



vehicle _ FOR AN AERIAL TRANSPORT SYSTEM



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA



ELITA LOUW
NOVEMBER 2008
MENTOR > NICO BOTES
STUDY LEADER > NICO BOTES

UNIVERSITY OF PRETORIA DEPARTMENT OF ARCHITECTURE
SUBMITTED AS PART OF THE REQUIREMENTS FOR THE DEGREE MAGISTER IN INTERIOR ARCHITECTURE [PROFESSIONAL]
IN THE FACULTY OF ENGINEERING, THE BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY



Figure 1: aerial transport (Louw: 2008)

Vehicle _ FOR AN AERIAL TRANSPORT SYSTEM

This thesis deals with the interior architecture of aerial transport systems as a method of transport.

The hypothesis argues that social barriers can be challenged through the physical formation of the aerial systems, its structure, assembly and adaptability to seasonal site.

The platform used to explore this premise is the Sani Pass in the Southern Drakensberg. There is a stigmatization around cable car systems within the raw, primal, vast and overwhelming South African landscape. It is a silent debate lingering within every mind at the mere mentioning of an aerial cable car system.

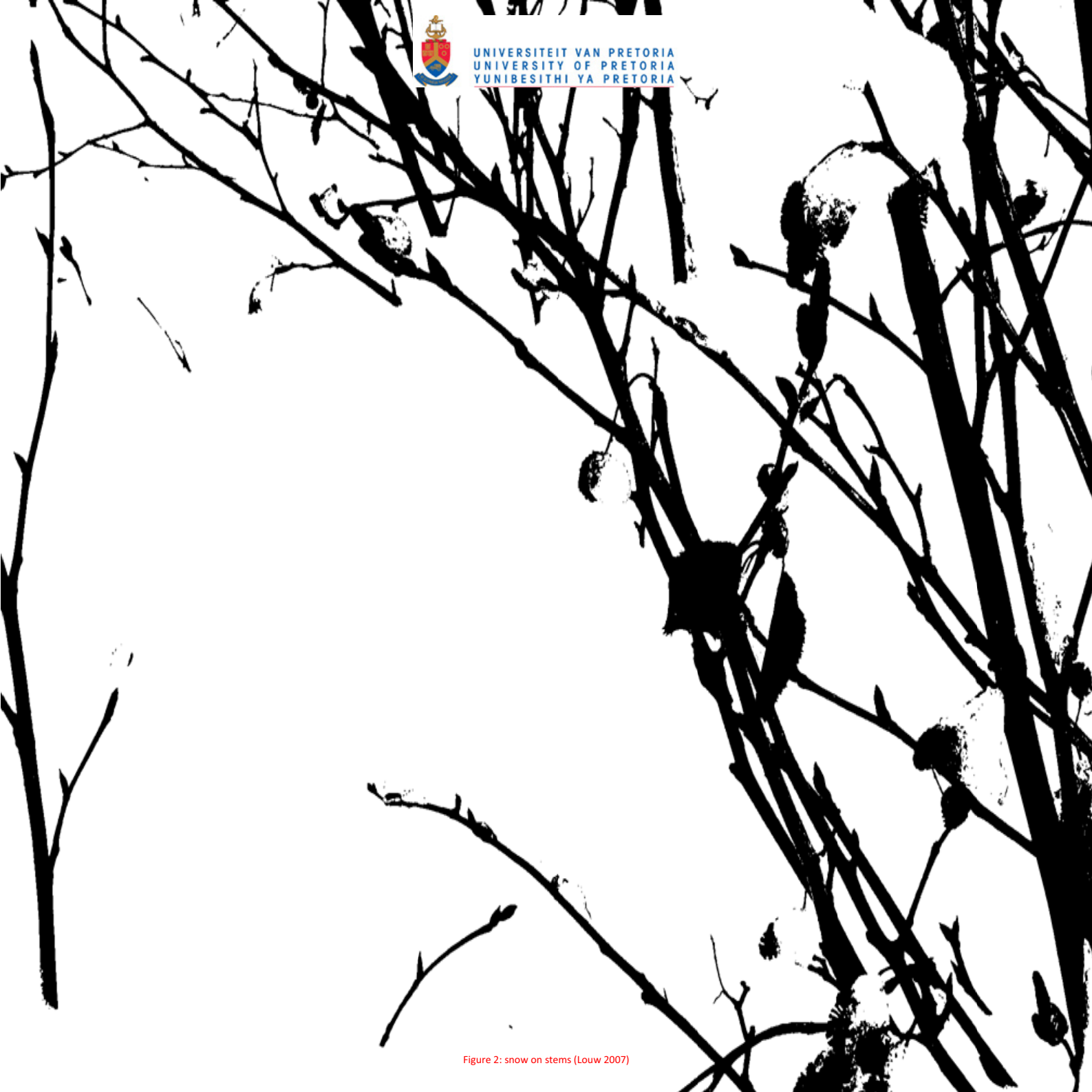


Figure 2: snow on stems (Louw 2007)

