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CONNECTIVITY

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This document is submitted in partial fulfilment for the degree:
Master of Architecture (Professional)
At the University of the Witwatersrand, Johannesburg, South Africa, in the year 2008.

00:00:04

Declaration

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Acknowledgement

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INTRODUCTION

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Introduction

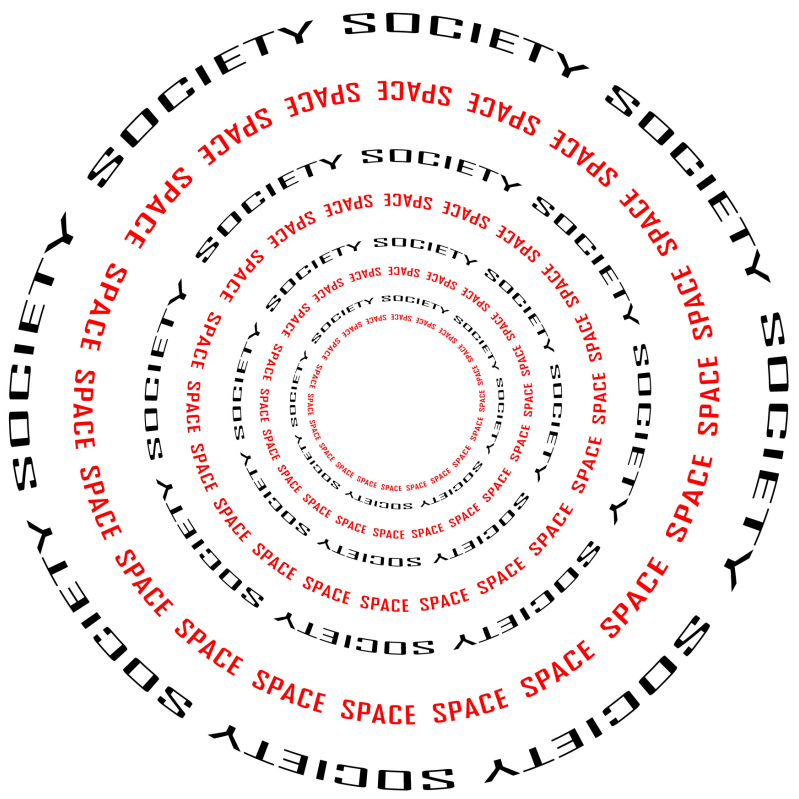
Architecture connects society to its environment through space. Peter Salter states that in any particular place "Circumstance is a term for criteria that must gather again those very connections, which are in need of expression." (2000:23)

This thesis examines the subject of connectivity within society and space by investigating Johannesburg's history of social-spatial segregation and intends to create an architectural intervention that forms a contemporary connection to society in post-apartheid greater Johannesburg.

Connectivity of the user, with entities ranging in scale from body to the city, is explored through programme and architecture, by analysing the physical and anthropological factors of the local user.

It investigates the conditions for connection through the current use of space, in a collective place around the dispersed urban environment of Soweto, a historically oppressed township situated on the south west of Johannesburg.

The proposed architecture seeks to evolve the existing experience of the environment for the everyday user, as well as integrate recreation and sport facilities into the environment so as to achieve a place of pleasure and enjoyment for the human and social fabric of the city.



00:00:11

2

Des-connection

The Grand apartheid legacy of historical racial segregation and exclusion left behind a deeply imprinted spatial disconnection in the landscape of Soweto; it rendered some meaningless spaces, the south shore of the Orlando dam is one such place. In order to reconnect it to society, the conditions of connection require to be considered and the disconnecting factors of each significant entity explored.

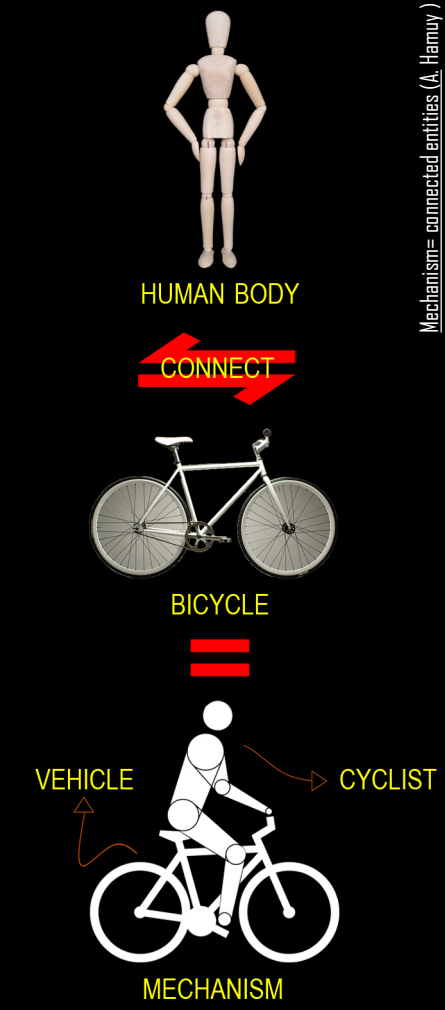
C O N N E C T I V I T Y

Manuel Castell[1] (2002: 441) suggests that "Space is an expression of society. Since our societies are undergoing structural transformation, it is a reasonable hypothesis to suggest that new spatial forms and processes are currently emerging. the township of Soweto is one such place "The concept of connectivity aims to investigate the conditions of connection and what forms they might take in order for space to communicate with society.

Gilles Deleuze[2] (Colebrook 2002:56) argues that only through connection can a production between entities be achieved. An entity is "nothing more than its connections," alone it has no closed identity but connected to another, a mechanism is created that "transforms and maximises itself."

To express these connections in an architecture that is decisive to society, Peter Beardsel[3] (2000:23) proposes to start with a criteria of, attentive evaluation to circumstance, by considering the present condition as most significant.

A socially responsive architecture requires a locality to place, attained by connecting the user with its surroundings. Bruno Stagno[4] (2001:71) describes these surroundings as local conditions, both physical and anthropological; climate, topology, cultural heritage, religious beliefs and social or historical determinants, that collectively "shape the human behaviour of society."



Mechanism= connected entities (A. Hamuy)

Jane Jacobs[5] (1962:13) provides a way to investigate these behaviours; one has to venture into the real world and look closely, with little previous expectation, "at the most ordinary scenes and events, and attempt to see what they mean and whether any threads of principle emerge among them."

These Socio-spacio processes articulate relations of spatial principle, subsequently sources for action can then emerge "by understanding how, what is regionally substantive is related to the bigger frames of architectural thought." (Beardsell 2000:23)

To connect with the users Henri Lefebvre[6] (2002:206) seeks an action that creates an experience of pleasure and enjoyment, "by the transfiguration of everyday life. It seeks to rediscover and magnify the festival "by overcoming the conflict between everyday life and festivity and enabling these terms to harmonise in and through urban society."

Essentially the result of this actions must form a functioning mechanism, between an architectural entity and a range of other relevant entities; user, place and city, that simultaneously address the urban fabric and the social condition.

In order for the occurrence of an architectural intervention that connects with the chosen site (Orlando dam south shore), to expresses its society, the anthropological factors and present condition of the site's relative entities have to be explored ; Greater Johannesburg, Soweto, the Orlando dam south shore and its surroundings.



Johannesburg

Soweto

Orlando dam south shore

Site analysis

00:00:15

J O H A N N E S B U R G

The history of Johannesburg has been, mainly underlined by two facts, its economy and segregation. The economic expansion corresponded mainly to the ups and downs of gold mining, an industry that remains to date "a key player in terms of investment and local employment." (Tomlinson et al 2003:23) And segregation, based on race, class and space which produced a divided city and disconnected society as a whole.

The discovery of gold on the high plains of South Africa in 1886 led to the creation of Johannesburg, "The location and growth of the sprawling city itself was rendered inevitable by the reefs of gold that lay beneath the surface" (Foster 1996:118), in a decade the mining camps rapidly evolved into a city due to its "geology, investment capital, experienced white miners and the presence of the labouring poor from all over southern Africa and beyond."(Chipkin 1993:195)

Mandy (1984:25) suggests that another contribution to growth were, the race related; legislations, forced removals and relocations, which according to De Kiewiet (Mandy 1984:37) all served to exclude the non- white labour class from good land, ample water, skilled labour and high wages, thus creating an economic and a socio-political policy of cheap labour and racial supremacy, for all ruling white governments throughout the city's history.

The actions taken by the city's authorities, from its inception till the late1970's, to uphold this policies indicates the progressive, gradual to strict, enforcement of segregation on the city which eventually shaped Johannesburg's racial landscape.

Today however, even after the 1994 democratically elected government implemented measures to combat the phenomena, the spatial exclusion continues in the form of economy, affecting especially the lower income group. The location of informal settlements and low cost houses on cheaper land south of the inner city are disempowering its residents through high travelling costs considering that almost all work is situated on the northern parts of Johannesburg.

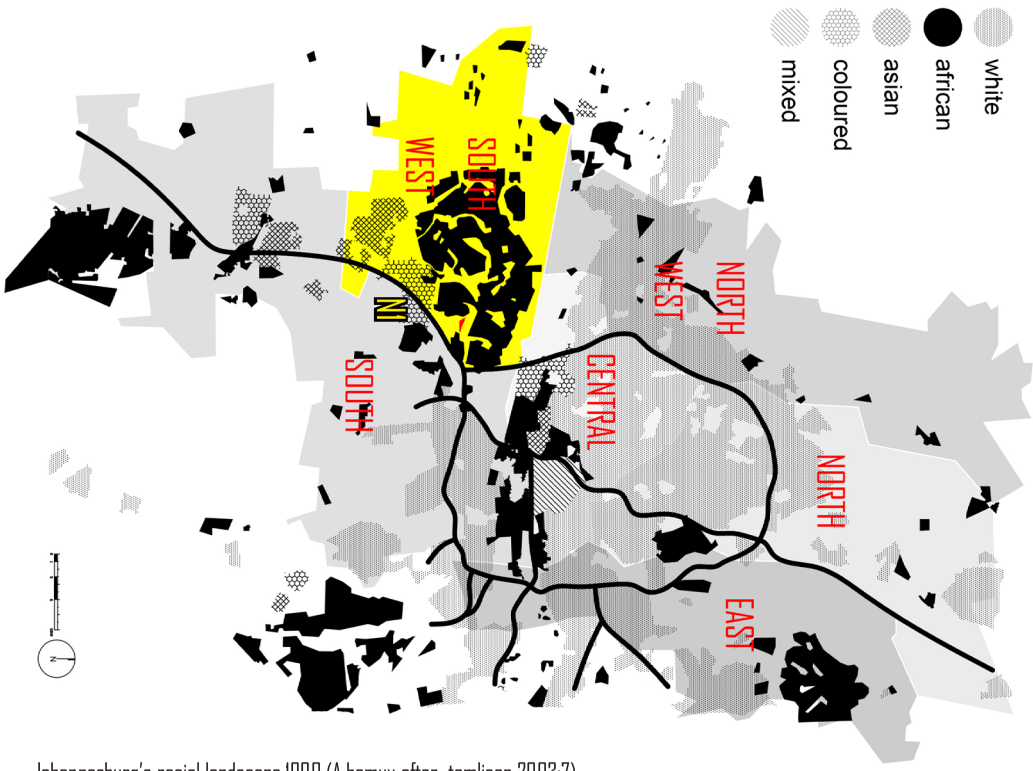
History

During the 1890's the labouring poor migrated to Johannesburg seeking work and "established themselves around the inner city, on mining properties and waste lands," (Chipkin 1993:197) known as locations. In 1904 bubonic plague broke out in the kafir and coolie 'locations' and residents were forcefully removed to Klipspruit farm 16 km south west of the city for sanitary reasons. The Urban Areas Act of 1923 entailed "total residential segregation and no security of tenure for blacks," (Chipkin 1993:200) it instigated the relocation of black people from the white urban areas to the peripheries of the city. By the late 1930's Johannesburg was proclaimed white and much of the black population had being moved to state- subsidised housing townships on the south west of the city (Soweto).

The birth of Grand Apartheid saw the strict implementation of legislations that formalised the 'separate development' system that segregated the city's landscape. It began with the Group Areas Act of 1950 which established a spatial segregation and relocation of the population groups followed by the Native Urban Areas Amendment Act of 1955 which served to "remove such concentrations of blacks as the servants living in central city blocks of flats" (Christopher 1994:122) and limit their access to the urban areas. Throughout the 1960's residents of Sophia town were relocated to Soweto, the Indian population of Pageview to Lenasia and the coloreds to Eldorado Park and Ennerdale, affirming a divided Johannesburg, with the southern suburbs mainly for non- whites and the northern exclusively for whites.

Due to the states "diminished capacity to enforce apartheid legislation, escalating repression and violence in the townships," (Tomlinson et al 2003:13) during the 1980's blacks started to move back to the inner city and its suburbs. The Free Settlement Act of 1988 allowed for a racial mix within designated group area of cities, an indication of the acceptance, by the state, of "the limitations of racial segregation." (Tomlinson et al 2003:25)

The 1994 democratically elected government implemented measures, such as low -income housing subsidy, to promote an integrated development of the city.



Johannesburg's racial landscape 1990 (A hamuy after tomlison 2003:7)

S O W E T O

The township of Soweto is a product of Johannesburg's historical segregation, intended to be a black dormitory town, its planning principals epitomised the Grand apartheid policies of population control and domination, through its isolation from the urban area of the city, ethnic sub-division, wasteland buffer zones and restricted commercial sustainability. The result was a disconnected urban landscape of inefficiently laid out low density housing which Chipkin (1993:216) described as a monotonous, sprawling, grey township that lacked all sense of place and amenity.

The establishment of residents in Soweto was directly related to the migration of black people into Johannesburg, caused by the city's labour demand and the impoverishment of the rural black population, a consequential result of the government's legislative acts of segregation. The constant, unsatisfied, demand to council for accommodation in Soweto created various dwelling responses; 4 rooms with covered stoep brick houses, attached and semi detached precast concrete block houses, site provision for owner built houses, standardised NE 51/6 type plan houses and single storey bunk barracks hostels. They created the now characteristic uniform housing landscape of Soweto.

Violence between ethnic groups, residents and authorities, hostility between different accommodation residents and general unhappiness of the; oppressive insanitary conditions, low quality of life, discrimination and lack of security created a very tense period in Soweto which exploded with the 1976 student uprising which subsequently generated a political rebellion through marches, boycotts, strikes, vandalism and violent acts.

Today 44% of Johannesburg's population resides in Soweto and the resultant deficiency and urban planning of apartheid is still strongly embedded into its fabric. Infrastructure, services and poverty are still key concerns for its residents "revealing of their own lives and frustrations, the youth said that poor people were those without anywhere to go or anything to do and without prioritised sport and recreation facilities, lacking in education, skills and income earning opportunities, they reflected that young people with time on their hands were tempted to crime". (Tomlinson et al 2003:207)

However with the current or planned integration of large; shopping malls, mix use precincts and housing developments, the once dormitory township is gradually shifting towards a sustainable balanced urban environment where residents can live work and play.

History

The existence of Soweto began in 1904 when the township of Klipspruit was established to house the forcefully removed 'location' residents, it consisted of corrugated iron shelters provided by Council. Municipal accommodation for 3000 people was supplied in the vicinity as part of the municipality's reaction to the 1923 Natives Urban Act that stipulated a separate housing provision for blacks living within the urban areas. By 1935 the city council had provided 3000 dwellings in the new township of Orlando and Pimville to address the influx of blacks into the city due to "insufficient land, lack of opportunity and taxation of blacks in rural areas." (Mandy1984: 175) During the next decade the black population increased a further 62% stimulated by the labour demands in the growing industrial sector and men migrating with their family (Morris 1980:10) .The accommodation demand was initially combated by an overcrowding solution of allowing house tenants to take in sub-tenants.

In 1944 squatters invaded land around the townships to protest the lack of housing supply, in response the council erected 4000 concrete block shelters in Shantytown, when that did not suffice, emergency camps for self-help shacks were established in Moroka and Jabavu, comprising of 6 x 6m sites with a provision of basic amenities as well as 8292 council houses in Orlando east /west and Jabavu. At the same time the 30 year leasehold area of Dube was allocated for the middle class black to build houses from predesigned government plans.

The 1950's acts of Grand Apartheid relocated the black population of Johannesburg in Soweto; increasing the population even further, in response council set up ethnically allocated 'site and service' schemes around Soweto, comprising of 12x21m serviced sites, where people built temporary shacks until council could replace them with permanent housing. Between 1953 and 1969 council erected 49 146 standardised 51/6 type plan housing units in this sites, according to the national Housing Commission, they complied with the; minimum standard of space, optimum neighbourhood densities and lowest cost. Simultaneously they built 88 schools, 8 clinics

and 9 TB centres. An attempt during this period to control the influx of the black population was introduced in the form of single sex hostel, they accommodated 38 095 black people.

Violence between ethnic groups, residents and authorities, hostility between different accommodation residents and general unhappiness of the; oppressive insanitary conditions, low quality of life, discrimination and lack of security created a very tense period in Soweto which exploded with the 1976 student uprising that generated a political rebellion through marches, boycotts, strikes, vandalism and violent acts.

In response, the apartheid government attempted a politics of reform, in 1978 it granted a 99 year leasehold to black people which escalated to freehold by 1986, it signified the permanence of the black population in greater Johannesburg (Tomlinson et al 2003:25), this act increased the renovations being made to state built houses and purchasing of new homes in suburban developments around greater Soweto. During the same time poverty, un employment and house shortages saw the increase in backyard shacks and informally settled squatter camps. From 1994 the private sector has taken over the delivery of new government subsidised housing and homeowner's houses.



Soweto's built form (A hamuy after Magubane 2001:6)

O R L A N D O

The Orlando power station, its dam and surrounding open spaces were historically disconnected to the residents of Soweto by its position and through its agenda. It is here that an opportunity lies to reconnect society to the space.

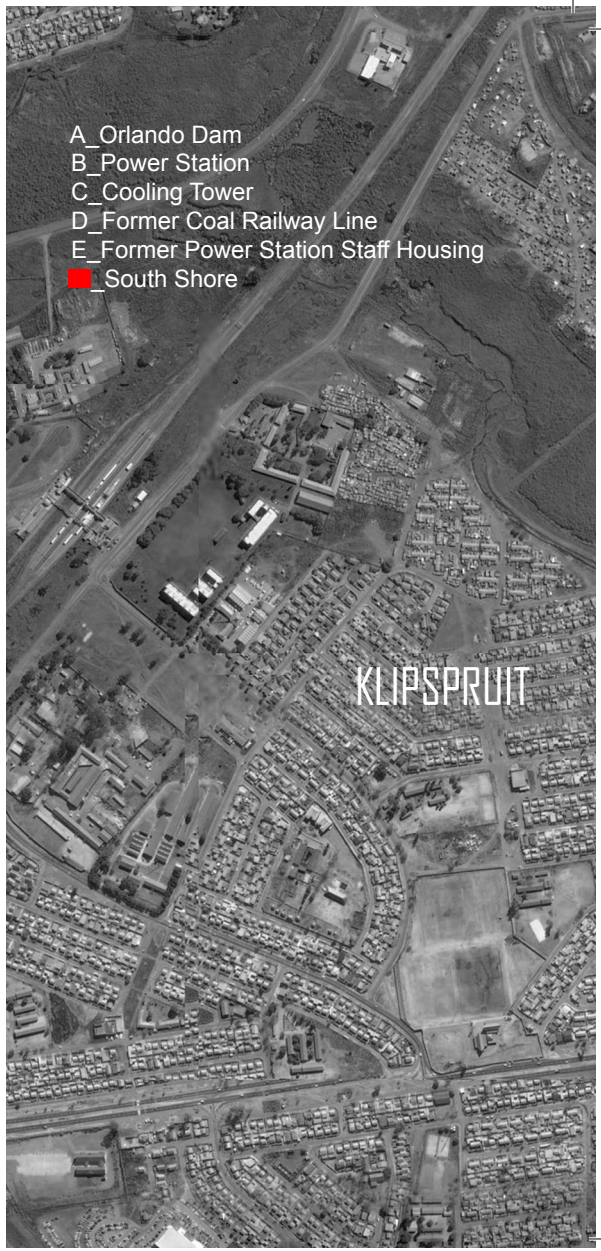
The Apartheid's urban planning of ethnically subdivided townships in Soweto was greatly facilitated by the buffer zones naturally created through valleys between townships in the area. One such disconnecting zone was the valley separating the Orlando and Klipsruit Townships, but during 1939 with the construction of the Orlando power station and cooling dam in its vicinity, its disconnecting significance escalated from local physical sub-divider to a purposeless disconnected space from Soweto.

