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A LIVING NECROPOLIS

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The introduction of a necropolis to the inner city of Pretoria, focusing on the cycle of life

In my beginning is my end. In succession
Houses rise and fall,
Houses live and die: there is a time for building
And a time for living and for generation
(Eliot 1985: 196)

Research field: Heritage and Cultural Landscapes

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A Vertical Burial structure and Promatorium

University of Pretoria, Department of Architecture

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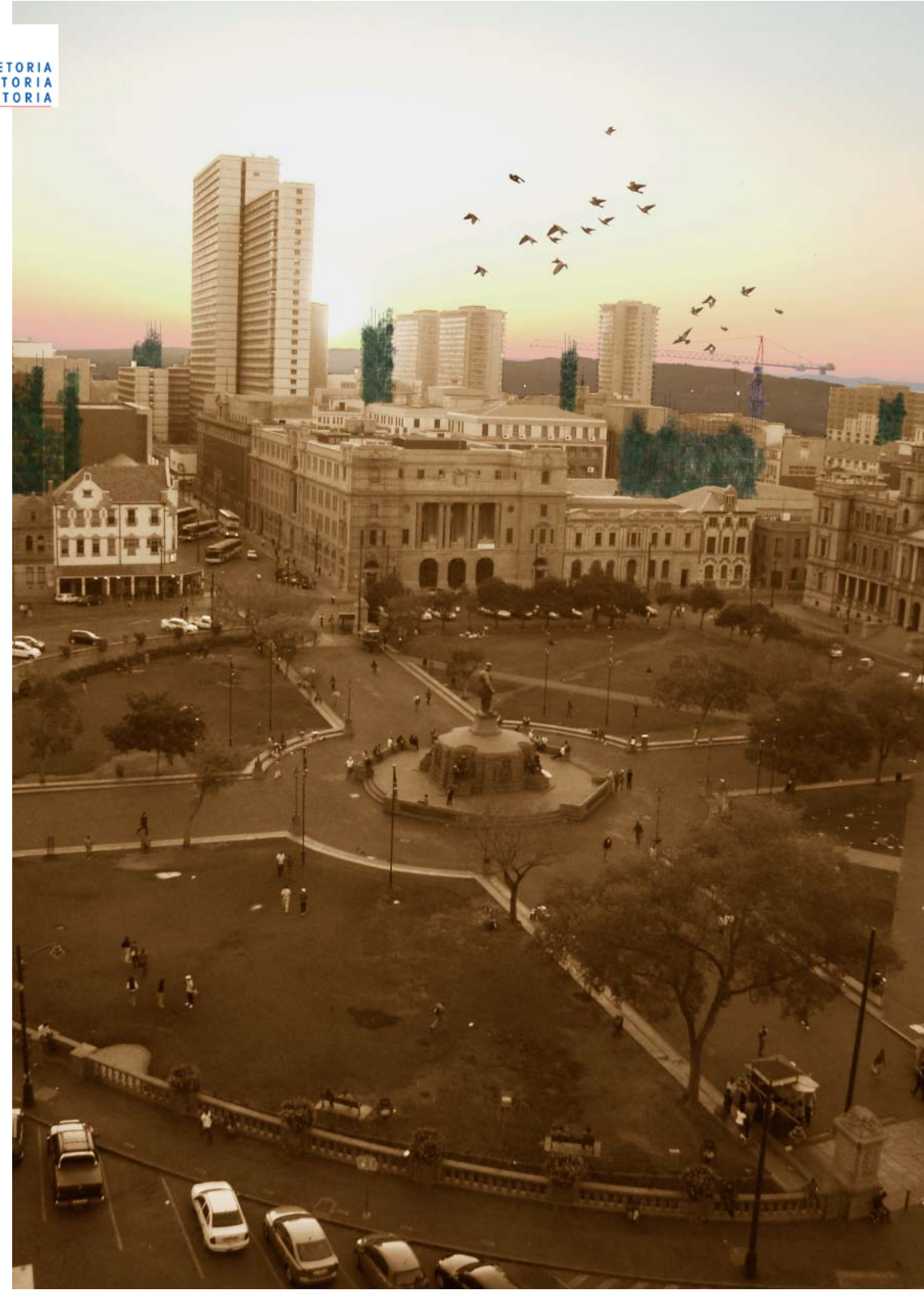


Fig. 1: (Opposite page) The vertical extension of the parks of remembrance within the inner city of Pretoria (Author, 2010).



Abstract

The proposed thesis design is a necropolis (city of the dead) in the form of a vertical park structure through which alternative methods of burial are investigated. The question of an architectural expression of consciousness to overcome cultural norms and challenge perceptions is researched through the theoretical exploration of the following: the cycle of life; the physical and meta-physical *between*; and collective dwelling.

Through exploring ways of sensitively infusing urban environments with an awareness and acknowledgement of death, life is celebrated by exposing death through a physical manifestation of the whole cycle of life, which will transcend several generations of urban dwellers. In populating the *between*, these anti-monument memorials would become accepted over time and a meta-physical awareness would be created to produce a new culture of urban life.



To You: This is all yours.

To my parents: thank you for your support, love and continuous interest in everything.

To Larin and Arthur: thanks for every kind and harsh word, encouragement, support and continual willingness to help whenever you can, even if I haven't always received in the same way it was given.

To Jacques and the masters group of 2011: Thanks for the push, encouragement and insightful talks. It is much appreciated.

To my grandmother: for her continual support and unconditional love.

To friends and family that have been neglected for the duration of this thesis: Thanks for still being there.

To everyone else that have shared ideas and stories, who have had a hand in this insightful and successful journey:

Thank you.

Jacobus.



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1. Introduction

Life has many seasons. Nature functions according to these seasons. Seasons bring change, not only the change in the weather, but also physical change. The cycle of life is analogous to a tree: it grows and withers and the cycle of life repeats itself with death, never achieving finality. Death becomes an event in the cycle of life, contributing to it.

The cycle of life refers to a developmental process, to generations that transcend the single lifetime of one individual (O’Rand & Krecker, 1990: 241). Bachelard (1994) explains *life*, with reference to human life, in the light of Minkowski’s “Vers une Cosmologie”, that the essence of life is not a “feeling of being, of existence,” but a feeling of participation, necessarily expressed in terms of time and secondarily expressed in terms of space. It can be understood that the *cycle of life* or the very sense of life is quite different from the temporality or participation of *human life* (McNeill, 2006: 2).

The distinction between human life and the cycle of life is evident when exploring the physical world we live in. Our cities were established centuries ago and are still functioning. Since 2007 urban environments have provided sustenance to more than half the world population (Burdett & Judjic, 2007: 8).

Unfortunately, death and life do not receive the same level of acknowledgement in our urban environments. To protect ourselves, we have removed death from our everyday life by relegating it to mass horizontal cemeteries on the periphery of our manmade landscapes (Harries, 1998: 294). The hurt and suffering brought on by the loss of life has been shunned from our everyday life (Kubler-Ross, 1981: 11). We try to run from the basic truth: death forms part of the cycle of life (Staudacher, 1995: 11).

This thesis explores the meta-physical *betweenness* (Heidegger, 1996: 55) - life and death, and verticality and spirituality - through the physical manifestation of the whole cycle of life in the urban environment.

The spatial *between* found in the vertical urban environment will house the physical manifestation of a necropolis. As time passes, these urban necropoli as places of remembrance, will foster an awareness of the relationship between life and death in urban life.

As time passes, the buildings around these vertical places of remembrance will come to the end of their life-span and will be demolished. They will become the form givers and regulators of the new built form. In this way over time, the dead will have a physical impact on the nature and structure of the ongoing community of the city (Harries, 1998: 264). Ultimately the vertical places of remembrance will establish a relationship between the present, past and future conditions of the city. This in itself will become a form of respect for and honour of those who have gone before (Harries, 1998: 295).

These places of remembrance are created for the urban dweller - the person who experiences the urban landscape as home.

Background

A link exists between architecture and death. When one examines the history of architecture it can almost be reduced to a history of tombs (Harries, 1998: 293). The historic monuments of funerary architecture would appear to have fulfilled the need to help mark the betweenness separating the realm of the living from the realm of the dead (Harries, 1998: *ibid.*). This chapter will give an illustrated background of the development of funerary architecture and explain the concepts behind it.

Evidence exists of monumental tombs dating from 4000 to 3000 BC (Colvin, 1991: 1). Termed "tumuli", they are characterized by huge pieces of stone set vertically and covered by horizontal slabs to form the roof. Some stones

weigh more than 20 tons, and as a result these structures have been termed megaliths (Colvin, 1991: *ibid.*). Tumuli were generally covered with earth to form a prominent mound in the landscape (Colvin, 1991: *ibid.*). These mounds are evident across Brittany, Western Europe and some parts of Italy. It has been argued that the reason for the creation of these monuments has been to house the dead, but they also to stand as visual symbols of stature (Colvin, 1991: 3).

In Egyptian architecture the pyramids were representational of mountains and gave Egyptians a sense of existential identity and security (Norberg-Schulz, 1983: 7). Tombs and mortuary temples are seen as "houses of eternity", demonstrating the continuation of life after death (Norberg-Schulz, 1983: 9).

Fig. 2: An ancient tumulus, showing the enclosure covered with earth (Colvin, 1991: 4).

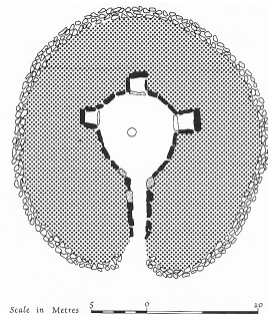


Fig. 3: A section through a tumulus showing the extent of the labour that was needed to build the structure (Colvin, 1991: 10).

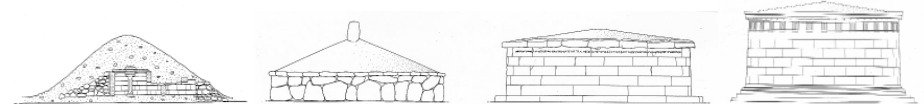
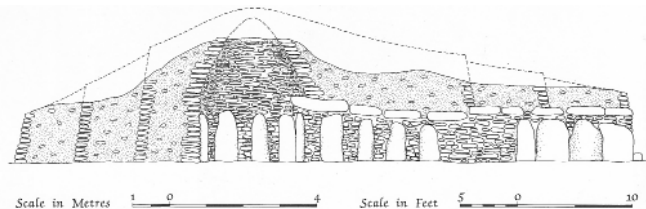


Fig. 4: The development of the tumulus over 3000 years into the stone tomb and later the mausoleum (Colvin, 1991: 14&24).

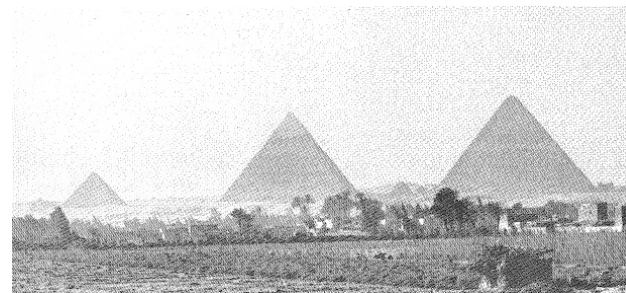


Fig. 5: The pyramids of Giza (2500 BC), representing mountains (Norberg-Schulz, 1983: 6).

During the first millennium BC the modest mound evolved from the tumulus to a very decorative stone sculpture called a mausoleum (Colvin, 1991: 15). As time passed, various Roman Emperors undertook the building of huge mausolea (Colvin, 1991: 43). These, like the tumulus, originated from a form of stature, power and influence (Colvin, 1991: 45). Figure 6 shows the Hadrian mausoleum which dates from the second century AD (Colvin, 1991: 49).

The images show the development of the mausoleum from a circular-based plan to a form referring to the formal layout of ancient Greek temples. Complete with an entrance lined with Corinthian columns, the mausoleum stood within a large arcaded enclosure (stoa) to give it prominence (Colvin, 1991: 54).

Fig. 6: The mausoleum of the Emperor Hadrian. Second century AD (Colvin, 1991: 49).

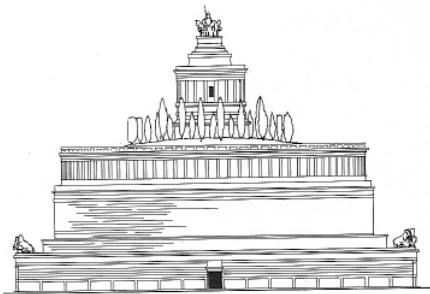
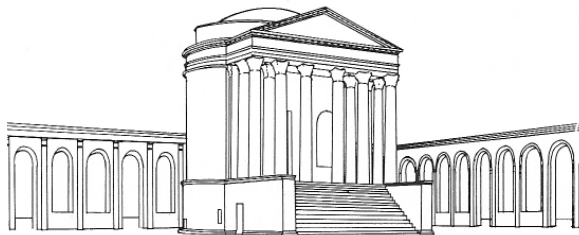


Fig. 7: The mausoleum of the Emperor Maxentius. The image shows the association between temple architecture and that of mausoleums in the third century AD (Colvin, 1991: 53).



The tower tomb was less prevalent in western architecture, but has reference to the Persian Empire. The most prestigious form of monument was the tower (Colvin, 1991: 1), and these sometimes rose to as many as 6 storeys high, accommodating 200 tombs per tower (Colvin, 1991: 78).

Christianity became more influential in the western world during the first and second century AD. Christian burial did not differ markedly from pagan burial (Colvin, 1991: 102), but rather borrowed from it. The images below show a Christian mausoleum (right) compared with a pagan mausoleum (left), both dating from the fourth century AD.

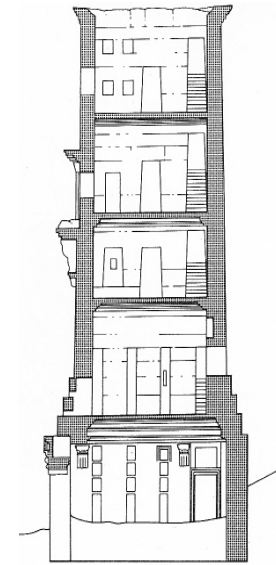
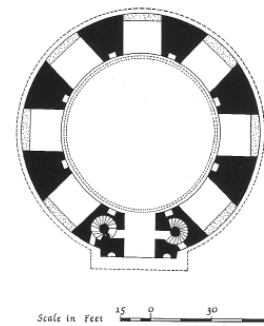
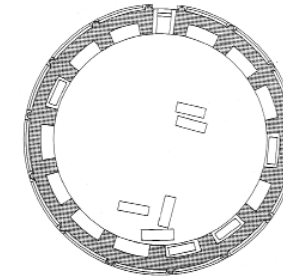


Fig. 8: Section of the Palmyra, a tower tomb. Second century AD (Colvin, 1991: 78).



Scale in Feet 15 0 30 60



Scale in Feet 0 10 20 30 40

Fig. 9: The layout of a pagan mausoleum in Greece (left), compared to the Christian mausoleum in Algeria (right) (Colvin, 1991: 52&103).

Christians worship only one God. However, the tortured bodies of martyred saints were given proper burial after the threat of persecution was lifted in the early fourth century AD. For Roman Catholic Christians this gave rise to a substitute way of connecting with God.

The tomb of a martyr was nearly always a point of religious gathering and growth. The desire for access to the burial place of a martyr grew (Colvin, 1991: 105). As a result of the growth of this new concept, martyr tombs became not only places for religious gathering but also for the burial of ordinary people, in the hope that the closer they were to a martyr, the better their opportunities would be to connect with God (Colvin, 1991: 110). As a result, martyriums grew and expanded, as shown in Figure 10 below.

Fig. 10: A Martyrium. Early Christian churches grew around the tomb of a martyr saint. Early fifth century AD (Colvin, 1991: 109).

Fig. 11: The development of burial within the confines of a church from the seventh century AD onwards (Colvin, 1991: 126).

As churches are places to connect with God, they became preferred places for burial (Colvin, 1991: 111). Only the elite – kings, queens and priests – were

initially allowed to have their coffins or caskets housed in the confines of the church. The intention was evidently to place the sarcophagi of those worthy of honour inside the church.

Over the course of time, many side chapels and tombs have been added to or placed in the existing church structure. Figure 12 shows evidence of the early stages of the Christian faith and the impact it had on the built form of the Old St Peter's in Rome (as recorded in the 17th century AD) (Etlin, 1984).

Figure 13 shows to what extent many churches in Europe have been added to.

Traditionally church and cemetery were seen as integrally related (Etlin, 1984: 10). This then implies that to be buried in the church burial ground was to rest within the consecrated precinct of the church and of God (Etlin, 1984: *ibid.*).

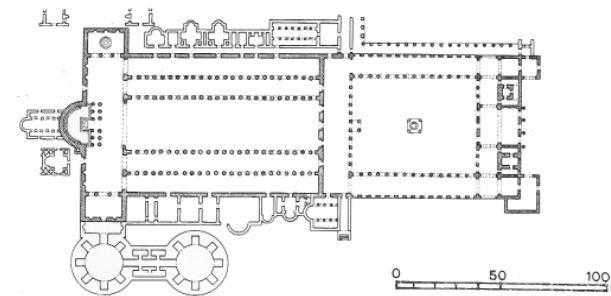
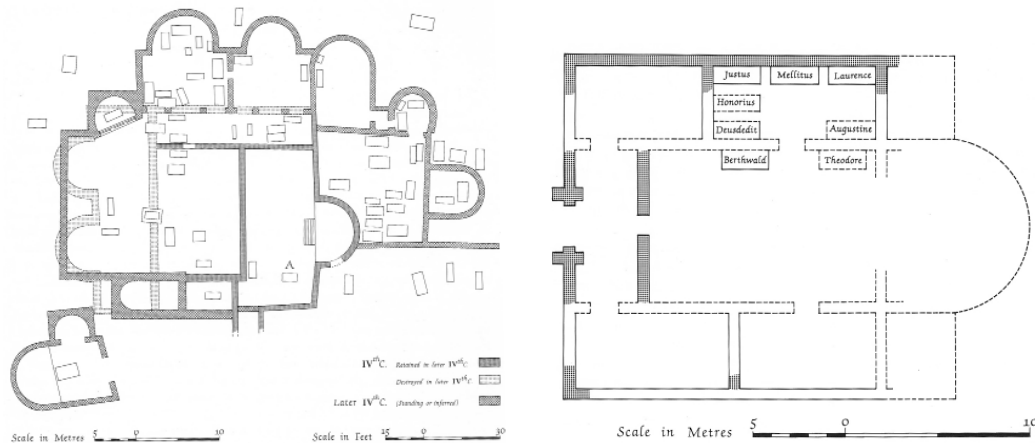


Fig. 12: Old St Peter's, Rome. Mausoleums and small burial spaces were connected to the interior of the church (Colvin, 1991: 116).

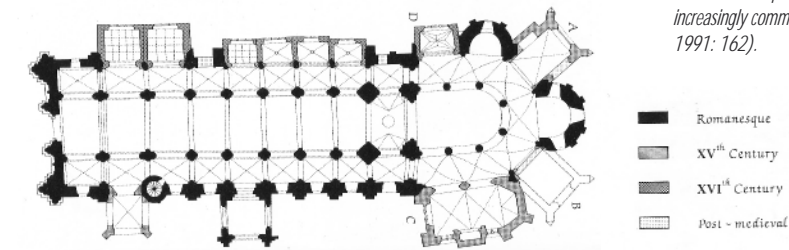


Fig. 13: Poitiers, France, Notre-Dame la Grande. By the fifteenth and the sixteenth centuries the additions of chapels had become increasingly common (Colvin, 1991: 162).

In the late fourteenth and early fifteenth centuries cemeteries entered the public domain of the city (Etlin, 1984: 3). Arcades were constructed along the boundary walls of these cemeteries. Each bay within this arcade could potentially be closed off to form a private chapel. Many wealthy members of the community furnished these spaces with ornaments and “beautiful” structures so as to secure a distinguished place of burial for themselves (Etlin, 1984: *ibid.*).

Unfortunately these cemeteries became over populated and resulted in various health risks, resulting in the removal of many remains to cemeteries on the outskirts of towns and cities. In the latter half of the 17th century several laws was put in place across Europe to govern the placement of cemeteries (Curl, 1993: 135).

During the Enlightenment, the concept of creating an Elysian field outside the

city became a driving force. Large landscaped burial sites gave rise to new thoughts on how to actually take on this new challenge (Etlin, 1984: 26).

As a result of removing the cemetery from the city, the dead could no longer be carried from the church to the grave. All the participants in the ceremony would not be able to take part in the final rites (Etlin, 1984: 24).

All these new restrictions as a result of the Enlightenment gave rise to new thoughts on burial and the meaning of the loss of life. One such train of thought that emerged at this time is the concept of the sublime. Boullée (Etlin, 1984: 101) explained the sublime as the extraordinary and marvellous quality in a discourse which enraptures and transports the participant. This metaphysical transportation is done through the production of the strongest emotion which the heart is capable of feeling (Etlin, 1984: *ibid.*).

Fig. 14: The Cemetery of the Holy Innocents was established in the fourteenth century within the confines of Paris (Etlin, 1984: 25).

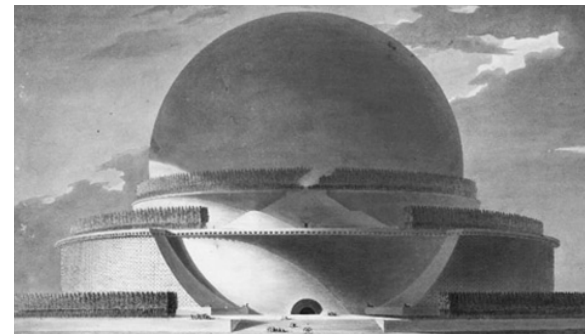
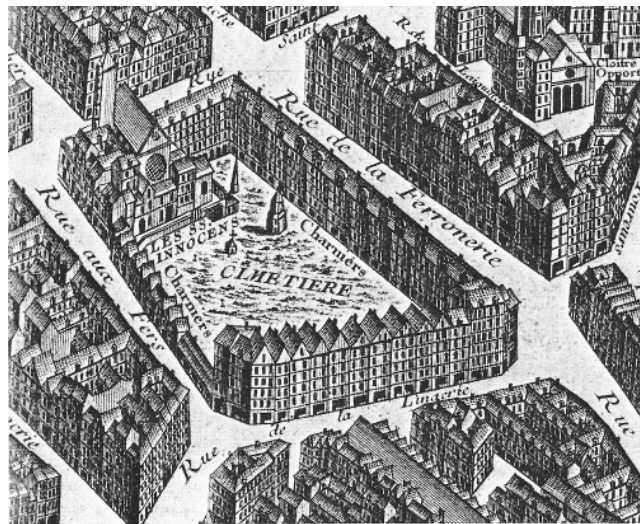


Fig. 15: The Cenotaph for Newton, by Etienne-Louis Boullée, 1784 (Etlin, 1984: 132).

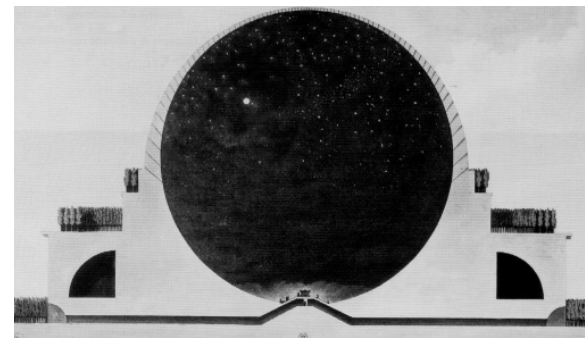


Fig. 16: A section through the Cenotaph for Newton by Boullée. An example of the expression of the sublime (Etlin, 1984: 133).

The reformers were interested in placing death in what was seen as its proper place (Eitlin, 1984: 26). Unfortunately, the triumph of the cemetery as Elysian field was short-lived. As time passed, death was no longer an event to be celebrated, nor marked by architectural or sculptural monuments (Colvin, 1991: 374). The graveyard had changed from a place forming part of the community, intertwined in everyday life, to one given only peripheral importance, physically and meta-physically.

An understanding of the history of funerary architecture clarifies the current condition of the cemetery. It shows the extent that people would go to to honour the dead. It also shows how easily the dead can be forgotten when set apart from the collective.

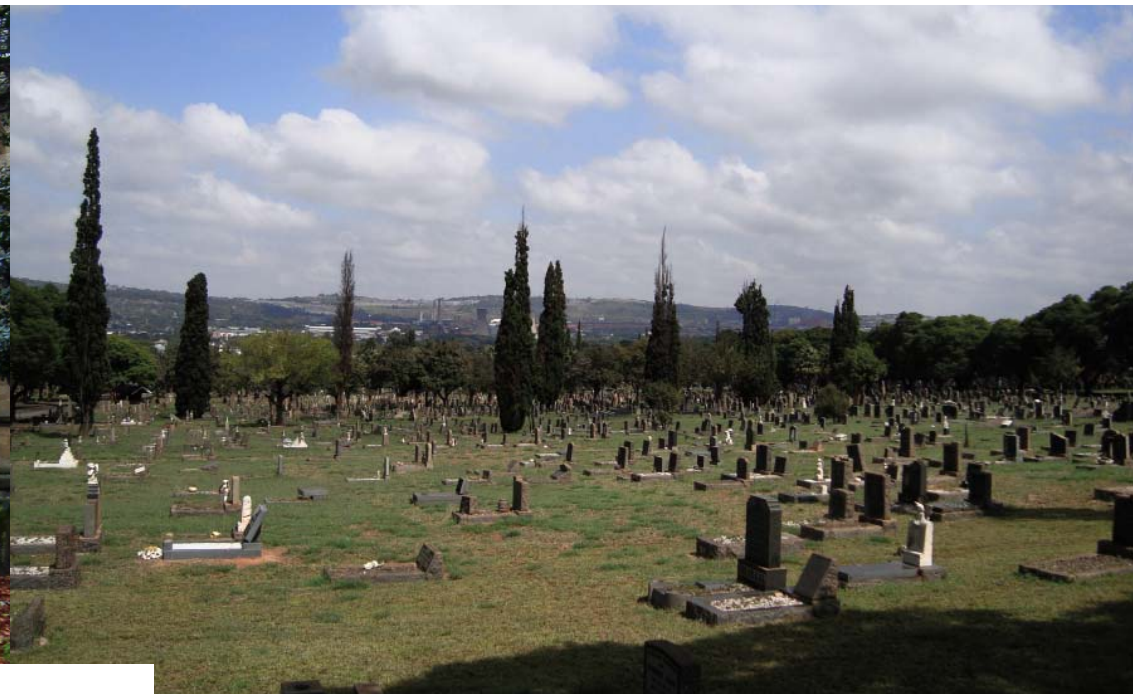
The 20th century has brought remarkable change in terms of technology and the start of the redefining of the cultural landscapes surrounding us. In the 21st century more than half the population find themselves in *vertically growing urban environments* and in close proximity to amenities.

It is the intent of this project to build on the history of funerary architecture, making use of technological advancements to create a funerary architecture that not only continues as part of the existing history, but which also forms part of the future built and social environments of urban landscapes.

Fig. 17: Church grave yard in the centre of Oxford. Current city conditions of housing and public amenities surround the site (Auhor, 2009).



Fig. 18: Rebecca Street Cemetery in Pretoria. Established in 1904, the cemetery has almost reached full capacity (Author, 2010).



Burial forms

Most of the cities in South Africa were established during the last two centuries. All cemeteries were planned on the periphery of the towns that have grown into cities over the course of time. These cemeteries have grown and new ones have been established on the new periphery of the city, far from the city centre. As a result, the distance between cemeteries and the active urban environment is constantly growing. Current cemeteries have lost the quality of being representative of a "field of rest" or a sanctuary that conveys sacredness. Instead, they have become mass burial sites for the convenient disposal of the dead, out of reach and out of sight (Alexander *et al*, 1977: 356).

The manifestation of a place of remembrance in the urban environment is made possible through the use of an alternative form of disposing of bodily remains. To support the conclusion of why an alternative is needed, current forms of disposal are presented.

Earth burials

Earth burial is considered to be the most common form of disposing of bodily remains. For the sake of hygiene, Napoleon issued a decree which required every city and town to establish a cemetery at a specific distance outside the city boundaries (Harries, 1998: 295). The decomposing bodies posed health and environmental problems by contaminating the ground and the ground water (Passorsiri, 2008: 16).

Earth burial still poses the same threat of contamination. However, today

the main reason for placing cemeteries on the outskirts of towns and cities is to alleviate the traffic congestion resulting from funerary processions (Van Copenhagen, 2010).

Cremation

Cremation became re-established in Western society during the 1870s. Only after a hundred years was cremation seen as socially acceptable (Monaghan, 2009: 1033). It is however becoming the preferred way of disposing of bodily remains in western cultures.

The coffin is placed in an incineration chamber heated to 800°C by means of flammable gas. The body is reduced to bone fragments, ash and non-combustible materials like prostheses, coffin handles and hinges (Monaghan, 2009: 1034). The non-combustible materials are removed, and the rest of the remains are transferred to a cremulator which processes the remains to a uniform texture for inurnment. The whole process takes about two hours depending on the size of the body (Passorsiri, 2008: 143).

Over the past two decades, cremation has been under scrutiny from environmental legislators. Pollutants such as hydrogen chloride, carbon monoxide and mercury are emitted through the process of cremation. In many developed countries like Finland and the United Kingdom, crematoria are the biggest contributors to mercury emissions (Monaghan, 2009: 1034). Even though cremains (ash left after cremation) use much less space than a grave (see addendum) the environmental effect is still not desirable.

Promession

Promession is a process making use of cryogenic technology. Though freeze-drying (with N_2 - liquid nitrogen) and vibration the bodily remains are turned into a powder, similar to cremains (Passornisiri, 2008: 22). The powder can be put into a biodegradable coffin and buried in a small, shallow grave. Over a period of 6 to 12 months the remains become mulch which can be used to act as nourishment for vegetation/seeds planted above the remains (Passornisiri, 2008: 22). In this way, we are reintegrated into the natural environment that we originated from.

This alternative form of disposing of bodily remains has several advantages, the resolution of which presents many opportunities. The summary below indicates the effects each form of burial has on natural resources:

Effects on natural resources:	Casket funeral	Cremation	Promession
General environ-mental effect	Negative	Negative	Positive
Energy consumption	Small	High, equivalent to 23 litres of fuel oil and half a kilogram of activated carbon for each cremation	High, "green energy" can be used
Air	None	Flue gases, mercury*, carbon dioxin(green house effect)	None
Drainage water	Yes	Yes	None
Ground water	Yes	Yes	None
Drinking water	Yes	Yes	None
Soil	Yes	None	Positive effects***
Burial ground (area)	Large areas. High demands on preparation, drainage and sewerage treatment	Small areas	Small to medium sized areas

Table 1: A comparison between three different forms of burial.

[Nitrogen (N_2) is a natural gas forming 78% of the air we breathe. Other than fossil fuels used in cremation that cause mercury and greenhouse gas emissions, any cases of spillage of N_2 (liquid nitrogen) poses no environmental threat, due to its swift evaporation back into the atmosphere (Monaghan, 2009: 1038).]

The process of promession

In the first step in the process of promession, the coffin with the body is frozen to -18°C in a normal mechanical freezer. Once the body is cooled to the appropriate temperature, it is placed into the promator (a sealed unit of 6m x 2.6m x 2.5m).

The process consists of 5 stages:

- The body is weighed to determine how much liquid nitrogen (N_2) will be required to freeze it. This works on a basis of 1kg of N_2 for every 1kg of body weight. The body is then frozen to a temperature of -196°C while the N_2 evaporates into the atmosphere. This stage takes roughly 2 hours.
- Once the body has been frozen to a temperature of -196°C it is transported onto a belt vibrating at a certain frequency. This disintegrates the remains into a frozen powder.
- The powder then moves into a vacuum chamber where the water evaporates and is dispersed into the atmosphere as natural steam.
- The dry powder passes through an electrical current, which extracts any metals that may be present. The metals are placed in a container to be recycled.
- The dry powder is placed in a container within the sealed unit that can then

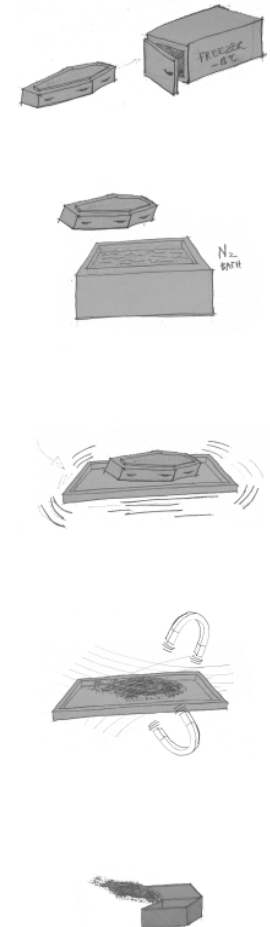


Fig. 19: Illustrations showing the process of promession. The whole process takes place in a closed container (Author, 2010).

be given to relatives to be buried or disposed of as they see fit.

It is recommended that the remains be placed in a biodegradable coffin that is then buried at a depth of approximately half a metre. In approximately 6 to 12 months the remains and the coffin will have become part of the life-giving nutrients of the soil. It is suggested that a plant or tree be planted on the grave to become a symbol of the deceased person and a representation of new life.

(www.cheshireeast.gov.uk).

Conclusion

Promession is chosen as a viable alternative to the traditional forms of earth burial and cremation. Even though promession has not been established or used in South Africa, several municipalities are looking into using promession in the future (Van Copenhagen, 2010). By making use of a renewable resource with no emissions during the promession process, and an end product to use as vegetation nourishment, opportunities are created for planting and creating *park-like environments* within the urban environment.

