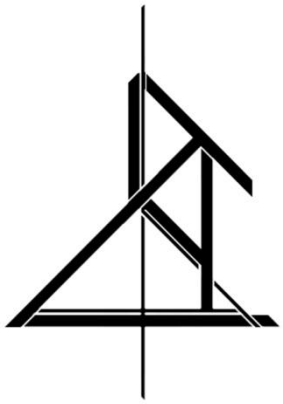
URBAN [infra]STRUCTURE:

- using neglected infrastructure as a framework for the regeneration of inner city voids -

Buckley Rodger Thompson



B u c k l e y R o d g e r T h o m p s o n

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"The dissertation suggests a shift in thinking, from an architecture as object to an architecture which, like a machine made up of components in relation, creating a "system of forces that give shape and rhythm to the everyday life of the body. Thus the object - be it a building, a compound site, or an entire urban matrix would be defined now not only by how it appears, but rather by practices: those it partakes of and those that takes place within it".

Sanford Kwinter
(Architecture of Time, 2001)

PURPOSE:

Submitted in fulfilment as part of the requirements

for the degree of Master of Architecture (Professional),

MArch(Prof), in the Faculty of Engineering,

Built Environment and Information Technology.

UNIVERSITY:

Department of Architecture

University of Pretoria

South Africa

2015

DEGREE:

Master of Architecture (Prof)

Infrastructure

COURSE CO-ORDINATOR:

Dr. Arthur Barker

STUDY LEADER:

Dr. Arthur Barker

KEYWORDS:

Infrastructure, Regeneration, Urban Decay, Periphery Condition

PROGRAM:

Community Green Station

SITE LOCATION:

Block of Brown Street

Central Business District

Pretoria

COORDINATES:

25°44'27.24"S

28°11'37.53"E

ARCHITECTURAL THEORETICAL PREMISE:

Theories of Decay and Regeneration are synthesised so as to

formulate an appropriate theoretical premise for the regeneration of urban voids.

ARCHITECTURAL APPROACH:

The exploration of Regenerative Architecture as a means of re-imagining the potential of

infrastructure to rehabilitate a state of urban decay brought about by a periphery condition.

CHAPTER

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P R E A M B L E

As the architectural discipline is a profession where reason is rooted in understanding, this investigation aims to present a logical and compelling argument. This document serves therefore not only as a design informant but also as a record of the overall design process. The composition of this book illustrates the narrative of the project and guides the reader through the various contextual, theoretical and precedential informants of the design process. The project is grounded on an awareness of the past, present and future. Architectural design for the future, based on an understanding of the past, in reference to the present **(see figure 0.1)**. Being established within current realities, the project is non-speculative in nature and should be viewed, understood and interpreted as such.

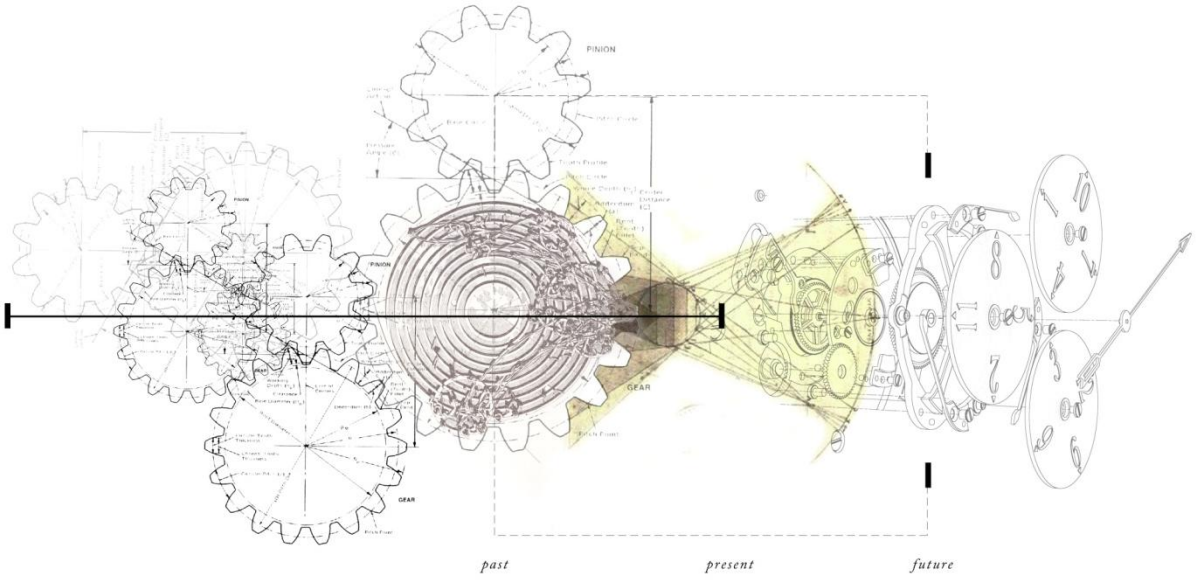

Figure 0.1 : Conceptual diagram of the project strategy in terms of past, present and future (Author, 2015).

