precedent studies_

6

Introducing the precedents

The precedents are classified according to themes they address

- *Relation* analyses organization and program: Greenlyn Village
- *Water* focuses on water systems: Water Master Planning
- *Digestive* examines modes of water cleaning: On Site Sewage Wetland and Vortex generator
- *Experience* explores the creation of uncommon encounters with water in the landscape: Weather Garden
- *Memory* looks at forgotten resources and the commemoration of change over time: Cape Town Foreshore Pedestrianisation
- *Reuse* reinterprets on site materials: Urban Outfitters Navy Yard Headquarters
- *Surface* explores the translation of the liquid properties of water into habitable space: Simcoe WaveDeck and Boreno-Sporenburg Bridges

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RELATION_ORGANISATION AND PROGRAM

Greenlyn Village, Menlo Park, Pretoria, South Africa

Greenlyn Village (figure 58) was chosen as precedent because it was designed as a social hub with restaurants, cafés and a few shops centred around a constructed stream and a semi-public open space. Layout, spatial orientation and function were part of the criteria for selecting the precedent.

Description

The centre sits on a whole city block in a suburb. The design attempts to create a public space that includes restaurants, shops, businesses, fitness and gardening outlets all utilizing the attraction of an introduced 'naturalistic' water course with a dam, wetlands and aquatic bird species.

Spatial organization

Connectivity

The complex surrounds the water element on all sides and allows no direct view from the four streets that surround it. Tall fences, although visually permeable, isolates the complex from street activities to form an exclusive island. On the southern side of the development a wide parking and planting buffer (figure 59) along with a height difference and a retaining wall adds to the segregated atmosphere of the development (figures 59 and 60). Large expanses of monotonous lawn (figure 61) add distance between the pedestrian and the core of the development and fenced off service yards and entrances (figure 62) gives an inactive and dead façade to one side of the development.

