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3.2 Heritage
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<table>
<thead>
<tr>
<th>Environment</th>
<th>3.1.1 Stormwater</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Stormwater runoff on Groenkloof campus should be collected and dammed.</td>
</tr>
<tr>
<td></td>
<td>-residential area</td>
</tr>
<tr>
<td></td>
<td>-main campus</td>
</tr>
<tr>
<td>B</td>
<td>The existing dam should be incorporated into the stormwater management plan of the site.</td>
</tr>
<tr>
<td></td>
<td>-existing dam</td>
</tr>
<tr>
<td></td>
<td>The overflow of dam1 should flow through the campus in bio-swales to the existing dam (dam 2).</td>
</tr>
</tbody>
</table>

1- Groenkloof campus’ stormwater management plan should be dealt with in zones.

2- The storm water run-off from the residential campus must be collected and dammed (dam 1) to irrigate this portion of the campus.

![FIGURE 80 - Storm water zones on Groenkloof campus, Author, 2008](image)

![FIGURE 81 - Dam 1 with overflow in to bio-swale that flow in to Dam 2 (existing dam), Author, 2008](image)
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Storm water from Klapperkop and Groenkloof residential area should be rerouted on to Groenkloof campus.</td>
</tr>
</tbody>
</table>

1- Stormwater calculations should be done to determine whether there is enough stormwater runoff to accommodate the scheme.

2- The existing channel should be kept. The concrete edges should be "softened" by widening the channel and allowing plant growth on the edges.

3- Implement weirs to dam water in the channel so that water can be captured and rerouted onto Groenkloof campus.

*Figures 82 & 83: Existing channel and proposed channel; Weir damming storm water in existing channel*
The water quality of the stormwater brought on to site should be improved by implementing the following:

1- A silt pond allows sedimentation to settle at the bottom of the pond. This pond must be lined with concrete for easy maintenance by a bobcat.

2- Oil traps better the quality of stormwater by separating the oil from the stormwater. Compartments in the oil trap separate the oil from the water.

3- A bio-swale is a planted shallow channel that slows water down. The plants in this system act as bio-filters.
1- Filtration ponds filter water through dams lined with plants. These ponds will attract birds, insects, and frogs. These ponds should be able to sustain fish.

2- Water flow through these filtration ponds should be planned in such a way so that no stagnant water areas occur.

3- The weirs of these filtration ponds should also act as pedestrian bridges with “waiting areas” or viewing decks along them.
1- The sub soil landfill could contaminate ground water if large amounts of water leach through this material.

4- The edge design of these ponds should discourage pedestrians from getting too close to the water edge.

5- A bird hide must be implemented on the edge of the filtration pond.

FIGURE 90 - Section through filtration pond edge, Author, 2008

FIGURE 91 - Bird hide in the filtration pond, Author, 2008

FIGURE 92 - Diagrammatic section of the geo-technical condition, Author, 2008
2- Specialist consultants should be brought in to assess the situation and provide recommendations and guidelines.

3- As this topic is out of the scope of this thesis it will only be recommended here that ground water monitoring points are set up so that water quality monitoring could take place.

**FIGURE 93 - Diagrammatic section with monitoring points that regulate ground water quality, Author, 2008**
3.1.2 Ecology

A

- Exotic species

- removal and reuse

1. All exotic species other than *Jacaranda mimosifolia* must be removed and replaced with indigenous species.

2. The wood of the removed trees must be reused in this scheme as:

- tree guards

- wood pecker nests

FIGURE 94 - Removal of exotic species, Author, 2008

FIGURE 95 - Exotic wood used as tree stakes, Author, 2008

FIGURE 96 - Habitat creation, Author, 2008
| B | - Indigenous species |
| C | - Synthetic Sport fields |

- All sportsfields should be synthetic. Synthetic fields have less maintenance and water needs.

**FIGURE 97** - Landscape features, Author, 2008

**FIGURE 98** - Bio-degrading wood for habitat creation, Author, 2008
1- Specie selection in this scheme should attract birds, insect, frogs, lizards and small mammals.

2- Water storage collection points should be located next to the sportsfields.