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Buildings will inevitably decay, and there is nothing architects or those charged with a building's upkeep can do about it. So, what is an architect to think or do about it?

Lebbeus Woods

(Inevitable Architecture, 2012)

Figure 0.2 : Exaggeration of degenerative state of Brown Street (Author, 2015).

CHAPTER

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Project Summary

by Study Leader:

D R . A R T H U R B A R K E R

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The project deals with a crime ridden area within the North Eastern periphery of the Pretoria CBD called Brown Street. Imagined for a future condition of water scarcity which, having come true recently in Gauteng, implies the current relevance of the projects intentions (Barker, 2015).

The project creates architecture from its infrastructural role which, amongst other, contains water collection, treatment, power generation and recycling. It is imagined that a number of these interventions be replicated in similar conditions all around the city at varying scales and containing varying programs (Barker, 2015).

CHAPTER

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A B S T R A C T

November of 2014 saw the approval and commission of Tshwane's 2055 vision for the city (Tshwane municipality, 2013: 6). It seeks the restructuring and rejuvenation of the inner city in an attempt to remedy a state of stasis resulting from urban decentralization and fragmentation. Although Tshwane's proposal has potential, its formal exclusive nature and prioritization of the city centre has initiated a process of decay in the informal zones of the urban periphery. This process of decay is particularly evident within the city block of Brown Street. Once a place where many a union march started, Brown Street now exists as a shadow of its former self (Valeska, 2013). A lack of supporting infrastructure and appropriate spatial conditions have facilitated a sharp increase in crime. The consequent privation of safety has, in turn, prompted vacancies of onsite industries. (Valeska, 2013). The loss of formal economic infrastructure (energy) alongside the simultaneous degradation of adjoining infrastructure has inevitably led to the decay of this city block.

This dissertation focuses on the possibility of rehabilitating and regenerating the decaying "in-between" (Woods, 1997: 13) spaces of the city block within its urban periphery. A theoretical approach to transformation is proposed, which, instead of opting for demolition, seeks to expand on existing systems. Therefore, by harnessing site potential, the project suggests that the neglected infrastructure become part of a regenerative machine; a system of components that will stimulate the re-investment and development of the city block. The main intention of the [infra]structure is to establish a coordinated relationship between the formal and informal of the city, the vision and the void. The goal is to create an organized centrality, where fragmented realities are brought together harmoniously using the neglected infrastructures as mediator.

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"I can do all things through Christ who strengthens me."

Philippians 4: 13 NKJV

CHAPTER

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A C H N O W L E D G E M E N T S

I cannot express enough thanks to my family for their continued support and encouragement: Rodger Buckley Thompson, my father; Linda Caroline Thompson, my mother; and Eloise Caroline Thompson, my sister. I offer my sincere appreciation to my parents for the learning opportunities provided.

The completion of this project could not have been accomplished without the continued support of my study leader, Dr. Arthur Barker. The faultless guidance you displayed toward me throughout the year will not be forgotten.

Finally, to my caring, loving, and supportive friend, Marni van der Hoven, my deepest gratitude. Your encouragement and companionship comforted me through the roughest of times. From this, Mr and Mrs van der Hoven for providing a home away from home.

UNDERSTANDING

[terminology]

STASIS:

(n.) 1. inactivity resulting from a static balance between opposing forces; 2. an abnormal state in which the normal flow is slowed or stopped.

VOID:

(n.) 1. an empty area or space; vacancy; emptiness; vacuum; 2. the state of nonexistence; nothingness; nullity; nihility.

VEIL:

(v.) 1. making undecipherable or imperceptible by obscuring or concealing; obscure; blot out; obliterate; hide; 2. to obscure, or conceal with or as if with a veil; (opp. of unveil)

INSULA:

(n.) 1. city block, including all the units that constitute the structural fabric as a whole for a city street block; 2. the individual units of private property that were isolated within the structural fabric of that street block.