CONTENT

CONTENT	vii
LIST OF FIGURES	ix
LIST OF TABLES	ix
A THOUGHT	2
INTRODUCTION	4
DESIGN TASK	6
PROBLEM STATEMENT	6
THE CHALLENGE	8
DESIGN OBJECTIVE	8
CONTEXT STUDY	10
SITE.....	10
USER PROFILE	12
PRECEDENTS	14
Galzigbahn.....	14
Marion Island	16
Antarctic Halley VI	18
Contemporary Art Container	20
Zaragoza Bridge Pavilion.....	20
Honda Puyo	22
BASELINE STUDY	24
1. GENERAL DESIGN	24
2. CARRIAGE CONSIDERATIONS	26
3. STATIONS.....	28
4. CONSTRUCTION CONDITIONS.....	30
5. COMMUNICATIONS	30
CONCEPTUAL THINKING	32
TERMINAL	32
CARRIAGE	36
DESIGN DISCOURSE	42
PRODUCT DESIGN	42
NEW DESIGN: AN ERA OF HYBRID PRODUCTS	42
ERGONOMICS	42
MULTI FUNCTIONALITY	44
LIFE CYCLE AND SUSTAINABILITY	44
COLOUR.....	46
TEXTURE	46
PROPORTION	46
INCLUSIVE DESIGN	50
TECHNICAL RESOLUTION	60
MATERIALS	62
PMMA (polymethylmethacrylate)	64
ASSEMBLY AND FASTENING	72
DESIGN DRAWINGS	74
BIBLIOGRAPHY	75
APPENDICES 1: TERMINOLOGY AND DEFINITIONS	80
APPENDICES2: MANUFACTURING	86



Figure 3: "gondola" cable car (Louw 2007)

LIST OF FIGURES

Figure 1: aerial transport (Louw: 2008).....	iv
Figure 2: snow on stems (Louw 2007).....	vi
Figure 3: "gondola" cable car (Louw 2007).....	viii
Figure 4: winter sport (www.flickr.com).....	1
Figure 5: extreme skiing (www.flickr.com).....	3
Figure 6: snowboarding (www.flickr.com).....	5
Figure 7 aerial transport (Louw: 2008).....	5
Figure 8: topographic map of Lesotho and rest of the contextual site (http://maloti.co.za).....	9
Figure 9: pictures multiple users designed for (www.flickr.com).....	11
Figure 10: the Galzighbahn base terminal (www.ropeways.net/aktuell/galzigbahn/galzigbahn.htm).....	13
Figure 11: new base scientific base at Marion Island (Raath: 2008).....	15
Figure 12: a module of the new Antarctic Halley VI base (Raath: 2008).....	17
Figure 13: interior of the bridge pavilion (www.ihalife.com/blogs/entries/7008.htm).....	19
Figure 14: new Honda concept car (www.hydrogencarsnow.com/Honda-Puyo.htm).....	21
Figure 15: safety principles should be followed due to high risk transport system (Louw: 2005).....	23
Figure 16: strong alloy structure, enhancing safety (Louw: 2004).....	25
Figure 17: a typical terminal with proper signage and safety (Louw: 2007).....	27
Figure 18: terminal construction complying with proper safety mechanisms (Louw: 2005).....	29
Figure 19: proposed terminal layout and data.....	31
Figure 20: terminal design considerations and system analysis planning.....	33
Figure 21: carriage design considerations and system analysis planning.....	35
Figure 22: carriage design, ergonomic application and planning.....	37
Figure 23: vehicles moving through the "ferris wheel".....	39
Figure 24: design should consider size, age and culture (Louw: 2007).....	41
Figure 25: designing with nature - sustainable (Louw: 2008).....	43
Figure 26: colour, texture and proportion on the Lesotho Mountains (Louw: 2008).....	45
Figure 27: proposed Lesotho brand.....	47
Figure 28: contrast (www.core77.com).....	49
Figure 29: clear and visible lettering in a gondola (Louw: 2007).....	51
Figure 30: a Pictographs/pictograms communicating spaces (www.architonic.com).....	53
Figure 31: application of visible controls and distinctive objects (www.jeep.co.za).....	55
Figure 32: gondola in Bulgaria (Louw: 2005).....	57
Figure 33: mountain activities and detachable chairlifts (Louw: 2005).....	59
Figure 24: exploring people, materials and texture (Louw: 2007).....	61
Figure 35: contemporary PMMA three dimensional systems (http://www.designsponge.blogspot.com).....	63
Figure 36: German Tiger Helicopter Equipped PMMA protective glazing (Moore: 2007).....	65
Figure 37: Marion Island base roof panel prepared for resin infusion (Moore: 2007).....	67
Figure 38: manufactured GRP component by MMS Technologies (Moore: 2007).....	69
Figure 39: component assembly of the body (lobes) of the designed vehicle.....	71
Figure 40: mountains and an aerial transport system (Louw:2005).....	73
Figure 41: mountains and an aerial transport system (Louw:2005).....	79
Figure 42: Resin Transfer Moulding (Composite Materials information sheet 2007).....	87
Figure 43 Wet-Lay-Up/Hand Lay-Up (Composite Materials information sheet 2007).....	88
Figure 44: Vacuum Bagging (Composite Materials information sheet 2007).....	89
Figure 45: Resin Film Infusion (Composite Materials information sheet 2007).....	90
Figure 43: the three unit types.....	90

