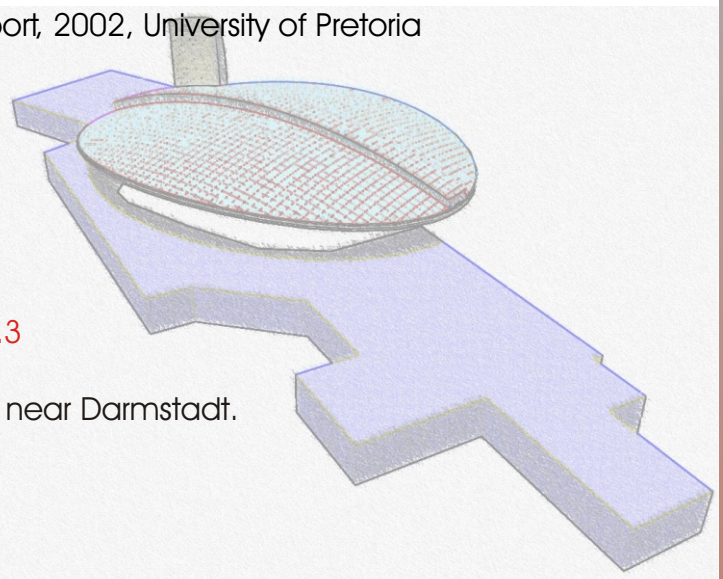
1. Hi-Performance Sports Centre, Tukssport, 2002, University of Pretoria

Fig.3

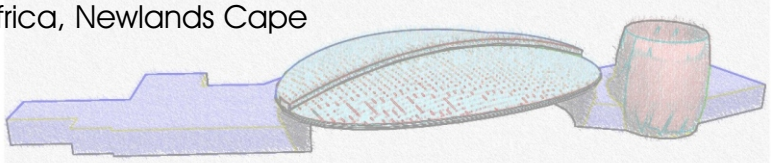


2. New Sports hall for a German school near Darmstadt.

Fig.4

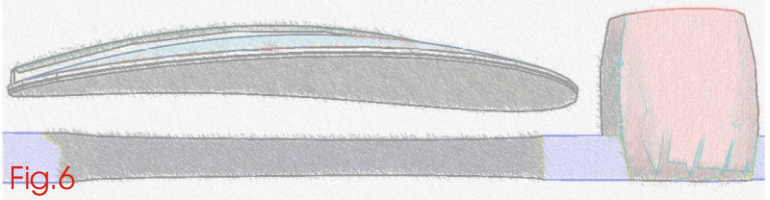
3. Sport Science Institute of South Africa, Newlands Cape

Fig.5



4. Australian Institute of Sport (AIS), 1981, Canberra.

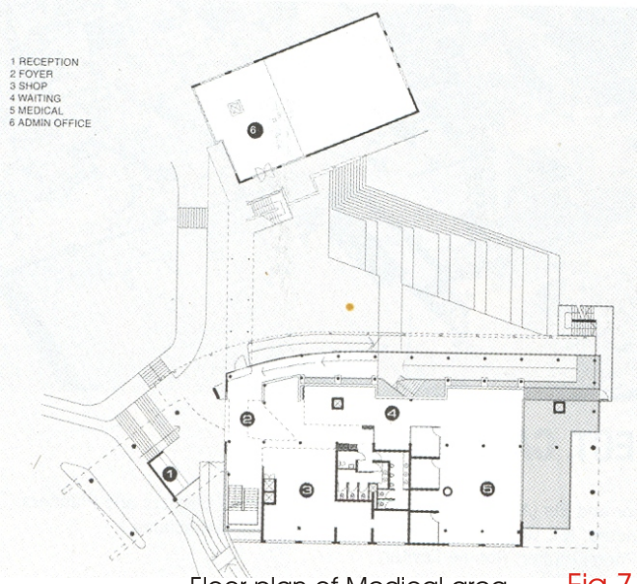
Fig.6



These Precedents are carefully selected to guide the context study. The Hi-Performance Sports Centre on University of Pretoria's sports ground, is the only one of its kind in South Africa and was visited and studied to act as an important guide and reference for the context study and brief. The other precedents studied were on another scale of interest and are discussed using other criteria. What follows is a detail description of each.

