



C O N C L U S I O N

The Tswaing Crater is an extraordinary place, not only in terms of beautiful scenery, but it is also rich in history and inherent meaning. The proposed project is an attempt to add layers of meaning to the experience of one visiting the site. It is seen as an opportunity to focus the attention of the visitor on certain characteristics of life that is often overlooked in contemporary day-to-day life. The existing landscape at the Tswaing Crater, as well as the knowledge of its origin, inherently reminds one of the earth that we inhabit, as well as the universe within which this earth resides.

The programme of storytelling is employed as a universal medium for understanding history and culture. In this way, a cultural layer is added to the experience of the site. The understanding of the programme is not limited to a single cultural group and indeed, has the potential to extend the experience to different communities and foreign cultures through the use of technology.

The project aims to lead the visitor along a path where different encounters; of the landscape, the architecture and the programme; creates a rich experience of a variety of elements and characteristics. The eventual revelation of the view of the crater, subsequently becomes more than a purely visual experience. The story of Tswaing has been revealed.

Fig. 307 View of the model

 \sim 134 \sim

References



Alexander, C. 1977. A Pattern Language. New York: Oxford University Press.

Alvar Aalto Foundation. The Muuratsalo Experimental House. [Online] Available at: alvaraalto:fi/info/experimentalhouse.htm [2009, October 22]

Anderson, B. 1996. Passive Solar Energy -The Homeowner's Guide to Natural Heating and Cooling. [Online] Available at: http://www.builditsolar.com/Projects/SolarHomes/PasSolEnergyBk/PSEbook.htm. [2010, April 16]

Brown, D. 1998. Voicing the Text: South African oral poetry and performance. Cape Town: Oxford University Press

Cope, M. 2005. *Ghaap, Sonnets fron the Northern Cape*. South Africa: Kwela Books/Snailpress

Cosmic Africa(2003), motion picture, Cosmos Studios, outh Africa. Director: Craig Foster and Damon Foster. Starring Thebe Medupe

Bob. 2005. *Grounded theory: a thumbnail sketch*. [Online] Available at http://www.scu.edu.au/schools/gcm/ar/arp/grounded.html

Eisenman, T. 2006. Raising the bar on green roof design. *Landscape Architecture*. 11: 22-29.

Gilbert, E. 2006. *Eat, Pray, Love: A woman's search for everything across Italy, India and Indonesia*. Penguin Books: United Kingdom.

Goodnow, KJ. 2002. Storytelling and the web in South African Museums. [Online] Available at: http://www.archimuse.com/mw2002/papers/goodnow/goodnow.html [accessed 19 April 2009]

Groak, S. 1992. The idea of building, thought and action in the desgn and production of buildings. London: E&FN Spon.

Graefe, R. Reconstruction of Antonio Gaudi's Church of the Colonia Guell. Proceedings from the Third International Congress on Construction History. May 2009. Cottbus. 729-736. Groenewald, HC. 2003. Zulu Oral Art. *Oral Tradition* 18/1: 78.

Heller, J. 2003. World full of great cities. Catch as catch can. London: Scribner.

Inaba, J. 2009. Storytelling. Volume Archis 2: 2

Jones, L. 2000. *The Hermeneutics of Sacred Architecture: Experience, interpretation, Comparison*. Cambridge, Massachusetts: Harvard University Press.

Kilian, A. 2004. *Linking Hanging Chain Models to Fabrication*. [Online] Available at: http://www.designexplorer.net/newscreens/cadenarytool/KilianACADIA.pdf. [2009, September 17]

Lebens, RM. 1980. Passive Solar Design. London: Applied Science Publishers.

Liptan, T et al. Watergardens as Stormwater infrastructure in Portland, Oregon. Proceedings from the Water Sensitive Ecological Planning and Design symposium. February 25-26 2000. Harvard Design School. 1-31.

Maryland Department of the Environment. 2000. *Maryland Stormwater Design Manual*. Baltimore.

Norberg-Schulz, 1985. *The concept of dwelling.* University of Michigan: Electra.

Norberg-Schulz, C. *The Phenomenon of Place. In Theorizing A New Architecture, An anthology of architectural theory* 1965-1995. Edited by K. Nesbitt. New York: Princeton Architectural Press, p.414-427.

Norberg-Schulz, C. Heidegger's thinking in architecture.



In Theorizing A New Architecture, An anthology of architectural theory 1965–1995. Edited by K. Nesbitt. New York: Princeton Architectural Press, p.430–439.