INFRASTRUCTURE:

(n.) 1. the stock of basic facilities and capital equipment needed for the functioning of a country or area; base; 2. the basic structure or features of a system or organization; substructure.

DEGENERATION:

(n.) 1. passing from a more complex to a simpler biological form; retrogression; 2. the process of declining from a higher to a lower level of effective power or vitality or essential quality; devolution; (opp. of development, evolution).

REGENERATION:

(n.) 1. forming again (especially with improvements or removal of defects); renewing and reconstituting; reformation; 2. the activity of physical renewal; 3. feedback in phase with (augmenting) the input; positive feedback; 4. (biology) growth anew of lost tissue or destroyed parts of organs.

ENTROPY:

(n.) 1. (thermodynamics) a thermodynamic quality representing the amount of energy in a system that is no longer available for doing mechanical work; "entropy increases as matter and energy in the universe degrade to an ultimate state of inert uniformity"; randomness; s.

RESILIENCE:

(n.) 1. the physical property of a material that can return to its original shape or position after deformation that does not exceed its elastic limit; resiliency; 2. an occurrence of rebounding or springing back; resiliency.

PERIPHERY:

(n) 1. the outer limits or edge of an area or object; 2. A marginal or secondary position in, or aspect of, a group, subject, or sphere of activity.

SATELLITE:

(n) 1. an artificial body placed in orbit round the earth or another planet in order to collect information or for communication; 2. something that is separated from or on the periphery of something else is nevertheless dependent on or controlled by it.

HUB:

(n) 1. a centre of activity or interest or commerce or transportation; a focal point around which events revolve

STRUCTURING

[contents]

INFRASTRUCTURE

[a brief history]

The word itself, "infrastructure" is derived from a combining of the Latin words *infra*, used by the Romans to mean "below", or "underneath", and the Latin word *structura* which means "building" or "structure" (Oxford Dictionary). The term is defined as "the basic physical and organizational structures and facilities needed for the operation of a society" (Dictionary.com). The development of infrastructure from an archaeological standpoint can be traced back to the earliest of times, however if one based such a study on the etymology of infrastructure, its origins can be traced back to ancient Rome. In fact, the ancient Romans are referred to as the "fathers of infrastructure" (Assante, 2009: 1). In ancient Rome the most significant of these organizational components included structures such as temples, amphitheatres and public baths however, the Appian Way and the Aqua Appia **(see figure 1.1)** - both planned and constructed by Appius Claudius Laeus (340 - 273 BC) became the model for the design and construction of greater Roman roads and aqueducts and left a mark as one of the greatest infrastructures (Assante, 2009: 1). Aqueducts were considered by the Romans as one of the most critical elements of infrastructure. They were essential to ancient Roman civilization and its evolution from a regional power into a vast empire with tranportational reach and influence. The Romans required aqueducts to grow and sustain larger populations. The first Roman Aqueduct, constructed in 313 BC brought fresh water to the city from the surrounding hills. Its construction coincides with that of the Appian Way. Sextus Tulius Frontinus, appointed to oversee and manage the system, wrote "with such an array of indispensible structures carrying so many waters, compare if you will, the idle pyramids or the useless, though famous, works of the Greeks".

