<table>
<thead>
<tr>
<th>YEAR</th>
<th>Event</th>
<th>brief event description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1498</td>
<td>various African chiefs are settled close to the bay</td>
<td>Portuguese 'lancados' traders begin settling on the Mozambiquan coast</td>
</tr>
<tr>
<td>1507</td>
<td>Portuguese settle &amp; fortify Mozambique Island as a trading &amp; naval base.</td>
<td>Arab trading with Africans at Sofala (Beira) &amp; inland.</td>
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<tr>
<td>1530</td>
<td>Portuguese captain Lourenço Marques makes the first known successful trading voyage to Delagoa Bay (site of Maputo)</td>
<td>Vasco Da Gama circumnavigates Africa, stopping twice on the Mozambique coast</td>
</tr>
<tr>
<td>1600’s</td>
<td>Portuguese 'lancados'</td>
<td>Sporadic European trade</td>
</tr>
<tr>
<td>1600’s</td>
<td></td>
<td>March 1721 Dutch East India Company founds trading station at Delagoa Bay.</td>
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<tr>
<td>1722</td>
<td></td>
<td>Dutch rebuild settlements following raids by the British</td>
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<td>1730</td>
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<td>1752</td>
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<td>1869</td>
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<td>1875</td>
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**FIGURE 1** Mozambiquan timeline. (adapted from Casson et al, 2011); **ILLUS 9** Maputo through the time (Rufino, 1925)
Portuguese colonial | transition | civil war | reconstruction of built fabric

**1900**
- 11 October 1899: British declare war on Boere in the Anglo-Boer war by 1900
- Lourenço Marques swamps are filled, botanical gardens & boulevard built
- 31 May 1902: Vrede van Vereeniging signed in Pretoria signifying end of Anglo-Boer war

**1924**
- Mozambique is made a province of Portugal

**1951**
- Nationalist movement Frente de Libertação de Moçambique (FRELIMO) is formed led by Eduardo Mondlane
- Sept. 1964: FRELIMO launch a ‘military campaign for independance’

**1969**
- Eduardo Mondlane assassinated.
- Samora Machel is elected leader of FRELIMO

**25 June 1975**
- Portugal grants Mozambique full independence.
- A transitional FRELIMO dominated government steps into power.

**1977**
- The one-party state of the ‘Peoples Republic of Mozambique’ is formed.
- FRELIMO declares its ‘Marxist-Leninist’ stance.
- Traditional beliefs & authority prohibited

**1980**
- FRELIMO engages the Resistência Nacional Moçambicana (RENAMO) in a civil war.
- RENAMO is funded by the Apartheid Government of South Africa
- Infrastructure is destroyed

**1986**
- President Samora Machel & 33 others are killed in a plane crash.
- Machel is succeeded by Joaquim Chissano

**1990**
- FRELIMO embraces social democracy

**1990**
- 4 October 1992: Acordo General de Paz peace agreement signed signifying the end of civil war

**1990**
- Name change to ‘Republic of Mozambique’
- New constitution allows voting and opposition political parties

**2009**
- Severe flooding & cyclone Jokwe wreak havoc

**2010**
- Protestors riot after bread price is raised
ILLUS. 10. Fort & trading settlement on an island in a swamp

ILLUS. 11. First phase of swamp reclamation & layout of formal street grid

ILLUS. 12. Circular demarcation of city limits & extension of street grid

ILLUS. 13. Second phase of swamp reclamation & extension
ILLUS. 14 organic extension. consolidation of erfs in second phase swamp reclamation

ILLUS. 15 extension to the North
The city of Maputo, formerly known as Lourenço Marques by Portuguese colonists, is the capital of Mozambique. It was once a small trading town established on the northern edge of an estuary. Since its early beginnings it has been a place of trade, with its nomadic origins being replaced by more permanent settlement from the 15th century, with the exchanges in power by the British, Dutch, French and finally Portuguese colonists who sought to establish a trade outpost. It was primarily a centre for trade in natural product such as ivory with the small settlement which was located on the island, then separated from the mainland by swamps (Jenkins, 2009; [2]).