The only thing the Station supplied to the area was pollution, as the power generated by its turbines predominantly supplied electricity to the white suburbs of Johannesburg. The exclusion of the Soweto residents was due to grand apartheid policies, the government controlled, Electricity Supply commission (EScom) "wrote off most black townships, arguing that their inhabitants would one day return to the so-called homelands."(Eberhard 2004:4)

Power supply to Soweto started to be supplied slowly during the 1970's and increased in pace in the 1980's after the uprising when government acknowledged the permanence of its residents, but throughout its functional life till the mid 1990's, when the station was deemed too expensive to maintain, the "whole area was fenced off and inaccessible to Sowetans" (Morris 1980:248)

The piece of open land on the south shore of the Orlando dam which forms part of the valley, is where an architectural intervention is proposed to reconnect society to the entities of; itself, its surrounding, Soweto and Johannesburg.

Currently the space is being utilised as; a daily thoroughfare by pedestrians taking a shortcut on the fastest route from A to B and on occasions as an event space for beach parties, beer festival and music concerts.

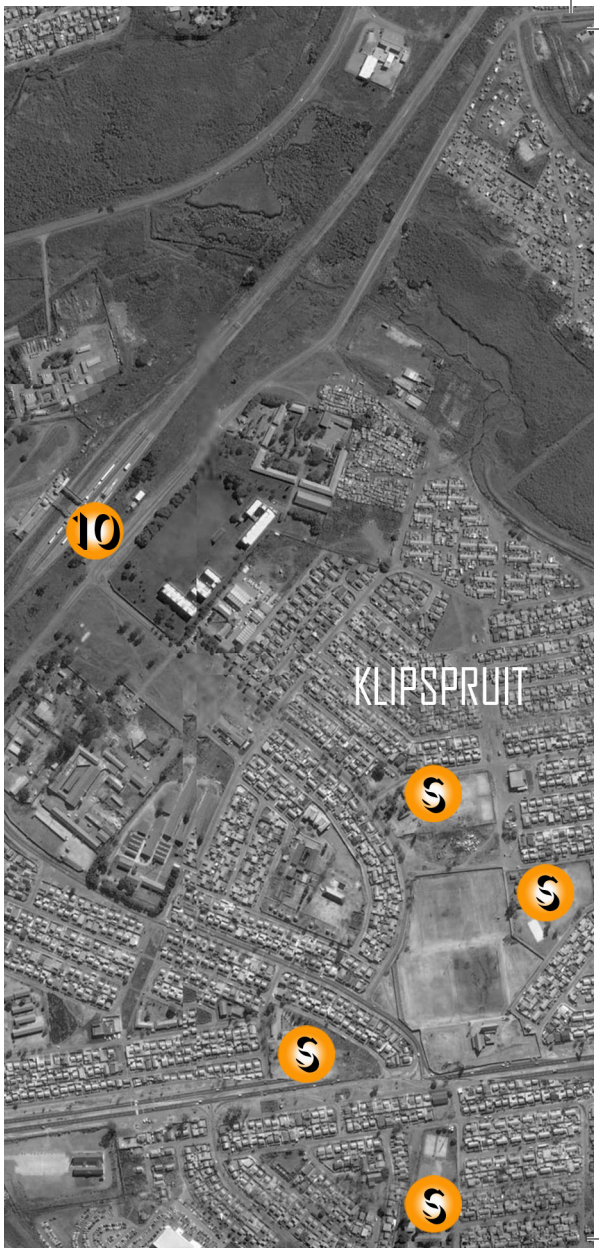


Power Station Precinct (A hamuy after Google earth 2007)


ORLANDO EAST
D
B
C
A
E

S I T E _ A N A L Y S I S

1_Orlando Dam
2_Power Station
3_Cooling Tower
4_Lesedi Clinic
5_Baragwanath Taxi Rank
6_Chris Hani Baragwanath Hospital
7_Lilian Ngoyi Community centre
8_University of Jhb - Soweto campus
9_Sotonga Koppie
10_Metro Train Station
S_Primary/High School
_South Shore




ORLANDO EAST
1
2
3
4
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9

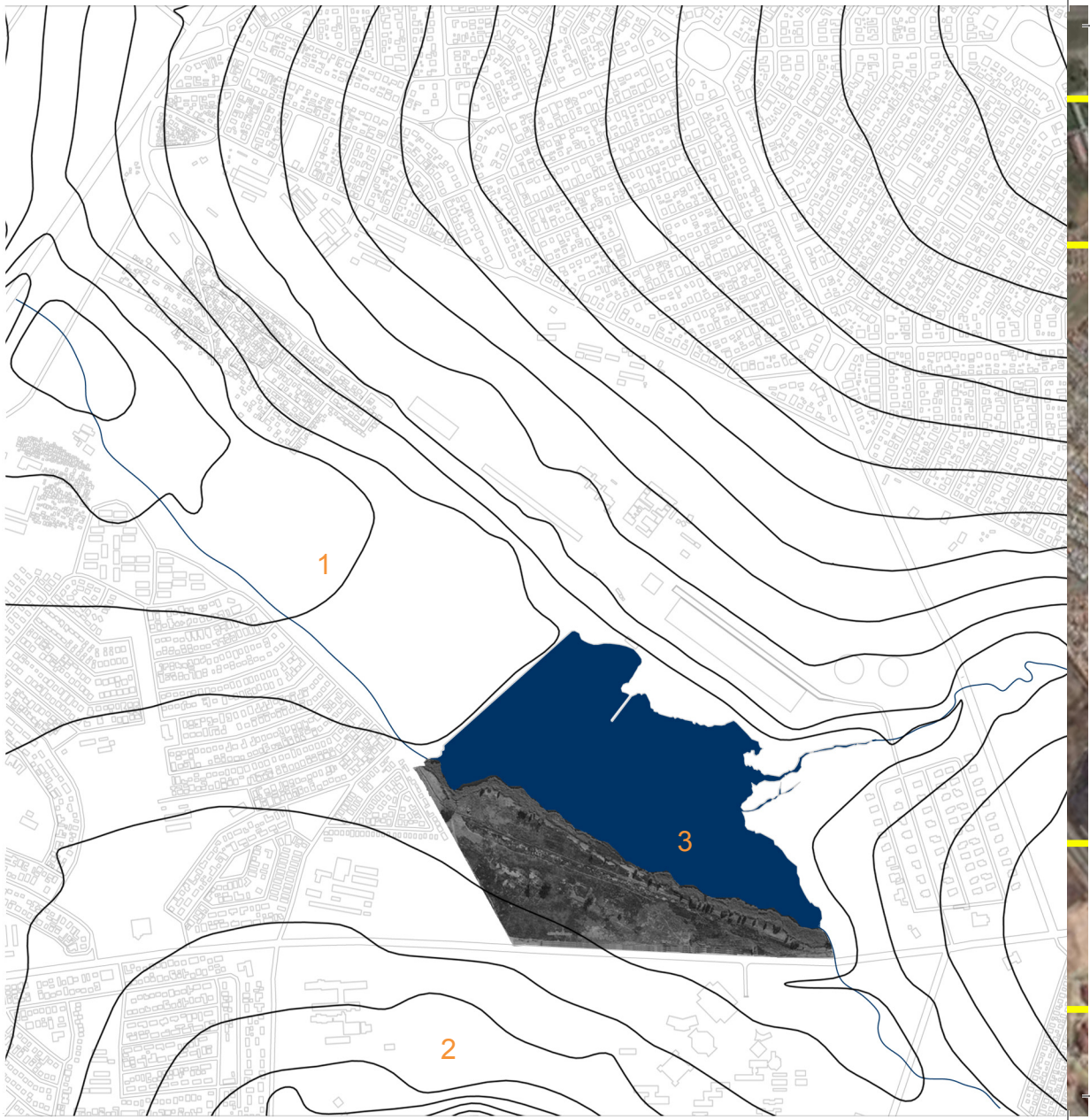
O R L A N D O _ D A M

The Klipriver waters runs through the valley's trough creating marshlands (1) and allowing for the collection of water in the man-made dam, this are elements that create a natural buffer zone between Orlando East and Klipspruit suburbs. The valley is also responsible for the slope on the south shore and the Stonga koppie (2) adjacent south to the space. The dam is currently been utilised as training water by canoeist (3).













marshland Informal housing



formal housing marshland Informal housing

Sections expressing the current built form and edge conditions along the marshland and dam.



old potchefstroom rd dam power station



old potchefstroom rd dam blue gum trees

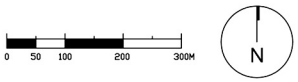
EXISTING_INFRASTRUCTURE

There is a defined spatial division running in a north-west direction. Most of the infrastructure consists of uniform low rise housing with the exception of a few institutional or industrial structures piercing the flat landscape; the former Power station, cooling towers (1) , University of Johannesburg:Soweto Campus (2) which surrounds the south shore and Chris Hani-Baragwanth hospital (3) on the east skyline.











Z O N I N G

There is a lack of diversity in use; a commercial node is lacking and demarcated areas for recreation are just vacant spaces. The majority are institutional and Formal (1,2) or informal (3) residential zones.

- Informal residences
- Formal residences







0 50 100 200 300M

N

A C C E S S _ R O U T E S

There is high volume of traffic on Old Potchefstroom road (1) adjacent to the south shore. The railway (2) and Old Potchefstroom rd are major access route in and out of Soweto for trains, buses, taxis (3) and private vehicles respectively. Public transportation is a mode used by most residents as a private vehicle is not affordable.













PEDESTRIAN_ROUTES

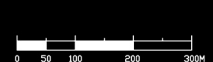
There is a large volume of pedestrian usage around (1) and through (2) the south shore, mainly to and from the residential areas (3) to the Baragwanath taxi rank and medical hub surrounding it. The open spaces provide a shorter but sometimes more dangerous route to the residential areas where as the arid non pedestrian conducive roads (4) provide a more visually secure path but with longer distances to travel.













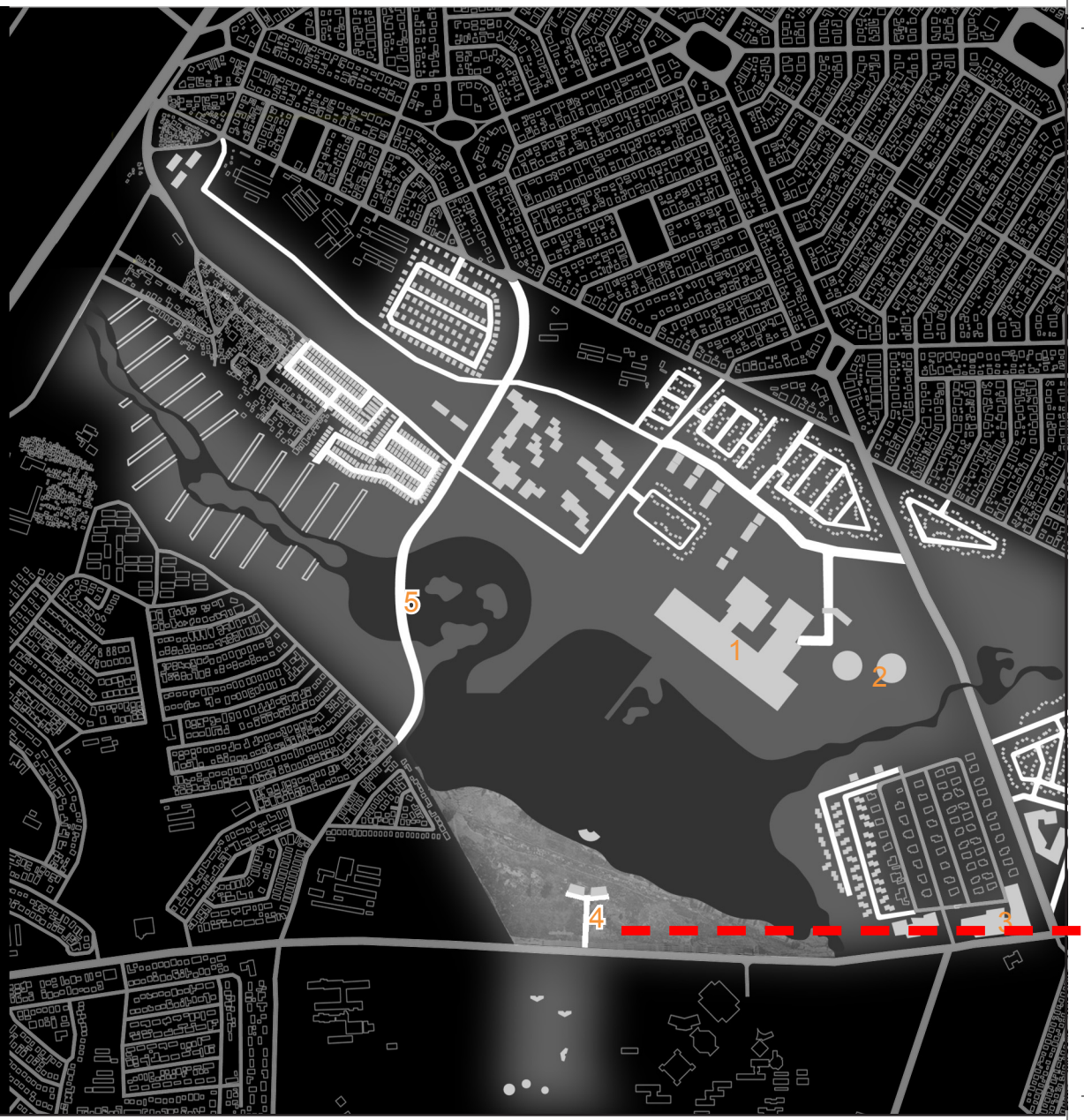


F U T U R E

The Johannesburg property company plan to transform the Orlando power station and its surrounding area into a mixed use precinct (Ekhaya) by developing high density housing, office towers, retail and entertainment spaces.

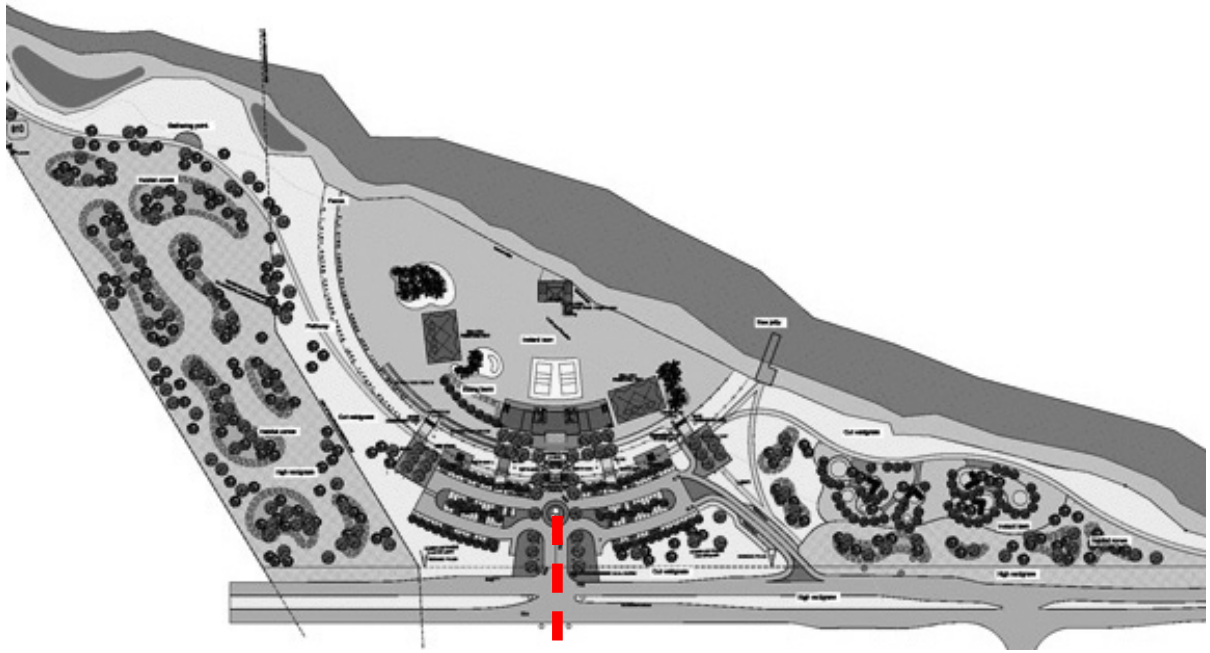
The main components consist of; the re-developed power station (1) into a mixed-use building with retail, offices and housing, the cooling towers (2) conversion into an extreme sport centre, an office tower (3) and the Elangeni entertainment development (4) on the south shore with its restaurants and seating

The scheme's diversity of programme and the heroes bridge (5) that connect the north and south will impact the south shore with an increase of vehicular and pedestrian traffic.



E L A N G E N I
ENTERTAINMENT_VENUE
B L U E - C U B E - S T U D I O

the Space is proposed to be an international destination that houses facilities for: theme restaurants, take-aways, festivals, concerts, parties, meeting/conference venue, picnics, braais, open space for recreation and water sports facilities.



00:00:31



Panoramic views depicting the different levels around the site as well as the visual restrictions arising from various objects.







Pedestrians use the bridge located next to the tunnel channelling the dam's water supply as a shortcut alternative to the Old Potch road above.





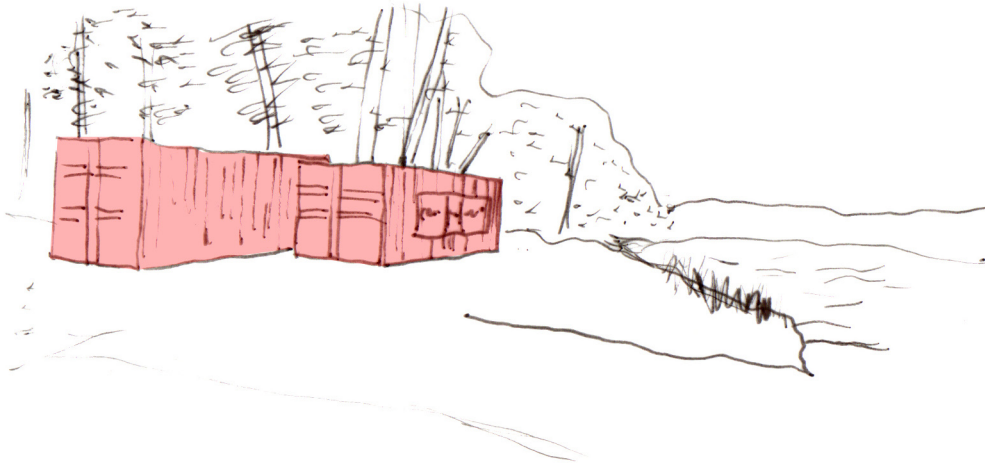
Old Potch road is one of the gateways to Soweto, it runs parallel to a big green open space next to the dam and is a direct connection to the Baragwanath taxi rank situated further up the road.





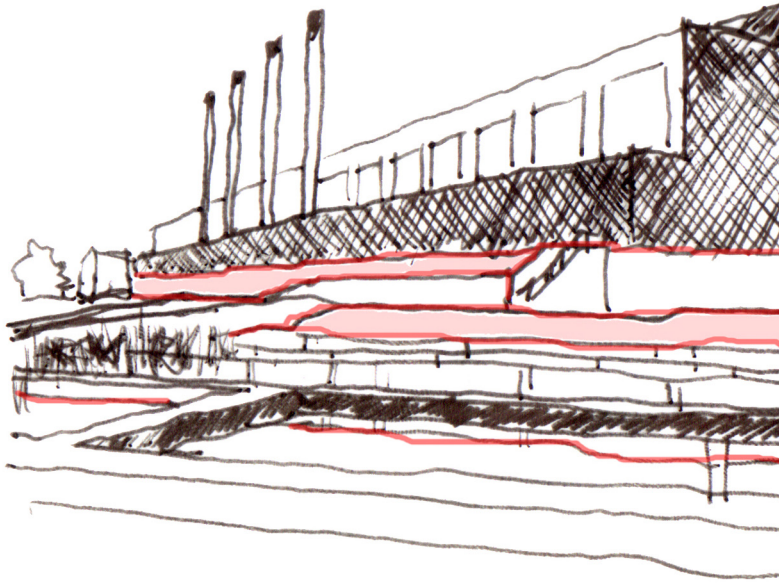
Existing boat shed on the dams edge consist of two shiping containers, it provides storage for canoes that are being used on the dam currently.





Existing power station on the north of the site, the sketch expresses the diffrent levels of the land towards the waters' edge in relation to the building.





INTERVENTION

The technocratic policies of the apartheid government served the purpose of the government but not of its people, it left behind a socially and geographically segregated Johannesburg and an undiversified, divided Soweto with disconnected spaces like that of the Orlando dam south shore.

To reconnect the urban fabric of Soweto, a diversity of programmes have to be integrated within its environment, the south shore will form part of this integration. One that is gradually seeing Soweto has to become a low density environment that no longer relies solely on its surroundings of Johannesburg for everything except accommodation but rather it becomes part of the city's urban dispersal.

