

# Entopia

creating an urban transition space

Oickers 2011

# ENTOPIA: CREATING AN URBAN TRANSITION SPACE

# Entopia: Creating an urban transition space by Heinrich Olckers

Study Leader: Rudolf Van Rensburg  
Coarse Coordinator: Jacques Laubscher  
Mentor: Jacques Laubscher

Submitted in fulfilment as part of the requirements for the degree Masters in Architecture (Professional)

Department of Architecture

Faculty of Engineering, Built Environment and Information Technology

University of Pretoria

# Plagiarism Report

In accordance with Regulation 4(e) of the General Regulations (G.57) for dissertations and theses, I declare that this thesis, which I hereby submit for the degree Master of Architecture (Professional) at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

I further state that no part of my thesis has already been, or is currently being, submitted for any such degree, diploma or other qualification.

I further declare that this thesis is substantially my own work. Where reference is made to the works of others, the extent to which that work has been used is indicated and fully acknowledged in the text and list of references.



---

Heinrich Olckers

# Project Summary

Full dissertation title:	Entopia: Creating an urban transition space	Client:	Public/ Private partnership.
Submitted by:	Heinrich Olckers (Mr)	Users:	Commuters entering and leaving the city.
Student number:	25010973	Site Location:	Erf R/785 corner of Paul Kruger and Scheiding Street, Pretoria.
Study leader:	Rudolf Van Rensburg (Prof. )	GPS Coordinates:	25°45'22.86"S, 28°11'21.23"E.
Course coordinator	Jacques Laubscher (Dr)	Theoretical Premises:	The role of Environmental Psychology and New Urbanism in socially concious architectue.
Mentor	Jacques Laubscher (Dr)	Architectural Approach:	Creating an urban transition space that facilitates desegregation social cohesion.
Degree:	Master of Architecture (Professional) - MArch(Prof)	Research Field:	Urbanism and human settlements.
Department:	Department of Architecture.	Main Research Question:	What is the role of architecture in facilitating social cohesion and community formation?
Faculty:	Faculty of Engineering, Built Environment and Information Technology.		
University:	University of Pretoria.		
Program:	Urban Transition space.		
Site:	corner of Paul Kruger and Scheiding Street, Pretoria CBD.		

# Table of Contents

List of Figures.....	iv	<b>Chapter 3 – Theoretical Investigation</b>	
Abstract.....	viii	Introduction.....	17
Terminology.....	x	Environmental Psychology.....	18
Acknowledgement.....	xii	Sociofugal + Sociopetal.....	18
<b>Chapter 1 – Introduction</b>		Precedent.....	19
Background + context.....	2	Interpersonal Distances.....	20
Choice of Site.....	3	Precedent.....	21
Importance of the Project.....	4	Crowding.....	22
Aim.....	4	Psychological Effect.....	24
Design Problem.....	5	Precedent.....	24
Research Methodology.....	6	Lively Communities.....	25
Assumptions + Delimitations.....	7	New Urbanism.....	26
<b>Chapter 2 – Reasoning and Project Justification</b>		Building Typology.....	26
Eutopia, Outopia & Entopia.....	10	Single Use + Multi Use.....	27
Choice of Program.....	11	Precedent.....	27
Client.....	12	Natural Features + Open Spaces.....	28
Problem Statement.....	12	Fostering Pedestrianism.....	29
Research Questions.....	13	Accessibility + Proximity.....	30
Hypothesis.....	13	Conclusion.....	31

## Chapter 4 – Framework

Location.....	34
Identity.....	34
Attractions.....	35
Problem.....	36
Pedestrian Movement.....	36
Fragmented Identity.....	36
Minnaar Street.....	36
Public Buildings.....	36
Target Group.....	46
Vision + Aims.....	46
Framework Proposal.....	47
Urban Problems Identified within the Study Area.....	48
Interventions + Opportunities.....	50
Urban Design Proposal for the Precinct.....	52
Response to Framework.....	54
Selected Sites.....	54

