growing population of city dwellers from escaping poverty (Figures 2.5 and 2.6). This stands in the way of the United Nations' 2020 goal of achieving significant improvement in

the lives of urban slum dwellers (Action Aid, 2006). This is because many African cities lack the infrastructures to withstand extreme weather conditions.

Poor urban planning and other urban governance challenges contribute to the risk of African urban slum dwellers. A lack of planning as urban development increases is evident in areas where new development should be prevented. It should be encouraged that unprotected areas should be left undeveloped, for instance wetlands. In the *Baixa's* case, the natural green ridge to the north-east of the city, poses to be undermined the same threat. This green strip of natural vegetation serves an important ecological role within the area. These green areas are pointed out as important role players and act as buffers against flooding risk (Adelekan, 2009). That is way these green spaces should be protected and reintroduced.

According to Action Aid International (AAI), Mozambique is rated to have the second-highest number of people that were affected by flooding from 1990 to 2004. It is estimated that 3.43 million people were affected during flood-related disasters. The main reasons thereof are climate change,

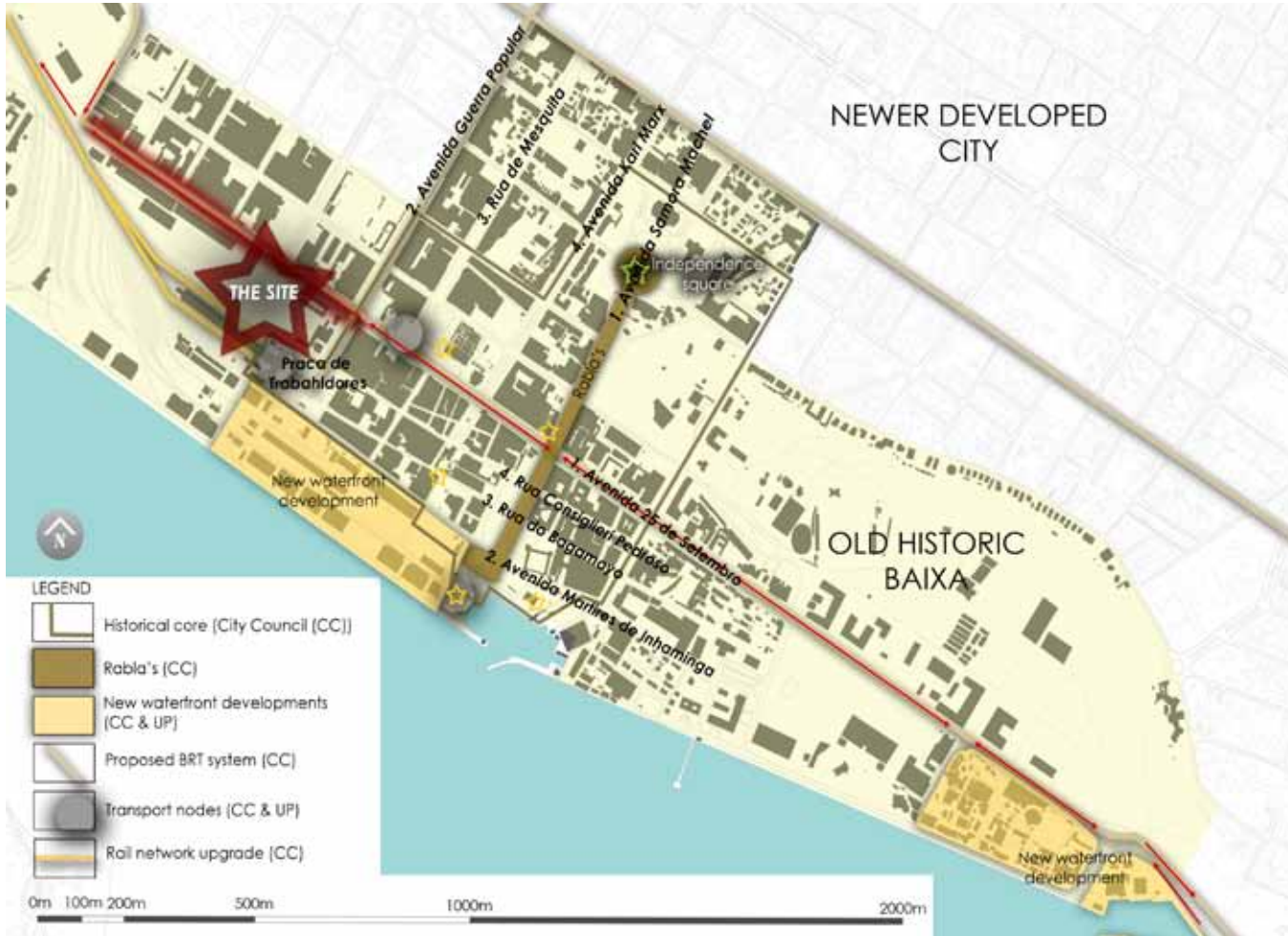


FIGURE 2.7: OVERLAY OF MUNICIPAL FRAMEWORKS (AUTHOR, 2011)

large built-up areas, poor urban planning, lack of infrastructure and so forth (Action Aid, 2006).

### 2.3 INTRODUCING THE FRAMEWORK

In 2011, a group of students attempted a collaborated urban design exploration. The group consisted of five architecture students and one landscape architecture student (the author) from the Department of Architecture of the University of Pretoria (UP).

Through this joined group effort a theoretical approach was identified, and as result a group framework (*The Framework*) was compiled (see Appendix A).