Rafi Segal (2008:7) sees an opportunity in dispersal to reinvent urbanity by establishing the notion of the city through combined "High degrees of exchange, inter-connectivity, overlapping of networks, juxtapositions and proximity of diverse programmes all which can create an intensity that generates an urban condition, urban in its function, notions and experiences."

Jane Jacobs (1962:241) indicates the need for this kind of diversities, as they are "intricately mingled in mutual support so that life in these environments can work decently and constructively, and so its people can sustain and further develop their society and civilisation." She describes public bodies such as parks, schools, auditoriums and hospitals to be enterprises partially responsible for diversity with the other part made up of the diversity of people.

Subsequently this thesis proposes an architectural intervention which becomes part of this diversity, through programmes that create collective public and semi-public spaces on the south shore. In order for the spaces to connect with the social realities of Soweto, it seeks an alternative design and planning approach to the regiment one of past policies, which totally discarded the ordinary realities and needs of everyday life in the townships. It involves the current circumstances in creating architectural conditions for the expected and potential of unexpected practices.

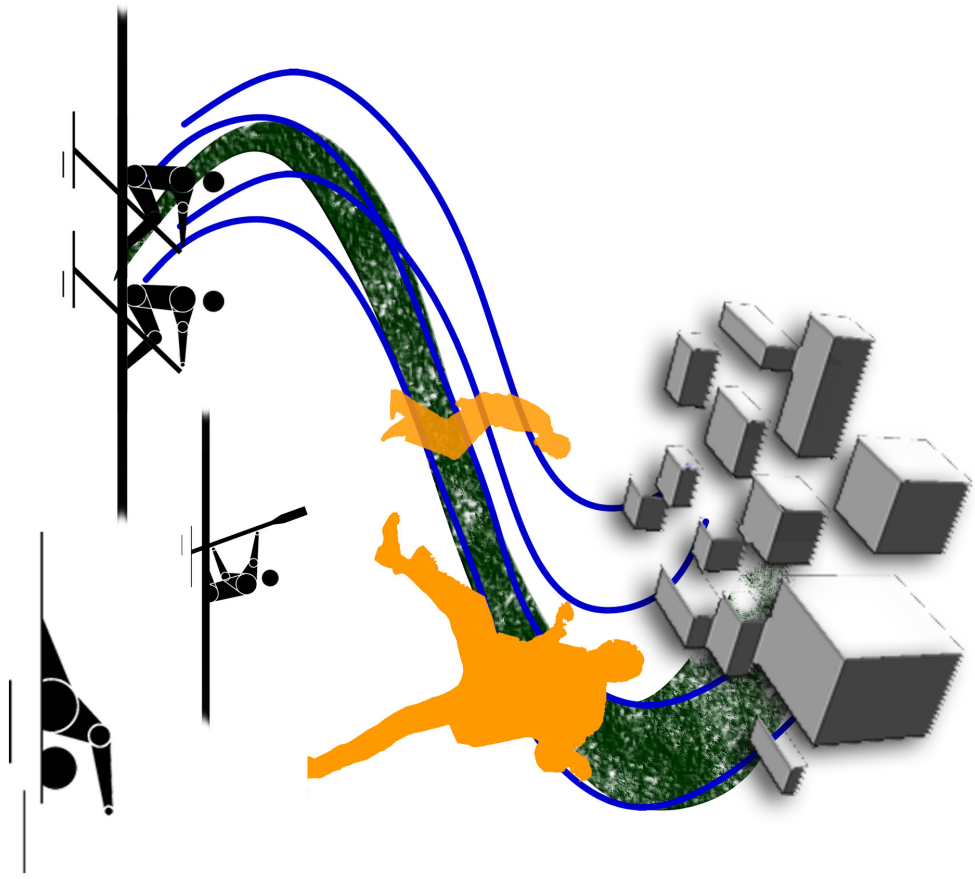
The existing elements of transition and destination of the south shore as well as its potential to connect the dam to its users will be explored through a sports and recreation centre.

As a social response it will supply a much needed sport and recreation facility for the youth and general public (as highlighted in the Soweto analysis).

The combination of sports and events will generate an even greater diversity to the compound program proposed for the Orlando Ekhaya precinct.

The water sport component will invite the public to connect with the dam and their bodies. It is here that connectivity will be explored to the fullest.

The centre will provide opportunity for experiential enhancement of the everyday function of the site as thoroughfare.



00:00:37

Pragmatics

Relevant principles and programme need to emerge for architecture to act on the south shore, to achieve this, it is necessary to explore the pragmatic and anthropological condition of Soweto's sport, the south shore surroundings and the presence of the embodied experience by the philosophical meeting of the body with the mind.

00:00:39

S P O R T

Sport is analysed in the framework of society, it defines social issues influencing development in sports, contextualises it in the South African culture, examines it through water sports in Johannesburg and analyses it logistically in the case study of Soweto's rowing and canoe clubs as well as Mondeor high school rowing club.

In a place like Soweto where poverty and crime transpire sport can be utilised to develop good Character in a human being. Adeyemi (2003:391) indicates that sport has an integral part in personal- social development and is related to attributes of affective-domain such as self-esteem, cooperation and fair play, which in turn enhances the central role of moral and ethical character development as well as the person as a whole.

Positive traits of sport like its capability to create goals that instigate a healthy approach towards life, are carried through to outside the realm of sport as implied by Kgathi (1997:87), it "empowers individuals to learn about their world and to be active participants within it. In so doing, human and social values are nurtured... in these ways our humanity can be most profoundly expressed."







S O C I A L _ R O L E _ O F _ S P O R T

Sport goes beyond the local, "beyond cultural boundaries, because it is international in character and is practised according to international sport events." Adeyemi (2003:387) It is for this reason that sport can be utilised as a form of unifier, globally and locally between all races, cultures and economic statures.

Sport "has value in improving Public health and is a medium of social engineering to reduce crime and social despair." Monnigton (2003:360) "South Africans see success in sports as the most desirable among potentially achievable goals, furthermore they support the image of sports as the land of equal opportunity and as an avenue of upward mobility from the ghetto" Monyeki (2003: 474) There is evidence of success in local projects like the Nelson Mandela Township rowing club project in Port Elizabeth, winners of the Cheetan award in recognition of a successful development initiative. However it has to be noted that, in its African context, water, gender and politics are obstacles facing water sports within the development sector in the previously disadvantaged areas of Johannesburg.

Roger Barrow (coach for the S.A. rowing academy) notes some cultural hurdles throughout Africa, "it's a very slow process to make people confident with Water, culturally many people are scared of rivers especially women, for them to put their head under water is a huge task, a lot of ancestors believe water is a resource to drink not something to play with, south Africa struggles with this a lot. He adds; sometimes they don't even know what a boat looks like." (M.S.B. 2007:20) This kind of issues dictates that the location of the intervention has to have maximum exposure value.

The social issue of Gender in society affects sport, specifically women, who have been socialised to perform their stereotyped gender roles. Burnett & Mkhonto (2003:110) expand on this matter in local and global context. "South African women are to a great extend marginalized in different spheres of society." They are divided along racial lines, cultural perceptions and socio economic positioning. "Women are subject to male hegemony and patriarchy that find expression in the structures and ideological manifestations that are imbedded in the social institutions of society of which the sport fraternity is but one." Through it women are denied the opportunity to improve their quality of life with participation in sport and physical activity.

"Sport has always been a bastion of male values and nation building to the exclusion of women and marginalization of traditional 'female sports." (ibid 2003:110)

Sage (1970:288) lists three reasons for the historical insignificance of women in sport;

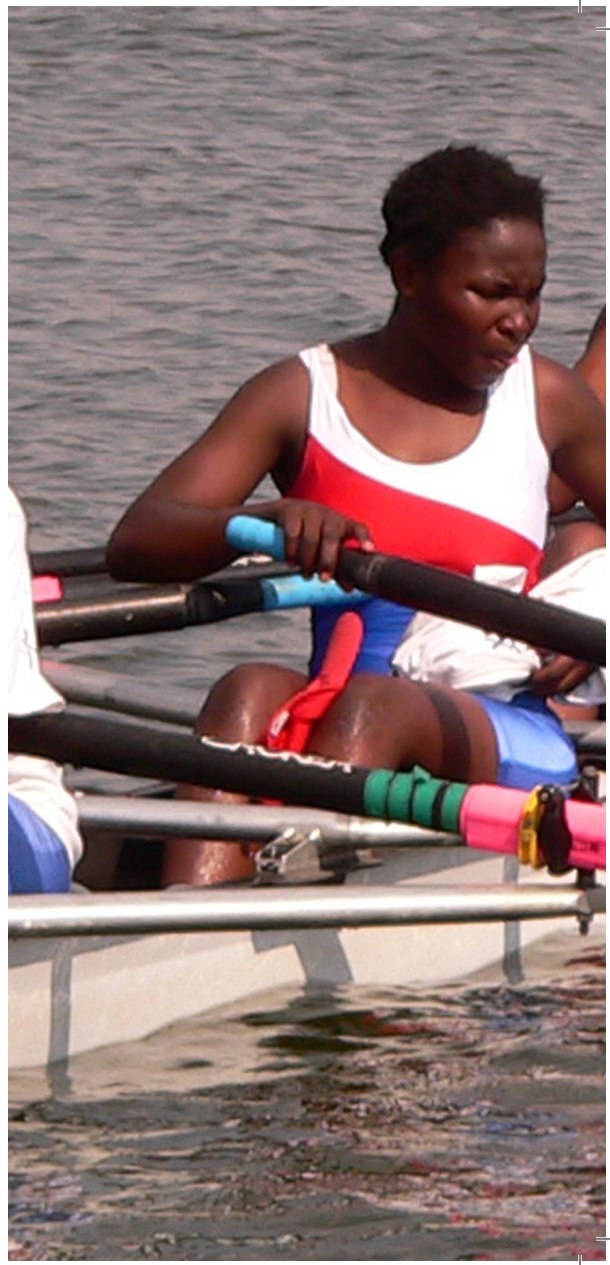
- Women's cultural "tasks" have been child rearing and home making. This left very little time for sport participation.
- There is a deep-seated suspicion that vigorous sports were a health hazard for women.
- Social mores of masculine –feminine sex roles have discouraged women from participating in sport.

The optimal urban placement of the intervention will help erase some negative cultural notions and expose a sporting essence to the female gender.

POLITICS_IN_SPORT

As much as sport unifies us, it also serves as a mode of identification, nations identify with their teams, sports man and women. Monnigton (2003:353-4) describes this role of sport as a development of nationhood and a creation of national identity, he takes it a step further by stating that, if this role is successful, it can enhance the popularity of individual Political leaders as a consequence of association. "African politicians have learnt that from personal experience as well as from politicians around the world, that identification with sport can bring both material benefits and political credibility to nation and leaders alike". He illustrates this association between sport and politics as the art to create an identity that has credibility with the media and general public.

The Apartheid regime did not spare sports from its policies of repression and segregation against the non-white community consequently they lacked access to sport facilities and representation on an international level. Today government is seeking 'transformation' in this field by providing equal opportunity to previously disadvantaged aspiring athletes. Government has implement a policy of "representation" that encourages all sport disciplines, through better funding and support, to proportionally represent athletes of all the different races in any local or international sport event. However in some cases the pressure to represent has lead to athletes being selected due to their colour not their merit and are often not the best performing athletes required for the task. To deal with such issue in a positive manner there is a need for greater talent identification so as to increase the figures of non-white athletes that can be developed to perform on international level.




ABSA

REQUIRED_FACILITIES_FOR_SPORT_DEVELOPMENT

Former Olympic competitor and current development consultant for rowing in Gauteng Colleen Orsmond notes the potential for water sports in the African continent and adds that there is scope for growth, however, she thinks growth will be relatively slow simply due to resource constraints, but that the potential definitely exists. She points out the importance for development to occur at two levels; at the grassroots as well as the elite level, for the sport is to be self sustainable. (M.S.B. 2007:20)To target the grassroots there is a need for a regatta centre that will grant access of equipment and training facilities to all aspiring and casual athletes in prompt and effective manner.

It is important to understand that the making of a champion athlete in contemporary sport requires more than reliance on raw sporting talents. "There is a need for a re-orientation of sports within national culture and integration at primary and high school level to establish a broad based pool for talent identification and nurturing." (Ogundare 2003:344)The need arises to foster innate curiosity and inquisitiveness into the phenomena of sport participation. To help athletes improve their performance and achieve their maximum potential; centres have to be established with an adaptation of an integrative approach where by the knowledge of all relevant fields of sport are practically applied to achieve this goal. (Toriola 2003: 449)One of the goals South Africa has set for itself is to train athletes, over a period, to be skilled international athletes and be prepared academically for future employment. (M.S.B. 2007:20) To achieve this, the centre necessitates being part of a network of facilities with top priorities given to educational facilities.

Funding required to realise all the needs stated above, come from various international water sport committees seeking to develop their respective sport in the African continent and locally from; the respective national sport authorities, the South African Sport and Olympic Committee (SASCOC), Department of Sport and Recreation, lottery and private companies. Funding from government institutions is boosted if good results are achieved internationally.

L O G I S T I C S

For a precise architectural intervention to manifest itself, a need arose to grasp a greater understanding of the needs, trials and tribulations of development athletes, their respective coaches and its facilities. To achieve this and gain a perspective on the local conditions, the following entities were logistically analysed; Soweto's canoe club (SCC), rowing club (SRC) and development athletes.

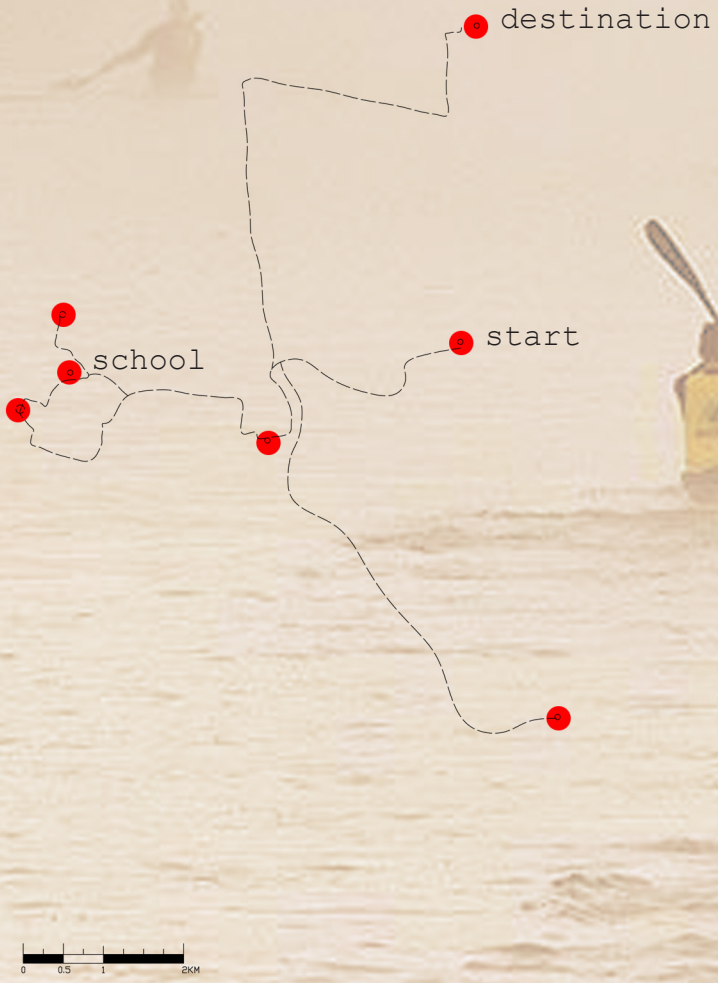
The findings were derived from articles, interviews with the institutions and following the athletes through their daily routine. The results portrayed below indicate the best or worst case scenarios of any issue.

In South Africa the first official accounts of formal rowing competitions in the country date back to 1861 when a race was organised in Table Bay between the South African Rowing Club and the Union Rowing Club. Four years later the Alfred Rowing club joined the fray. Today, that club located at Zeekooivlei near Muizenburg in the Cape, is the oldest surviving sports club in the country. (www.rowsa .co.za)

Currently there are over 3200 registered rowers in South Africa, a large percentage comes from high school students with the rest comprising of University students, Olympic aspirants, physically challenged athletes and recreational rowers. According to Peter Nyman (rowing SA communications committee member) currently there are 9 University Clubs, 35 School Clubs and 10 Senior Clubs spread out over six provinces.

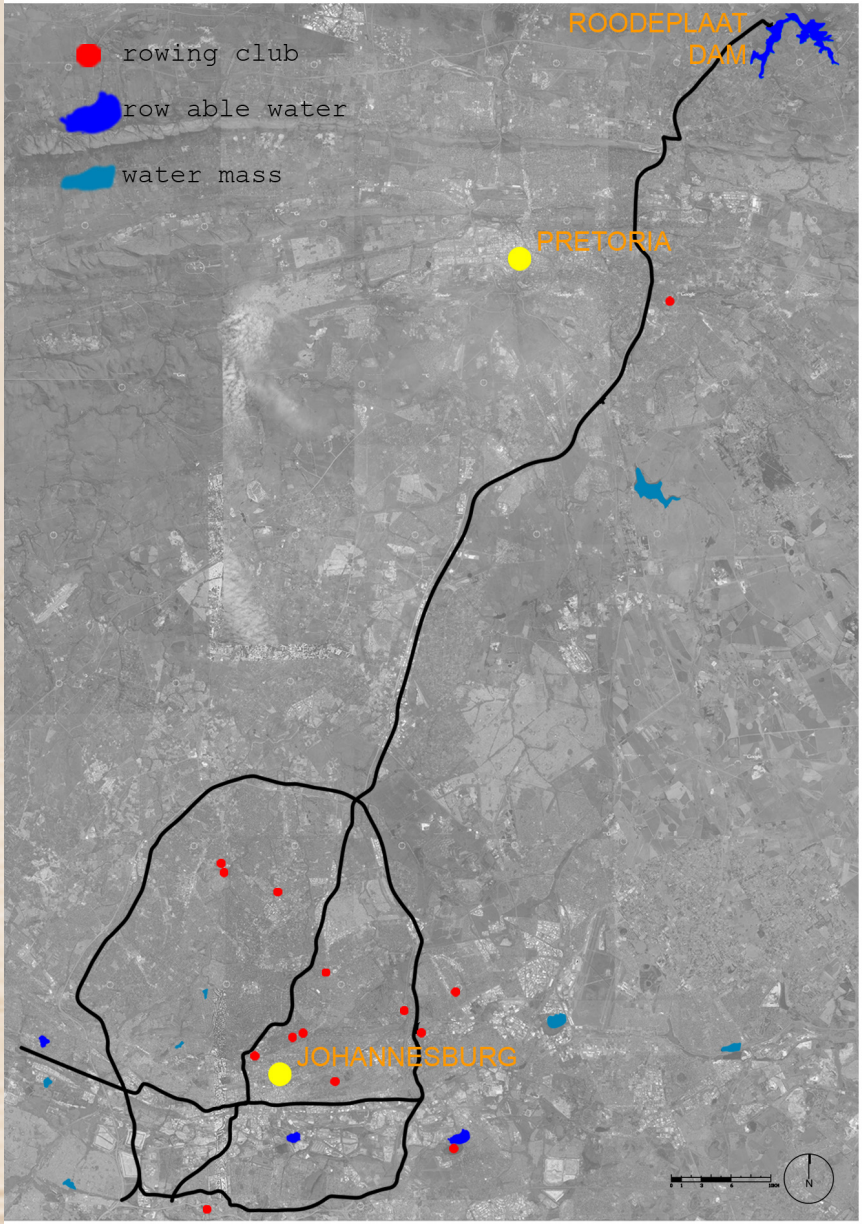
Soweto lacks facilities for most sports; the SRC is a testament to this as it has to accommodate itself in the facilities of Florida Lake, situated outside of Soweto to the north. The very temporary facilities of the SCC which are based in Soweto's Orlando dam, face a general problem affecting all water sports' seeking to develop in this area, the use of the facilities to date has been minimal due to the inability of a large proportion of the local community to swim.

It is essential then to first provide the aspiring athletes with swimming skills that they can choose to further or as the first safety step necessary before been introduced to any other form of water sports requiring boats.



The illustrated route, maps the pick up route performed on a typical weekday morning session practise on water (outside Soweto), instead of it been a 2 stop process for the coach (school-water), due to no available public transport outside of Soweto at that time of the morning, and due to lack or no means of support from parents, the process consists of six stops, one at each athletes residence. As seen it involves going back and forth on the same route, a misuse of time and resource. It is to be noted that valuable resting/practising time is squandered on travelling and this situation could only occur when dealing with a small amount of athletes.

