Chapter 3

Design goals and guidelines

3.1 Environment
3.1.1 Stormwater
3.1.2 Ecology
3.1.3 Integration with sport, social and heritage

3.2 Heritage
3.2.1 Levels of scale
3.2.2 Chimneys

3.3 Social
3.3.1 Providing for all visitors

3.4 Sport
3.4.1 Hockey
3.4.2 Soccer
3.4.3 Water sport

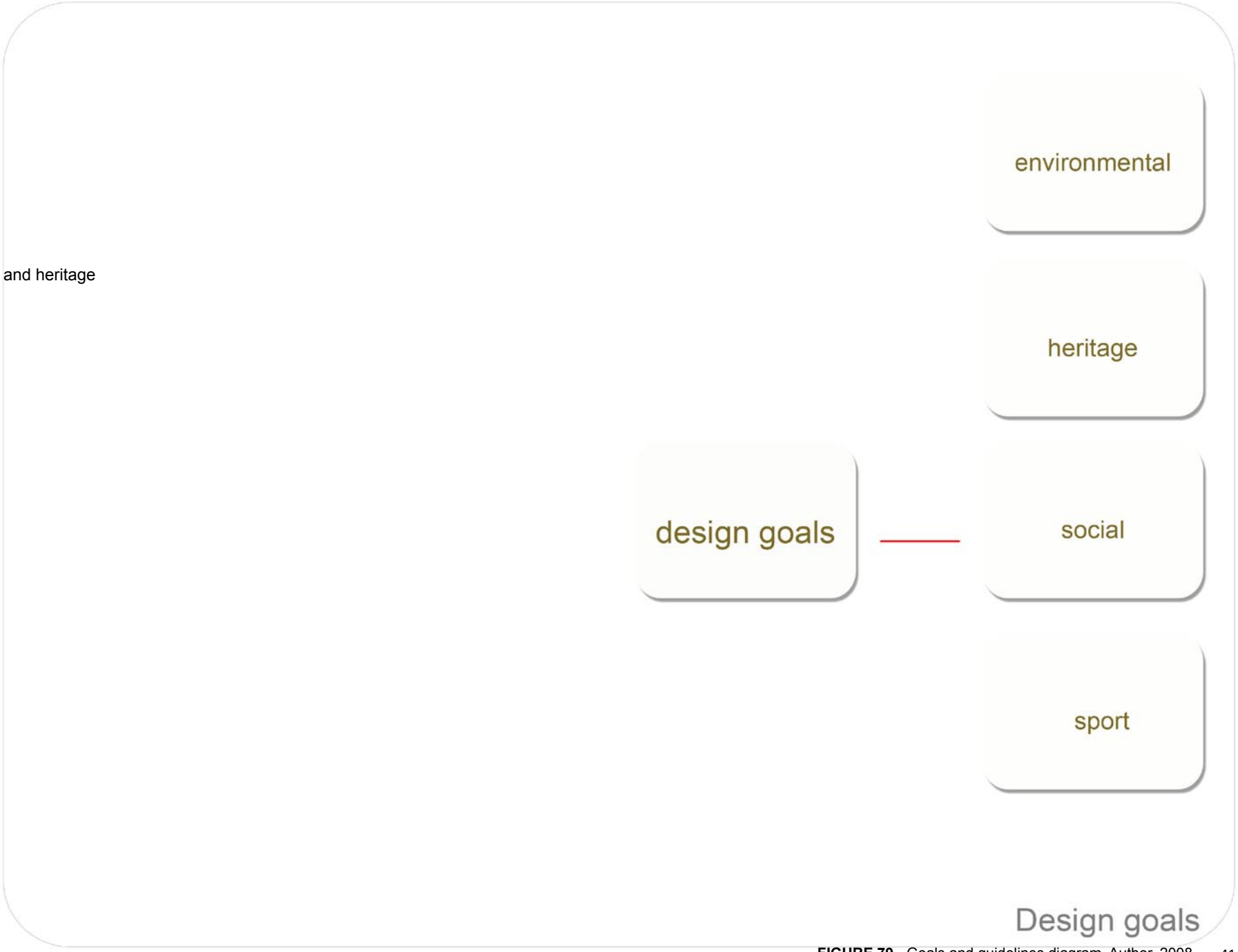


FIGURE 79 - Goals and guidelines diagram, Author, 2008

	Environment		
	3.1.1 Stormwater	**A** **-Stormwater runoff on Groenkloof campus should be collected and dammed.** -residential area -main campus **B** **-The existing dam should be incorporated into the stormwater management plan of the site.** -existing dam	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. 1- The overflow of dam1 should flow through the campus in bio-swales to the existing dam (dam 2).

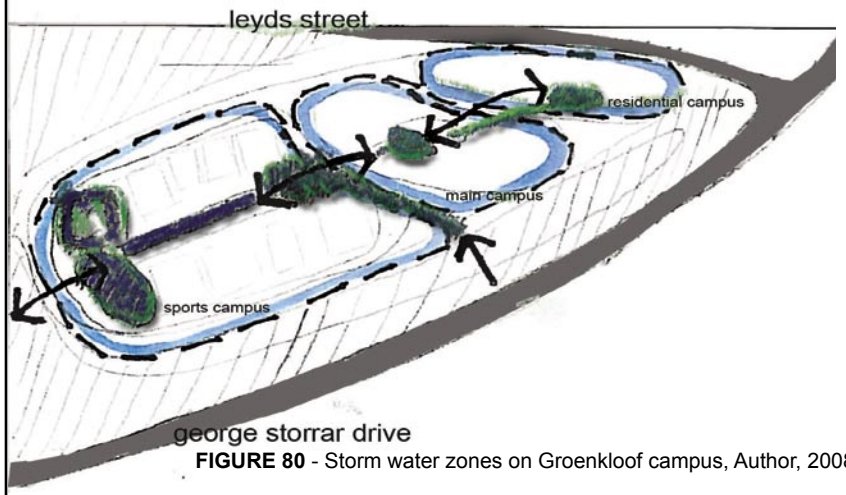


FIGURE 80 - Storm water zones on Groenkloof campus, Author, 2008

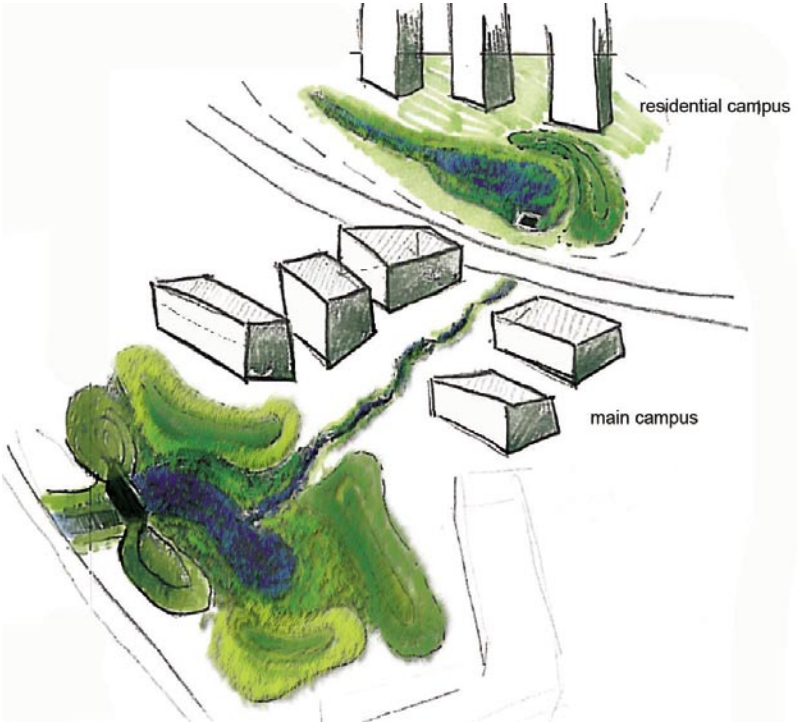


FIGURE 81 - Dam 1 with overflow in to bio-swale that flow in to Dam 2 (existing dam) , Author, 2008

		C **-Storm water from Klapperkop and Groenkloof residential area should be rerouted on to Groenkloof campus.**	1- Stormwater calculations should be done to determine whether there is enough stormwater runoff to accommodate the scheme.
		-existing channel	2- The existing channel should be kept .The concrete edges should be "softened "by widening the channel and allowing plant growth on the edges.
		-weir	3- Implement weirs to dam water in the channel so that water can be captured and rerouted onto Groenkloof campus.

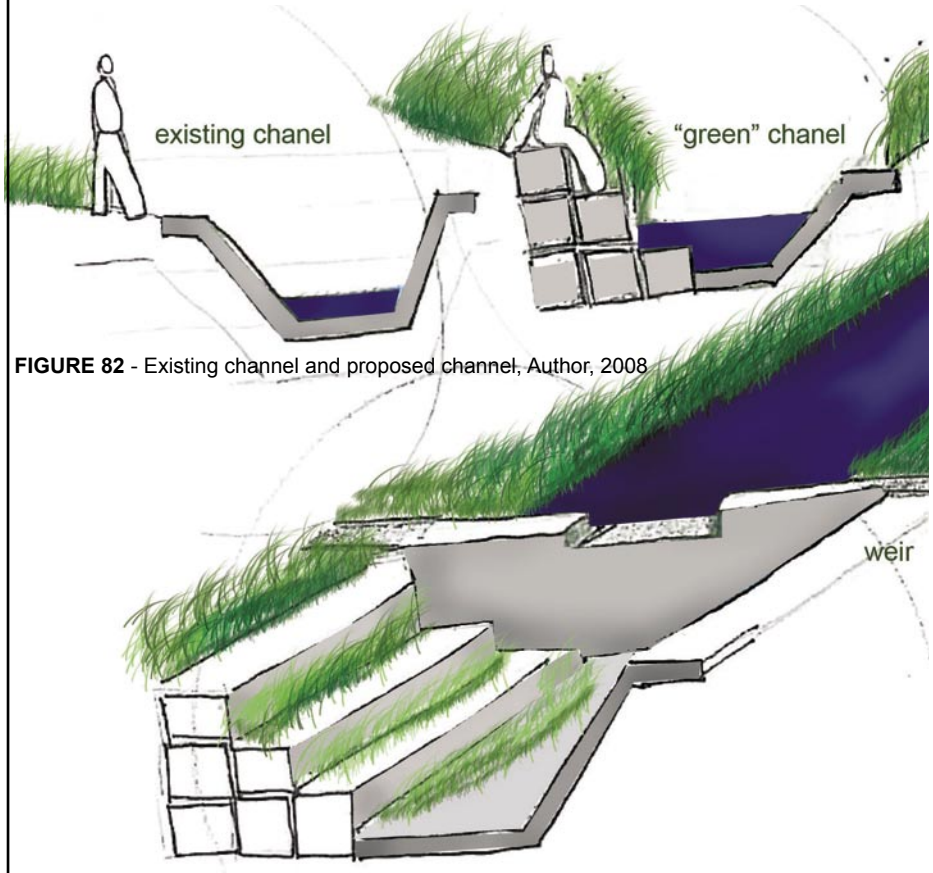


FIGURE 82 - Existing channel and proposed channel, Author, 2008

FIGURE 83 - Weir damming storm water in existing channel, Author, 2008

		D **-The water quality of the stormwater brought on to site should be improved by implementing the following:**	
		-silt pond	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.
		-oil trap	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.
		-bio swale	3- A bio-swale is a planted shallow channel that slows water down. The plants in this system act as bio-filters.

