05

CHAPTER FIVE

CONTEXT:THIRD READING

INFRASTRUCTURE AT THE SCALE OF THE SITE

Identifying the Site
Photographic Overview of the Site and Precinct
Site as a collection of isolated infrastructural systems
Micro scale analysis - Existing constituents of the site
Statement of Heritage Significance
Theory for the Site Vision

5.1

Identifying the Site

The chosen site has been identified as a collection of fragmented surplus sites adrift between the infrastructural edges of Nelson Mandela Drive and the Apies River Corridor. The site is hinged on its northern boundary to the historical Ceremonial Boulevard known as Stanza Bopape S treet, as potential inception point of a collection of positive opportunities to be the extracted and amplified between the city and surrounding suburbs. (See Figure 5.1)

The potential of the Apies River Corridor, and its relegation to an engineered concrete channel due to the demands of modernisation, has resulted in layers of water, built fabric, transport and energy infrastructure that presently dissect the site into rigidly controlled, isolated functions. This has resulted in the loss of its collective presence and significance in the city.

- The river's ecological resources and potential as well as its enigmatic and symbolic presence have been straightjacketed into a linear concrete entity.
- Its historical significance for the establishment and development of the city, as well as its significance as recreational entity has been rendered anonymous.
- Fragmented enclaves and impasses (deadlock urban situations) have diminished the potential of public spaces.

In their damaged state, these surplus marginal spaces offer new opportunities to be extracted and reimagined towards sustainable development of the inevitable densification of the city centre.

Figure 5.1: Locality map of the identified site

5.2

Photographic Overview of the Site and Precinct

Figure 5.2: Panoramic view from Stanza Bopape street towards the site, Lion Bridge and the confluence of the Apies River and Walker Spruit. (Photograph by Author 2015)

Figure 5.3: Panoramic view South down the Apies River Stormwater channel, looking towards the Eastern suspended site. (Photograph by author 2015)

Figure 5.4: Panoramic view North towards Stanza Bopape street from the proposed project site. towards the site and Lion Bridge (Photograph by Author 2015)

Figure 5.5: Panoramic view from Stanza Bopape street towards the site, Lion Bridge and the confluence of the Apies River and Walker Spruit. (Photograph by Author 2015)

Figure 5.6: Panoramic view from Stanza Bopape street towards the site, Lion Bridge and the confluence of the Apies River and Walker Spruit. (Photograph by Author 2015)

Figure 5.7: Panoramic view from Pretorius Street owards the site. (Photograph by Author 2015)

5.3

The Site as a Collection of Isolated Infrastructural Systems

More recently, there has been an increased interest in the architectural discourse regarding ecological awareness and the production of public space in infrastructure design. The author is in agreement with Meyboom (2009:76) that architects (including landscape architects) are well positioned to coordinate a cross-disciplinary approach to constructing a successful multi-faceted infrastructural project. The insights and interests regarding such multi-faceted infrastructural projects should aim to go beyond the limitations of economics and efficiencies.

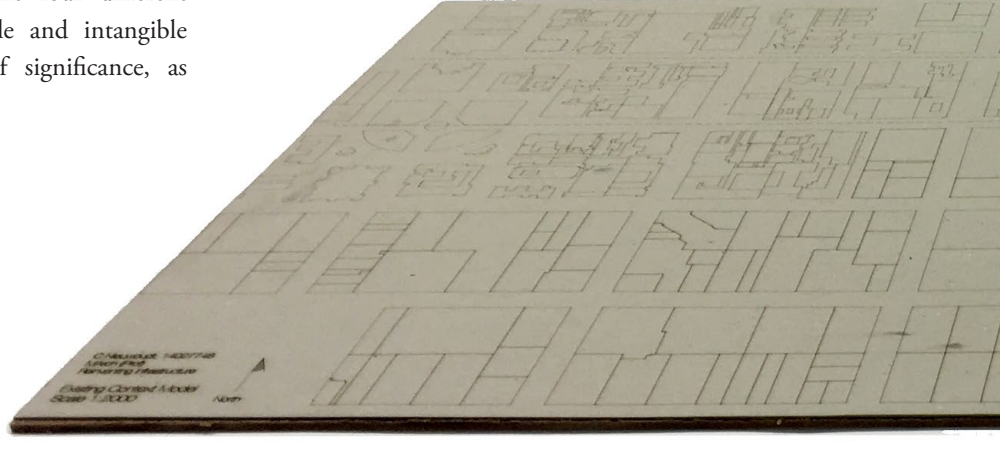
The architectural relationship between structure and space is stimulated by the sectional arrangement of the existing layered infrastructure. The success and potential of public space therefore relies on the equal consideration for and integration of both infrastructural form and its direct and indirect service to its spatial and socio-economic purposes.

Ecosystemic thinking and implementation in the planning of cities and sites, according to Ken Yeang (2009), are achieved through an integrated, dynamic living system that is designed to be functional as well as responsive. A system should encourage a symbiotic relationship between all four infrastructural frameworks facilitating human activity – frameworks categorised as ecological infrastructure (green), water infrastructure (blue), transport infrastructure (grey) and social infrastructure (red). The investigation at the scale of the precinct examines the transformation of the site's infrastructural networks according to the four different frameworks and their respective tangible and intangible heritage significances in a hierarchy of significance, as discussed in the four following categories.

An alternative approach towards an ecosystemic infrastructure requires the integration and therefore investigation and comprehension of these various existing and presently isolated infrastructural realms as identified. The design should aim to provide a platform / structure that encourages alternative and spontaneous spatial conditions to emerge from interaction between the designed and the indeterminate future appropriations and occurrences.

In Meyboom's article "Infrastructure as Practice" (2009:76), Foreign Office Architects state, "There is no difference between making a city and making a building or a detail." Meyboom further argues the inclusion of infrastructure in this statement and declares that the design thereof should be approached with techniques that investigate unconventional ways of appropriation, the historical significance of the place, and the physical interaction of infrastructure with activities, in addition to the environment as a space both for recreation and a resource to be maintained (2009:77).

For infrastructure construction it may be an unfamiliar alternative investigation, and yet for architecture it simply becomes an exploration at various scales and with a diverse programmatic content.



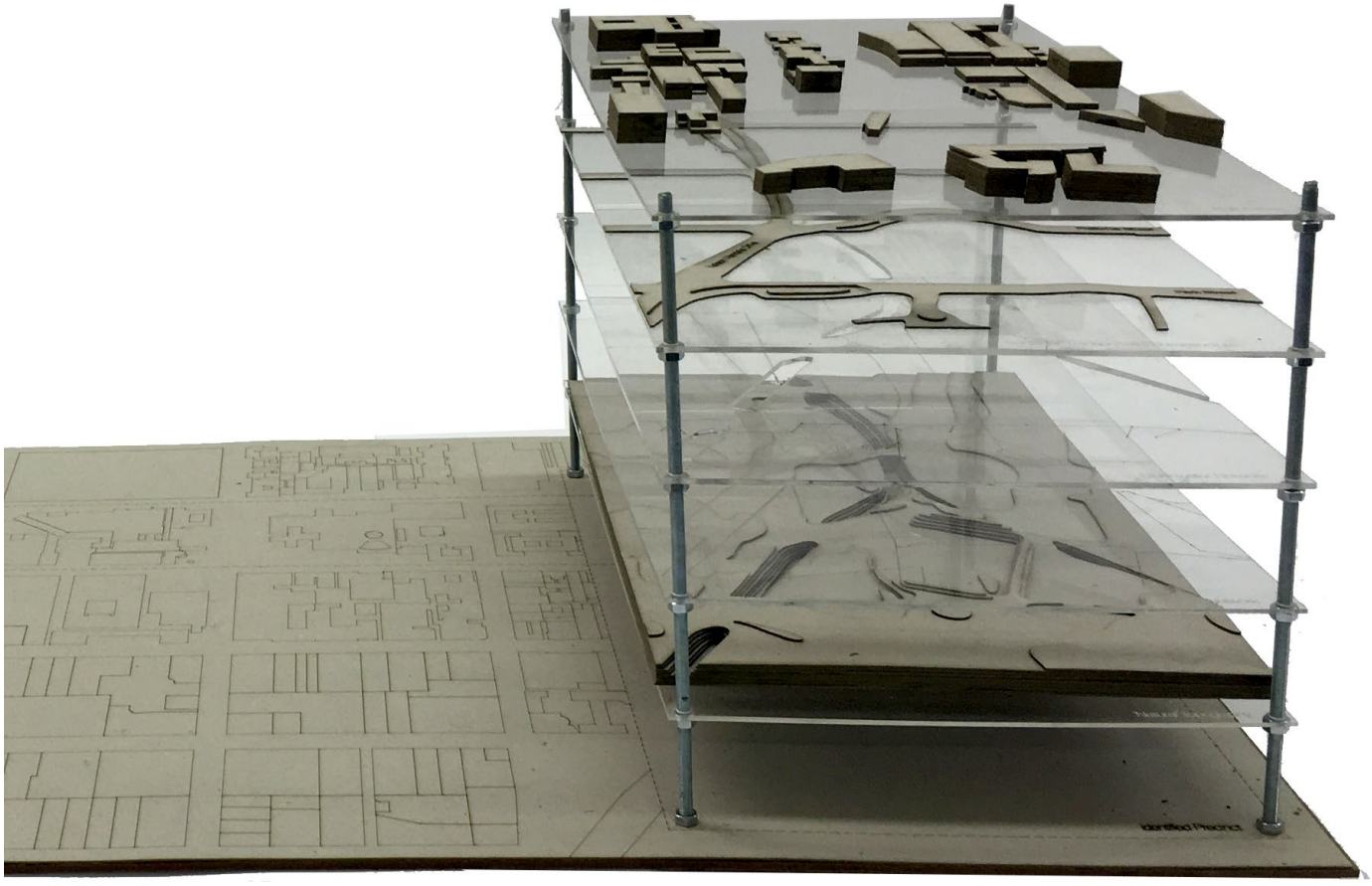


Figure 5.8: Existing Isolated networks of infrastructural systems within the site. (Author 2015)