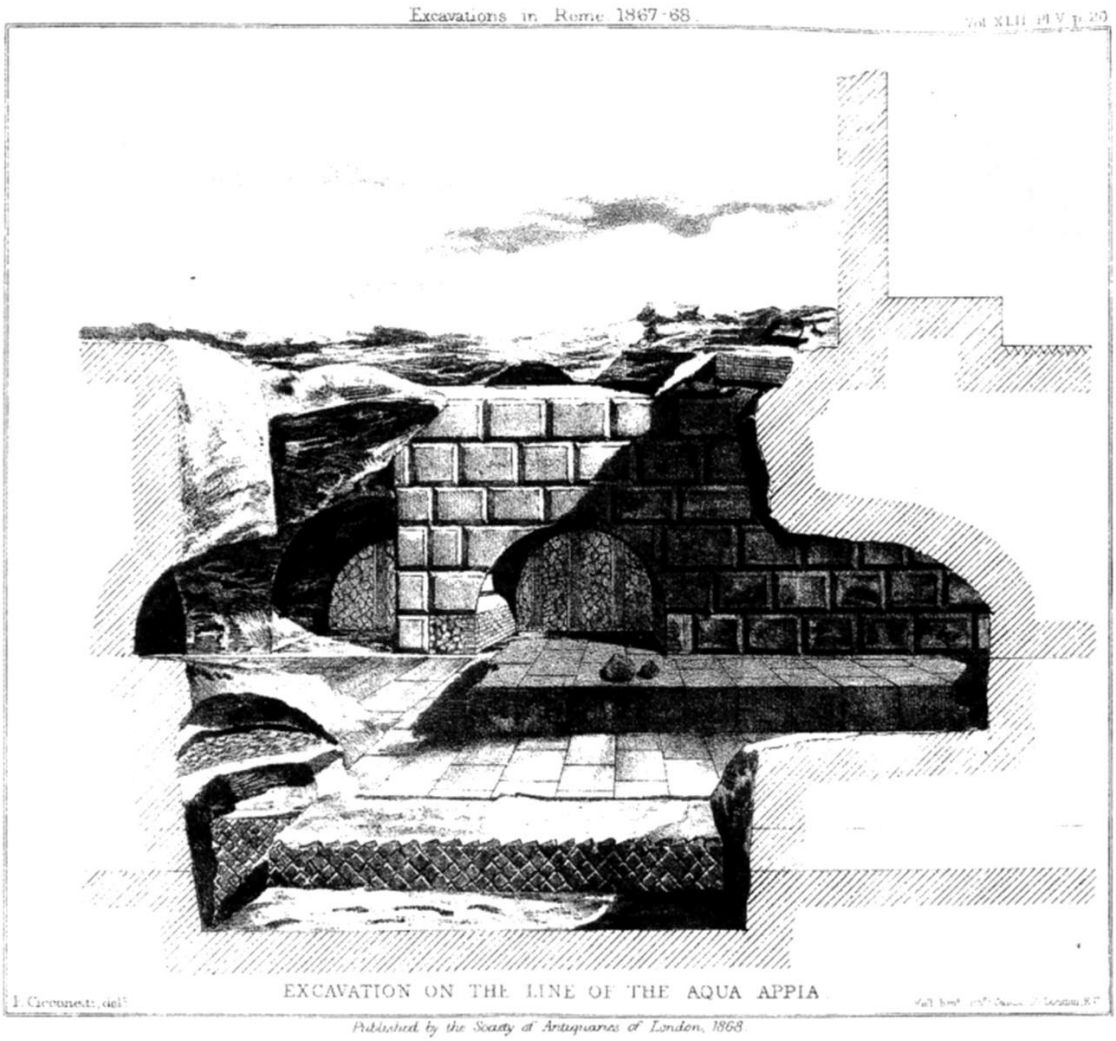

Figure 0.3 : drawn section of the roman Aqua Appia. Illustrating spatiality of water infrastructure (Assante, 2009: 3).

FLEXIBILITY

[the infrastructural era of architecture]

There is of recent a tendency of architects toward the design of infrastructure **(see figure 1.2)**. This is because, due to the fact that our urban spaces are undeniably influenced and ultimately shaped by economic exchanges, architecture can no longer tend toward the idle and the object but instead toward the flexible. David Harvey (Zaera-Polo, 1994: 25) explains in his theory entitled "flexible accumulation" that cities adapt to over-accumulation, not by means of density but through "mechanisms of spatial and temporal displacement". This implies that cities adapt their form to an increasing mobility or recourses and capital. Cities are therefore required to maintain a flexible organization so as to absorb a continuous spatial reformation without losing their specificity and centrality (Delalex, 2006: 51). Therefore, as fluidity of urban condition draws architects attention toward the links that establish themselves between objects and buildings, they naturally enforce their interest for infrastructure (Delalex, 2006: 53).

Urban projects often carry infrastructural meaning; not only because of their size but also because of the large-scale forces they attempt to integrate. This suggests that architecture is shifting towards the field of infrastructure (Delalex, 2006: 53). As stated by Stan Allen (1997: 52): "they [architects] can begin to redirect their own imaginative and technical efforts toward the questions of infrastructure. A toolbox of new and existing procedures can be expanded by reference to architecture's traditional alliance with territorial organisation and functionality". Since architecture attempts to stitch territorial scales it approaches a more material form of practice, which Allen labelled as "infrastructural urbanism". Infrastructural urbanism interprets buildings as infrastructures (Allen, 2006: 54). It favours instrumental approaches and realistic strategies. These are not devoted to the design of autonomous objects, but rather to the production of material conditions; conditions that are similar to those of peripheral districts.