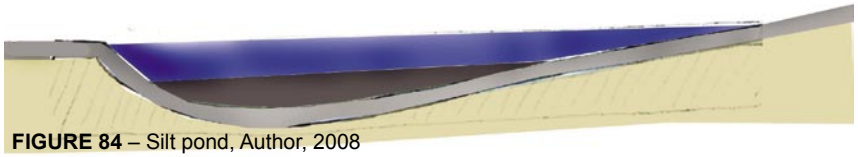


FIGURE 84 – Silt pond, Author, 2008

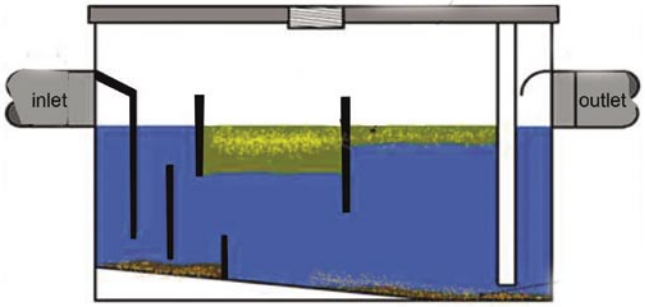


FIGURE 85 - Oil trap, Author, 2008

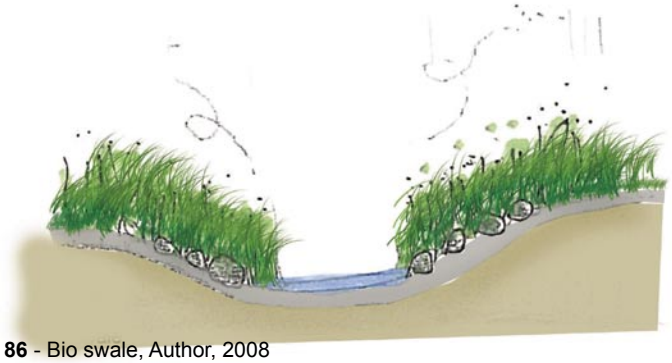


FIGURE 86 - Bio swale, Author, 2008

		-filtration ponds	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.

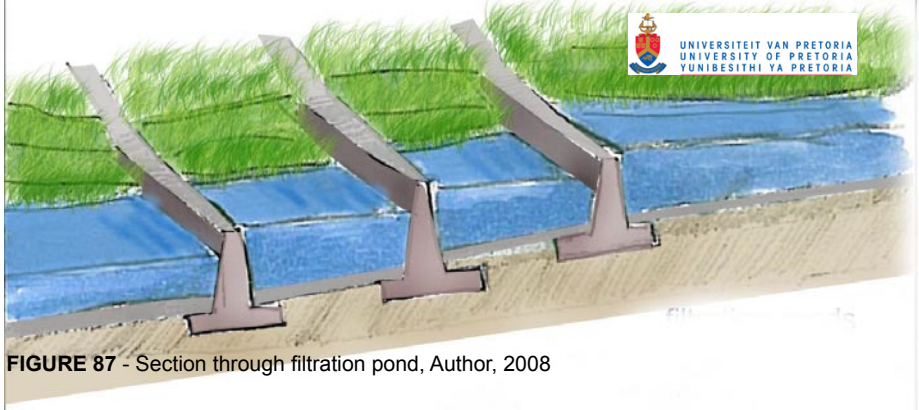


FIGURE 87 - Section through filtration pond, Author, 2008

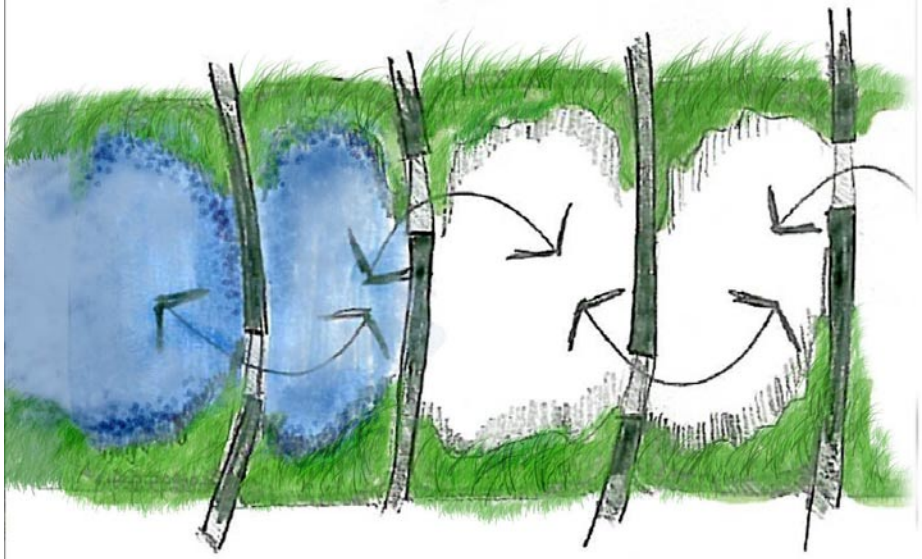


FIGURE 88 - Weir location and water flow, Author, 2008

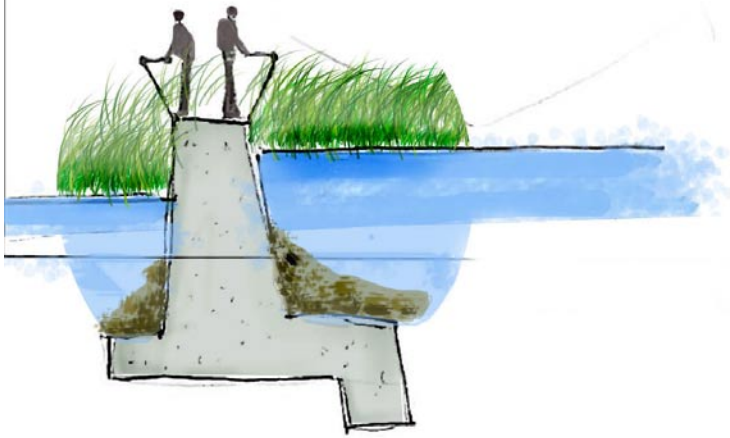


FIGURE 89 - Weir of filtration pond acting as pedestrian bridge, Author, 2008

			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.
		E **-Underground water** -existing conditioned	1- The sub soil landfill could contaminate ground water if large amounts of water leach through this material.

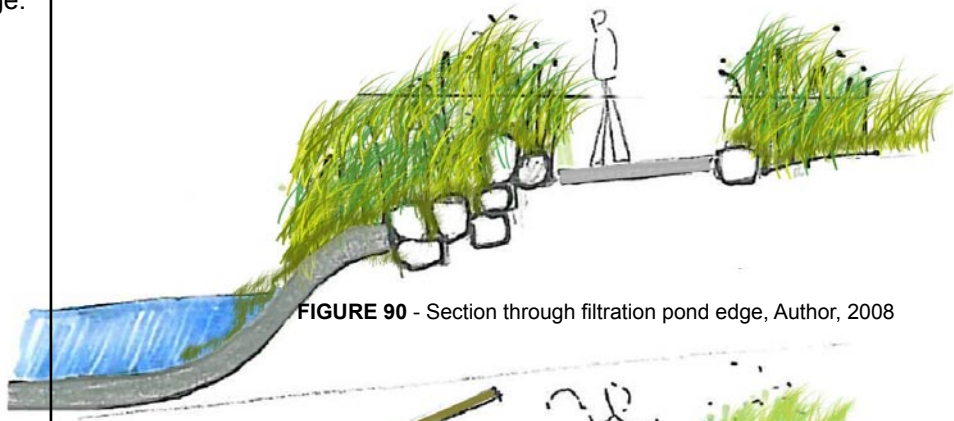


FIGURE 90 - Section through filtration pond edge, Author, 2008

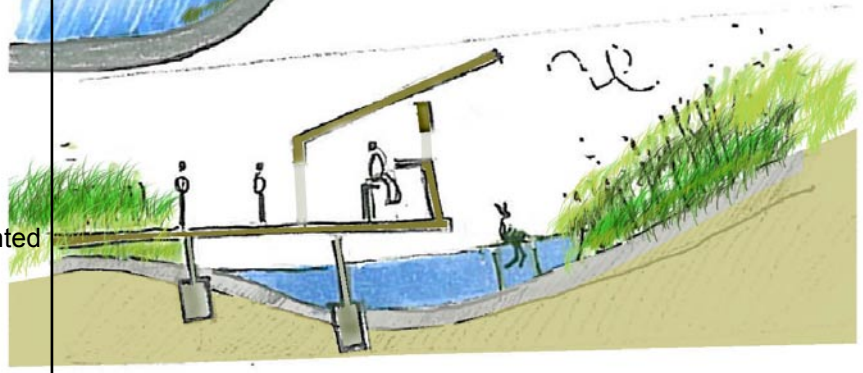


FIGURE 91 - Bird hide in the filtration pond, Author, 2008

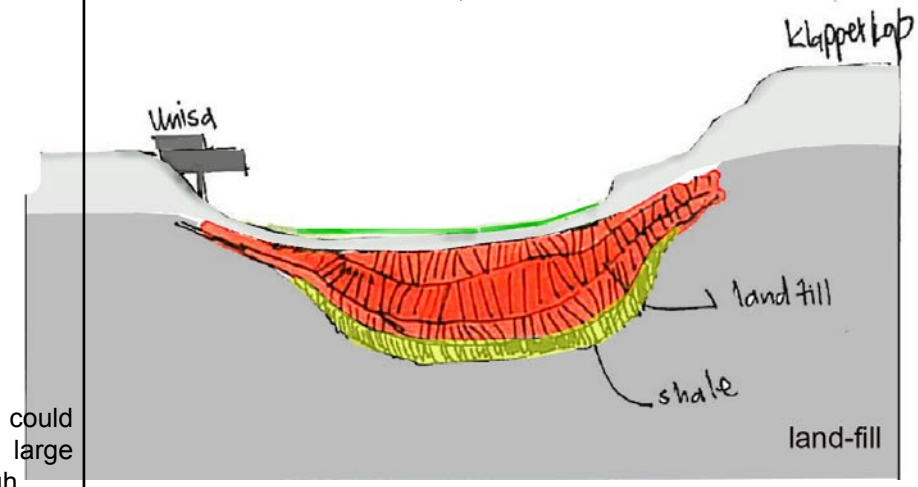


FIGURE 92 - Diagrammatic section of the geo-technical condition, Author, 2008

		-possible ground water contamination	2- Specialist consultants should be brought in to assess the situation and provide recommendations and guidelines.
		-control measures	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.

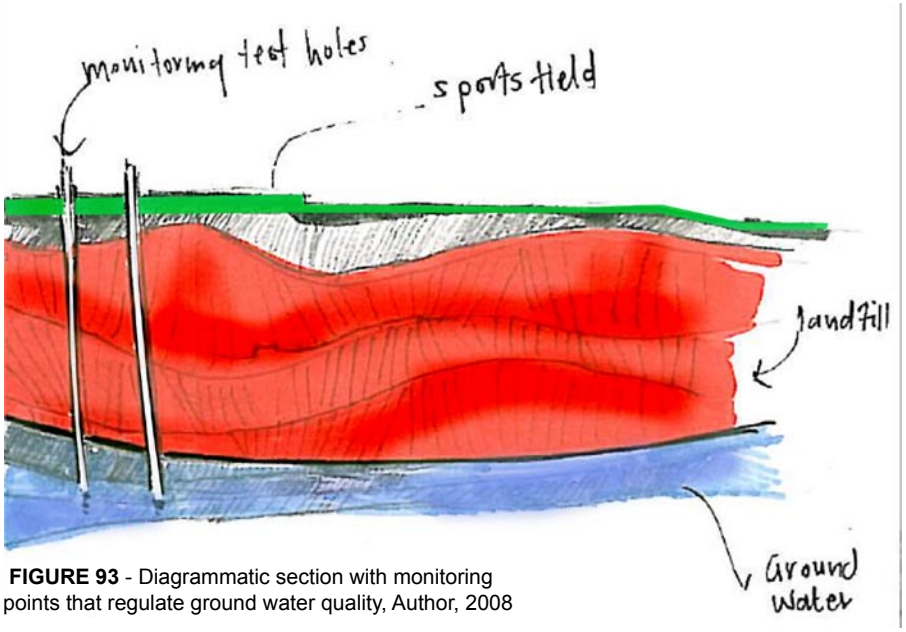


FIGURE 93 - Diagrammatic section with monitoring points that regulate ground water quality, Author, 2008

	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

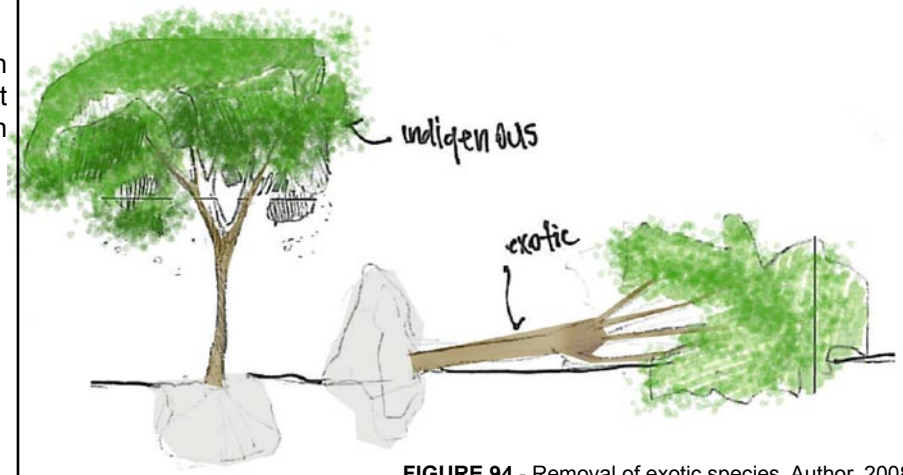


FIGURE 94 - Removal of exotic species, Author, 2008

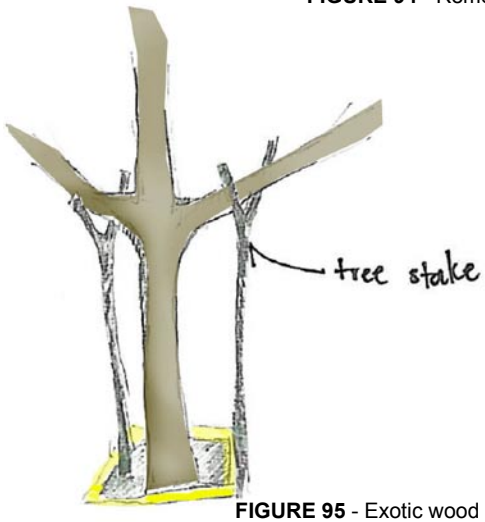


FIGURE 95 - Exotic wood used as tree stakes, Author, 2008

FIGURE 96 - Habitat creation, Author, 2008

		B **-Indigenous species**	-landscape features -habitat creation
		C **- Synthetic Sport fields**	1- All sportsfields should be synthetic. Synthetic fields have less maintenance and water needs.