HI-PERFORMANCE SPORTS CENTRE, TUKSSPORT, UNIVERSITY OF PRETORIA

Soundspacedesign Architecture & Urban Design, 2002



Floor plan of Medical area Fig.7

Background

The 5000 m² phase project is one of its kind in South Africa and highly popular for foreign athletes for training.

The site was organised to maximise the sense of arrival, its connection to the highly urban Hatfield High Street, and its views of the rugby fields beyond, and to make legible the functional hierarchies that exist

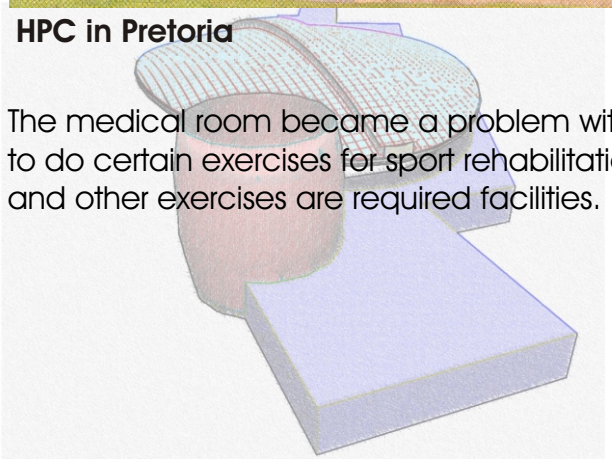
The HPC was mainly designed for rugby training. South Africa's attractive weather conditions makes' it a perfect destination for overseas sports teams for training. Because of this high request for training facilities, the HPC is now not used for all kinds of sport. The HPC gives athletes the opportunity to train on state-of-the-art sport-science diagnostics equipment and have access to the medical room with Physiotherapist and Biogenesis for sports rehabilitation. The dining-room give the athletes the opportunity to get a balanced nutrient meal every day.

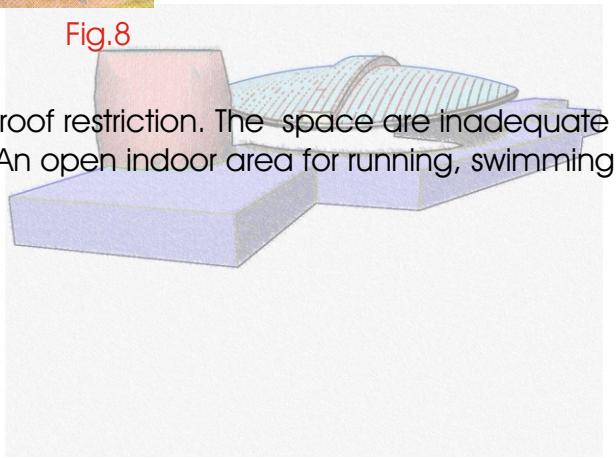
HPC in Pretoria Fig.8

Problems and changes

With the different kind of athletes visiting the HPC, it had to change some of its facilities to accommodate their needs. The Admin building has changed into a school for permanent scholars staying in 'The lockers'.

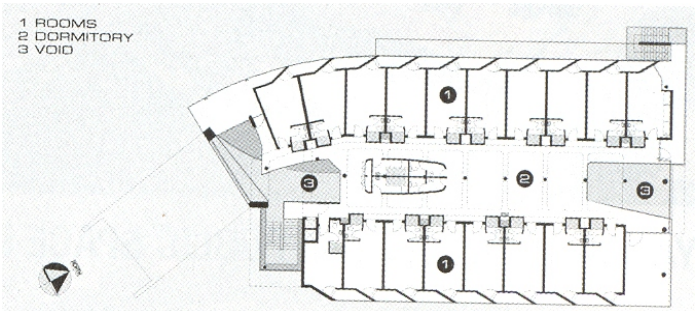
The medical room became a problem with its roof restriction. The space are inadequate to do certain exercises for sport rehabilitation. An open indoor area for running, swimming and other exercises are required facilities.





