

solī deo gloria

**URBAN WATER CENTRE:** *educate and celebrate!*

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Submitted in partial fulfilment of the requirements  
for the degree

***Magister in Landscape Architecture (Professional)***

in the department of Architecture, Landscape  
Architecture and Interior Architecture, Faculty of  
Engineering, Built Environment and Information

Technology,  
University of Pretoria  
2009.11.24

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## SUMMARY

This thesis explores the role of water in urban landscape architectural design and identifies strategies that will conserve and optimise the use of water in the built environment.

This is done through selecting a site in Pretoria at the intersection of the Apies River channel and Nelson Mandela drive and designing an Urban Water Centre that explores; exposes and celebrates water in the urban context. The design creates opportunities for kids from nearby schools, students from TUT, residents from the area, pedestrians and tourists to interact on a physical and emotional level with water. Educating people about water conservation is an important aspect of the project and raising awareness is the first step.

The design addresses the city-wide need for green public open space and provides opportunities for urbanites to connect with water and the Apies River.

This connection is established through the facilitation of significant encounters with water. These include physical contact play with water, creating interest and anticipation around rain events and through translating some of the associated attributes of water into a solid surface.

The design approach is influenced by studying the Sustainable Sites Initiative's ecosystem service approach. Green Star SA is investigated for a possible application to landscape architecture. The findings from the Sustainable Sites Initiative are enhanced by General Systems Theory and then used to generate systems that supports the the desired experiences.

The first and largest system lifts some of the base flow from the Apies River channel with a waterwheel, where after it is purified in a constructed wetland and a chlorine-free disinfecting process. The clean water is then displayed in a play pond that partially drains through a gravity driven vortex generator. The vortex generator aerates and cools down the water while adding movement; sound and a sense of the passage of time to the human experience.

From the vortex, water flows into a constructed pebble lined stream that children can play in and experience stream ecology. The pebbles and vegetation refers back to the Apies River before it was lined with concrete. From the stream the water rejoins the channel.

The second on site water system addresses rainwater. The design creates anticipation and curiosity associated with rain events. Rainwater from one of the on site buildings are harvested and displayed in a rain-meter garden. A first-flush system intercepts the first dirty water where after it drizzles down a rain-curtain into a rain-meter system. The rain-meters are large bullet resistant glass tank-like containers, calibrated to show how many millimetres of rain have fallen during the shower. A rain-sensor drains the water into a temporary wetland and lets in percolate into the underground storage tank.

The third on site water system treats grey water from buildings through a stepped constructed wetland and displays the cleaned water in a jubilant motion activated display at one of the pedestrian entrances. Water from the rain-meter system; the grey water system and harvested surface runoff all contributes towards meeting the water needs of irrigation and buildings.

Other eco-system service strategies identified in the study are applied in the design. These include the protection of on site biomass along with the introduction of region appropriate planting; design for- and use of waste reducing materials and the integration of on site systems to enrich the experience.

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## INFORMING THE ABSTRACT

“Landscape Architecture is a design profession committed to a sustainable future by applying an integrated and holistic approach to living systems.” (Institute of Landscape Architecture South Africa, 2007)

“Green design is not simply about picking parts from a catalog[ue]. It is about ensuring that an ecological design intent is achieved.” (Kwok, 2007, p. 1)

Green building rating tools sets criteria and measurements of quality that objectively evaluates how *green* a building is. The Green Star South Africa rating tool is based on the Green Star Australia system. (Green Building Council of South Africa, 2008).

The Sustainable Sites Initiative is an American organization that promotes the practice of sustainable site development and management. (Sustainable Sites Initiative, 2008)

## ABSTRACT

The world wide water crisis will soon become personal and water needs to be conserved in any way possible. The study aims to explore the role of water in urban landscape architectural design and to identify strategies that will conserve and optimise the use of water in the built environment. Creating awareness of all the on site water systems is a step towards educating the public on the importance of water and its role in green landscape architectural design.

## ELABORATING ON THE ABSTRACT

By using the Sustainable Sites Initiative (SSI) as a primer to establish possible relationships of parts and systems on a specific site, the author will attempt to elaborate on sustainable strategies that are applicable to Landscape Architecture in South Africa and the context of the City of Tshwane Metropolitan Municipality (CTMM).

## SAMEVATTING

Die wêreldwye water tekort raak almal, dit lei daartoe dat water besparing op alle gebiede nodig is. Die studie ondersoek die rol van water in stedelike landskapargitektuur. Strategië wat die gebruik en besparing van water op die hart het word ondersoek en geformuleer. Die publiek word ingelig oor die belangerikheid en plek van water in die stad en *groen* landskapargitektuur deur hul bewus te maak van die water verwante sisteme op die terrein.

## CHAPTER LAYOUT

**Chapter 1** introduces the site through discussing the relevance of the site in light of the identified theme. A possible program and design problem are discussed and an approach formulated. Possible clients are identified and the brief is set and delimited.

**Chapter 2** sets the scene for the dissertation; global ecological and environmental problem are discussed through focusing on the water crisis. An exploration of world events that led to the rise of the green building industry in South Africa follows. The Green Star SA Office v1 is discussed in terms of the possible contribution of Landscape Architecture to a project's green status. The relevance of the study is discussed and possible outcomes are envisioned.

**Chapter 3** aims to ground the dissertation through discussion of the problem statement and defines the hypothesis. Relevant topics and theories are discussed and interpreted.

**Chapter 4** addresses the many uses, memories and aspects of water.

**Chapter 5** addresses the context, site, design goals and objectives.

**Chapter 6** discusses precedent studies and draws conclusions.

**Chapter 7** explains the design development and tests it against the systems approach strategies.

**Chapter 8** elaborates and explains the design solution through appropriate representational drawings and sketch plan, visualization of the strategies and integrating them into a physical whole.

**Chapter 9** focuses on the technical report and design resolution.

**Chapter 10** sees the project audited with the appropriate Green Star SA categories. The application of Green Star SA on Landscape Architecture is discussed. The project is concluded.

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