The theory used as main driver is that of Kevin Lynch's *Five Elements of Mental Maps* as well as *Finding Lost Space* by Roger Trancik (Trancik, 1986). Lynch (Lynch, 1960) describes paths, edges, districts, nodes and landmarks as the five elements from which users understand their surroundings in consistent and predictable ways (ebid).



FIGURE 2.8: INDEPENDENCE SQUARE (FORJAZ, 2011)

These five maps form an important base from which analysis was done and conceptual opportunities were identified. These range on all aspects, from movement patterns and important building locations, to open space location and mixed use functions (*The Framework*, 2011).

### 2.4 FRAMEWORK DEVELOPMENT

Over the years three main planning schemes have addressed Maputo and the *Baixa* and the urban planning thereof. Figure 2.7, which summarises these schemes, include:

- The *Baixa Urban Design Framework* by the UP students–2011 (*The Framework*, 2011).
- *PEUMM Framework* by the Maputo City Council –2008 (*PEUMM*, n.d.). *PEUMM* was translated out of a Portuguese presentation and has an unknown meaning. It refers to the proposed framework done in 2008, by City Council.
- Proposed- or future projects by City Council –2011. Some future ideas was mentioned in a class interview (CC, 2011)



FIGURE 2.9: RAMBLA'S IN BARCELONA, SPAIN (GREEN NEWS ADMIN, 2009)

The 2011 Urban Design Framework by the UP students, conceived the following vision for the city and was identified in assistance with the relevant theory. Refer to Appendix A for *The Framework* (*The Framework*, 2011).

In 2008, the City Council, created a framework namely *PEUMM*. This framework was guided by principles of urban development and is consistent with the fundamental laws of the country (*PEUMM*, n.d.).

The *PEUMM* Framework forms part of the UP students' framework. The *PEUMM* Framework was sourced from a presentation during a Maputo visit. The *PEUMM* Framework was originally presented in Portuguese and had to be translated by the author by means of *Google translator* (<http://translate.google.co.za>) and may thus appear somewhat incoherent.

The *PEUMM* Framework was drawn up to ensure the following basic rights to citizens with regard to urbanity:

- The right to the city.
- The right to urbanised land.
- The right to decent housing.