Request from personnel

More office space
More private Medical treatment
Larger Consultation rooms
Open indoor area with 200m running track and high roof for sport injuries and research
Sanitation in Medical room
Deeper swimming pool for exercises
More bedrooms
More classrooms
Under cover parking for personnel and shuttle service



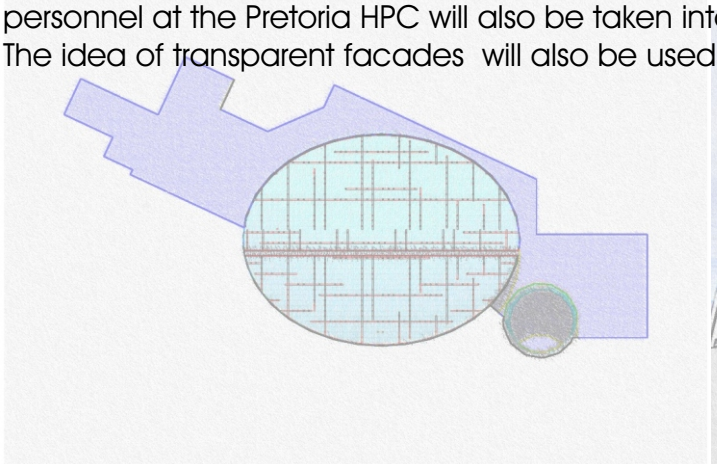
Second floor plan Fig.9

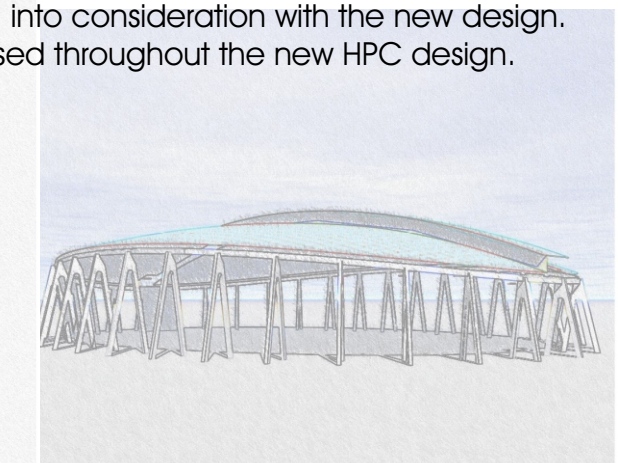
Architecture

Architecturally the building conveys a high technology image with its concrete, steel and glass finishes. In the design of a HPC it is difficult to design it in such a way that the building gives you an expression and feeling that it is a sport facility. In the design this objective is well accomplished with the site selection and transparent facade that reveals the vibrant activities in the building. The vertical elements (fig.9) are not taken through the whole facade breaking the building up in fragments. The western facade with its glass finish contributes to the energy consumption of the building. The hostels(lockers) that are situated away from the building give it a more private setup where sportsmen can relax.

Conclusion

The tremendous demand for this type of facility in South Africa makes this HPC over populated according to 2003-04 bookings. Currently the accommodation at the HPC is private, where the athletes can relax in the evenings without feeling that they are at a training facility. To accomplish this at the HPC in Centurion, the Hennops River will be used to separate the training area from the accommodation. The requests from the personnel at the Pretoria HPC will also be taken into consideration with the new design. The idea of transparent facades will also be used throughout the new HPC design.





New Sports hall for a German school Darmstadt.