With these advantages presented, a new form of urban burial place can be developed for the urban collective, one which would facilitate the inter-relationship between life and death in the cycle of life.

Definitions

Promession: An alternative burial method making use of cryogenic technology to freeze-dry remains and reduce them to a powder.

Promess: The act of promession.

Promains: The bodily remains after the act of promession.

Promator: An enclosed machine (6m x 2.5m x 2.6m) in which the body is promessed.

(Monaghan, 2009: 1038)

Place of Remembrance: Vertical necropolis with various levels used for planting and the housing of remains — acting as a vertical park within the city. Also referred to as a *vertical park of remembrance* later on in the document.

Necropolis: A cemetery, especially a large one belonging to an ancient city. Origin from Greek: *nekras*: “dead person” + *polis* “city” (Pearsal, 2001: 1239).

Research Questions

The study focuses on the design of a place of remembrance within an urban environment.

The questions that will be investigated are the following:

Can an architectural expression of consciousness and respect for those that have passed, overcome cultural norms and ultimately change our perceptions of what a city and urban environment could be?

What significance lies in appropriating the *between* — physically and meta-physically?

Given the opportunities presented by promession and the urban dweller as user, how will these aspects influence the physicality of the place of remembrance?

These questions will be explored by investigating the concepts of the cycle of life; function; the *between*; collective dwelling; and site.

Problem Statement

Burial structures have a long history as places of significance and have played an integral part in the development of man and his perceptions (Colvin, 1991: 1). Even though these horizontal cemeteries have been placed and planned on the periphery of urban centres for centuries, the city of the dead still plays an integral part in the life of the city. Unfortunately, over the last three centuries, cemeteries have lost their importance in the happenings of the city (Alexander *et al*, 1977: 354).

During the past ten years an alternative way of disposing of bodily remains has been developed. Promession provides the opportunity to integrate those that have passed on into the urban fabric. Rather than creating a monument to memorialize the dead in our urban environments, an architectural expression of consciousness and respect for those that have passed is the aim.

Through sensitively appropriating the *between*, the cycle of life represented by the memorial can ultimately change perceptions of what a city and urban environment should be.

Delimitations

The purpose of this thesis is not to create a facility for a particular religion or belief system. It is also understood that not all religions and beliefs can be accommodated in the facility provided. As the process has some relation to cremation it is assumed the facility will attract like-minded people looking for an environmentally friendly alternative to earth burial or cremation (Monaghan, 2009: 1038).

As the intention of this document is to address the appropriate use of space through alternative methods of burial, the place of remembrance will not house coffins, but only promains or cremains. The facility will also accommodate those who wish to be cremated at another facility and still make use of the place of remembrance as a permanent housing facility for the remains.

Assumptions

It is understood that the promatorium and place of remembrance provided would be new to many. Historical evidence suggests that cremation was accepted over time (Monaghan, 2009: 1033); it is assumed that promession would take a similar route towards acceptance.

The facility will not be for a specific denomination or group of people. The place of remembrance hopes to attract people who see themselves as urban dwellers and would like to further their existential stay in the urban environment.

The promatorium proposed is not intended to serve the whole City of Tshwane, but rather those that are in close proximity to the facilities. As demand grows, more promatoriums will be provided in other parts of the greater City of Tshwane, followed by many more vertical places of remembrance.

The site chosen will not consist of one parcel of land, but will rather belong to several different owners, accumulating the collective space between buildings.

It is assumed that the Department of Cemeteries of the City of Tshwane Metropolitan Municipality will, as with all other official burial spaces in the greater City of Tshwane, run and manage the new facilities provided.

2. Literature review

In “Being and Time”, Heidegger explains *life* as being embedded in our historical and social context (Davis, 2010: 2).

This document addresses the integration of a necropolis into the existing urban fabric by exploring the cycle of life. Through appropriating the *between* that exists physically (spatially) and meta-physically, the project aims to create a meaningful environment that forms a necessary and essential part of our existence (Norberg-Schulz, 1983: 227). The theoretical background is divided into three parts: the *cycle of life* as an encapsulating concept; defining the *between* and its significance in the broader whole; and the existential meaning of *collective dwelling*.

The cycle of life

Human existence in its basic make-up is temporal, with reference to the moment of presence in the greater whole (McNeill, 2006: 2). This means that a human exists only momentarily, which causes *being* (human existence) to be caught up

in time. Heidegger explains this phenomenon of life as the relation between the finite being of human life and the happening of the world (McNeill, 2006: 2). The concept of “world” denotes a human being’s entire dwelling (McNeill, 2006: *ibid.*), as does “being in the world” (McNeill, 2006: 48).

The concept of life has been defined in many ways. Life is sometimes seen as purely part of a biological process of birth, decay and rebirth into some other form of life (McLennan, 2004: 64). Various philosophers like Dilthey, Scheler and Nietzsche conceived life as metaphysical and historical (Inwood, 1991: 118), explaining how life embraces our mental states, conscious and unconscious, and the expressive and creative acts which constitute our history. The concept of life entails both physical and meta-physical aspects.

The *cycle of life* is a commonly used concept — especially in philosophy and social science (O’Rand & Kreckler, 1990: 241). For this reason an attempt will be made to explain the cycle of life in the context of life, and the meta-physical philosophy behind this concept, with reference to the proposed thesis project.

Human life, in being temporary, constitutes beginning and end — birth and death — life span (O’Rand & Kreckler, 1990: 242). Even though a human life has a life span, the course of life is what makes *being* part of *happening* during our temporary existence. This life course refers to the social process of maturation (O’Rand & Kreckler, 1990: 244).

Both these concepts — life span and life course — have no reference to the *transcendence* of a single human life, only to the stages of a human life (O’Rand & Kreckler, 1990: 241). The concept “cycle of life” does refer to the whole process of developmental phenomena and also the *transcendence* of a single life (O’Rand & Kreckler, 1990: *ibid.*), placing human life within a larger cycle of life.

The cycle of life is evident in our urban environments: People come and go. The

physical make-up of the city changes and goes through various processes. Jane Jacobs (1961: 448) describes good urban environments as lively, diverse and intense cities which contain the seeds of their own regeneration, with enough energy to carry over for problems and needs outside of the urban dwellers themselves. But without human existence urban life would not be able to sustain itself, nor would it exist at all. Human life not only brings an essential part of the cycle of life into the urban environment, but also creates meaning within the urban environment. Norberg-Schulz (1983: 5) explains that since remote times physical manifestations have helped man to give meaning to his existence. This meaning refers to both the expression of meaning and the participation in constructing meaning through the ordering of spaces and social relationships (Psarra, 2009: 2).

Urban life would not exist without human existence. Human existence is part of the cycle of life and so is urban life. But do urban environments include the whole cycle of life?

The between

The *between-ness* of this study in itself lies in the middle of various *betweens*. It will be explored as the spatial relationship between two objects which do not physically exist, yet can be defined. Another *between* that this thesis tries to explain is the relationship between the physical and meta-physical being — thought, consciousness and sub-consciousness. The last *between* that is defined for all practical matters in relation to the subject of this thesis is the relationship between the physical and the spiritual.

Heidegger always explains *being* as “being in the world” (Heidegger, 1996: 50). Being in the world is an encapsulating concept of worldliness (Heidegger, 1996: *ibid.*). “Being in” then constitutes an in-ness, or as being in something (Heidegger, 1996: *ibid.*). The “in-ness” is explained as a relationship between two beings — or things — extended in space. Like water and glass — the water

in the glass; or closet and dress — the dress in the closet. These categorical relationships are explained as objective presence in something objectively present (Heidegger, 1996: 50).

The space between two objects is a physical manifestation of the relationship of the *in-ness* between objects.

In its very basic sense, a living being is generally understood as an organism that has various organs (McNeill, 2006: 3). The idea of the whole being equal to the sum of the parts originated in mechanistic thought. An arm is still an arm even if it isn't attached to the body. Socrates raised the question of the relation between the unity of a living being and its various sense organs (McNeill, 2006: *ibid.*), specifically with respect to the human being. Socrates explains this question by analysing each sensual organ with its function. By asking the question "if each sensual organ functions separately from others, what will the outcome be?" (McNeill, 2006: *ibid.*). What will the effect of someone who could see and hear and smell and taste, all at the same time, be without a *unifying element*? (McNeill, 2006: 3).

There needs to be a unifying element or activity between the senses where they could belong together and be all at one at the same time (McNeill, 2006: 3). Socrates names this togetherness the result of the soul (McNeill, 2006: *ibid.*). Heidegger defines the soul as the "being seen" of a man (McNeill, 2006: 4). The apprehension of the unity between the senses and their objects is not simply an apprehending that occurs by way of the sense organs conceived as instruments. This apprehension stretches throughout the various channels of sense perception, relates them to one another and holds them together in their unity (McNeill: 3). This *being* not only unites that which actively does the perceiving, but also creates perception.

Being is encapsulated in Heidegger's concept of *Dasein* (Inwood, 1991: 42). *Dasein* directly translated from German means "being there", which Heidegger

explains later as more than just "being there" but "there where being dwells" (Inwood, 1991: *ibid.*). It is this concept of *Dasein* that separates us from other organisms with organs — organisms which also entail a kind of being, but a different kind of being (McNeill, 2006: 5).

Dasein (*there where being dwells*) constitutes the "between" — *between* the physical and the meta-physical which is enveloped within a human being.

The last form of *between* can be explained as the consciousness man has of an afterlife (Thompson, 1998: 276). This consciousness of an afterlife can be traced back to early times to the realization of the supreme crisis of death (Colvin, 1991). This consciousness can also be traced to the builders of the pyramids (Harries, 1998: 293), who believed in the soul's immortality, and the relationship mortals have with the immortals of the afterlife. The *in-between* meta-physical space has long been expressed through the physical manifestation of funerary architecture. Funerary architecture has helped man to mark the boundary separating the realm of the living and the realm of the dead (Harries, 1998: 293). Funerary architecture can then be seen as a physical expression of the meta-physical *between*.

Collective dwelling

The word "dwelling" means more than having a roof over one's head and a certain number of square meters at one's disposal. Firstly it means to meet others for the exchange of products, ideas and feelings; that is, to experience *life as a multitude of possibilities* (Norberg-Schulz, 1985: 7). Finally it means to be oneself, in the sense of having a small world of one's own. These modes of dwelling can be called collective, public and private (Norberg-Schulz, 1985: *ibid.*). Collective means "the gathering or the accumulation of..." (Alswang *et al*, 1995: 145). Collective dwelling could potentially mean *the gathering or meeting of a number of people in the same place*. It also has the potential meaning of *a group of people that have the same convictions and cultural norms*

— creating a collective way of life.

The urban space: a place of discovery, a milieu of possibilities. Norberg-Schulz (1985: 13) explains how man collectively dwells in urban space to experience the richness of the world. It is in this richness of urban space and in the milieu of possibilities presented to the collective, that through collective dwelling the possibility arises for exploration to overcome conventional cultural norms, creating instead a rich potential for meaning and establishing a new culture (Prassa, 2009: 3).

Conclusion

This thesis investigates the role of a programme that no place can be without. No matter where we go or what we do, death is part of life. No matter how much we try to avoid it we will be confronted by death. The cycle of life includes both life and death, but more importantly it also includes collective dwelling. Collective dwelling becomes the connection, the “in-ness” between life and death. It is this “in-ness” or relationship that is the unifying element which Heidegger explains as part of Being. It is this part of Being that makes it possible to create new meaning — meaning which enhances and *celebrates life*. In doing so, this new meaning can lead to a new form of urban life and ultimately change perceptions and norms over the course of time.

The finality of loss can also come through the shared experience of the collective. Sharing with others, even though they are unknown to the mourner, brings comfort to the mourner and acknowledges the loss of life.

In the book “South African Architecture: 10 years + 100 buildings”, Prof. Pattabi Raman discusses various narratives in his article: “Change and continuity in contemporary South African architecture and urbanism”. He goes on to refer to Lyotard’s call for design gestures (narratives) forming part of the environment, rather than having grand symbolic narratives (Joubert, 2009).

It is imperative that these narratives or design gestures bring meaning to the environment that they are placed in, enhancing collective dwelling within that particular environment.

With the introduction of a necropolis in an urban environment, one has the potential to create new meaning and a culture of urban life within the urban environment. Ultimately, these goals will probably take several generations to achieve. It is however necessary to realize and understand that there is a need for the incorporation of the whole cycle of life into our collective urban environments.

3. The client

The client is the City of Tshwane Metropolitan Municipality. The city council is in the process of upgrading the existing crematorium to adhere to current environmental legislation aimed at minimising emissions (Van Copenhagen). Pretoria has only one crematorium, and the city council is in the process of expanding their facilities to accommodate the high demand.

The cost of replacing and upgrading an existing incinerator is comparable to the cost of a promator (Monaghan, 2009: 1038). The council is considering alternatives for future expansions (Van Copenhagen, 2010).

The Department of Cemeteries of the City of Tshwane Metropolitan Municipality will be in charge of the facility.

4. Context



Tshwane



Gauteng



South Africa



Africa

Site Selection

In an age when more than half the world population is concentrated in cities (Brudett & Sudjic, 2007: 8), Pretoria, like so many other world cities, is faced with questions of globalization, sustainability, jobs, immigration and social exclusion (Brudett & Sudjic, 2007: *ibid.*). At this time in history, cities all over are undergoing great changes to increase the quality of social interaction and diversity of activities within urban areas (Gehl, 2006: 7).

Urban centres will become places of high density and will include a diversity of activities (Brudett & Sudjic, 2007: 68). To create a healthy urban environment, amenities like housing and work opportunities need to be in close proximity for the future urban dweller (Alexander *et al*, 1977: 53). Walking and public transport will be the main forms of transportation in urban centres. Our engineered cities governed by vehicular access and movement routes will be re-appropriated (Gehl, 2006: 45). The need for private transportation will be minimized by the close proximity of amenities found in the urban environment (Jacobs, 1992: 35).

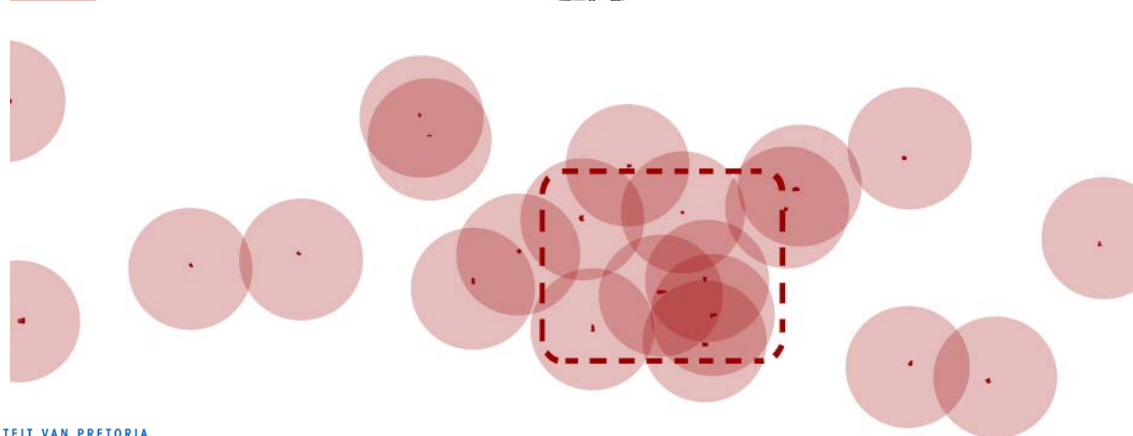
Fig. 20: Aerial view of the Pretoria CBD (www.tshwane.gov.za).



Fig. 21: Figure ground study of the Pretoria CBD, with places of worship in red. The circles indicate a 5 minute walking radius drawn around the places of worship (Author, 2010).



Fig. 22: The image shows the circles and places of worship. The study area is located where the most circles overlap, indicates the study area (the red dashed rectangle) (Author, 2010).



The Place of Remembrance is meant for the urban dweller: not exclusively for a particular group of people, or geared towards a particular religious group. Relationships “between” is the primary drive of the project. To strengthen the relevance of the site selection process, an “inbetweenness” is used as primary parameter for the site selection process. The *physical manifestation* of the relationship *between* the physical and the spiritual is chosen. By identifying *places of religious worship* within the urban environment, and using humanistic planning principles (Gehl, 2006: 7), a study area is identified.

Humanistic planning principles are centred around the idea of a concentration of activities within reach of people on foot, limited to a 5 minute walking radius (Gehl, 2006: 83). Circles with a 5 minute radius are drawn around each place of religious worship. Potential study areas are identified by selecting areas where multiple circles overlap.

Within the study area, several *conditions of inbetweenness* are identified as primary site informants. As numerous conditions exist in the urban environment, specific conditions of inbetweenness need to be identified within the study area.

For the purpose of this study the *conditions of inbetweenness* are limited to those conforming to the following requirements:

- space found within the limits of a city block
- awkward space: space not able to be used for the general functions found within an urban environment
- left over/lost and under-utilized space
- vertical inbetweenness

Sometimes unplanned, these conditions of inbetweenness carry the inherent function of delivering much needed ventilation and light to the buildings framing them. These two functions also play a major role in the design of the place of remembrance as it will populate the inbetween.

The images show the process of site selection. Within the study area *six* conditions of inbetweenness have been identified. All these sites could house a vertical place of remembrance, as it is the aim to have more than one vertical place of remembrance in the urban environment.

These sites are evaluated according to a more detailed set of requirements to establish a specific site. For the purpose of the study a specific site is needed that will house the first of many vertical places of remembrance.

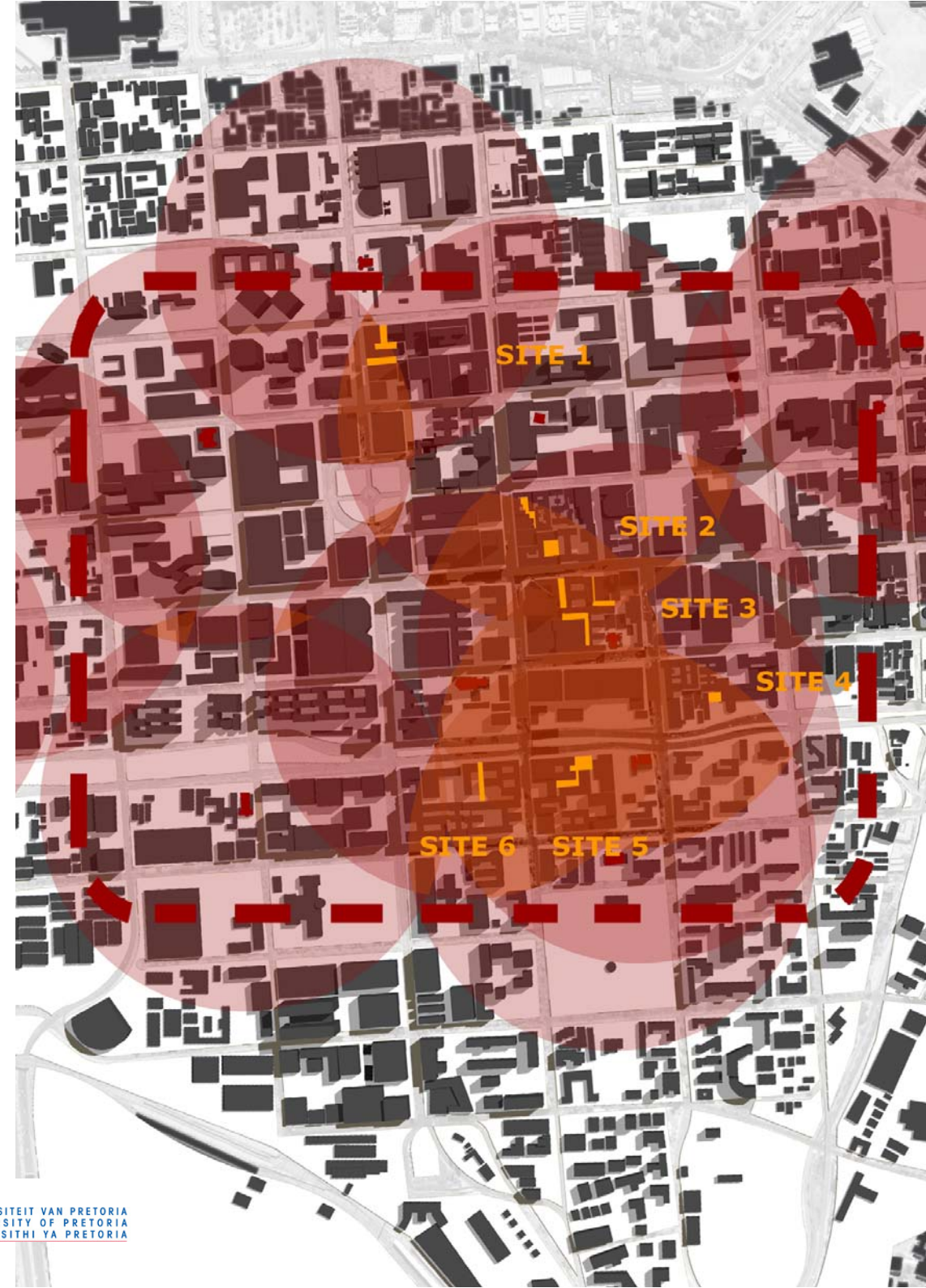


Fig. 23: (Opposite page)
Enlarged study area (Author,
2010).

Site selection as per requirements

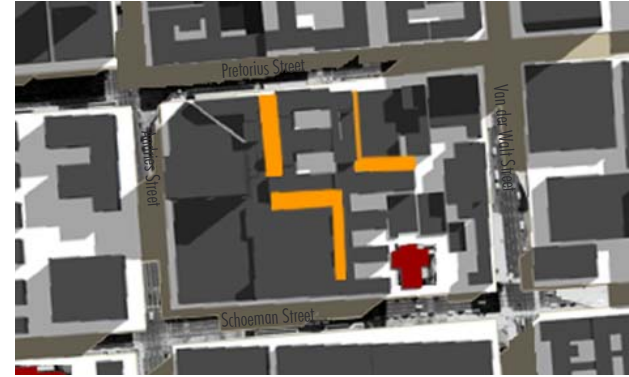
Table 2: A detail set of requirements set out in table form.

Requirements:	Site:					
	1	2	3	4	5	6
Proximity to the city centre (< 1km)	x	x	x		x	
Accessibility of the condition of inbetweenness	x		x	x		x
Visibility from street	x		x	x	x	x
Existing condition of collective dwelling on site			x			
Possible scenarios of private and public space	x	x	x		x	x
Condition of verticality		x	x			
Site infrastructure (existing services and parking)		x	x	x		x

Site 1



Site 2



Site 3



Site 4



Site 5



Site 6

Site analysis

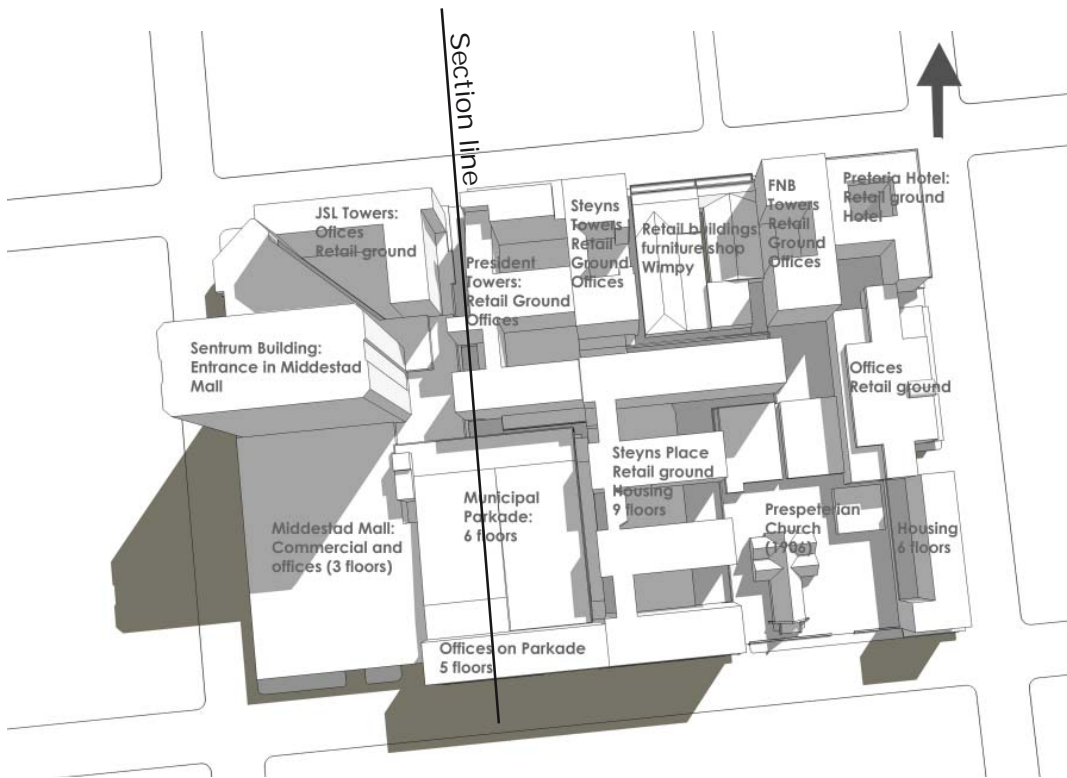
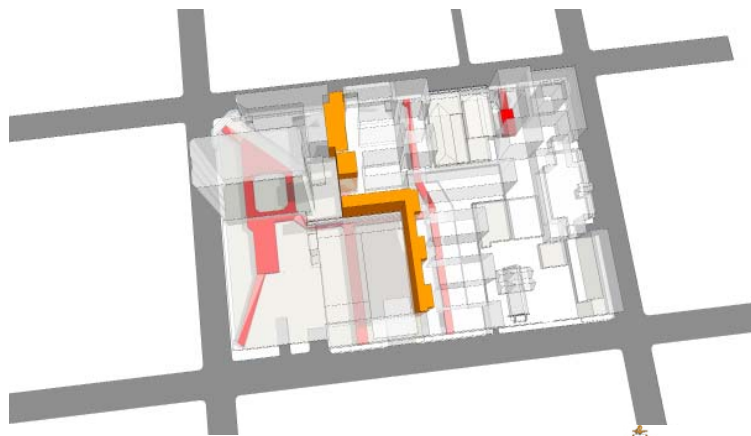


Fig. 24: Functions housed on the block of the proposed site (Author, 2010).

Fig. 25: The image shows the "in-between" to be used on the site for the vertical park of remembrance (Author, 2010).

Fig. 26: (Opposite page) 3D figure ground of Pretoria CBD with site highlighted, showing close proximity to many amenities in the CBD (Author, 2010).



Site Accessibility

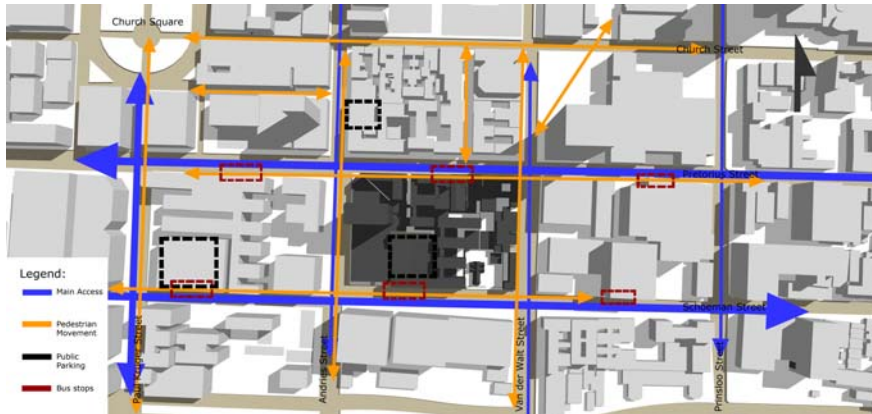


Fig. 27: The diagram shows the accessibility of the block with access roads, pedestrian movement and parking in and around the block (Author, 2010).

Accessibility: Interior

The block, located between Pretorius, Van der Walt, Schoeman and Andries Streets, has an existing arcade system, the President Arcade, the Steyn Arcade and the Middestad Mall, providing access to its interior. This provides an opportunity to utilize the interior, as pedestrian access is already in place. In Figures 16 and 17 one can see the existing arcade system (indicated in red) providing access to the block interior.

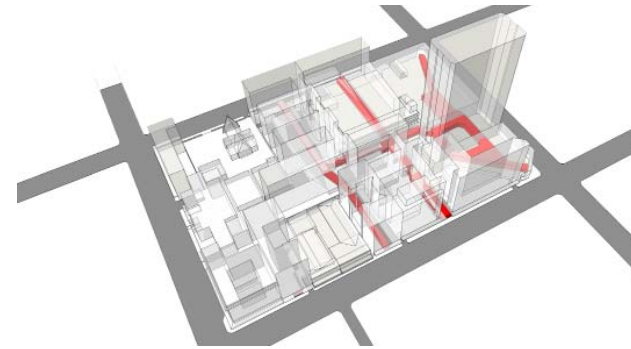
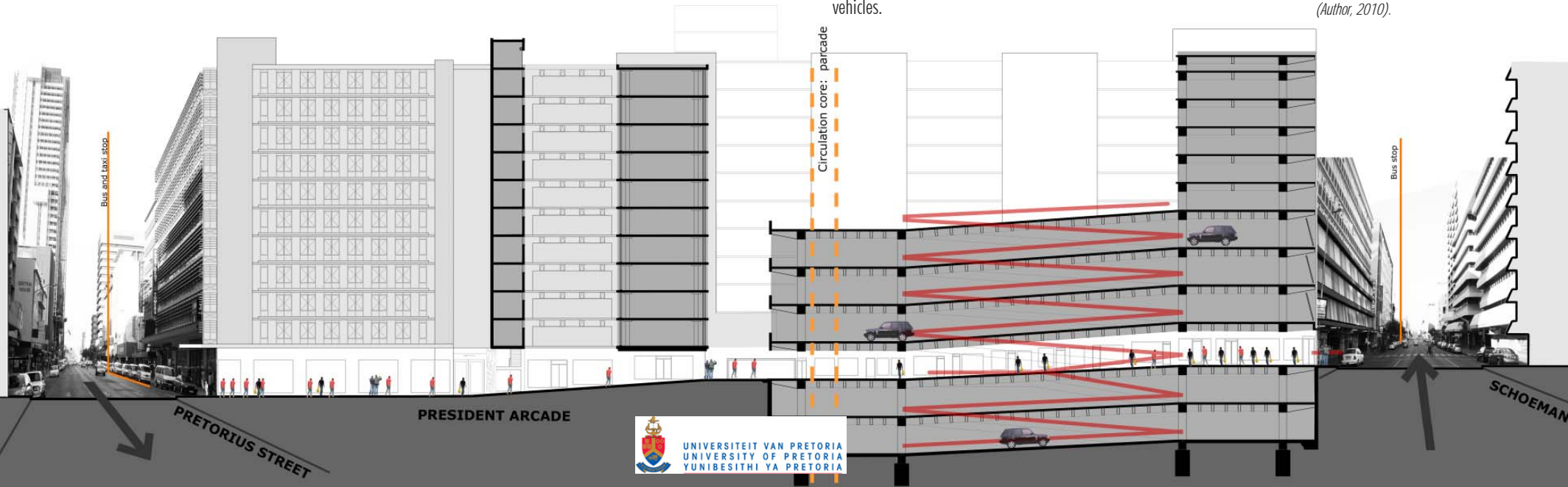


Fig. 28: 3D block with arcade system indicated in red (Author, 2010).

The section below indicates an existing public parking structure on the southern part of the site. The parking structure will serve as access for services to the facilities. When a memorial service takes place, it can be used by private vehicles.

Fig. 29: Block section showing accessibility to block interior (Author, 2010).





Northern Facade

Fig. 30: Composite image of the northern facade of the block (Author, 2010).

Fig. 31: Composite image of the southern facade of the block (Author, 2010).



Southern Facade

Fig. 32: Activity in Pretorius Street at the entrance to President Arcade (Author, 2010).

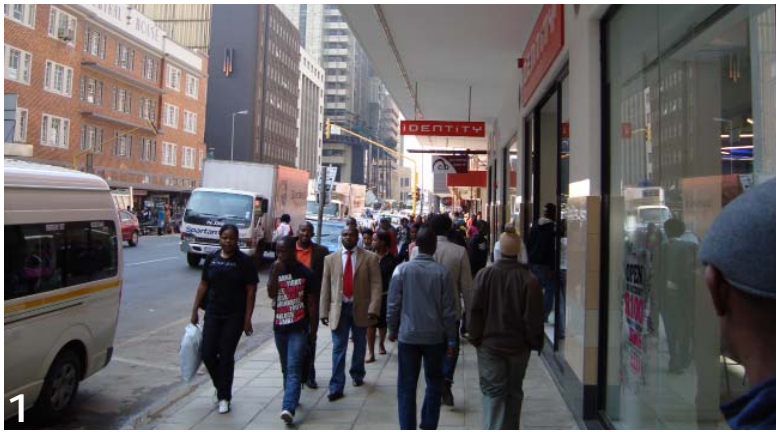


Fig. 34: President Arcade south entrance (Author, 2010).



Fig. 33: Municipal arcade with its entrance to the south of the block in Schoeman Street (Author, 2010).



Fig. 35: Key of block.



Fig. 36: The site's northern street face, showing the verticality of the "in-betweenness" (Author, 2010).

Fig. 37: Figure ground study done using an aerial photo from 1937 (Van der Waal collection, University of Pretoria) (Author, 2010).