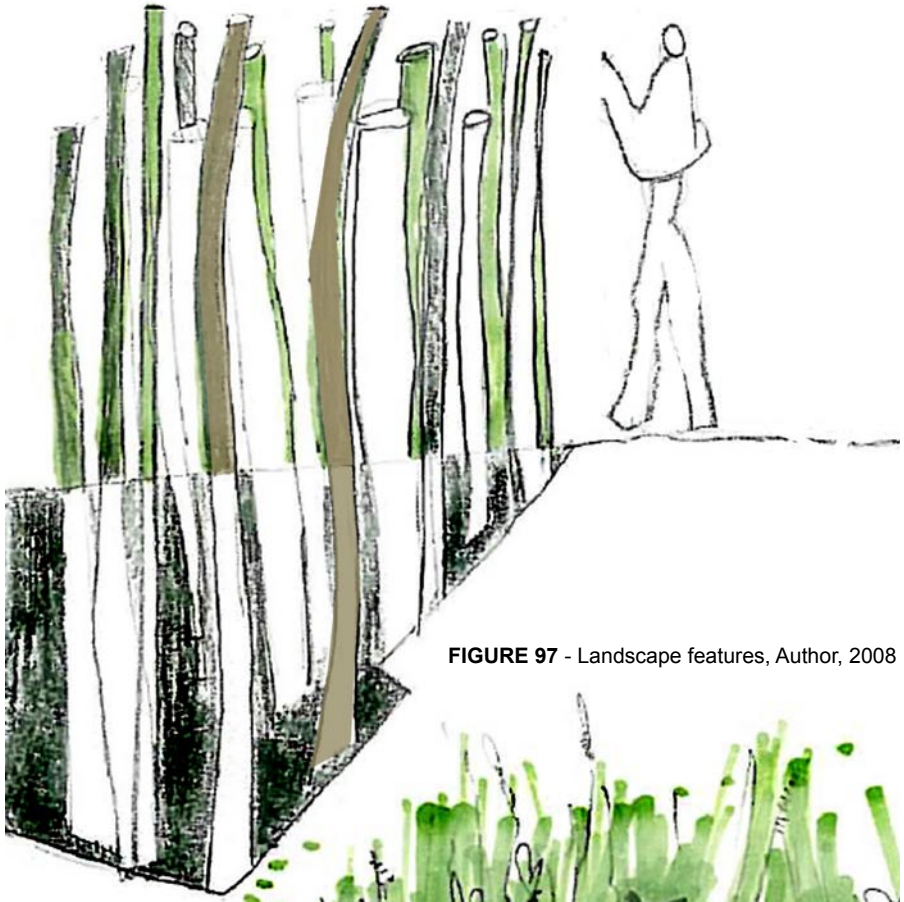


FIGURE 97 - Landscape features, Author, 2008

FIGURE 98 - Bio-degrading wood for habitat creation, Author, 2008

		products	2- Water storage collection points should be located next to the sportsfields.
		-drainage	3- Sportsfield drainage should be implemented by specialists.
		D **-Habitat creation**	1- Specie selection in this scheme should attract birds, insect, frogs, lizards and small mammals.

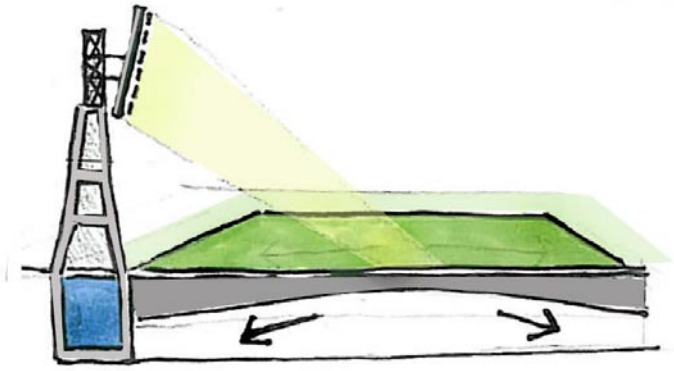


FIGURE 99 - Diagrammatic section showing water storage in base of towers, Author, 2008

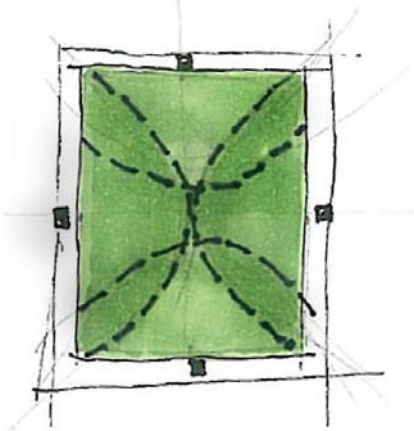


FIGURE 100 - Diagram indicating water collection points next to fields, Author, 2008

FIGURE 101 - Habitat creation, Author, 2008

		-filtration pond -bio-swale -planting species	2- The filtration ponds and bio-swales should be planted with plants that allow nesting and nest building material for bird species.
		-storm water spine through campus	3- A storm water system running through the Groenkloof main and sports campus will enhance the ecology on Groenkloof campus.
		E **-Onsite nursery**	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.

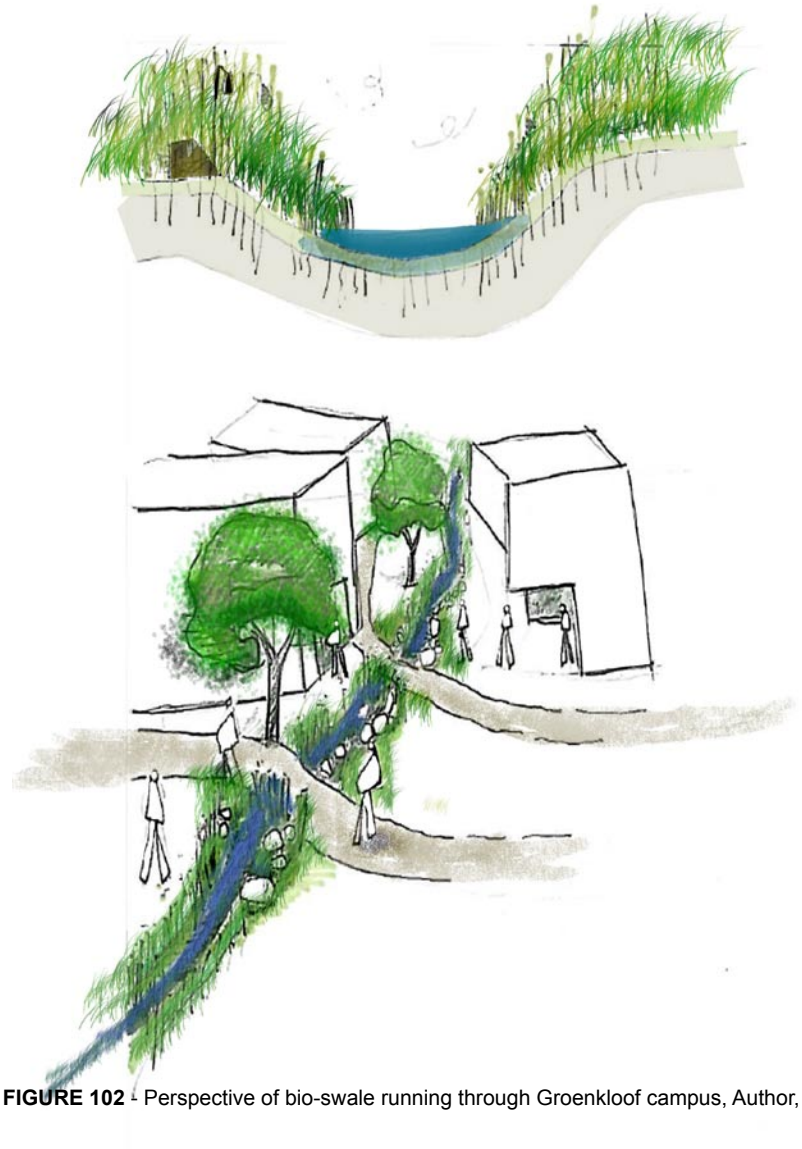


FIGURE 102 - Perspective of bio-swale running through Groenkloof campus, Author, 2008

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

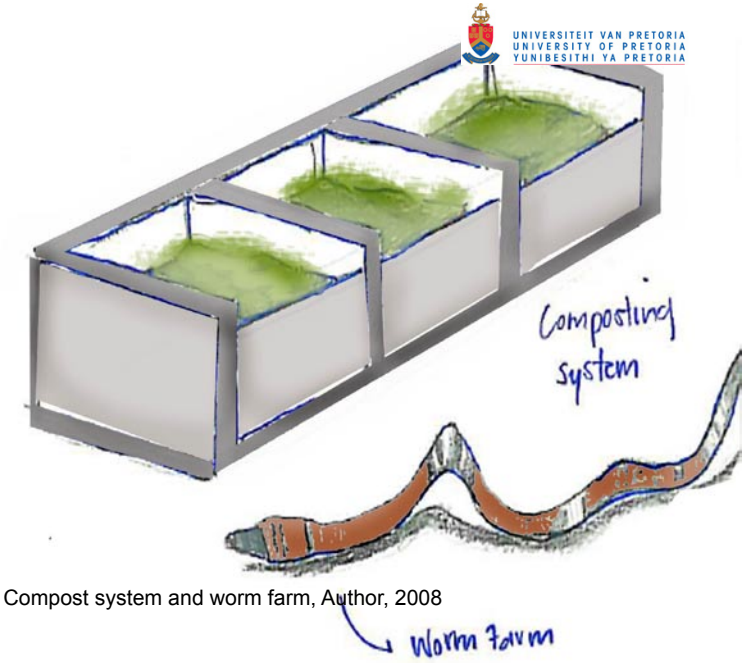


FIGURE 103 - Compost system and worm farm, Author, 2008

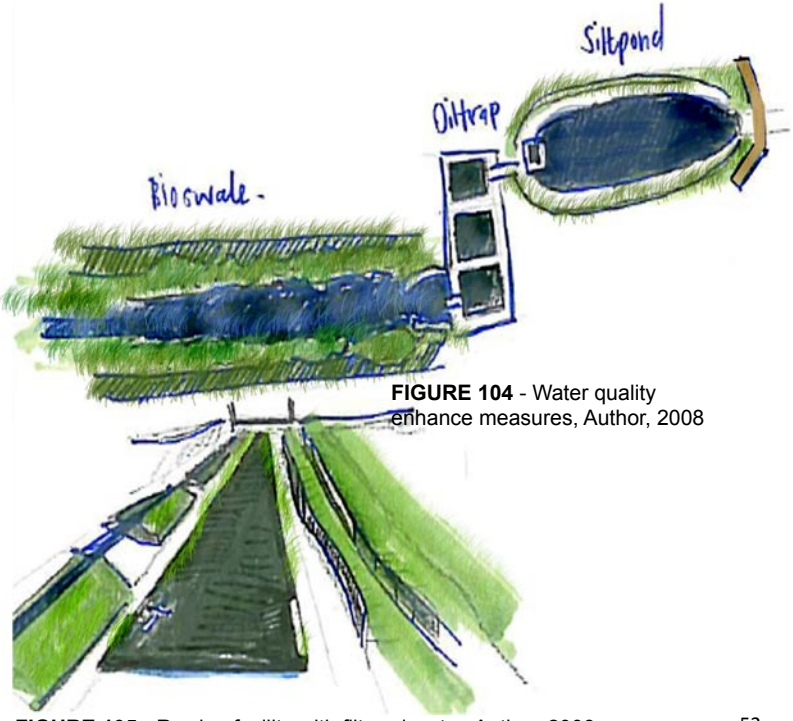


FIGURE 104 - Water quality enhance measures, Author, 2008

FIGURE 105 - Rowing facility with filtered water, Author, 2008

		-slalom course	3- A slalom course must be developed.
		-recreation	4- Walkways, gathering spaces and seating areas must be designed along the dams' edges.
		-irrigation	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.