With the ever-present threat of invasion from inland tribes and other colonial powers, much of the built fabric was based around the opportunity for defence, with access to the island being limited to one road linking to the mainland as well as a large fortress and praça (central square) to allow for public gathering and lines of sight (see Illus. 10). The historic citadel of Lourenço Marques can be clearly identified from the surrounding areas by its tight knit urban fabric featuring smaller block sizes divided by narrow streets.

Following the discovery of gold in Lydenburg in the late 19th century (ibid; [4]) a connecting road was built to allow for a port link between the Republic of Transvaal and Lourenço Marques. The subsequent economic boom led to an expansion over the swamps to the higher lying mainland as well as a new dock to accommodate the increased steamship activity. Land reclamation of the dividing swamp lands began in the late 1880’s in a two phased procedure, eventually linking the lower lying Baixa area to the higher lying and rapidly expanding city. Urban plans from both 1903 and 1940’s propose large scale development for the rapidly expanding city. The distinction between the finer grained historic citadel and the grid-like upper urban pattern, with a two kilometre radius from the historic praça is clearly evident in Illustration 12 and 13. This radial development can be seen to define a barrier between the formal “cement city” (ibid; [10]) and the informal residential housing lying to the North of the city.

By the late 1960’s industrial activity began decentralising itself from the commercial Baixa district due to lack of space and land prices and migrated towards Matola, to the west of Lourenco Marques. The increased foreign investment resulting from the growing port activities resulted in rapid development and improvement of areas within the inner ring of the city. The subsequent building boom resulted in a number of high rise apartment buildings and private sector developments (ibid; [13]).

This development was cut short after the 1974 revolution after which a rapid de-colonisation of the city began as power shifted away from the Portuguese colonial government. Following independence, the decreased foreign investment lead to state intervention in which unfinished buildings became state owned and developed. Increased populations on the outer extents of the city, now known as Maputo, saw rapid development in the peri-urban sector to the North (ibid; [14]). State development was focused in the unfinished sites in the “cement city” resulting in “the previous bustling and rapidly verticalising central business district ‘Baixa’, with its major associated entertainment and commercial infrastructure, [beginning] to ‘hollow out’ as food
became channelled through state ration shops throughout the city” (ibid; [15]).

The civil war in the late 1980’s however, resulted in a significant influx of residents into both the Baixa and higher lying ‘cement city’ seeking safety from the war-ravaged rural areas, resulting in a rapid densification of residential areas.

The last 20 years has seen resurgence in development aided by increased foreign investment, particularly from the Republic of China. High rise developments along the reclaimed land to the east of the Baixa and a general lack of municipal control over development have allowed a new threat of gentrification and insensitive development to be placed upon the historic fabric.

This is the current context in which this dissertation will be based. As such the subsequent intervention must seek to play the role of intermediary between the historical layers of cultural heritage and the developing multi-national character that will be characterised in future developments for Maputo.
macro_scale

meso_scale

micro_scale
Map showing Maputo greenscapes (unspecified scale)

- natural vegetation
- parks & gardens

macro_scale
meso_scale
micro_scale
observations_
- High levels of movement clustered around transport nodes
- High density at Mercado Central
- Strong pedestrian links up main connector streets North-South
- Strong North-South transport connections
- Avenue 25 de Septembre main vehicular artery
- Main Chapa routes along North-South connections to greater Maputo

ILLUS. 21 Transport networks (Casson et al, 2011)
Limited green spaces within urban centre - mostly under utilised and poorly maintained

- Large portion of land blocking seafront from urban fabric
- Areas of vacant land and parking lots can become part of greater green network
- Pockets of lost and abandoned space within fabric
- Large pocket of vacant land forming inconsistancy in urban fabric
- Potential for block at corner of 25 de Septembre and Ave Samora Machel to be re-developed

ILLUS. 22 Green networks (Casson et al, 2011)
Informal retail clustered around transport interchanges and markets
- Large portion of informal trade is not fixed
- Fixed informal usually related to formal retail function within building

ILLUS. 23 Formal and Informal trade (Casson et al, 2011)
observations

- Highest density of movement around transport interchanges
- Informal trade clustered along pedestrian routes
- Heavy pedestrian movement along pavements needs to be accommodated

ILLUS. 24 Combined analysis (Casson et al, 2011)
macro_scale
meso_scale
micro_scale
Lynch categorises the five elements of urban environments as consisting of nodes, paths, edges, districts and landmarks. These elements, whether in singular form or as a combination of linking elements, begin to define urban areas and create positive urban environments and spaces.