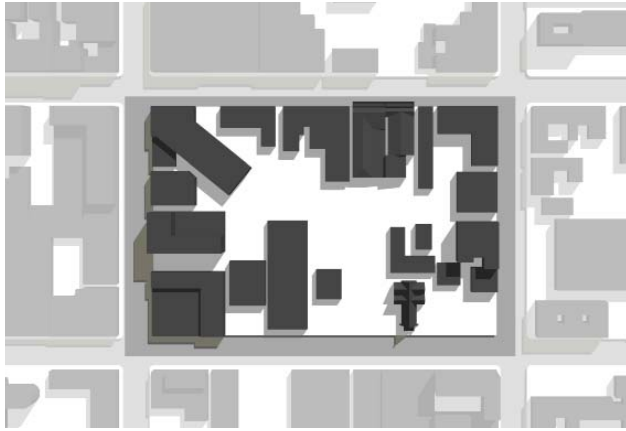


Fig. 38: Figure ground study done using an aerial photo from 1947 (Van der Waal collection, University of Pretoria) (Author, 2010).



Fig. 39: Figure ground study done using an aerial photo from 1975 (Van der Waal collection, University of Pretoria) (Author, 2010).

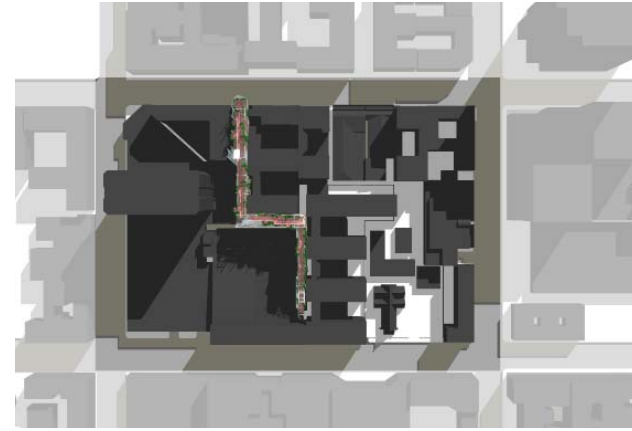
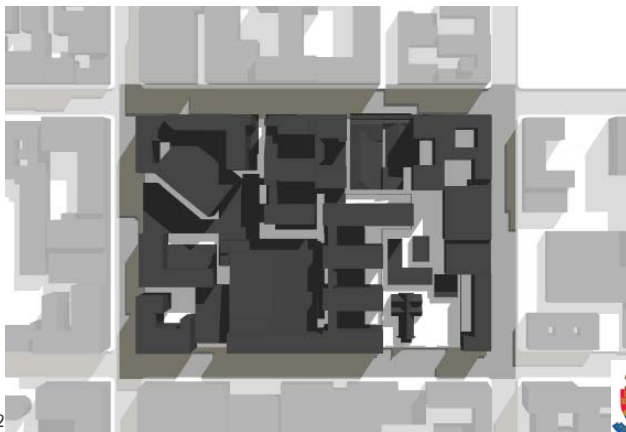


Fig. 40: Figure ground study done using an aerial photo from 2010 (www.tshwane.gov) (Author, 2010).

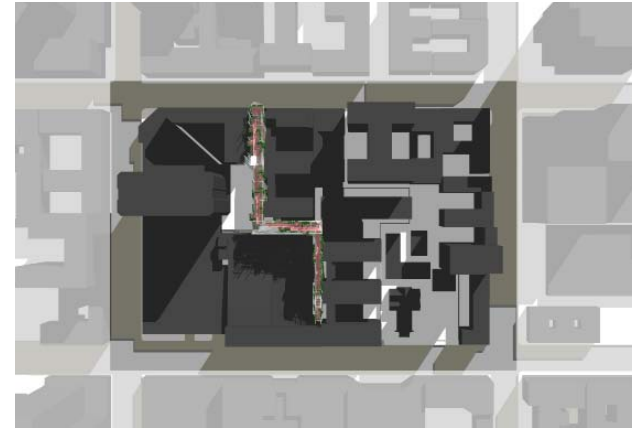


Fig. 41: Figure ground study done for the site for 2030. The development shows how the vertical place of remembrance influences the built form around it over time (Author, 2010).

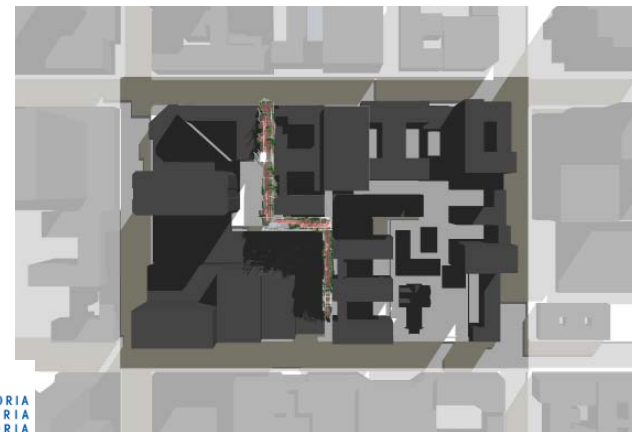


Fig. 42: Figure ground study done for the site for 2050. The development shows how the vertical place of remembrance further influences the built form around it over time (Author, 2010).

5. Precedents

León Tarantorio, León, Spain
BAAS Architects
2000



Crematorium Baumschulenweg, Berlin, Germany
Axel Schultes Architekten
1998



Modena Cemetery, San Cataldo, Italy
Aldo Rossi
1971-1978



MFO Park, Zurich, Switzerland
Raderschall Landschaftsarchitekten



Introduction

Fig. 43: (Previous page, top) Bird's eye view of León Tarantorio mortuary (Cohen & Metz, 2002: 93).

Fig. 44: (Previous page, second from top) Entrance facade of the crematorium in Berlin (Rusel, 2000: 227).

Fig. 45: (Previous page, third from top) Some of the completed buildings in the Modena cemetery, designed by Aldo Rossi (Adjmi, 1991: 21).

Fig. 46: (Previous page, bottom) MFO Park: a steel structure is put in place to support vines which will become a green canopy for users in a dense urban environment (Martholis & Robinson, 2007: 16).

The proposed thesis project consists of a vertical place of remembrance and a promatorium. Promession is a relatively new technological advancement with few existing examples. Crematoria are investigated for the similarities that exist between the functional requirements of crematoriums and those of promatoriums.

The main function of vertical parks of remembrance is to house the remains of those who have passed on in a park-like structure. Precedents are investigated with relation to vertical storage of remains and vertical planted structures.

The main issues to assess in every precedent:

- context
- movement
- light
- structure and materials
- spatial hierarchy

León Tarantorio, León, Spain

BAAS Architects

2000

The municipal mortuary (“tarantorio”) balances the idea of a large sunken tomb with the sky reflected in the rooftop pool above, creating a sheltered environment for mourning. The building was conceived from counterbalanced references — earth and sky; weight and lightness; openness and intimacy (Cohn & Metz, 2002: 93).

From the reflective pool, angled concrete “fingers” emerge not only to bring daylight into the chapel below, but also to emphasise the entrance (Cohn & Metz, 2002: 95). One enters the mortuary via a processional timber ramp, to find oneself in a large foyer with a full length window all along the building. The foyer becomes the public gathering space, furnished and divided with v-shaped columns that support the reflective pool above. Several private mourning vigil rooms flank the foyer. These spaces are illuminated by sunken private courtyards.

Fig. 47: View of the mortuary, dropped into the ground and covered by a reflective pool ((Cohen & Metz, 2002: 93).



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Context

Set within a high density residential area, the building had to respond accordingly. As a result the building was sunk into the ground (Cohn & Metz, 2002: 93).



Movement

Visitors to the mortuary arrive on ground level, next to the building. They experience a procession as they move down via a wooden ramp to the entrance of the building (Cohn & Metz, 2002: 95). They enter the foyer space through a set of glass doors and then move on into various vigil rooms.



Light

Light is used in two ways in the design, first in the foyer where the living commune. A full length window floods the public area with light. As one enters more private spaces shared by the living and the dead, light is used very specifically to emphasise the dead.

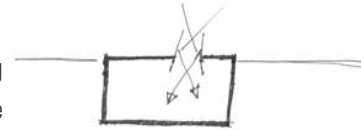


Fig. 48: The plan layout of the mortuary. The concepts of intimacy and openness can be read clearly in the articulation of the plan (archdaily.com).



Structure and materials

Concrete and wood are the main materials used in the building (Cohn & Metz, 2002: 97). The weightiness of the concrete structure is counterbalanced with the pool that reflects the sky above. The white concrete is offset in the interior with timber — signifying the complex relationship between life and death.

Spatial hierarchy

The mourner arriving at the mortuary experiences several emotions during this time. The first threshold becomes a ramp going down into the mortuary. Once inside, one is still aware of the environment outside. As the mourner progresses to the closed chapel or vigil rooms, light is used specifically to emphasize the relationship with the deceased.

Conclusion

The tarantorio in León responds to the context very specifically. The building is sunken not only to respect the existing environment it is placed in, but also as reference to the traditional form of burial. As one progresses into the building via the ramp one is conscious of the thresholds that are created and how both the physical structure and the use of light are used to emphasise

Fig. 49: Chapel interior showing the quality of light that fills the space and accentuates the plinth where the coffin is placed (archdaily.com).



these thresholds. The use of materials and light evokes different emotional responses. The building is successful in conveying the conceptual idea very clearly. The design houses not only the physical requirements of the building, but also addresses the emotional requirements of the bereaved.

In the context of the thesis project, placing spaces underground has much relevance in terms of the respect shown to the existing. The articulation of the spatial hierarchy and the very specific use of light are concepts evident in much funerary architecture, and will also be incorporated to identify different spaces in the facilities provided by the proposed thesis project.

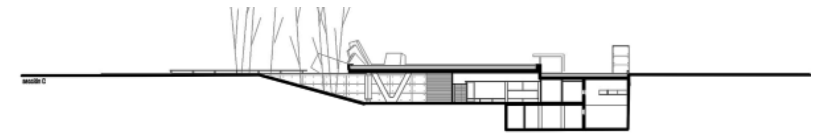


Fig. 50: Section showing the procession as one enters the space at a level lower than the ground floor. As in the plan the concept is visible in the articulation of the section (archdaily.com).

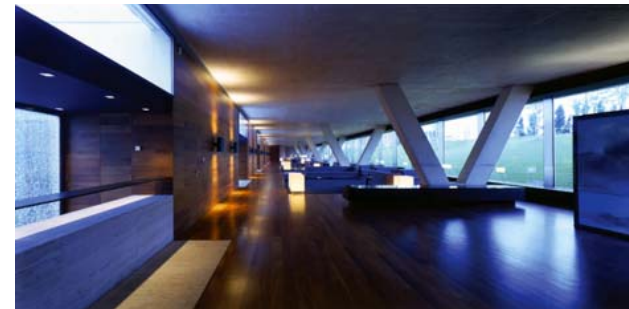


Fig. 51: The waiting area looking out towards the green berm (archdaily.com).



Fig. 52: The chapel interior. The contrast between the materials used is evident (archdaily.com).

Crematorium Baumschulenweg, Berlin, Germany

Axel Schultes Architekten

1998

The architects were commissioned with the task of creating a place that is non-religious and open to all to pay their respects to those who have passed on. The place had to convey a spirit of tenderness, intimacy and awe, without inflicting “God-fearing terror” (Russel, 2000: 225).

The monumental building is set within a 20th century cemetery. On passing through the tree forecourt on arrival, one is confronted with the stark modular concrete-framed block. The entrance is flanked by a chapel on each side and leads up into the main gathering hall with its double storey volume (Russel, 2000: 226). One large communal gathering space is created that binds people together to share their grief. Concrete columns with skylights are scattered throughout the space. Representing a meta-physical forest, the columns are a dominant feature whatever the number of people in the space. From the gathering space one can enter any one of the three chapels. The chapels are flooded with light through the glass façade, which is shaded with metal louvers.

Fig. 53: Public entrance to the memorial service spaces of the crematorium (www.jerembuczowski.pl).



Context

Set in an old cemetery, the crematorium sits in a serene setting with lush vegetation (Russel, 2000: 225). The building is perceived as a solid object in the landscape, confronting the mourner on first approach.



Movement

The mourner enters the building through one of three entrances. Wide steps lead up to the double volume gathering space. From the main gathering space the mourner can enter the various chapels. Deliveries are made on the opposite side of the building. The coffins are received and stored on the lower ground level. Elevators for coffin circulation link the lower ground storage with the chapels. Once the memorial service is over, the coffin is taken back down to the various incinerators in the building (Russel, 2000: 231).



Light

Light has been used to illustrate the concept of eternity. From the entrances the mourner is drawn into the space by slits in the concrete roof slab (Russel, 2000: 231). These slits are taken through the building, dividing the roof slab and washing the walls of the gathering space with light. The interfaces between obvious structural elements are disconnected and filled with light, stressing the notion of eternity (Russel, 2006: *ibid.*). In the main space the concrete

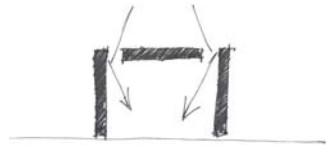


Fig. 54: The condolence hall: the main gathering space between the various chapels, dominated by the concrete columns (worldcities.bloguez.com).

columns with their light connections take on a ceremonial role. The entire front façade of the chapels is glazed and shaded with steel louvers (Russel, 2006: 227).

Structure and materials

The main material used is fair faced concrete (Russel, 2000: 225). The cold and barren simplicity of the structural material is contrasted with hints of light. Concerning the structure of the chapels: the glass façade, removed from the concrete box, seems to wrap over the concrete and envelop the mourner in the space. When one looks at the section one can see how the structure creates a distinction between public and service spaces — the floor of the gathering space is articulated through the thick ceiling void. This not only carries the structure above, but also provides opportunities for installing services. This separation and articulation of structural elements is also used in the plan to indicate hierarchy.

Spatial hierarchy

In all the above discussed aspects of the design, one can see how all the

elements have been used to create thresholds — space dividers aiding in the division of public and service spaces. The building plays with particular relationships to create spatial hierarchy. These relationships and instances of threshold creation are evident when moving between spaces that are carefully orchestrated so as not to feel forced.

Conclusion

Having a difficult brief, the architects accomplished a building that makes use of a limited material palette, and is flooded with light to accomplish the desired emotive reactions. The integration of both light and structure was used to create spatial hierarchy, aided by the use of thresholds. Instead of using hierarchy in a linear process, the design makes use of a circular form of hierarchy: public — service — private — service — public. The way this was done seems to have been effortless, yet when studied one realizes the complexity of this spatial formation.

In the proposed thesis design, light will be used to create an emotive space. The circular formation of spatial hierarchy is a valuable concept that can be incorporated. However, the building as object in the landscape is contrary to the objective of this thesis — being integrated and anti-monumental in its conclusion. Its value therefore lies in understanding the internal arrangement of the building rather than its relationship to the landscape.



Fig. 55: (Left) The image shows the differentiation between the concrete chapel box and the glazed facade wrapping around it (Russel, 2000: 230).

Fig. 56: (Right) One of the entrances to the main hall (Russel, 2000).

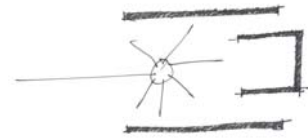
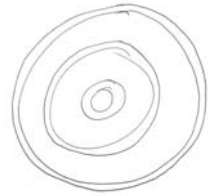
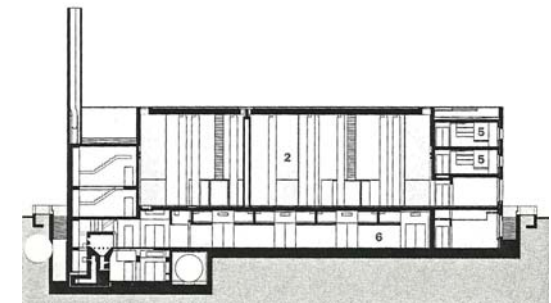
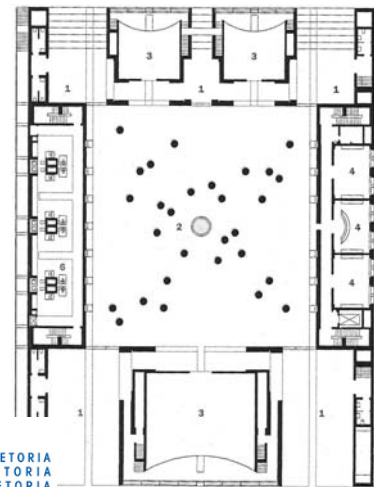


Fig. 57: The ground floor plan (Russel, 2000: 226).

- Key:
1. Entrance
 2. Hall of condolence
 3. Chapel
 4. Waiting area
 5. Offices
 6. Crematorium

Fig. 58: Section of the building. The relationships and thresholds between the different spaces are visible (Russel, 2000: 226).



Modena Cemetery, San Cataldo, Italy

Aldo Rossi

1971-1978

By using repetitive and universally recognised forms, Rossi creates architectural meaning through the largeness of space (Allibone, 1987: 12). The intent was to create a city for the dead that forms part of the urban space rather than being a monument. This was achieved through the creation of a public passage through the cemetery (Freiman, 1991: 58). The design consists of various elements that make up the cemetery. A perimeter building runs all along the boundary of the site; a second building running parallel to the perimeter building contains the ossuaries. This building is raised on a series of slender fins. A sense of eternity is instilled as one walks down the length of the raised ossuary. The main columbarium stands as an element in the landscape, yet forms part of the cemetery complex. The multi storey columbarium is penetrated by openings, flooding the interior space with light (Freiman, 1991: 62).

Fig. 59: Presentational drawing of the plan of Modena cemetery (www.anthonysilvioudaulario.com).

Fig. 60: (Opposite page, left) View of the main columbarium from the public walkway (Adjmi, 1991: 21).

Fig. 61: (Opposite page - right) The thin concrete fins of the raised ossuary create an endless rhythm (picasaweb.google.com).

Set on the periphery of the town of Modena, the cemetery was established after a design competition in 1971, with construction only starting in 1976

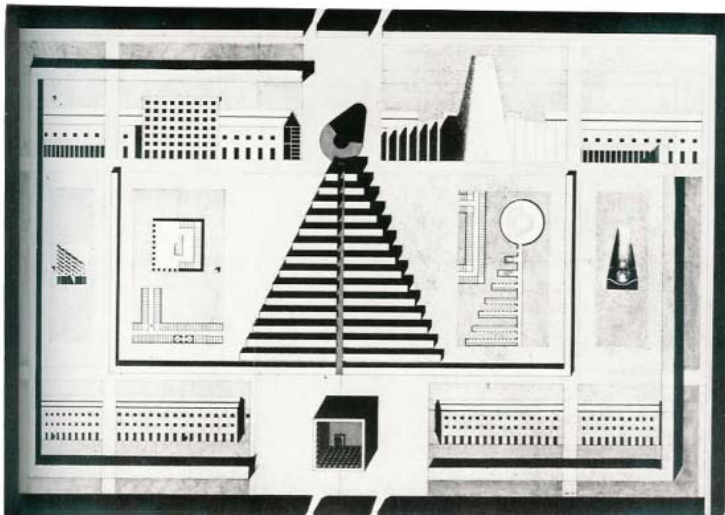
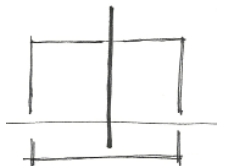
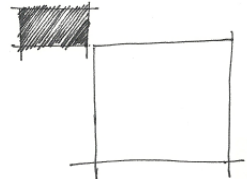
(Freiman, 1991: 49). The cemetery is still under construction. All the peripheral ossuaries have been completed. The main multi-storey columbarium has also been built. As the cemetery grows, it is completed in phases. The design was intended as a city for the dead, forming part of the urban environment next to the cemetery. This connection between the existing urban area and the cemetery is formed and strengthened by a public passage through the cemetery (Freiman, 1991: 58). The buildings in the design sit as stand-alone objects, but the spaces between these objects are crucial to the experience of the living, creating vistas, vantage points and framed perspectives.

Context

The cemetery is located in the well established town of Modena, Italy. It is being built on the periphery of the town next to the existing ossuary structures. Even though the town has grown over the past thirty-five years, the cemetery is still very much on the outskirts.

Movement

Movement through the site and the buildings is quite simple. As one enters on the axis of the cemetery one can either walk across the open interior court or enter one of the ossuaries encircling the cemetery. The ossuary facing the interior court is raised on thin concrete fins (Freiman, 1991: 62), which create



a walkway. Movement culminates at the object buildings, and from there proceeds to other parts of the cemetery.

Light

Light has been incorporated with rhythms and repetitions in the structures to create several forms of meaning in the cemetery complex. One such example is the slender concrete fins under the raised ossuary. The spatial quality speaks of eternity as the rhythm continues along the length of the building (Freiman, 1991: 62). The articulation and use of light in the main columbarium are also evident where the deep structural walls are penetrated with light openings next to the units housing the remains of the dead.



Structure and materials

As in most of Rossi's designs, humble and local materials are used in the construction of the buildings (Allibone, 1987). The buildings read as solid in their making, signifying the concept of strong vs. weak used in the structure of the buildings.



Spatial hierarchy

A reading of the plan shows which buildings and elements in the design carry higher importance through their articulation and placing in the design. The ossuary on the periphery has a communal, public character to it, similar to a stoa in Ancient Roman architecture. The arcade beneath provides space for communal gathering and meeting. As one moves through the site to the main columbarium, its importance is emphasized through the absence of structures in the immediate vicinity of the building. It also sits on the same axis as the main entrance, as well as next to the public passage progressing through the cemetery.



Conclusion

The cemetery is a personification of the work of Aldo Rossi. Making use of geometric shapes, his approach has a very strong emotive component (Freiman, 1991: 49). The design is based on the siting of objects in the landscape, but these become part of the composition of the cemetery. Rhythm is not only used to diffuse light, but also to create a sense of eternity, which has value in terms of the spatial quality and existential response desired in the proposed thesis design. The cemetery has a timelessness to it that has been enhanced through the typology and urban design used by the architect. This form of axial organisation can also be used in a small space to create a form of coherence in the spatial hierarchy. The Modena cemetery strives to provide a healing space, to restore the institution and reconstitute the public domain (Freiman, 1991: 49).

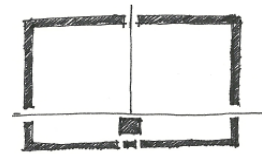
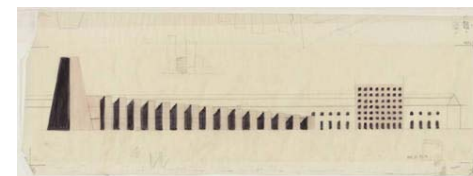


Fig. 62: (Opposite page, left) The interior of the main columbarium structure. The image shows light penetrating the structure (www.flickr.com).

Fig. 63: (Opposite page, right) The ossuary hallway conveying a feeling of eternity (Adjmi, 1991: 23).

Fig. 64: Elevation of the cemetery at Modena (www.moma.org).



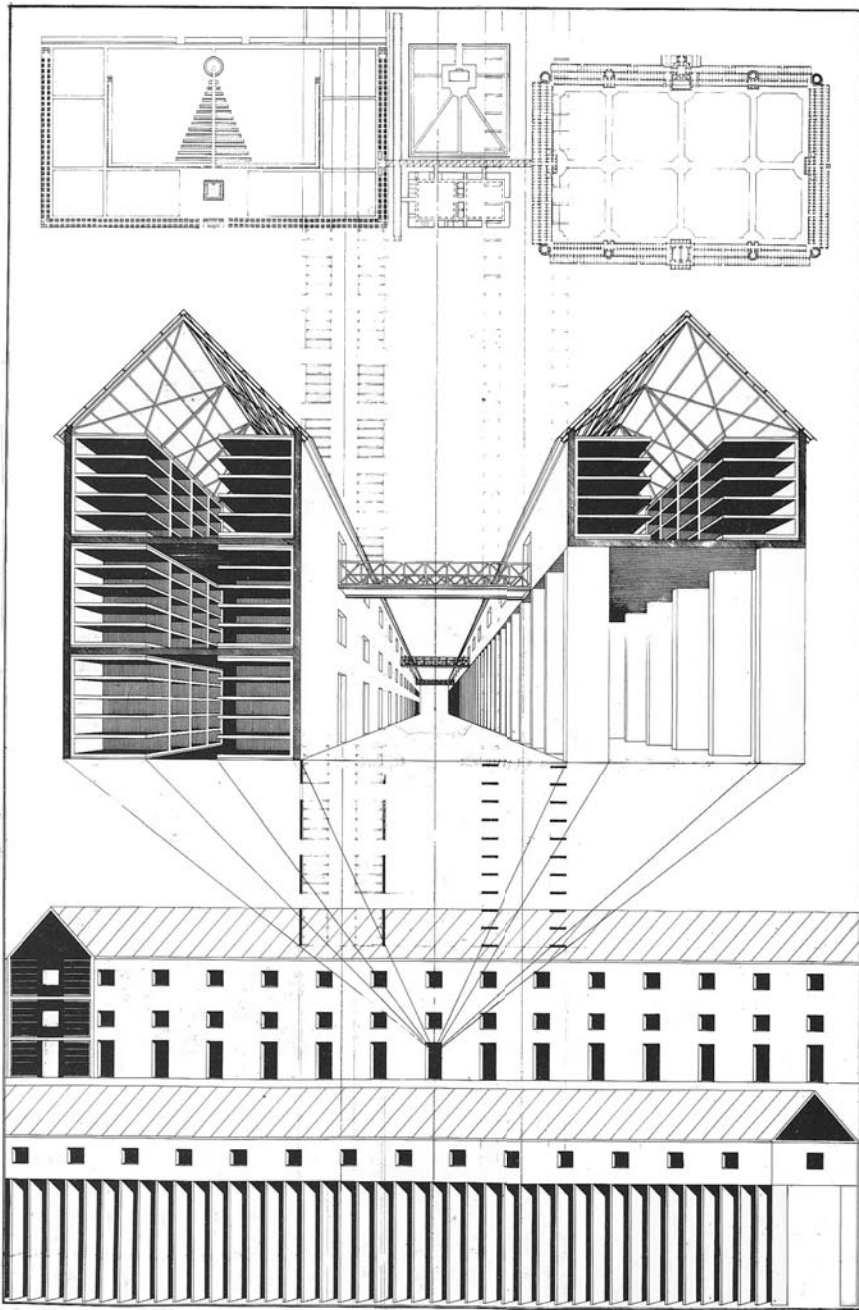


Fig. 65: Presentational drawings by Aldo Rossi: perspective section and elevations of the peripheral structures (Allibone, 1987: 15).

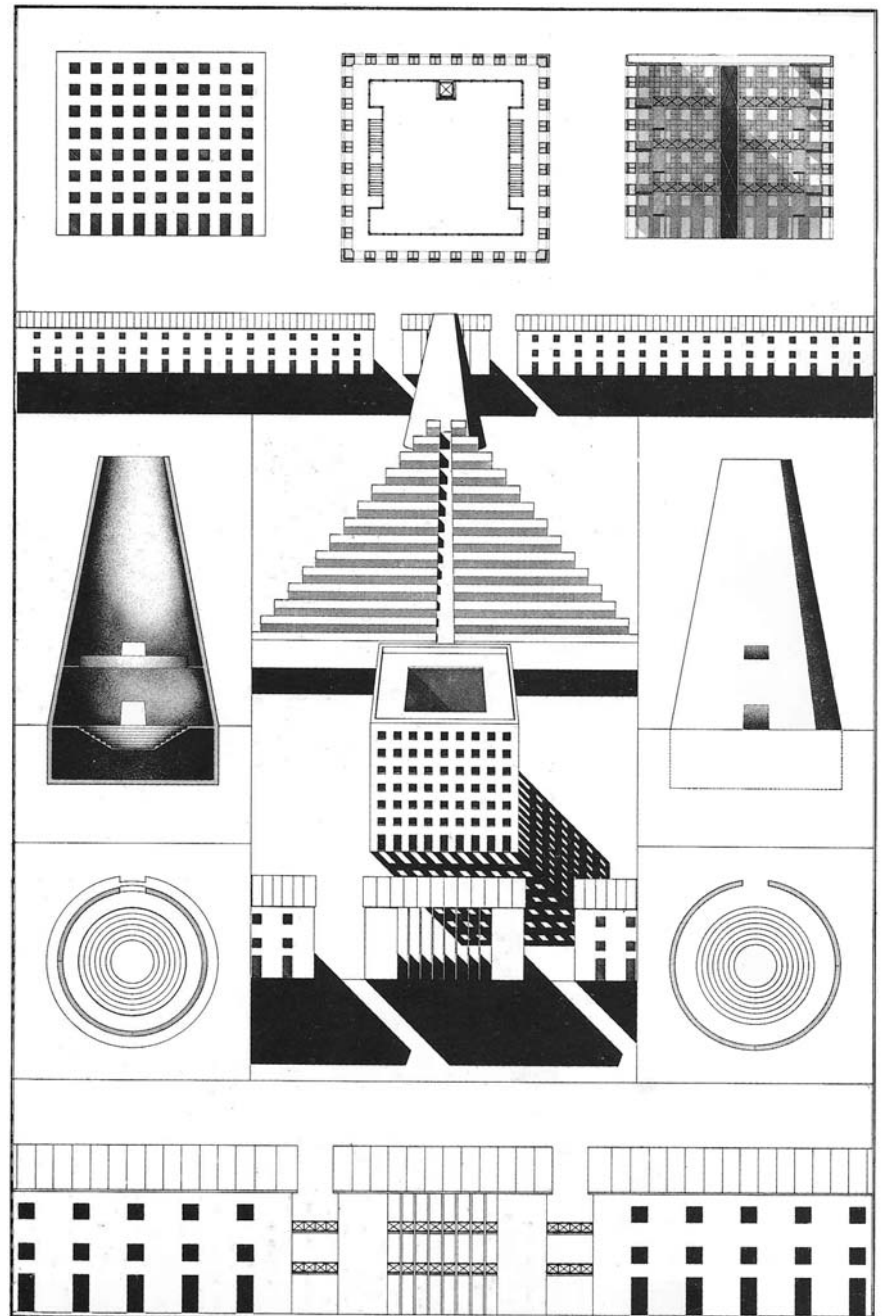


Fig. 66: 3D exploration of the different elements forming one design - another presentation drawing by Aldo Rossi (Allibone, 1987: 16).

MFO Park, Zurich, Switzerland Raderschall Landschaftsarchitekten

Commissioned as a park, it was seen fit to make reference to the industrial past of the area in constructing a steel structure (McLeod, 2008) and covering it with vegetation. A network of cables is tensioned for the vegetation to grow on (McLeod, 2008). With creepers and climbers planted on ground level, a second layer of planters was incorporated higher up in the structure to ensure that the whole structure will be dominated by vegetation. The vegetation is irrigated through a catchment system that conveys water drained from the floor of the park to planter pits, after which it is pumped up to serve not only the vegetation on the ground floor but also that on the higher level (Margolis & Robinson, 2007: 18). With each seasonal cycle the vegetation consumes more of the skeletal structure.

A gathering space with timber benches and a circular pool sits at the one end of the park. The structure contains circulation routes. Some platforms protrude through the envelope, set apart from the circulation routes. These protrusions become featured gathering spaces in the air, suspended from the structure above (Margolis & Robinson, 2007: 18).

Context

Set within an old industrial area, this structural park is part of a redevelopment (Margolis & Robinson, 2007: *ibid.*). It is clear from the images that buildings

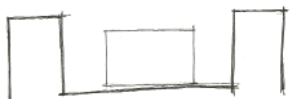


Fig. 67: One of the suspended platforms (Fajardo, 2008: 54).

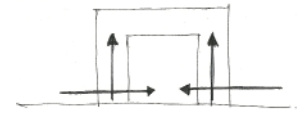


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surround the park structure. Small hedges introduce the user to the park, creating a threshold to the main space inside the park.

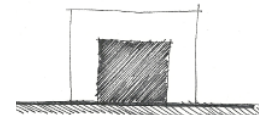
Movement

Horizontally the site is permeable from every direction. Vertical movement is facilitated by three staircases linking various platforms and gathering spaces in the structure (Margolis & Robinson, 2007: *ibid.*).



Light

Light will change as the vegetation changes and fills the structure over the course of time. Some creepers and climbers are deciduous and have a seasonal effect on the colour of the light that fills the space. Large halogen lights hang from the structure and are used in the evenings to create the illusion of an interior space rather than a park. Light, or the absence of daylight, frames the space.

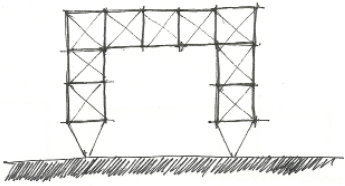


light frames/
absence of light frames

Fig. 68: MFO Park - a steel structure with a cable network for vegetation to envelop the structure (McLeod, 2008).