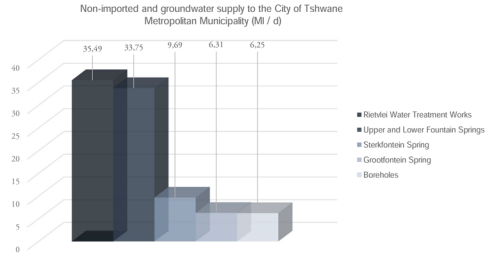
5.3.1

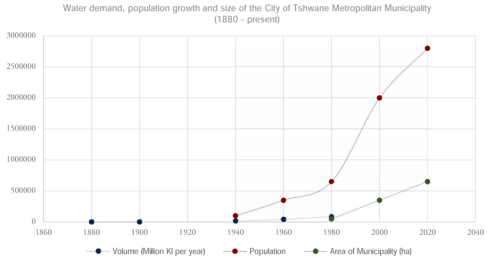
Water Infrastructure

The water and ecological infrastructures are regarded as most significant in structuring an integrated approach, as these mediate between the systems of the site and the broader city networks.

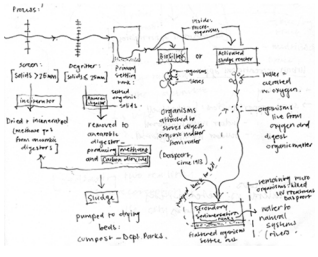
The water infrastructure in essence manages a sustainable approach to all water related potentials and constraints of the site, and includes the insurance that surface water run-off remains on site and ground water is replenished where possible, as well as the protection of and emphasis on the significance of water within the built environment and its context. This includes comprehending existing stormwater, rainwater, surface run-off and sewerage conditions as well as their larger spheres of influence within the precinct, in order to reimagine alternative strategies of harvesting, storage, filtration and conveyance of this precious and limited resource.

The tangible and intangible heritage significance includes the concrete water channels conveying stormwater run-off and, as indicated on the map (See Figure 5.10), the remembrance of Pretoria's first water mill built on the western bank of the Apies River in 1875 and later demolished during the course of the development of the city.

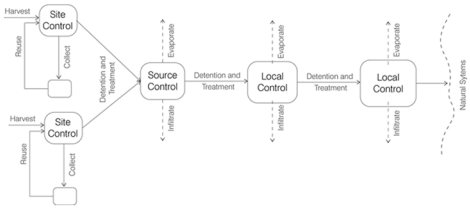




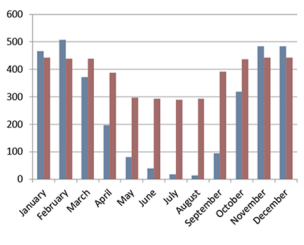
Existing wastewater treatment process:



Proposed decentralised treatment network:



Water calculations based on existing site conditions:



Water yield: Rainwater from existing buildings as indicatedSurface Run-off from hard surfaces to remain

Water demand: Based on Greenhouse irrigation requirements determined by approximate size requirements for 500 servings daily

Total Shortage of 1518 m^3 anually to be harvested and retained from proposed intervention's rain- and grey water.

Figure 5.9: Sumary of the investigation of Water systems of the Apies River and greater City of Tshwane Metropolitan Municipality
Source: Dippenaar,M, . Geology Department, University of Pretoria, South Africa , www.up.ac.za/geology

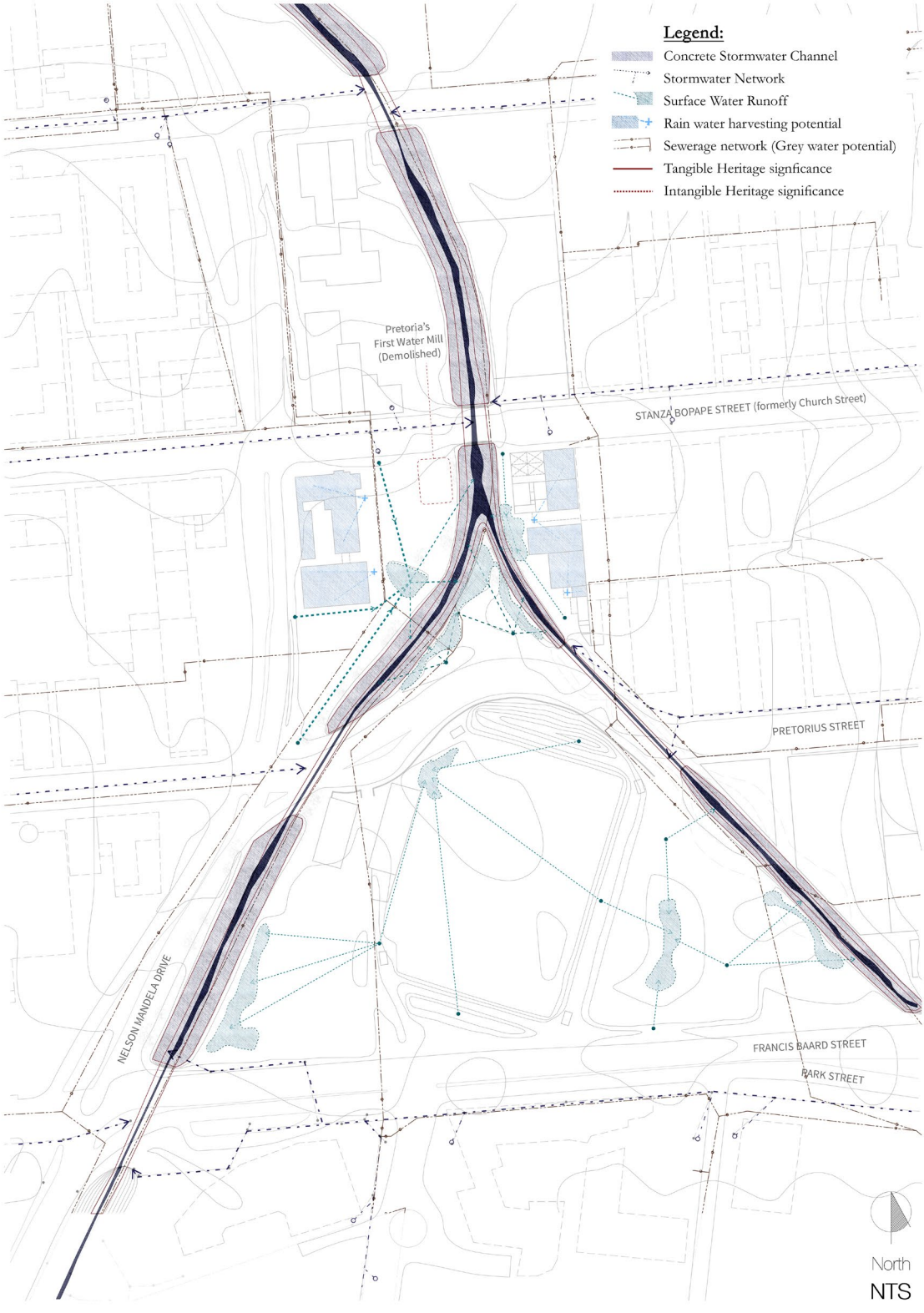


Figure 5.10: Synthsised map illutrating the combined water processes within the precinct and site. (Author 2015)

5.3.2

Ecological Infrastructure

The ecological infrastructure is a network of interrelated natural systems and open spaces on the site, which includes existing contours and topography, naturally vegetated spaces, artificial landscaped spaces and 'undeveloped natural spaces' (See Figure 5.11 and Figure 5.12 – ecological maps). Its tangible and intangible heritage significance, as indicated, includes the historical date palm trees planted along the banks of the Apies River during 1912, depicted in many artists' representations of the landscape such as Pieter Wenning's "Canalization of the Apies River"

The qualitative information substantiating the spatial presentations includes species of vegetation identified along the river channels and their significance, the geology and soil types of the primary river catchment area, as well as a shadow analysis of the site identifying possible areas with productive ecological potential.

Through understanding and proposing alternative strategies for reinventing existing ecological infrastructure, emphasis on the management of natural potential and characteristics present on the site would enable the conservation of the relationship between the urban and ecological environments. To maintain a continuity of these systems, especially across hardscape surfaces, the proposed infrastructure can be designed to bridge the barriers through what Yeang describes as 'ecobridges' or 'eco-undercrofts'. The benefits of the presence and utilisation of ecological infrastructure and its integration with development frameworks include carbon sinks, pollution control, flood prevention, natural cooling and biodiversity enhancement.