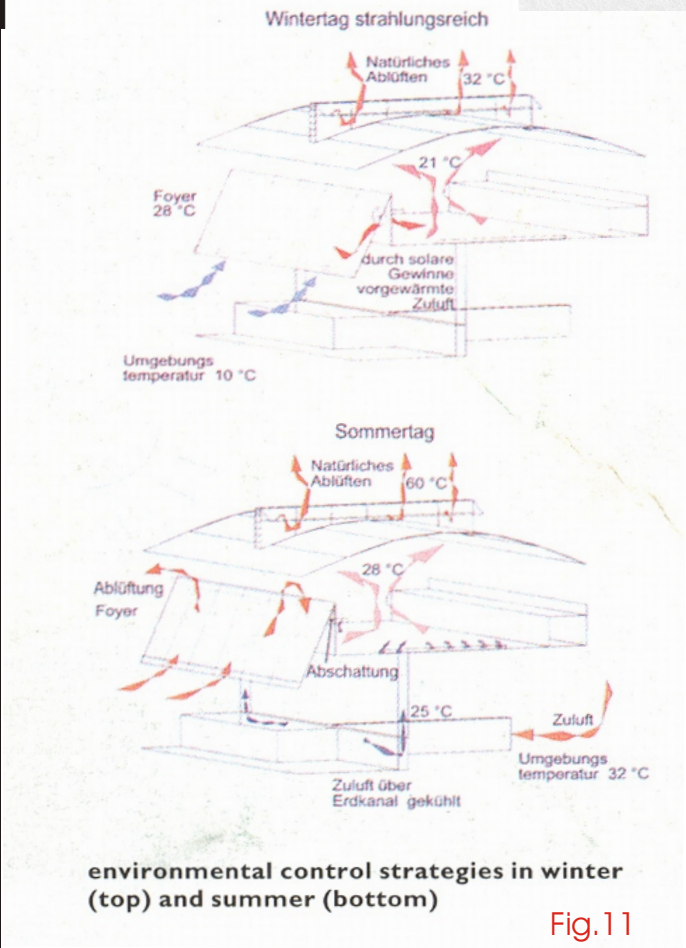
Peter Hubner,
1997

Background

New Sports hall in Darmstadt Fig.10

The Odenwaldschule is one of a handful of private schools started in Germany as a result of the progressive School reform movements in the 20th century. Set in hill country south of Darmstadt, the school occupies a steep wooded hillside, dominated architecturally by it's villa-like boarding houses.
The sloping site with its numerous trees and its strict nature conservation rules seemed at first to offer no plausible place for a large building such as a sports hall. Hubner saw the possibility of setting it into the hill on the edge of a meadow and letting the sea of waving grass continue onto its roof. A curved profile would allow the ground surface to rise and fall again, while leaving the optimum space inside to accommodate the trajectory of a ball.