Okpewho, I. 1992. African Oral Literature: Background, character and continuity. Bloomington and Indianapolis: Indiana University Press.

Orton, A. 1988.. *The way we build now. Form, scale and technique.* London and New York: Spon Press

Pallasmaa, J. 2000. Hapticity and time. *The Architectural Review* 207.1239: 78.

Pennycook, K. 2008. *The Illustrated Guide to Renewable technologies*. [Online] Available at: http://www.bsria.co.uk [2008, October 15]

Reimold, WU., Brandt, D., De Jong, R. & Hancox, J. 1999. *Tswaing Crater: An introduction to the natural and cultural history of the Tswaing region including a description of the hiking trail*. Council for Geoscience: Wits University.

Richardson, P.2007. XS Green: Big Ideas, Small Buildings. London: Thames & Hudson.

Scheub, H. 1975. The Xhosa ntsomi. London: Oxford University Press.

St John Wilson, C. 1992. Architectural Reflections: Studies in the philosophy and practice of

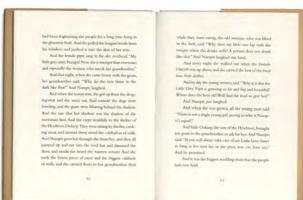
architecture. Oxford: Butterworth Architecture.

Tolkien, J.R.R., 1995, *The Shaping of Middle-earth*, NY, Ballantine Books.

Trochim, W. 1999. *The Research Methods Knowledge Base, 2nd Edition*. [Online] Cornell Custom Publishing, Cornell University, Ithaca, New York. Available at: http://www.socialresearchmethods.net. [2009, May 9]

United States Environmental Protection Agency. 1999. Water Efficiency Technology Fact Sheet. Composting Toilets. Office of Water: Washington DC





And behind the pulings Nampti heard what they were saying.

And when the grass was almost dry, the walked in the kiep und: "What kind of wife did I get? Where does : veld and she called: "O, my Linde Grey States, the heart trembled. And when Nampti was walking in the veld your word, I shall come to own harm?" "Nampti, my Little Grey Sister, must never drain And the Little Grey Pipit sang over her head: "When cover her head with the kasses." he arms of the woman?" And Nampti laughed as she And that night when Natispi was deeping in the walked back to the shelper And when night fell, she said: "My husband, is it not water from the large calabath on the food shelf. And het the currons that the man should rub buche orgo the base arms? Why then is this custom dead in our house?" And when it grew light, he met with the heading And little Oaksep took the crushed buchs out of the little skin bag and he rubbed her arms. And it grew dark; and behind the palings sat the councillors. And litlike green fee, and the laps with the songue when the And the cosmellors said. "This is a very bad thing. We shall stand guard tonight and peep through the smoke mpti laughed. And again he said: "Why do my Nauger mile grow crooked and long?" And Nampri laughed

And his voice trembled and he said: "Why are there hairs on an Namphi amen" And Nampa laughed and the said: "Bab he behavior has keep the common."

And his hour gree week; and he said: "There is a down at my American and Nampa said:" In some the said with perfect a down at my Namphi aren."

And Nampa said: "In some the said and said and the said in a said in said and he radeds on the said, and be for the said in a said in said and the said in the said." In the said in the said in the said in the said: In said the said in the said. It must be not demonal." And their Cokkips was obstrated and he said: "In said and the said in the said i