## Chapter 5 – Context + Site

Context.....	59
Axis + Transport.....	60

Historical Consideration.....	60
Pretoria Station + Station Square.....	60
Victoria Hotel.....	60
Gautrain.....	61
Climate.....	61
Materiality.....	62
Material Response to Typology.....	62
Uses Around Site.....	64
Problems.....	66
Lack of Identity.....	66
Barrier.....	66
Site Orientation.....	67
Gateway.....	68
Resting Space.....	68
Conclusion.....	69

## Chapter 6 – Design Development

Introduction.....	72
Entopia.....	72
Programmatic Response.....	72
Volumetric Exploration.....	74

Theoretical Elements.....	78	Material Selection.....	116
Parti Diagram.....	80	Building Envelope.....	116
Extension of Public Space.....	82	Formica SolidCore.....	116
Gateway Formation.....	84	Steel.....	117
Communication Activator.....	86	Light Gauge Steel Trusses.....	117
Plan Development.....	88	Services.....	118
		Fire.....	119

## Chapter 7 – Technical Investigation

Introduction.....	100
Parti Diagram.....	102
Building Structure.....	104
Screen Structure.....	106
Solar Studies + Response.....	108
Sustainability.....	109
System Selection.....	109
Cross Ventilation.....	110
Adaptability.....	110
Summer Systems.....	112
Winter Systems.....	113
Ventilation Ducts.....	114
Natural Light.....	114
Water.....	115

## Chapter 8 – Conclusion

Conclusion.....	123
Bibliography.....	124



# List of figures

## Chapter 1 – Introduction

- Fig. 1.1: Women resisting apartheid on 9 August 1956 (Creativeroots, 2011)
- Fig. 1.2: Continuing segregation two weeks after blacks were allowed to travel on 'white-only' buses on February, 1990 (Rathe, 2011)
- Fig. 1.3: Apartheid Space Planning (adapted from Osman & Hindes, 2005)
- Fig. 1.4: Tswane Apartheid Space Planning (image by author, 2011)
- Fig. 1.5: Panorama of threshold (photo by author, 2011)
- Fig. 1.6: Locality Map (adapted from Afrigis, 2011)
- Fig. 1.7: Design process followed during the project (image by author, 2011)
- Fig. 1.8: Existing building on site (image by author, 2011)

## Chapter 2 – Reasoning and Project Justification

- Fig. 2.1: Liminal Deploy by Karla Hackenmiller ([Tanks], 2011)
- Fig. 2.2: Liminal Deploy analysis (image by author, 2011)
- Fig. 2.3: Existing Skyline with little attention given to gateway (image by author, 2011)
- Fig. 2.4: Creating a gateway (image by author, 2011)

## Chapter 3 – Theoretical Investigation

- Fig. 3.1: Isivivane sociopetal space (adapted by author from Freedom Park, 2011)
- Fig. 3.2: Isivivane sociopetal seating (adapted by author from Freedom Park, 2011)
- Fig. 3.3: S'khumbuto sociopetal main gathering space (adapted by author from Freedom Park, 2011)

- Fig. 3.4: Isivivane sociofugal seating (adapted by author from Freedom Park, 2011)
- Fig. 3.5: Wall of names - sociofugal corridor (adapted by author from Freedom Park, 2011)
- Fig. 3.6: Gallery of leaders sociofugal space (adapted by author from Freedom Park, 2011)
- Fig. 3.7: Interpersonal distances (adapted by author from Gifford, 1997: 98)
- Fig. 3.8: Sammy Marx Square with empty central space and inhabited sides (photo by author, 2011)
- Fig. 3.9: Empty centre (photo by author, 2011)
- Fig. 3.10: Inhabited side (photo by author, 2011)
- Fig. 3.11: Formal garden with empty central space and inhabited sides (photo by author, 2011)
- Fig. 3.12: Urban rooms (photo by author, 2011)
- Fig. 3.13: Urban rooms (photo by author, 2011)
- Fig. 3.14: Crowding in Church Street (photo by author, 2011)
- Fig. 3.15: Crowding in Paul Kruger Street (photo by author, 2011)
- Fig. 3.16: Entrance to Sammy Marx Mall (photo by author, 2011)
- Fig. 3.17: Melrose Arch, Johannesburg (Alet, 2010)
- Fig. 3.18: Streetscape activation: Scheiding Str. (photo by author, 2011)
- Fig. 3.19: Natural resting space: Burgers Park (photo by author, 2011)
- Fig. 3.20: Natural resting space: Church Square (photo by author, 2011)
- Fig. 3.21: Corridor typology (image by author, 2011)
- Fig. 3.22: Unicrest, Hatfield - corridor typology (Private property Listings, 2011)

