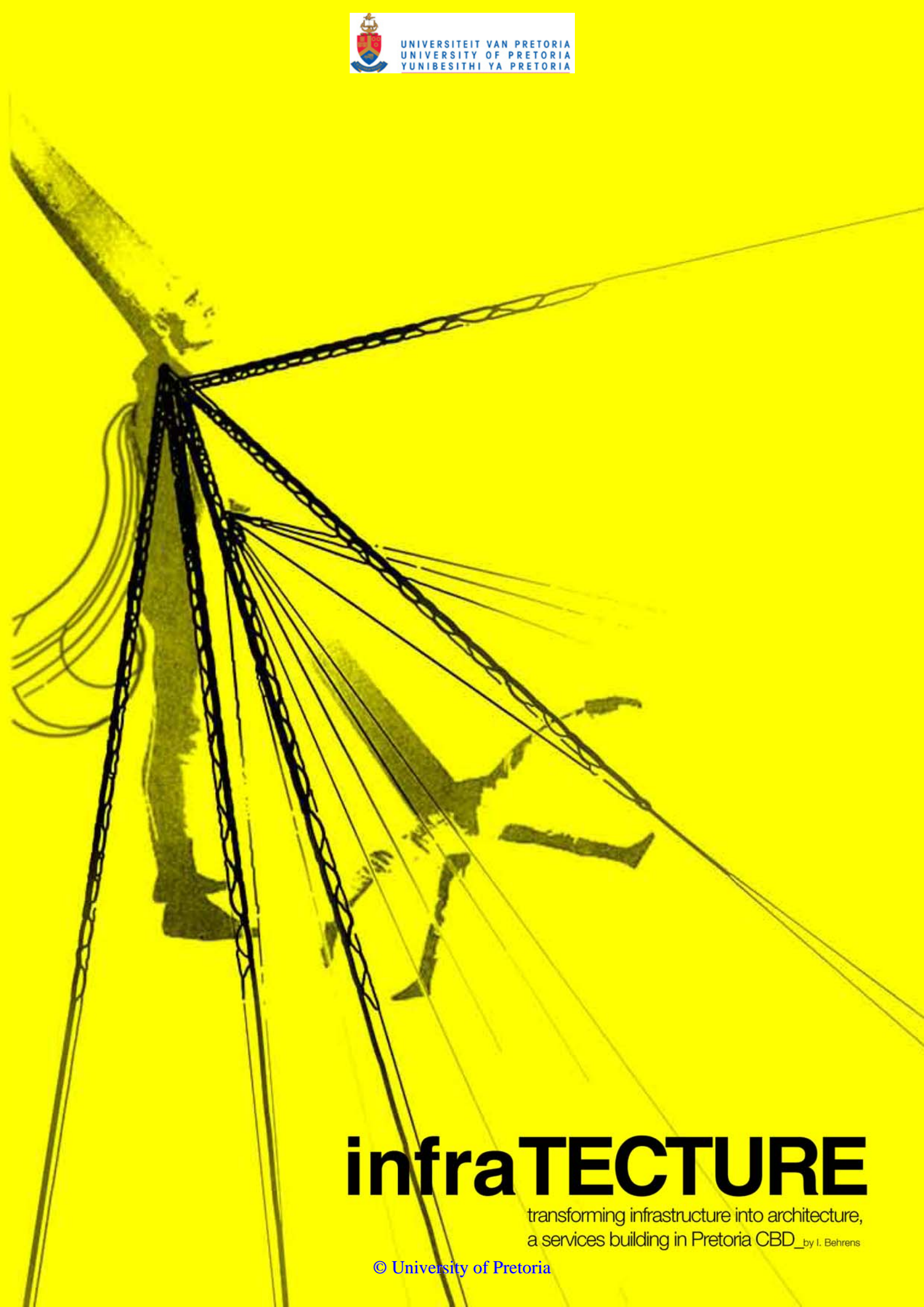




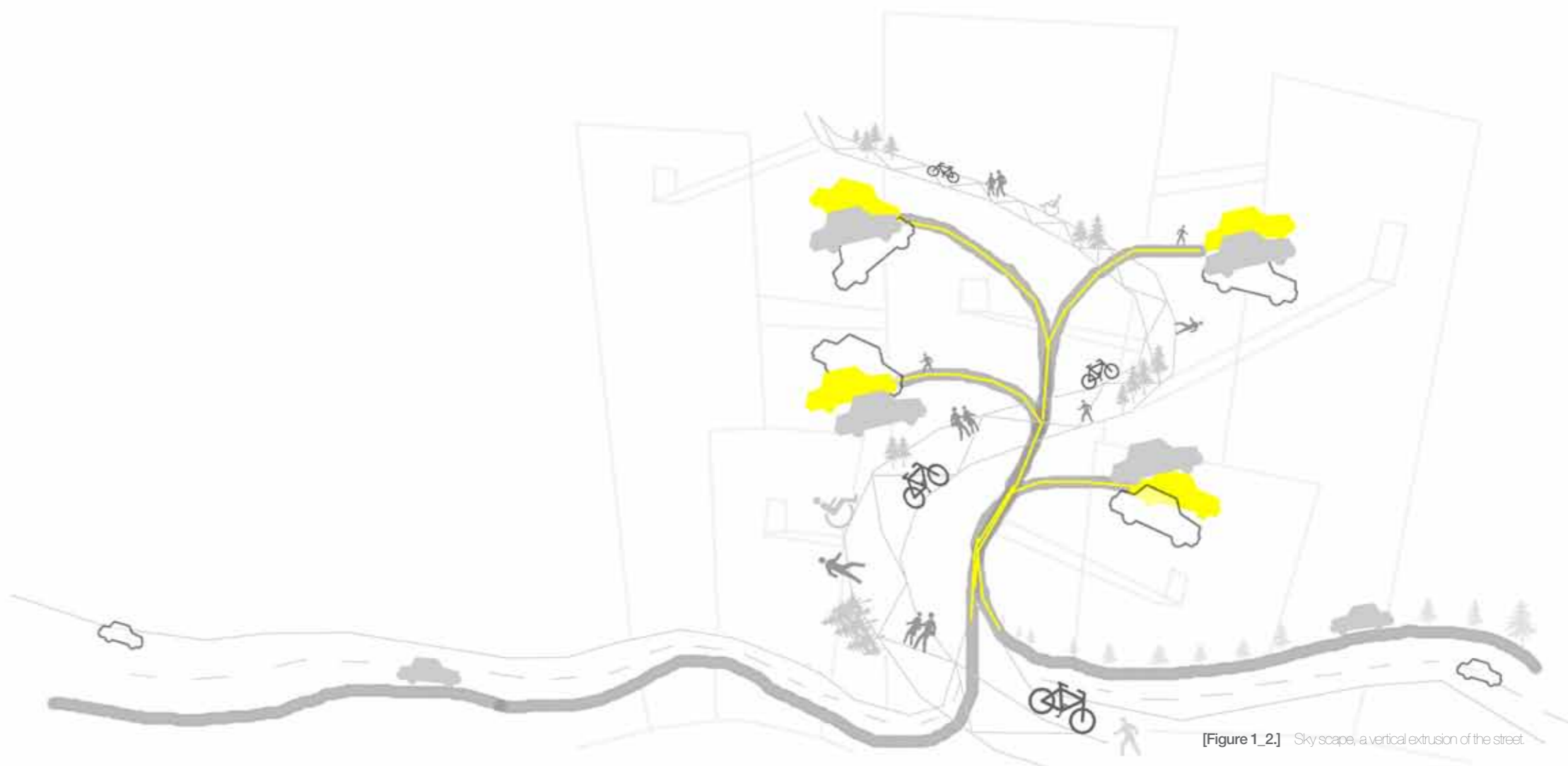
UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



# infraTECTURE

transforming infrastructure into architecture,  
a services building in Pretoria CBD\_by I. Behrens

© University of Pretoria



[Figure 1\_2.] Sky scape, a vertical extrusion of the street.

**Infratecture**

by [ Ilse Behrens ] [ilse2behrens@gmail.com](mailto:ilse2behrens@gmail.com)

Study leaders: Derick de Bruyn &  
Johan Nel Prinsloo

Submitted in part requirement for the Degree Master  
in Architecture (Prof.) in the Faculty of Engineering,  
Built Environment & Information Technology.

University of Pretoria: Department of Architecture. November 2010

[ Dankie ]

Ma, Pa en Jan julle het deurlopend my arms omhoog gehou. Aan my Vader al die prys en eer.