FIGURE 2.10: PROPOSED WATERFRONT TO THE EAST OF BAIXA (DO JOSE, 2010)

- The right to sanitation.
- The right to safe transit and urban mobility.
- The right to infrastructure, services and equipment for urban education, health, information and culture, sport, leisure and public safety.
- The right to participation. (University of Eduardo Mondlane, 2011)

The third and final framework that influenced design decisions, was proposed for future projects. During one of the various interviews, information was made available regarding future developments due to take place in the city (City Council, 2011).

In this "Future Projects" Framework, a spokesman from the city council briefed the students on future developments, soon to take place. These included a *Rambla's* project along *Avenida Samora Machel* similar to the one in Barcelona, Spain (Figure 2.9); An Independence Square were the *Rambla's* "originates" (Figure 2.8) and a proposed waterfront along the harbour front (Figures 2.10 and 2.11).



FIGURE 2.11: PROPOSED NEW WATERFRONT (DO JOSE, 2010)

## 2.5 CONTEXT INFLUENCING THE SITE

### Streets:

1. **The first street** under discussion is *Avenida 25 de Setembro* (Figure 2.12 - next page). Through a process of intensive height analysis (by the author) within the *Baixa*, *Avenida 25 de Setembro* (the street) was found to be the lowest part of the *Baixa*. As further analysis showed, a part within the relevant street was calculated to be the very lowest point within the *Baixa*. Due to this state, water accumulates along the street and results in urban flooding of great extent. All water accumulation is from storm-water run-off from buildings and the other hard surfaces in the *Baixa* (fresh, inland water). This is discussed in more detail in *Chapter 4*.

The main focus of this site intervention will be to "divert" storm water to more suitable sites and allow for treatment and urban reuse. Excess water is proposed to be discharged into the Maputo bay.

To state the importance of *Avenida 25 de Setembro* to the reader and the final site design, the street is analysed and discussed in detail:

The street is a strong vehicular artery feeding traf-

fic into the *Baixa* from the west, and leading access towards the east and vice versa. It is strongly vehicle-orientated, forming a barrier between the old, historic *Baixa* in the south, and the newer developed city to the north (Figure 2.7). The area to the north is mainly commercial and residential, while the southern part is mixed use. The street does, however, have a strong pedestrian and informal trade character due the presence of the Central Market, located centrally in the street. The street acts as an important pedestrian connector, but does not cater for movement across.

This also serves as connection link to the new developments occurring to the east and west in the street. The intention of the street within *the framework* is to retain its vehicle hierarchy, whilst ensuring adequate sidewalks for pedestrian movement, informal retail and formalising of parking bays. Bridging the barrier between new and old *Baixa* will be addressed

at the intersections through traffic-calming methods such as surface change and level differences.

The changes proposed by the author regarding the introduction of storm-water channels along the street, will also serve as possible motor calming method and pedestrian movement encourager. This could possibly be done through speed bumps and warning signage along the street and bridging and steel grids along the water channels (Figure 2.13) as original sketches show.

The aim would be to adjust the street in such a way as to keep its important vehicular function, but also to serve as a water channel to which water can be allocated and then be transported to the specific site (of the project) and the other sites within the *Baixa*. The challenge for that reason, is to keep the existing parking bays along the street and merge it with the open water channel system.

It is aimed that the outcome will add to the city's rich and unique *genius loci*.

Compared to suggested street types by Llewelyn-Davies (Llewelyn-Davies, 2000) in his book *Urban Design Compendium*, the streets in the *Baixa* are identified within the group's framework. These are identified as having the following potential characteristics (Llewelyn -Davies, 2000):

The avenue is potentially a vibrant linear spine for a public open space network in the future. This spine can possibly include numerous soft green spaces, public squares, both passive and active. Roger Trancik in his book, *Finding Lost Space*, describes linkage through a network of streets as one of the key ingredients of place making (Trancik, 1986). Streets, their layout and connectedness are pivotal within a greater urban design vision.