3- Sportsfield drainage should be implemented by specialists.
<table>
<thead>
<tr>
<th>-filtration pond</th>
<th>2- The filtration ponds and bio-swales should be planted with plants that allow nesting and nest building material for bird species.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-bio-swale</td>
<td>3- A storm water system running through the Groenkloof main and sports campus will enhance the ecology on Groenkloof campus.</td>
</tr>
<tr>
<td>-planting species</td>
<td>1- A nursery should be implemented on site to supply plant material and maintain the landscape of Groenkloof campus. Groenkloof campus nursery will also create jobs.</td>
</tr>
</tbody>
</table>

**FIGURE 102** - Perspective of bio-swale running through Groenkloof campus, Author, 2008
3.1.3 Integration of sport with, social and heritage goals.

F
-Onsite compost system and worm farm

1- Healthy aerated soil will ensure healthy plant matter. In close proximity to the nursery a compost plant and worm farm should be put into operation.

A
-Storm water used in sport and recreation

1- Stormwater filtered through the silt pond, oil trap, bio-swale and filtration ponds will be of a better quality than stormwater that is not bio-remediated. Contact with filtered, moving water is better than contact with non-filtered stagnant water.

2- A linear rowing facility should be implemented at the end of the filtration ponds

FIGURE 103 - Compost system and worm farm, Author, 2008

FIGURE 104 - Water quality enhance measures, Author, 2008

FIGURE 105 - Rowing facility with filtered water, Author, 2008
3- A slalom course must be developed.

4- Walkways, gathering spaces and seating areas must be designed along the dams’ edges.

5- The stormwater management should be planned to satisfy irrigation and aesthetic needs of this scheme by:

6- dividing the site into irrigation zones. Each area should have a collection dam to satisfy the irrigation needs for that portion in summer.
- Water back to Apies River

- The dam with the most capacity should be located at the lowest point of the site.

This water in this dam must satisfy irrigation needs of the upper campus in summer and the sport campus in summer and winter.

6- The existing overflow into the Apies River should be retained and upgraded.
<table>
<thead>
<tr>
<th>3.2.1 Levels of scale</th>
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</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>-respond to Unisa`s strong architectural lines.</td>
</tr>
<tr>
<td>1- The steep slope along the existing drainage line of the site should be terraced. The retaining walls used to create the terraces should be 4-5m high to match the large scale of Unisa.</td>
<td></td>
</tr>
<tr>
<td>2- Red clay brick should be used as finish on these retaining walls to commemorate the Kirkness brickfields and emphasize these walls.</td>
<td></td>
</tr>
<tr>
<td>3- The retaining walls should be lit up at night, to enhance the strong architectural lines of Unisa.</td>
<td></td>
</tr>
</tbody>
</table>
B
- enhance the vistas to surrounding monuments

C
- use red bricks in the detail design to commemorate the brick fields

1- The views towards Freedom Park and the Voortrekker monument should be enhanced by facing walkways and gathering spaces in the direction of these monuments.

- walkways

- seating walls

- retaining walls with history story boards

FIGURE 112 - Vista’s to surrounding monuments, Author, 2008

FIGURE 113 - Seating walls along walkways, Author, 2008 (p55), Author, 2008

FIGURE 114 - Retaining wall with relief brick work and history text, Author, 2008
3.2.2 Chimneys (Kirkess brickfields)

- Celebrate the Kirkness brickfields by reinventing the brick chimneys.

- The retaining walls can be used as canvasses that depict the cultural significance of Groenkloof.

1- 25 to 30m red brick flood light towers should be placed onsite for lighting and aesthetic purposes.

2- Lower brick towers can be used as orientation beacons and landscape features.

3- These towers could be used as refreshment shops for the spectators and park users.
4 - Ablution facilities can be accommodated in these brick structures.

5 - The history of Groenkloof campus can be depicted on the sides of the brick towers.
<table>
<thead>
<tr>
<th>Social</th>
<th>3.3.1 Inclusive design</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Athletes</td>
<td></td>
</tr>
</tbody>
</table>

1. The existing clubhouses should be incorporated in the new developmental plan of Groenkloof campus.

2. Athletes should be provided with sports facilities of international standards.

3. The HPC should be located near the hostels, cafeteria and HPC school.

**FIGURE 119** - Floodlight towers positioned around sports fields, Author, 2008

**FIGURE 120** - The diagrammatic sketch indicate the proposed location of the HPC on Groenkloof campus, Author, 2008
B  Families

C  -Elderly

D  -Physically challenged

E  -Visually challenged

1- Pocket parks and walkways with history stories built into the route should be implemented to accommodate families visiting the sports park.