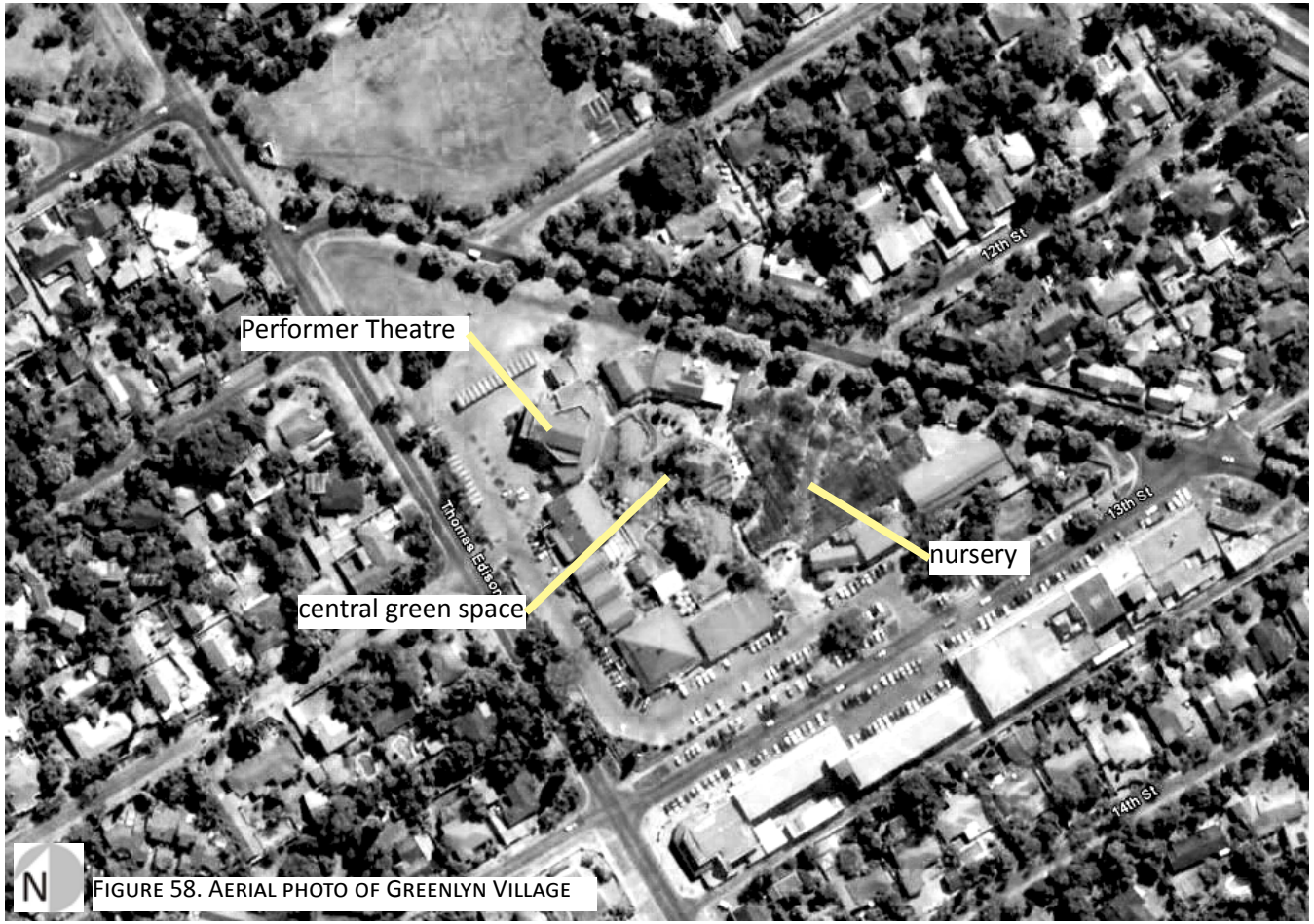

Figure 58. Aerial photo of Greenlyn Village

Security

In spite of the high fence, the development experiences security issues like break-ins and robberies. The author is of the opinion that the exclusiveness of the design and the organization of the buildings to focus inwards and turn their back on the street adds to the safety dilemma.

Visual amenity and use of amphitheatre

Apart from the muddy water (figure 63), the water element has a calm and relaxing quality that has a lot of potential. The amphitheatre is hardly ever used except for shopkeepers on a smoke break (figure 64). The amphitheatre is a novel idea, but when it is not integrated functionally into the design it loses its integrity.

Economic viability

Some of the restaurants change ownership frequently which might lead to the conclusion that the project might not be as economically feasible as it was intended. This may be due to too many restaurants or the spatial configuration. The introduction of a green island in the heart of a suburb might also not be as significant as it would have been for example in the inner city where green space is a valued and scarce commodity.

Conclusion

- Pedestrians and motorist should be enticed with views of the attraction
- The development should be programmed to include all income groups
- Configure the spatial layout to prevent dead facades and unsightly service entrances from deactivating streets
- Details and construction should anticipate the effect of introduced or attracted wildlife on water systems and embankments
- Sedimentation ponds are needed in a systems where disturbance occurs on erodible banks

Figure 59. Large buffer and height difference between buildings and street

Figure 60. Wide buffer between buildings and street (looking towards 13th street)

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FIGURE 61. LARGE EXPANSES OF FENCED OFF LAWN

FIGURE 62. DEAD STREET INTERFACE

FIGURE 63. MUDDY WATER AND A DISTANCE BETWEEN BUILDINGS AND WATER ELEMENT

FIGURE 64. AMPHITHEATRE WITH THE PERFORMER THEATRE ON THE RIGHT

WATER_ FLEXIBLE SYSTEM

Water Master Planning

Heritage Middle School, Raleigh, North Carolina, USA

The school was selected as a precedent for its extensive rainwater and storm water harvesting system that integrates harvesting, cleaning and reusing.

Description

The school retrofitted nine sustainable strategies onto the buildings.

The strategies includes

- Rainwater harvesting from roofs
- Constructed wetland (figure 65)
- Solar geysers
- Photo Voltaic (PV) panels
- Day-lighting of interiors
- An energy efficient building shell (GreenNews, 2007, p. 3)

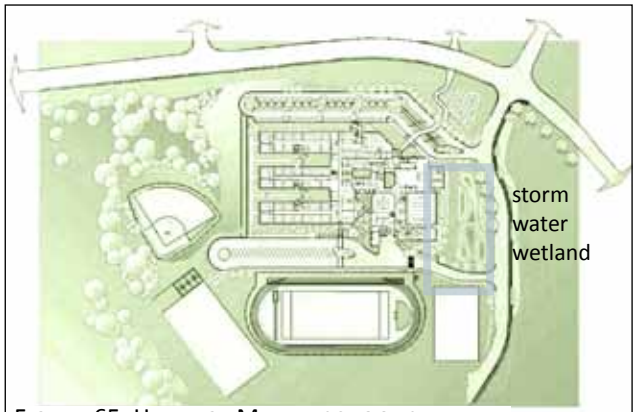

Figure 65. Heritage Middle school site plan


Figure 66. Heritage Middle school wetland

Rainwater collection system

From the roofs the water is collected in underground cisterns; water for flushing toilets is treated with chlorine. The system is diagrammatically explained to students and visitors. Low flow and conserving sanitary appliances are used throughout the facilities and harvested rainwater is used for irrigation.