**2. The second street** under investigation is *Avenida Guerra Popular* (People's War Avenue) demonstrated in Figure 2.14 for the reason that the site falls within an important crossing and link between *Avenida 25 de Setembro* and *Avenida Guerra Popular*.

*Avenida Guerra Popular* is a strong vehicular artery linking the historic core of the *Baixa* with the

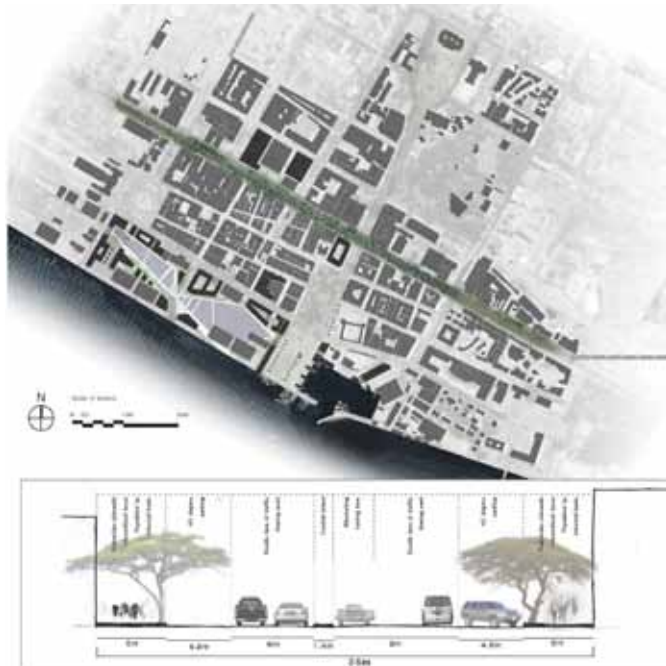


FIGURE 2.12: AVENIDA 25 DE SETEMBRO HIGHLIGHTED (THE FRAMEWORK, 2011)



FIGURE 2.13: SKETCH SECTIONS OF THE STREET WATER CHANNELS (AUTHOR, 2011)

newer parts of the “cement city” further inland. The street acts as an important connector of public transport facilities. It was designed as a wide boulevard which allows for multilane roads. The street is congested largely due to the taxi rank located to the north of the intersection, for which the available space is insufficient. Due to this public transport facility the street is full of pedestrians.

Infrastructure is provided for pedestrians, such as wide pavements, but similar to most other streets in the *Baixa*, vehicles take over by parking on streets and inhibiting pedestrian movement.

It culminates to the south in *Praca de Trabalhadores* (Workers Square), to which the railway station faces. To the north the avenue leads to *Maputo International Airport*.

The intention for the street within The Framework is

also to retain its vehicular hierarchy, whilst ensuring adequate sidewalk for pedestrian movement and informal retail, and the formalising of parking bays both in parallel and on the central island. Pavements will be defined for the pedestrian by demarcating parking for vehicles. Access across the road will be defined by way of pedestrianised routes linking across via the central island. The island will also provide for controlled sectional diagonal parking.

Similar to the function of *Avenida 25 de Setembro*, *Avenida Guerra Popular* can also be characterised as a district distributor. It has traffic throughout the different parts of the urban area. It is suggested as an avenue or boulevard with formal and generous landscaping and tree planting (*The Framework, 2011*).

## 2.6 SUMMARY ON SITE SELECTION

Through analysis, it became clear that *Avenida 25 de Setembro* should provide the following attributes:

- Relevant avenue or boulevard with formal and generous landscaping proposed by UP students (*The Framework, 2011*).
- A water channel on the side of the road which will serve as 45 degree parking during dry spells. By making use of an adjusted water system, the flooding problem can be successfully lowered (proposed by the author).