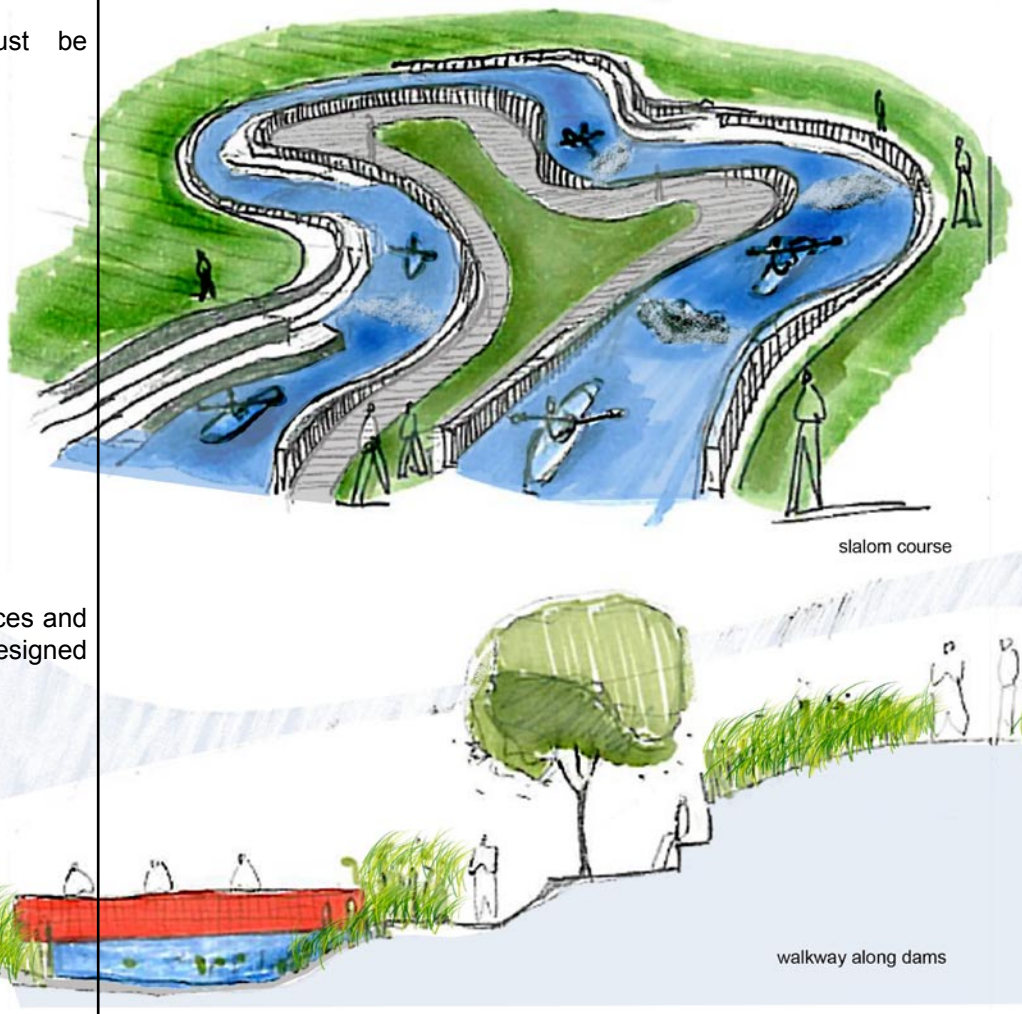


FIGURE 106 - Slalom course and walkways next to filtration pond and irrigation dam, Author, 2008

-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.

-water back to Apies River

6-The existing overflow in to the Apies River should be retained and upgraded.

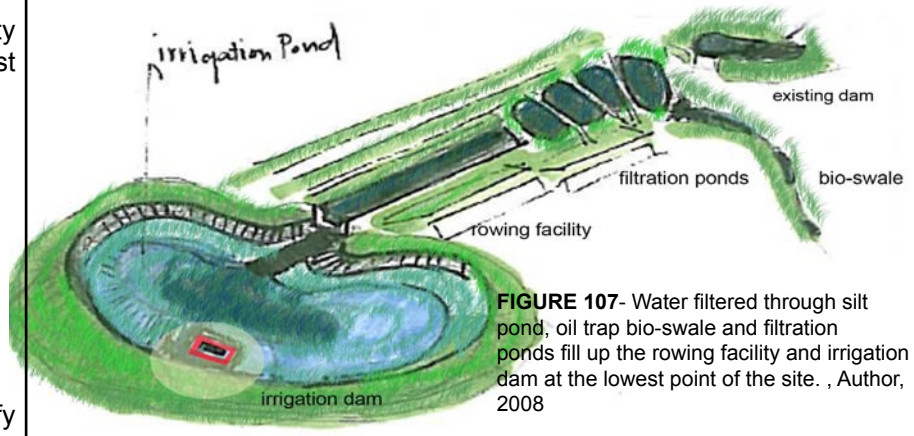
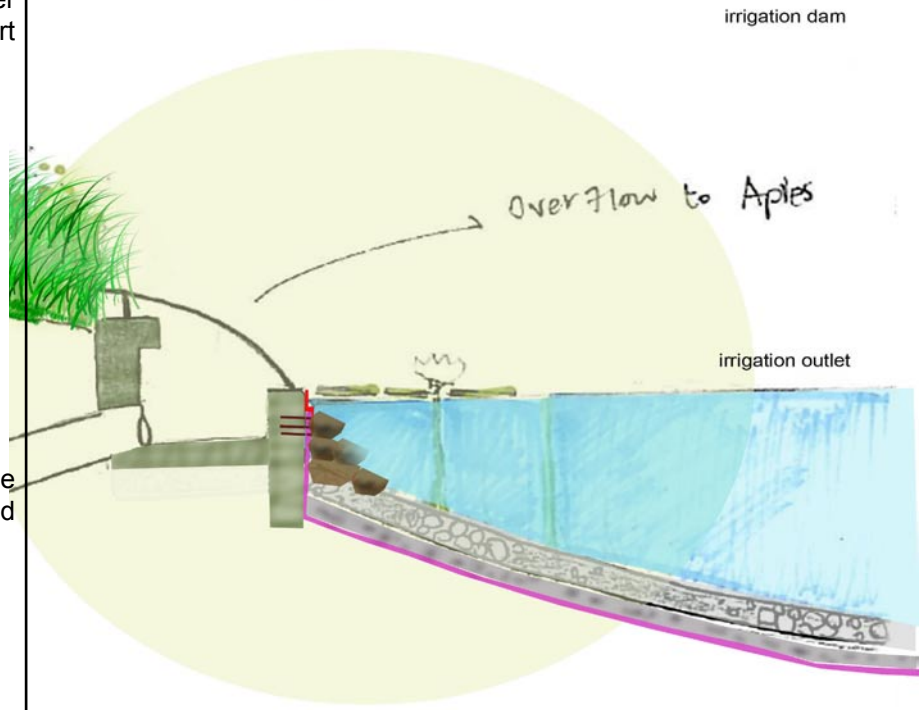


FIGURE 107- Water filtered through silt pond, oil trap bio-swale and filtration ponds fill up the rowing facility and irrigation dam at the lowest point of the site. , Author, 2008



3.2.1 Levels of scale

A
-respond to Unisa`s strong architectural lines.

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.

FIGURE 108 - Diagramatic section of existing landscape at Groenkloof, Author, 2008

FIGURE 109 - Proposed landscape profile, Author, 2008

2- Red clay brick should be used as finish on these retaining walls to commemorate the Kirkness brickfields and emphasize these walls.

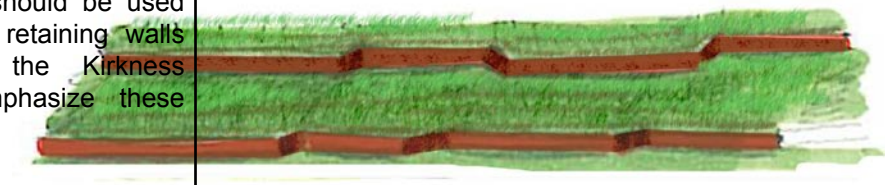


FIGURE 110 - Red brick retaining walls, Author, 2008

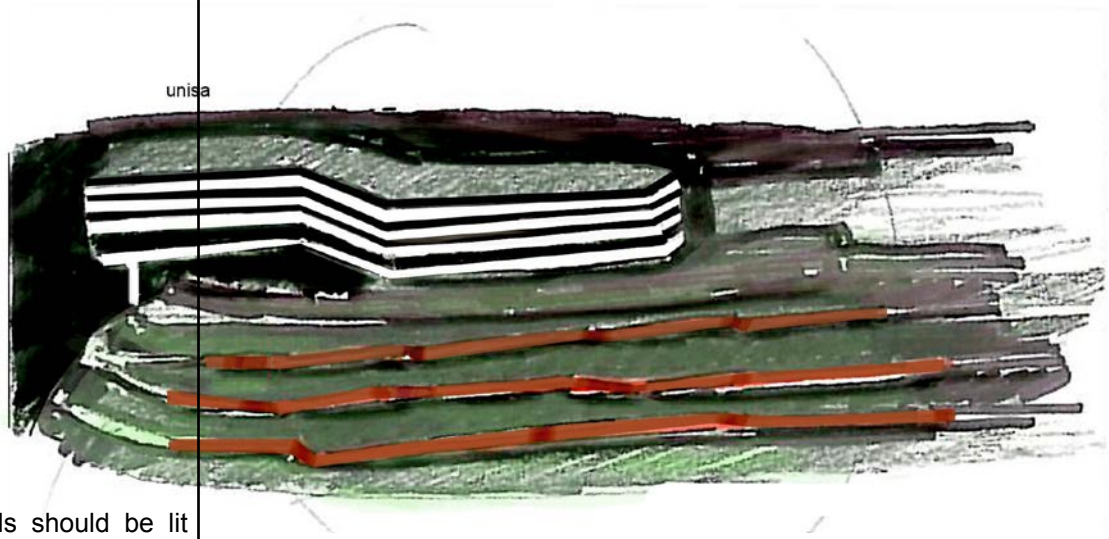


FIGURE 111 - Groenkloof landscape acting as plinth to Unisa, Author, 2008

3-The retaining walls should be lit up at night, to enhance the strong architectural lines of Unisa.