Other strategies

Extensive lawn areas are replaced by regional planting and mulched areas. A constructed wetland is used for education and treats runoff from fields before it enters a nearby river. Pathways into the wetlands (figure 66) allow the study of wetland soil and gives access to the PV powered aerator that prevents mosquito breeding. (Kinkade-Levario, 2007, pp. 149-151)

Conclusion

- Raising awareness through signs and notices cultivates understanding of green strategies
- Integrating rainwater harvesting with irrigation and sanitary appliances saves on the use of potable water
- Native planting, mulching and reduction of conventional lawn area is needed in order to eliminate the use of potable water in irrigation
- Making systems visible and understandable gives the opportunity for education and exploration
- The rainwater harvesting process should be expressed visually for a richer educational experience

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DIGESTIVE_CLEANING WATER

On Site Sewage Wetland

Sidwell Friends School, Washington, D.C., USA

The project was selected for the integration of different water systems on site. Sewage treatment on site allows for education and water use reduction and an extensive grey water recycling system.

Description

The on-site sewage treatment integrates with the other water related strategies on site and interlaces landscape and architecture to the enhancement of both. The visibility of the system adds richness and an educational aspect to the project (figure 67).

Technical

An underground treatment tank is the first step in sewage treatment, where after the effluent circulates in a subsurface manner through reed-planed terraces. Sand- and trickle filters treat the effluent further. The cleaned effluent is reused for all the toilets in the building. A closed system is formed where re-cycling supplies the system with adequate water (figure 68).

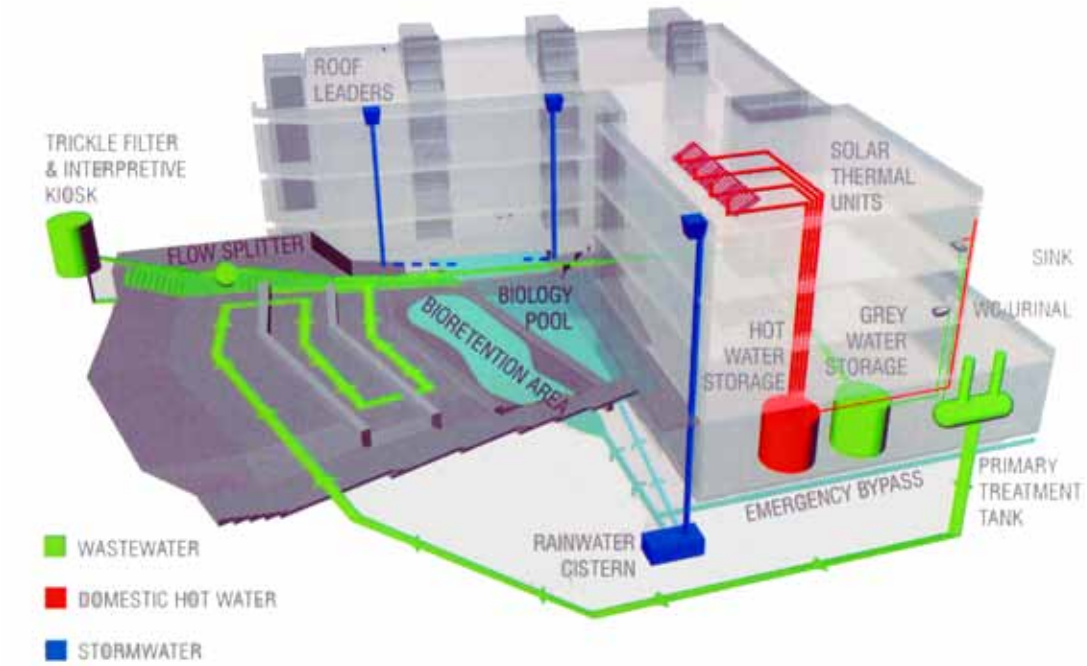
Figure 67. Sidwell friends - stepped wetland

Storm water runoff is collected in a rain garden and pond, the pond is topped up with harvested rainwater from cisterns in the basement. The rain garden doubles up as an overflow for the pond during heavy rain. The changing water levels of the system reflect the fluctuating annual rainfall of the region. (Margolis, 2007, pp. 112-113)

Conclusion

- Successful on-site sewage treatment can enhance the qualities of the landscape and add to an educational experience
- Different water systems can complement and complete each other and enhance the overall function and experience of water on a site
- A symbiosis between Architecture and Landscape Architecture is needed for integrated functional systems that work on various levels

Figure 68. Sidwell Friends - Water system



Vortex generator

Water Vortex Power Plant, Obergrafendorf, Austria

The project was chosen for the vortex it creates. The physical properties of the system guide the design of the vortex pool in the thesis project.