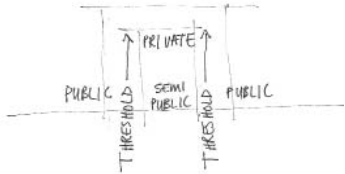


Structure and materials



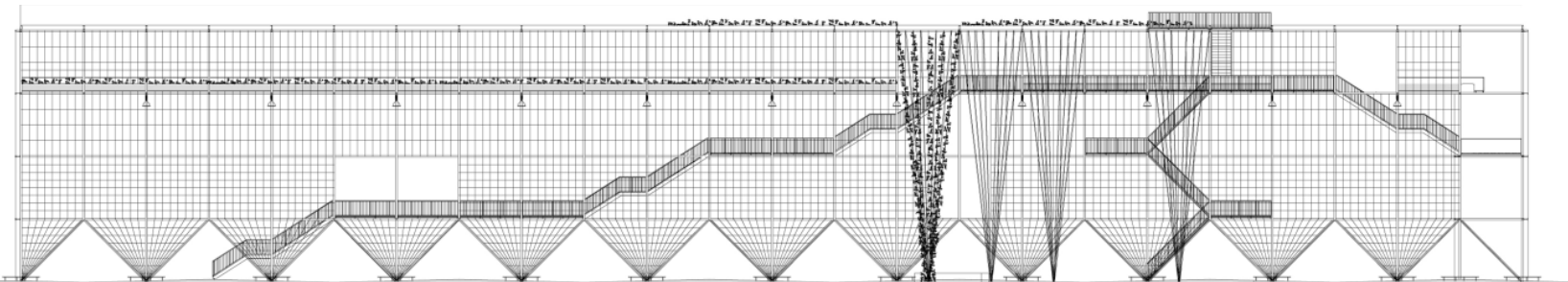
With an industrial past, the obvious choice of material is steel. Like old factory buildings, the structure has deep steel structural trusses spanning the large unobstructed interior space. The timber platforms and walkways allow the structure to be animated with people. The structure is covered with a network of cables (Margolis & Robinson, 2007: 18) for the vegetation to grow along, also animating the structure over time.

Spatial hierarchy



Several thresholds are created in the design. Two systems of hierarchy exist: horizontal and vertical. On the ground floor the user can move freely through the space, with a more intimate space formed at one end of the structure by using a difference in ground covering and adding furniture. Horizontally, users can make use of three vertical forms of circulation, two moving straight up, and the other progressing gently upwards, creating an experience of the space from several levels. Suspended platforms extrude from the structure into the interior of the space. These platforms become even more intimate spaces, removed vertically from the main space and also set apart from the vertical circulation routes.

Fig. 69: Elevation of the trellised structure indicating the various forms of movement in and through the structure (McLeod, 2008).



Conclusion

Very different from the previous precedents, this precedent is investigated as an example of vertical parks of remembrance. The MFO Park employs context and history to generate a three-dimensional exploration of what a park within an urban environment could become. The structure provides opportunities for horizontal and vertical movement, creating a spatial hierarchy not only on the ground but vertically also. The concept of the vegetation enveloping the structure is a valuable way of introducing the notion of the natural world reclaiming some of our urban landscapes. Several small and more intimate gathering spaces are created by breaking the boundary of the structure and not choosing conventional places for gathering to happen: by protruding from the structure and being suspended in the air the spaces are given a uniqueness which sets them apart from the rest.

The idea of a modular structure has relevance for the proposed thesis project in terms of the skills required for its erection. The ease of construction is further assisted as the application of such a structure will occur in a small space where large machinery will not necessarily be able to assist in its erection.

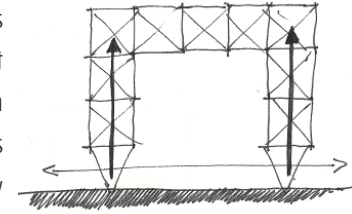


Fig. 70: The interior view of the park, showing the overhead structure that will be vegetated over time to create a green canopy (McLeod, 2008).

Fig. 71: A gathering space protruding through the vegetated wall into the main space (Fajardo, 2008: 52).





6. Design

Harries (1998: 118) refers to Laugier's: *An Essay on Architecture* when writing about the representational power enabling architecture to be more than just building.

This thesis aims not only to represent the cycle of life within the urban environment, but rather to re-present (Harries, 1998: 118) the cycle of life. In doing so, the intention is to show the importance of housing all parts of the cycle of life within our urban environments. By emphasizing the *between* – collective dwelling (between the living, but also between the living and the dead) – the design will challenge perceptions and cultural norms, creating a new culture of *urban life*.

As the place of remembrance will be occupying a *between* space within the urban environment, current cemetery conditions of horizontality cannot be accommodated. For this reason the notion of utilizing vertical urban space is presented as an alternative.

The physical manifestation of man's vertical and horizontal relations can

Fig. 72: (Opposite page) Initial conceptual drawing of a ramped system moving through the vertical place of remembrance (Author, 2010).

be seen and experienced in Romanesque and Gothic architecture (Norberg-Schulz, 1983: 111). Churches were designed in such a way as to represent the relationship between man and divinity. Churches became a vertical representation of man's relationship with the spiritual. The towns surrounding these churches represented a physical manifestation of man's horizontal relationship with his environment (Norberg-Schulz, 1983: 111). It is also this vertical and horizontal relationship – between being (mortal) and being (immortal); and being (mortal) and being (mortal) – which will be re-presented in the design.

By appropriating the *between* the design becomes a memorial to the lives of those who have passed. It is not the intention of the design to become a monument to the dead, as can be seen throughout history, but rather to create an anti-monumental memorial that celebrates life.

The diagrams below, shows how the theory; concept; program; user and context has influenced the design.

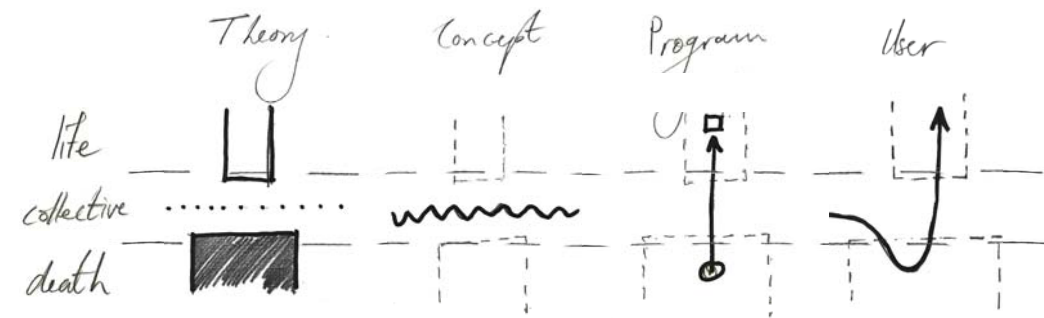


Fig. 73: The theory established the importance of the whole cycle of life and identifies the condition between life and death (Author, 2011).

Fig. 74: The concept focuses on the between: collective dwelling between the living and the dead (Author, 2011).

Fig. 75: The program is the process that makes the connection between the living and the dead possible (Author, 2011).

Fig. 76: The main user is the mourner: suddenly confronted by death. During the process of finding finality the mourner comes to the realization that life carries on and also need to carry on living (Author, 2011).

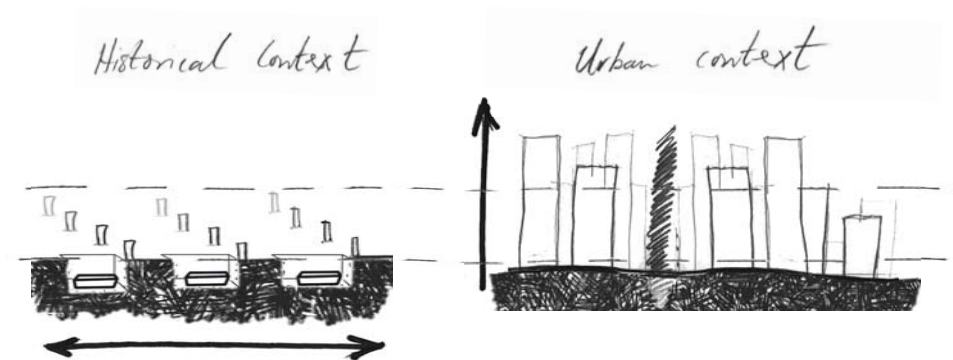


Fig. 77: The historical (and current) cemetery context is one which is spread out horizontally over a large area (Author, 2011).

Fig. 78: The urban context calls for an intervention which reacts vertically. Not much horizontal space is available (Author, 2011).

Concept

All the illustrations on this page show the basis on which the project has been built and have all been part of the design concept from the outset.

- Appropriating the *between*;
- *Celebrating life*, by exposing death;
- *Collective dwelling*: between the living and the dead;

Fig. 79: The initial idea of appropriating the "between" found within the urban environment (Author, 2010).

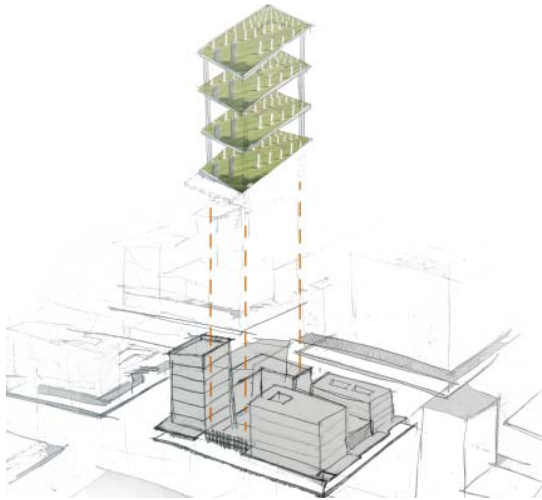


Fig. 80: Indicating the vertical movement within the structure, representing the process of reaching finality and moving on with life (Author, 2010).

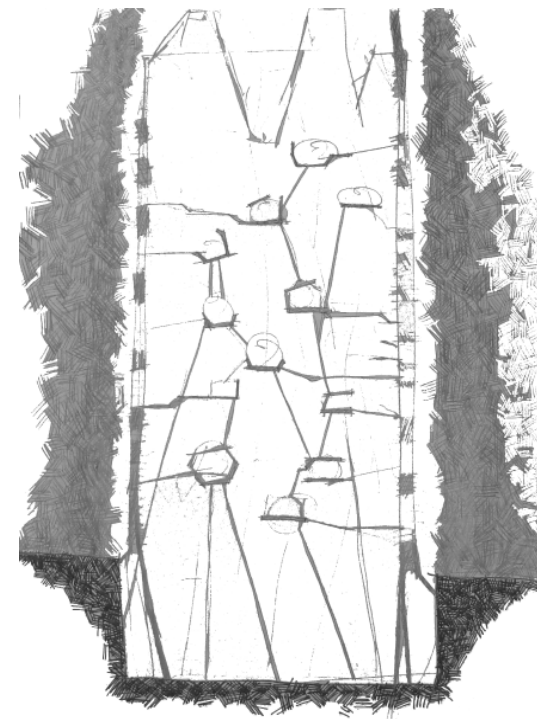
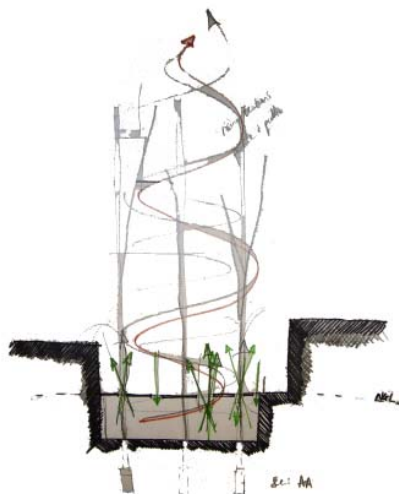


Fig. 81: The idea is to create private pockets within the structure where people can commune with the dead. This will also help also to create individual rituals as people continually revisit loved ones (Author, 2010).

Fig. 82: (Next page) A concept image illustrating the appropriation of the between, and initial arrangement of the functions (Author, 2010).

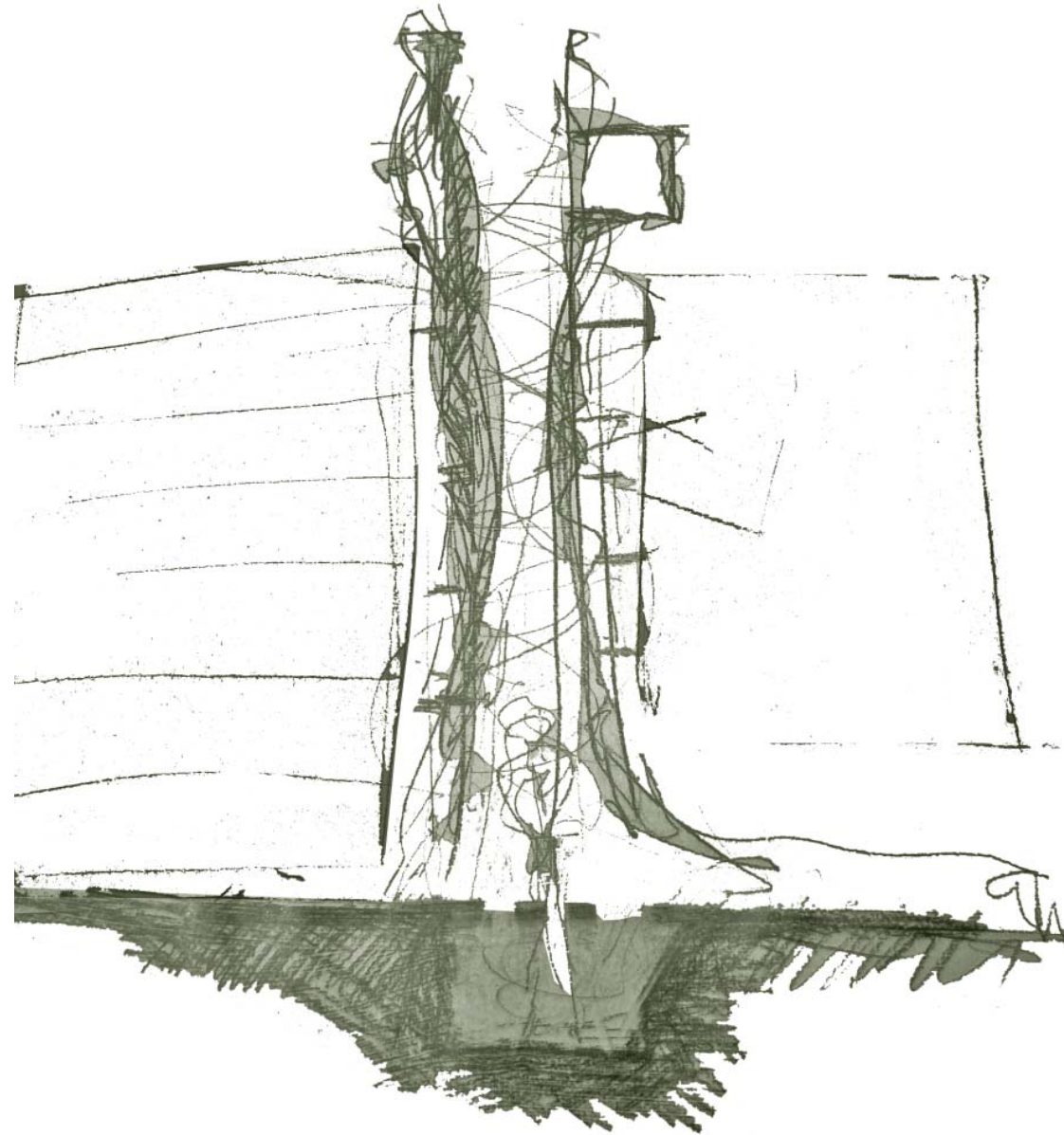
Emotive Exploration

The concept is set in the *between*. The space is filled with a vertical necropolis. The structure is set within the urban, reaching out over the existing built form, sensitively revealing its presence to the city. Only a small passage links the memorial structure to the urban life outside. The mourner enters through a small passage with only a glimpse of the greenery within the *between*. On entering the space, the mourner experiences the greenery from a distance. Through a processional way the mourner is directed underground: only momentarily. Once in the memorial hall, the mourner is confronted for the first time with the scale of the memorial structure above. Light fills the void in the middle of the structure. Glimpses of the structure are visible to the mourner through gaps in the floor above. The mourner is ushered through the space, ever aware of his own mortality. Placing the remains in the voided structure the mourner is greeted by the soft light beyond:

eternity.

Where the mourner would like to be.
If only for a moment...

The mourner, draped in light, moves up in the structure to a collective space above the city. Here the mourner can commune with the living and find healing and comfort in those that surround him still.



3D Development

The images below show the 3D development of the design. Some of the images illustrate ideas how the street facade is addressed, interaction between the intervention and the surrounding buildings, and the vertical extension of the design.



Fig. 85: Developed further the intervention permeates the "between" that is normally unused (Author, 2010).



Fig. 83: The model shows a walkway and ramped system that fills the "between" (Author, 2010).

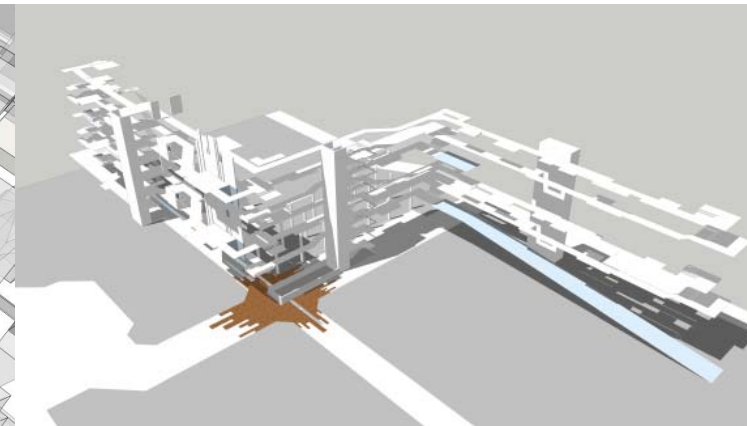


Fig. 86: An identical model of the intervention above, without the context. The image shows the idea of employing walkways with several spaces on either side of the walkway. No structure is shown (Author, 2010).



Fig. 84: A conceptual representation of the different ramps within the "between" (Author, 2010).

Fig. 87: The intervention not only fills the "between" found within the block, but the intervention also fills the gap in the street facade (Author, 2010).

Fig. 88: One of the first 3D models which has structure. The structure made the design read as a solid entity which is not the intention (Author, 2010).

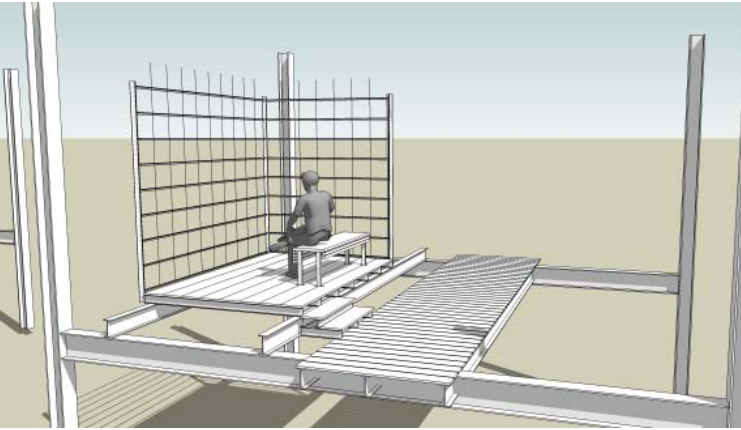
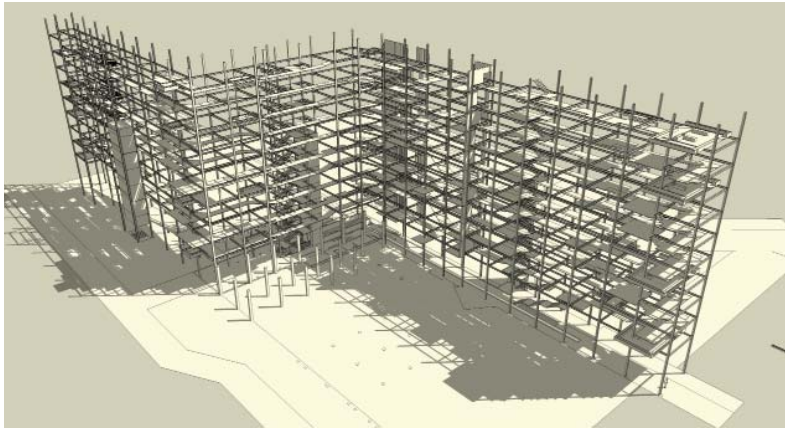


Fig. 91: A structural exploration of the walkways and the burial spaces. Some separation between the mourner and the passers-by drove this particular design (Author, 2010).

Fig. 89: Structural members have been re-sized and removed to aid the design of a permeable structure, allowing natural ventilation and light to penetrate the space (Author, 2010).

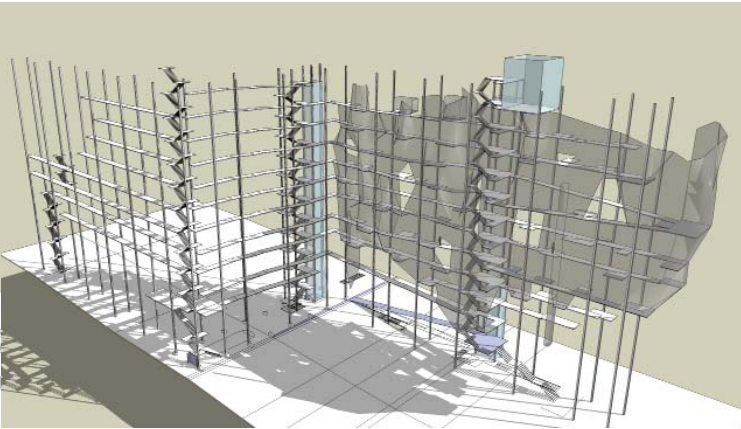


Fig. 92: The essential structure with steel H-columns carrying the ramped system from where many burial spaces will be designed. A mesh system was proposed to cover the structure. The intention was for the vegetation to use the mesh and create a green vertical structure (Author, 2010).

Fig. 90: 3D developed model, set within the context. The model explores an initial idea of vertical extension over the existing (Author, 2010).

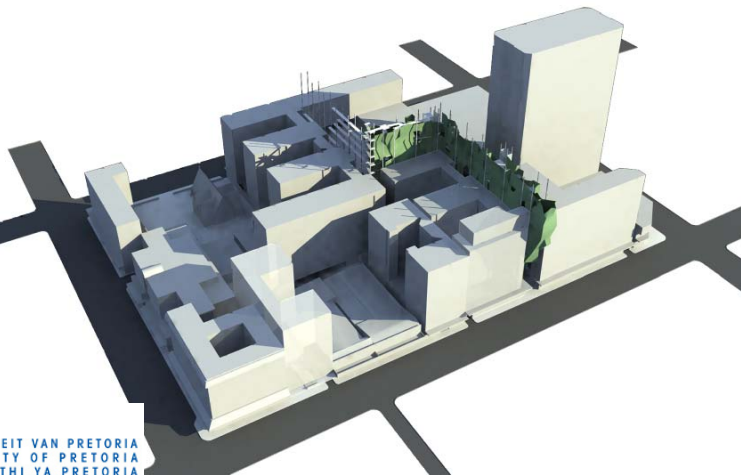


Fig. 93: A representation of the park of remembrance as it will sit in the "inbetween" of the site (Author, 2011).

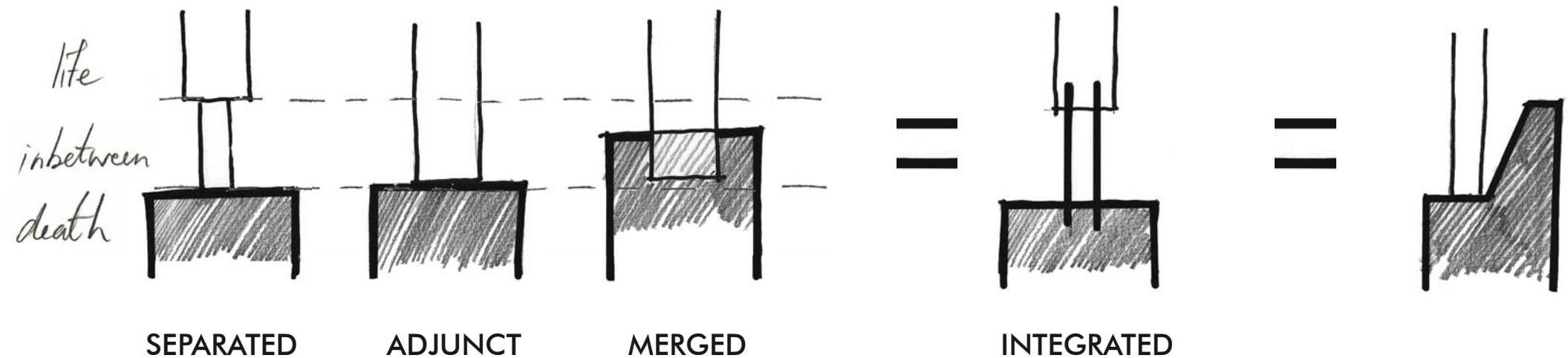
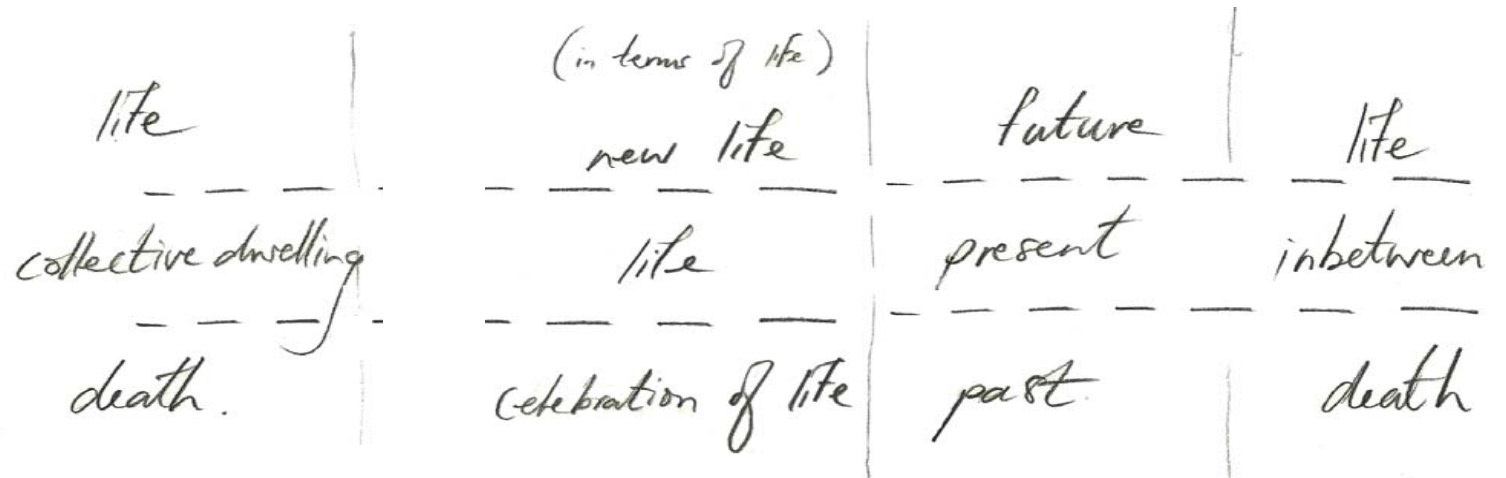


Fig. 94: Mass model of the CBD of Pretoria as it is at present with the introduction of a new place of remembrance within the city (Author, 2010).



Parti

Fig. 96: The diagrams show the development of the parti diagram (Author, 2011).



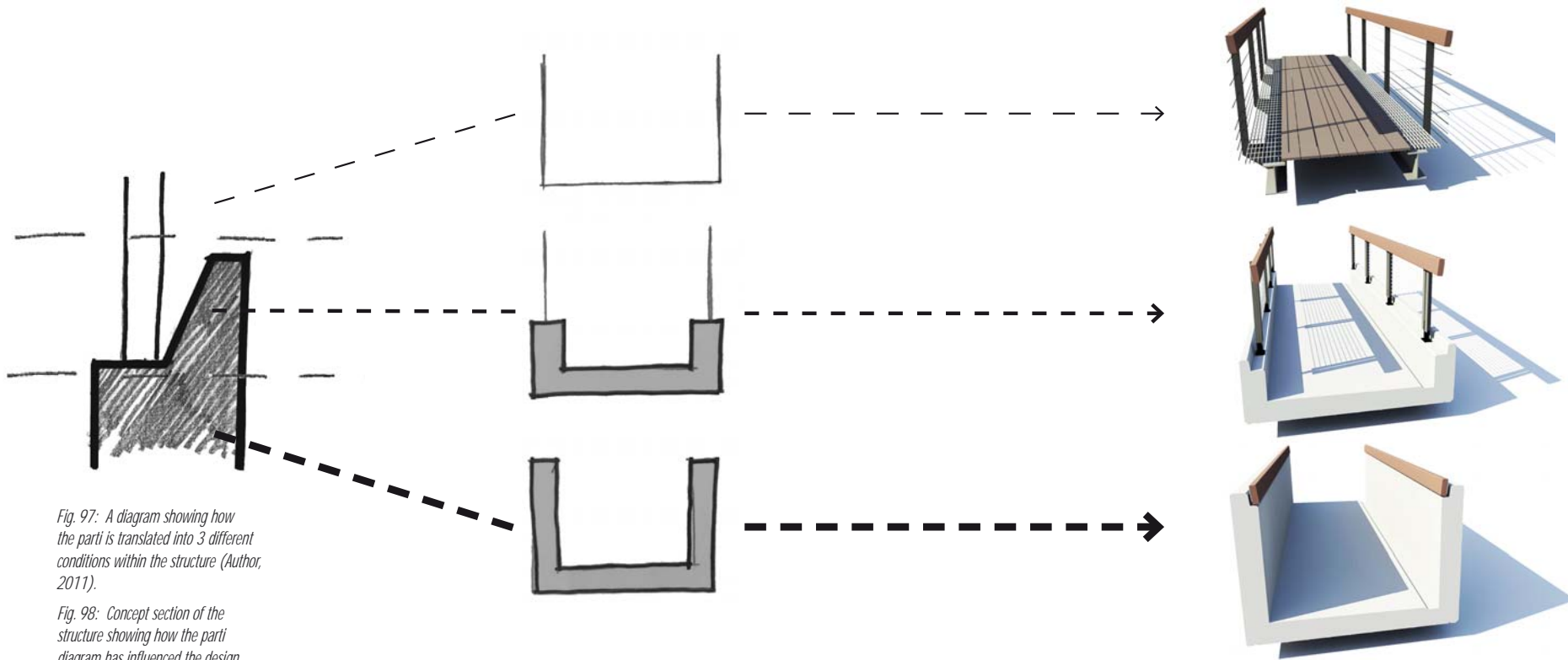
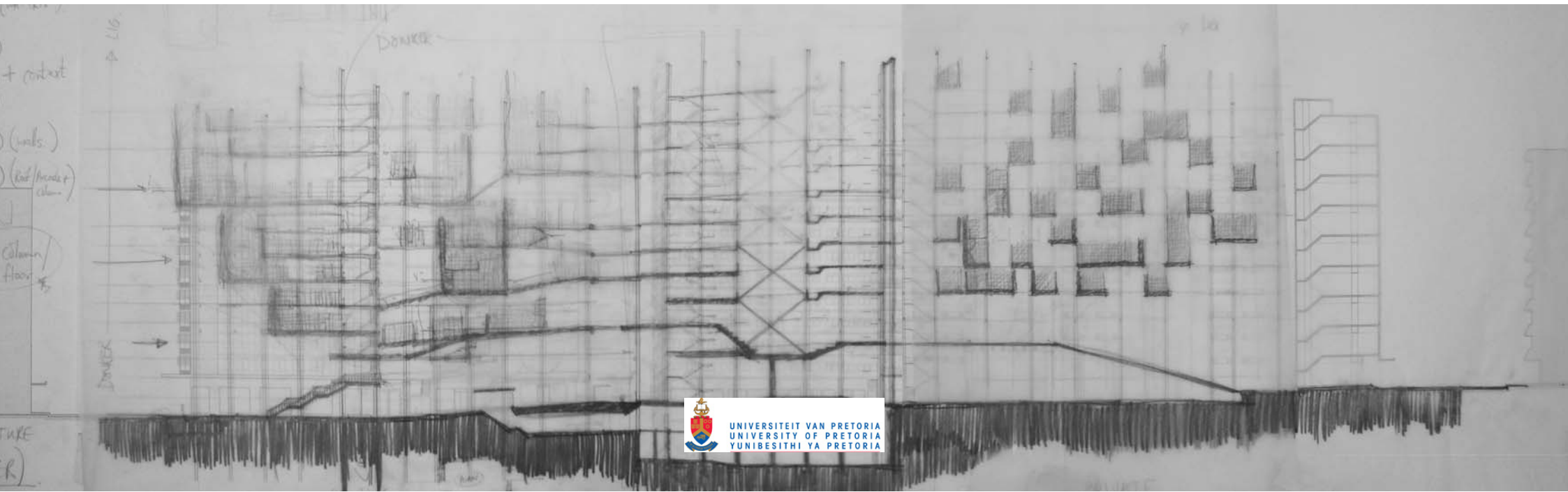


Fig. 97: A diagram showing how the parti is translated into 3 different conditions within the structure (Author, 2011).

Fig. 98: Concept section of the structure showing how the parti diagram has influenced the design (Author, 2011).



Existing site plan

The plan shows the existing site conditions.

The orange hatched area is the *condition of inbetween* that exist on the site.

The red dashed lines indicates the arcade running through the block on ground floor.