Figure 5.11: Vegetation identified along the banks of the Apies River channel. (Author 2015)

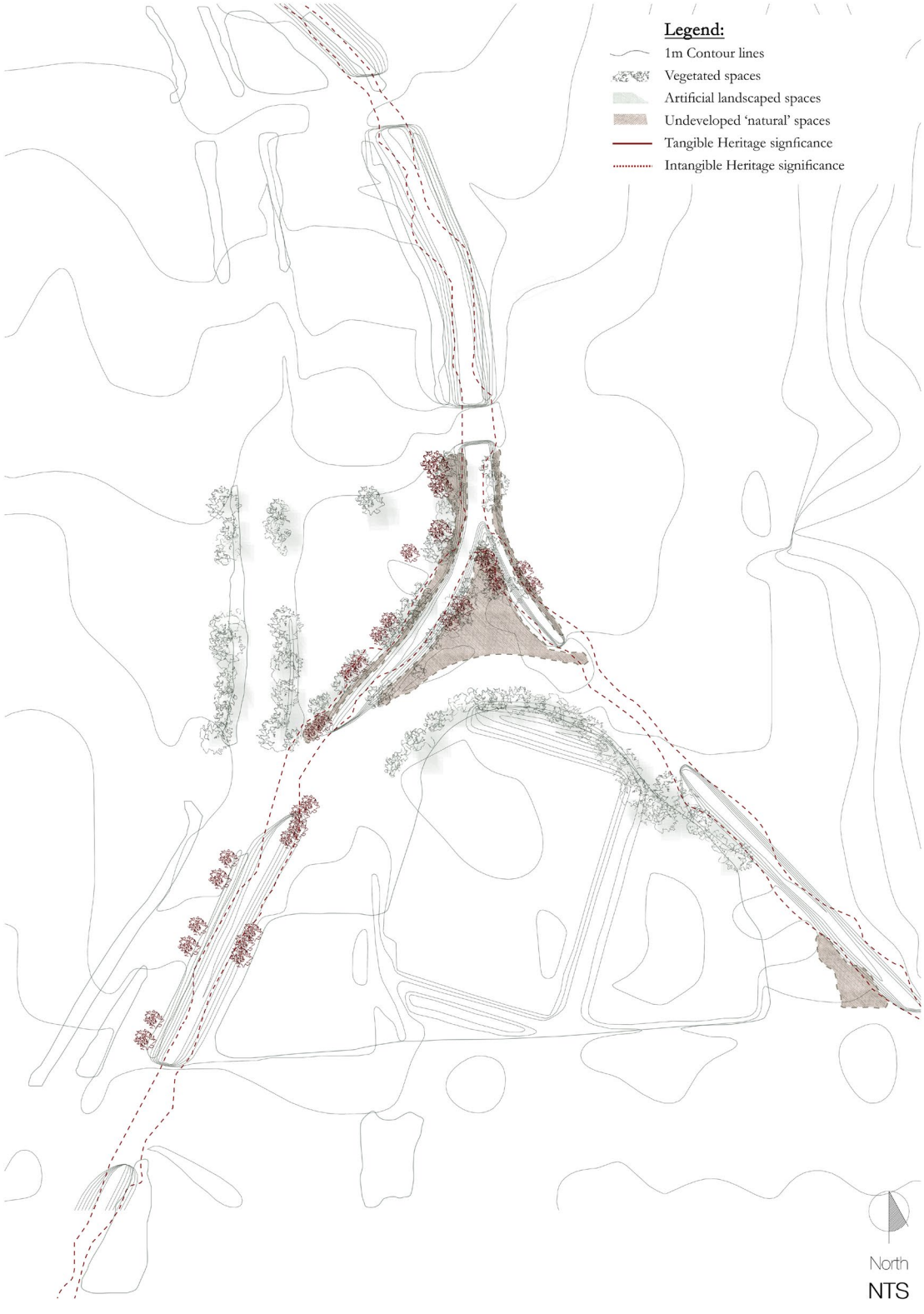


Figure 5.12: Synthsised map illutrating the combined ecological existence within the precinct and site. (Author 2015)

5.3.3

Social Infrastructure

The social infrastructure includes all infrastructure facilitating cultural practices such as existing built forms, recreational spaces, pedestrian networks, important access and gathering points on site, as well as economic and informal social networks. The investigation represents the building uses within the precinct as well as the conditions surrounding the site, polarised by the surrounding building uses and physical fabric (See Figure 5.15). Ecosystemic infrastructure integrates the social with the water, ecological and transportation infrastructures, establishing a relationship between the cultural and natural realms of the urban landscape.

Insurgent spatial practices such as public bathing and sleeping occurs in concealed areas of the site such as the river channel, stormwater drainage pipes and densely vegetated spaces, inaccessible and hidden from the public realm. (See 5.2 Photographic Overview of the Site and Precinct)

The tangible heritage significance within the precinct includes heritage structures indicated such as the Emmanuel Christian Church building adjacent to the Caledonian Sports Field, as well as the club house, the flood light structures and the stone boundary wall of the sports field. (See Figure 5.13 and 5.14)

The intangible heritage within the precinct includes the demolished Central Public Swimming Pools, redeveloped as a government precinct, as well as the historical Ceremonial Boulevard on Stanza Bopape Street which, as Church Street, has been the scene of various marches in the country's history. Its regeneration within the Re Kgabisa Tshwane Inner City Development Project includes landmarks such as Heroes' Acres, Kruger House, Church Square, the Palace of Justice, Ou Raadsaal, Lilian Ngoyi Square, the State Theatre, the Reserve Bank, the Caledonian Sports Field and Union Buildings to support a future pedestrianisation strategy at critical points, as proposed.

Figure 5.13: Historic curved stone boundary wall and floodlight structure of the Caledonian Sports Grounds. (Photograph by author 2015)

Figure 5.14: Photograph of the heritage pavilion structure at the Caledonian Sports Grounds. (Photograph by author)

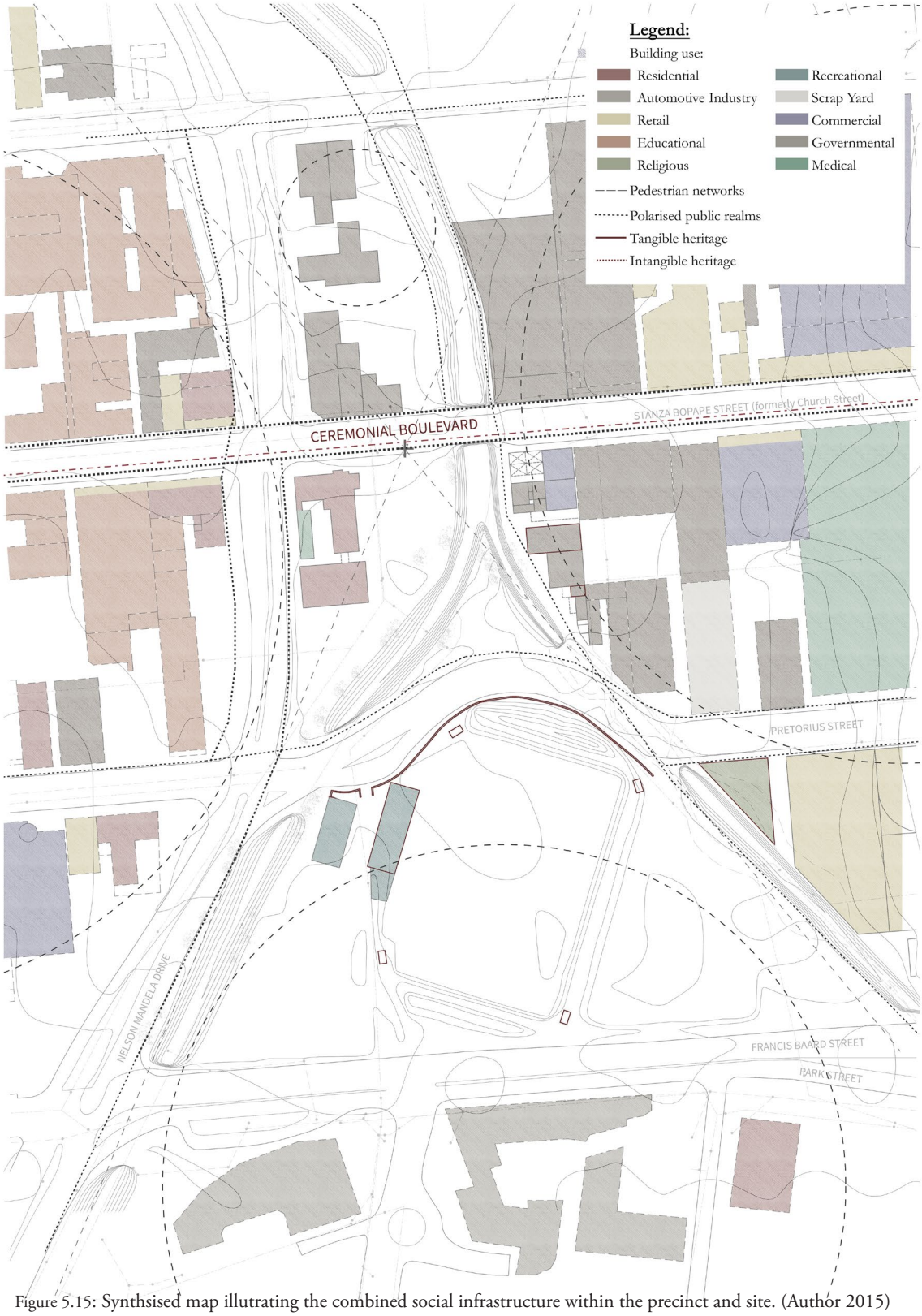


Figure 5.15: Synthsised map illutrating the combined social infrastructure within the precinct and site. (Author 2015)