Within the Baixa context multiple linkages consisting of paths connecting spaces of interest can be found. The most significant of which can be found along Samora Machel Avenue and the proposed Las Ramblas project (based largely on the Spanish Las Ramblas of Barcelona) (Forjaz, 2011). This pedestrian boulevard will serve to link a newly created municipal precinct, complete with amphitheatre and parking facilities as designed by local architect Jose Forjaz, and the proposed water terminal linking the Baixa to both national and international inhabitants (Maputo workshop, 2011). It will also serve as a uniting element linking the two large open green lungs within the Baixa area, namely the Jardim tudura (botanical gardens) and praca 25 Junho. The Ramblas also becomes a critical orientating device for visitors to the city.

ILLUS. 25 Open space network (Casson et al, 2011); ILLUS. 26 Municipal buildings Maputo (Hart, 2011); ILLUS. 27 Proposed municipal precinct development (Forjaz, 2010); ILLUS. 28 Las Ramblas, Barcalona (Hart, 2010); ILLUS. 29 View down Avenue Samora Machel (Hart, 2011); ILLUS. 30 Proposed street section through Las ramblas (Casson et al, 2011); ILLUS. 31 Proposed las Ramblas atmosphere (Hart, 2011)
Recognised heritage buildings

Other notable buildings

1. **CONSELHO MUNICIPAL** (City Council)  
   - 1903-1905

2. **CATEDRAL** (Cathedral of our lady)  
   - Construction commenced 1936  
   - Inaugurated 14 August 1944  
   - Gothic style

3. **RADIO MOZAMBIQUE**  
   - Constructed 1948  
   - Modern style  
   - Tropical climate response, brise soleil

4. **TELECOMMUNICATIONS OF MOZAMBIQUE**  
   - 1946-1948  
   - Art Deco style

5. **CENTRO CULTURAL FRANCO MOZAMBIQUE**  
   - Construction began 30 June 1898  
   - Colonial style with large balconies

6. **CASA DE FERRO** (Iron House)  
   - Rediscovered 1960  
   - Prefabricated Iron & Steel  
   - Representation of capabilities of material

7. **STATUE SAMORA MOSES NASCHEL**  
   - Inaugurated 1989  
   - Reinforced concrete, marble, bronze

8. **TRIBUNAL SUPREMO** (Supreme Court)  
   - 1890  
   - Colonial style

9. **MERCADO CENTRALE** (Central Market)  
   - 1901-1903  
   - Manifestation of Industrial Revolution  
   - Iron construction, dome

10. **Predio Pott**  
    - 1891-1905  
    - Steel frame construction  
    - Built for later consul to Transvaal

11. **CORREIO DE MOZAMBIQUE** (Central post office)  
    - 1903

12. **IMPRENSA NACIONAL** (National Press)  
    - 1857

13. **MUSEU DE MOEDA** (Museum of Money)  
    - 1873 Portuguese Government Building  
    - 1964 proclaimed historical monument

14. **CAMINHOS DE FERRO DE MOZAMBIQUE** (Central Station)  
    - 1908-1910  
    - Manifestation of Industrial Revolution

15. **MONUMENTO A PRIMEIRA GUERRA MUNDIAL** (WW1 Monument)  
    - Inaugurated 1935

16. **CASA DOS AZULEJOS** (House of Tiles)  
    - 1879

17. **FORTALEZA DE MAPUTO**  
    - Between 1851-1867  
    - Site of old fort circa 1780-1796