LIST OF FIGURES



	UNIVERSI	TY OF PR	ETORIA or vegetation. (Author, 2009)
Fig. 1	Schematic of the Tswaing Crater. (Author, 2009)		ETORIA vegetation. (Author, 2009)
Fig. 2	Photograph by Dora Maar	Fig. 40	Surrounding vegetation. (Author, 2009)
Fig. 3	The Mapungubwe Interpretation Centre. (Rich, P et al. 2009. Mapungubwe National park Interpretive	Fig. 41	Contour map. (Author, 2009)
J	Centre. Architecture SA)	Fig. 42	Geology map. (Reimold, WU., Brandt, D., De Jong, R. & Hancox, J. 1999. Tswaing Crater: An introduction
Fig. 4	Interpretation of Ferry Shelter precedent. (Author, 2009)		to the natural and cultural history of the Tswaing region including a description of the hiking trail . Council
Fig. 5	Interpretation of Ferry Shelter precedent. (Author, 2009)		for Geoscience: Wits University.)
Fig. 6	Photographs and sketch of Ferry Shelter, Tiree, Scotland. (Richardson, P.2007. XS Green: Big Ideas, Small	Fig. 43	Ridge sensitivity. (Author, 2009)
g. 0	Buildings. London: Thames & Hudson.)	Fig. 44	Vehicular roads. (Author, 2009)
Fig. 7	Interpretation of Ferry Shelter precedent. (Author, 2009)	Fig. 45	Footpaths. (Author, 2009)
Fig. 8	Photographs of Dune House. (http://onlinewsj.com/media/dune_E_20090316114830.jpg)	Fig. 46	Wetlands. (Author, 2009)
Fig. 9	Diagram of Dune House. (Orton, A. 1988 <i>The way we build now. Form, scale and technique</i> . London and	Fig. 47	Existing staff housing. (Author, 2009)
rig. 7	New York: Spon Press.)	Fig. 48	Mine building ruins. (Author, 2009)
E:- 10	Muuratsalo Experimental house, Alvar Aalto. (http://alvaraalto.fi/3764699031_14f571736a_b.jpg)	Fig. 49	Map of sensitive areas. (Author, 2009)
Fig. 10	Muuratsalo Experimental house, Alvar Aatto. (http://alvaraalto.fi/3149218619_e7ece2e999_b.jpg)	Fig. 50	Existing viewpoint. (Author, 2009)
Fig. 11 Fig. 12	Muuratsalo Experimental house, Alvar Aalto.(http://alvaraalto.fi/3658345752_5dda4361bd_o.jpg)	Fig. 51	Existing entrance. (Author, 2009)
_		Fig. 52	Existing visitor's centre. (Author, 2009)
Fig. 13	Muuratsalo Experimental house, Alvar Aalto.(http://alvaraalto.fi/3658342866_212beaa8d4_o.jpg)	Fig. 53	Existing Visitor's Certifie. (Nutrior, 2007) Existing Kgotla. (Author, 2009)
Fig. 14	Roter Kamm Impact structure.		'
Fig. 15	Kalkkop impact structure. (Reimold, WU., Brandt, D., De Jong, R. & Hancox, J. 1999. <i>Tswaing Crater: An</i>	Fig. 54	Development framework. (Author in cooperation with Anja Bredell, 2009)
	Introduction to the natural and cultural history of the Tswaing region including a description of the hiking	Fig. 55	Artwork from the Middle Ages. (http://commons.wikimedia.org/wiki/File:Universum.jpg)
	trail. Council for Geoscience: Wits University.)	Fig. 56	The ceque system, Cuzco, Peru. (Nasca Display Interpretation Project(1974-2005)
Fig. 16	Tswaing Crater impact structure, (Author, 2009)	Fig. 57	The Hogon Temple. (Cosmic Africa(2003), motion picture, Cosmos Studios, outh Africa. Director: Craig
Fig. 17	Impact Crater distribution. (https://www.dmr.nd.gov/ndgs/Geology%20Notes/Meteor/images/Crater%20		Foster and Damon Foster. Starring Thebe Medupe)
	Impact%20Map.jpg)	Fig. 58	The observatory at Nabta Playa. (http://www.ancient-wisdom.co.uk/Images/countries/Egyptian%20
Fig. 18	Morokweng Impact Crater. (en.wikipedia.org/wiki/Morokweng_crater)		pics/nabta3.jpg)