Water sport facilities within Soweto, close to public transport and educational institutions can alleviate some of this pressures



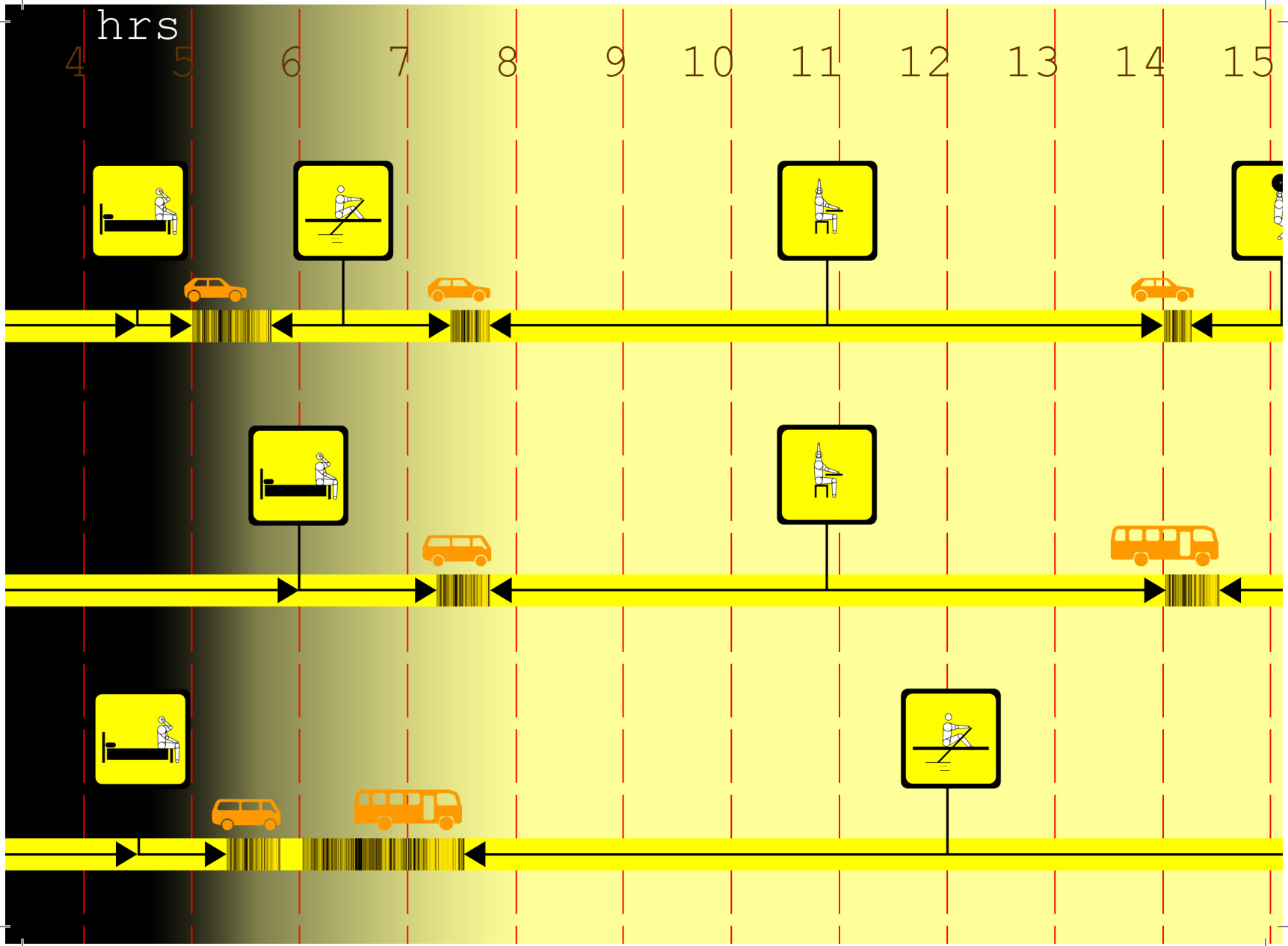
A. Hamuy after google earth (2007)

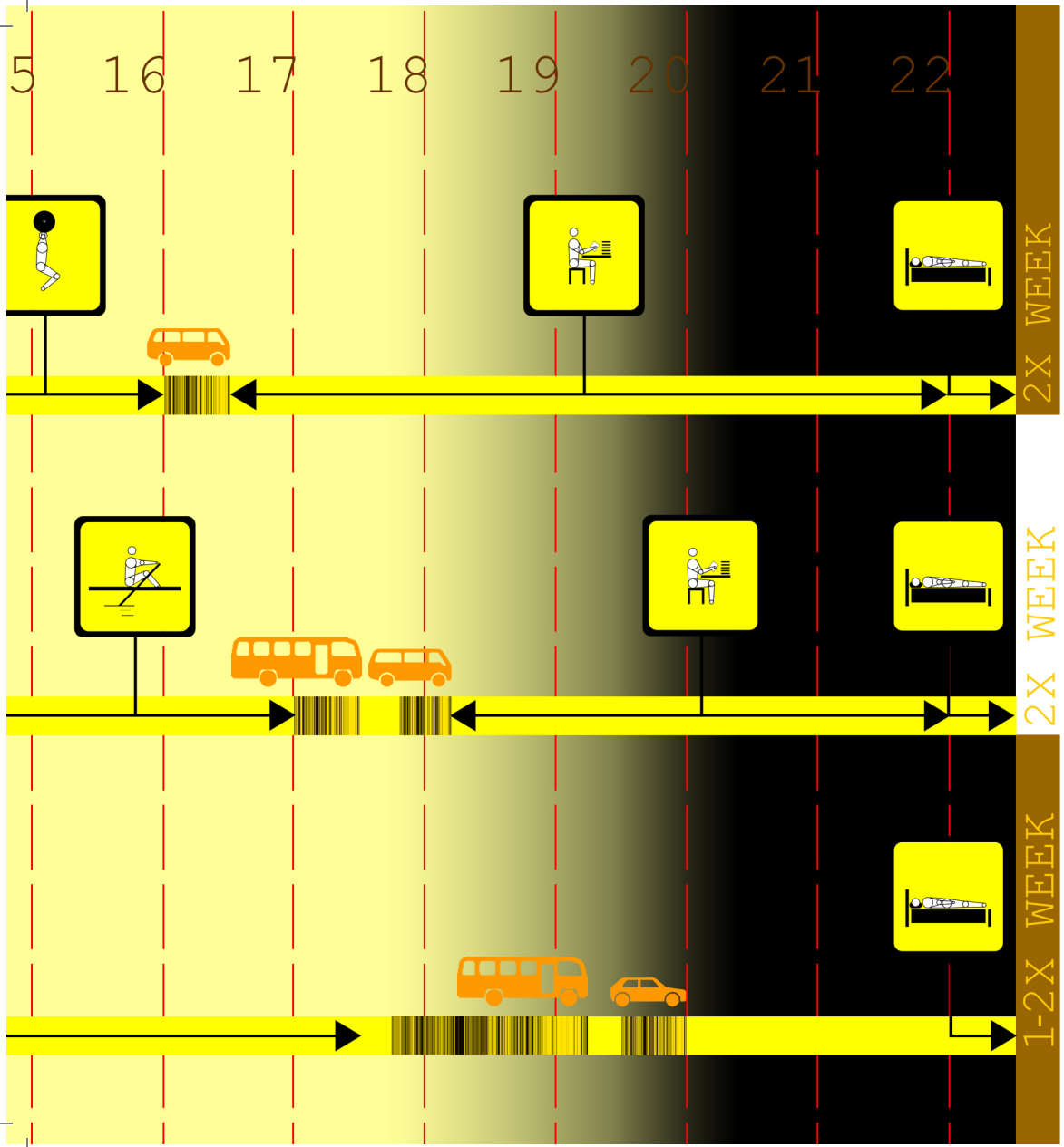
Parental support is lacking, some of these athletes' parents have never seen their child race, some don't even know what a boat looks like, the main reason for this lack of participation can be attributed to expenses in cost and time required to access the race courses that are scattered around greater Johannesburg and even further. Accessibility can be optimised by bringing these facilities into the urban fabric of Soweto, through the use of public transport and shortening of distance and time.

The map stretches from southern Johannesburg all the way north past Pretoria to Roodeplaat dam, in terms of development, it points out the relation between all existing rowing clubs and Soweto (the bases for development identification in Johannesburg.)

In Johannesburg currently almost all registered competing water sports athletes are from outside Soweto, a large percentage comes from high school students with the rest comprising of University students, Olympic aspirants, physically challenged athletes and recreational ones. (www.rowsa .co.za)

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TRANSPORT

The chart is a graphic representation of documented daily activities performed by the school athletes through out a common week.

Travel duration takes up considerable time that could be narrowed down, if all the activities nessecary to perform are close together.

The bottom bar represents regatta days or weekend camps to Roodeplaat dam.

Transport modes are problematic, due to no possesion of private transportation by some of their parents, after sessions and regattas, there is a reliance on public transport which are not always reliable and do not operate at all necessary times.

wake up

water session

school session

gym session

study session

pass out

school bus

taxi

private

travel duration

E X P E R I E N C E

For architecture to connect with its users it requires actions that celebrate the everydayness through experience. Architecture by means of space and movement, becomes a machine that enhances the metaphysical body; through utility and bodily experience. To achieve this experience the necessity arises to explore its relation to the body's mental and physical aspects, as well as the body's relativity to architecture as a machine for means of movement in a spatial itinery.

One can perceive the body as; an emotional, spiritual and physical being, according to Tadao Ando (Tavernor 2002:317) it "is not a dualistic being in whom spirit and flesh are essentially distinct but a living, corporeal being active in the world." For architecture to connect with these attributes it requires to stimulate the bodily senses through the body's "unconscious and conscious attitudes and priorities concerning the senses, their relative roles and interactions, which have an essential impact on architecture."(Pallasma 1996:10)

The sensual experience of a space allows architecture to engage with the body's senses. Frampton (1998: 234) suggest that it is found within the detail "the anthropomorphic elements with which we have intimate contact" and its materiality, for example; the coldness of metal or the warmth of wood. Ando (Tavernor 2002:305) expands on materiality by relating it to the body, in the case of concrete he perceives it to be something cold and hard and recognises the body as something warm and soft, "In this way the body is in dynamic relationship with the world."

Water and light are natural elemental powers in architecture. By the presence of nature, architecture is animated in "subtle and diverse ways, from the movement of the wind to the fluctuation of water, from the sensuous pleasure of the body to the constant modification of space under the impact of luminosity" (ibid:316)

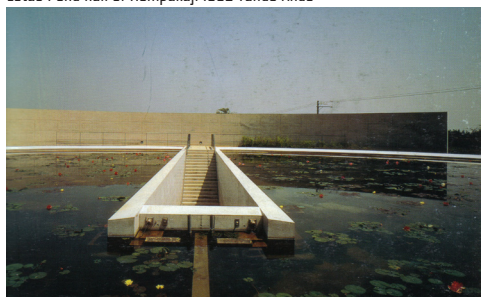
As the body moves through spaces it must be made "acutely aware of constantly changing natural phenomena"(Tavernor 2002:314)

"Architecture is deeply engaged in the metaphysical questions of the self and the world, interiority and exteriority."(Pallasma 1996: 10)Our bodies acquire space, from the minimum that is itself to its surroundings, we claim space and within this space we express our being. Ando describes this self as man's articulation to "the world through his body, since he has an asymmetrical physical structure with a top and a bottom, a left and a right, and a front and a back, the articulated world in turn naturally becomes a heterogeneous space" (Tavernor 2002:317)

"It is the opposition offered to the body by space which makes it possible for the space to share in the life of the body, and reciprocally, it is the body's opposition which animates spatial form." (Frampton 1998: 241)



Lotus Pond hall of Hompukuji 1992 Tando Ando

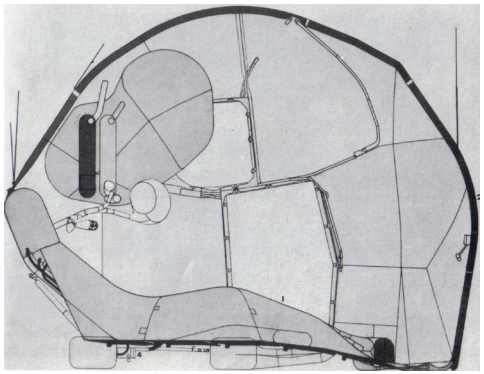


Lotus Pond hall of Hompukuji 1992 Tando Ando

Okar Schlemmer spoke of "space filled with, through, and as body." he taught "the body as art, science and spirit". He proposed that "architecture, body and space were dynamic and inextricably linked". (Tavernor 2002:229) Archigram in works like, Mie webs 1966-1967 Cushicle, proposed further that space is an extra skin to the body.(Hill J. 2003:34)

Structure/place can be seen as the machine that controls the bodies' pragmatic movement of daily or occasional iteniry through the spaces in order to accomplish maximum output there has to be a symbiotic relation between body and machine.

Ando characterises the body as being ritualistic, therefore its passage through architecture must "invariably involve a carefully orchestrated spatial itinery" (Tavernor 2002:306)



Cushicle 1966 Mie Web

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For Example...

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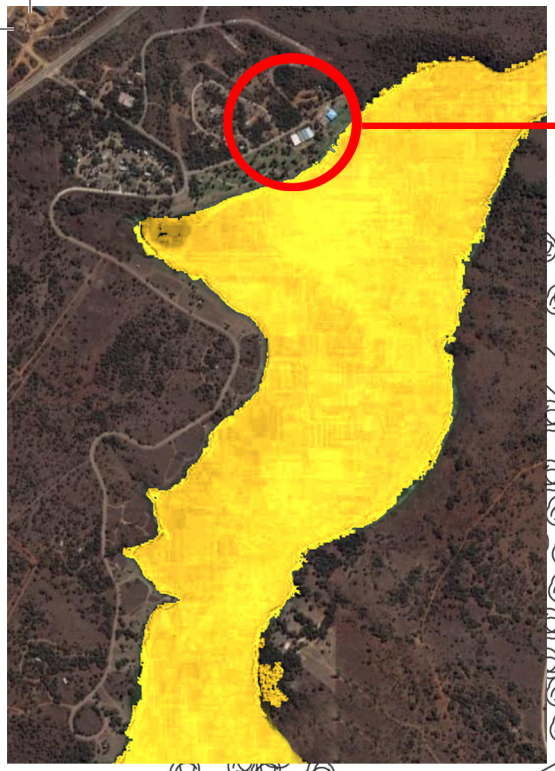
Precedent studies

Sport centres
Connective architecture
Event spaces

ROODEPLAAT REGATTA CENTRE

Tswane 1970

The centre is used to host all national and international rowing and canoeing regattas in Gauteng. From this analysis, one can deduct the facilities required to execute a regatta as well as getting an understanding of the events and the relationships between :users, infrastructure and waters' edge.



Site Plan Showing Inferstructure and Users Activities During Events . (A. HamuyAfter Google earth 2008)

Red indicates the spaces used by spectators to watch the races, these spaces have a direct visual link to the water through level changes (as illustrated by the section) the rest of the open space is consumed by athletes walking around and boats sitting on racks or being carried to launch on the jetties.

1. Boat sheds
   A place of meeting, of shelter from the weather.
2. Finish Tower
   A place of information, Also acts as a visual focal point as well as a podium to address the crowd
3. Waters' Edge
   Mainly used by the athletes to launch and spectators gather to cheer for races.
4. Level Changes
   Are used to create maximum visual contact of the event on the water.
5. Trees
   A device used by athletes to shelter and demarcate their clubs' spot.
6. Spectators
   The regatta is a full day event, spectators set up Gazebos, camping chairs and cooler boxes etc.
7. Crowds
   Middle level is used as a square where there is constant flow of people during the races and is used as a gathering point for prize giving .



A. Hamuy (2008)



A. Hamuy (2008)



A. Hamuy (2008)



A. Hamuy (2008)


A. Hamuy (2008)



A. Hamuy (2008)

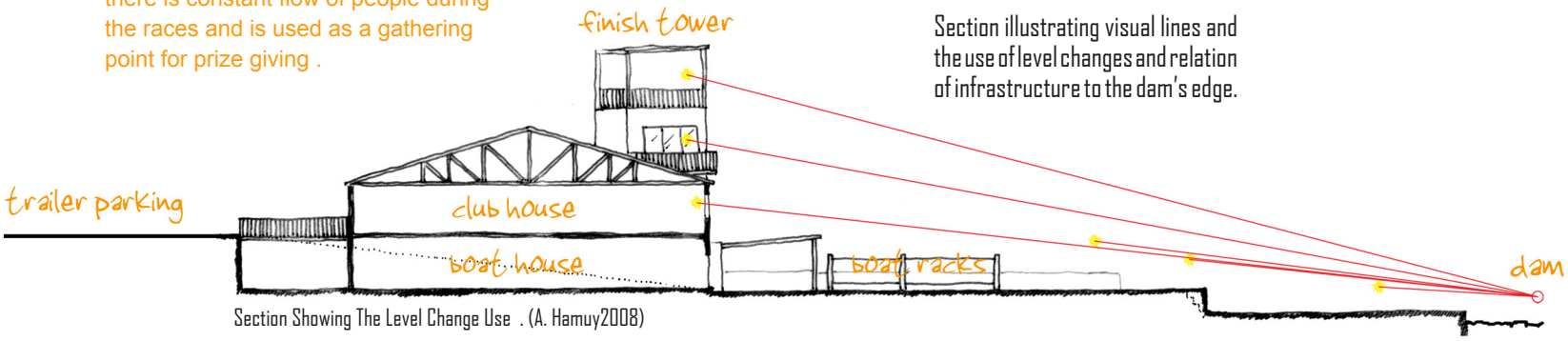


A. Hamuy (2008)



A. Hamuy (2008)

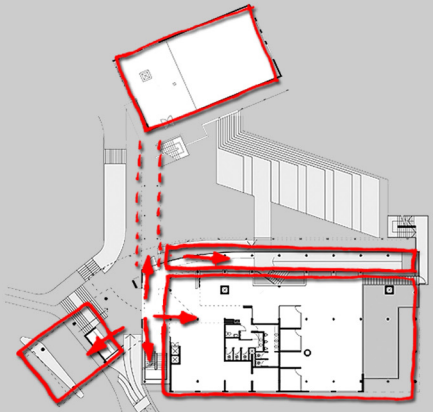
Section illustrating visual lines and the use of level changes and relation of infrastructure to the dam's edge.



Section Showing The Level Change Use . (A. Hamuy2008)

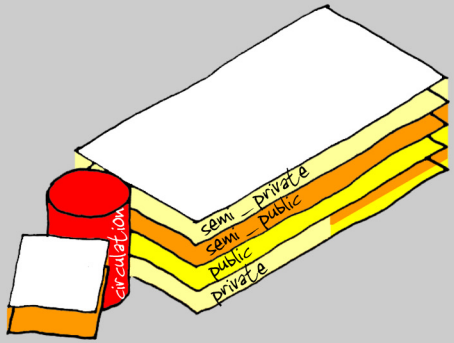
HIGH PERFORMANCE CENTRE

Soundspacedesign (Pretoria 2004)

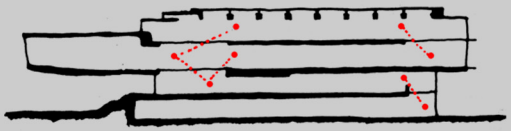


Ground Floor Plan (A. Hamuy after Cooke J. July/August 2005)

Flow through the structure is easily achievable by creating a circulation volume within the entrance of the building.



The building very intuitively arranges and creates a balance between the private and public extremities through the circulation core.



Section (A. Hamuy after Cooke J. July/August 2005)

Visual Connectivity throughout the building is achieved by double volumes and level changes.

A. Hamuy (2008)



Entrance is accentuated by the form of the auditorium as a focal point.

A. Hamuy (2008)



Materiality and structure is clearly expressed, the juxta positioning of brick, concrete, steel and glass create an array for the visual sensory.

A. Hamuy (2008)



Light is filtered into the centre of the building through opening on the roof.

A. Hamuy (2008)



Through level changes one space is used for a restaurant and dinning hall .

A. Hamuy (2008)



Double volumes create human interaction

THE PAVILION OF KAMIICHI

Peter salter (Japan 1994)

Source: Beardsell (2000:24)

The building is an "expression of response to extreme seasonal conditions."

The building functions as a viewing platform and offers coolness, contrast and shade.

Its main attention is to the weather. During the winter months the building is buried in snow, The building responds with an exterior shell that takes compression like a boat, and behaves as if the building were in water.

Means of entry for smallish animals is provided so as for the structure to function as a hibernation shelter for the winter months.

During spring the guttering takes the melted snow indoors through the interior space and out into a tank. There are three overflows that feed the water back into the river of which the gutter has become a tributary.