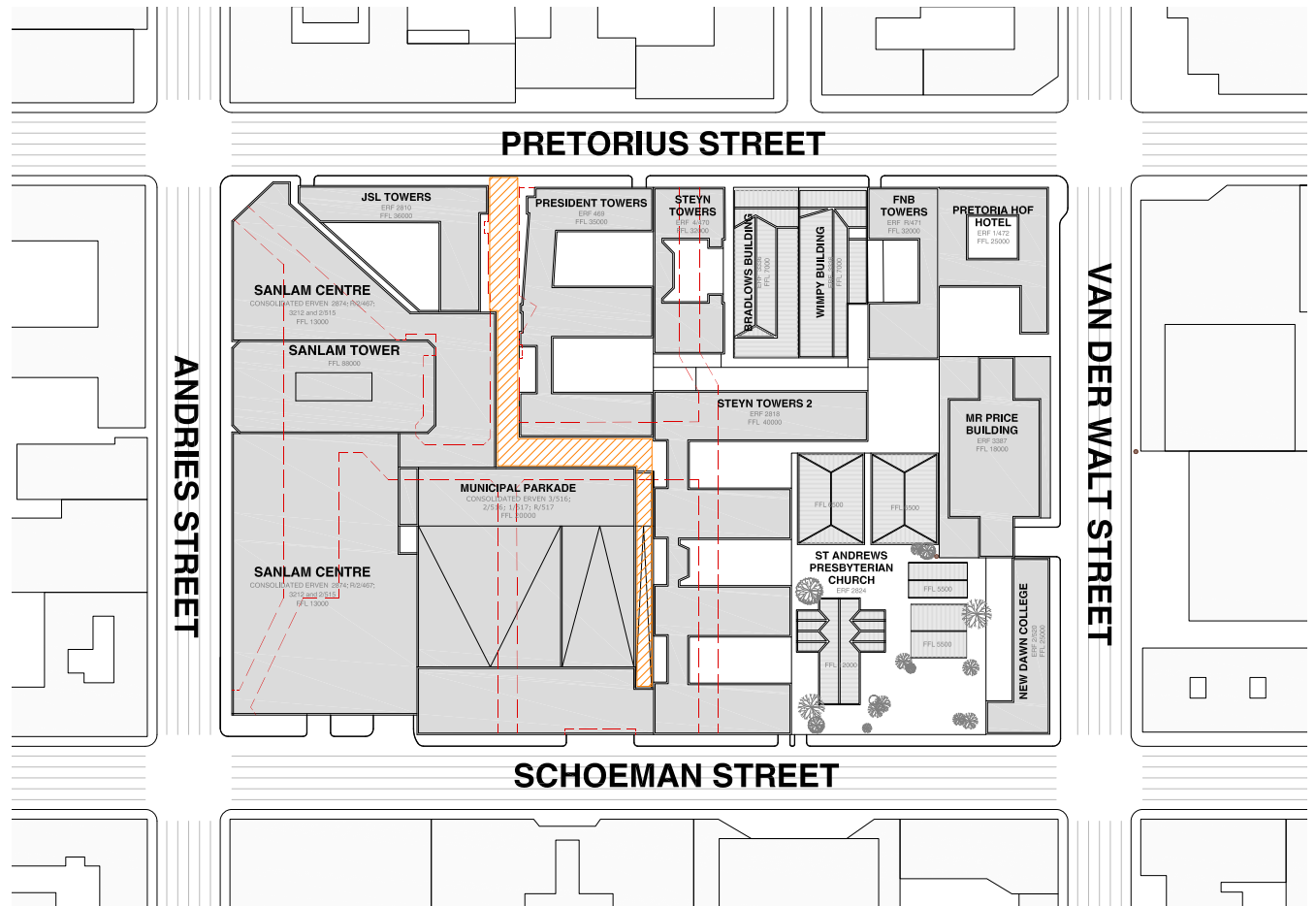


Fig. 99: The existing site plan, showing "inbetween space" with the potential to be occupied (Author, 2010).

Site development

The site plan is overlaid with a hierarchy diagram to show intensity, representing public to private. The site plan is also overlaid with points of circulation within the structure, to create access to all parts of the vertical place of remembrance.

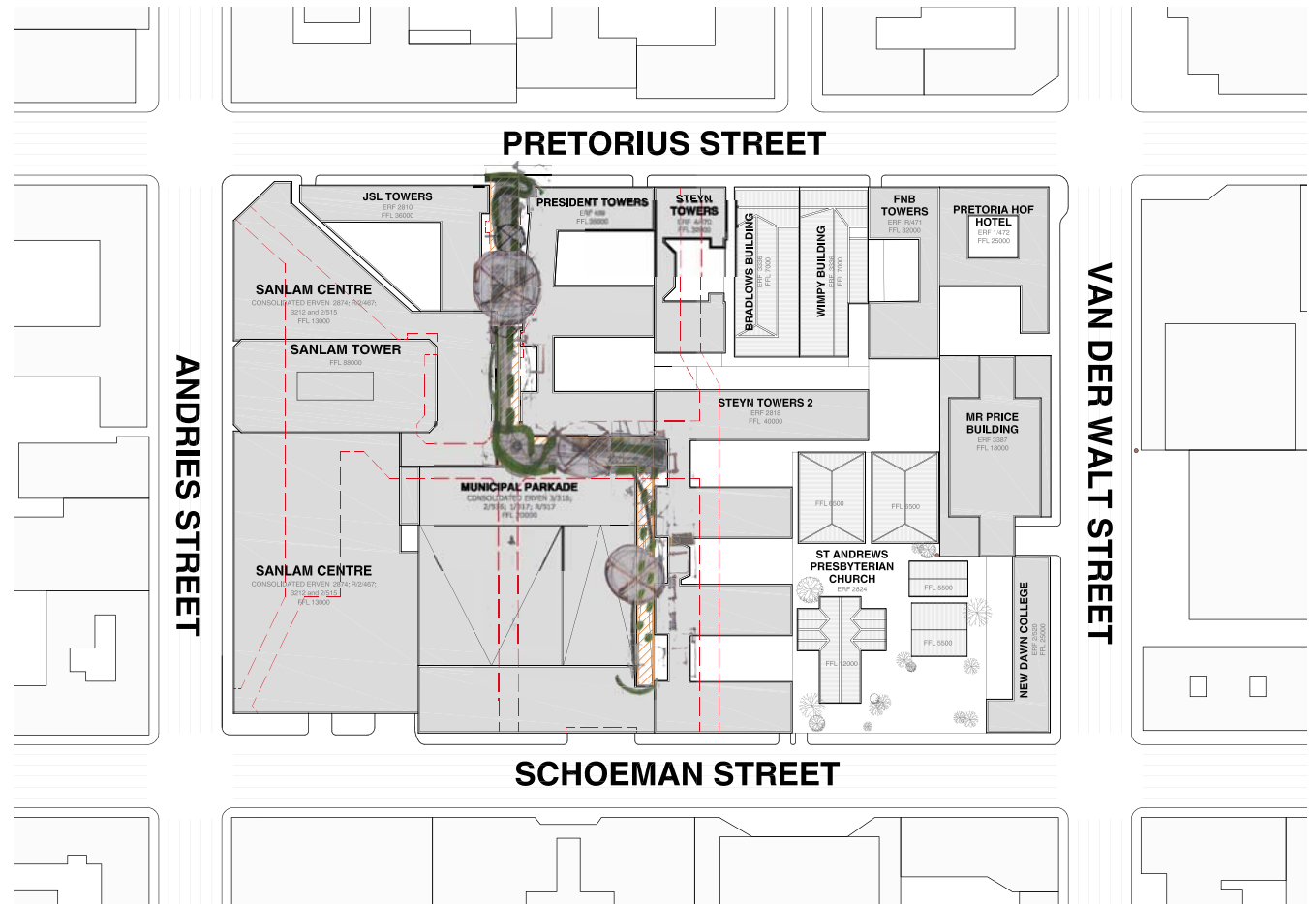


Fig. 100: Existing site plan, with diagrams overlaid (Author, 2010).

New proposed site plan

Taking into consideration the development of the site plan the proposed new site plan occupies the *between* and consolidates the respective ideas for the site.

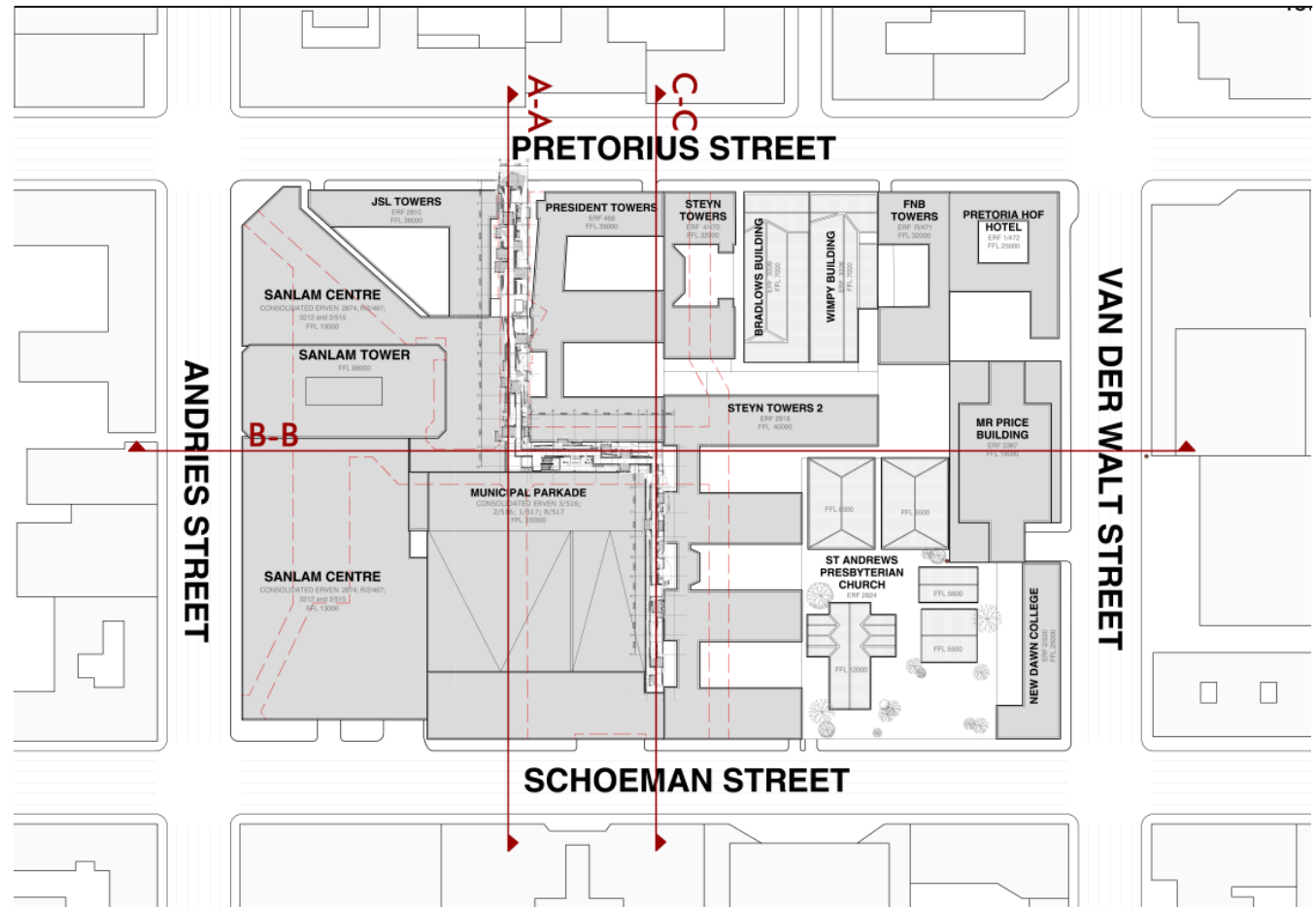


Fig. 101: New site plan with the place of remembrance in the "between" (Author, 2011).

Ground floor plan

On ground floor, there are various point of contact between the place of remembrance and the arcade. There is also various entrances to the memorial space below ground floor within the arcade.

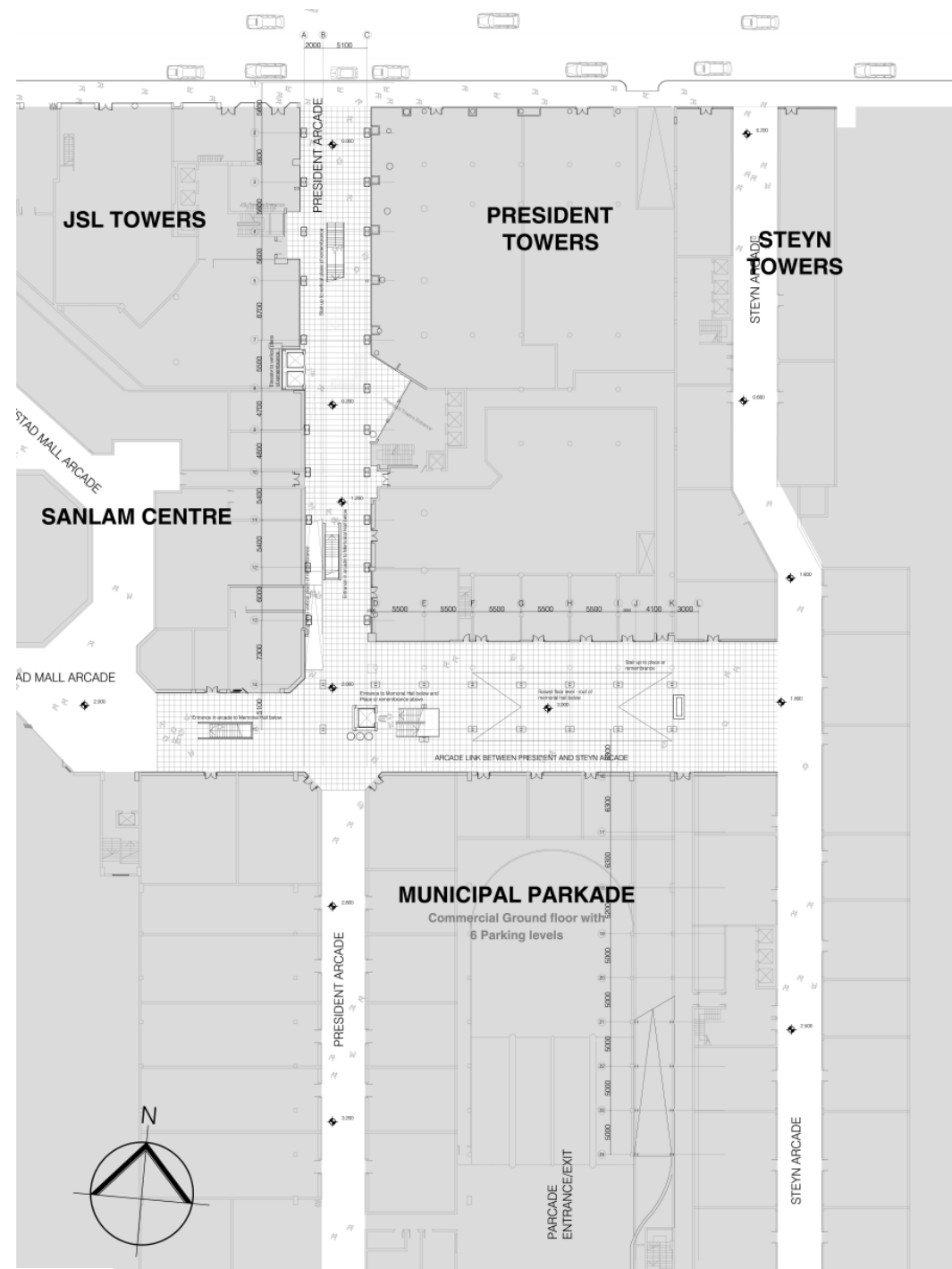


Fig. 102: The ground floor plan showing the arcade and the connections between the memorial space below and the place of remembrance above (Author, 2011).

Memorial space

The memorial space consists of two main spaces – the condolence hall and the memorial hall where the memorial service is held. The condolence hall is a space to enhance the collective, a shared space to share the grief. A combination of a ramp and stairs from the condolence hall enhances the transition to the memorial hall. The function of the memorial hall is to enhance the relationship the mourner had with the deceased. Once the memorial service has been concluded, the mourner ascends to the *between* above. The roof of the memorial space penetrates the floor of the arcade above, and gives evidence of the loss of life – re-presenting the cycle of life in the realm of the living.

Fig. 103: Section A-A shows the arcade and the entrance in President Arcade, to the memorial space below (Author, 2011).

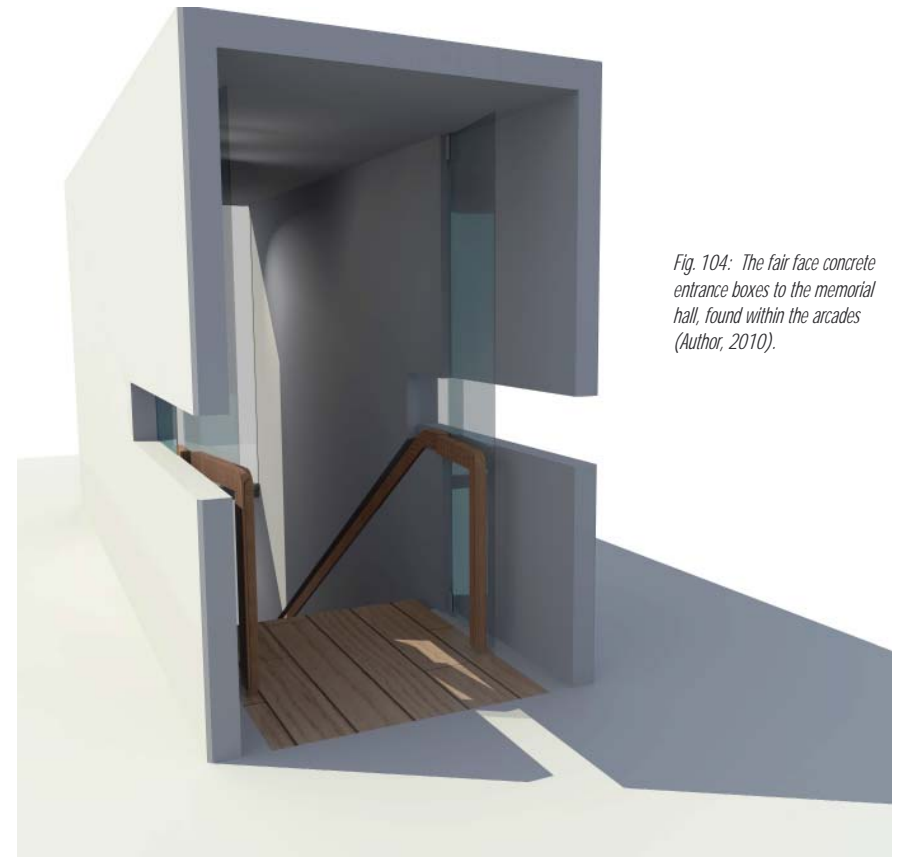
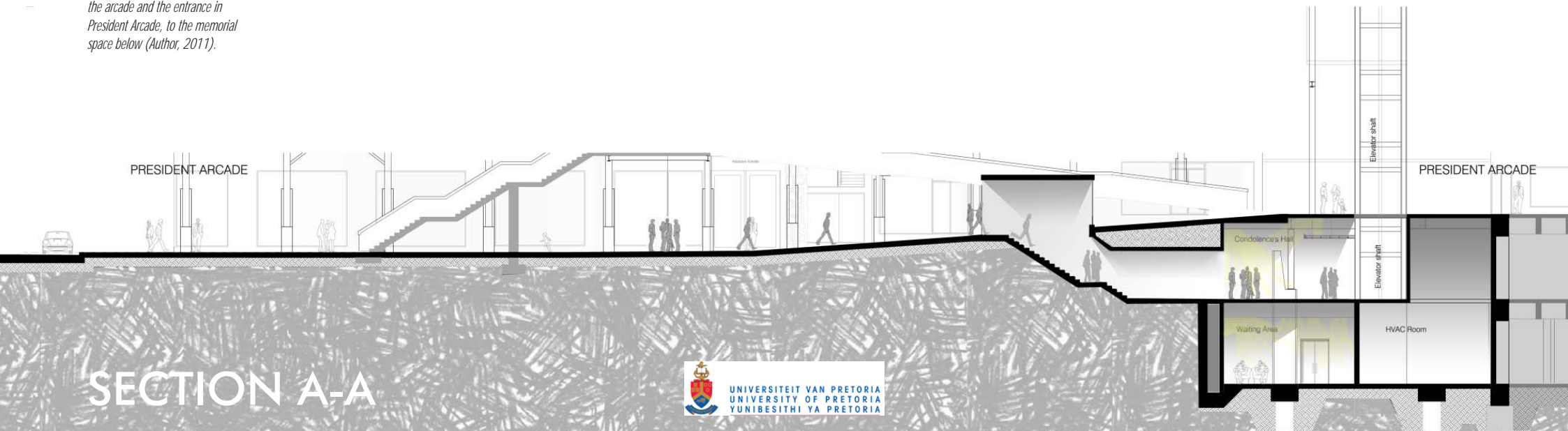


Fig. 104: The fair face concrete entrance boxes to the memorial hall, found within the arcades (Author, 2010).



SECTION A-A

Fig. 105: Section B-B shows the arcade level above and the memorial space below. One can see how evidence is given in the arcade, of a space below, through the raised floor level (Author, 2011).

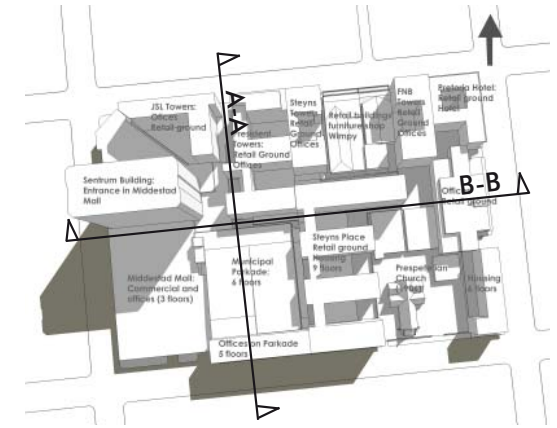
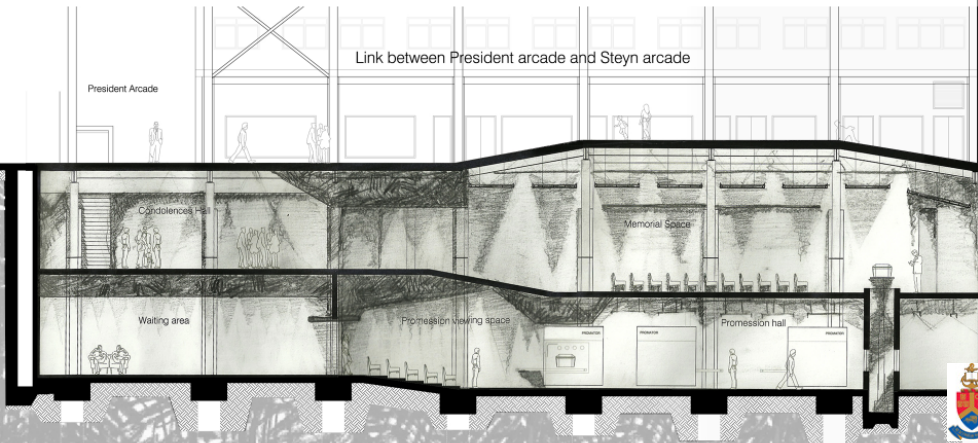
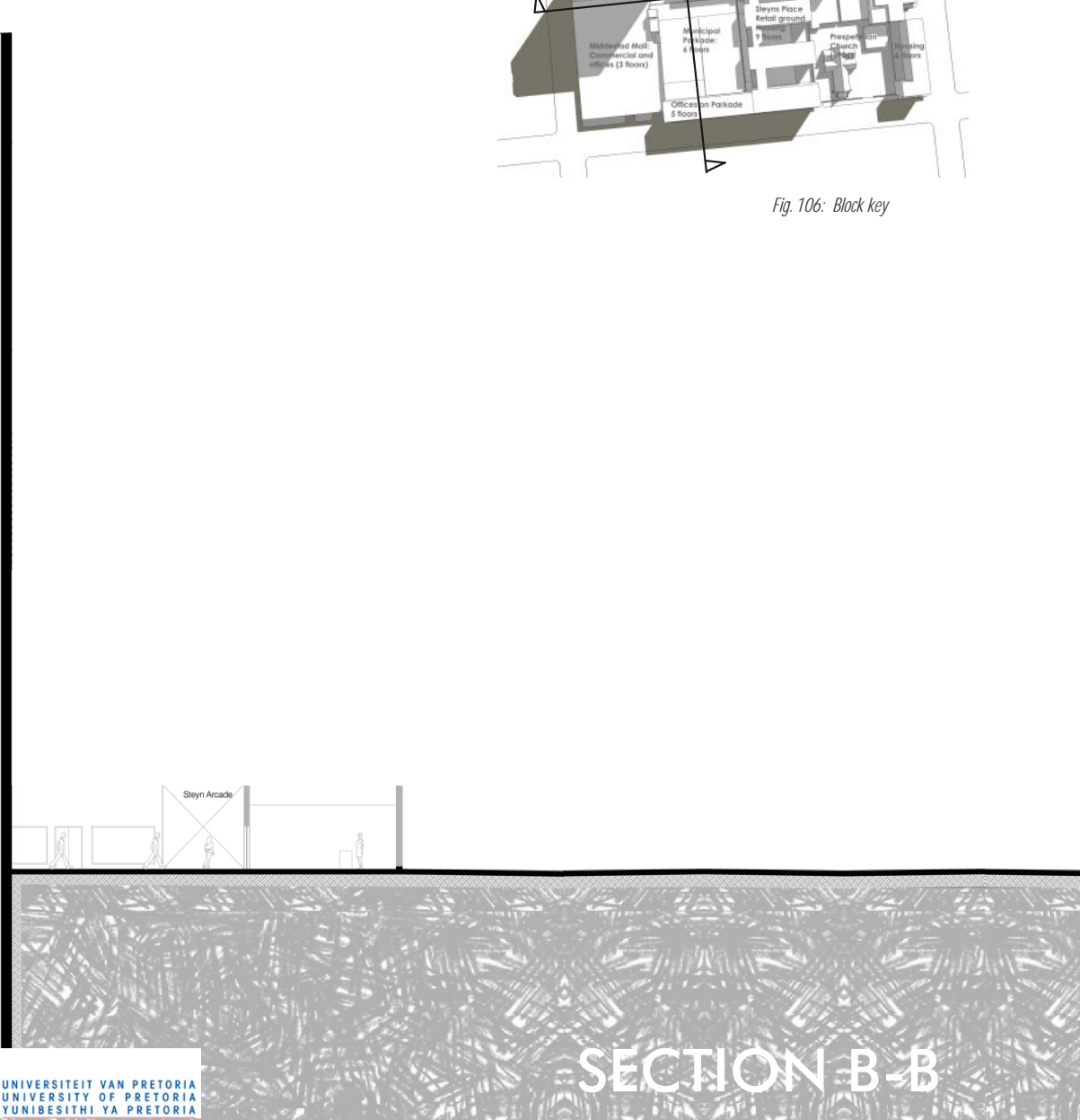


Fig. 106: Block key



SECTION B-B

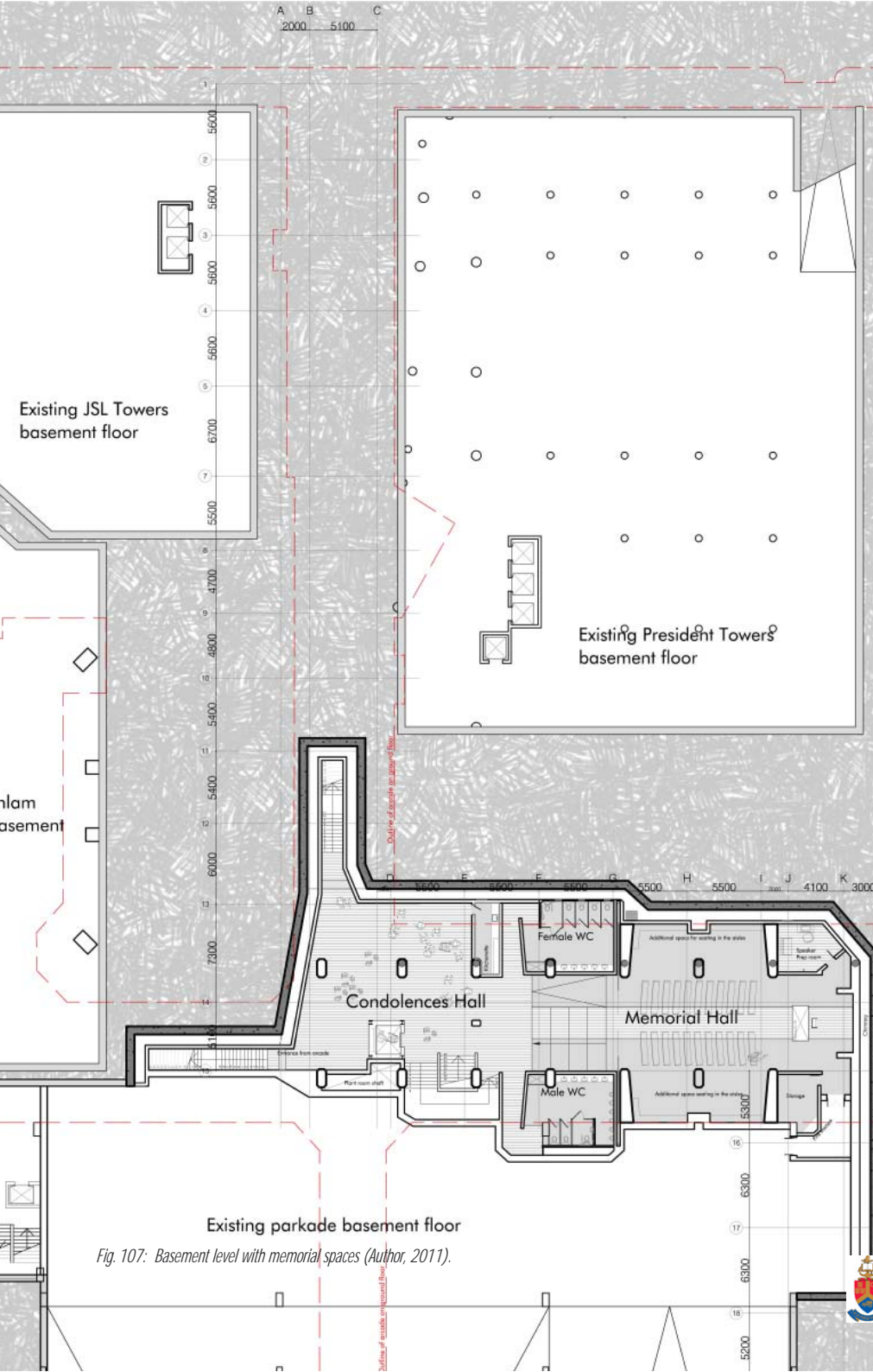


Fig. 107: Basement level with memorial spaces (Author, 2011).

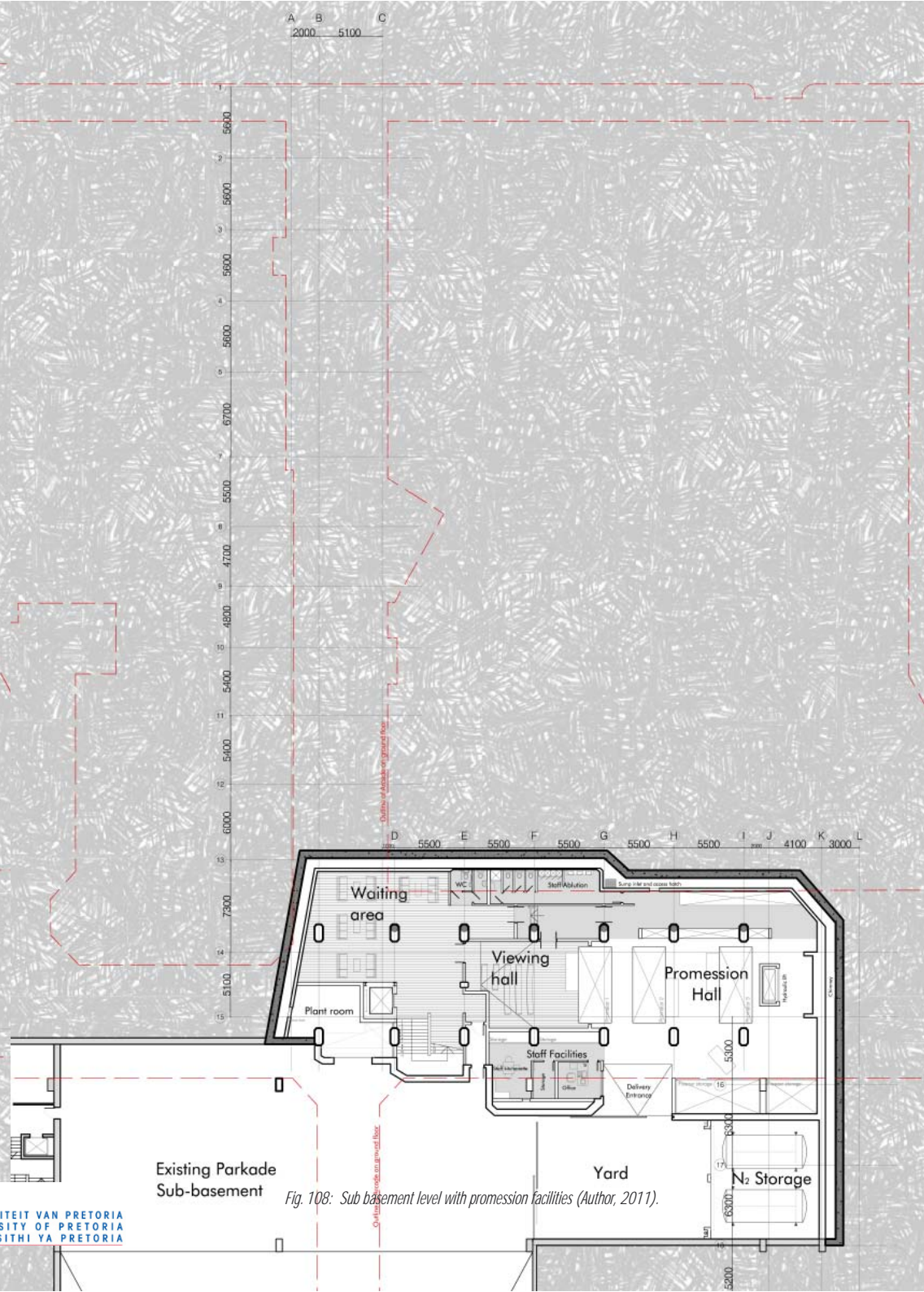


Fig. 108: Sub basement level with promession facilities (Author, 2011).