		B **-enhance the vistas to surrounding monuments**	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.
		C **-use red bricks in the detail design to commemorate the brick fields**	1-walkways -seating walls -retaining walls with history story boards

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

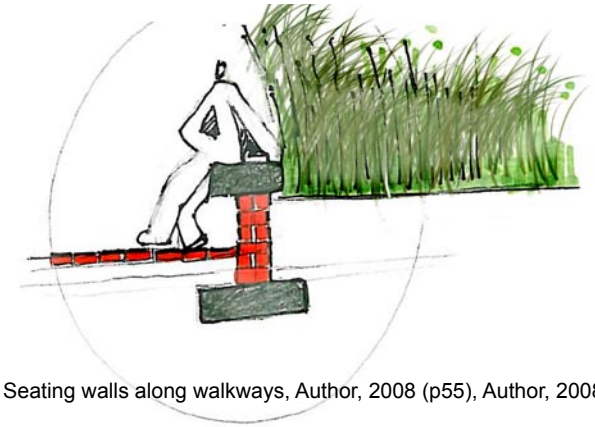


FIGURE 113 - Seating walls along walkways, Author, 2008 (p55), Author, 2008

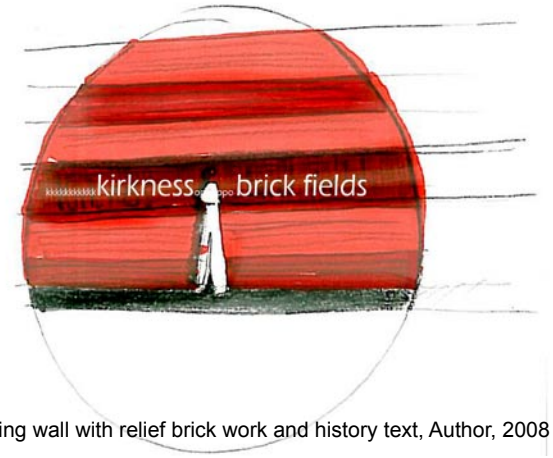


FIGURE 114 - Retaining wall with relief brick work and history text, Author, 2008

	3.2.2 Chimneys (Kirkess brickfields)	**A** **-celebrate the Kirkness brickfields by reinventing the brick chimneys.**	-The retaining walls can be used as canvasses that depict the cultural significance of Groenkloof.
		-flood light tower	1- 25 to 30m red brick flood light towers should be placed onsite for lighting and aesthetic purposes.
		-orientation beacon	
		-refreshment shop	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.

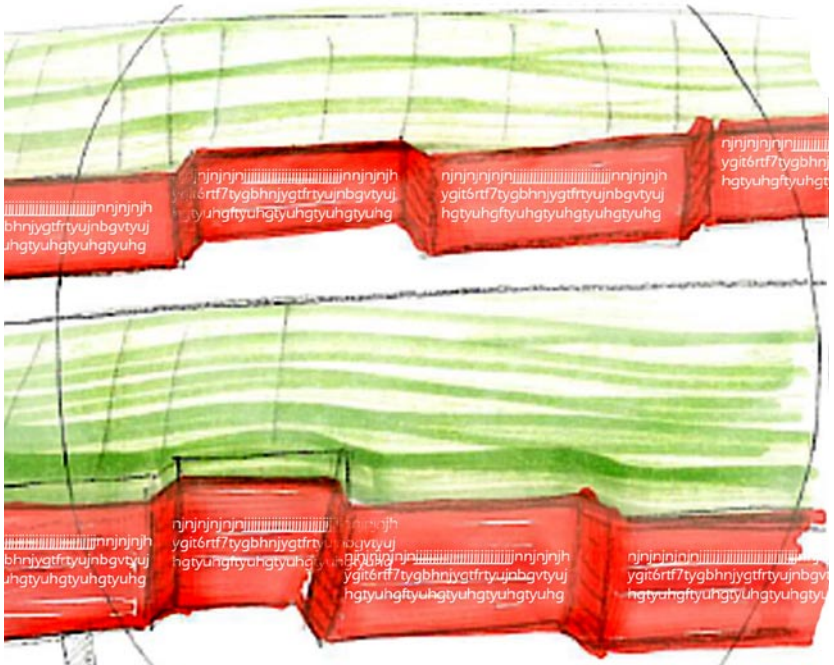


FIGURE 115 - Retaining walls with history text, Author, 2008

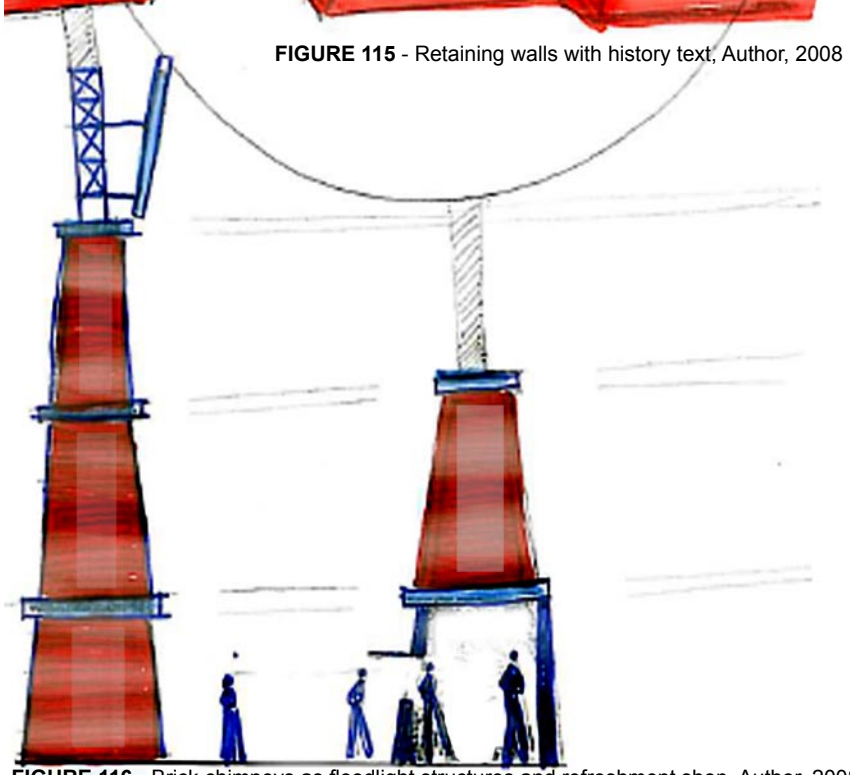


FIGURE 116 - Brick chimneys as floodlight structures and refreshment shop, Author, 2008

		-ablution	4 -Ablution facilities can be accommodated in these brick structures.
		-history story canvasses	5- The history of Groenkloof campus can be depicted on the sides of the brick towers

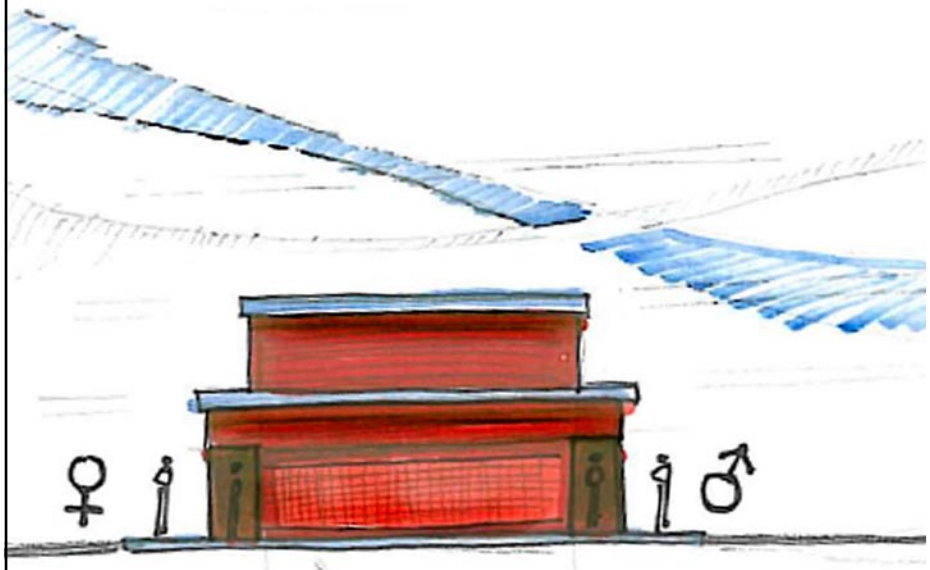


FIGURE 117 - Ablution facility with red brick, Author, 2008

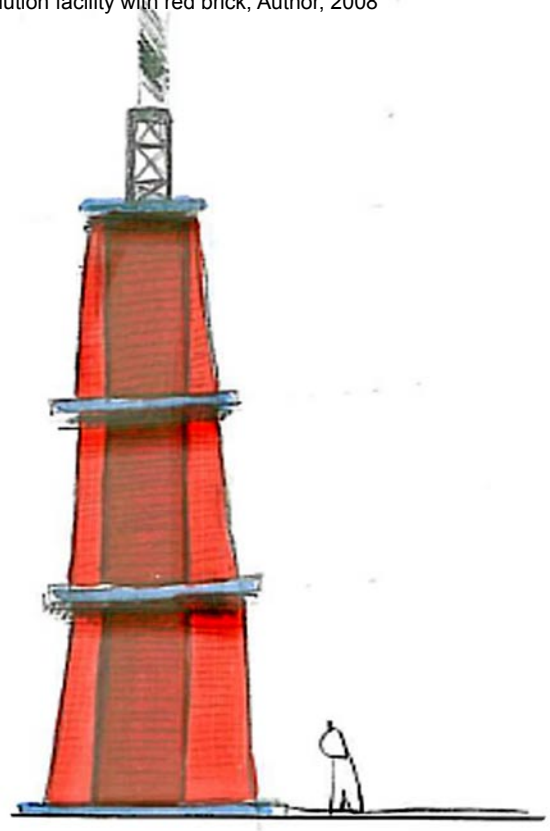


FIGURE 118 - Red brick tower with large up-light feature, Author, 2008

	Social		
	3.3.1 Inclusive design	**A** -Athletes	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.

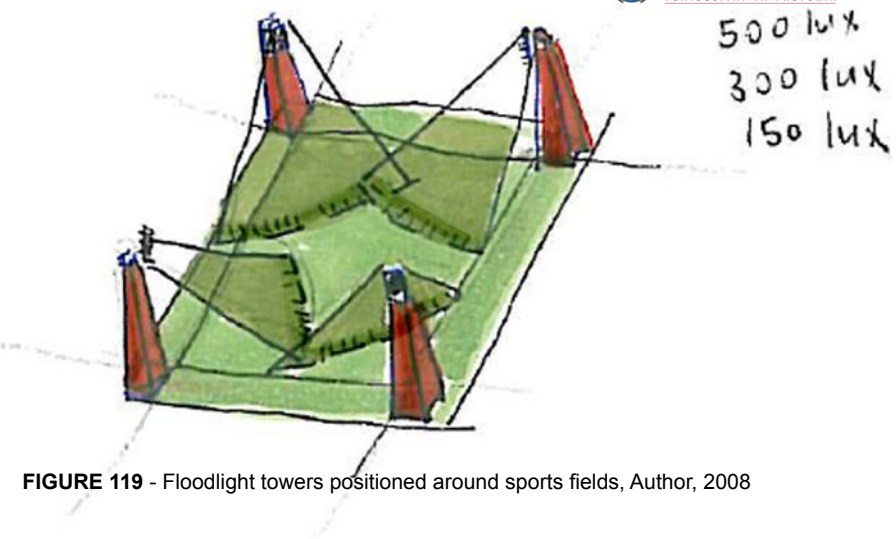


FIGURE 119 - Floodlight towers positioned around sports fields, Author, 2008

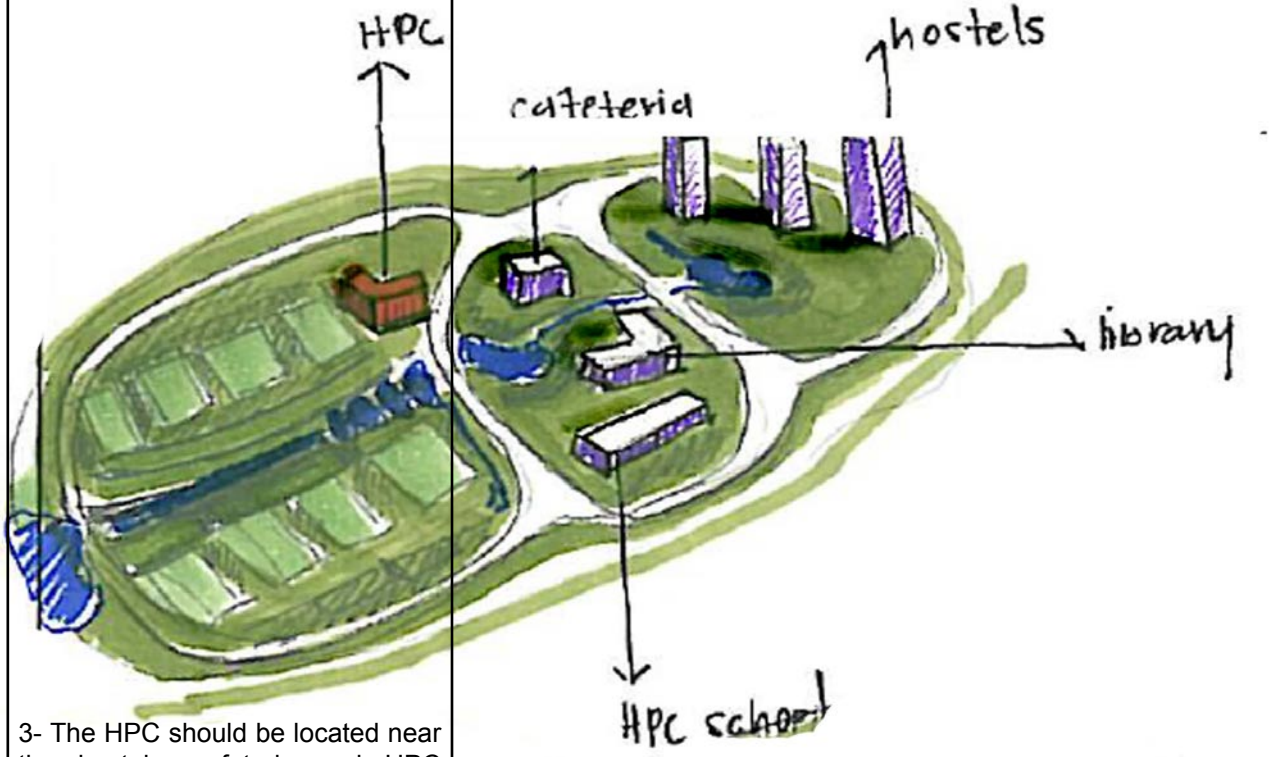


FIGURE 120 - The diagrammatic sketch indicate the proposed location of the HPC on Groenkloof campus, Author, 2008

		B Families	1- Pocket parks and walkways with history stories built in to the route should be implemented to accommodate families visiting the sports park.
		C -Elderly	
		D -Physically challenged	1- All ramps should be 1:12 and benches with shade trees and drinking fountain provided at every 100m meters.
		E -Visually challenged	1- All history text should be translated to braille on plaques to accommodate the visually impaired.