18. **GIL VICENTE CINEMA**  
    - 1925-1927

19. **MILLENIUM BIM Bank of Mozambique**

20. **MINISTRY OF FINANCE**  
    - Pancho Guedes building

21. **PASTELARIA SCALA AND CINEMA SCALA**  
    - Built 1931

22. **MCELL TOWER**  
    - Tallest building within the baixa at 33 floors

23. **ESTACAO NACIONAL** (Central Post Office)
ILLUS. 32 (OPPOSITE) heritage buildings (Casson et al., 2011);
ILLUS. 33 Character of Baixa (Casson et al., 2011);
**Maputo city grid**

- Typical Maputo blocks
  - Irregular in size and shape
  - Organic subdividing evident

**Pretoria city grid**

- Typical Pretoria block
  - Regular in size and shape
  - 230x 150 m
The Maputo grid system was largely introduced in 1881 during the implementation of the urban plan designed by the military leader Araujo. It was largely based on grid systems found in many western cities (Perez, 2011; 2). While the urban plan was never realised, many elements including the suburb divisions and semi circular linking road dividing formal and informal housing areas have been adopted.

Roads in Maputo do not follow the largely regulated *cardo* (north-south axes) *decumanus* (east-west orientators) lines which can clearly be seen in the Pretoria urban layout. Maputo roads often vary in orientation creating an irregular grid shape. In addition, the organic subdivision of larger thinner blocks by smaller informal roads which become permanent allows for a grid pattern with great diversity.

ILLUS. 34 (OPPOSITE) Grid analysis (Google earth, 2011); ILLUS. 35 Block analysis (Hart, 2011);
macro_scale
meso_scale
micro_scale

ILLUS. 36 Maputo city textures (all by Hart, 2011)
ILLUS. 37
Predio Potts
Introductory Images (all by Hart, 2011)
The Predio Pott building was built in 1891, for the then consul to the Transvaal Province, Gerrard Pott. Originally it consisted of a single story building on the southern corner of the site located on the corner Avenida Aguiar (now Avenue Samora Machel) and Avenida D Carlos (now Avenue 25 September). The façade was altered in late 1894 with the extension along Avenue Samora Machel. In 1903 the upper stories were added to the current building footprint (Perez, 2011; [11]).

Built by a Durban based architectural firm ING & Anderson, the building, was erected during the height of the political excitement in Laurenço Marques that followed its classification as a city.

The 1877 expedition of engineers invited by the mayor, General Joaquim Jose Machado, brought with them new construction techniques and materials. (ibid, [7]) The adoption of the Victorian style of building as well as the use of new materials such as cast iron and cement have a large influence on the subsequent construction method employed.

Revolutionary for its time, the building consists of concrete and plaster clad steel columns supporting steel I sections onto which the upper floors and walls where supported. The steel work used within the building was imported from the Glengarnock Steel Works in Scotland. This mill was a pioneer in the rolling of structural steel members which in its day “acquired a high reputation among structural engineers” (Findlay, [2009], np) and due to its competitive price in comparison to other manufacturing works in Europe, allowed it to become widely exported. The punched company name can still be seen on many of the structural members within the building.

The early mixed use typology of the building consisted of retail on ground level, residential of level one and commercial studios on the second floor.

On the 12th December 1990 the building was devastated by a fire which remained unextinguished for several days due in large part to a lack of fire fighting equipment and water as well as poor response times from the fire department (ibid, [12]).

Many of the residents living in the building at the time were refugees of war-ridden rural areas who had sought refuge in the building. 17 families lost their homes in the blaze (ibid, [7]).

While planning permission to restore the building was sought by the owners, to date, no restoration efforts have been made.
form_
The eclectic style found within the building originates largely as a result of a varied range of influences within the building’s history. Following the appointment of Dutch architect Sytse W. Wierda as the head of the Transvaal department of public works by President Kruger in 1877 (Corten, 2009; 16), a number of buildings commissioned through the department show distinct stylistic references to Dutch architecture of the time. The Ou Raadssaal (1889-1902) and Palace of Justice (1897), were largely designed by Dutch trained architects, a number of whom had strong working ties to Transvaal Republic. In contrast to the popular Victorian style of architecture, seen used during this time period internationally, the influence of the Dutch as opposed to the colonial British architects, led to a more eclectic style of architecture being developed. The “Transvaal Republican” style (Corten, 2009; 16) is essentially a derivative of the Wilhelminian style of architecture which has links to both 19th
Century German and Dutch architecture. As former consul to the republic of Transvaal (Perez, 2011,5), Gerrard Pott would have undoubtedly been familiar with governmental architecture of the time which may have been influential on the subsequent design of the Prédio Potts.