Vertical place of remembrance:

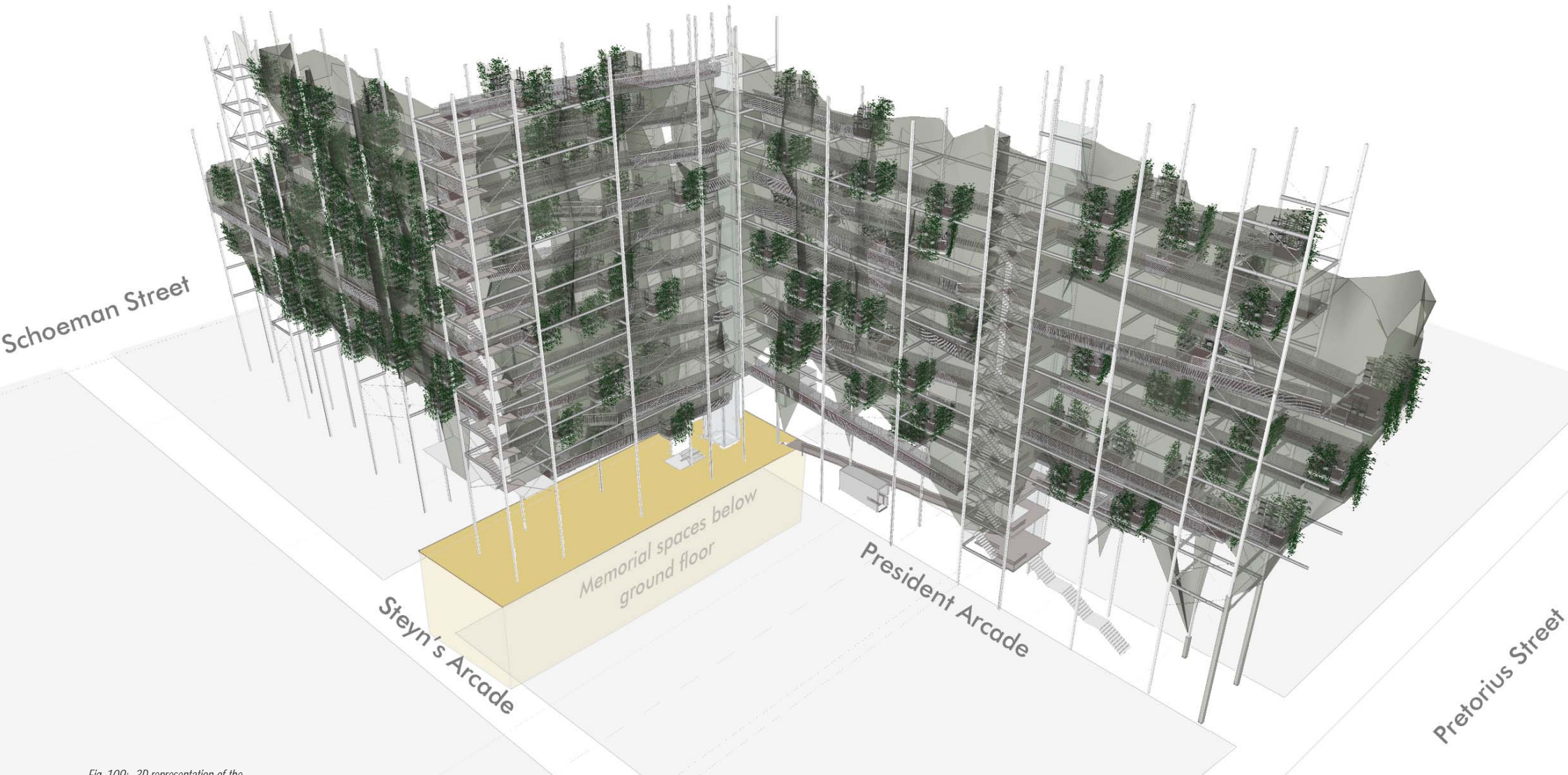
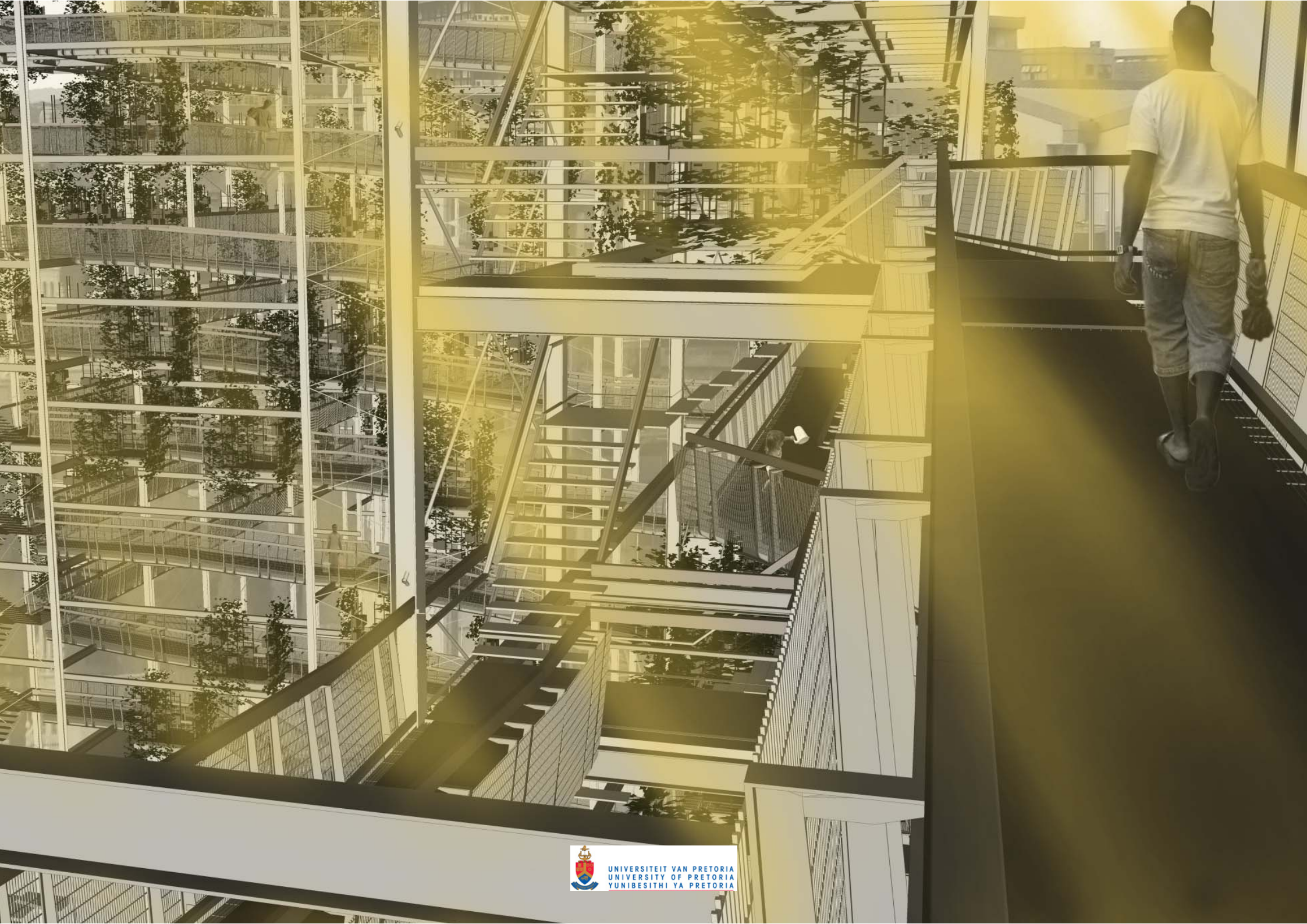


Fig. 109: 3D representation of the Vertical place of Remembrance (Author, 2011).

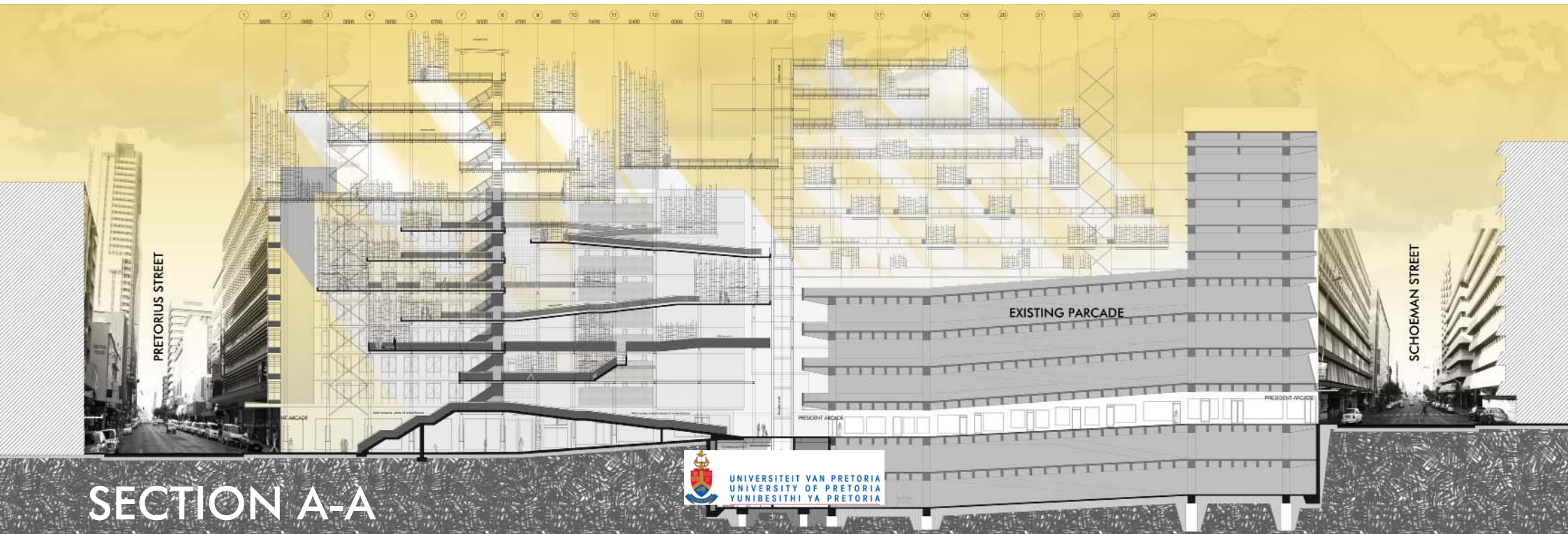


The structure will house the remains of the deceased. Re-presenting the *between*, the function of the structure is to become the common ground between the realm of the living and the realm of the dead – communing in the structure. The common ground established is also where the mourners [the living] will commit the deceased to the realm of the dead in a ceremonial way, placing the remains into the structure. As the mourners leave the structure they once again form part of the collective, from which they were temporarily removed. The structure represents that which lies between “here and there”.



Fig. 111: The vertical place of remembrance fills the void in the urban facade (Author, 2010).

Fig. 112: Section A-A - shows the public part of the place of remembrance, with easy access from the street (Author, 2011).



SECTION A-A

Within section B-B one can see the progression from one condition to the next. An additional gathering space within the structure above is designed, for either formal or informal gathering. From this space in the structure one can either move to the more public burial spaces or to the smaller, private burial spaces.

Fig. 113: Section B-B with the memorial spaces underneath the arcade and the place of remembrance above. The progression from one condition within the structure is most evident on this section (Author, 2011).

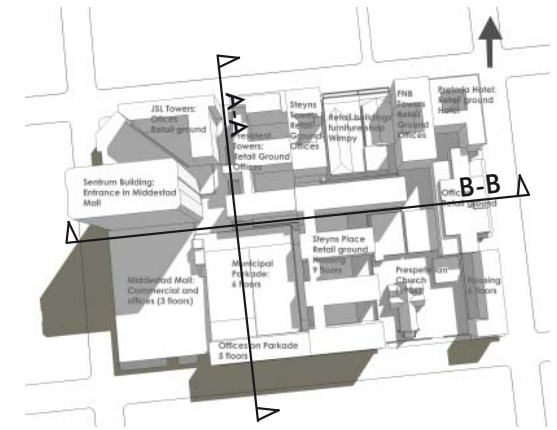


Fig. 114: Key plan

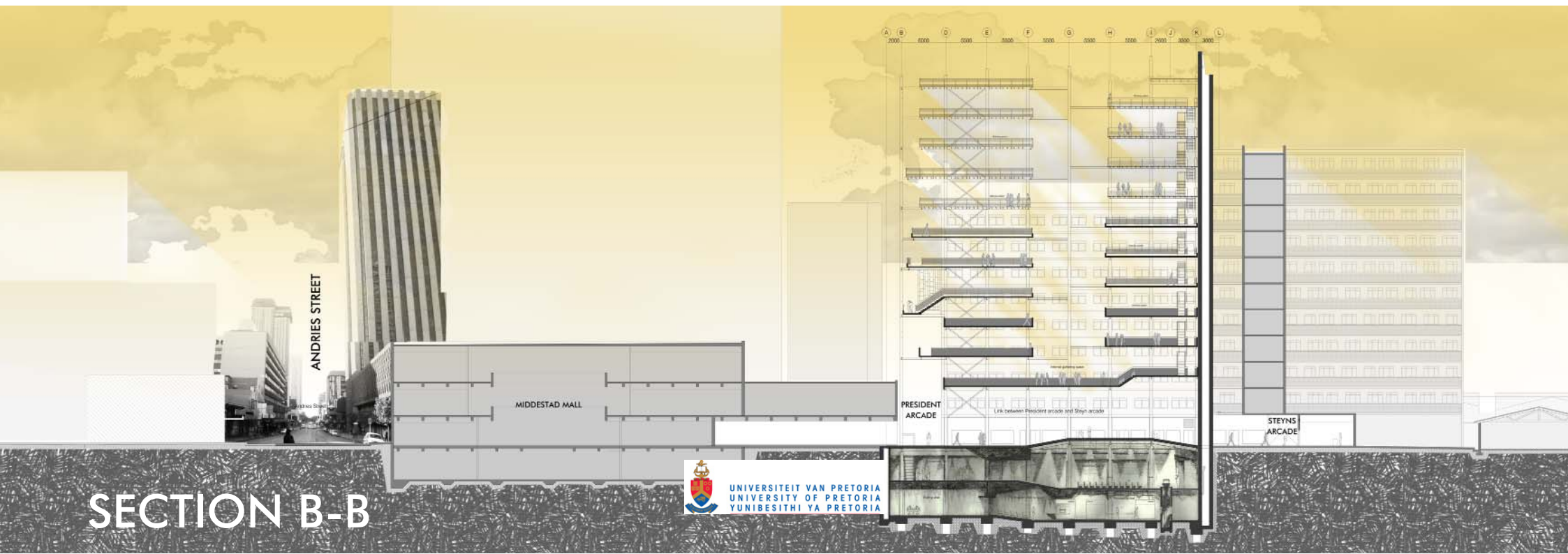
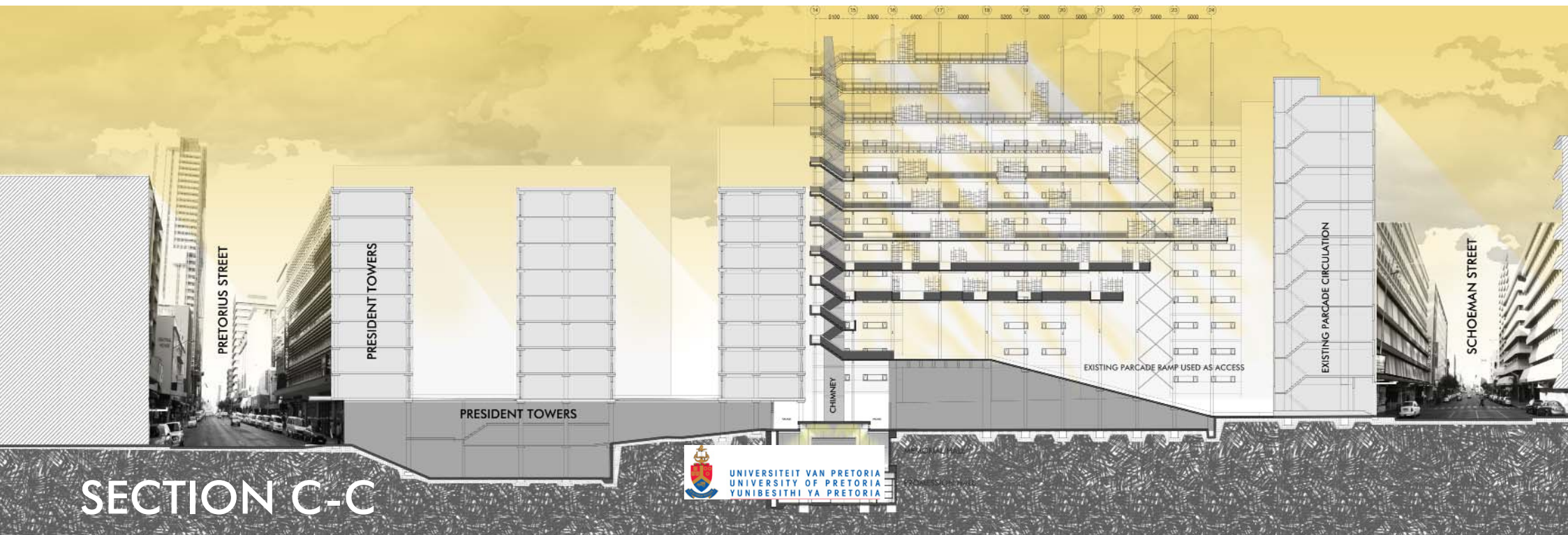




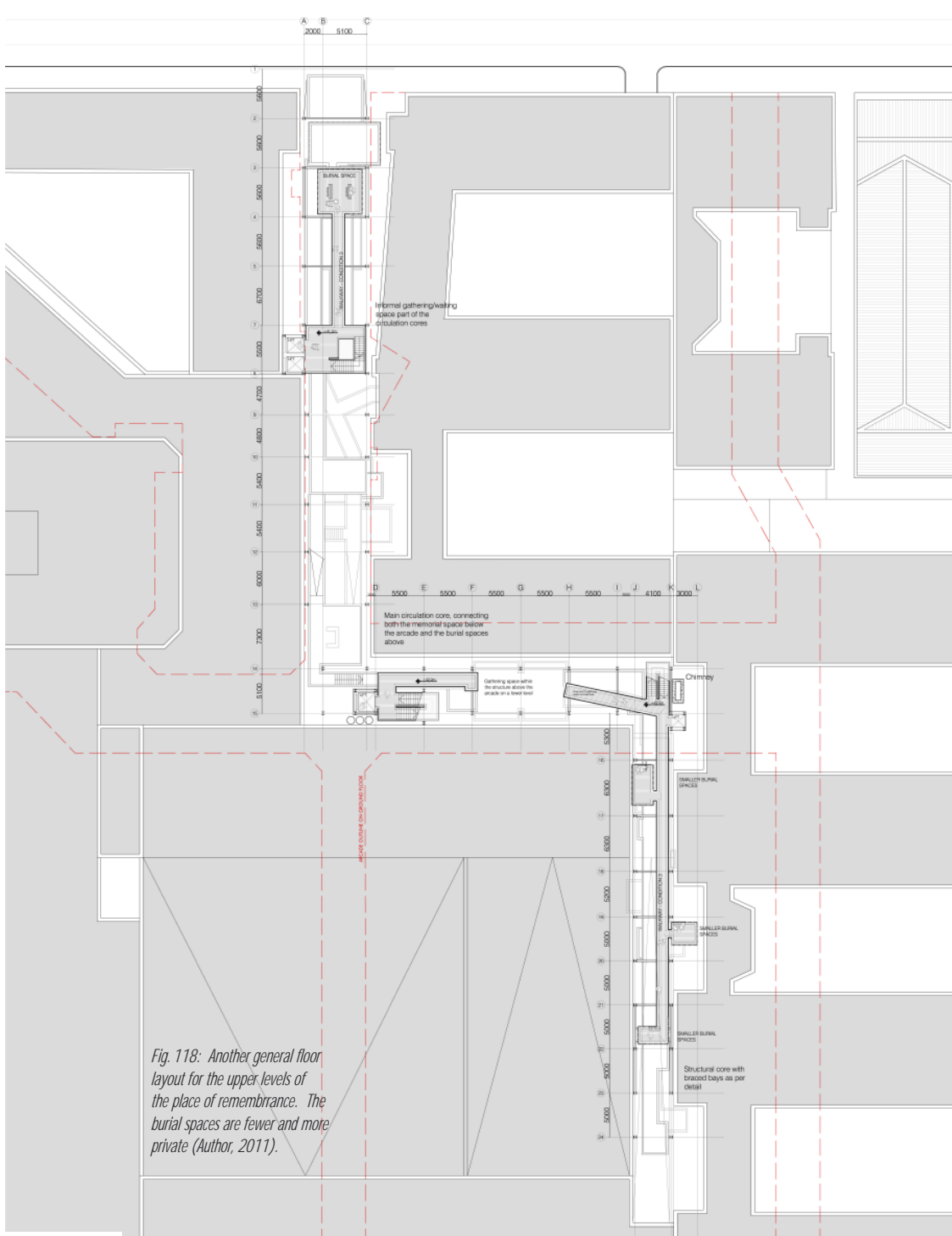
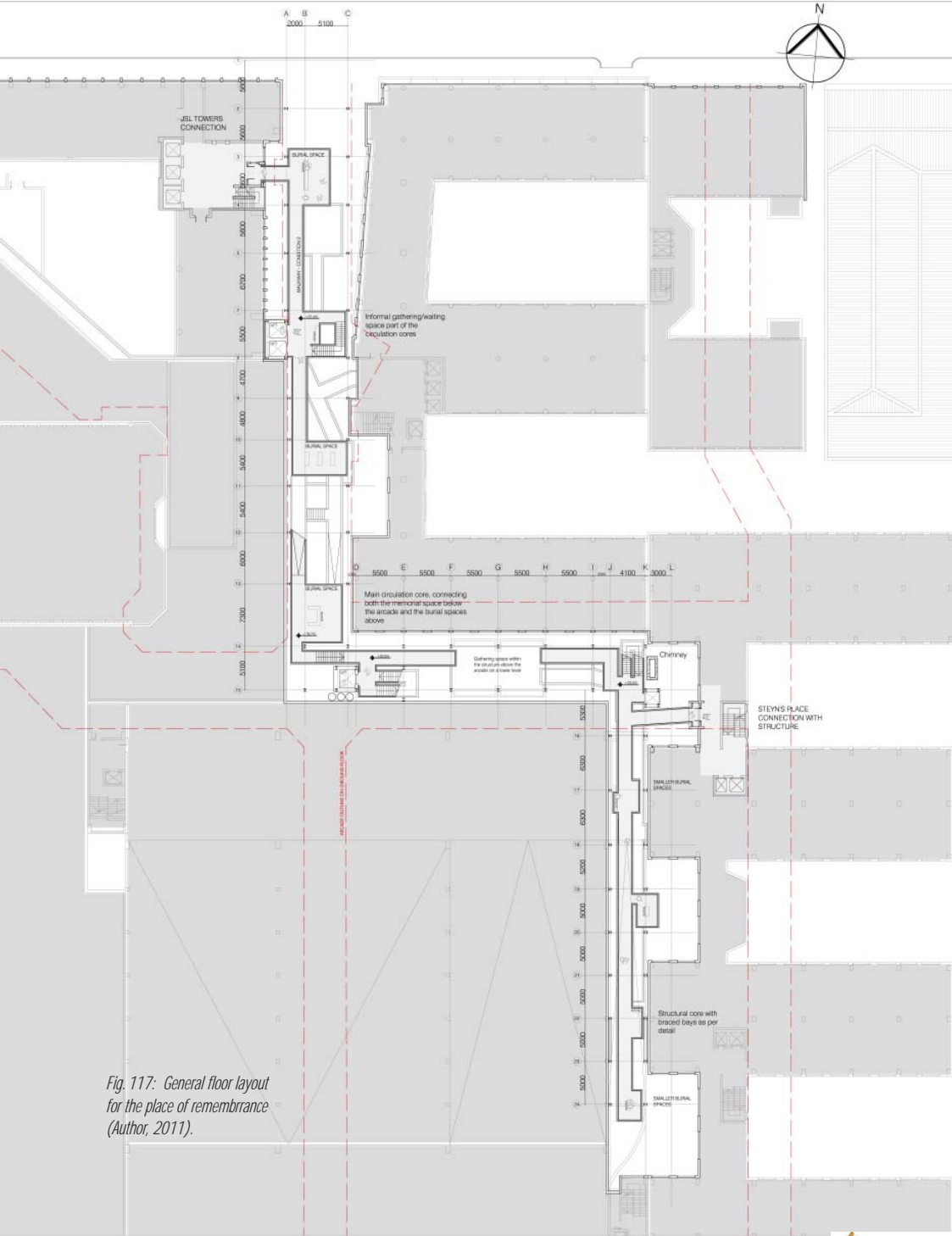
Fig. 116: Key plan

In section C-C the burial spaces are smaller. This part of the structure is a private section in the structure. Within the structure as a whole one can not only read the three conditions as one progress vertically, but also as one progress through the structure horizontally.

Fig. 115: Section C-C (Author, 2011).



SECTION C-C



PRETORIUS STREET

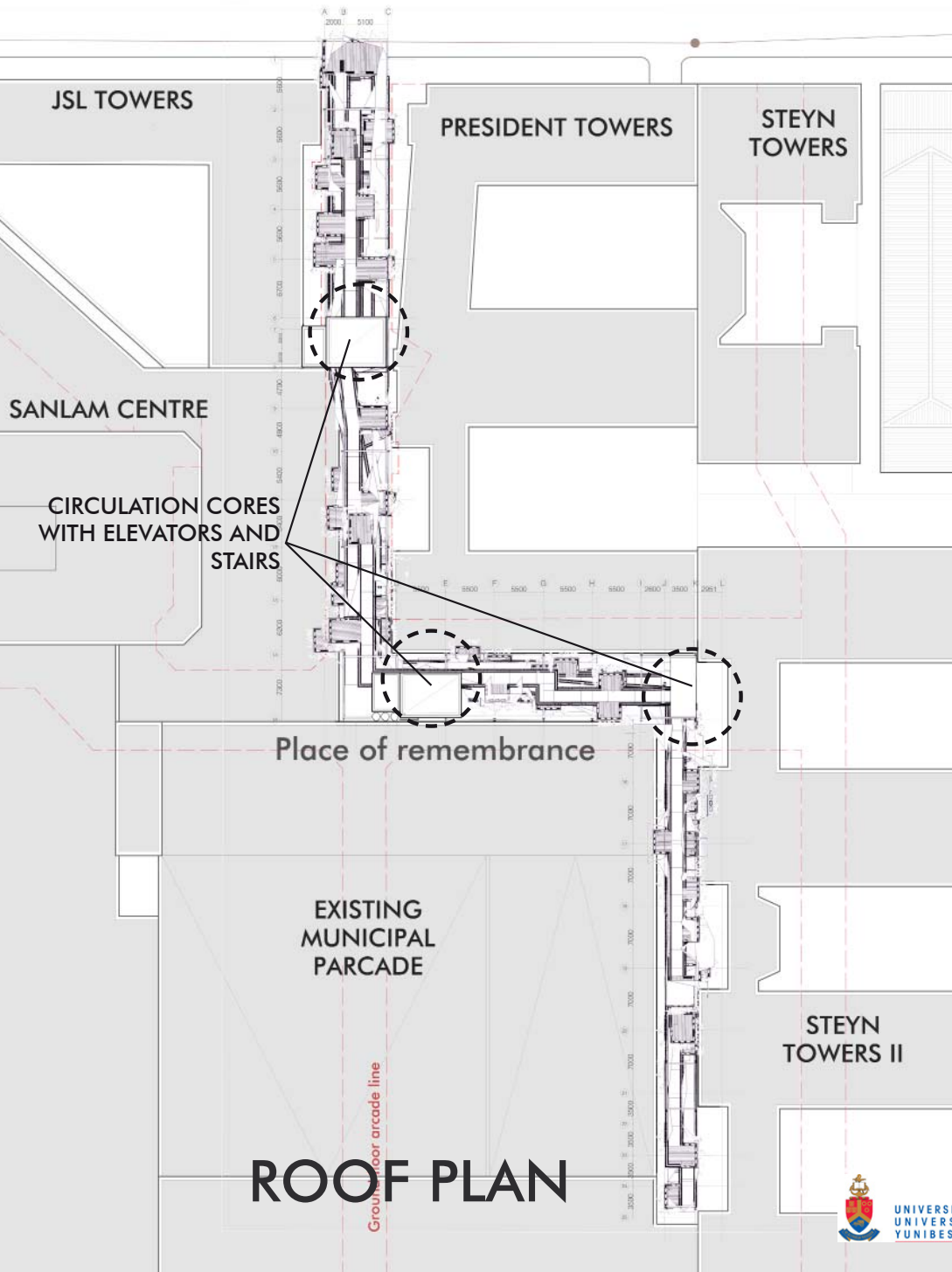


Fig. 119: A representation of a burial space, with various boxes placed within the structure (Author, 2011).



Fig. 120: A view of the northern entrance of President arcade with the place of remembrance (Author, 2011).



7. Technical Resolution

Structural diagrams and calculations

Fig. 121: Structural cores (Author, 2010).

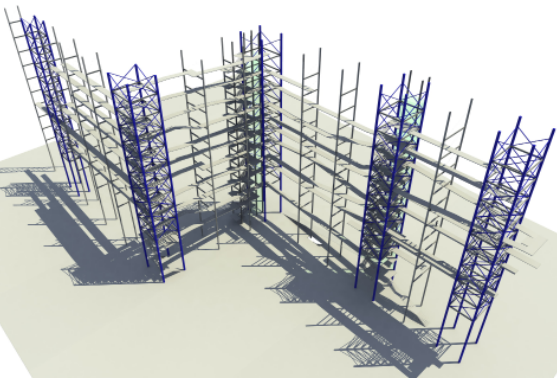


Fig. 122: Circulation cores (Author, 2010).

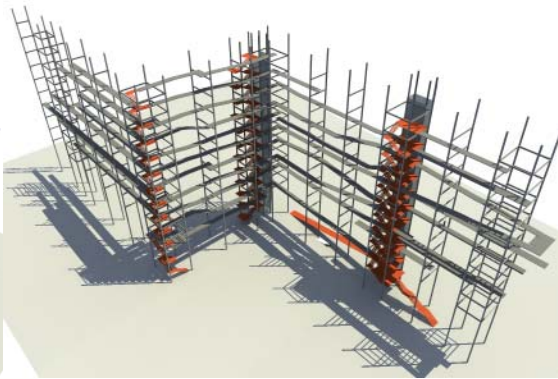


Fig. 123: Secondary bracing in terms of girders and joists (Author, 2010).

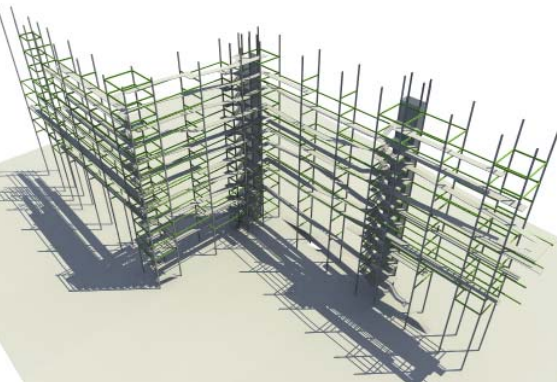
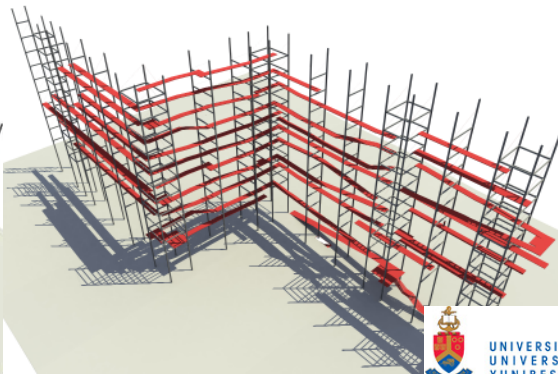


Fig. 124: Walkway system in the structure (Author, 2010).