Fig. 19	Vredefort Dome impact structure. (en.wikipedia.org/wiki/Vredefort_Dome)	Fig. 59	The ceque system, Cuzco, Peru. (http://www.timstouse.com/images/EarthHistory/NazcaLines/19991014-
Fig. 20	Schematic of impact event. (Reimold, WU., Brandt, D., De Jong, R. & Hancox, J. 1999. <i>Tswaing Crater: An</i>		raycenter.jpg)
	introduction to the natural and cultural history of the Tswaing region including a description of	Fig. 60	Plan of the observatory at Nabta Playa. (http://www.ancient-wisdom.co.uk/Images/countries/
	the hiking trail . Council for Geoscience: Wits University.) Author adaptation.		Egyptian%20 pics/nabta3.jpg)
Fig. 21	The Great comet of 1577. (http://commons.wikimedia.org/wiki/File:Great_Comet_of_1577.gif)	Fig. 61	View from atop the Tumulus building. (Author 2009)
Fig. 22	The flight of the comet of 1665. (http://commons.wikimedia.org/wiki/File:Komet_Flugschrift.jpg)	Fig. 62	Perspective views at Maropeng. (Sketches from photos by the author, 2009)
Fig. 23	The Great comet of 1861. (http://commons.wikimedia.org/wiki/File:Great_Comet_1861.jpg)	Fig. 63	The art of storytelling concept sketch. (Author 2009)
Fig. 24	The comet Donati of 1858. (http://commons.wikimedia.org/wiki/File:CometDonati.jpg)	Fig. 64	Storytelling structure. (Inaba, J. 2009. Storytelling. <i>Volume Archis</i> 2: 2) Author adaptation.)
Fig. 25	Extract from a Tintin graphic novel. (Herge.1974. The Adventures of Tintin- The Shooting star.(p.71) UK:	Fig. 65	Storytelling structure. (Inaba, J. 2009. Storytelling. <i>Volume Archis</i> 2: 2) Author adaptation.)
	Egmont)	Fig. 66	Storytelling structure. (Inaba, J. 2009. Storytelling. Volume Archis 2: 2) Author adaptation.)
Fig. 26	Devastation caused by the Tunguska event. (en.wikipedia.org/wiki/Tunguska_event)	Fig. 67	Scottish Storytelling Centre facade. (http://www.scottishstorytellingcentre.co.uk/centre/ netherbow_
Fig. 27	Hadschar al Aswad. (http://www.meteoris.de/basics/cult3.html)		centre_104)
Fig. 28	Contextual location of the Tswaing Nature Reserve. (The City of Tshwane Metropolitan Municipality. Hill_	Fig. 68	Scottish Storytelling Centre. (http://www.scottishstorytellingcentre.co.uk/centre/
	shade_A4.mxd.) Author adaptation.	3	23116948674abf339e2d b)
Fig. 29	Surrounding area. (Author, 2009)	Fig. 69	Scottish Storytelling Centre library. (http://www.scottishstorytellingcentre.co.uk/centre/ scottish_
Fig. 30	Boundaries and circulation routes around Tswaing. (University of Pretoria GIS.) Author adaptation.		storytellingmfa06_mcneill3)
Fig. 31	Salt mine ruins. (Author, 2009)	Fig. 70	Scottish Storytelling Centre theatre. (http://www.scottishstorytellingcentre.co.uk/centre/ scottish_
Fig. 32	Iron age factory. (Author, 2009)	1.9.70	storytellingmfa06_mcneill5)
Fig. 33	Mining reservoir. (Author, 2009)	Fig. 71	Storytelling along a path. (Author 2009)
Fig. 34	Warming pools. (Author, 2009)	Fig. 72	African storytelling structure. (Author 2009)
Fig. 35	Historical oxwagon road. (Author, 2009)	Fig. 73	Concept drawings for viewpoint. (Author 2009)
Fig. 36	Mauss cutting. (Author, 2009)	Fig. 74	Concept drawings for multimedia space. (Author 2009)
Fig. 37	Salt mine. (Author, 2009)	Fig. 75	Concept drawings for mainmedia space. (Author 2007)
g. 07		1 lg. 7 U	Concept arawings for entrance. (Author 2007)