J. Hill (2006)



J. Hill (2006)



J. Hill (2006)



J. Hill (2006)



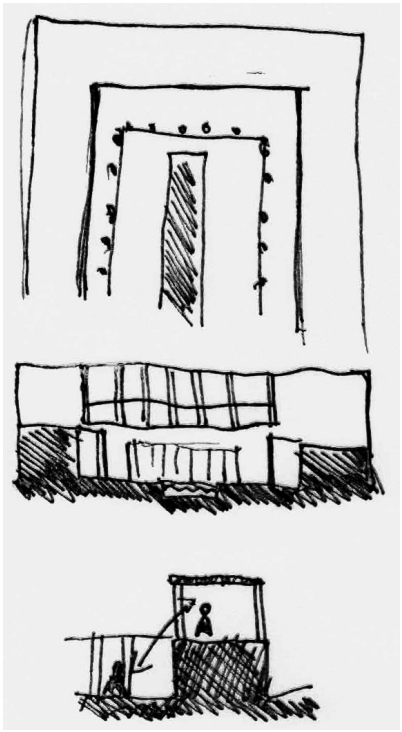
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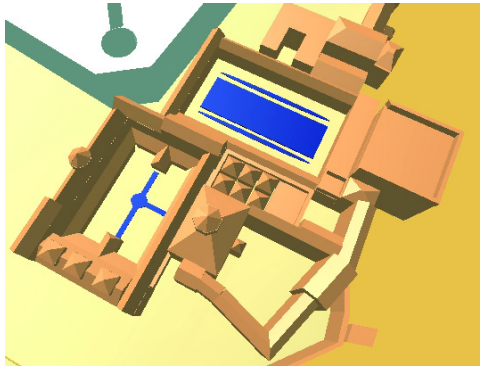


PALACE OF NASRID DYNASTY

Spain Alhambra (1390)

The reflective water pools and fountains are surrounded by courtyards and slender column arcades which are flanked by buildings of one or two storeys. A connection to the courtyards is achieved on both levels: on the ground there is physical edge that is accessible all around, with the second storey having a non- accessible visual connection. The courtyards through the use of nature create a tranquil environment with water is used as the element that connects all the spaces together.









00:00:58

J. Young (2006)

W A T E R

Water forms an integral part of this thesis, so it is important to study its notions and abilities to the user and architecture. Water will be analysed in its still form as it occurs on the site .The relationship to water differs subjectively to all users, the athlete, the spectator and the general public.

The athlete's body experiences a very physical connection to water, however to the by-stander the relation the body has to water are notions only linked visually.

Water makes a tangible connection, it can be felt cooling the skin and surrounding the body. But it is also invested with an intangible presence, made evident by its undulant nature: as it flows, surrounds and swirls, it remains ungraspable and uncontainable. (Moore 1994:20)

There are many metaphors and representations associated with water; "its power as a cleansing agent for physical purification that leads to spiritual rejuvenation. Tame water, particularly when it is reflective, fresh and clear, suggests youthful health and beauty." (Moore 1994:20) "For they pensive stillness and silent collection, still waters have traditionally represented the contemplative and pervasive 'indwelling spirit' of nature." (Moore 1994:122) Ando suggests water contains a strange power to stimulate the imagination and makes us aware of life' possibilities, "it is a monochromatic material, seemingly coloured yet colourless. In fact, in that monochromatic world there are infinite shades of colour. Then too water is a mirror. I believe there is a profound relationship between water and human spirit."(Tavernor 2002:316) Moore (1994:122) poetises waters reflective quality; "waters of reflection return to the eye a thousand twinkling stars and the ripening fruit of surrounding nature." Still water embody notions of collection and reflection "their glassy surfaces and calm bodies." Apart from water' representations and metaphors, its elements can be used to enhance architecture; below are direct objective ways of intervening to waters qualities and notions.

- Stationery waters are natural reflectors, their mirrored surfaces absorb, repel and refract their surroundings, mirrored images of landscape or buildings expand space by extending the foreground in a silver sheen or repeating the infinite depth of blue skies. (Moore 1994:124)

- Long water pieces can serve as an organising spine of space and spatial organiser. (Moore 1994:160)

- Piers, boardwalks and decks accommodate a common phenomenon, people need to approach as close as physically possible to the waters edge.

The nature of the pier or jetty is to extend the edge of land to a point of immediate contact with water to provide the exciting nearness of something that is limitless. (Moore 1994:160)

- Emotional contact with water occurs when people are allowed to get as close as possible without actually touching it, resulting in "mental leaning out over" the most important thing to consider when making designs involving emotional contact with water is the edge. (Moore 1994:204)

- The chief element for achieving a naturalistic edge is amorphous shapes with soft and untrained banks that connect harmoniously to the neighbouring terrain. (Moore 1994:125)

- The flat plane that water naturally seeks can be used as an embellishment for composition" (Moore 1994:201)

- Liquid courtyards relieve claustrophobia by creating a negative space ...its refreshingly empty (Moore 1994:200)





Tall column elements announce the entrance to the axial walkway that connects the sport stadiums.

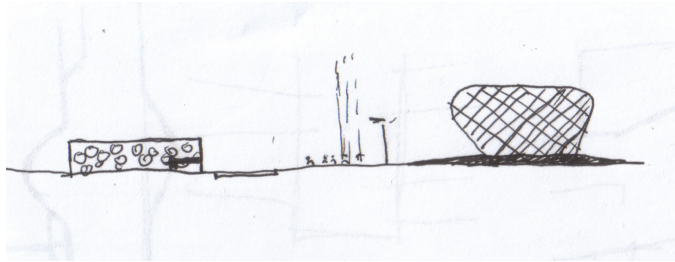


The axis is aligned to have a visual connection with an ancient chinese temple and is framed by the towers.



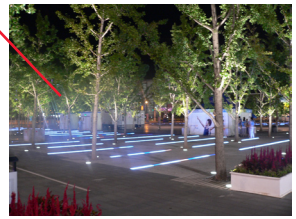
Along the pathway simple concrete benches shaded by trees provide a platform for a rest space or activities to occur







The space between the aquatic centre and athletics stadium provides the opportunity to engage with it by pushing out trickles of water sprays from the floor (a great relief during the hot summer days and night) as well as by providing resting structures and interactive floor lights.
The overwhelming scale of the two stadiums is brought down by the low lying light poles.





AQUATIC CENTRE
PWV architects(Beijing 2008)

The entrance to the centre is scaled to the human body by formalising a low lying cut out on the corner of the cube.



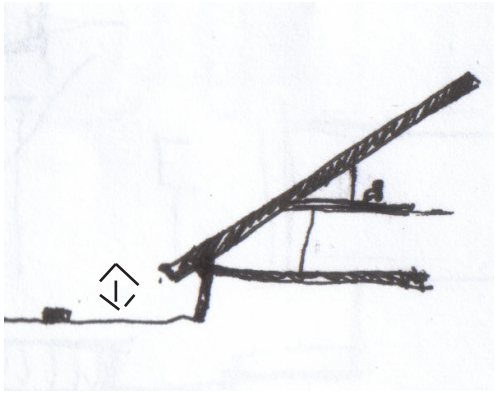
NATIONAL STADIUM
Hertzog & de Mueron(beijing 2008)

The entrance to the stadium seems very effortless as the level change is progressively sloped so by the time you reach the entrance, the transition into your seat is direct.

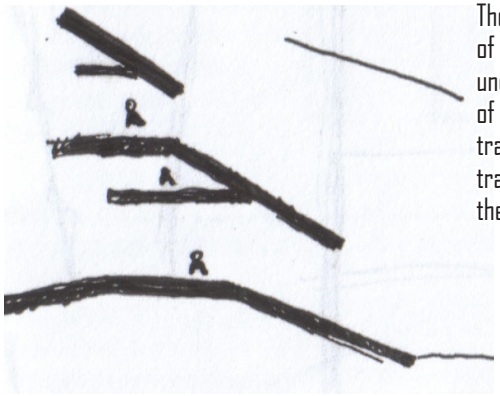


The underside of the seating stands is utilised as a transitional element to the seating, to deal with the level change, the approach is by formal stairs.





The section illustrates the use of the underside as well as the understanding of how the edge of the seating stands to the pool should be higher so as to have a better view of the swimming race.



The section illustrates the use of the underside as well as the understanding of how the edge of the seating stands to the track can be very close to the track level for a better view of the race.

00:00:61

5

Design Process

Program
Principles
Design development: a search

P R O G R A M

The design program in terms of its facilities and possible quantities of people using it is based on the research of local precedent conditions of water sports, the urban analysis of the site and the incorporation of the proposed Elengani development.

The funding will come from the various water sport institutions of Johannesburg, SASCOC, the lottery fund and governments sport and recreation department.

Multi function Centre

Management centre

Info Office

Sick Bays / First Aid Rooms

Restaurant – 100 seat

Take-away Restaurant

Offices - 200 sq m

Conference/ meeting/teaching facilities

Male & Female changing areas

Swimming pools in and outdoor

Delivery space

Gym space +relative change rooms and offices

Toilets

Boat water tank

Retail space

Club house

Used for regattas as well as functions requiring a hall.

Hall

Kitchen

Toilets

Boat sheds

Change rooms

First aid room

Store rooms

VIPs seating

Start and finish towers

Swimming pool/ performance space

Used for teaching kids to swim, swimming galas, recreational swimming and can be transformed into a concert space.

Covered seating 1800ppl

Tuck shop

Toilets

Change rooms

In and outdoor pool

Storage

Pump house/water management/purifier.

Ticket Offices

00:00:65

Design principles

Experience

A physical experience of space through out the site

Nature

Use of light, water and climate to enhance the senses of the body thus creating an experience.

Materials

Materials that can handle the wear and tear of sport and mirror the existing materiality of its surroundings.

Form

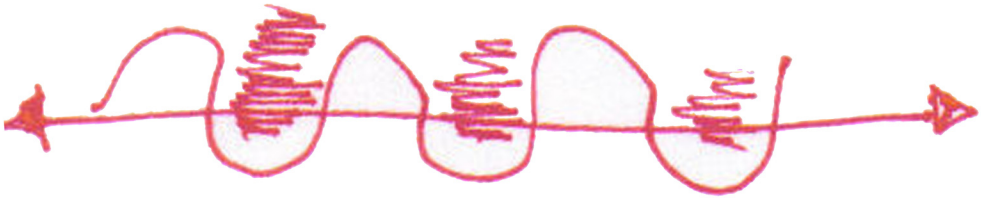
Scale to adhere both the human and urban.

Translation

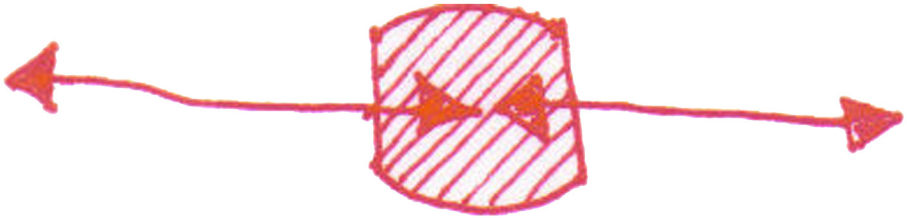
Movement will be used as the driving aspect to translate the programme into a building



PATH OF EXPERIENCE



ARCHITECTURAL INTERSECTION



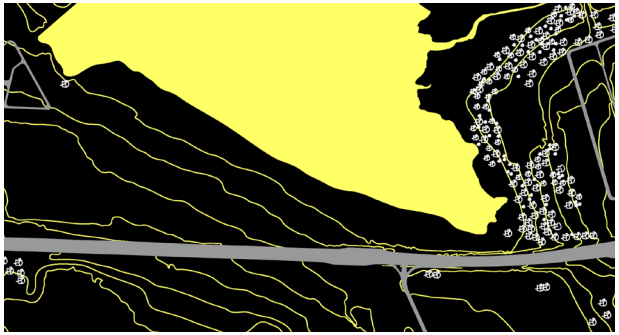
PLACE OF PAUSE

00:00:67

The following diagrams define the entities that form the edges of the site.
The diagrams develops an understanding of the edges on the site and informs possible positioning of the structures.







The natural parameters of water and trees form the north and east edges of the site. The slope channels the site down towards the waters edge on the north.

Old Potch road forms the southern edge of the site. The heavy vehicular usage of this road also creates a defined edge for the pedestrian.



The U.J. campus on the south of the site links to our site in its potential for usage of the sports programme, its vehicular entrance with traffic lights formalises a junction for the south shore to use. As a form of potential income revenue, expanded parking usage on event days can be provided by the U.J. existing parking lot and the dilapidated field of the Thaba Jabula school.



Existing boundary walls of Thaba Jabula secondary school form the west edge to the site,

The space between U.J's and the jhb dpt of education walls on the south clearly define the opening of the nature reserve situated on the south of the site.

Testing the ideas

The first 3 concepts started exploring positioning of the structure with in the precinct, keeping in mind the design urban principles stated .

1

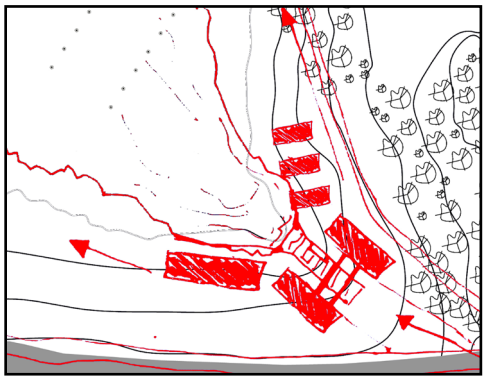
The idea of creating a gateway for the new ekhaya development was envisioned on the east south point of the dam and park. It maximised the vehicular intersection but lacked a pedestrian one. The structure got lost in the park with no continuity. However the concept of creating place by holding space together with buildings was found to be very successful.

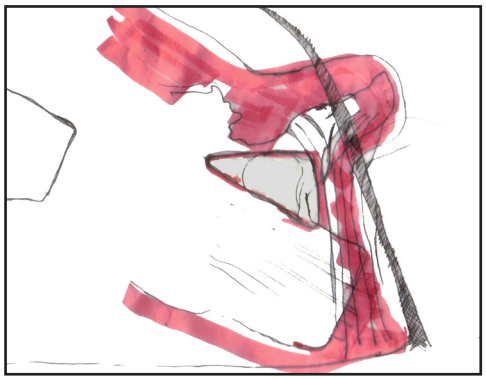
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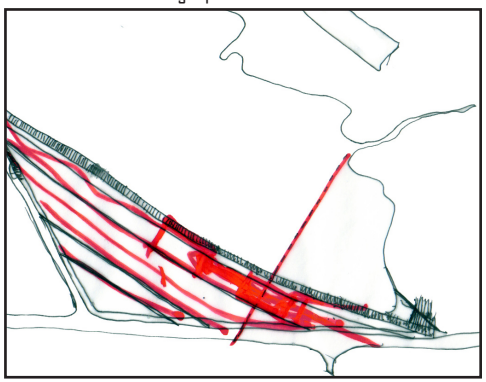
The idea of an island was conceptualized for having maximum connection with the dam, however on analysis the urban connection was minimal having little integration with the urban fabric. Missing out on the potential pedestrian and vehicular interaction of old Potch road. Surrounding the building spaces with the dams water as a connective aspect was found to be a success.

3

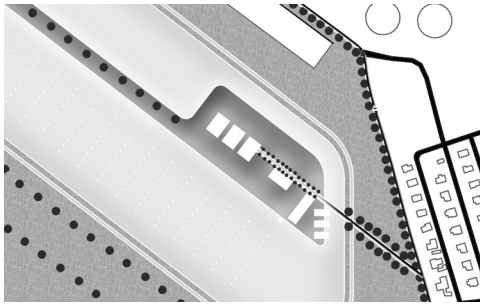
A linear innervation along the waters edge was explored, maximizing the pedestrian intersection on the waters edge and creating a minimal interruption into the parks landscape by digging into the existing slope. The vehicular and pedestrian intersection on old Potch road was highly neglected as well as the identity of the structure was non legible. The idea of creating strands along the site as a means of separating levels was found to be a very successful mechanism for creating a parameter to the site and structure.

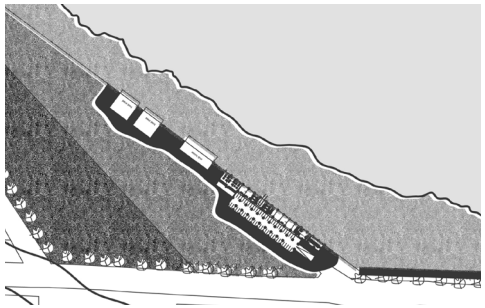












4

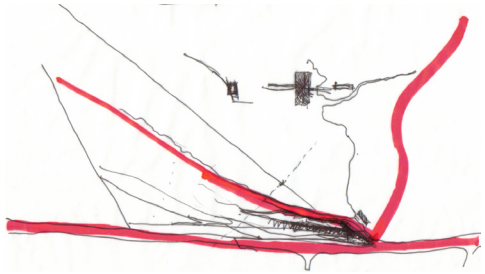
Following the studies, this concept was seen as the best solution to adhere to all the design principles.

Create an perpendicular axis to the waters edge from top to bottom of the slope with buildings flanking on either side, placed on strands that sloped with the site. Connect the water physically by extruding and intruding the dam and land mass.

The First stab at the concept pointed out the need to-
Find positioning anchors to relate to.
Announce the entrance on the road edge
Vehicular access to the site
Circulation of pedestrians on the waters edge and water access for those using the dam as a sport facility (boats).
Increase the size and programme of facilities. as phases to the project.

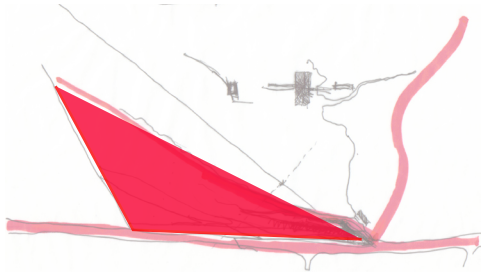
The concept of connectivity is translated to site in the form of routes/path that will connect the site and structures. It looks particularly at the water's edge as well as the main adjacent vehicular road.

The paths deal with Transitional users and affords the opportunity to enhance their everyday experience of the site, especially their connection to the water.

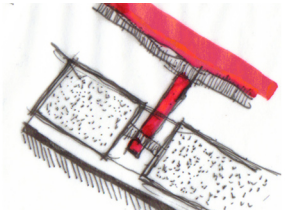


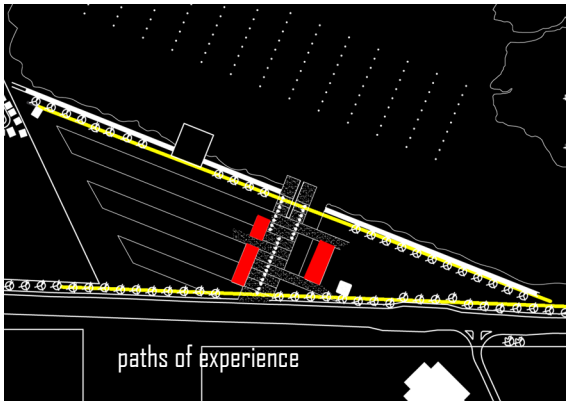
Event/destination

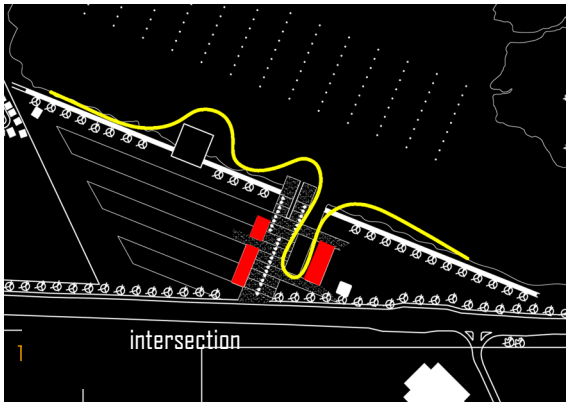
The space in between is for everyday destination users and events.

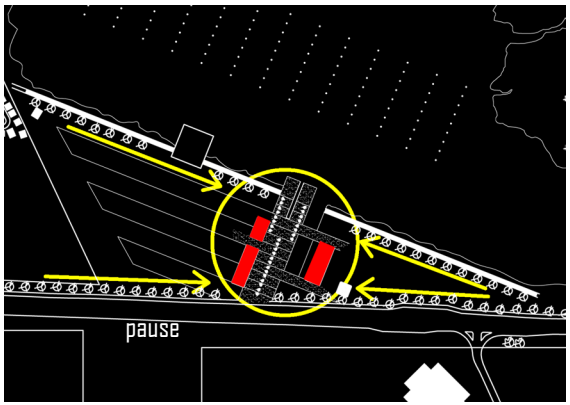


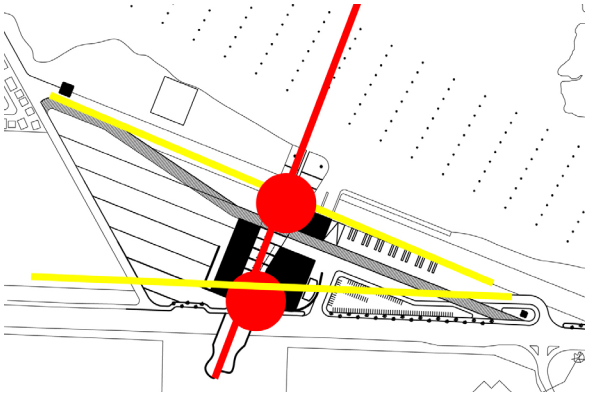
The idea of incorporating water is realised through the erosion of land to bring the water into and around the structures. This way water forms the connective tissue to the dam and site.