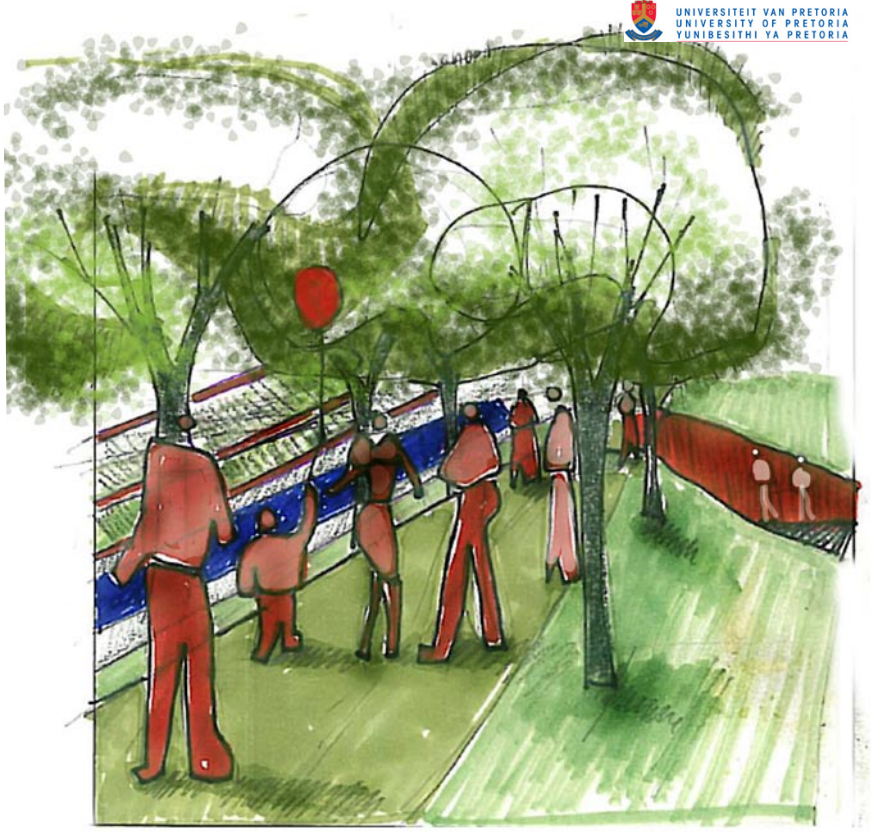


FIGURE 121 - Walkway with shade trees and views on to water sports, soccer and hockey fields, Author, 2008

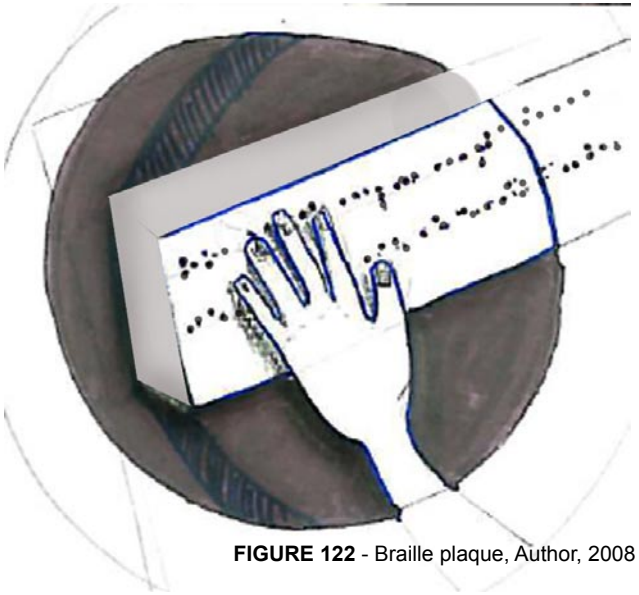


FIGURE 122 - Braille plaque, Author, 2008

F
-Spectators

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.

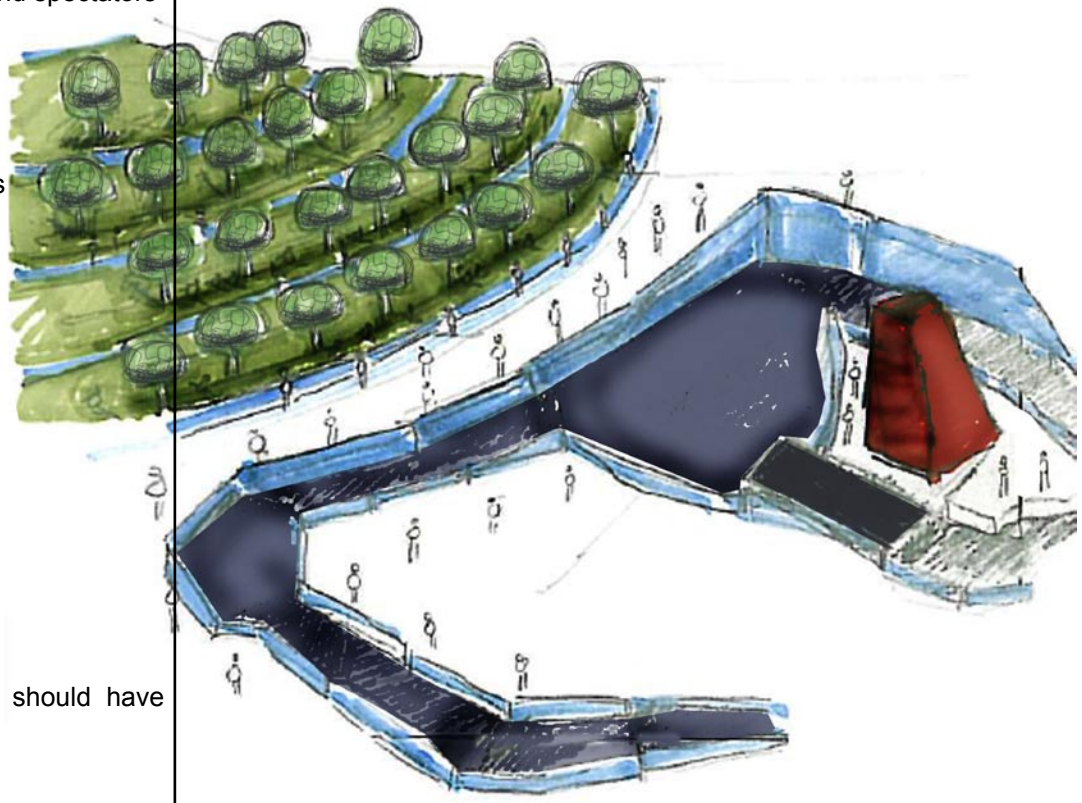


FIGURE 123 - Slalom course with shaded spectator seating, Author, 2008

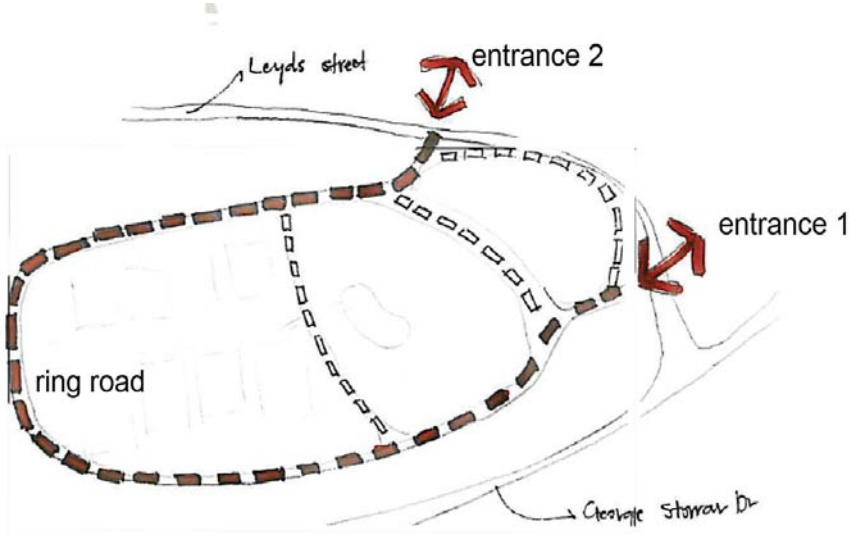


FIGURE 124 - Ring road diagram, Author, 2008

	Sport		
	3.4.1 Hockey	**A** -Facilities	1- Water storage facilities should be located next to the fields as synthetic hockey fields need to be kept wet throughout play time.
		-Spectators	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.

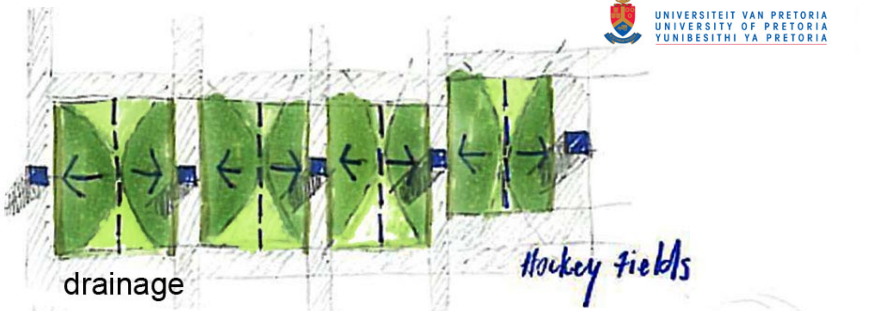


FIGURE 125 - Drainage diagram for hockey fields, Author, 2008

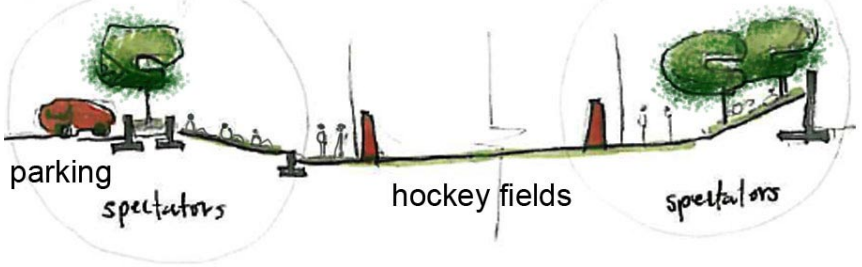


FIGURE 126 - Diagrammatic section of hockey fields with spectator stands, Author, 2008

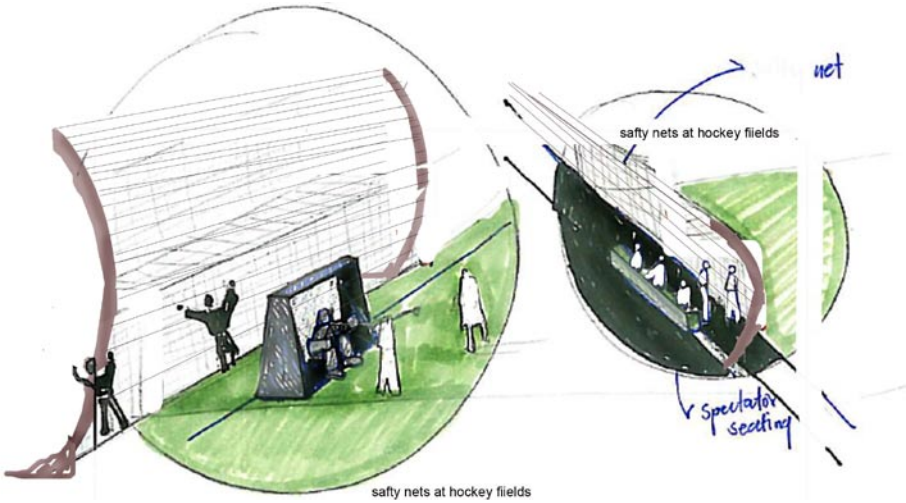


FIGURE 127 - Safety nets at hockey goal-posts, Author, 2008

	3.4.2 Soccer	**B** -Facilities -Spectators	1- Water storage facilities should be located next to the fields as synthetic soccer fields needs 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.