This is not a return to master planning as it still incorporates a certain complexity of the real, meaning that architects redirect their interest toward questions of scale, use, movement, flow and ex-change, moving toward an infrastructural design. As architects reclaim their original tools, they relate architecture to material practices, such as ecology and engineering, which are concerned with the conception and transformation of large scale assemblages over time (Delalex, 2006: 54). Having failed to make provision for the flexibility of its urban centre, the City of Tshwane now exists in a state of stasis. No longer able to meet the requirements of its governing body, this national landmark has begun to decay. However, contributing considerably toward the decay of the country's capital, is predicted water scarcity. It is projected that by 2025 water supply will have become as much of a crisis as electricity is currently.

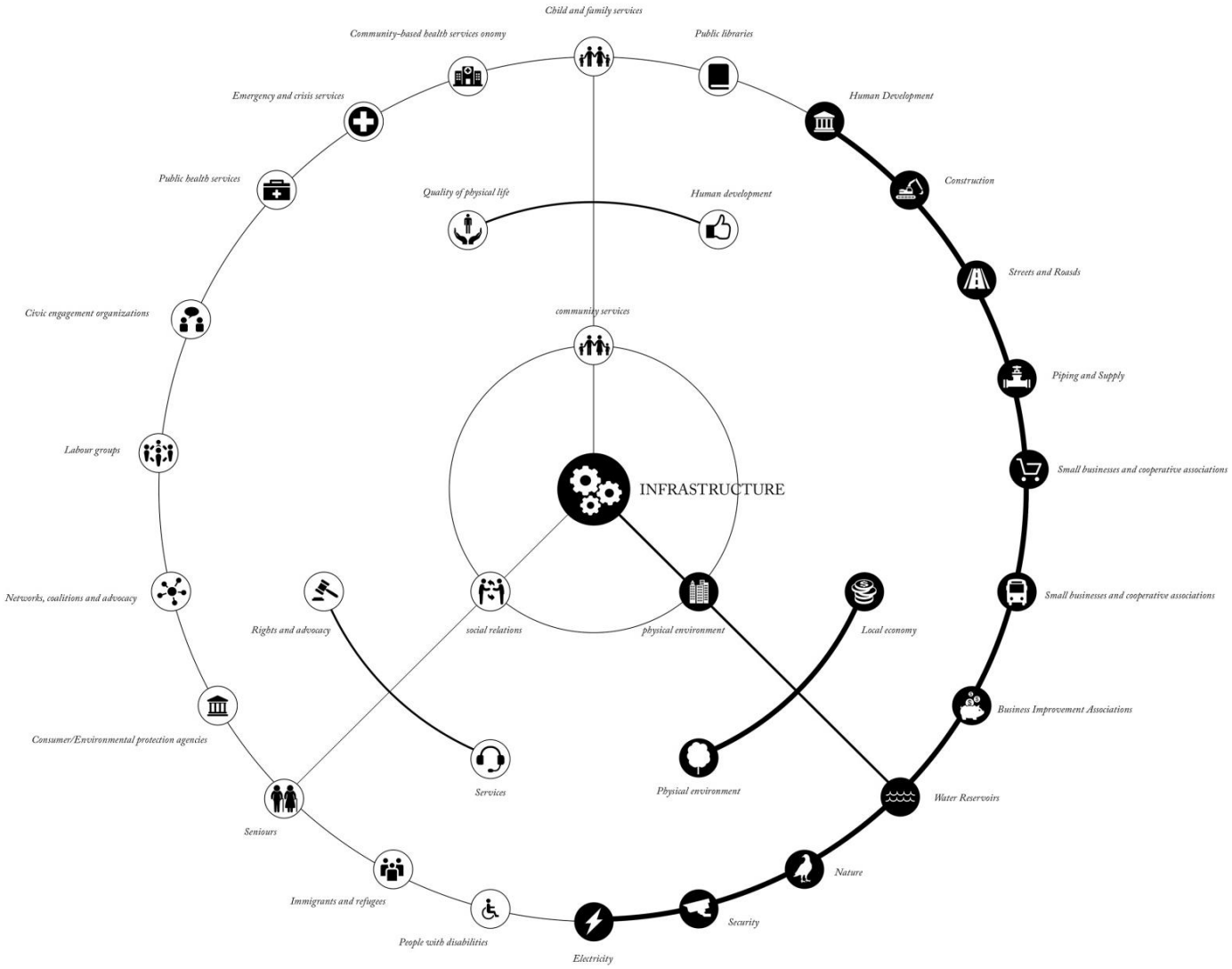

Figure 0.4 : Diagram of the three primary city infrastructures and their various components (Author, 2015).