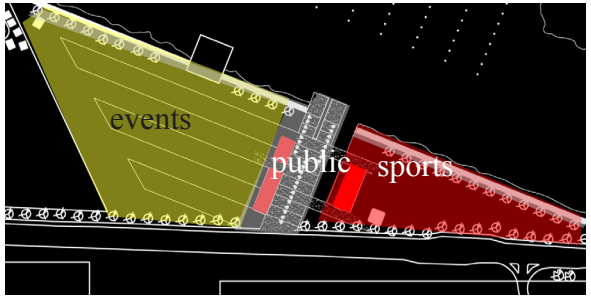




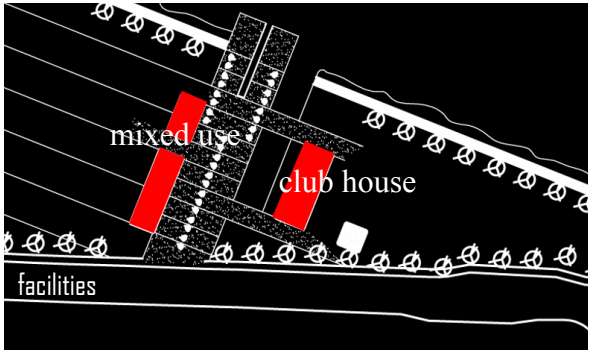


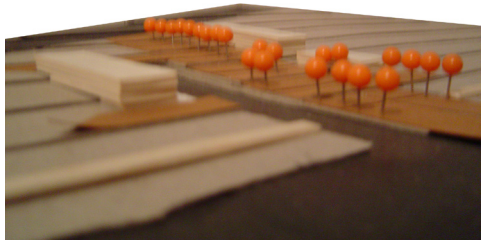


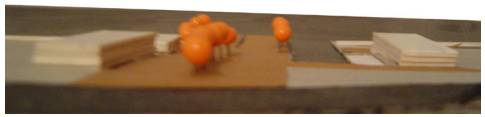
axis creates a junction at the pedestrian routes

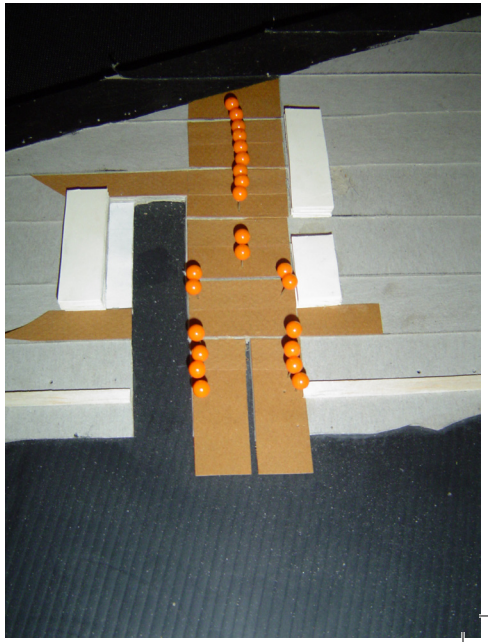


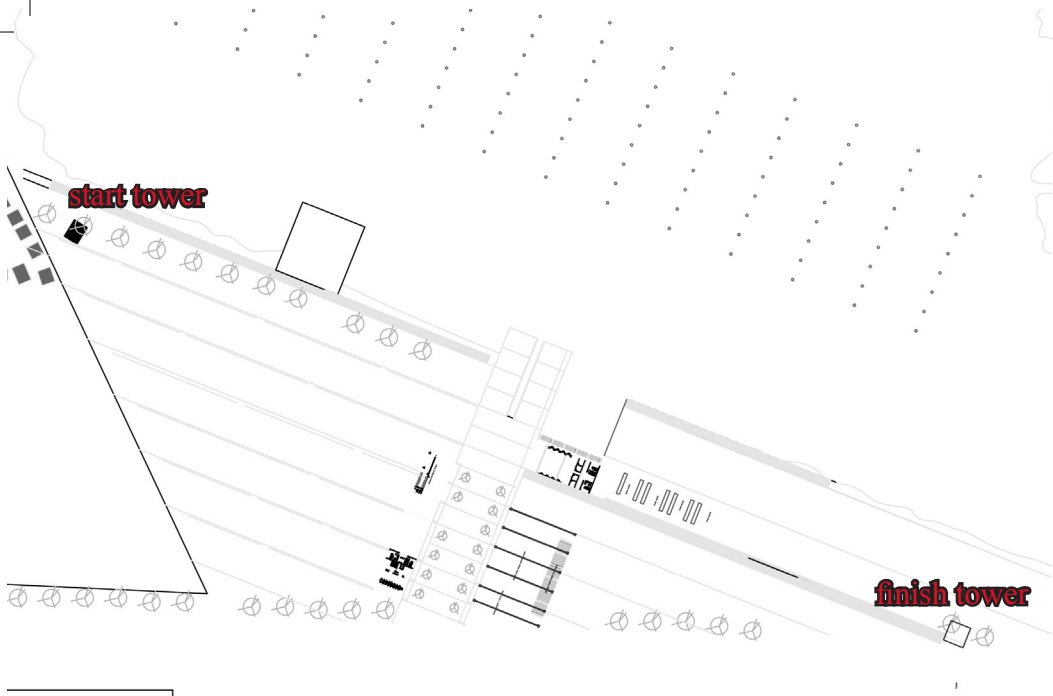
program division



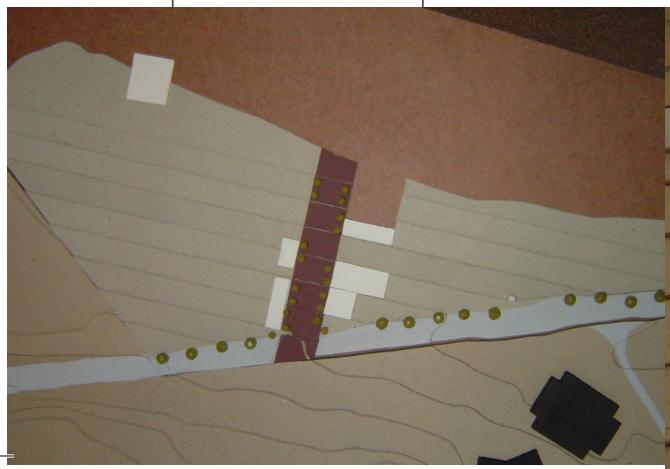


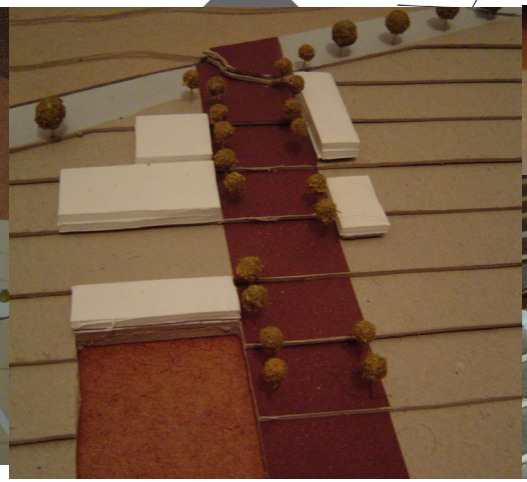


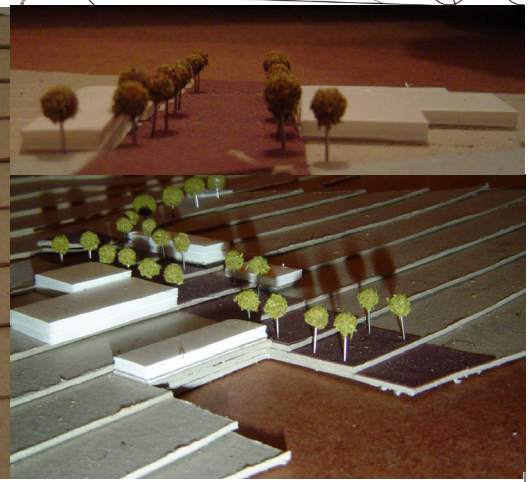


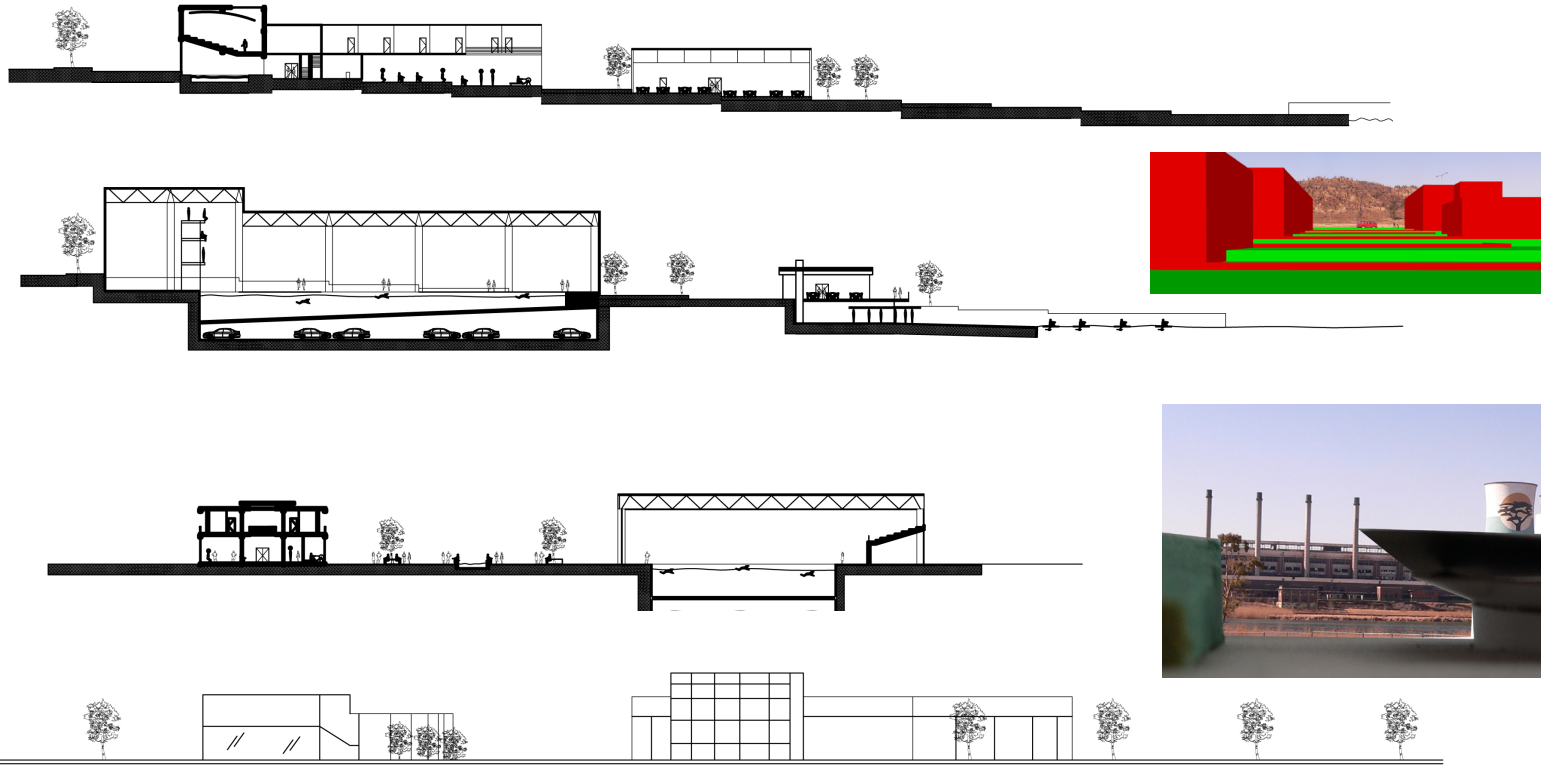

start tower
finish tower


clubhouse
mixed use
swimming pool







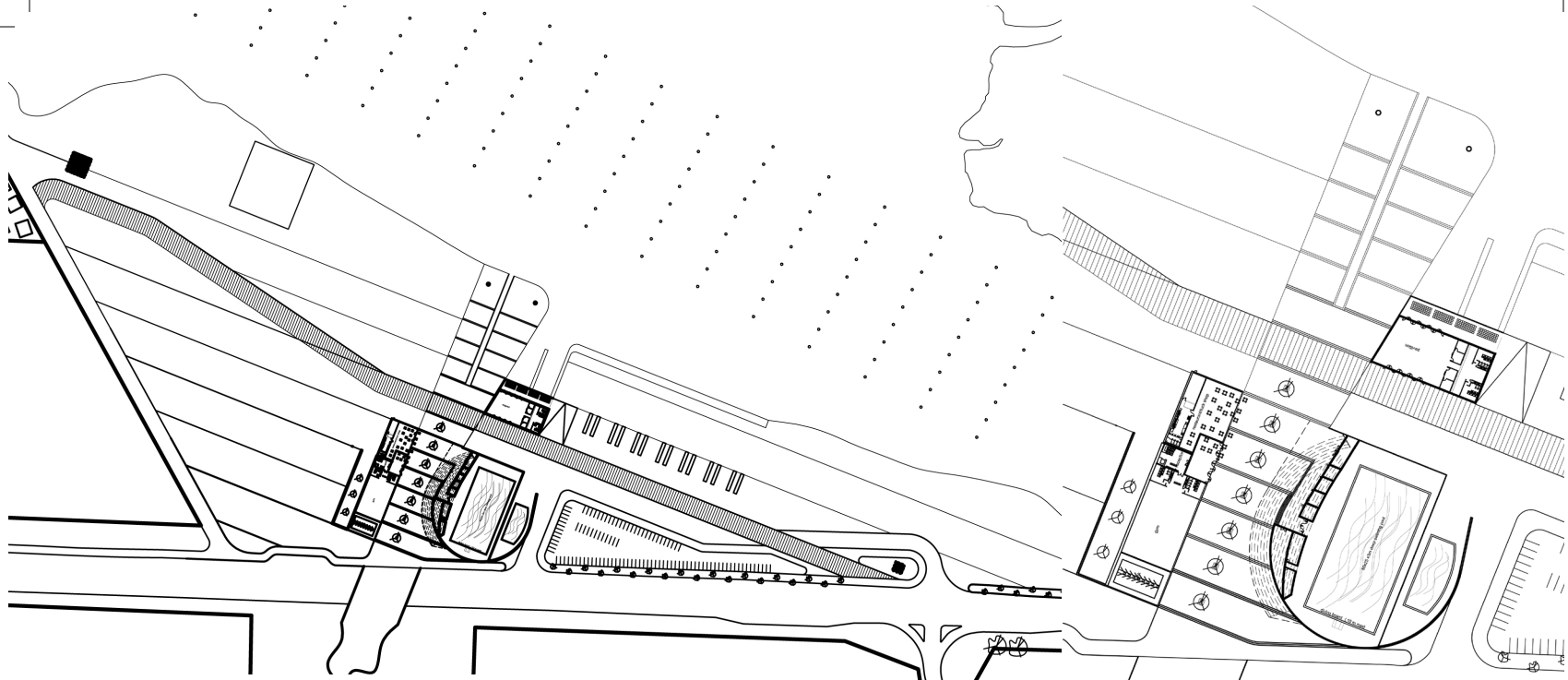


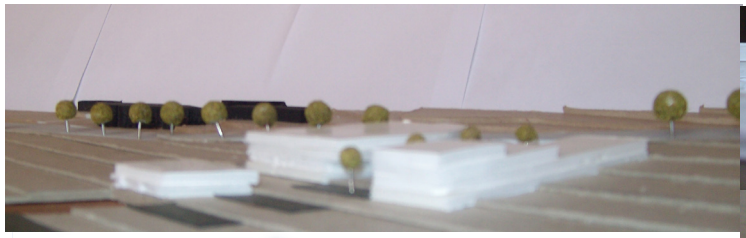
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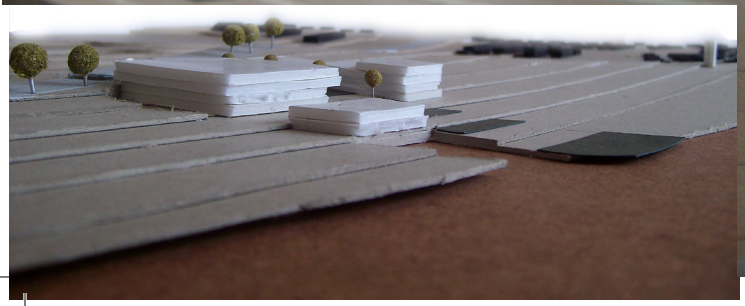
The needs were addressed by positioning the axis in line with the vista koppies and power station and creating a vehicular access linking UJ campus to the site. The facade was brought forward and raised to create a frame to the dam and power station. Swimming and diving facilities where incorporated.

The pedestrian path on the waters edge was redirected to maximise the interaction with relevant facilities by intruding water into the land as a docking station for boats.

The design sections pointed out the need to re size the promenade axis in relation to a suitable scale to the one of the buildings and the need to defend the buildings and surrounding space during a mass event.