Description

The prototype is a gravitation driven water power plant that uses the rotation push of a water vortex. The system not only generates energy, but aerates the water as well.

> "The water vortex disseminate homogeneously contaminants in the water and increases the contact surface of the disseminate contaminants for microorganisms and water plants. So the biological water purification process will be accelerated." (Zotlöterer, 2007)

Technical data

- Water head of 1,3m (falling height)
- A flow rate of $1m^3/s$
- Diameter of the rotation tank is 5,5m
- Turbine turns at 25rpm
- Effectiveness of the turbine 80% at 3/3, 83% at 2/3 and 76% at 1/3 of the maximum flow rate
- Produced electrical power 8kW

(Zotlöterer, 2007)

Conclusion

- A vortex can be created by asymmetrically channelling a large amount of water through a shaped container (figure 69).
- Aeration and consequently cleaning of water can be achieved through a gravity fed vortex generator
- Water temperature is reduced by going through a vortex

Figure 69. Vortex power generator

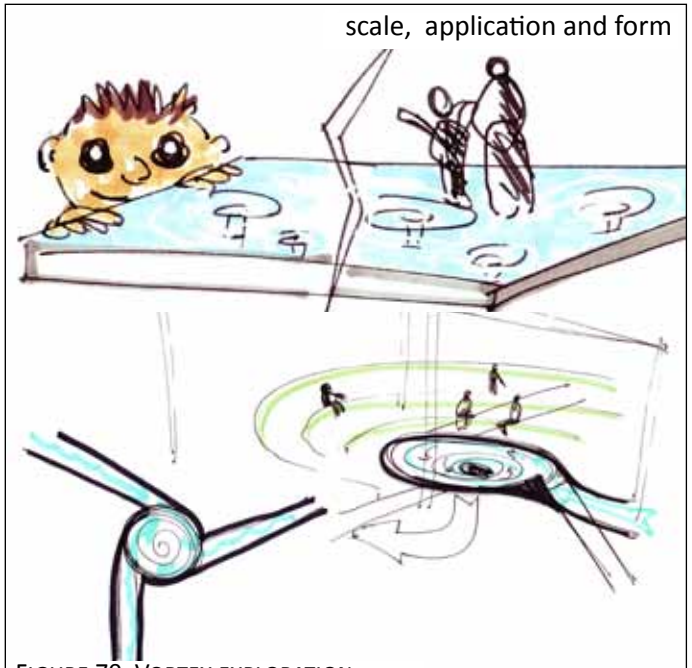


Figure 70. Vortex exploration

EXPERIENCE_UNCOMMON ENCOUNTERS

Weather Garden

Impression of Rain, Weather Garden, The Park Hyatt Hotel_Zurich, Switzerland

The simplicity and effectiveness of this project to communicate the event of a rain shower is inspiring.

Description

A stone garden is reinterpreted in the form of stone paving slabs that captures and holds puddles of rainwater to evaporate (figure 72). The slabs have been hollowed out individually (figure 71) to create unique puddle shapes and depth. Different evaporation rates highlight the "materiality of rainwater and its phase changing qualities" (Margolis, 2007, p. 146). The subtlety of the intervention poetically draws attention to the overlooked phases of water and the surface qualities of the regular streetscape. (Margolis, 2007, pp. 146-147)

Conclusion

The phases and aspects of water, for example evaporation can be celebrated by using low technology materials and principles.