- Fig. 3.23: Courtyard typology (image by author, 2011)
- Fig. 3.24: Apartheid Museum courtyard, Johannesburg (Myfundi, 2002)
- Fig. 3.25: Schubart Park illustrating residential blocks and courtyard (Prinsloo, 2010)
- Fig. 3.26: Church Square (photo by author, 2011)
- Fig. 3.27: Reserve Bank garden (photo by author, 2010)
- Fig.3.27: Paul Kruger axis (photo by author, 2011)
- Fig. 3.28: Department of Public Works entrance (photo by author, 2011)
- Fig. 3.29: Scheiding Street taxi rank (photo by author, 2011)
- Fig. 3.30: Bloed Street taxi rank (photo by author, 2010)
- Fig. 3.31: Freedom Park aerial view (adapted by author from Afrigis, 2011)
- Fig. 3.32: Social design principles (figure by author, 2011)

#### Chapter 4 – Framework

- Fig. 4.1: Precinct analysis: boundaries + nodes (Framework group, 2011)
- Fig. 4.2: Pretoria Station (photo by author, 2010)
- Fig. 4.3: Victoria Hotel (photo by author, 2010)
- Fig. 4.4: City Hall (photo by author, 2010)
- Fig. 4.5: Pretorius Square with Transvaal Museum (photo by author, 2010)
- Fig. 4.6: Burgers Park (photo by author, 2010)
- Fig. 4.7: Melrose House (photo by author, 2010)
- Fig. 4.8: Museum Park district (photo by author, 2010)
- Fig. 4.9: Analysis\_1: strengths weaknesses and threats (Framework group, 2011)
- Fig. 4.10: Building functions within the area (Framework group, 2011)
- Fig. 4.11: Public space network (Framework group, 2011)
- Fig. 4.12: Average daytime pedestrian activity (Framework group, 2011)
- Fig. 4.13: Average night time pedestrian activity (Framework group, 2011)

- Fig. 4.14: Vehicular transportation routes (Framework group, 2011)
- Fig. 4.15: Public transportation routes + nodes (Framework group, 2011)
- Fig. 4.16: Landmarks, views + visual corridors (Framework group, 2011)
- Fig. 4.17: Analysis\_2: opportunities (Framework group, 2011)
- Fig. 4.18: Urban problems identified within the study area (Framework group, 2011)
- Fig. 4.19: Interventions + opportunities (Framework group, 2011)
- Fig. 4.20: Urban design proposal for the precinct (Framework group, 2011)
- Fig. 4.21: Selected sites within the precinct (Framework group, 2011)