The main site intervention (the site) should provide the following characteristics:

- Brown field site (current state).

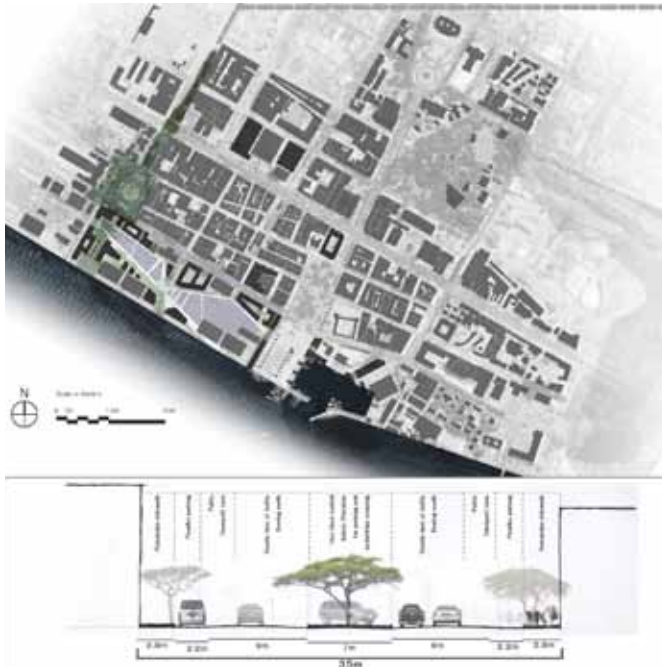


FIGURE 2.14: AVENIDA GUERRA POPULAR HIGHLIGHTED (THE FRAMEWORK, 2011)



FIGURE 2.15: SITE AS INFRASTRUCTURAL AND GREEN LINK (AUTHOR, 2011)

- Lowest point of water accumulation in the whole street (as measured by the author).
- The site lies within an active transport zone on an important axis, intersected by two district distributors and the railway station.

The *Baixa* is seen as the heart of the city and the place of origin and everyday business. The site for that reason lies in the historical core of the city and serves as an important economic and social function (Figure 2.16).

## 2.7 CONTEXTUAL OVERVIEW

Figure 2.15 shows that the site forms an important link from east to west in terms of a green link (green corridor) in regard to open spaces in the city. On a city-wide scale, the site (and the street), reconnects the gap between the undeveloped, natural green ridge from east to west.

On a more local scale, the site connects the sta-

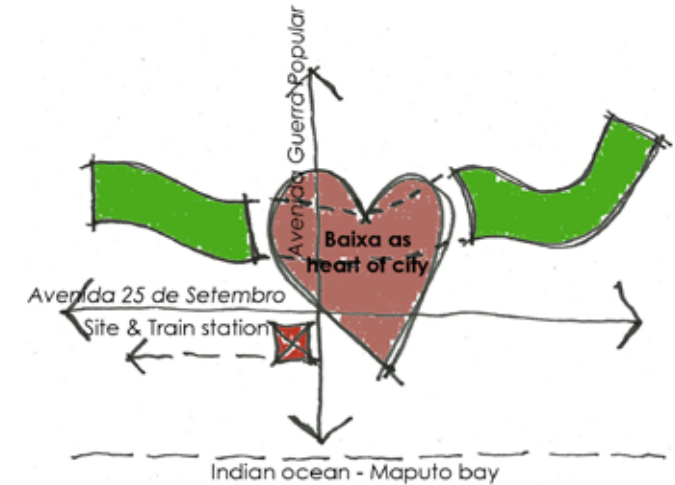


FIGURE 2.16: BAIXA AS HISTORIC HEART OF MAPUTO (AUTHOR, 2011)

tion and *Praça de Trabalhadores* to the newer developments in the west. The site is located on the edge of the *Baixa* and for this reason will encourage new developments along the perimeter of the historical core. This catalytic concept acts as one of the main drivers within the dissertation and framework. The catalytic approach aims to use this type of intervention, to introduce and encourage new developments to take place around the site.