In addition, the architectural practice responsible for the design of the building, based at the time in Durban, South Africa, would also have had a large influence on the eclectic style of the building. FJ Ing of the firm ING and WELLS (later ING and ANDERSON), a British trained architect, had been working in Johannesburg during the 1880’s, until such time as he and then partner EP Wells, were awarded the contract to build the Durban Club in 1898 (ref here). When examining buildings designed and built in a similar time period within the Durban context such as the Town Hall (see illus **) one can see clear stylistic references such as the incorporation of Corinthian capitals, plasterbanding and decorative, almost byzantine style towers.

With the outbreak of the Anglo-Boer war in 1899, work and building materials within South Africa became a scarcity. In this time, the firm were commissioned by Pott, to design the primarily commercial building in the city of Lourenco Marques.

Steel shortages in South Africa due to the war, as well as the proximity of the Maputo Port, facilitated the large amount of imported building materials within the building.

Largely built as a steel framed warehouse typology, the building incorporated large ground floor openings for retail purposes, and smaller residential units (added at a later stage) on the level above. Predominantly two storeys in height, the northern portion on Avenue Samora Machel is the only three storey portion on the site with the tall tower structures raised above this level. Roofs would have originally been constructed with corrugated iron roof sheeting on double pitched, timber roof truss construction. Cast iron decorative fretwork and balustrading was used, some of which can still be seen in portions of the building. Internal rooms on ground floor are relatively large due to column structure, whilst on the upper levels smaller roughly square partitioned rooms, suitable to the residential function can be found.

The building in both style and materiality can be clearly identified as completely foreign to its surrounding context (Hart, 2011). It is this unique architectural quality, as well as its cultural connection to political powers based in Lourenco Marques at the time, that give this building such an important historical identity with the Baixa context.
ILLUS. 42 (ABOVE FROM LEFT) Cast iron fretwork (Perez, 2011);
ILLUS. 43 artistic impression Predio Potts circa 1948 (Perez, 2011);
ILLUS. 44 Durban Town Hall 1883-1910 (Unknown, 2011);
ILLUS. 46 original turret with roof, Predio Potts circa 1990 (Perez, 2011);
ILLUS. 46 facade detail Predio Potts, 2011 (Hart, 2011);
ILLUS. 47 Dutch influenced tulip plaster detail (Hart, 2011);
ILLUS. 48 Turret in current condition (Hart, 2011)

ILLUS. 49 Predio Pott, East-West Section A (Hart, 2011)

ILLUS. 50 Predio Pott, East-West Section B (Hart, 2011)

ILLUS. 51 Predio Pott, East-West Section C (Hart, 2011)
Primarily a column and beam construction, steel I-sections are supported on a concrete column grid with bearers and cross members supporting the floor and wall structure of the floors above. The use of steel as a framing mechanism was first seen in 1893 in Cape Town, South Africa, in the Jagger & Co warehouse by Anthony de Witt, the architect largely credited with the introduction of the construction method to South Africa. (Hartdegen, 111; 93) The following decade saw an increase in popularity of the method with arguably the most ambitious of which being the Carlton Hotel in Johannesburg, in 1904 (ibid). Given the construction period of the Prędio Potts building, during 1891 to 1903, the design would have been directly influenced by the technological knowledge of the time. This can be seen in the use of steel sections within the Prędio Potts building. While the strength of the steel I section lies largely in its depth, many of the beams are placed on their sides, possibly as a result of poor construction understanding given the limited knowledge of the material at the time.