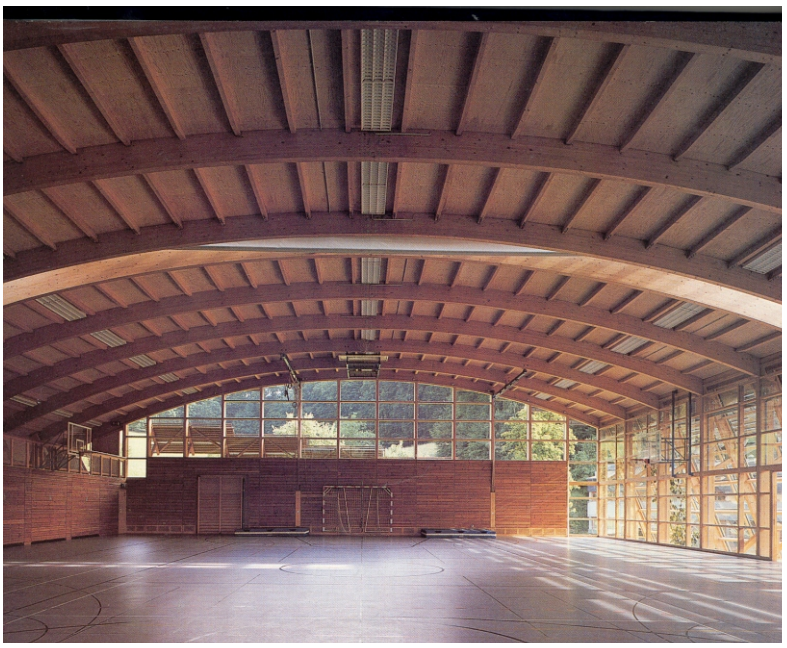
Problems and solutions



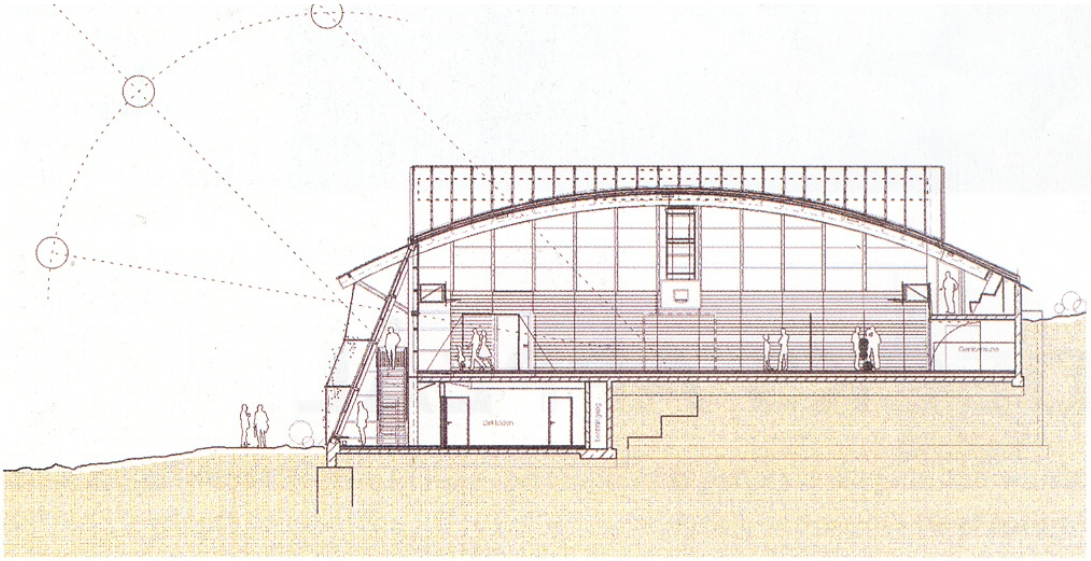
environmental control strategies in winter (top) and summer (bottom) Fig.11

The major problem in the centre was the need that the hall should be divisible in two with a central curtain, for it seemed impossible that such a thing is hung from the curve, remains removable, and leave the volume unobscured. Hubner conceived the idea of housing the curtain within a straight box projecting up to appear on the curved profile like a backbone. Glazed it could be visually delicate while introducing a shaft of daylight into the centre of the room. So began a servicing strategy that is truly green, since it saves on both building and running costs. It avoids complex mechanical plants that are expensive to install and maintain and air conditioners that burn energy and use noxious chemicals. Instead, it balances out the given conditions with a series of open able barriers. On hot summer days, the glazed box on the roof heats contained air so that it rises through open vents, drawing more with it.

It is on winter afternoons that the foyer really starts to work for its living, both as a buffer for the hall and as a solar collector. When it reaches the required temperature, a photocell-powered fan cuts in to deliver its hot air to the hall. The parts of the building belonging to the ground are in concrete, the parts above in timber and glass. The roof deck is of thick plywood covered by insulation, membrane and turf, giving a natural surface at once protective and insulating.



New Sports hall interior Fig 8



cross section Fig 9

Conclusion:

The investigation shows that green architecture can be applied to sport halls with all its thermal requirements.
Despite its undoubted green inspiration, the large building makes the gentlest impact in its precious context, and is a joy to use. Sport is not compulsory at this school and is left to pupils to co-operate and organize teams. Since the new building was opened sport has become more popular meaning that good architecture can truly changes lives. The design of a building can be successfully incorporated in nature without restricting the designer. The concept of green Architecture will be incorporated in the design process of the Centurion HPC.