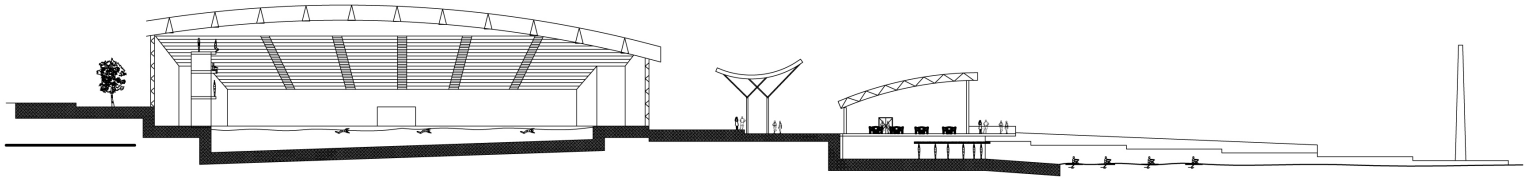


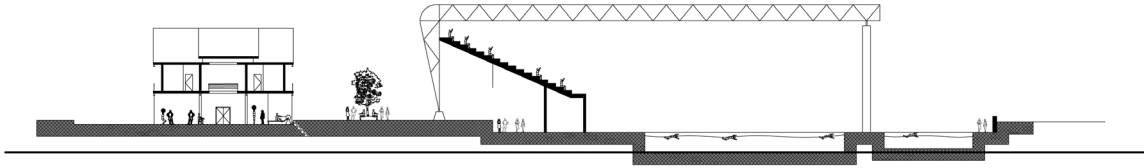


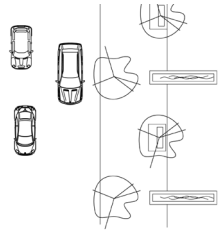




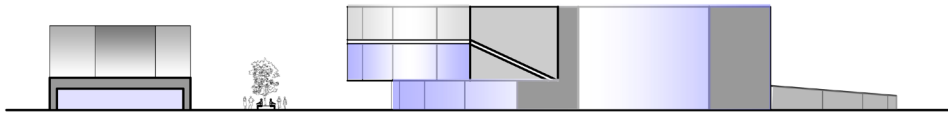




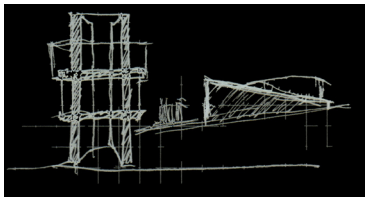




PEDESTRIAN EXPERIENCE THROUGH OLD POTCH ROAD







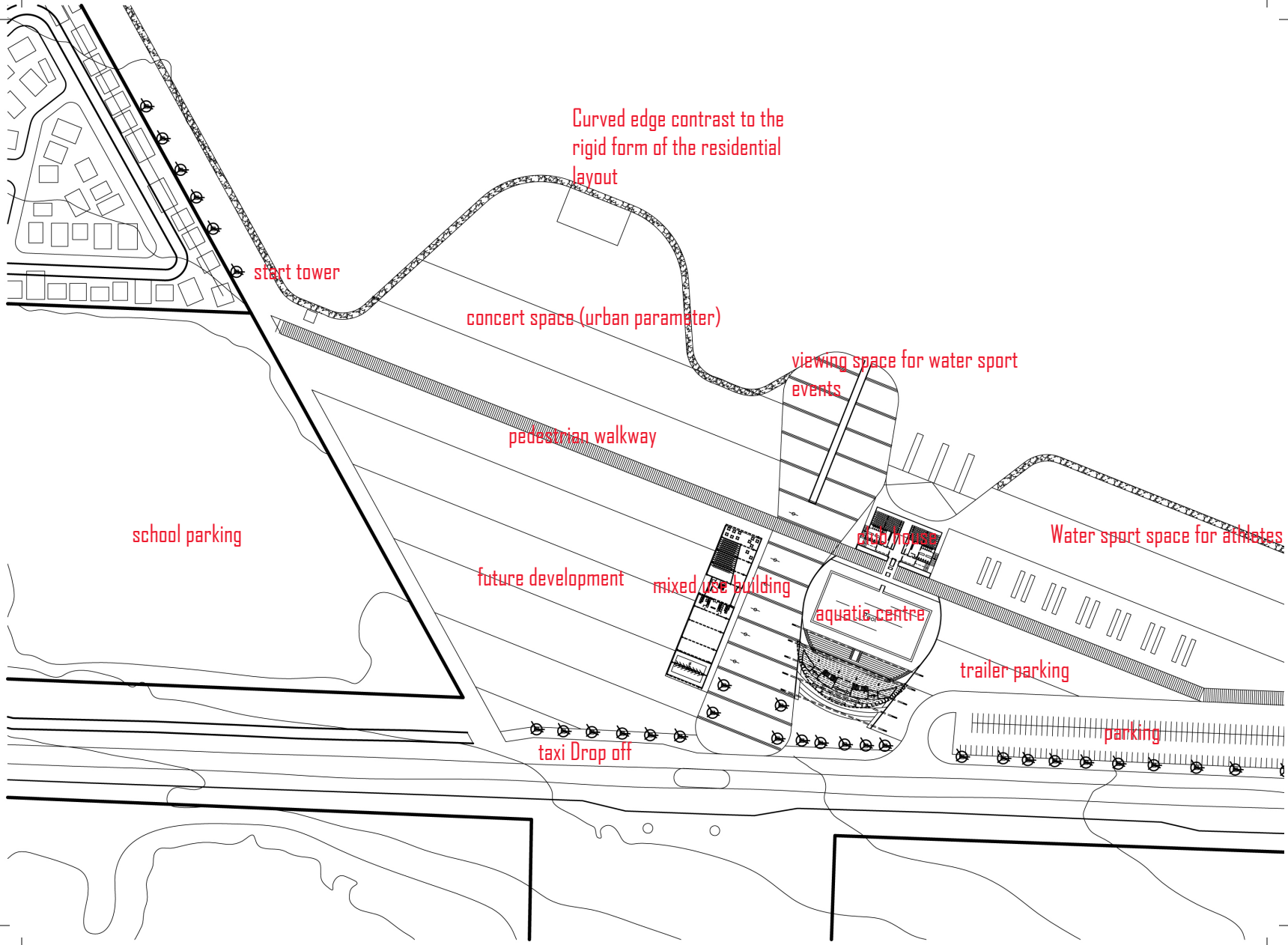
Tower as approach element

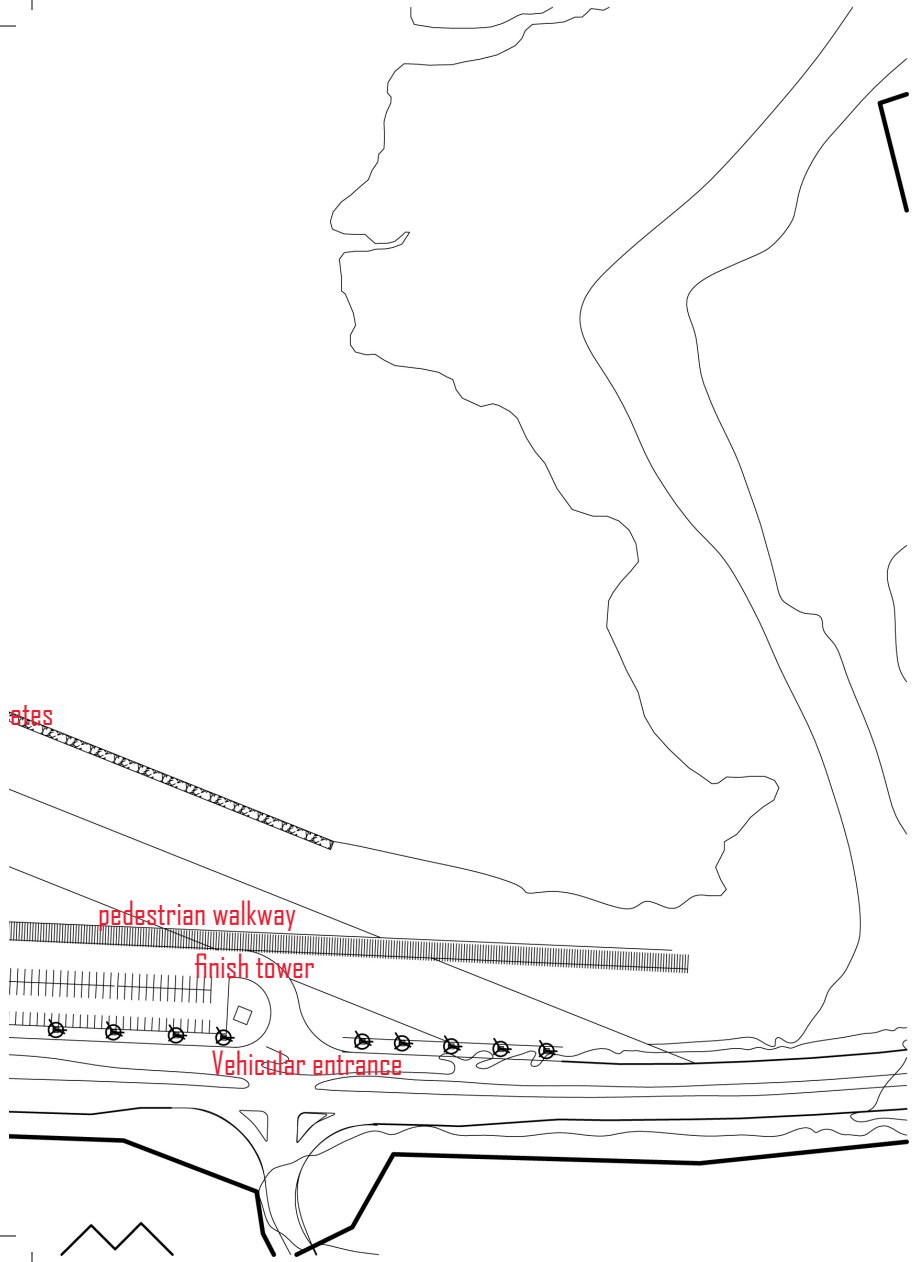
6

Exploration of fluid forms and movement start to shape the design, the curve lines invite the approach of the user while maintaining the frame. The towers are used as entrance marks both for the vehicular on old Potch and the pedestrian on the north west approach. Issues of transition into the buildings from the promenade started to be addressed. Spaces around the site were formalised in terms of parking, event spaces, race viewing.

The design pointed out the missing opportunity for the swimming pool's grand stand to face the view of the water. It also questioned in the context of south African weather the necessity for the pool to be fully closed/covered?

The proportional scale between pool and club house started to be addressed but it has not reached a satisfactory solution.

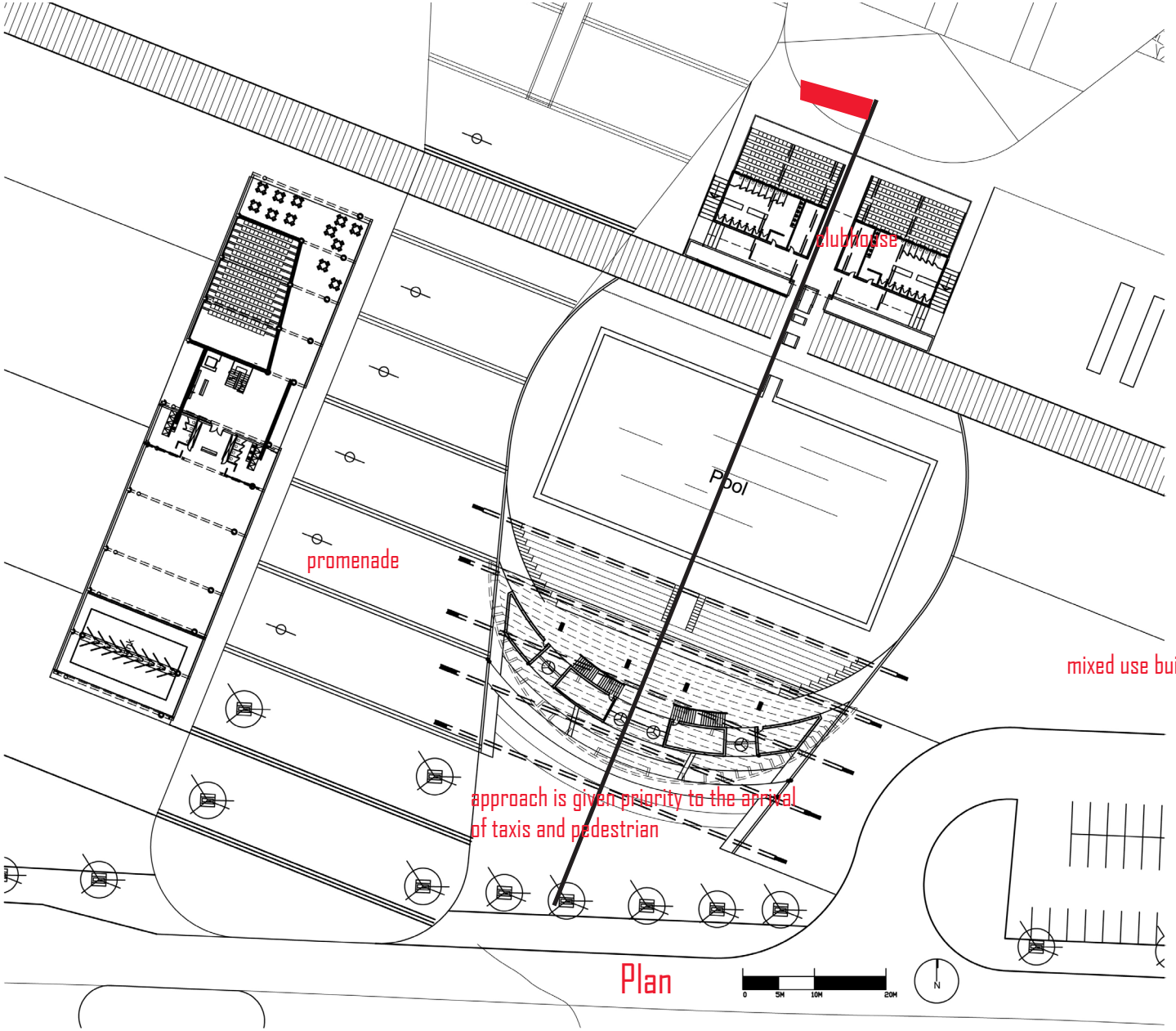

Curved edge contrast to the rigid form of the residential layout
start tower
concert space (urban paramater)
viewing space for water sport events
pedestrian walkway
school parking
club house
Water sport space for athletes
future development
mixed use building
aquatic centre
trailer parking
parking
taxi Drop off



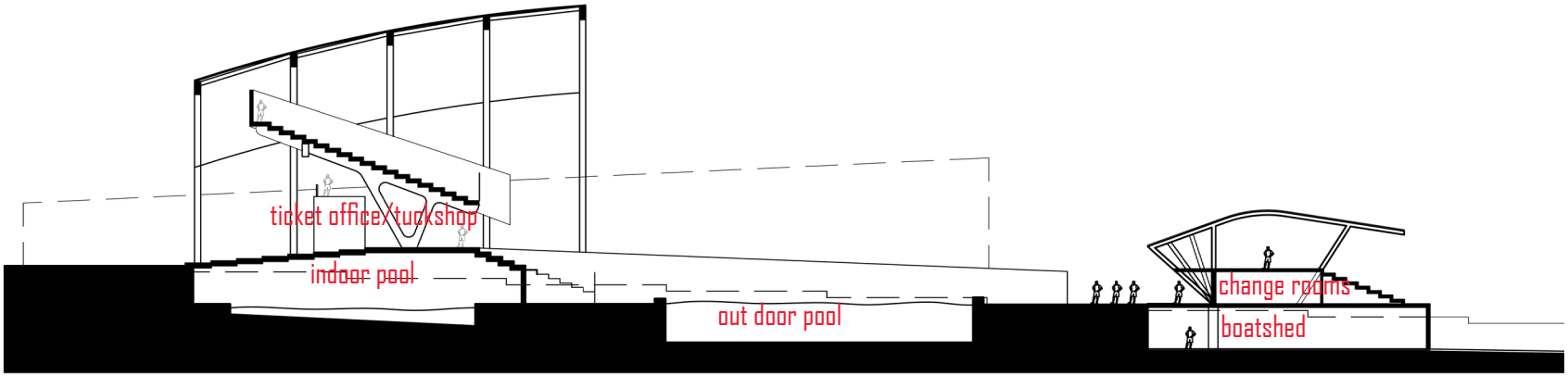
Site plan

7

Fluidity is further explored, scale changes have being used to help scale down the building to human scale, repetion has been incorporated to translate movement. Pedestrians ad public transport users have being given priorety to access routes as the majority of users either walk or use taxis.
Event spaces have being formalised.
And sections are being tweaked to achieve maximum view to the water in all buildings.


clubhouse
Pool
promenade
mixed use building
approach is given priority to the arrival
of taxis and pedestrian
Plan
0
5M
10M
20M
N

00:00:80

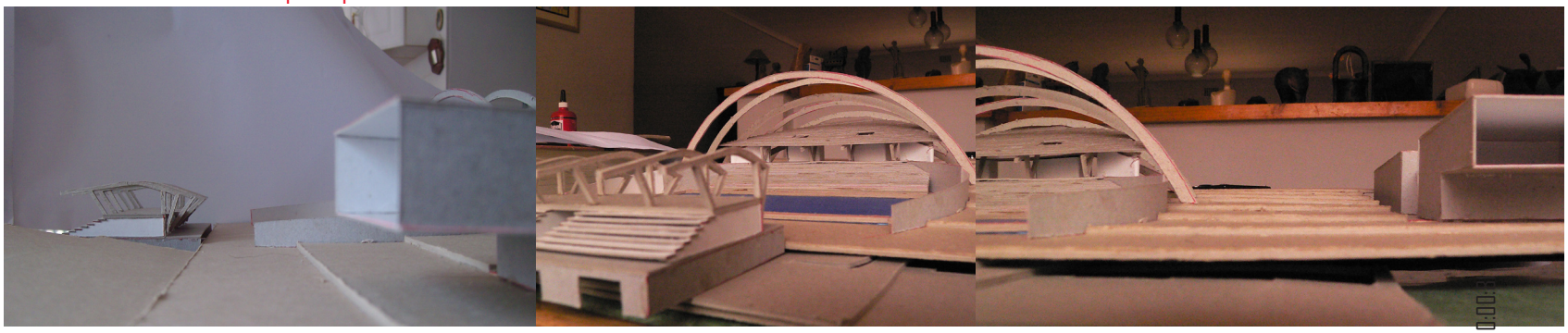


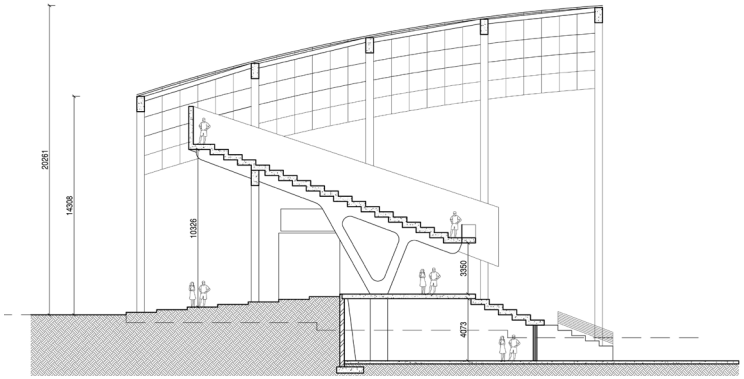
section through the aquatic cenre and clubhouse

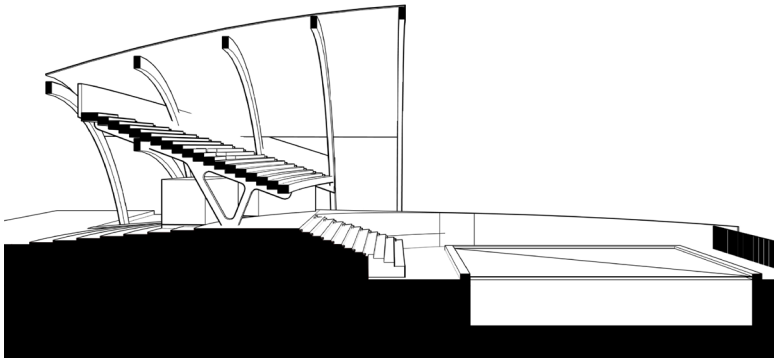


Pedestrian approach from the start tower. Underside of mixed use Bldg to house public amenities. tuckshop and public toilets