Potential users for the site as proposed are:

Primary users:

- Daily commuters and tourists that make use of the station.
- Business people before, after and during working hours.
- Local residents that will utilise the site as a neighbourhood park.
- Students for educational purposes.



Transport & pedestrian movement



FIGURE 2.17: TRANSPORT & PEDESTRIAN MOVEMENT (THE FRAMEWORK, 2011)

Secondary users:

- Purpose bound pedestrians.
- Users of on-site retail facilities.
- Office users around the site.

## 2.8 DESIGN OBJECTIVES

Design objectives will aim to address the following city-wide scale (Figure 2.15) and site-specific issues:

City scale:

- The Baixa-wide (city-wide scale) problem of flooding during annual rainy seasons (Figure

Flooding map



FIGURE 2.18: BAIXA FLOODING (THE FRAMEWORK, 2011)

2.18) as set out by the problem by Chapter 1.

- The lack of green spaces in the general Baixa precinct.
- Ecological, historical and cultural memory of the area by relating to what was there before and how it could be in the future (elaborated in Chapter 6 and 7).
- Implement the vision of the Baixa student Urban Design Framework (*The Framework, 2011*) for Avenida 25 de Setembro and Avenida Guerra Popular, as discussed.

Site specific:

- A design of a vibrant public open space

that entices use throughout the day.

- Enhancement and protection of the openness of the site.
- A metaphysical connection between the people and the water (water gathered from flooding).
- Seasonal change and use, in regard to rainy to dry season.
- Ecological, historical and cultural memory of the site by relating to what was on-site before and how it could be in the future.
- The introduction of systematic components to create diverse ecosystem components.

## 2.9 POSSIBLE FUNCTIONS

The project proposes an urban water-holding park that will:

- Act as an precedent to the other open and vacant sites along *Avenida 25 de Setembro*. This proposal will be illustrated on city-wide scale, due to the fact that an entire system along the street will be proposed.
- Gather surfaced storm water and then attempt cleaning, harvesting and discharging the excess.
- Create a project of importance to address the social, economic and ecological needs of the immediate *Baixa* environment.
- Innovative landscape design to such extent to educate users of the project and make certain principles clear. This in regard to water conservation, water management

and water quality in urban environments.

- Additionally, people are made aware of the system and strategies involved by means of signage or an information centre. This can illustrate how flooding can possibly be solved or at least be minimised.

The following functions is proposed by the author:

- An information centre.
- Visible on-site water treatment through:
  - Litter traps.
  - Oil traps.
  - Sediment settlement.
  - Constructed wetland.
  - Dam structure.
  - Treated water to be used as irrigation and other purposes.
- Public park that:
  - Provides space for relaxation, social interaction, meetings.

- Has multifunctional green spaces.
- A public plaza (hard surface), bordered by restaurants, an office, a market and a waterfront.
- Establishes a metaphysical connection between the city dweller and the wetland and dam structure.
- Celebrates the *Baixa* and its context in regard to its history, people and natural surroundings through material use and allowing for change.
- Should be safe with adequate security and lighting. This could possibly be encouraged through photography and other methods of documentation.

## 2.10 CLIENT

The project is an integration of users and functions. Stating this, it is lastly aimed to identify a number of patrons to uncover the potential of the city.

Possible patrons:

- Maputo City Council .
- Department of Parks and Gardens, Maputo
- *Portos e Caminhos de Ferro de Moçambique (CFM) (Mozambique Ports and Railways)* Currently involved in relevant projects of upliftment within the city of Maputo.
- Private companies, like *Vale*, a Brazilian mining corporation (second-largest mining company in the world) who is interested in regeneration projects (Nichol, 2007).
- Schools in the area that will make use of the park.
- New developers that will develop around these proposed sites.