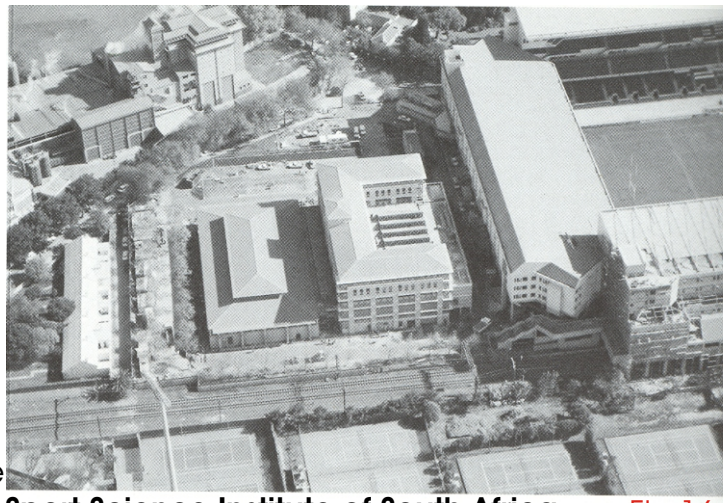
New Sports hall northern Facade Fig 10

Sport Science Institute of South Africa, Newlands Cape town, MLH Arcitects and Planners, 1991

Sport Science Institute of South Africa Fig.15

Professor Tim Noakes' internationally acclaimed Bioenergetics of Exercise Research Unit-operating without adequate equipment and facilities in the dingy semi-basement of the Physiology Department on the University of Cape Town's medical campus- was the obvious structure around which such a Sports Science Institute could be created. It had set itself five primary goals:

- To undertake world-class research in applied sports focusing on a select group of sports;
- To apply the knowledge acquired from the research programs to improve the competitiveness of South Africans who participate in those sports;
- To advance and coordinate the teaching and research activities in sport medicine and the sports sciences in South Africa.
- To initiate and coordinate scientifically based training programs;
- To assist in the development of broad-based programs to optimise the identification and nature of those persons with special sporting talents.

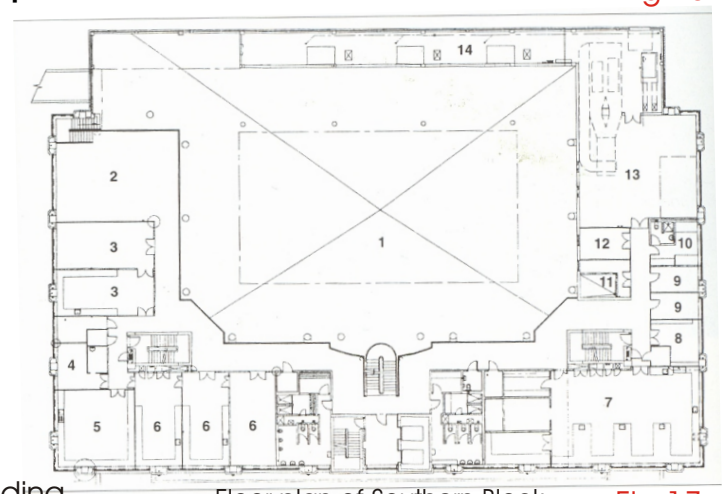


Sport Science Institute of South Africa Fig.16

Design

Three basic design influences of the building.

- Separate high-activity areas allocated for semi-public and common usage from more private offices, research and teaching areas.
- Provide sufficient site parking
- Recognise the many site constraints