LIST OF TABLES

Table 1: Terminal design and distances travelled.....	32
Table 2: material strength of GRP compared steel and cement (Composite Materials information sheet 2007).....	68



Figure 4: winter sport (www.flickr.com)

A THOUGHT

Bookchin (1980:22) states that social ecology integrates "the human and natural ecosystems through understanding the interrelationships of culture and nature." He also claims that social ecology shares ideas with holism. Social ecology argues that people are interdependent, and should live in harmony with nature.

Social ecology "not only provides a critique of the split between humanity and nature; it also poses the need to heal them," says Professor Bookchin.

Social ecology is a plan for a new type of human community, with a new relationship with the non-human world.

Bookchin claims that social ecology has its origins in humanity's initial awareness of its own sociality. By this Bookchin means that social ecology has its inspiration in the relationship which ancient communities had with the natural world; a relationship in which nature was an active partner in human society rather than being "mummified and muted" as in modern society. In the ecological community of the future, relations between people and non-human nature will more closely resemble relations in what Bookchin calls "organic communities" – communities from the distant past which were characterized by a sexual division of labour and by the absence of hierarchy.

One of the fundamental principles of modern biology is that processes occurring in organisms obey the laws of chemistry and physics, just as processes in non-living systems do. The special properties of life arise because of the complex organization of organisms and the chemical processes that occur within them (biocentric based on biology). The anthropocentric system functions in the same way. The human specie still remains a biological form of life and reacts similar to other forms of life. However, design also resembles biology but is influenced and determined by social ecology. White males previously dominated the *nuclei* but with social evolution, females and other races have become part of this essential density. A sub-cultural boundary has been crossed. The structure of the eccentric cell remains the same with the centre on the one side of the community, forming a boundary of the community and bulging into the community, although the various nuclei and density rings remain.

As Bookchin's social ecology is mutating, ethnic, cultural and gender conflicts are waning. Females, blacks, children, everybody are merging within these social cells. *Promenades* are becoming part of the *interchange* and all is changing green. The entire infrastructure is more aware of the environment and this boundary between eccentric nuclei is amalgamating biocentric and the anthropocentric. People (all cultures) are merged with nature and walking green routes to work, it's evolution of a social ecology.

Relaying away from destructive ideas of people - architects - hindering the nervous tissue of ecosystems and communities within, and rather recognizing shortcomings within the structure of reconstructing (and redesigning) one could intentionally realize needs within the primal landscape and design upon these needs without hindering. We are romanticizing and redesigning poverty, and somehow we see this as a primal goal – to keep a culture untouched. We are protecting, restoring and procuring a community (instead of the surrounding structures) that longs for contemporary architectural development. We are inherently trying to keep the infant infantile, forgetting that all forms of life will grow. Allison Jagger (1983:56) defines oppression as: " hierarchy, a specific form of domination in which those on the upper side unjustly deprive those on the lower side autonomy and self-determination by unfairly restricting."

In conclusion, the thesis that follows will challenge the above by accepting nature as an entity and designing in response, but also realizing that the community within range should be seen as another creative, living and growing entity with assimilating needs and alliterating ideas.