		JNIVERSITEIT VAN PRE	TORIA
Fig. 76	Concept drawings for outside spaces. (Author 2009)	INIVERSITY OF PRE	TORIA ne typical topography at Tswaing. (Author 2010)
Fig. 77			TORIA tic exploration of the wall. (Author 2010)
Fig. 78	Concept drawings for sketchplan. (Author 2009)		iagrammatic exploration of the wall. (Author 2010)
Fig. 79	Written interpretation of african stiorytelling. (Marais, E. <i>The Rain Bull.</i> 3rd ed. Cape Town: Human		iagrammatic exploration of the wall. (Author 2010)
	Rousseau)		ontour model. (Author, 2009)
Fig. 80	Site Contour plan. (Author 2009)	=	nitials in a tree. (www.flickr.com)
Fig. 81	Site section. (Author 2010)		olated elevation of the wall in the landscape. (Author 2010)
Fig. 82	The path highlighted. (Author 2009)		ne Kaikai wall of expression. (kaikai.co.za/wall-of-expression.htm)
Fig. 83	Confluence Park, Washington, Maya Lin, 2007.		ngraved metal plaques, Constitutional court. (Author 2006)
Fig. 84	Physical interpretation of narrative structure. (Author 2009)		ietnam veterans Memorial, Washington DC, Maya Lin, 1981.
Fig. 85	Paths on the site plan. (Author 2010)		ne chalk wall, Virginia, Steve Ainsworth, 2006. (http://pbase.com/The_Chalk_Wall.jpg)
Fig. 86	Parti diagram. (Author 2010)	=	ne Kaikai wall of expression. (kaikai.co.za/wall-of-expression.htm)
Fig. 87	Parti diagram indicating outdoor spaces. (Author 2010)		erspective of the wall meeting the landscape. (Author, 2009)
Fig. 88	Site plan showing sections. (Author 2010)	Fig. 135 Ca	oncept diagrams for intimate space. (Author 2010)
Fig. 89	Site fabric. (Author 2010)		oncept diagrams for poetic service spaces. (Author 2010)
Fig. 90	Site fabric. (Author 2010)		oncept diagrams for a view of the landscape. (Author 2010)
Fig. 91	Existing entrance. (Author 2010)	Fig. 138 Pl	an of the Storytelling spaces. (Author 2010)
Fig. 92	Section AA. (Author 2010)	Fig. 139 Sc	outh-West facade of storytelling building. (Author 2010)
Fig. 93	Composite view from entrance. (Author 2010)	Fig. 140 Pe	erspective of entrance to Storytelling building. (Author 2010)
Fig. 94	Site fabric. (Author 2010)	Fig. 141 Ac	ccommodation diagram. (Author 2010)
Fig. 95	Site fabric. (Author 2010)		oncept drawing of interior of storytelling building. (Author 2010)
Fig. 96	Site fabric. (Author 2010)	Fig. 143 Ca	oncept drawings. (Author 2010)
Fig. 97	Site fabric. (Author 2010)	Fig. 144 Ca	oncept drawings. (Author 2010)
Fig. 98	Site fabric. (Author 2010)	Fig. 145 Ca	oncept development sketches. (Author 2010)
Fig. 99	Site fabric. (Author 2010)	Fig. 146 Ca	oncept development sketches. (Author 2010)
Fig. 100	Site fabric. (Author 2010)	Fig. 147 Ca	oncept development sketches. (Author 2010)
Fig. 101	Composite view around tree. (Author 2010)	Fig. 148 Ca	oncept development of the plan. (Author 2010)
Fig. 102	Section AA. (Author 2010)	Fig. 149 Ca	oncept development of the plan. (Author 2010)
Fig. 103	Site fabric. (Author 2010)	Fig. 150 Ca	oncept development of the plan. (Author 2010)
Fig. 104	Site fabric. (Author 2010)	Fig. 151 Ca	oncept development of the plan. (Author 2010)
Fig. 105	Site fabric. (Author 2010)	Fig. 152 Ca	oncept development of the plan. (Author 2010)
Fig. 106	Site fabric. (Author 2010)	Fig. 153 Ca	oncept model. (Author 2010)
Fig. 107	Site fabric. (Author 2010)	Fig. 154 Ca	oncept model. (Author 2010)
Fig. 108	Site fabric. (Author 2010)	Fig. 155 Ca	oncept model. (Author 2010)
Fig. 109	Site fabric. (Author 2010)	Fig. 156 Ca	oncept model. (Author 2010)
Fig. 110	Site fabric. (Author 2010)	Fig. 157 Ci	irculation of storytelling building. (Author 2010)
Fig. 111	Site fabric. (Author 2010)	Fig. 158 Ca	oncept development. (Author 2010)
Fig. 112	Site fabric. (Author 2010)	Fig. 159 Ca	oncept development. (Author 2010)
Fig. 113	Site fabric. (Author 2010)	Fig. 160 Ca	oncept development. (Author 2010)
Fig. 114	Site fabric. (Author 2010)	Fig. 161 Ca	oncept model. (Author 2010)
Fig. 115	Diagram explaining the work of Alvar Aalto. (Groak, S. 1992. The idea of building, thought	Fig. 162 Ca	oncept model. (Author 2010)
	and action in the desgn and production of buildings. London: E&FN Spon.) Author adaptation.	Fig. 163 Ca	oncept model. (Author 2010)
Fig. 116	Elevation of Multimedia building. (Author 2009)	Fig. 164 Co	oncept model. (Author 2010)
Fig. 117	Concept development plans. (Author 2009)	Fig. 165 Co	oncept diagrams for a view of the landscape. (Author 2010)
Fig. 118	Concept development drawings. (Author 2009)	Fig. 166 Co	oncept diagrams for a view of the landscape. (Author 2010)
Fig. 119	Concept development drawings. (Author 2009)		evelopment of the section. (Author 2010)
Fig. 120	Concept development drawings. (Author 2009)	Fig. 168 De	evelopment of the section. (Author 2010)
Fig. 121	Concept development drawings. (Author 2009)	Fig. 169 C	Concept diagrams for intimate space. (Author 2010)