scale from the aquatic centre is brought down by the clubhouse and pool wall

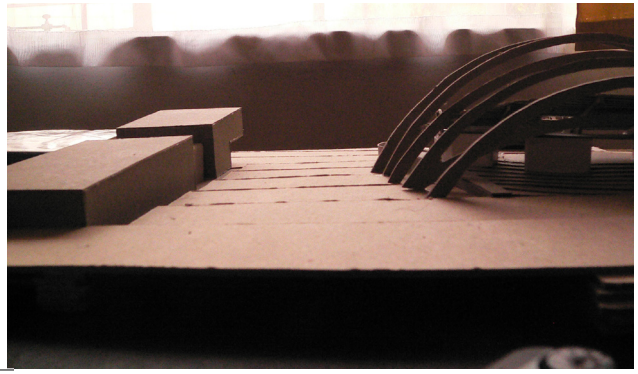




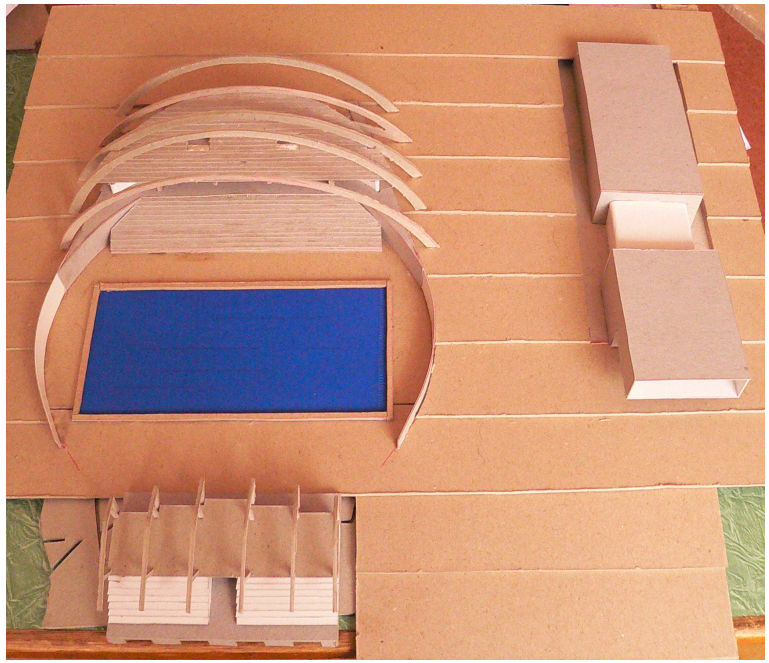




Entrance to aquatic centre



Relationship betweenmixed use and aquatic centre

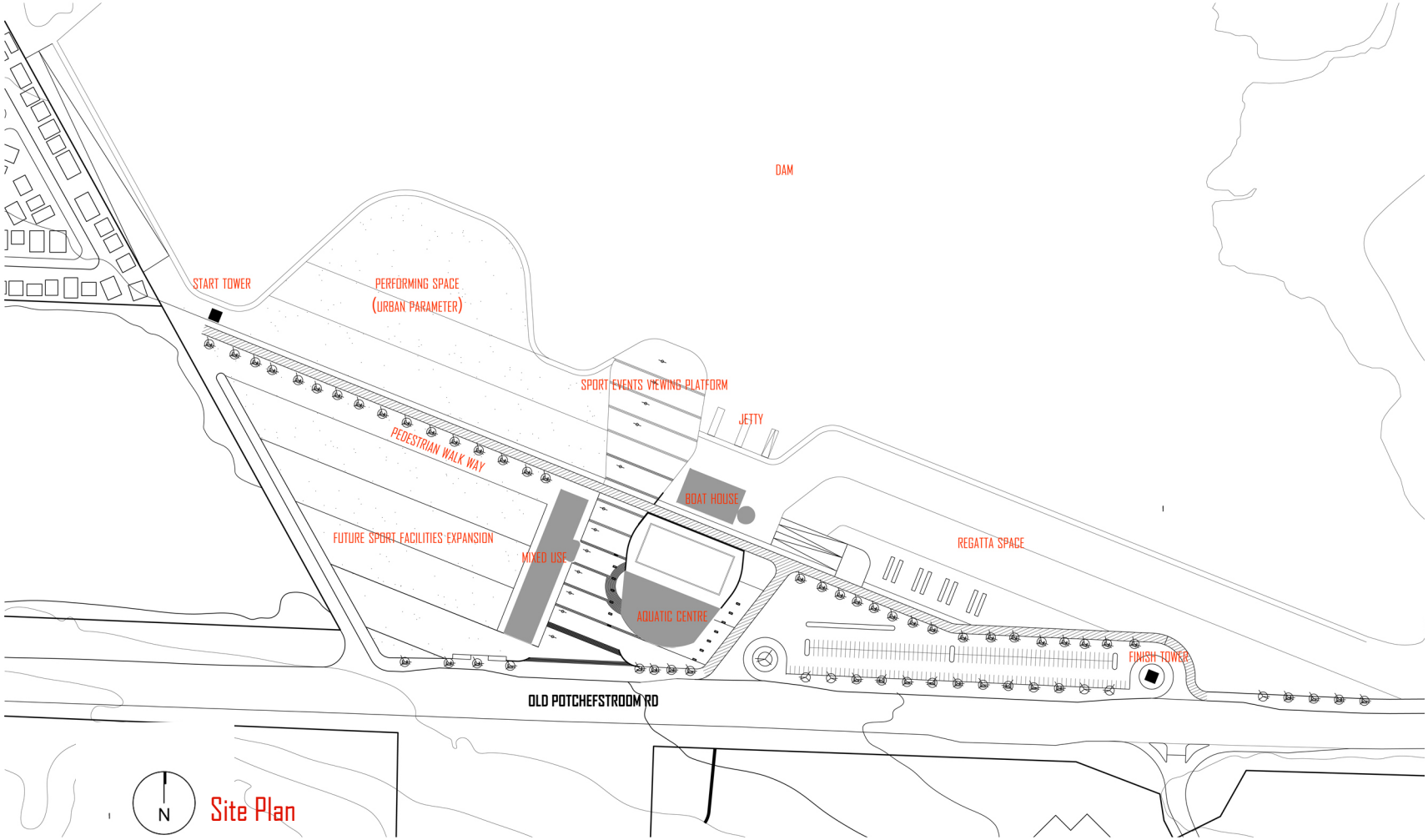




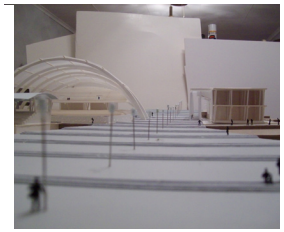
00:00:84

ACCOMPLISH




DAM
START TOWER
PERFORMING SPACE
(URBAN PARAMETER)
SPORT EVENTS VIEWING PLATFORM
JETTY
PEDESTRIAN WALK WAY
BOAT HOUSE
FUTURE SPORT FACILITIES EXPANSION
MIXED USE
REGATTA SPACE
AQUATIC CENTRE
FINISH TOWER
OLD POTCHEFSTROOM RD
N

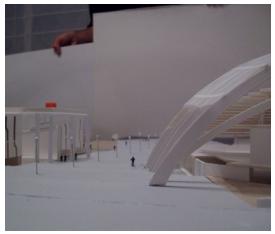
Site Plan

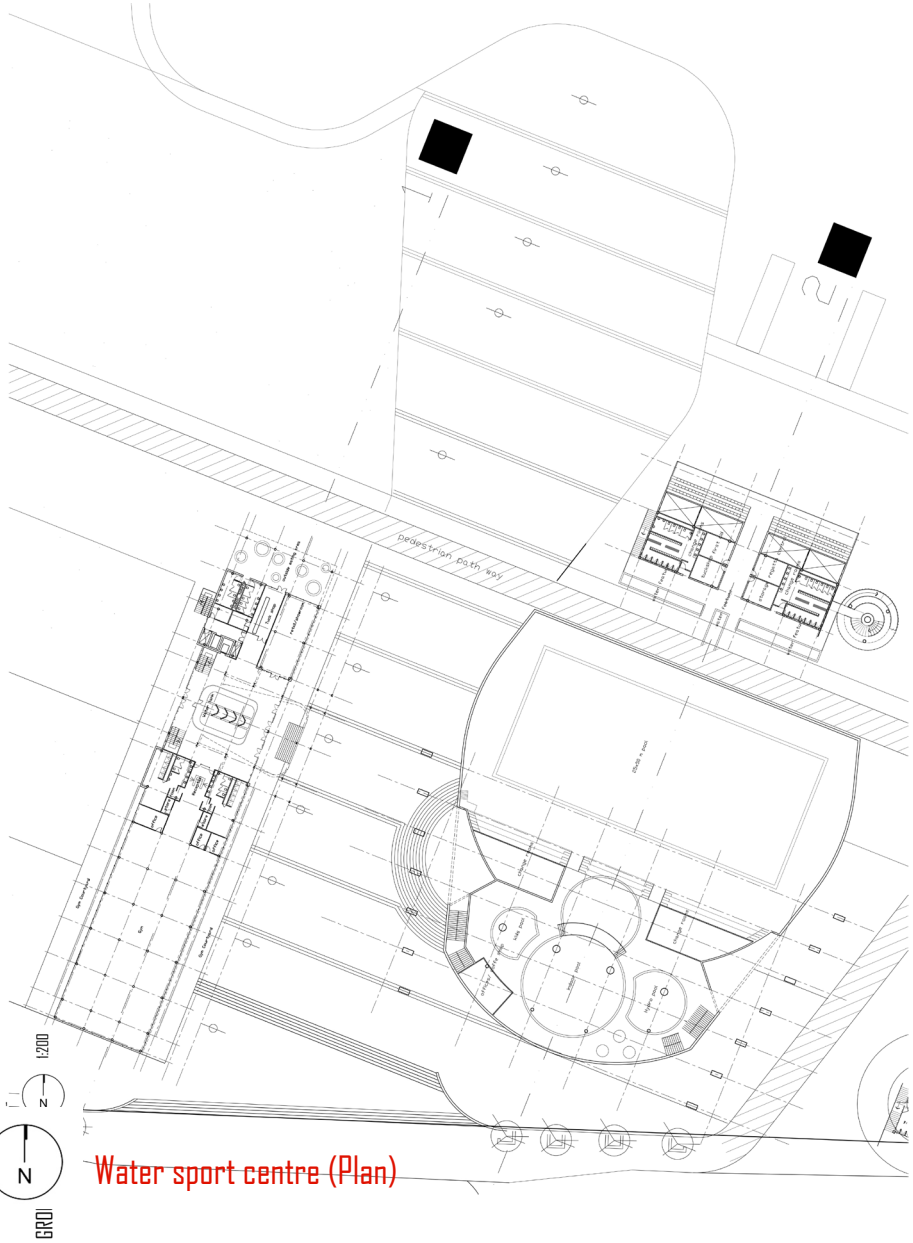






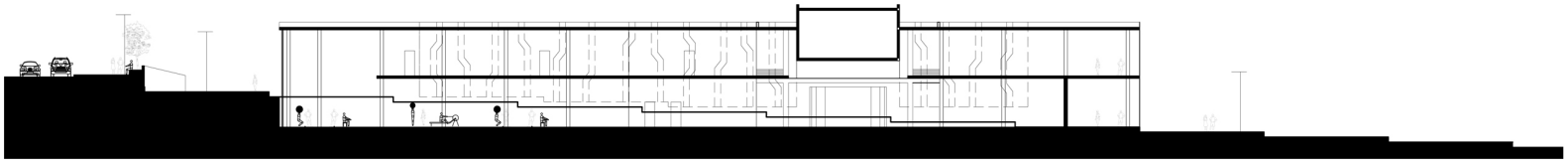




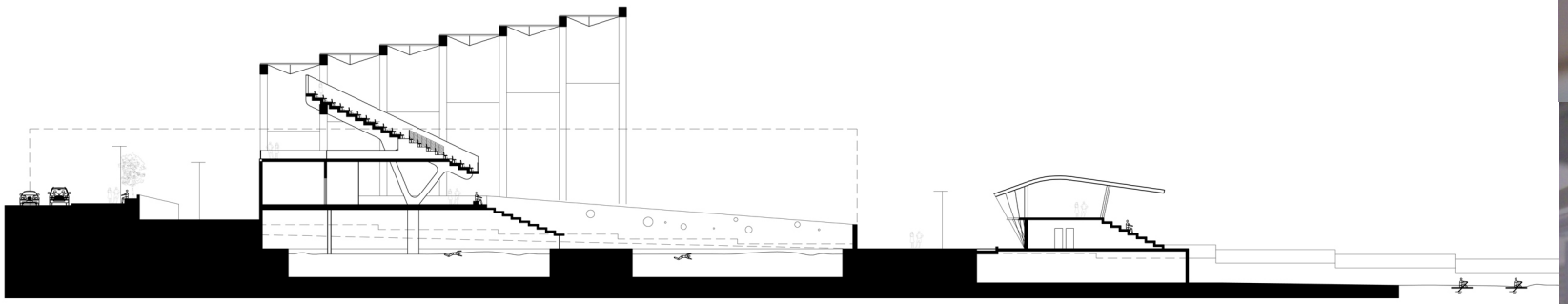


Water sport centre (Plan)

00:00:87

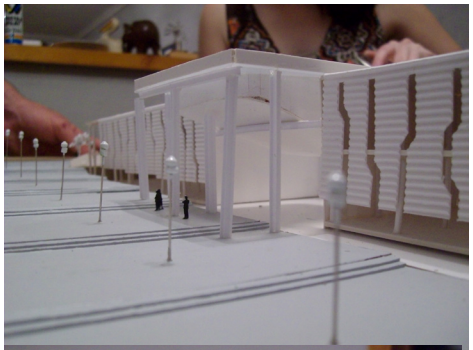


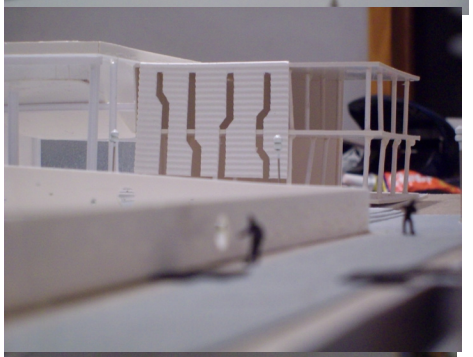
Section 1



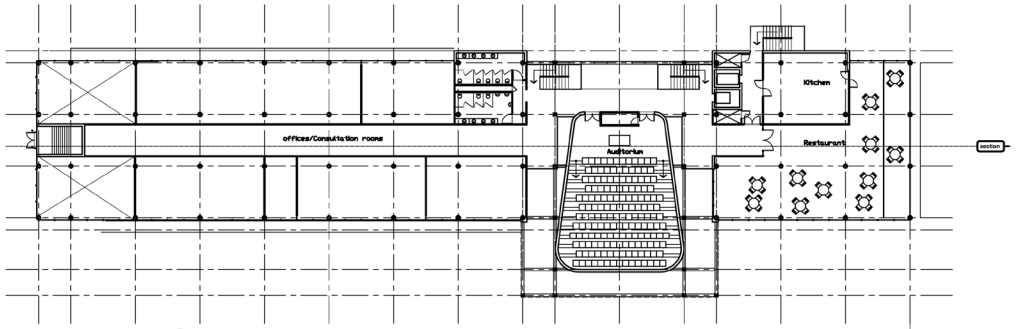
Section 2

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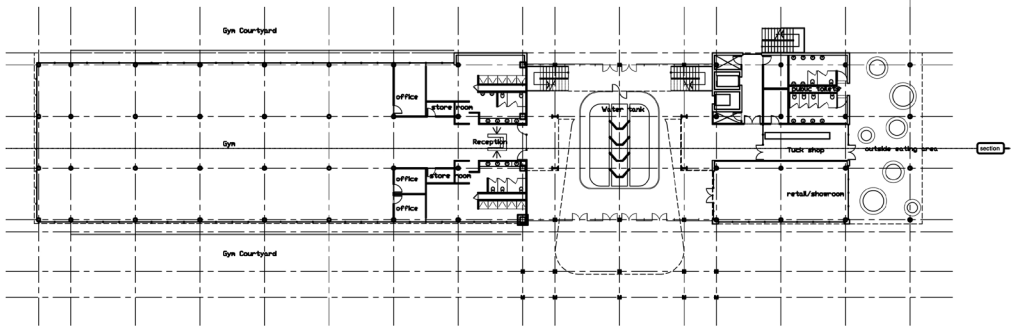




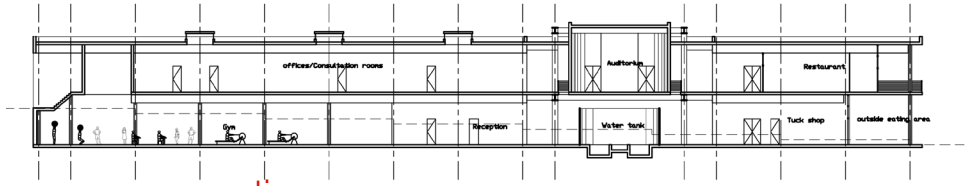




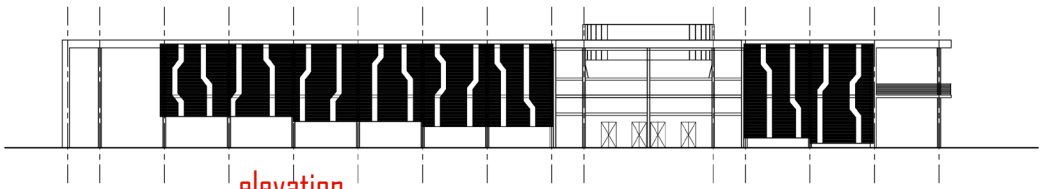
first floor



ground floor



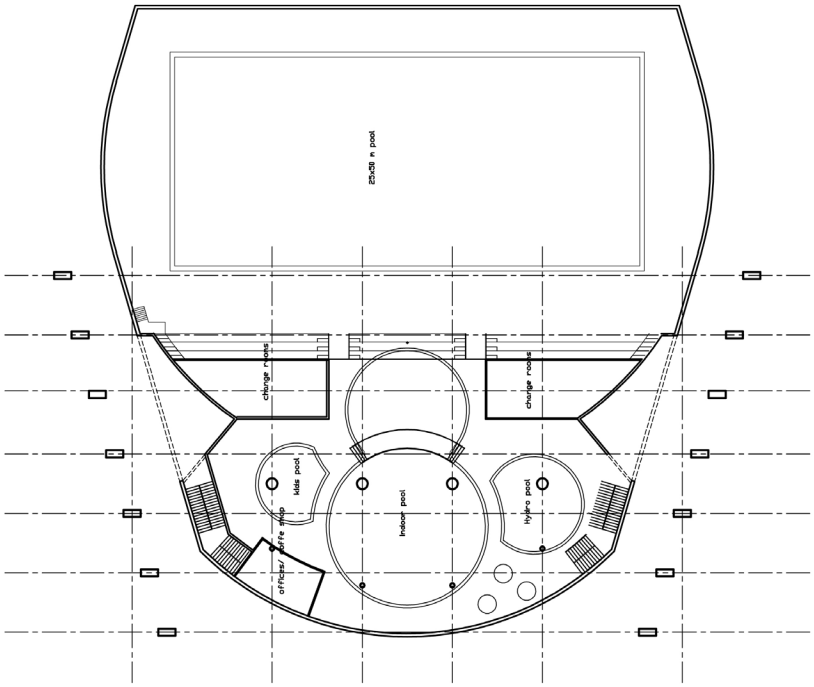
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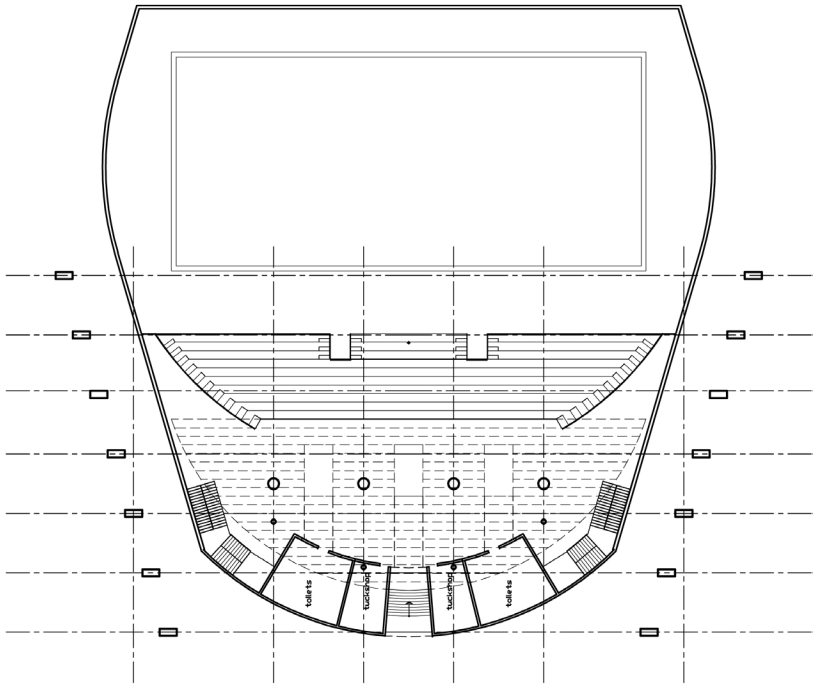
elevation

Mixed use Bldg

68:00:00



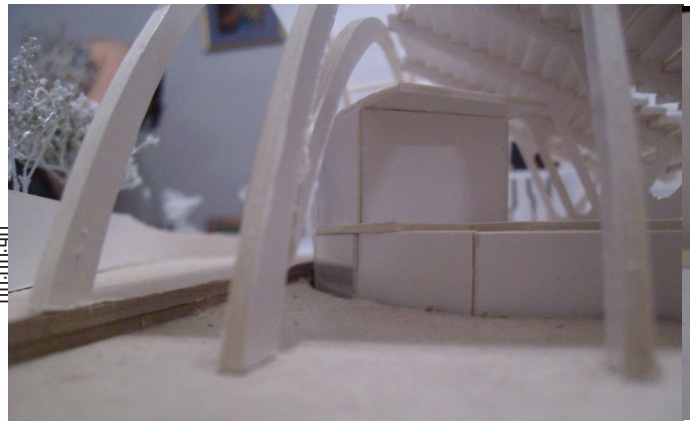
ground floor

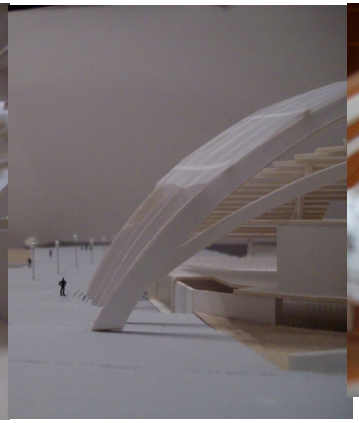


first floor

Aquatic Centre

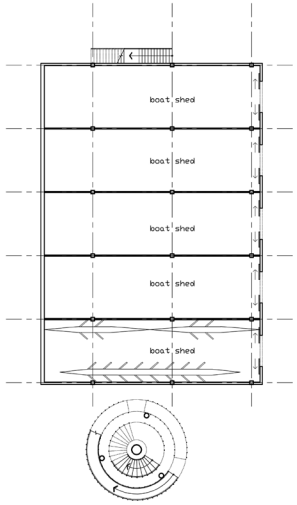
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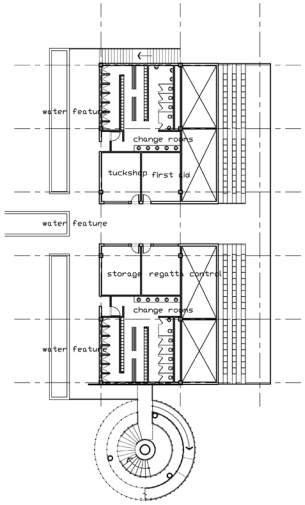




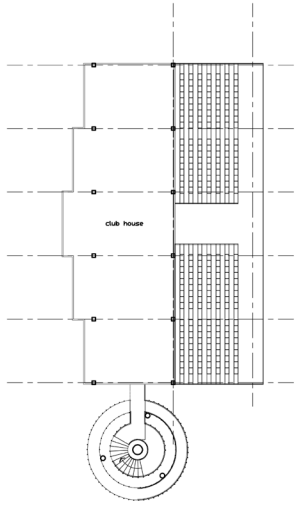
Club House



ground floor



first floor



Second floor







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