COLUMNS $h/d = 7-18$

$$\frac{4000}{320} = 12.5$$

∴ 305 x 305 x 137 H-SECTION

GIRDERS $l/d = 15-20$

$$\frac{6000}{310} = 19.35$$

∴ 305 x 165 x 54 I-SECTION

JOIST $l/d = 15-20$

$$\frac{5500}{305} = 18.03$$

∴ 305 x 165 x 41 I-SECTION

COMPOSITE BEAM (STEEL + CONCRETE) $\frac{7500}{540} = 13.8$

$$l/d = 8-15$$

∴ 533 x 210 x 109 I-SECTION

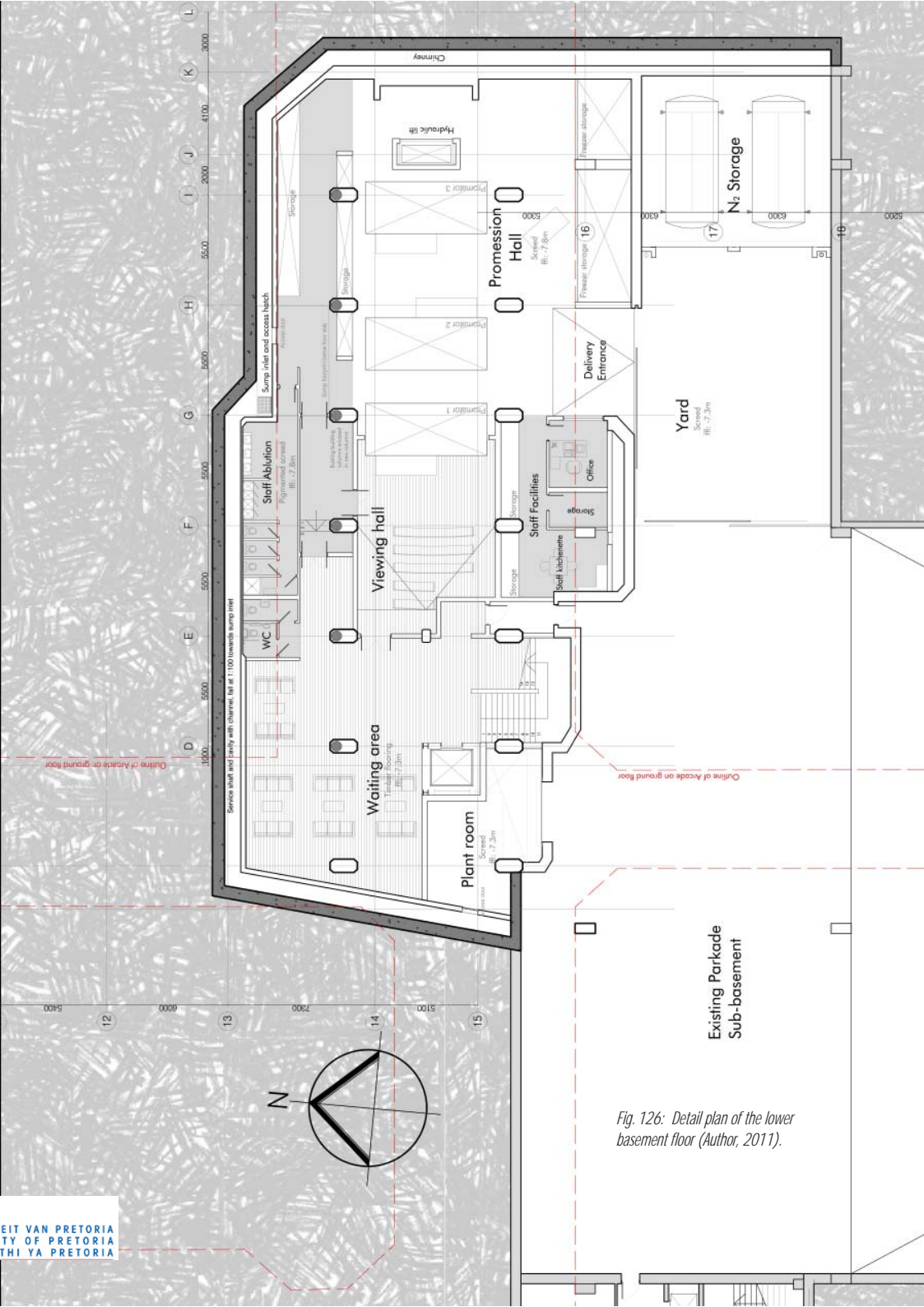
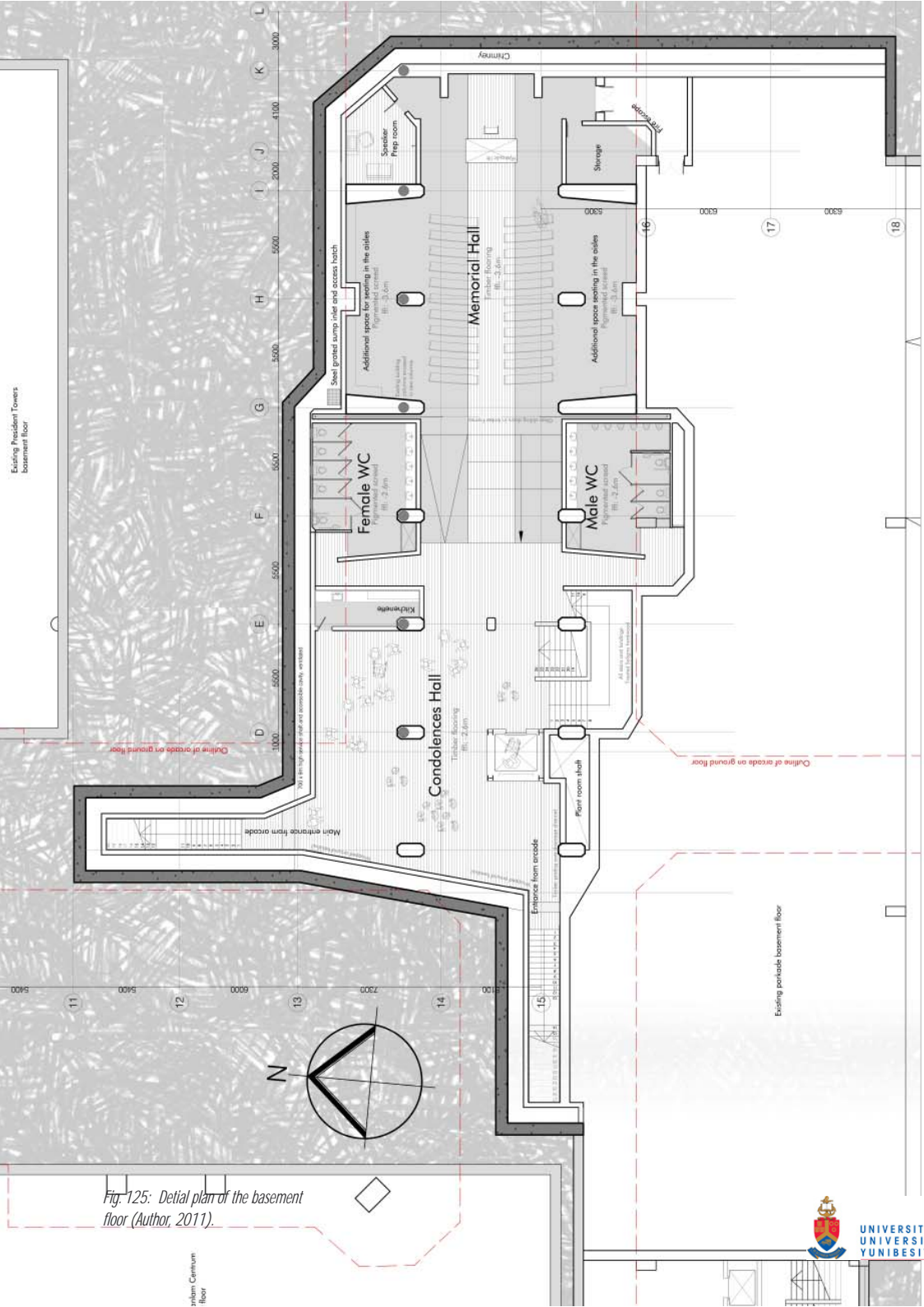


Fig. 125: Detail plan of the basement floor (Author, 2011).

Fig. 126: Detail plan of the lower basement floor (Author, 2011).

Walkway conditions

The walkway is a representation of perceptions and cultural norms, enveloped in human life. The change in materiality of the walkway represents how perceptions and norms of life and death in the urban realms can change over time.

Condition 1

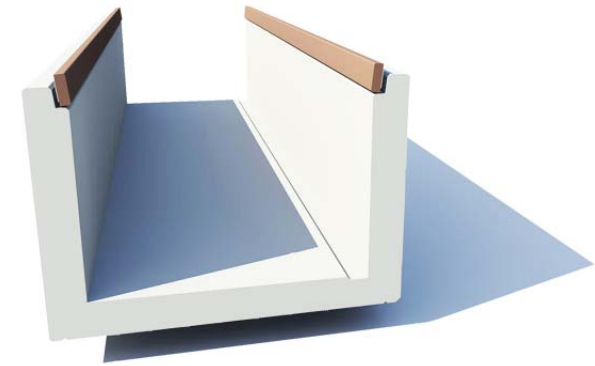
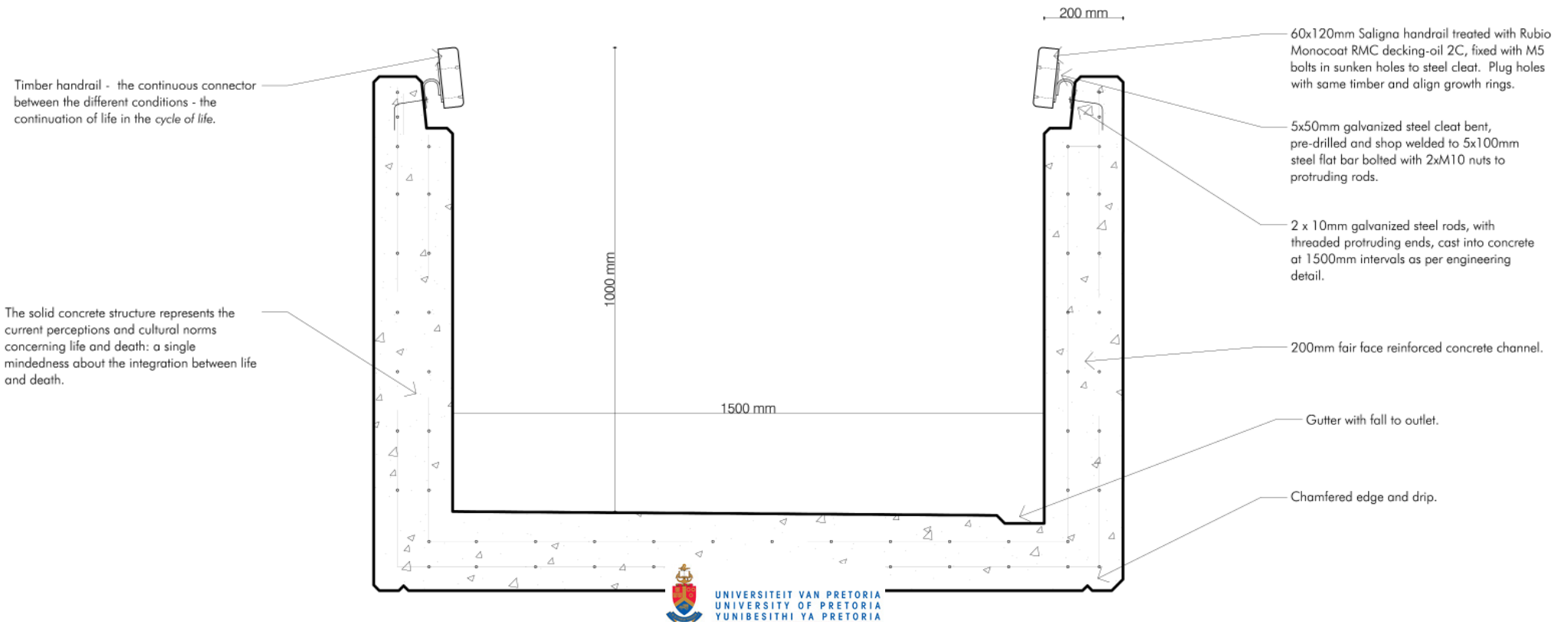
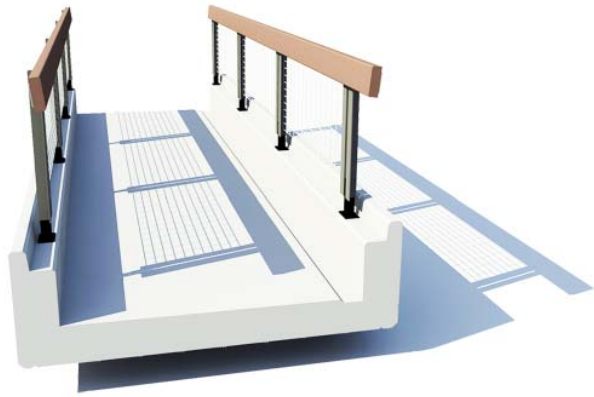


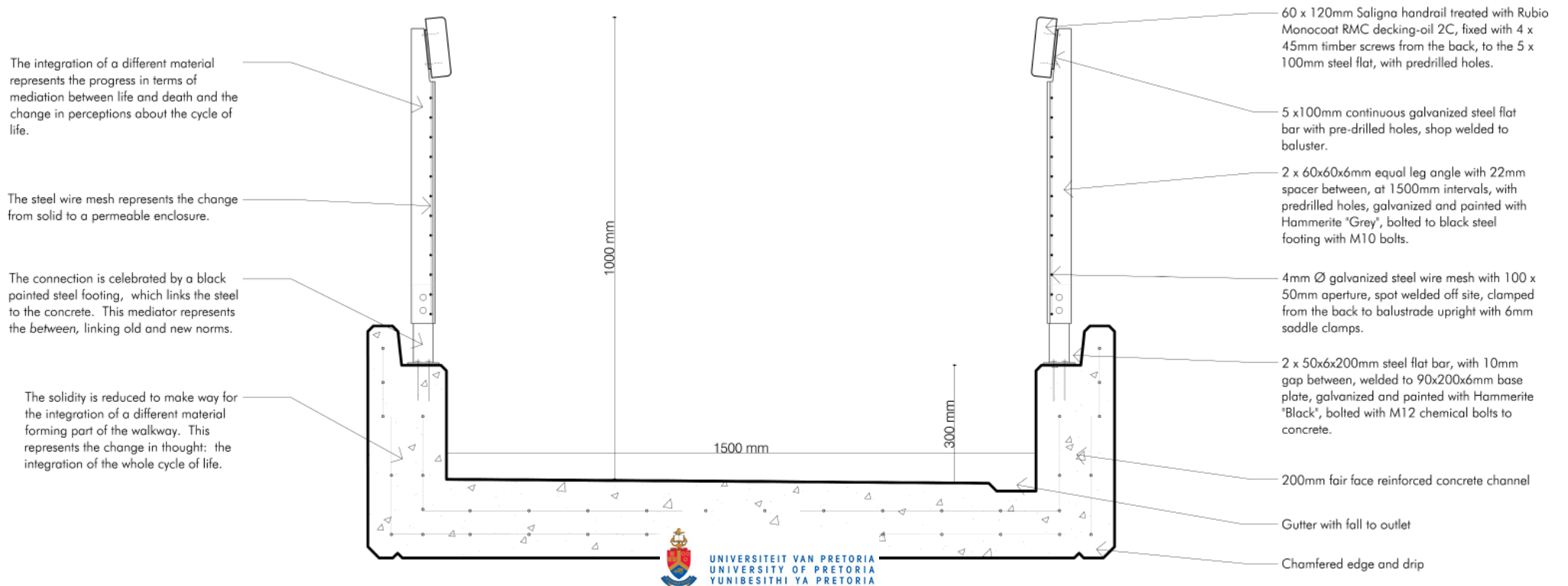
Fig. 127: Walkway condition 1 (Author, 2011).

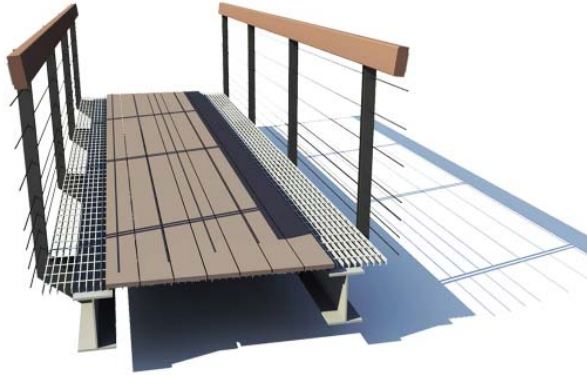




Condition 2

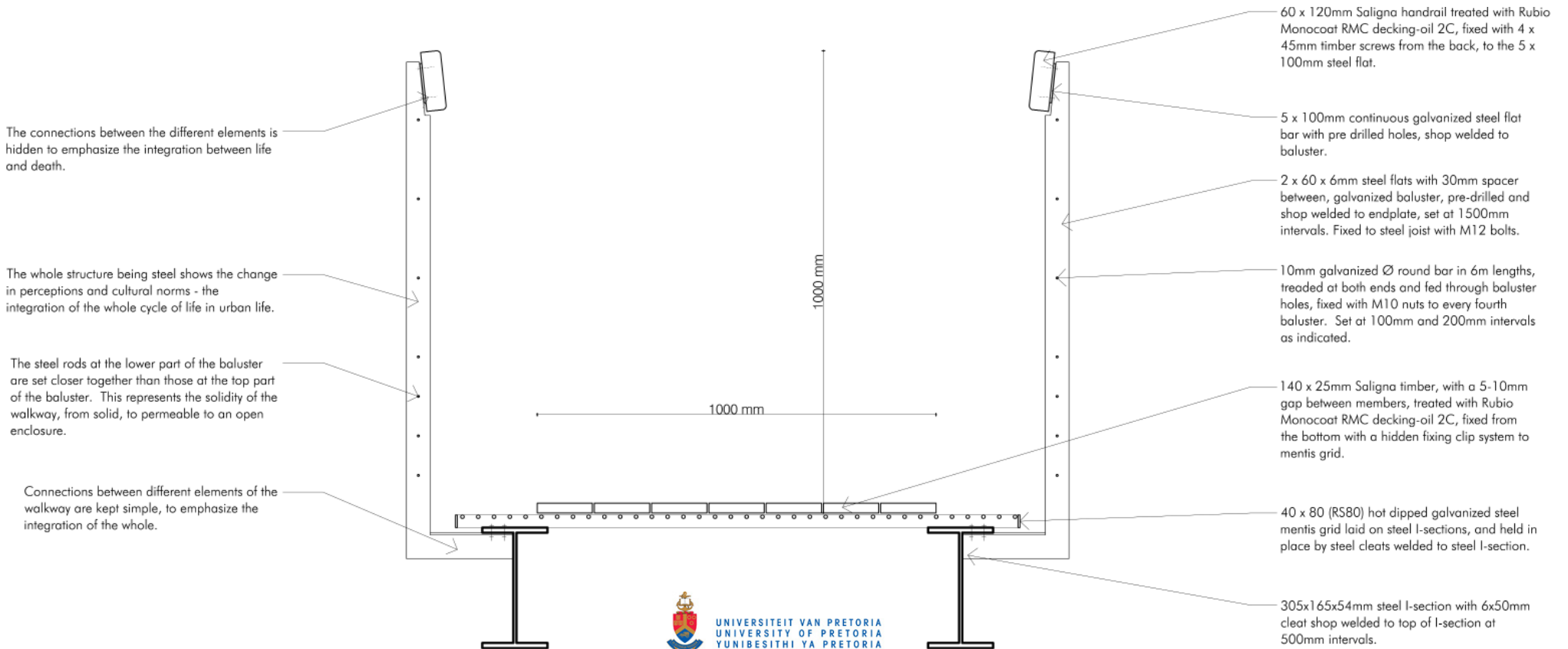
Fig. 128: Walkway condition 2
(Author, 2011).





Condition 3

Fig. 129: Walkway condition 3
(Author, 2011).



Bracing



Fig. 130: Bracing detail (Author, 2011).

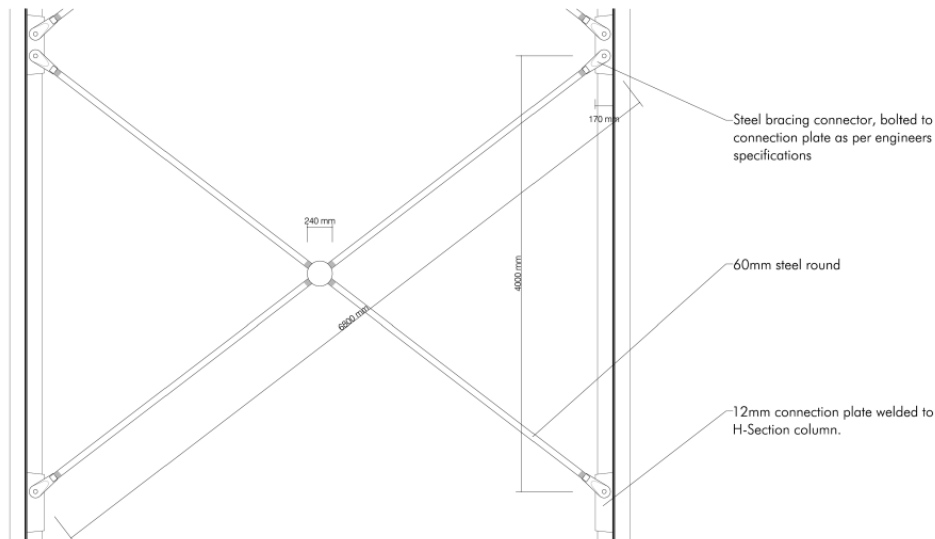
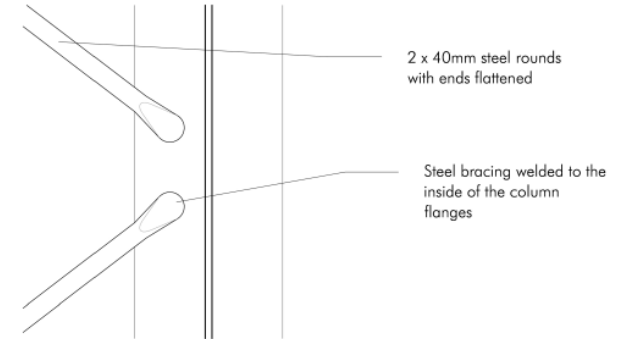


Fig. 131: (Opposite page) Different bracing conditions as the structure develops according to the different conditions (Author, 2011).

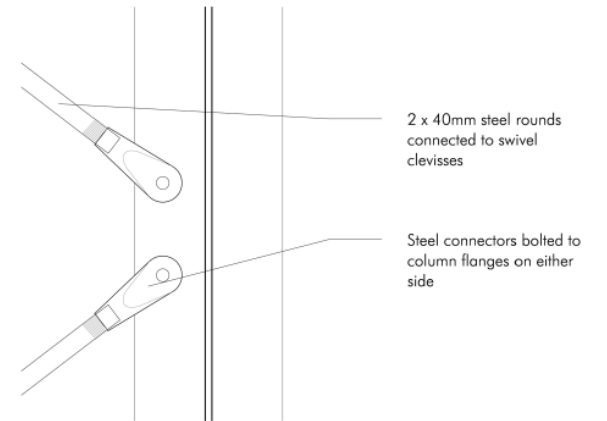
Bracing condition 3: the bracing is now integrated into the structural system by welding the bracing members to the column flanges, showing how the two entities become part of the same system: *life and death* ultimately being integrated.

CONDITION 3



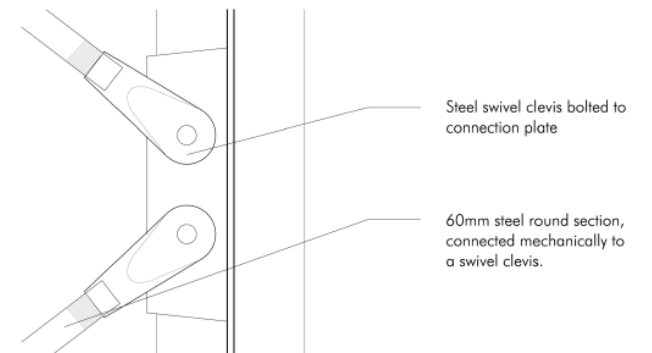
Bracing condition 2: a smaller section is used, made possible by employing two cross bracing members, connected to the flanges of the structural column. No connector plate. This implies the steady integration of the two structural systems, as the *between* mediates between two different entities - *life and death*.

CONDITION 2



Bracing condition 1: with the employment of a connector plate and bolts the mechanical connection between the two different structural systems is emphasized - *the between*.

CONDITION 1



Tanking detail

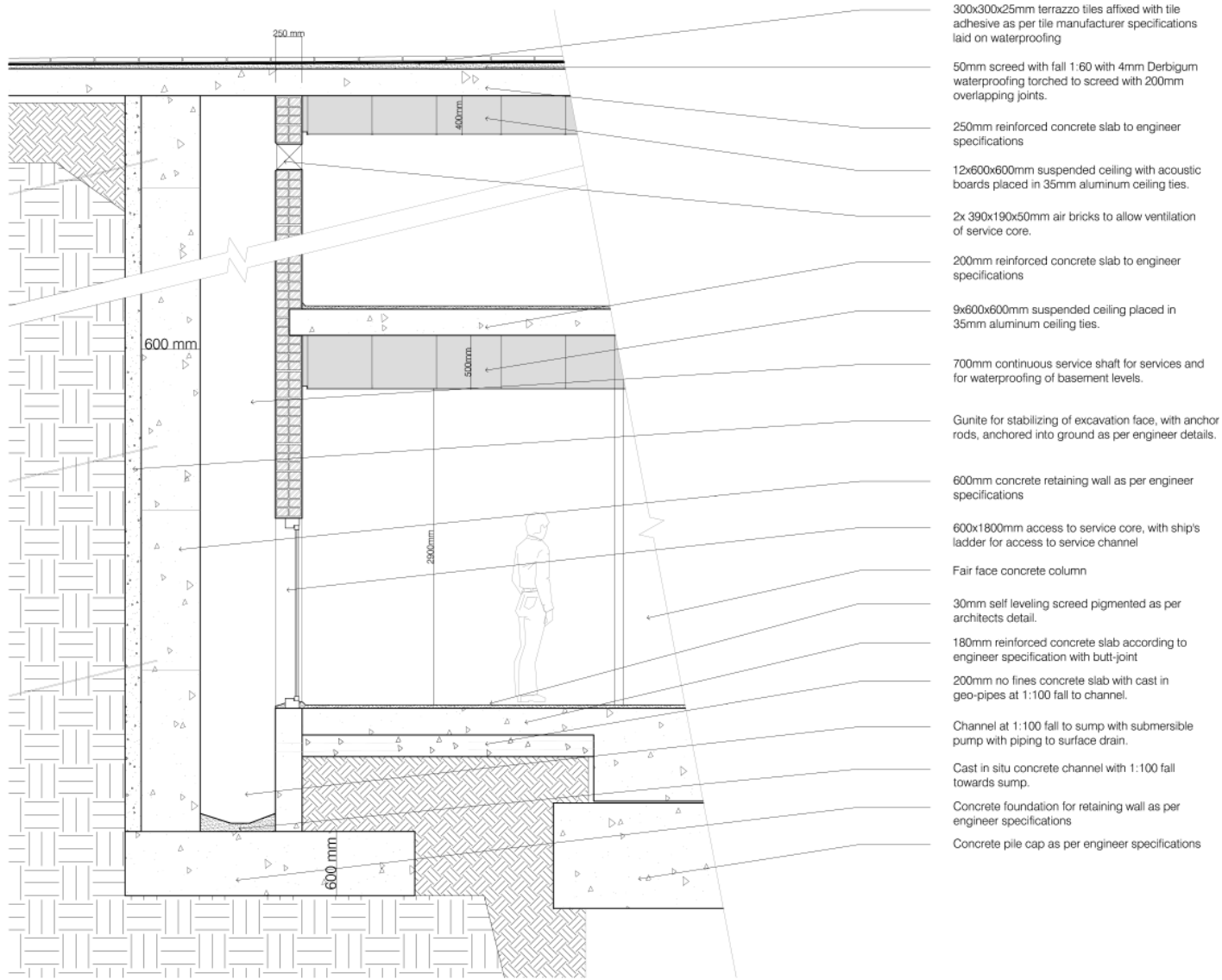


Fig. 132: Waterproofing detail (Author, 2011)..

Concrete entrance

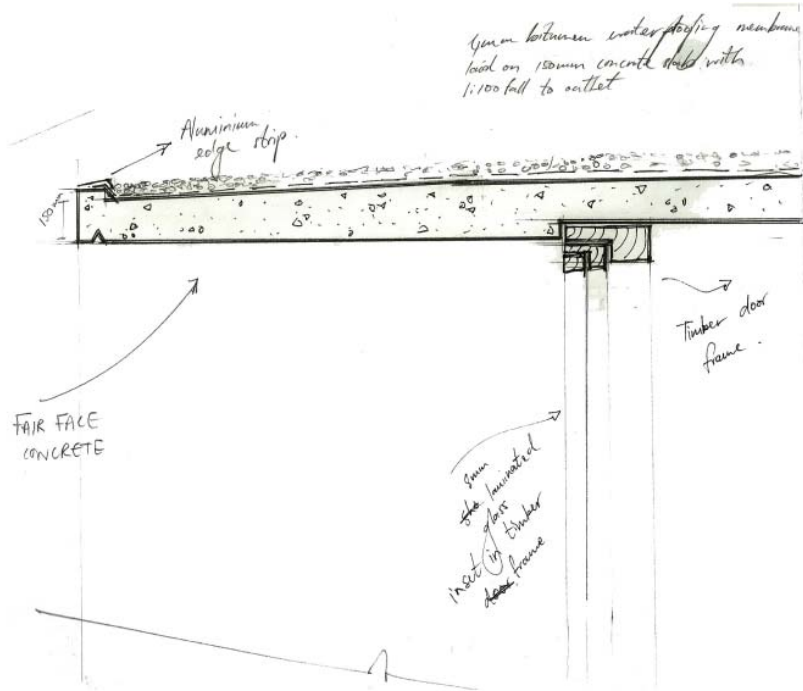
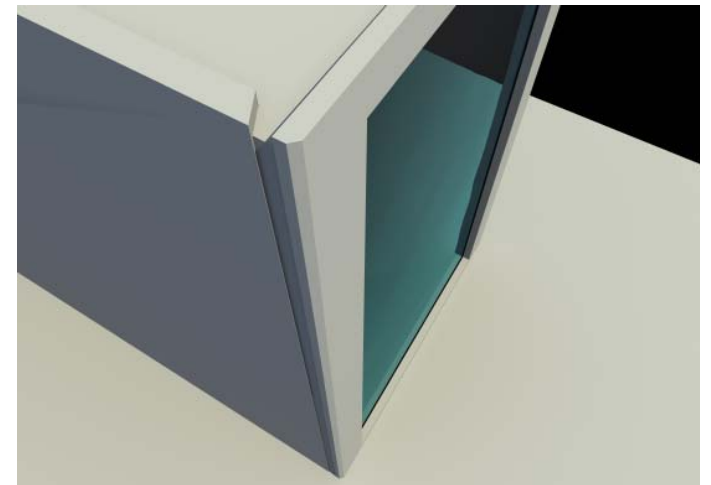
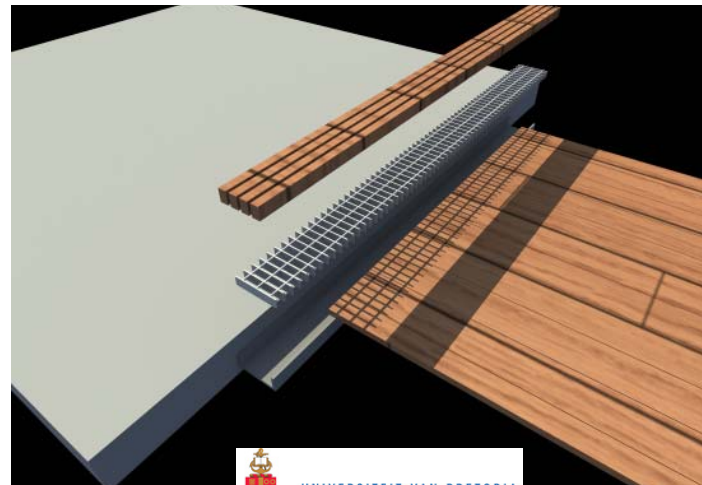


Fig. 133: Detail of concrete roof edge (Author, 2010).

Fig. 134: (opposite page left) Entrance, showing handrail (Author, 2010).

Fig. 135: (middle) Drainage in front of entrance. (Author, 2010)

Fig. 136: Drainage detail from concrete slab (Author, 2010).