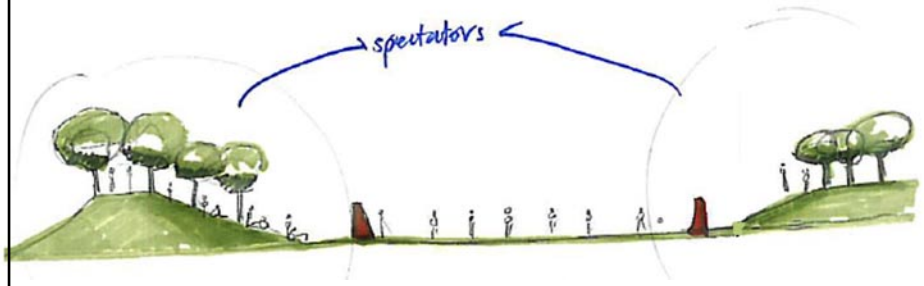


FIGURE 128 - Diagrammatic section of soccer fields with spectatorstands, Author, 2008

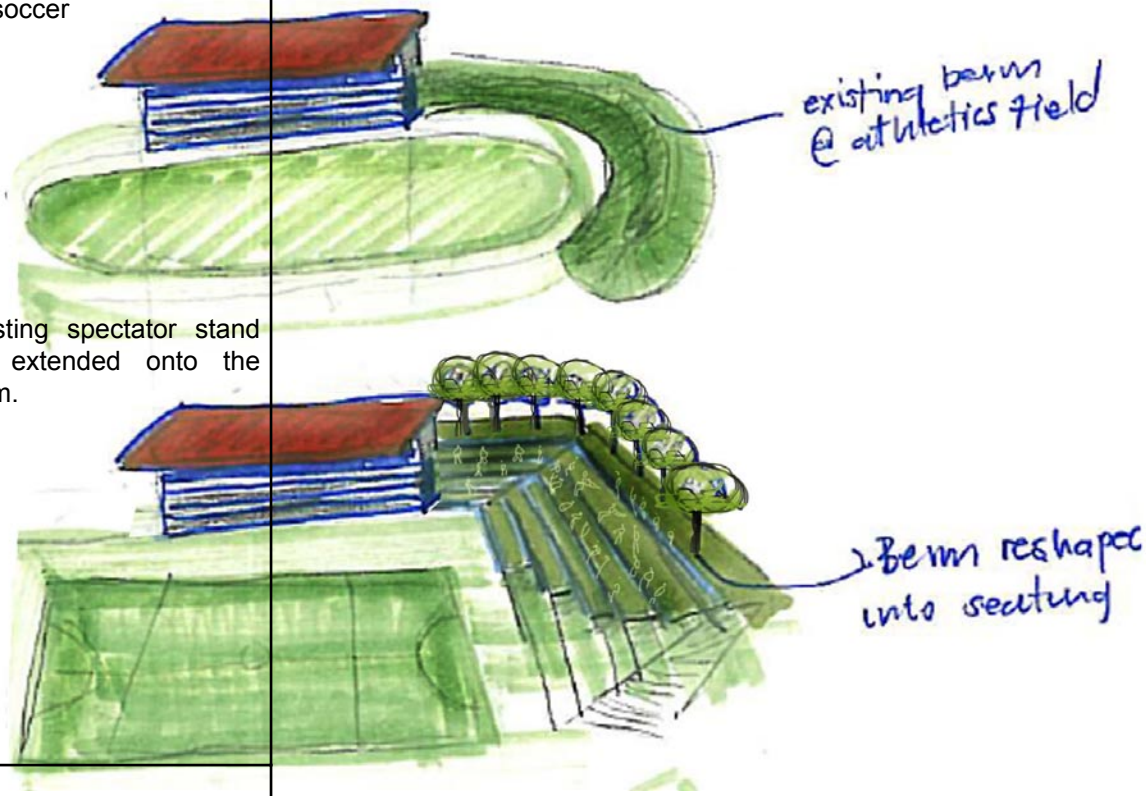


FIGURE 129 - Before and after of the existing berm changed to spectator stand, Author, 2008

	3.4.3 Water sport	**Rowing** **C** -Facilities -Spectators	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.

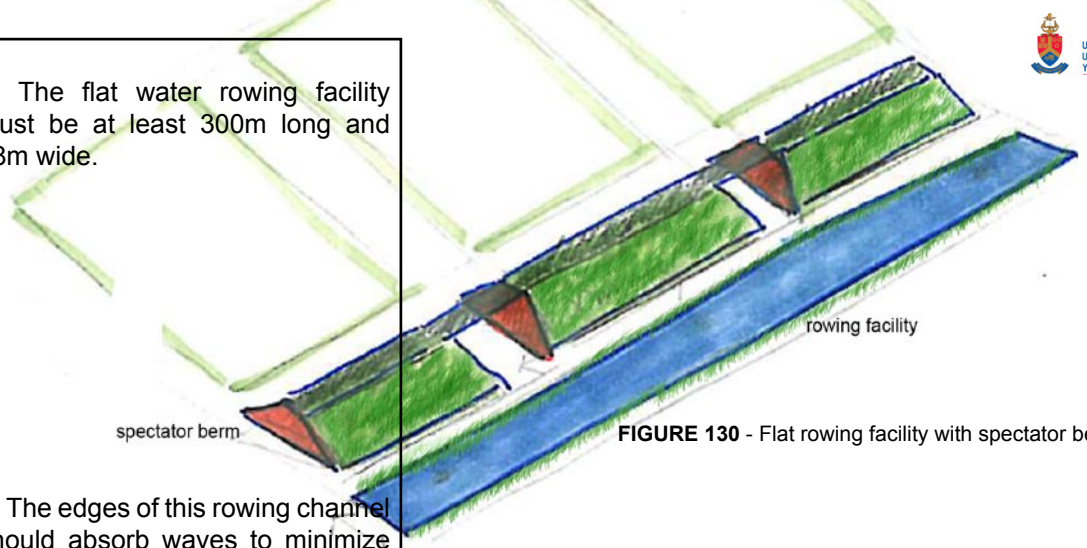


FIGURE 130 - Flat rowing facility with spectator berms, Author, 2008

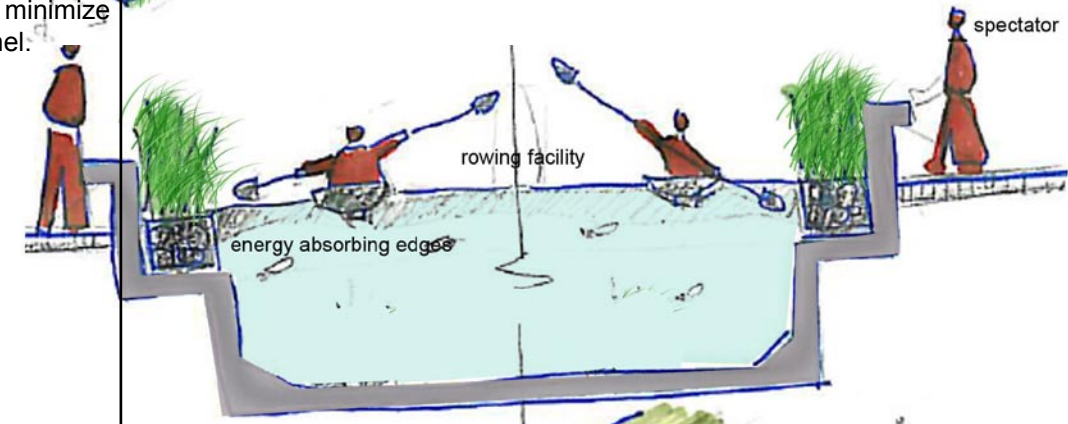


FIGURE 131 - Section through rowing channel with energy absorbing edges, Author, 2008

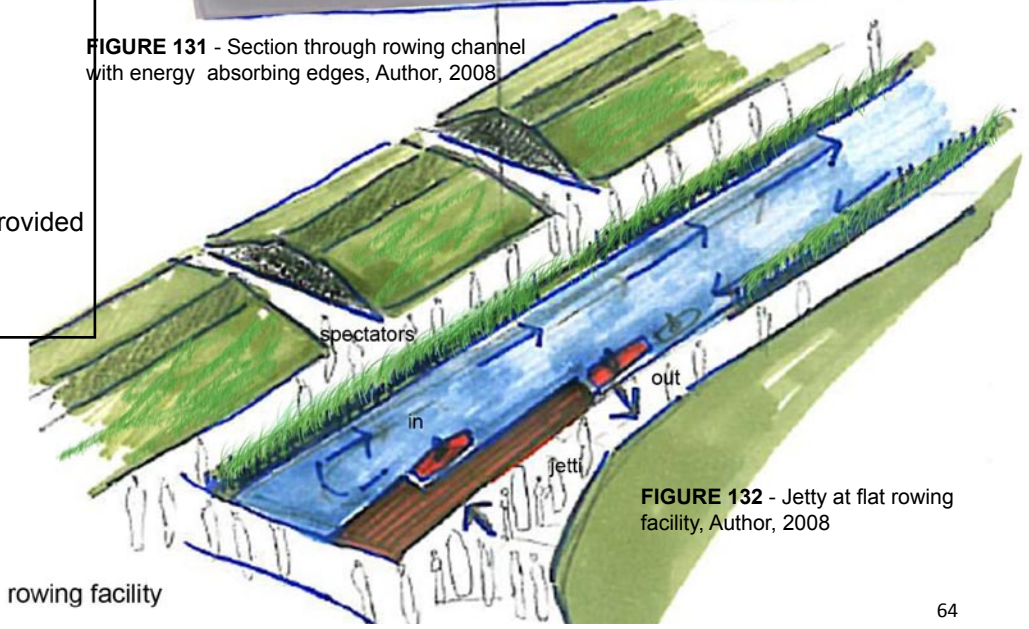


FIGURE 132 - Jetty at flat rowing facility, Author, 2008

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.