6.3.4

Transportation Infrastructure

According to the Yeang's infrastructural categorisation, the grey infrastructure comprises of all the large urban engineering systems essential to the support and effective operation of any human urban development, including roads, telecommunications and energy structures, such as street lighting. The contextual analysis of the dissertation precinct however delimits the investigation to transportation infrastructure as it is the only significant engineering system present within the precinct. All other infrastructural services within this category are therefore excluded and the topic from here on referred to transportation, instead of engineering infrastructure. (Ken Yeang: Ecomasterplanning 2009)

The transportation networks investigated includes the vehicular networks, Tshwane Bus stops, informal taxi gathering nodes and parking spaces within the precinct. (See Figure 6.17)

The tangible heritage significance within the precinct as indicated includes Lion Bridge, reconstructed in 1887 and discussed in chapter 4.2 First collective reading of the city, 5.2 Timeline: Transformation of the Apies River Identity as well as 6.3 Statement of Heritage Significance . (See Figure 6.16 – Lion Bridge)

The intangible heritage significance as indicated includes the commemoration of the trajectory of old Edward Street, presently demolished as well as the previously linear Pretorius Street, removed and reinstated in a curvilinear trajectory due to the form and positioning of the Caledonian Sports Fields.

An Ecosystemic infrastructural approach to transportation requires a reinvention of public opportunities that is ecologically responsive and integrated with other frameworks. In our present condition, the implementation of these urban systems are dominated by economics and convenience, modifying the site's existing topography, involving extensive earthworks. An ecosystemic approach to infrastructural implementation aims to avoid such land alterations by appropriating the proposed infrastructural implementations within existing topographical conditions and constraints, working with the potential opportunities and improving constraints of existing movement and access conditions. Thus avoiding substantial modifications to the existing topography, topsoil removal, soil erosion and pollution of watercourses.

Figure 5.16: The historic Lion Bridge on Stanza Bopape Street, crossing the Apies River channel. (Photograph by author 2015)

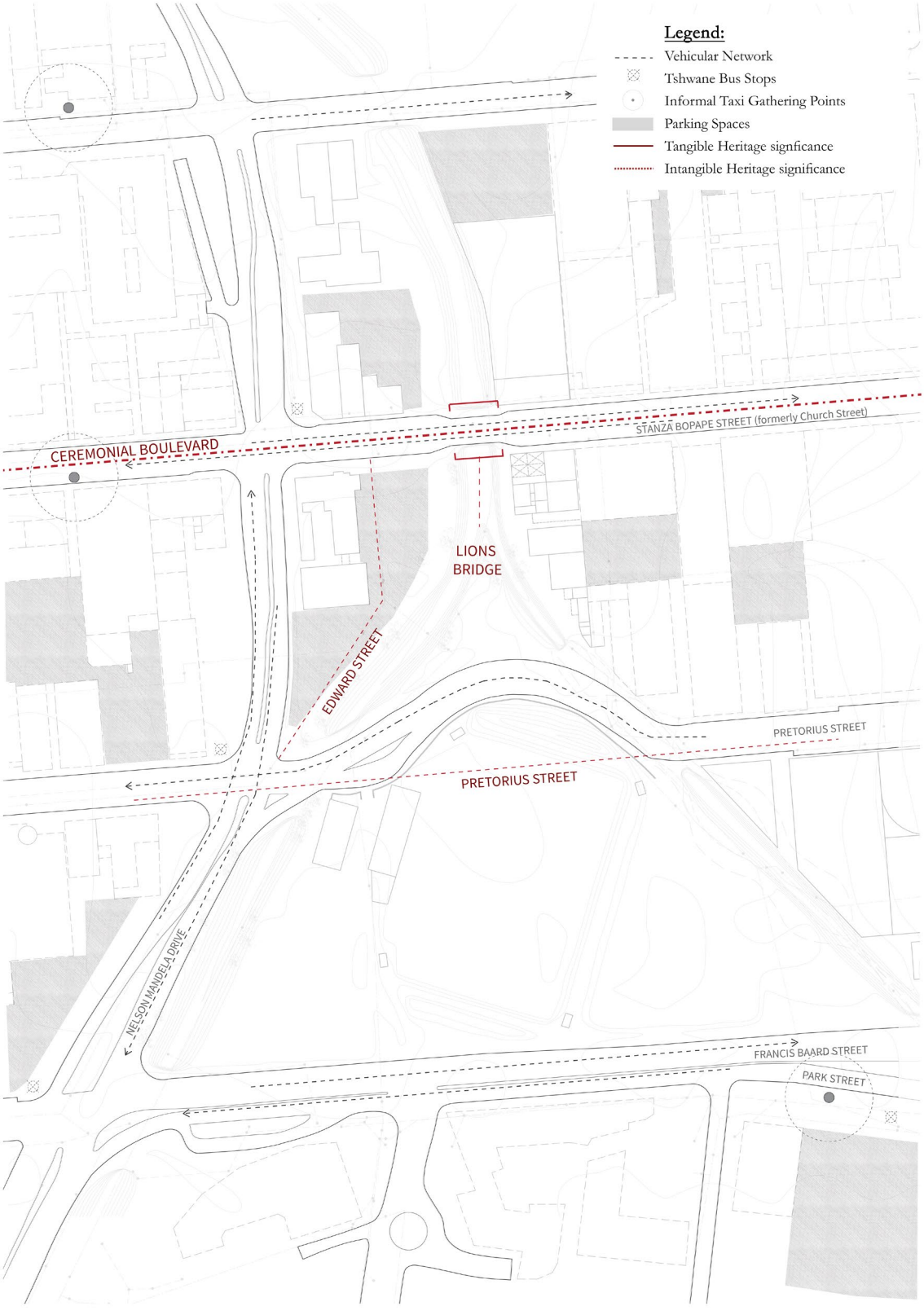
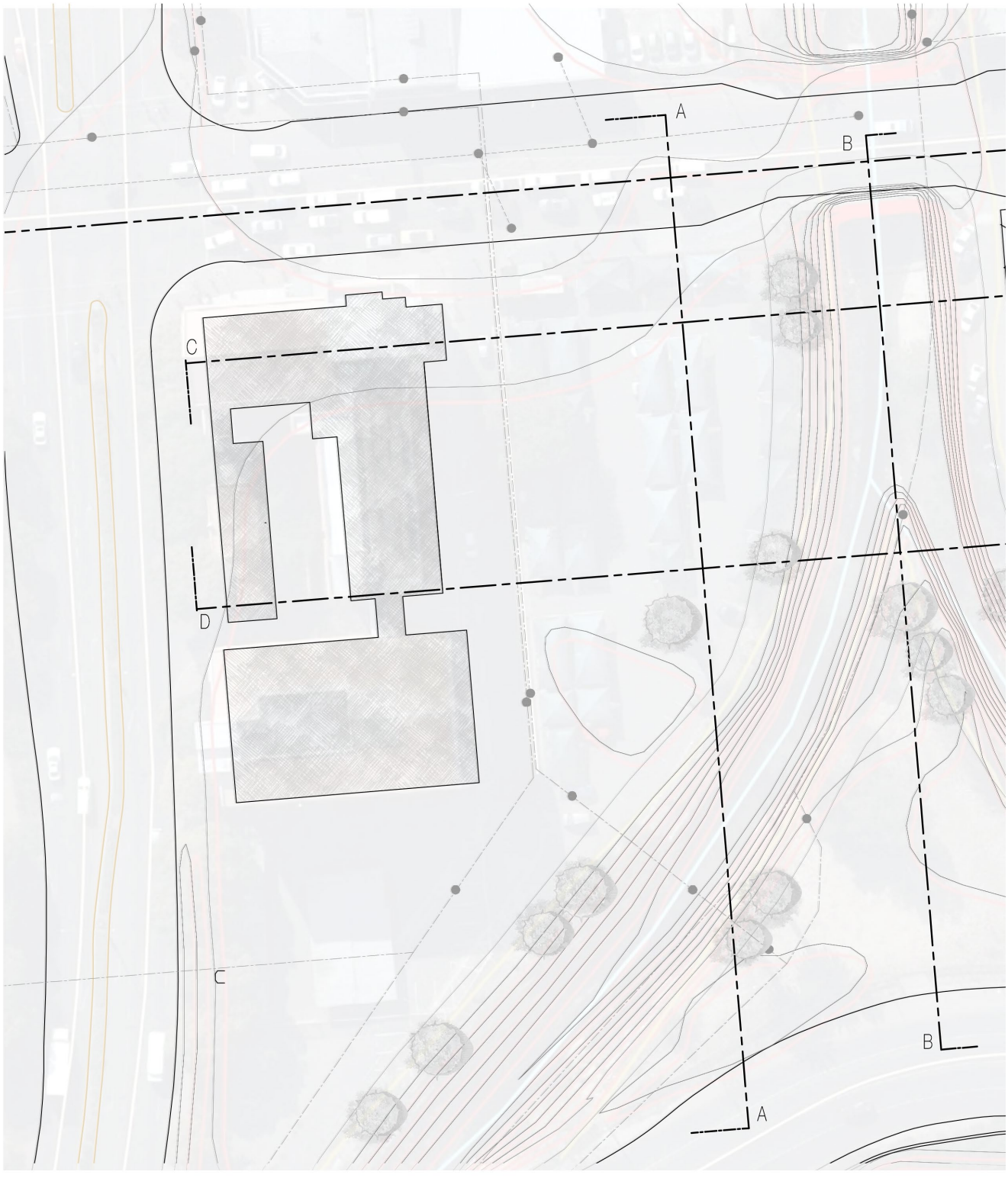