Burial holder

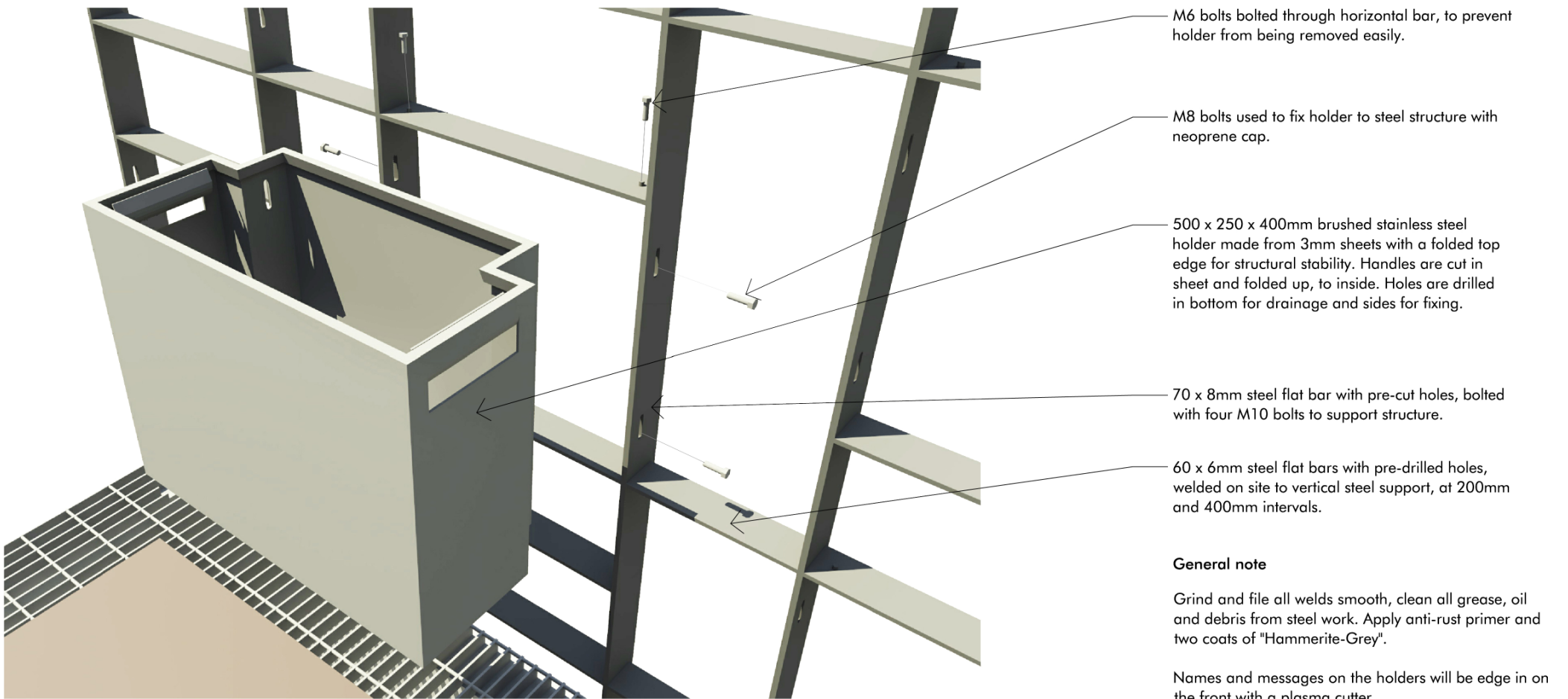


Fig. 137: Burial holder with drainage holes (Author, 2011).



Fig. 138: Burial holder detail (Author, 2011).

8. Conclusion

The place of remembrance investigates the ability of an architectural exploration to respectfully challenge conventional cultural norms (Prassa, 2009) and create new perceptions of what an urban environment could be. It also considers the significance of appropriating the *between*, physically and meta-physically.

The investigation has led to the theoretical exploration of the *cycle of life*; defining the *between* (Heidegger, 1996); and the power of *collective dwelling* (Norberg-Schulz, 1985). In conclusion it explains how the introduction of the complete cycle of life into our cities may help to form a collective urban environment. It continues to explain that the inclusion needs not be of a grand symbolic nature, but can rather be in the form of a design narrative, which in this case will be housed in the *between* of the urban environment. The importance of the *between* helps to understand the significance man has placed on the physical manifestation of the meta-physical expression of collective dwelling.

The urban environment is explained as a place of activity and dynamic life. Unfortunately current circumstances have given death only peripheral

importance, both physically and meta-physically. It is the aim of this project to introduce the whole cycle of life into the urban environment: *celebrating life by exposing death*. Through the physical manifestation of a place of remembrance for the dead, a meta-physical awareness is fostered in collective urban life.

To achieve the inclusion of the whole cycle of life in the urban environment, a *between* found within the city was identified. A vertical park structure is sensitively introduced in this *between*. An alternative process called promession is implemented to help create the *vertical park* which includes the remains — as nutrients — in the soil, furthering the idea of *new life*.

The architectural expression is achieved by implementing counter balances of life and death; solid and void; vertical and horizontal; and physical and meta-physical. The vertical structure is articulated as a temporary structure through the use of steel as material. The structure reads as temporary, yet the function of housing the dead renders it permanent within the life of the city. The memorial service space and process of promession which are both used by the living to honour the dead (celebrating life), are placed beneath ground level, in a more solid, permanent structure. The processes housed in the structure though are temporary, and after the memorial service the living ascend from the space into the collective urban space and further into the place of remembrance above, to place the remains of the deceased permanently in the park structure.

Hierarchy is achieved through the use of vertical distribution, lingering spaces and thresholds, sensitively creating differentiation in the importance of spaces.

In the memorial space below ground, light is used to draw people through the different thresholds into the memorial hall, where the relationship between the mourner and the deceased is accentuated by light.

The place of remembrance, being found within the *between*, sensitively creates an awareness of the whole cycle of life. It does so by appropriating the *between*

and becoming an anti-monumental memorial in the city. The awareness of the loss of life is not imposed by monumental structures awkwardly placed in the urban environment. This process of infusing the *between* and creating a culture of urban life will take time. As time passes and the place of remembrance becomes accepted, several more can be built in the *between* spaces found in the city, creating a new culture of urban life.

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Statistics

According to the mid-year population estimates released by Statistics South Africa in 2009, South Africa at that point had a population of 49 320 500 people. The City of Tshwane had a population of 2 346 000 people. This amounts to 4.4% of the total population of South Africa.

In the year 2009 there were 613 900 deaths in South Africa; there are approximately 1682 deaths per day. 4.4% of the total deaths per day is 74, which means that in the City of Tshwane there are 74 deaths per day. There are 42 cemeteries in the city, with 8 cemeteries not in use anymore after being filled to capacity (www.tshwane.gov.za). This means that there are some cemeteries where more than two burials take place per day.

	Number of Births	Total number of deaths	AIDS deaths	Percentage AIDS deaths
2001	1 138 600	523 900	202 200	38,6
2002	1 132 500	562 400	236 900	42,1
2003	1 120 400	596 600	267 700	44,9
2004	1 109 200	626 200	293 900	46,9
2005	1 096 600	634 100	298 600	47,1
2006	1 083 900	628 600	289 800	46,1
2007	1 064 900	621 600	279 600	45,0
2008	1 049 300	602 800	257 500	42,7
2009	1 044 900	613 900	263 900	43,0

Table 3: Births and deaths for the period of 2001-2009

Of a total of 613 900 deaths in 2009, 27 000 of those deaths occurred in the City of Tshwane. An average grave takes up around 5m² of actual surface space. If the average square metreage is multiplied by the total number of deaths in the City of Tshwane for the year 2009, it shows that 135 000m² of horizontal surface was needed for burial in that year. By evaluating the numbers and considering the growth of the city, one can just imagine how the need for more land for burial will increase every year. These portions of underutilized land can potentially be used for other purposes.

A crematory urn (or the box supplied by the crematorium) is 215mm x 175mm x 262mm in size. The total floor space needed for the box is 0.06m². That alone, if multiplied with the number of deaths per year in the City of Tshwane, will make a considerable difference to the space problem. If the crematory urns are placed in a 2m high wall with the same (0.06m²) footprint, the wall will be able to accommodate 6 urns. This then reduces the floor space needed for one crematory urn to 0.01m². Hypothetically, if everyone in the City of Tshwane was to be cremated, then the total floor space needed for all 27 000 people who died in 2009 will amount to 270m². Compare 270m² to 135 000m², and it is a fraction of the floor space needed to house the same number of people.

If promession is used and the remains are still to be buried, it will take up approximately a third of the space needed for a normal burial.

History of cemeteries in Pretoria

Pretoria was established in 1855, and the layout of the town was done in the mid 1870's. The town of Pretoria is situated between a series of ridges that form borders to the north and to the south. The Apies River was the natural boundary to the east, with Steenhoven Spruit forming a boundary to the west.

Before the official planning of the town layout of Pretoria, farms had their own family burial grounds. After the town was laid out in the 1870s, the first cemetery was planned at the (then) main western entrance into the town on Church Street, just outside the borders of the town. Church Street cemetery is known as Heroes' Acre, with several former presidents and influential people like artists and writers buried among British soldiers who died in the Pretoria region during the Anglo-Boer War (1899-1901).

A second cemetery was established during the Anglo Boer War. It is situated south of Pretoria in Irene. Unlike Church Street cemetery, this cemetery was not planned but was established out of necessity. The Irene cemetery is an old concentration camp cemetery, used by people held captive during the Anglo Boer War (www.anglo-boer.co.za).

The second official cemetery was opened in 1904. Established further to the west of the city, Rebecca Street Cemetery has been in use ever since. The cemetery has, unlike the Heroes' Acre, several sections that house all cultural and religious groups. The cemetery is however reaching a point where it cannot expand or move its borders — it will be reaching its full capacity soon.

The cemeteries that are situated to the east of Pretoria were established during the 1960s (Silverton Cemetery) and the late 1970s (Pretoria East Cemetery). The cemeteries to the west of the city centre and most of the cemeteries in the north were established in the 1960s, with some new additions during the 1990s.

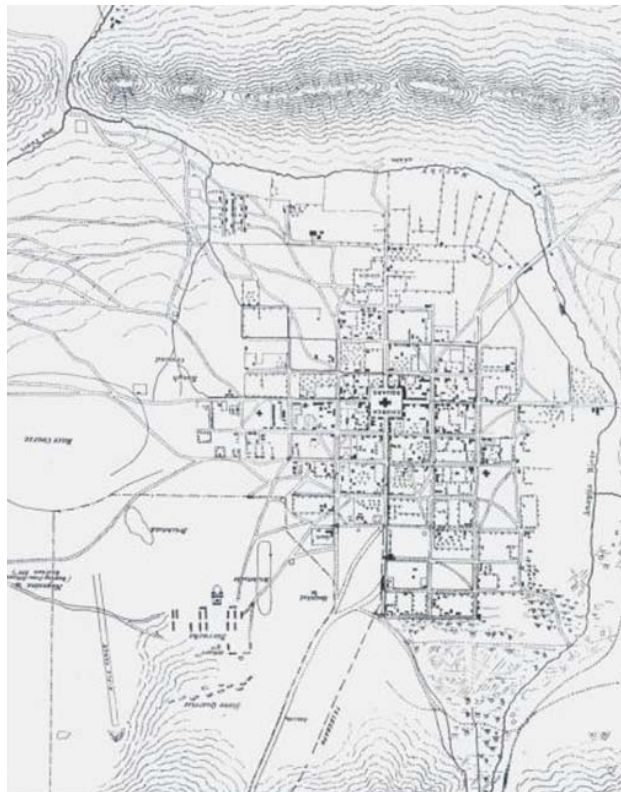


Fig. 139: Reconnaissance map of Pretoria by the British RE in 1880. To the left of the map, the Steenhoven spruit forms the edge of the town. At the main western entrance of the town, on the opposite side of the spruit, the first cemetery was established (Van der Waal Collection, University of Pretoria Library).

As a result of growth, cemeteries were also placed on the periphery of new suburbs, even further away from the city centre. In the second half of the twentieth century apartheid also played its part, not only in the segregation of communities and the differentiation between culture groups, but also in many planning issues that resulted from this separation. New developments far from the city meant that amenities needed to be provided for the communities. Currently, the City of Tshwane has a total cemetery count of 42, as a result of growth, apartheid and urban sprawl over the course of history.

Fig. 140: Figure ground of the Pretoria CBD showing the first cemeteries in Pretoria: Church Street Cemetery and Rebecca Street Cemetery in the top left corner of the image (Author, 2010).



First cemeteries in Pretoria

1. Heroes' Acre (1870's)
2. Irene Concentration Camp Cemetery (1899-1901)
3. Rebecca Street Cemetery (1904)

Fig. 141: Church Street Cemetery, also known as Heroes Acre, the first cemetery in Pretoria (Author, 2010).



Fig. 142: Irene Concentration Camp Cemetery, with memorial building (Deckler, 2006: 36).



Fig. 143: Rebecca Street Cemetery entrance with an avenue of well established trees (Author, 2010).



Complete list of cemeteries in the City of Tshwane

- Centurion Cemetery
 - Church Street Cemetery
 - Crematorium (Rebecca Street)
 - Eersterust Cemetery
 - Hatherley Cemetery
 - Heatherdale Cemetery
 - Irene Cemetery
 - Olievenhoutbosch Cemetery
 - Pretoria East Cemetery
 - Rebecca Street Cemetery
 - Silverton Cemetery
 - Zandfontein Cemetery
 - Honingnestkrans Cemetery
 - Atteridgeville Cemetery
 - Lotus Gardens Cemetery
 - New Mabopane cemetery
 - Mamelodi East Cemetery
 - Mamelodi West Cemetery
 - Saulsville Cemetery
 - Soshanguve Cemetery
 - Dilopye Cemetery
 - New Eersterust Cemetery
 - New Ga-Rankuwa Cemetery
 - Majaneng Cemetery
 - Selosesha Cemetery
 - Temba Cemetery
 - Winterveldt Cemetery
 - Five Acres Cemetery
 - Morokolong Cemetery
 - Old New Eersterust Cemetery
 - Old Mabopane Cemetery
 - Old Ga-Rankuwa Cemetery
 - Old Soshanguve Cemetery
 - Stinkwater 1, 2 & 3 Cemeteries
 - Suurman 1, 2 & 3 Cemeteries
 - Makanyaneng Cemetery (previously Twelve Acres Cemetery)
 - Klipkruisfontein Cemetery
 - Tshwane North Cemetery
- (tshwane.gov.za,2010)

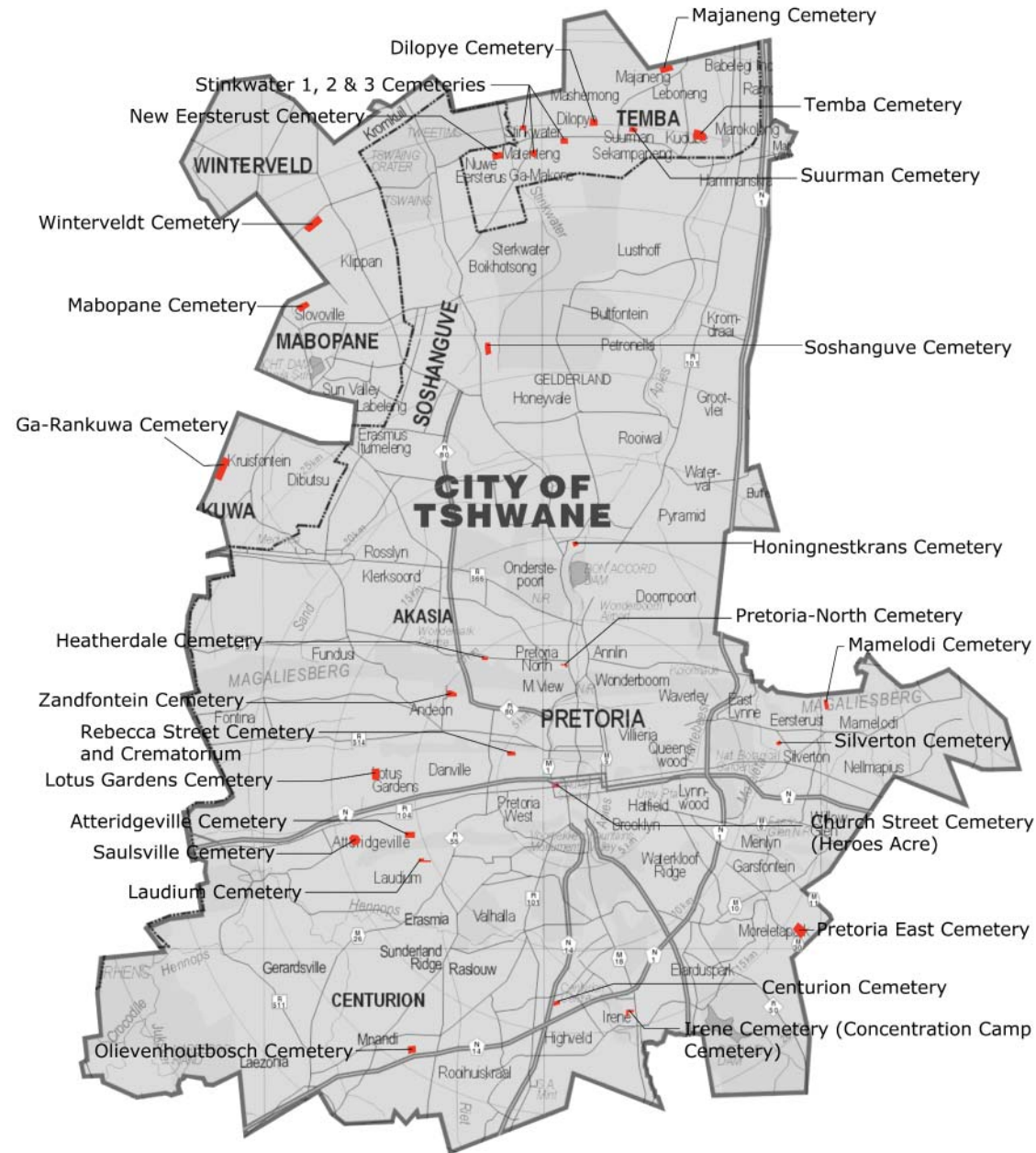


Fig. 144: A map showing most of the cemeteries in the City of Tshwane. One can see how the cemeteries sit on the periphery of certain areas within the broader city limits (Author, 2010).

Final presentation and model



Fig. 145: Presentation (Author, 2011).



Fig. 146: Final model (Author, 2011).

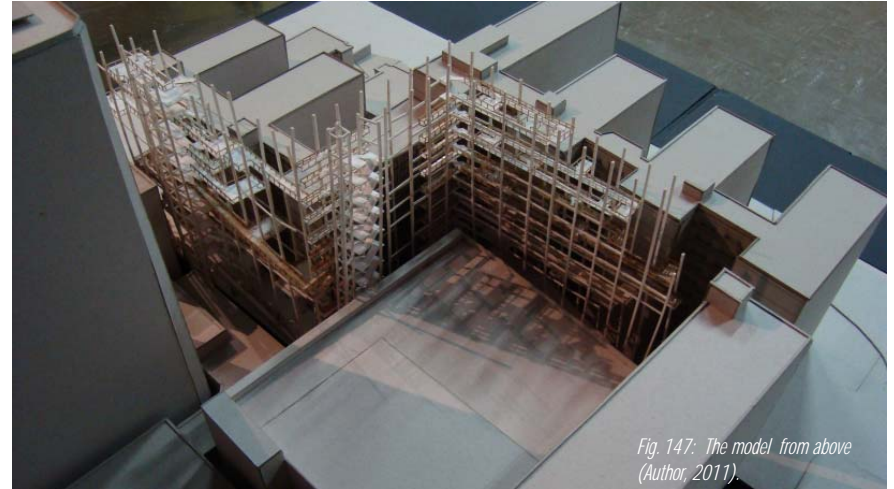


Fig. 147: The model from above (Author, 2011).



Fig. 148: The model moved open (Author, 2011).

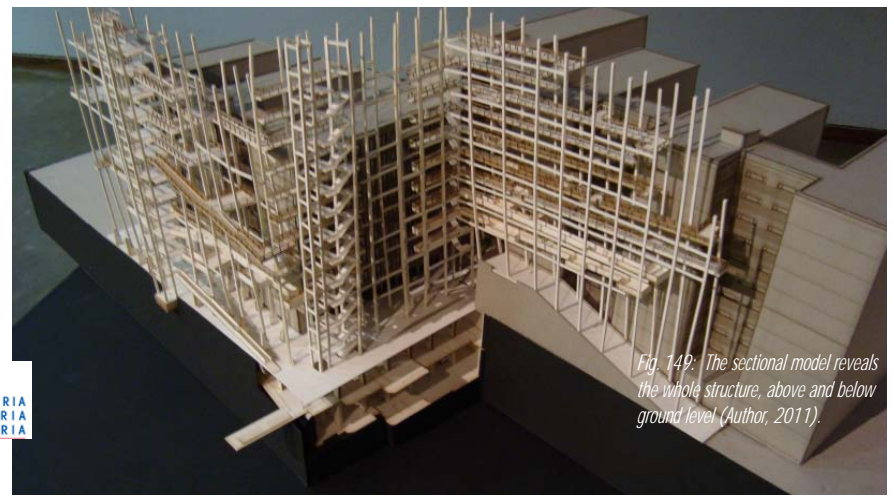


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Fig. 19: Illustrations showing the process of promession. The whole process takes place in a closed container (Author, 2010).

4. Context

Fig. 20: Aerial view of the Pretoria CBD (www.tshwane.gov.za).

Fig. 21: Figure ground study of the Pretoria CBD, with places of worship in red. The circles indicate a 5 minute walking radius drawn around the places of worship (Author, 2010).

Fig. 22: The image shows the circles and places of worship. The study area is located where the most circles overlap, indicates the study area (the red dashed rectangle) (Author, 2010).

Fig. 23: (Opposite page) Enlarged study area (Author, 2010).

Fig. 24: Functions housed on the block of the proposed site (Author, 2010).

Fig. 25: The image shows the "in-between" to be used on the site for the vertical park of remembrance (Author, 2010).

Fig. 26: (Opposite page) 3D figure ground of Pretoria CBD with site highlighted, showing close proximity to many amenities in the CBD (Author, 2010).

Fig. 27: The diagram shows the accessibility of the block with access roads, pedestrian movement and parking in and around the block (Author, 2010).

Fig. 28: 3D block with arcade system indicated in red (Author, 2010).

Fig. 29: Block section showing accessibility to block interior (Author, 2010).

Fig. 30: Composite image of the northern facade of the block (Author, 2010).

Fig. 31: Composite image of the southern facade of the block (Author, 2010).

Fig. 32: Activity in Pretorius Street at the entrance to President Arcade (Author, 2010).

Fig. 34: President Arcade south entrance (Author, 2010).

Fig. 33: Municipal arcade with its entrance to the south of the block in Schoeman Street (Author, 2010).

Fig. 35: Key of block.

Fig. 36: The site's northern street face, showing the verticality of the "in-betweenness" (Author, 2010).

Fig. 37: Figure ground study done using an aerial photo from 1937 (Van der Waal collection, University of Pretoria) (Author, 2010).

Fig. 38: Figure ground study done using an aerial photo from 1947 (Van der Waal collection, University of Pretoria) (Author, 2010).

Fig. 39: Figure ground study done using an aerial photo from 1975 (Van der Waal collection, University of Pretoria) (Author, 2010).

Fig. 40: Figure ground study done using an aerial photo from 2010 (www.tshwane.gov) (Author, 2010).

Fig. 41: Figure ground study done for the site for 2030. The development shows how the vertical place of remembrance influences the built form around it over time (Author, 2010).

Fig. 42: Figure ground study done for the site for 2050. The development shows how the vertical place of remembrance further influences the built form around it over time (Author, 2010).

5. Precedents

Fig. 43: (Previous page, top) Bird's eye view of León Tarantorio mortuary (Cohen & Metz, 2002: 93).

Fig. 44: (Previous page, second from top) Entrance facade of the crematorium in Berlin (Russel, 2000: 227).

Fig. 45: (Previous page, third from top) Some of the completed buildings in the Modena cemetery, designed by Aldo Rossi (Adjmi, 1991: 21).

Fig. 46: (Previous page, bottom) MFO Park: a steel structure is put in place to support vines which will become a green canopy for users in a dense urban environment (Marholis & Robinson, 2007: 16).

Fig. 47: View of the mortuary, dropped into the ground and covered by a reflective pool ((Cohen & Metz, 2002: 93).

Fig. 48: The plan layout of the mortuary. The concepts of intimacy and openness can be read clearly in the articulation of the plan (archdaily.com).

Fig. 49: Chapel interior showing the quality of light that fills the space and accentuates the plinth where the coffin is placed (archdaily.com).

Fig. 50: Section showing the procession as one enters the space at a level lower than the ground floor. As in the plan the concept is visible in the articulation of the section (archdaily.com).

Fig. 51: The waiting area looking out towards the green berm (archdaily.com).

Fig. 52: The chapel interior. The contrast between the materials used is evident (archdaily.com).

Fig. 53: Public entrance to the memorial service spaces of the crematorium (www.jeremibuczowski.pl).

Fig. 54: The condolence hall: the main gathering space between the various chapels, dominated by the concrete columns (worldcities.bloguez.com).

Fig. 55: (Left) The image shows the differentiation between the concrete chapel box and the glazed facade wrapping around it (Russel, 2000: 230).

Fig. 56: (Right) One of the entrances to the main hall (Russel, 2000).

Fig. 57: The ground floor plan (Russel, 2000: 226).

Fig. 58: Section of the building. The relationships and thresholds between the different spaces are visible (Russel, 2000: 226).

Fig. 59: Presentational drawing of the plan of Modena cemetery (www.anthonysilviodaulerio.com).

Fig. 60: (Opposite page, left) View of the main columbarium from the public walkway (Adjmi, 1991: 21).

Fig. 61: (Opposite page - right) The thin concrete fins of the raised ossuary create an endless rhythm (picasaweb.google.com).

Fig. 62: (Opposite page, left) The interior of the main columbarium structure. The image shows light penetrating the structure (www.flickr.com).

Fig. 63: (Opposite page, right) The ossuary hallway conveying a feeling of eternity (Adjmi, 1991: 23).

Fig. 64: Elevation of the cemetery at Modena (www.moma.org).

Fig. 65: Presentational drawings by Aldo Rossi: perspective section and elevations of the peripheral structures (Allibone, 1987: 15).

Fig. 66: 3D exploration of the different elements forming one design - another presentation drawing by Aldo Rossi (Allibone, 1987: 16).

Fig. 67: One of the suspended platforms (Fajardo, 2008: 54).

Fig. 68: MFO Park - a steel structure with a cable network for vegetation to envelop the structure (McLeod, 2008).

Fig. 69: Elevation of the trellised structure indicating the various forms of movement in and through the structure (McLeod, 2008).

Fig. 70: The interior view of the park, showing the overhead structure that will be vegetated over time to create a green canopy (McLeod, 2008).

Fig. 71: A gathering space protruding through the vegetated wall into the main space (Fajardo, 2008: 52).

6. Design

Fig. 72: (Opposite page) Initial conceptual drawing of a ramped system moving through the vertical place of remembrance (Author, 2010).

Fig. 73: The theory established the importance of the whole cycle of life and identifies the condition between life and death (Author, 2011).

Fig. 74: The concept focuses on the between: collective dwelling between the living and the dead (Author, 2011).

Fig. 75: The program is the process that makes the connection between the living and the dead possible (Author, 2011).

Fig. 76: The main user is the mourner: suddenly confronted by death. During the process of finding finality the mourner comes to the realization that life carries on and also need to carry on living (Author, 2011).

Fig. 77: The historical (and current) cemetery context is one which is spread out horizontally over a large area (Author, 2011).

Fig. 78: The urban context calls for an intervention which reacts vertically. Not much horizontal space is available (Author, 2011).

Fig. 79: The initial idea of appropriating the “between” found within the urban environment (Author, 2010).

Fig. 80: Indicating the vertical movement within the structure, representing the process of reaching finality and moving on with life (Author, 2010).

Fig. 81: The idea is to create private pockets within the structure where people can commune with the dead. This will also help also to create individual rituals as people continually revisit loved ones (Author, 2010).

Fig. 82: (Next page) A concept image illustrating the appropriation of the between, and initial arrangement of the functions (Author, 2010).

Fig. 83: The model shows a walkway and ramped system that fills the “between” (Author, 2010).

Fig. 84: A conceptual representation of the different ramps within the “between” (Author, 2010).

Fig. 85: Developed further the intervention permeates the “between” that is normally unused (Author, 2010).

Fig. 86: An identical model of the intervention above, without the context. The image shows the idea of employing walkways with several spaces on either side of the walkway. No structure is shown (Author, 2010).

Fig. 87: The intervention not only fills the “between” found within the block, but the intention also fills the gap in the street facade (Author, 2010).

Fig. 88: One of the first 3D models which has structure. The structure made the design read as a solid entity which is not the intention (Author, 2010).

Fig. 89: Structural members have been re-sized and removed to aid the design of a permeable structure, allowing natural ventilation and light to penetrate the space (Author, 2010).

Fig. 90: 3D developed model, set within the context. The model explores an initial idea of vertical extension over the existing (Author, 2010).

Fig. 91: A structural exploration of the walkways and the burial spaces. Some separation between the mourner and the passers-by drove this particular design (Author, 2010).

Fig. 92: The essential structure with steel H-columns carrying the ramped system from where many burial spaces will be designed. A mesh system was proposed to cover the structure. The intention was for the vegetation to use the mesh and create a green vertical structure (Author, 2010).

Fig. 93: A representation of the park of remembrance as it will sit in the “inbetween” of the site (Author, 2011).

Fig. 94: Mass model of the CBD of Pretoria as it is at present with the introduction of a new place of remembrance within the city (Author, 2010).

Fig. 95: Mass model of the CBD of Pretoria in 50 years. It not only shows the growth of the city, but also the inclusion of many more places of remembrance (Author, 2010).

Fig. 96: The diagrams show the development of the part diagram (Author, 2011).

Fig. 97: A diagram showing how the parti is translated into 3 different conditions within the structure (Author, 2011).

Fig. 98: Concept section of the structure showing how the parti diagram has influenced the design (Author, 2011).

Fig. 99: The existing site plan, showing “inbetween space” with the potential to be occupied (Author, 2010).

Fig. 100: Existing site plan, with diagrams overlaid (Author, 2010).

Fig. 101: New site plan with the place of remembrance in the “between” (Author, 2011).

Fig. 102: The ground floor plan showing the arcade and the connections between the memorial space below and the place of remembrance above (Author, 2011).

Fig. 103: Section A-A shows the arcade and the entrance in President Arcade, to the memorial space below (Author, 2011).

Fig. 104: The fair face concrete entrance boxes to the memorial hall, found within the arcades (Author, 2010).

Fig. 105: Section B-B shows the arcade level above and the memorial space below. One can see how evidence is given in the arcade, of a space below, through the raised floor level (Author, 2011).

Fig. 106: Block key

Fig. 107: Basement level with memorial spaces (Author, 2011).

Fig. 108: Sub basement level with promession facilities (Author, 2011).

Fig. 109: 3D representation of the Vertical place of Remembrance (Author, 2011).

Fig. 110: Interior view of place of remembrance from one of the ramps (Author, 2011).

Fig. 111: The vertical place of remembrance fills the void in the urban facade (Author, 2010).

Fig. 112: Section A-A - shows the public part of the place of remembrance, with easy access from the street (Author, 2011).

Fig. 113: Section B-B with the memorial spaces underneath the arcade and the place of remembrance above. The progression from one condition within the structure is most evident on this section (Author, 2011).

Fig. 114: Key plan

Fig. 115: Section C-C (Author, 2011).

Fig. 116: Key plan

Fig. 117: General floor layout for the place of remembrance (Author, 2011).

Fig. 118: Another general floor layout for the upper levels of the place of remembrance. The burial spaces are fewer and more private (Author, 2011).

Fig. 119: A representation of a burial space, with various boxes placed within the structure (Author, 2011).

Fig. 120: A view of the northern entrance of President arcade with the place of remembrance (Author, 2011).

7. Technical Resolution

Fig. 121: Structural cores (Author, 2010).

Fig. 123: Secondary bracing in terms of girders and joists (Author, 2010).

Fig. 122: Circulation cores (Author, 2010).

Fig. 124: Walkway system in the structure (Author, 2010).

Fig. 125: Detail plan of the basement floor (Author, 2011).

Fig. 126: Detail plan of the lower basement floor (Author, 2011).

Fig. 127: Walkway condition 1 (Author, 2011).

Fig. 128: Walkway condition 2 (Author, 2011).

Fig. 129: Walkway condition 3 (Author, 2011).

Fig. 130: Bracing detail (Author, 2011).

Fig. 131: (Opposite page) Different bracing conditions as the structure develops according to the different conditions (Author, 2011).

Fig. 132: Waterproofing detail (Author, 2011).

Fig. 133: Detail of concrete roof edge (Author, 2010).

Fig. 134: (opposite page left) Entrance, showing handrail (Author, 2010).

Fig. 135: (middle) Drainage in front of entrance. (Author, 2010).

Fig. 136: Drainage detail from concrete slab (Author, 2010).

Fig. 137: Burial holder with drainage holes (Author, 2011).

Fig. 138: Burial holder detail (Author, 2011).

Appendix

Fig. 139: Reconnaissance map of Pretoria by the British RE in 1880. To the left of the map, the Steenhoven spruit forms the edge of the town. At the main western entrance of the town, on the opposite side of the spruit, the first cemetery was established (Van der Waal Collection, University of Pretoria Library).

Fig. 140: Figure ground of the Pretoria CBD showing the first cemeteries in Pretoria: Church Street Cemetery and Rebecca Street Cemetery in the top left corner of the image (Author, 2010).

Fig. 141: Church Street Cemetery, also known as Heroes Acre, the first cemetery in Pretoria (Author, 2010).

Fig. 142: Irene Concentration Camp Cemetery, with memorial building (Deckler, 2006: 36).

Fig. 143: Rebecca Street Cemetery entrance with an avenue of well established trees (Author, 2010).

Fig. 144: A map showing most of the cemeteries in the City of Tshwane. One can see how the cemeteries sit on the periphery of certain areas within the broader city limits (Author, 2010).

Fig. 145: Presentation (Author, 2011).

Fig. 146: Final model (Author, 2011).

Fig. 147: The model from above (Author, 2011).

Fig. 148: The model moved open (Author, 2011).

Fig. 149: The sectional model reveals the whole structure, above and below ground level (Author, 2011).

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