Fig. 217

2010)	

UNIVERSITEIT VAN PRETORIA UNIVERSITY OF PRETORIA or 2010) YUNIBESITHI YA PRETORIA 1 diagram. (Author 2010) Fig. 220 Beam system diagram. (Author 2010) Fia. 221 Flat roof system. (Author 2010) Fig. 222 Vertical support typologies. (Author 2010) Fig. 223 Vertical support typologies. (Author 2010) Fig. 224 Vertical support typologies. (Author 2010) Fig. 225 Vertical support typologies. (Author 2010) Vertical support typologies. (Author 2010) Fig. 226 Fig. 227 NG Universiteitsoord, Jan van Wijk. (Author 2010) Fig. 228 NG Universiteitsoord, Jan van Wijk. (Author 2010) Fig. 229 NG Universiteitsoord, Jan van Wijk. (Author 2010) Fig. 230 NG Universiteitsoord, Jan van Wijk. (Author 2010) NG Universiteitsoord, Jan van Wijk. (Author 2010) Fig. 231 Fair-faced concrete sample. (Author 2010) Fig. 233 Exposed aggregate sample. (Author 2010) Fig. 234 Copper sample. (Author 2010) Fig. 235 Radius shuttering. (Author 2010) Fig. 236 Concrete wall concept. (Author 2010) Fig. 237 Sagrada familia, Antonio Gaudi. (www.flickr.com) Exploded view of gridshell. (Author, 2009) Fig. 238 Fig. 239 Hanging chain model. (Author, 2009) Fig. 240 Hanging chain model process. (Author, 2009) Fig. 241 Lattice connection detail. (Author, 2009) Lowering the lattice into the gridshell form. (Author, 2009) Roof edge detail of the multimedia space gridshell. (Author, 2009) Fig. 243 Fig. 244 Model builing process. (Author, 2009) Fig. 245 Detail of Mannheim Multihalle gridshell.)Orton, A. 1988.. The way we build now. Form, scale and technique. London and New York: Spon Press.) Author adaptation Mannheim Multihalle, Frei Otto, 1975. (http://www.flickr.com/3646160577_7c63c35b9d) Fig. 246 Fig. 247 Detail of Weald and Downlands gridshell. (Author interpretation, 2009) Fig. 248 The Weald and Downlands Museum, 2002. (http://www.edwardcullinanarchitects.comprojectswd.html) The Savill Building, Geln Howells Archtects, 2006 (http://www.annular.org.uk/ Savill_Building_front) Development of the gridshell roof. (Author 2010) Fig. 250 Fig. 251 Development of the gridshell roof. (Author 2010) Fig. 252 Development of the gridshell roof. (Author 2010) Fig. 253 Development of the gridshell roof. (Author 2010) Fig. 254 Development of the gridshell roof. (Author 2010) Fig. 255 Development of the gridshell roof. (Author 2010) Fig. 256 Development of the gridshell roof. (Author 2010) Development of the gridshell roof. (Author 2010) Fig. 257 Development of the gridshell roof. (Author 2010) Fig. 259 Development of the gridshell roof. (Author 2010) Diamond copper cladding plan. (copper.org/dome_diagonal_flat_seam_system/) Author adaptation Fig. 261 Copper cladding concept model. (Author, 2009) Fig. 262 Exploded view. (Author 2009) Copper detail 1. (copper.org/joints_and_seams) Author adaptation Copper detail2. (copper.org/joints_and_seams) Author adaptation