#### Chapter 5 – Context + Site

- Fig. 5.1: Site location (photo by author, 2011)
- Fig. 5.2: Site plan indicating site location, axis, transportation nodes and historical buildings (adapted by author from Afrigis)
- Fig. 5.3: Railway line steel pergola (photo by author, 2011)
- Fig. 5.4: Masonry and mosaic tile facade (photo by author, 2011)
- Fig. 5.5: Masonry and exposed structure (photo by author, 2011)
- Fig. 5.6: Masonry and exposed structure (photo by author, 2011)
- Fig. 5.7: Masonry and exposed structure (photo by author, 2011)
- Fig. 5.8: Masonry and steel window frames (photo by author, 2011)
- Fig. 5.9: Masonry and exposed structure (photo by author, 2011)
- Fig. 5.10: Painted masonry and use of soldier bond (photo by author, 2011)
- Fig. 5.11: Masonry and use of brick on edge bond (photo by author, 2011)
- Fig. 5.12: Sheet metal roof + exposed timber truss (photo by author, 2011)
- Fig. 5.13: Timber window frames (photo by author, 2011)
- Fig. 5.14: Masonry construction and shadow lines (photo by author, 2011)
- Fig. 5.15: Decorative plaster finish (photo by author, 2011)
- Fig. 5.16: Smooth plaster finish and steel shading (photo by author, 2011)

Fig. 5.17: Building height and roof construction (photo by author, 2011)

Fig. 5.18: Uses around site (photo by author, 2011)

Fig. 5.19: Panorama indicating site within context and building functions  
(by author, 2011)

Fig. 5.20: Site plan indicating problems identified within the liminal space  
(adapted by author from Afrigis, 2011)

Fig. 5.21: Shadows on site (image by author, 2011)

Fig. 5.22: Site plan (image by author, 2011)

## Chapter 6 – Design Development

Fig. 6.1: Development of building program (by author, 2011)

Fig. 6.2: Levels of contact (by author, 2011)

Fig. 6.3: Volumetric exploration (by author, 2011)

Fig. 6.4: Model #1 (by author, 2011)

Fig. 6.5: Model #2 (by author, 2011)

Fig. 6.6: Model #3 (by author, 2011)

Fig. 6.7: Model #4 (by author, 2011)

Fig. 6.8: Model #5 (by author, 2011)

Fig. 6.9: Model #6 (by author, 2011)

Fig. 6.10: Development of theoretical elements (by author, 2011)

Fig. 6.11: Square connection to Pretoria Station, Station Square + Victoria  
Hotel (by author, 2011)

Fig. 6.12: Parti diagram (by author, 2011)

Fig. 6.13: Square connection to Victoria Hotel + Paul Kruger Street  
(by author, 2011)

Fig. 6.14: South western perspective (by author, 2011)

Fig. 6.15: North western perspective (by author, 2011)

Fig. 6.16: Extension of public space development (by author, 2011)

Fig. 6.17: Gateway formation development (by author, 2011)

Fig. 6.18: Communication activator development (by author, 2011)

Fig. 6.19: Basement plan and development (by author, 2011)

Fig. 6.20: Ground floor plan and development (by author, 2011)

Fig. 6.21: First floor plan and development (by author, 2011)

Fig. 6.22: Second floor plan and development (by author, 2011)

Fig. 6.23: Third floor plan and development (by author, 2011)

Fig. 6.24: Fourth floor plan and development (by author, 2011)

Fig. 6.25: Fifth floor plan and development (by author, 2011)

Fig. 6.26: Roof plan (by author, 2011)

Fig. 6.27: Southern elevation (by author, 2011)

Fig. 6.28: Section AA (by author, 2011)

Fig. 6.29: Section BB (by author, 2011)

## Chapter 7 – Technical Investigation

Fig. 7.1: Section CC (by author, 2011)

Fig. 7.2: Section BB (by author, 2011)

Fig. 7.3: Strip section indicating response to function and hierarchy through  
building envelope (by author, 2011)

Fig. 7.4: Detail: cantilevered slab of new public square (by author, 2011)

Fig. 7.5: Concrete columns and slabs (by author, 2011)

Fig. 7.6: Screen structure (by author, 2011)

Fig. 7.7: Roof structure (by author, 2011)

Fig. 7.8: Ventilation towers structure (by author, 2011)

Fig. 7.9: Structural diagram of entire building (by author, 2011)

Fig. 7.10: Detail: screen construction (by author, 2011)

Fig. 7.11: Detail: cantilever beam to tie beam (by author, 2011)