Figure 5.17: Synthsised map illutrating the combined transportation infrastructure within the precinct and site. (Author 2015)

5.4

Micro scale analysis - Existing constituents of the site



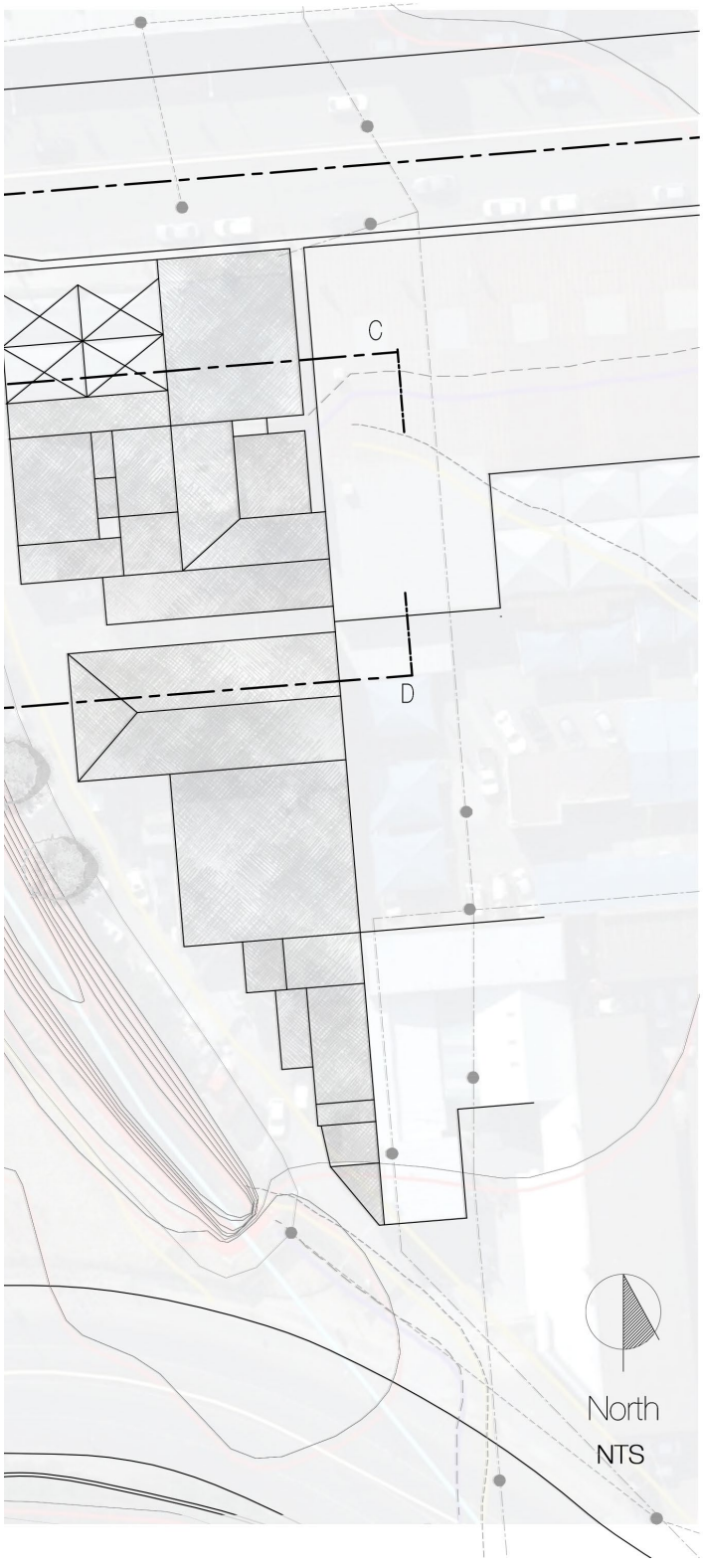
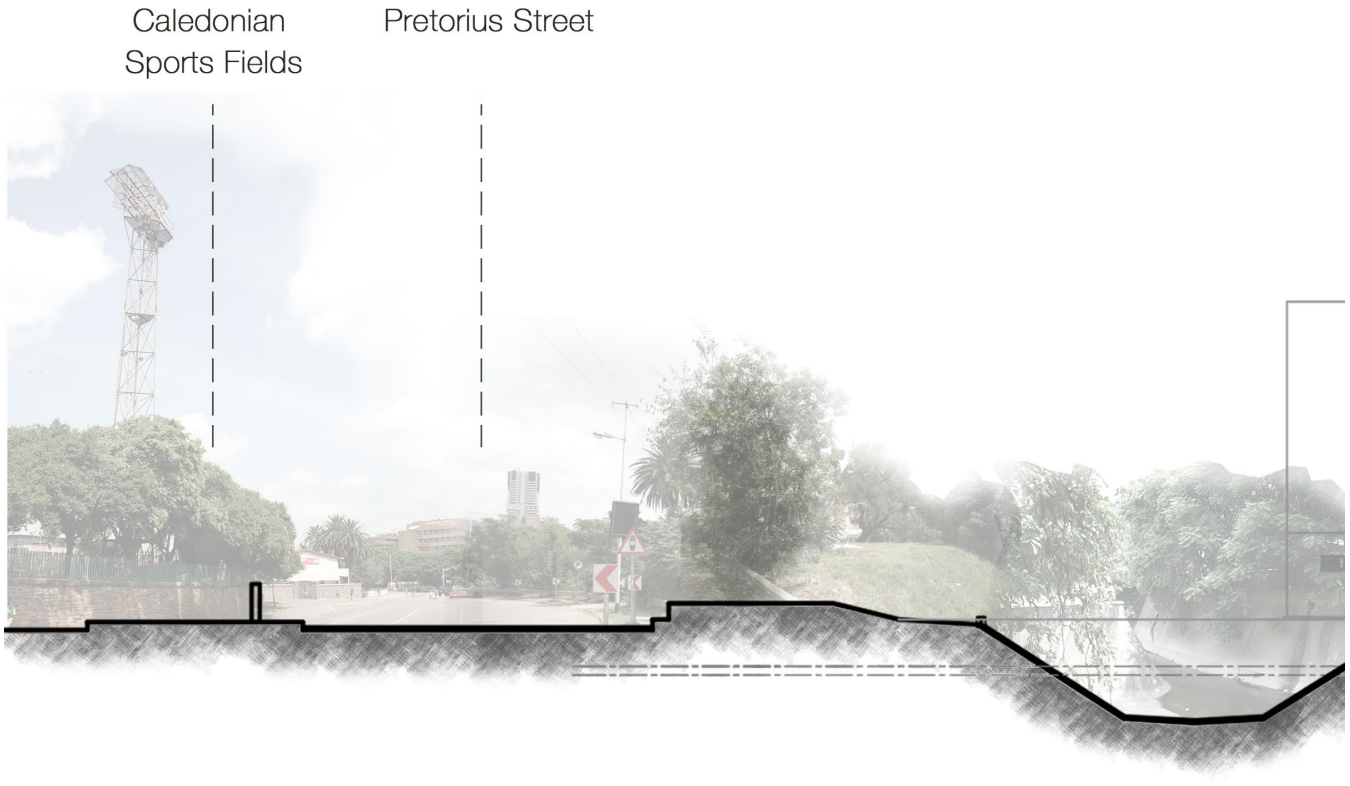
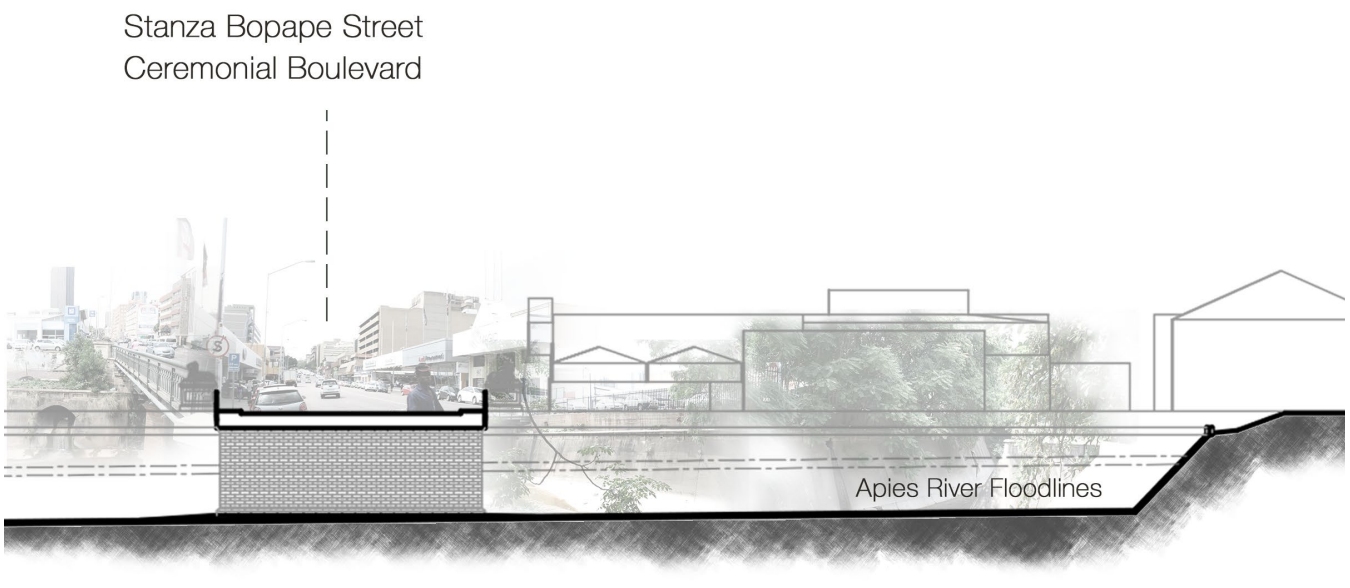