The advantages of the steel framing is that it allows for large open planned spaces on ground floor suitable for retail purposes. Double steel I sections are used as lintols above openings. A similar construction detail of the time can be seen in Illus 51. Steel beams are clad with a gypsum plaster board construction to increase fire resistance of the structural steel. However, much of this cladding has deteriorated and been removed.

Internal walls are placed directly onto the steel members with timber bearers being suspended between, onto which the timber floor boards were placed. Much of the original flooring has been removed or was destroyed in the 1990’s fire. A small portion, mostly external walkways, consists of a concrete floor slab which remains largely intact. Single internal masonry walls are bagged and painted with double external walls being internally plaster rendered.

Originally timber sliding sash windows as seen in Illus. 52, cottage pane French doors, as well as decorative screening elements would have been found in openings within the building. Much of the timber and steel decorative work has been removed since the building has been vacant.
When heated, steel expands and elongates. When this elongation is restrained at its ends by walls or by connections to other structural members it can result in deformation of the structural member in the forms of twisting or buckling. One predominant method of increasing fire resistance thus reducing the subsequent spread of fire within a steel frame building is the encasement of the steel member within concrete. If the steel member then becomes heated, this expansion causes the concrete casing to “pop” off in a process known as spalling. The steel member is thus then exposed to direct heat which can result in loss of strength of the structural member.

At a temperature of between 550 to 600°C, steel undergoes a physical change and realignment in its atomic bonds. This can result in a lowered yield stress of up to 40% (Milke, 2002; 5) as can be seen in the stress strain graph. The yield strength of steel at room temperature (20°C) after being heated to 600°C is roughly half that of the original yield strength of the member. Temperatures reached within building fires vary depending on material type, ventilation conditions etc. and can be estimated to reach approximately 1200°C (Milke, 2002: 4).

Given the deformation range of steel above the 600 °C mark, hot rolled steel members can be deemed structurally sound should they exhibit no form of deformation such as twisting or warping (Tata steel, 2011) following a fire as the member is assumed to have not reached a temperature in excess of this. If the load exerted on the structure was less than the design load for the intended structural member however, this may result in an inaccurate visual assessment of the member (Tata steel, 2011). This necessitates the implementation of hardness tests to deem any steel work structurally sound. While structural members within the building do not show signs of deformation such as warping or twisting, it is plausible, given the construction knowledge of the time that the structural members may have been overdesigned for the actual loading. Thus it is assumed that all members within close proximity to the source of ignition of the fire, which appear, in the present day state, to be exposed to potential fire damage, to be unfit for any additional structural loading by any future building.

In addition, the typical method of extinguishing fires is with the use of water. As such, when the relatively cooler water comes into contact with the super-heated steel member, a rapid cooling known as quenching occurs. This process is often used in the making of steel products as the rapid crystallisation of particles during cooling to create a hard and durable surface. This process can however increase the brittleness of the steel resulting in compromised structural integrity.

When examining historic accounts of the 1990’s fire within the Predio Potts building, it is noted that the fire was not completely extinguished due in large part to a lack of water and fire fighting equipment. While this could have allowed for a gradual reduction in temperature of the steel members as opposed to the quenching of the steel when exposed to water, the assumption has been made that all exposed steel members within the building could potentially have been subject to quenching and are thus assumed to be not structurally sound.
current building function
Current observations of the building function (based on site visits made in February and June 2011) can be summarised as follows:

- The facade creates a boundary edge around the site - containing the space behind it.

- Vegetation has begun to repossess the spaces within the ruin, gaining footholds in now vacant shops which have resulted in the creation of green areas within the built fabric.

- An informal residential component towards the rear of the site on both the upper and lower levels has occurred.

- A central linking circulation spine (shown in blue in illus opposite) can be established along which residential activities are clustered

- The beginnings of threshold between existing spaces have been allowed due in large part to the degree of ruination of structural elements. The absence of the elements begins to blur edge conditions

ILLUS. 57 Found structural analysis (Hart, 2011); ILLUS. 58 Predio Potts February 2011 (Hart, 2011); ILLUS. 59 Plaster informal housing in ruin (Hart, 2011)