Fig. 7.12: Detail: cantilever beam to slab mounted channel (by author, 2011)

Fig. 7.13: Development of screen structure (by author, 2011)

Fig. 7.14: Solar study (by author, 2011)

Fig. 7.15: Solar suitability (Kitwe, 2008)

Fig. 7.16: Evacuated-tube solar collector (Green terrafirma, 2007)

Fig. 7.17: Evaporative cooling effectiveness

(adapted by author from Air & Water, 2011)

Fig.7.18: Pretoria wind roses (redrawn by author from Wegelin, 2009:129)

Fig. 7.19: Cross ventilation (by author, 2011)

Fig. 7.20: Development of environmental system (by author, 2011)

Fig. 7.21: Sustainability diagram (by author, 2011)

Fig. 7.22: Twist outlet floor diffuser (Alibaba, 2011)

Fig. 7.23: Posi lock access floor (Marion Group, 2011)

Fig. 7.24: Posi lock access floor composition (Marion Group, 2011)

Fig. 7.25: Detail section indicating functioning of systems (by author, 2011)

Fig. 7.26: Strip section illustrating day lighting on northern facade

(by author, 2011)

Fig. 7.27: Detail: roof construction and southern light through celestary window (by author, 2011)

Fig.7.28: Exploded axonometric of ventilation tower (by author, 2011)

Fig.7.29: Rain water calculations (by author, 2011)

Fig. 7.30: Corobrik Roan Satin brick (Corobrik, 2009)

Fig. 7.31: Low e safety glass (PG Group, 2011)

Fig. 7.32: Low e safety glass composition (PG Group, 2011)

Fig. 7.33: Formica SolidCore (PG Bison, 2009)

Fig. 7.34: Light gauge steel trusses (Specifile, 2011)

Fig. 7.35: Vela U-truss (Specifile, 2011)

Fig. 7.36: Material time lag due to the flywheel effect (Bothma, 2004: 75-76)

Fig. 7.37: Service distribution: fourth floor (by author, 2011)

Fig. 7.38: Service distribution (by author, 2011)

Fig. 7.39: Circulation (by author, 2011)

Fig. 7.40: Fire plan: fourth floor (by author, 2011)

# Abstract

**Keywords:** Post-Apartheid, segregation, social cohesion, community formation, *entopia*

The study addresses the continuous segregation within Post-Apartheid cities. The project aims to determine the role of architecture with regards to social cohesion and community formation and aims to establish whether architecture can be instrumental to the reversal of segregation.

The architectural building type that will be investigated is an urban transition space that will facilitate movement into and out of the city through the creation of a gateway or urban threshold.

An architectural space that facilitates social interaction will be investigated by determining appropriate environments for different types of interaction.

The architectural intervention will make use of social design strategies and adapt them to the local context in order to achieve *entopia* (achievable space).

# Terminology

**Architecture** – The term architecture collectively refers to the three schools of architecture and includes: architecture, landscape architecture and interior architecture.

**Built Environment** –The term built environment is used to describe all man made alterations to the environment. The term includes buildings and structures as well as interventions within the landscape such as parks.

**Urban waiting room** – An urban waiting room is defined as a space within the urban environment which is open to the public and serves the main function of waiting or the passage of time while waiting for a different event to occur.

**Entopia** – The term *entopia* translates to achievable space. *Entopia* relates to architecture of the every day and aims to address problems within the built environment that is unique to its place and setting.

**Social Cohesion** – Social cohesion is defined as a multidimensional phenomenon where there is a sense of belonging for all communities. The main characteristic of social cohesion is the ability to develop strong and positive relationships between people of different backgrounds and ethnicities.

**Genius Loci** – The prevailing spirit, character or atmosphere of a place.

**CBD** – Central Business District

**SETA** – Sector Education and Training Authority

**ABET** – Adult Basic Education and Training



# Acknowledgement

Thank you to my parents, Lelanie, Z + Charl for your continuous support and understanding and to Rudolf + Jacques for your leadership and guidance.