Figure 5.18: Existing Plan of the site including floodlines, sewage networks, stormwater networks and the positions of the historical Date Palm trees to be retained on site. (Author 2015)





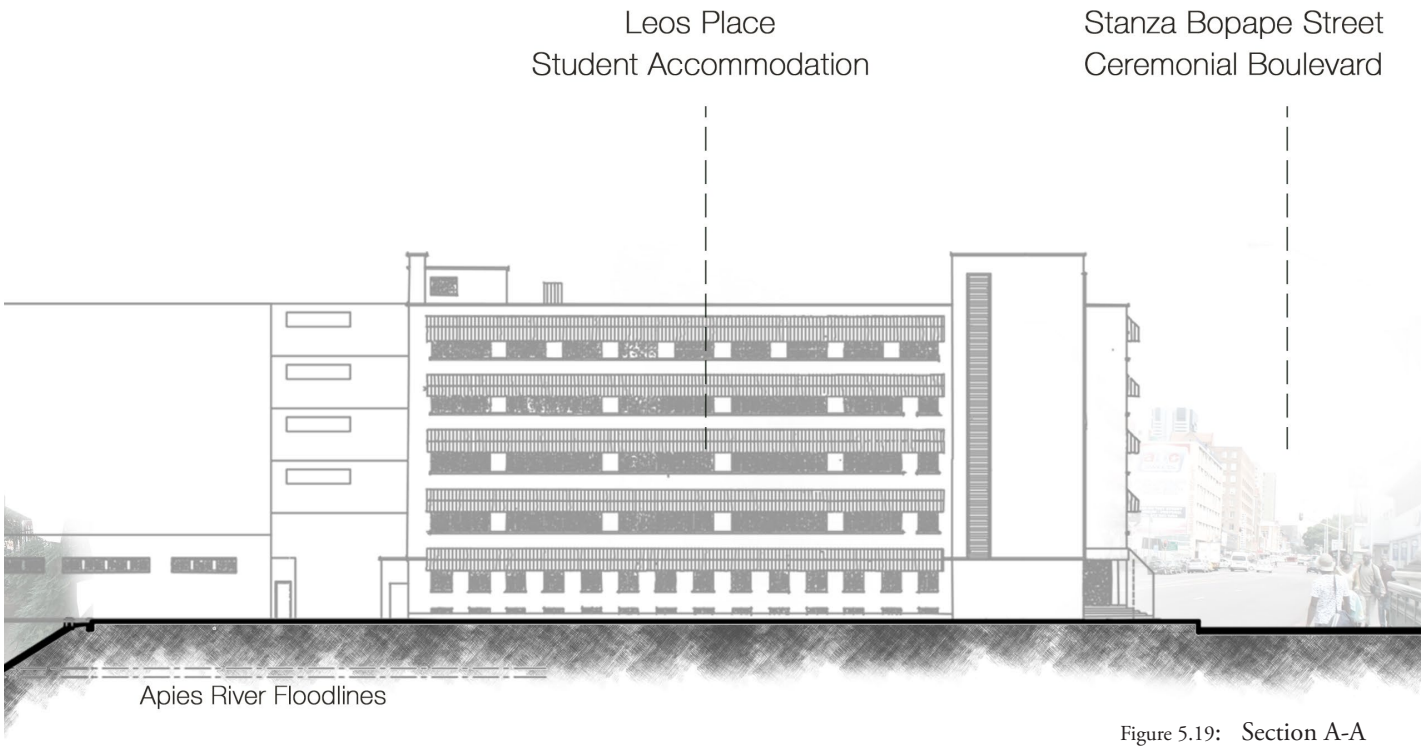


Figure 5.19: Section A-A
NTS

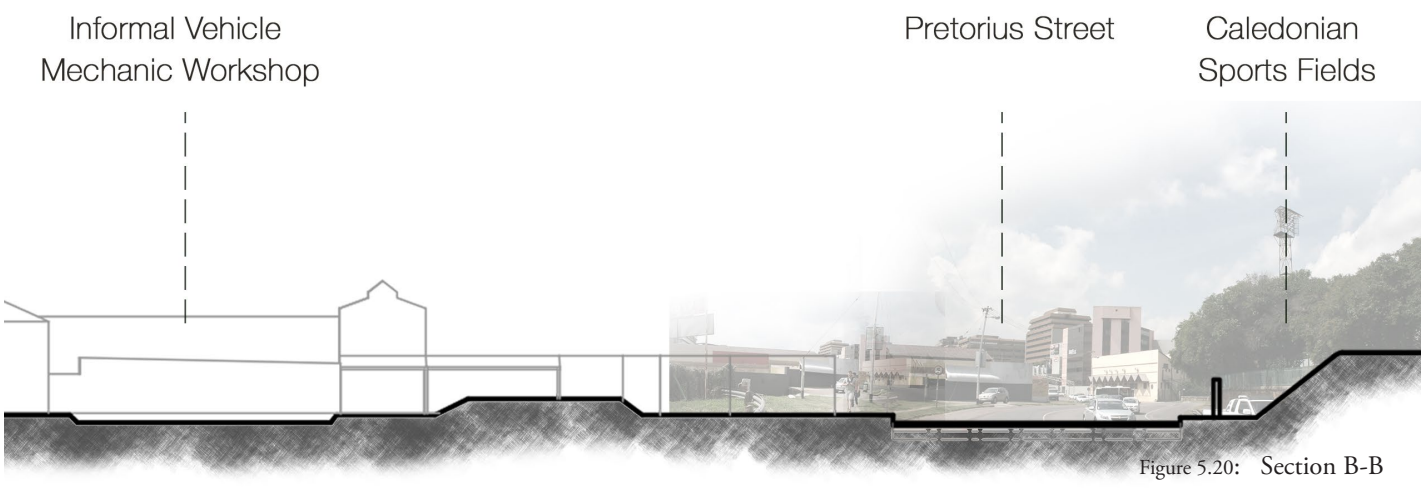
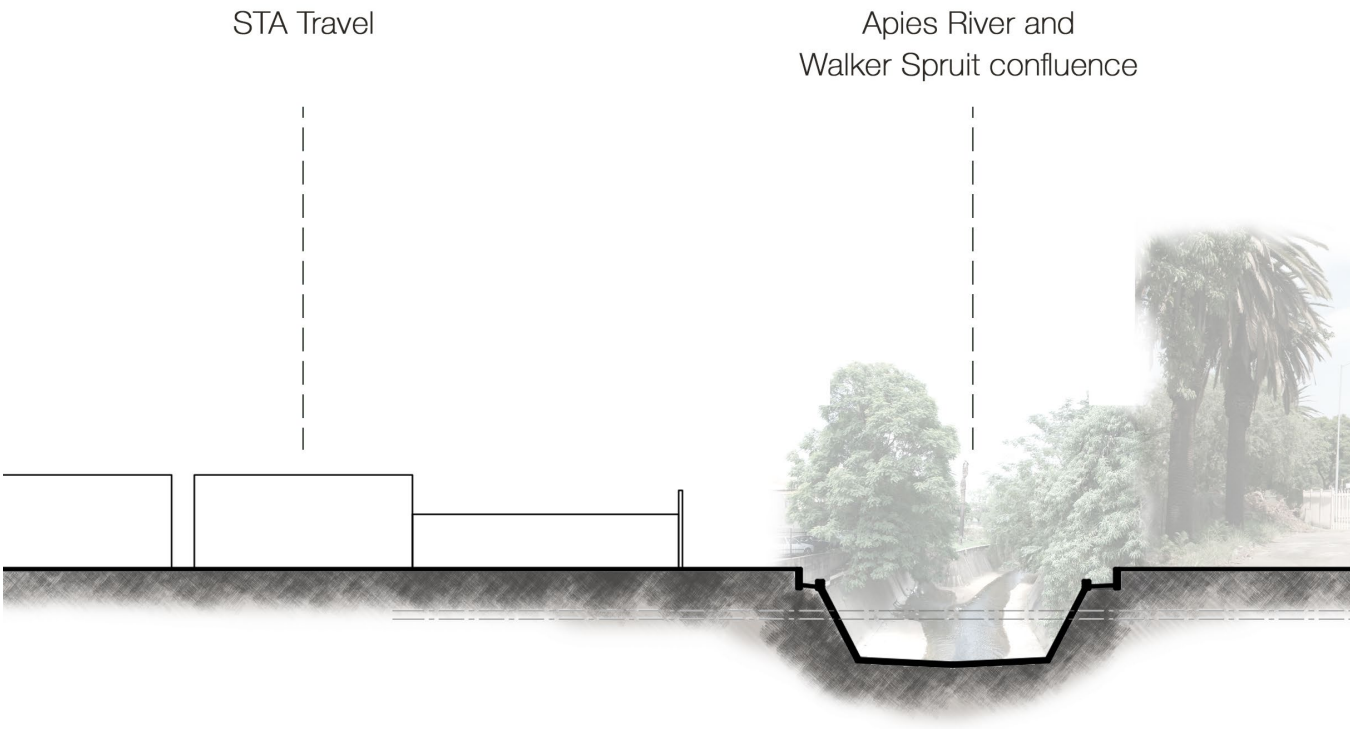
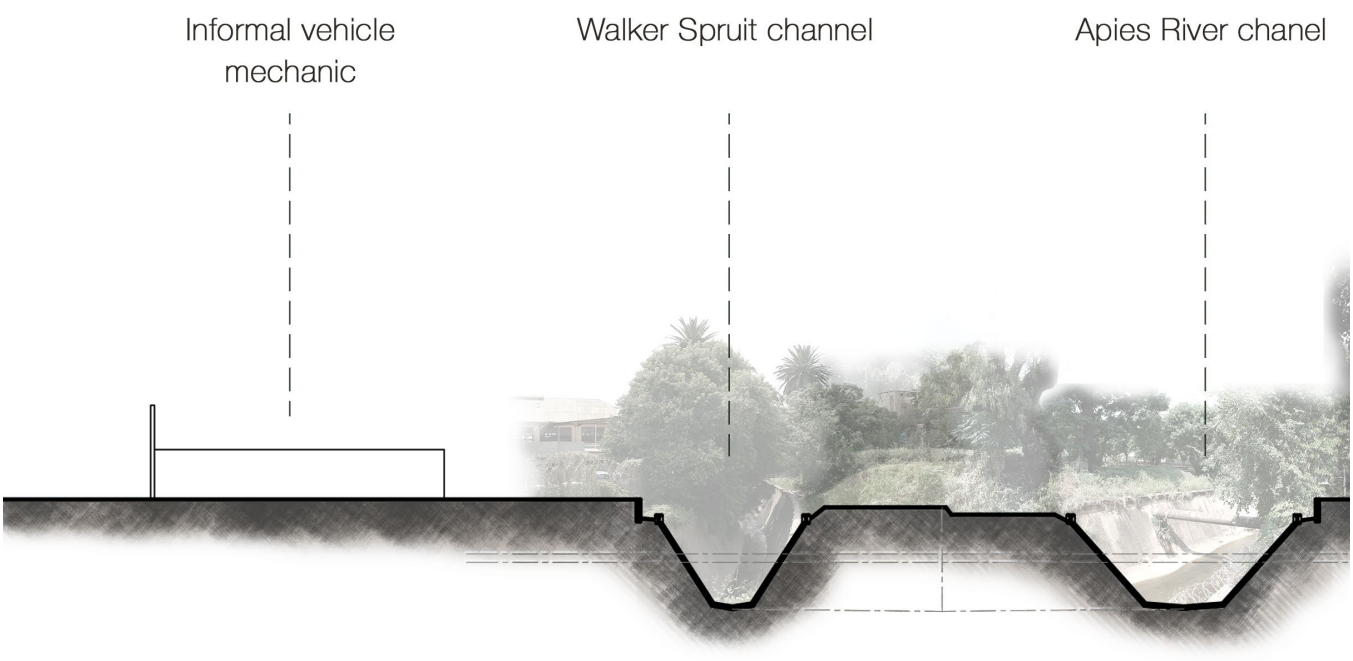