1- All ramps should be 1:12 and benches with shade trees and drinking fountain provided at every 100m meters.

1- All history text should be translated to braille on plaques to accommodate the visually impaired.

FIGURE 121 - Walkway with shade trees and views on to water sports, soccer and hockey fields, Author, 2008

FIGURE 122 - Braille plaque, Author, 2008
1- Enough parking should be provided for visitors and spectators.

2- Refreshment shops and ablution facilities should be suitably situated.

3- Spectator seating should have shade trees.

4- Vehicle circulation of the campus must enable large traffic volumes to flow through the campus. A ring road system must be implemented.

**FIGURE 123** - Slalom course with shaded spectator seating, Author, 2008

**FIGURE 124** - Ring road diagram, Author, 2008
<table>
<thead>
<tr>
<th>Sport</th>
<th>3.4.1 Hockey</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-Facilities</td>
</tr>
<tr>
<td></td>
<td>-Spectators</td>
</tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

1- Water storage facilities should be located next to the fields as synthetic hockey fields need to be kept wet throughout play time.

2- Seating for hockey spectators should be provided for next to the hockey fields.

3- Safety nets should be installed next to the hockey fields to protect the pedestrians and motor cars from injury or damage.

**FIGURE 125** - Drainage diagram for hockey fields, Author, 2008

**FIGURE 126** - Diagrammatic section of hockey fields with spectator stands, Author, 2008

**FIGURE 127** - Safety nets at hockey goal-posts, Author, 2008
### 3.4.2 Soccer

<table>
<thead>
<tr>
<th>B</th>
<th>Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Spectators</td>
</tr>
</tbody>
</table>

1. Water storage facilities should be located next to the fields as synthetic soccer fields need to be moist and not drenched.

2. Seating for Soccer spectators should be provided for next to the soccer fields.

3. A spectator berm can be shaped using the “cut” soil from the dams. This berm will provide seating for rowing and soccer spectators.

4. The existing spectator stand should be extended onto the existing berm.

**FIGURE 128** - Diagrammatic section of soccer fields with spectator stands, Author, 2008

**FIGURE 129** - Before and after of the existing berm changed to spectator stand, Author, 2008
3.4.3 Water sport

Rowing

- Facilities

1- The flat water rowing facility must be at least 300m long and 18m wide.

2- The edges of this rowing channel should absorb waves to minimize wave actions in the channel.

3- Access jetties should be provided at two ends of this facility.

-Spectators

FIGURE 130 - Flat rowing facility with spectator berms, Author, 2008

FIGURE 131 - Section through rowing channel with energy absorbing edges, Author, 2008

FIGURE 132 - Jetty at flat rowing facility, Author, 2008
4- Parking should be in close proximity to the rowing channel.

5- Rowing spectators should be accommodated for.

6- The flat rowing facility and the slalom course should be in close proximity to each other so that athletes can easily move from one facility to the next without crossing a road.

A walkway underneath the vehicle bridge will connect the two water sport facilities.
1- The slalom facility should not be in the stormwater path. This facility needs constant maintenance and should be able to be emptied out at any time.

2- Water should be pumped from the irrigation dam to maintain the slalom course.

3- This course must cater for advanced slalom athletes and beginners. A challenging and less challenging leg is proposed.

4- Spectators and coaches should be able to move around the slalom course.

5- A red brick lookout tower that houses the pump systems for the slalom course should be implemented.

FIGURE 136 - Slalom course diagram showing the “easy” route with green arrows and “difficult” route indicated in red arrows, Author, 2008
6- The pump must be able to run on several speeds to make the course water speed adjustable.

7- The "peg-bo" system (a system that makes the course adjustment possible) should be used to construct each obstacle. (These obstacles can be moved around in the course, changing the difficulty and types of challenges in the course)

8- A screen berm should be shaped from the soil cut out from the slalom course to screen the slalom course from the highways. By so doing the slalom course will not compete or harm the southern gateway into the city.