[ Amen ]

Programme

Supplementary **Infrastructural** building (amalgamation of functions; parkade, loading yard, cyclist facilities, commercial, energy supply, water supply, waste disposal & public-social spaces)

Site

**Pretoria CBD** North-east Block, Between Andries-, van der Walt-, Church- and Vermeulen str.

Client

**Tshwane Metro Municipality** in Public Private partnership

Theoretical Premises

Uniting **Urban infrastructure and sustainability** to irrigate urban cores

Main Research question

Can a **building be designed as part of infrastructure** to supply resources like water, electricity and waste removal not only for itself but for the surrounding existing urban fabric as well?

Architectural issue

Re-addressing the **nature of services** in Architecture, imagining infrastructure as architectural space

# [Project Summary]



**D**riving past farms and small towns I am almost always charmed by the occasional wind-pump or remnants thereof. A wind-pump is a symbol of so many tales and trials. In many settlements the absence of a wind-pump would coincide with the absence of life.

The wind-pump is a constant reminder of man's dependence upon nature. This tall, feeble machine spins obediently to the moods of the wind, reaching deep into the earth to lure its cool clear water towards the rays of the sun. To the people in these settlements, the reality of their dependence stands tall in their backyards. Thus they are aware of the blades in the sky, turning or waiting, they are thankful for wind, rain and the sun, they know that these elements sustain their lives.

In the urban environment our water and electricity 'appear' from somewhere we are not familiar with. The moods and tides of nature is cured by the flick of a button or the draw of a curtain. We have no wind-pump to remind us when to slow down or well up. We have no idea that the wind has stopped blowing.

## [Preface]

Introduction	[1]	Background Problem statement Hypothesis Sub Problems Aims Client Outline Brief Methodology	[1.1] [1.2] [1.3] [1.4] [1.5] [1.6] [1.7] [1.8]	p. 18 p. 19 p. 19 p. 19 p. 20 p. 21 p. 21 p. 23
Theoretical Discourse	[2]	Urban Sustainability Urban Infrastructure Tshwane Infrastructure Infrastructure Architecture Conclusion	[2.1] [2.2] [2.3] [2.4] [2.5]	p. 30 p. 36 p. 39 p. 50 p. 55
Contextualizing	[3]	Site Selection Site Introduction Interviews Site Analysis	[3.1] [3.2] [3.3] [3.4]	p. 59 p. 67 p. 78 p. 82
Programme and Accommodation Schedule	[4]	Programme Assembly Programme Exploration Accommodation Assembly Volumetric Assembly	[4.1] [4.2] [4.3] [4.4]	p. 100 p. 111 p. 116 p. 126
Concept	[5]	Introduction Design Informants Concept Exploration Concept Development	[5.1] [5.2] [5.3] [5.4]	p. 132 p. 132 p. 136 p. 144
Design Development	[6]	Design Generators Sketch Design Conclusion	[6.1] [6.2] [6.3]	p. 150 p. 175 p. 190
Architectural Language	[7]	Introduction Structural Expressionism Sustainable Architecture Contextual Architecture Conclusion	[7.1] [7.2] [7.3] [7.4] [7.5]	p. 194 p. 196 p. 198 p. 200 p. 204
Design	[8]	Plans Sections and Elevations Vignettes and Perspectives	[8.1] [8.2] [8.3]	p. 218 p. 238 p. 244
Technical Resolution	[9]	Systems Design Details	[9.1] [9.2]	p. 258 p. 274
Conclusion	[10]	Discussion Future Vision	[10.1] [10.2]	p. 308 p. 310
List of References	[11]	Resources Consulted List of Figures	[11.1] [11.2]	p. 314 p. 318

# [Contents]



## [Abstract]

How does one appropriately design a self-sufficient building in the existing urban fabric without damaging historical urban centres? The role of architecture is to adapt, to not only serve and support people but, also to support its context and surrounding architectures. Thus a new typology needs to be created, by designing the architecture of 'giving'. By looking at how resources travel between and through buildings, one could start to re-address the nature of services within architecture, starting with the outer workings of infrastructure. Through experimenting with the potential of creating space & place as an architectural expression via the re-imaginative design of infrastructure, the existing urban fabric can be served in a sustaining manner. The design is of a services building housing a parkade for conventional and electrical cars and bicycles which generates its own energy, harvests and stores water for itself and surrounds, process waste and sewage and cycles on site resources.