Figure 5.20: Section B-B
NTS

Existing Sections through the site





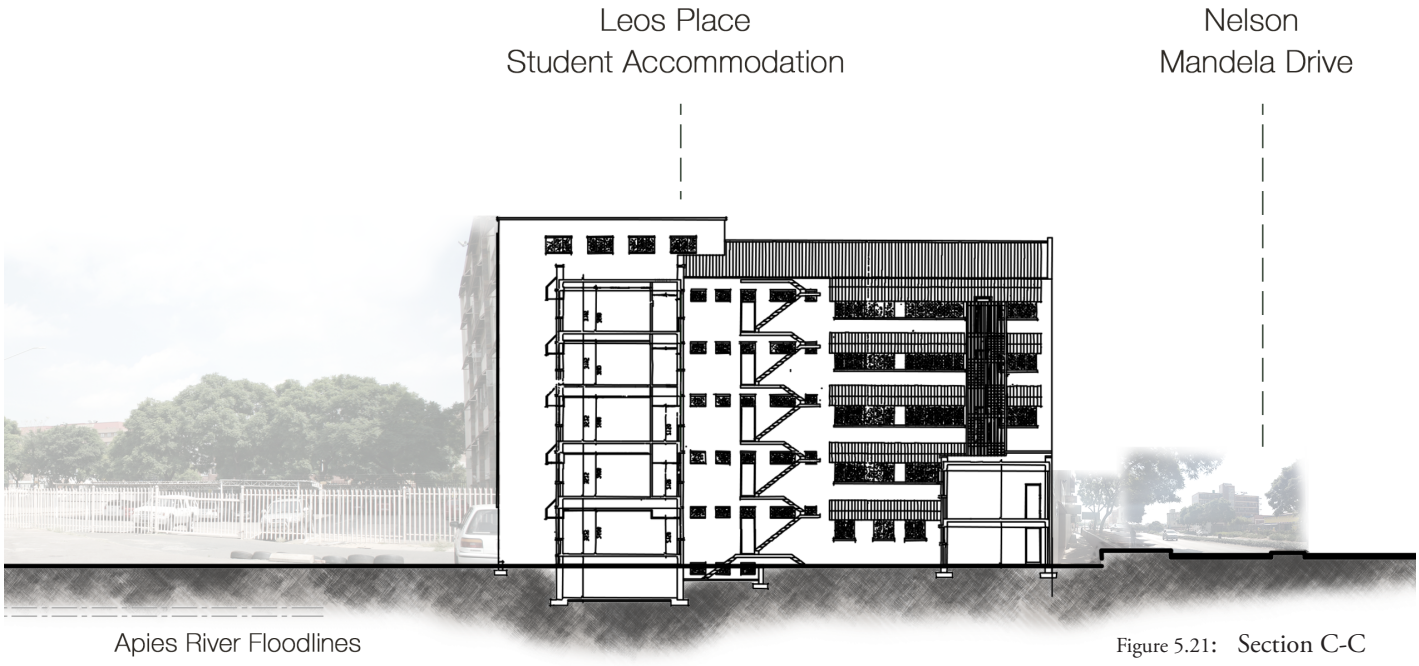


Figure 5.21: Section C-C
NTS

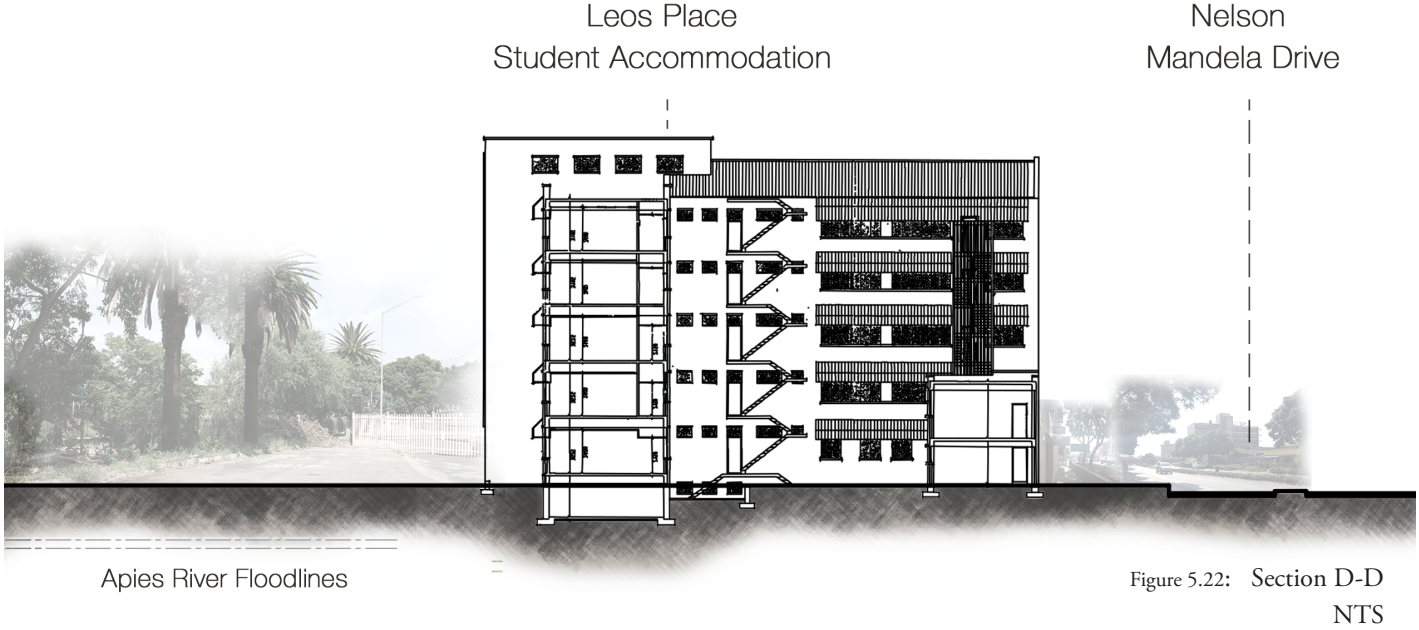


Figure 5.22: Section D-D
NTS

Existing Sections through the site

5.5

Statement of Heritage Significance

The motivation for the conservation of cultural significance, as stated in the International Council on Monuments and Sites (ICOMOS) Burra Charter, is the importance of providing a deep and inspirational sense of connection to community and landscape, to its past and to lived experiences (International Council on Monuments and Sites 2013:1). These represent a manifestation of important characteristics of identity and experience. The identified values could be categorised as aesthetic, historic, scientific, social and spiritual. The Burra Charter therefore encourages a well-considered approach to change and argues that any intervention be considered to: do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained (International Council on Monuments and Sites 2013:1).

The Apies River Corridor and project precinct contribute a considerable amount of cultural significance, including aesthetic, historic, social and spiritual values, to the city of Pretoria. The Apies River and its former natural presence within the city as significant source for the establishment of the town, is presently expressed by the course of the concrete-lined stormwater channel covering the majority of its expanse throughout the city, symbolising the cultural advancements of urbanisation and industrialisation of water infrastructure in urban areas.

At the crossing of Church Street and the Apies River, the construction of the Arcadia Bridge in 1888 replaced what was formerly known as Meintjiesdrift. However, due to the construction method and the strength of the stream during heavy rainfall periods throughout the summer months, the Arcadia Bridge was soon to be replaced by Lion Bridge, the construction of which was completed in 1894. This structure of importance, designed by S.W. Wierda and decorated with symbolic bronze lion figures on pedestals, reinforces the significance of Church Street as main axis between the town centre and surrounding suburbs.This important historical and cultural artefact should be conserved yet celebrated in any proposed design interventions through an emphasis on its location, and its historic and aesthetic values.

The ecologically significant vegetated areas along the channel edges that include the historic date palms planted in 1912, provide an important aesthetic and recreational aspect as visual landmark of orientation in the city, as depicted in various artists' representations and discussed in Chapter 6.2.2_Ecological Infrastructure. The aesthetic and ecological values of these channel edges, as well as important views along them to noteworthy bridges, should be retained and celebrated in any new interventions.

The historical Ceremonial Boulevard on Stanza Bopape Street becomes an important contributor to the celebration of heritage significance throughout the site. The proposal for a future pedestrianisation strategy at critical points along this boulevard, as published in the Re Kgabisa Tshwane Inner City Development Project, becomes a fundamental consideration in the project's architectural relationship to the northern boundary of the site. Architecturally, programmatically and visually, this boundary of the proposed intervention should be exploited to establish a celebratory emphasis on the various culturally significant elements and characteristics of the site as identified and discussed in the previous paragraphs.

The southern boundary of the site on Pretorius Street borders the Caledonian Sports Fields, recognised for its recreational significance in the city. The Pretoria Regional Style Clubhouse, the stone boundary walls and the steel floodlight structures are all of noteworthy historical significance. The importance of this recreational entity to various cultural groups, as substantiated through a number of personal accounts and published records, should be preserved.

It is the author's belief that the use of the site is however to be diversified to emphasise this significance and activate it more sustainably – as discussed in Article 1 item 1.9 of the Burra Charter, which defines adaptation as changing a place to suit the existing use or a proposed use (International Council on Monuments and Sites 2013:2) in order to conserve its cultural significance.