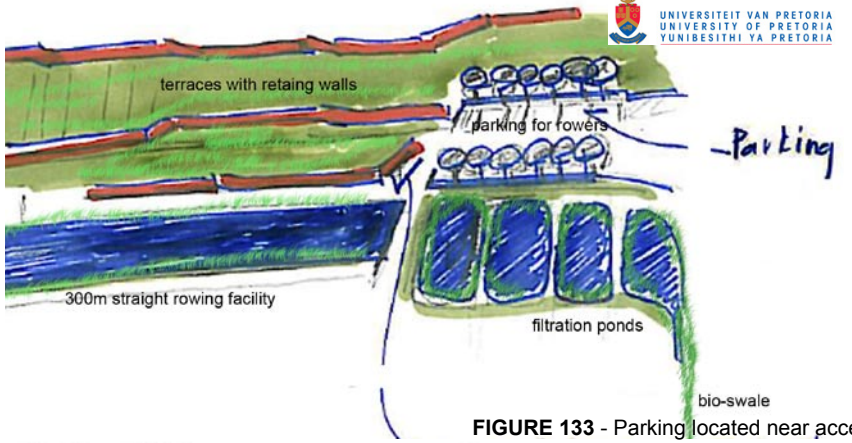


FIGURE 133 - Parking located near access point of rowing facility, Author, 2008

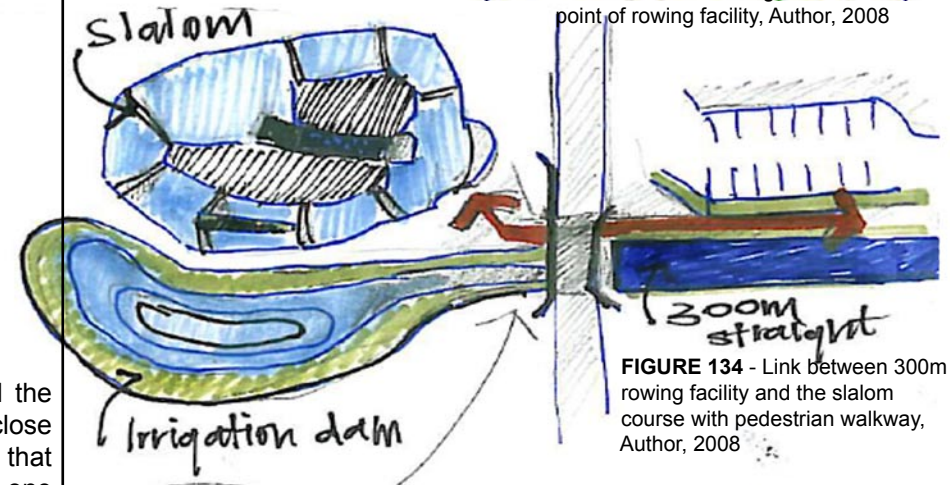


FIGURE 134 - Link between 300m rowing facility and the slalom course with pedestrian walkway, Author, 2008

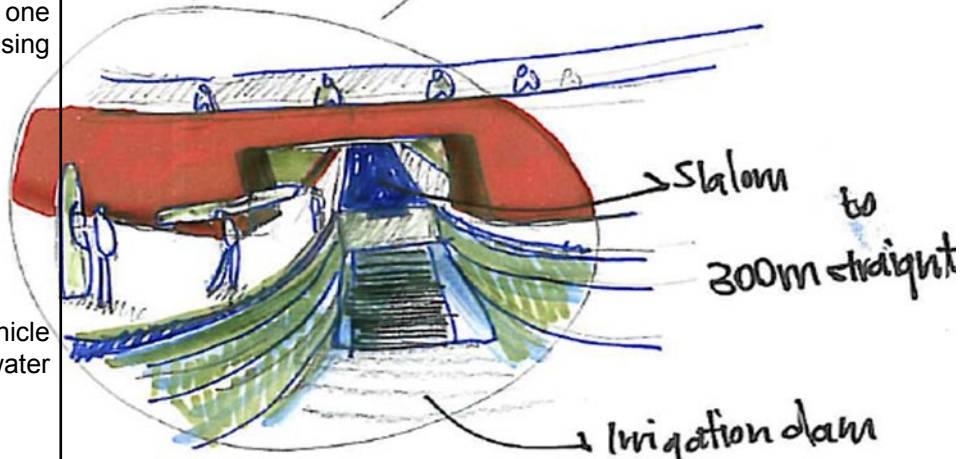


FIGURE 135 - Perspective of link between 300m rowing facility and the slalom course with pedestrian walkway underneat bridge. The rowing course overflows in to the irrigation dam., Author, 2008

		Slalom course **D** -Facilities	1- The slalom facility should not be in the stormwater path. This facility needs constant maintainance 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.

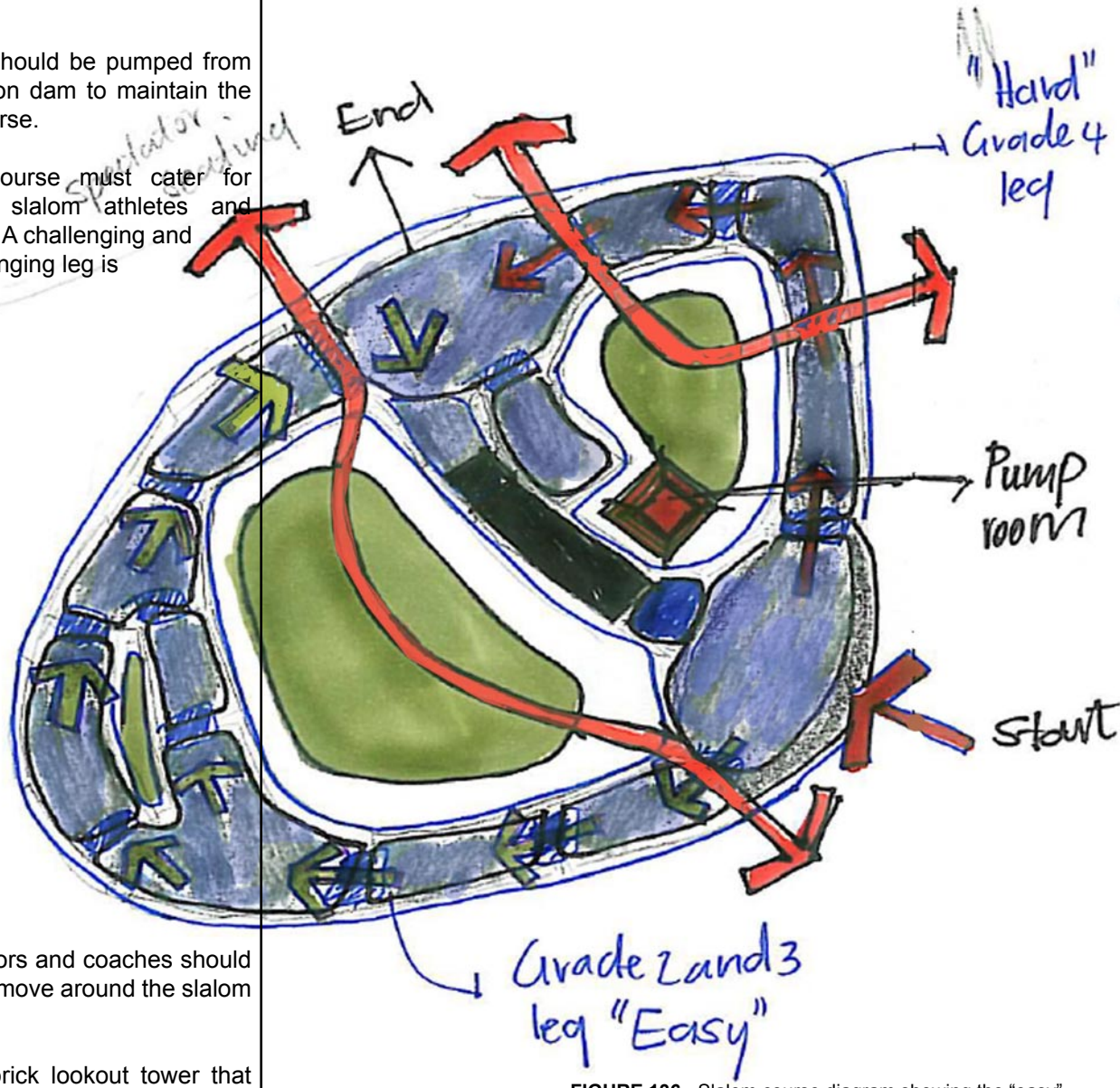


FIGURE 136 - Slalom course diagram showing the "easy" route with green arrows and "difficult" route indicated in red arrows, Author, 2008

		-Spectators	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.

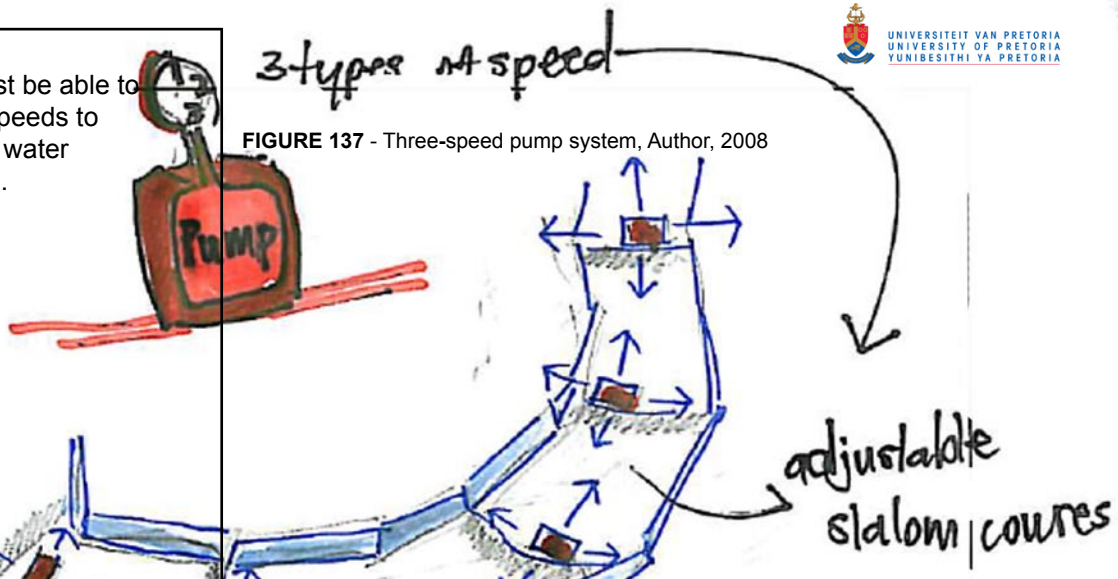


FIGURE 137 - Three-speed pump system, Author, 2008

FIGURE 138 - Diagram of slalom course with adjustable, Author, 2008

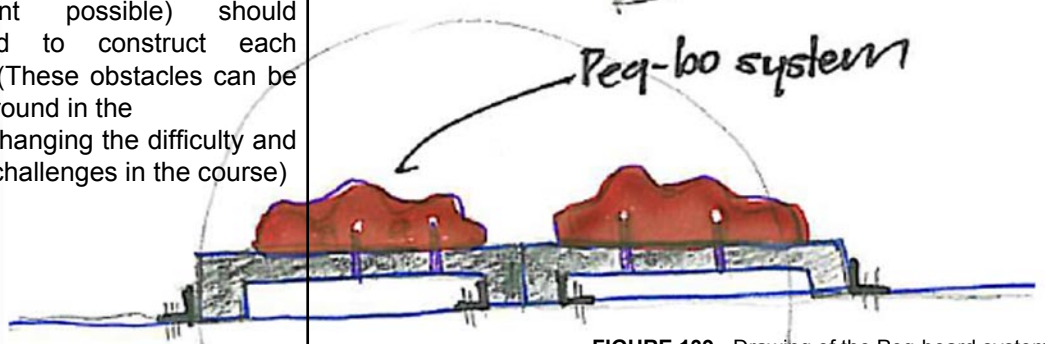


FIGURE 139 - Drawing of the Peg-board system in slalom course, Author, 2008

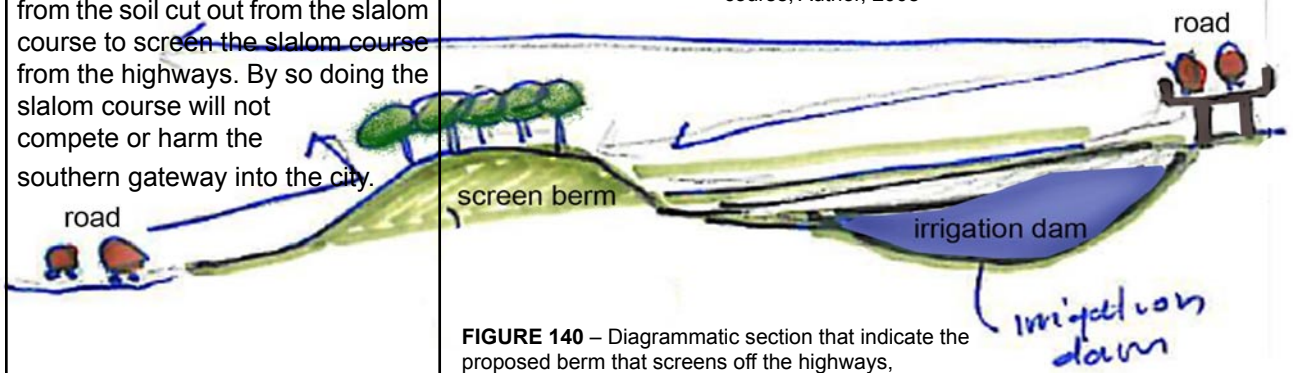


FIGURE 140 – Diagrammatic section that indicate the proposed berm that screens off the highways, Author, 2008