Fig. 265	Copper folded seam process. (Elder, AJ et al. AJ Handbook of building enclosure. 197 Architectural Press.) Author adaptation.
Fig. 266	Green roof drainage layers. (Safeguard fixing guide for flat roofs. www.safeguardeurope.com)
Fig. 267	Typical green roof section. (Author, 2010)
Fig. 268	Roof edge NG Universiteitsoord. (Author, 2010)
Fig. 269	Roof edge NG Universiteitsoord. (Author, 2010)
Fig. 270	Roof positions concept drawing. (Author, 2010)
Fig. 271	Restaurant roof plan Scale 1:500. (Author, 2010)
Fig. 272	Roof edge detail. (Mathews, P. 2007. <i>Detail housed</i> . South Africa: Visual Books.) Author adaptation.
Fig. 273	Perspective of planted roof. (Author, 2010)
Fig. 274	Roof edge concept. (Author, 2010)
Fig. 275	Section AA. (Author, 2010)
Fig. 276	Climate graph. (http://www.climatedata.eu/climate/php/locsfxx0044langen) Author adaptation.
Fig. 277	Solar chimney.(Anderson, B. 1996. <i>Passive Solar Energy -The Homeowner's Guide to Natural Heating and Cooling</i> . [Online] Available at: http://www.builditsolar.com/Projects/SolarHomes/PasSolEnergyBk/PSEbook. htm. [2010, April 16])
Fig. 278	Concept sketch for the manipulation of the micro-climate. (Author, 2010)
Fig. 279	Detail of ventilation opening. (Author, 2010)
Fig. 280	Diagram of air movement. (Author, 2010)
Fig. 281	Sun angles on trombe walls. (Author, 2010)
Fig. 282	Concept detail of trombe wall. (Author, 2010)
Fig. 283	Concept drawing of exterior shading devices. (Author, 2010)
Fig. 284	South-West facade of storytelling building. (Author, 2010)
Fig. 285	Diagram for the calculation on fin and overhang sizing. (Shading Strategy. [Online] Available at: http://windows/lbl.govdaylightingdesignguide_section5.pdf)
Fig. 286	Earth-coupled water systems.(http://treenutscatpsgeothermalheatpump.jpg)
Fig. 287	Schematic section of earth-coupled air system. (Pennycook, K. 2008. <i>The Illustrated Guide to Renewable technologies</i> . [Online])
Fig. 288	Plan of earth-coupled air system. (Author, 2010)
Fig. 289	Detail 3. (Author, 2010)
Fig. 290	Plan and section of hollow blocks.(Orton, A. 1988 <i>The way we build now. Form, scale and technique</i> . London and New York: Spon Press.) Author adaptation.
Fig. 291	Connection concepts drawings. (Author, 2010)
Fig. 292	Concept drawing of acoustic reflection. (Author, 2010)
Fig. 293	Pervious turf pavement. (http://www.metrocouncil.org/ CH3_RPPImpTurfPaver)
Fig. 294	Section of the grassed swale. (http://www.metrocouncil.org/CH3_STDetDrySwale)
Fig. 295	Pervious turf pavement. (http://www.metrocouncil.org/CH3_RPPImpTurfPaver)

Fig. 299 Section of a vegetation filter. (Liptan, T et al. Watergardens as Stormwater infrastructure in Portland, Oregon.

Proceedings from the Water Sensitive Ecological Planning and Design symposium. February 25-26 2000.

Fig. 300 Section of a pervious bottom planter. (Liptan, T et al. Watergardens as Stormwater infrastructure in Portland, Oregon. Proceedings from the Water Sensitive Ecological Planning and Design symposium. February 25-26

Fig. 296 Perspective of path along wall. (Author, 2009)

Harvard Design School. 1-31.)

2000. Harvard Design School. 1-31.)

Fig. 297 Local pervious pavers.(terraforce.com/terraforce_products)
Fig. 298 Local pervious pavers.(terraforce.com/terraforce_products)

NIVERSITEIT VAN PRETORIA
NIVERSITY OF PRETORIA Pollution Control Laboratory. (Liptan, T et al. Watergardens as Stormwater infrastructure in
UNIBESITHI YA PRETORIA
1. Proceedings from the Water Sensitive Ecological Planning and Design symposium. February
25-26 2000. Harvard Design School. 1-31.)

- Fig. 302 Site plan indicating stormwater treatment. (Author, 2010)
- Fig. 303 Section CC. (Author, 2010)
- Fig. 304 Bathroom plan indicating self-composting toilet units. (Author, 2009)
- Fig. 305 Self-composting toilet typical section of commercial product. (http://www.enviro-loo.com)
- Fig. 306 Initial sketch of greywater irrigation. (Author, 2009)
- Fig. 307 View of the model. (Author, 2010)