FIGURE 72. RAINWATER PUDDLES

FIGURE 71. SLAB SHAPING

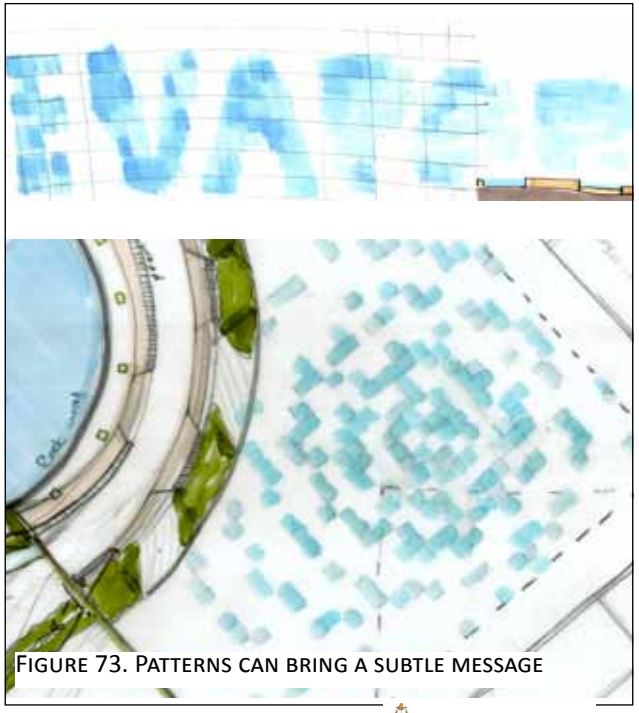


FIGURE 73. PATTERNS CAN BRING A SUBTLE MESSAGE

MEMORY_ FORGOTTEN RESOURCES AND THE COMMEMORATION OF CHANGE

Cape Town Foreshore Pedestrianisation, Cape Town, South Africa

Centre Island Adderley street

The Adderley street island (figure 74) reminds pedestrians and motorists of the spring water from Table Mountain that runs in pipes below the surface in Cape Town. By displaying the water in a "grachte" the observer is not only reminded of the natural resources that goes unnoticed, but of the ways water has been used in Cape Town historically.

Jetty Square

On Jetty Square (figure 75), skeletal shark sculptures by Ralph Borland reminds the user that the ground one stands on have once been below sea level. The installation thus comments on the impact man has on the environment. The interactive sculptures change orientation according to the wind direction and emits flute like sounds that is generated by the wind.

Conclusion

Reminding the public of what was lost or forgotten can be as simple as displaying something that lies hidden, or by paying homage lightheartedly through sculpture.

FIGURE 74. ADDERLEY STREET ISLAND

FIGURE75. JETTY SQUARE

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REUSE_REINTERPERATING ON SITE MATERIAL

Urban Outfitters Navy Yard Headquarters, Philadelphia, Pennsylvania, USA

Reduce, reuse, recycle and respect was the reasoning behind this reinvention of on site materials that would have been dumped in a landfill (figure 76).

Description

D.I.R.T. Studios reveals traces of previous production and use on site by conserving and reusing the in-situ concrete slabs. Reinforced and un-reinforced slabs was used in a 'crazy pave' configuration with compacted stone dust infill in-between (figure 77). All the demolition debris generated from the slabs have been used. (Margolis, 2007, pp. 114 - 116)

Conclusion

- Reusing on site materials can save money, reduce the load on landfill sites and be a reminder of the history of the site.
- Reusing materials in their current state reduces energy consumption. If all the concrete were to be crushed and used as aggregate, more energy would be used in the process.

Figure 76. Concrete crazy pave

Figure 77. Crazy pave process

Surface_translating properties

Simcoe WaveDeck, Waterfront Toronto, Canada

This inspiring project pushes the boundaries of the conventional approach to surfaces and blends the boundaries between sculpture and Landscape Architecture in an effortless way. The user is brought closer to the idea of water and the water's edge simultaneously.

Description

West 8 Urban design and Landscape Architecture translates the shoreline of Ontario's lakes and the 'cottage experience' of life on the lakes into undulating WaveDecks in the harbour (figure 78). These decks facilitate access to the harbour and act as informal gathering spaces (figure 80).

Technical

The decks are supported on custom made curved steel beams, clad with wood and decked afterwards (figure 79).

Conclusion

Manipulation of the ground plane not only adds sculptural qualities, but also forces the user to interpret the surroundings in another light.

Figure 79. Wave deck construction

Figure 78. Wave deck view 1

Figure 80. Wave deck view 2

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Pedestrian bridge, Borneo-Sporenburg, Amsterdam, The Neatherlands

This bridge by West 8 Urban design and Landscape Architecture is turned into a sculpture that facilitates an enriched experience of crossing the water. The bridge creates an identity for the development and become landmarks.

Description

A series of pedestrian bridges by West 8 Urban design and Landscape Architecture connects residential blocks on the Amsterdam docks (figure 81).

Conclusion

The forms of these bridges might seem frivolous and excessive but it calls for a level of intuitive interpretation and it questions the norm of walking surface.

From the precedents

The components of systems should be integrated into place making objects and the built fabric; thus each component has more than one function. Systems should complement and complete each other, working corroboratively towards site design goals. Systems should be designed to be as self explanatory as possible so that users will intuitively sense something about their working at a glance and on closer inspection understand the design intent. Awareness is the first step towards understanding that leads to education.

The limiting factors that certain system resources impose on other systems should be taken into account and used as control devices to form a designed feedback loop (for example water limits on planting area).

Figure 81. Bridge perspective