The architectural intent is to create a project that supports the cultural significance of the area and starts to inform an appropriate design response.

The architectural position for the revitalization of the identified sites is aimed at the re-interpretation and re-activation of the current unfeasible use value through:

- determining opportunity for necessary change and implementing a conservative approach to the redevelopment of the significant tangible and intangible elements such as the concrete channels and Lion Bridge itself.
- making required additions that are sensitively considered, yet expressive and identifiable through a distinct separation between confident interventions and existing fabric, with the boundary to be developed to facilitate a comprehensive dialogue. The separation created should be an expression of difference rather than dissonance. New work should be adaptable to change, as required by the development, without diminishing existing ascribed value.

Figure 5.23: Historic curved stone boundary wall and floodlight structure of the Caledonian Sports Grounds. (Photograph by author 2015)

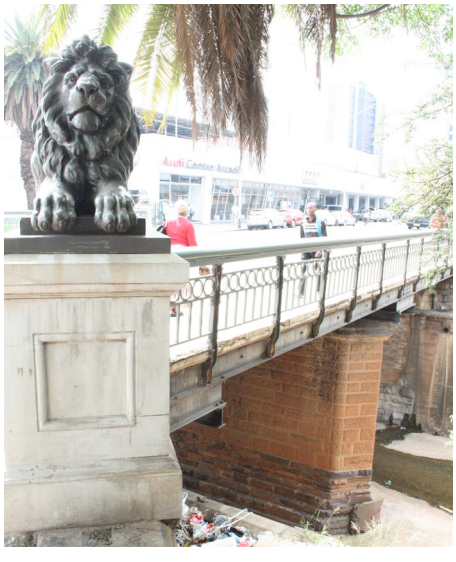


Figure 5.24: Photograph of the heritage pavilion structure at the Caledonian Sports Grounds. (Photograph by author)

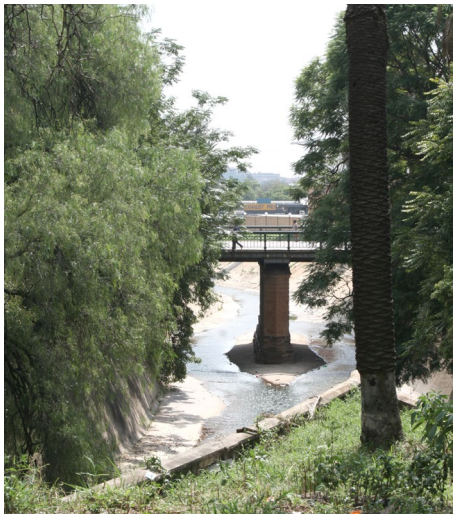


Figure 5.25: The historic Lion Bridge on Stanza Bopape Street, crossing the Apies River channel. (Photograph by author 2015)

5.6

Theory for the Site Vision

5.6.1

Towards Ecosystemic Infrastructure

Historically, infrastructural projects such as bridges and railways were acknowledged as heroic achievements expressing the progressive identity of cities, and were celebrated as such. Today however, the urban landscape has evolved into a collection of dense urban centres surrounded by sprawling peripheral suburbs. Currently, the construction of infrastructure is no longer considered as heroic or momentous, but is concerned with the provision of an additional layer or extension of a ubiquitous infrastructural system. Its existence is mostly utilitarian and, apart from addressing more recent ecological concerns, its implementation is subject to the provision of control, convenience, economic efficiency and exploitation of resources, as layers of networks connecting decentralised concentrations of developments (Meyboom 2009:73).

Regardless of its necessity, the physical nature of the present infrastructure of the Apies River demonstrates a barrier to interaction across its boundaries, and contributes to the deterioration of the physical and social conditions of its surroundings, due to its lack of significance, place and ownership.

The present condition of infrastructure in the city, as previously discussed in the general theoretical premise and in the investigation of the transformation of the Apies River landscape specifically, has led to the implementation of isolated, mono-functional, engineered infrastructural systems that have consequentially fragmented adjacent public spaces that have become impracticable for public utilisation and discourage spontaneous activities and modes of movement.

The rapid increase in population and urbanisation, leading to an increased demand for infrastructural support, can no longer be provided for by simply adding to or extending the capacity of existing networks, further encouraging isolated linear water systems and neglecting the reality of current water concerns. An alternative reinvention of existing infrastructure is required that would integrate and exploit the various potentials of this essential life source.

The potential of infrastructure within the city could be exploited to produce a generative response that creates place through the utilisation of its multi-faceted opportunities, as well as a directive response that supports progressive future development.

An alternative ecosystemic approach to infrastructure, with an emphasis on the production of public space and socio-economic opportunities as primary generators of a formal and spatial response, could encourage the integration of innovative, responsive elements with the existing infrastructures, subsequently generating a multiplicity of networks, functions and places as well as providing for future potential development (Meyboom 2009:72). Such a strategy should aim to stimulate a symbiotic relationship between the non-living and living entities identified on site, enriching the existing ecological composition and structures and thus establishing a more sustainable approach to an artificially constructed environment that resembles nature's ecosystemic processes.