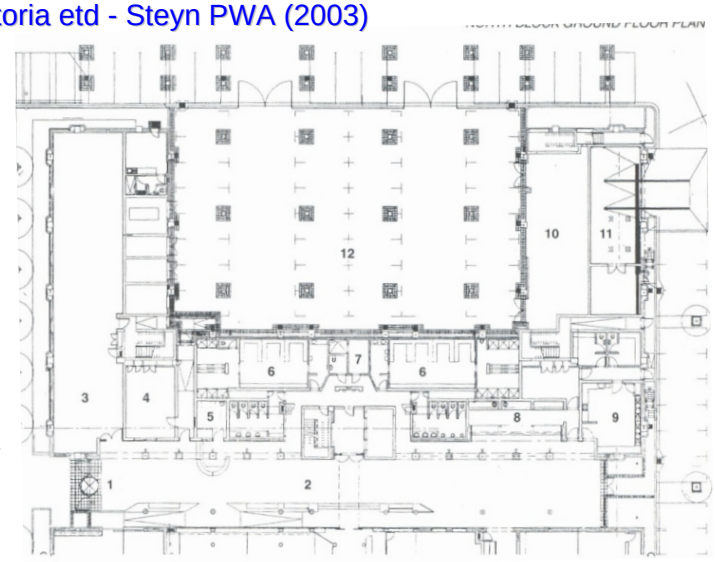
Floor plan of Southern Block Fig.17

1. Entrance
2. Galleria
3. SARFU Museum
4. Building Management
5. Security
6. Change/showers
7. Disabled change/showers
8. Juice Bar/Servery
9. Kit area
10. Planparking room
11. Refuse rooms
12. Undercover

The high activity areas required
- Natural light
- Large spans
- Open areas

The sport Science Institute's three main Functions:
- Services
- Academic research
- Teaching

These three functions are arranged over three consecutive levels and are connected vertically by an internal steel staircase. The public interface service function on the first floor of the North Block incorporates sports medicine, treatment of sports injuries and physiotherapy and it is from here that clinics for cardiac rehabilitation and weight-loss programs will be run.



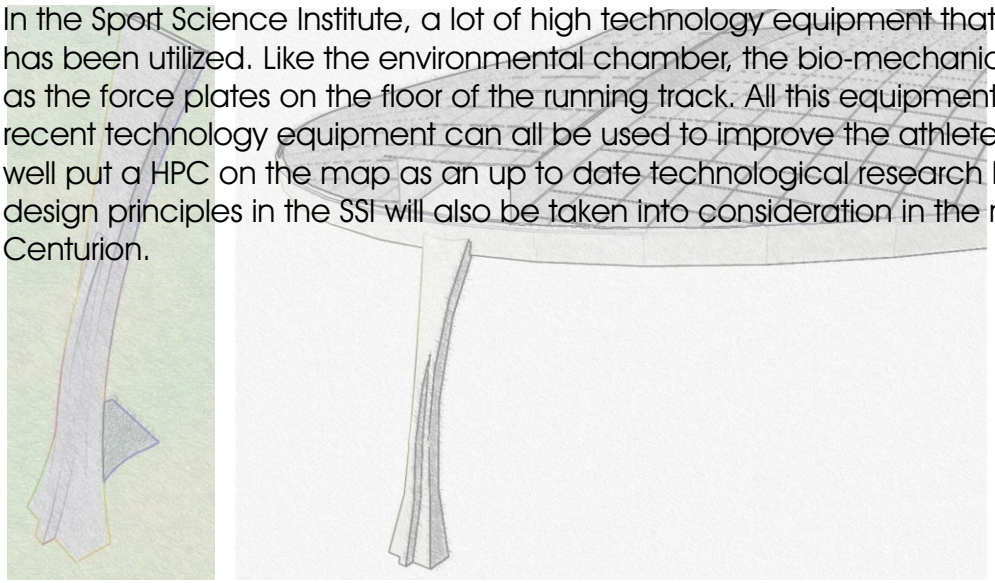
Floor plan of Northen Block Fig.18

1. Galleria
2. WP Rugby Academy
3. Auditorium
4. Seminar/lecture rooms
5. Swimming pool
6. Toilets
7. Change/ shower rooms
8. Control desk/office
9. Filtration/ventilation Plant room

Consulting rooms for both UCT staff as well as outside specialists are provided. The bio-mechanics laboratory, where research will be conducted on athletes in action will be linked by stairs to a multipurpose hall. This hall is large enough for most indoor sports, even tennis, but is used mainly for exercise. An external elevated track makes it possible for athletes to run into the building so that their movement can be measured electronically on force plates in the floor of the track and also monitored and filmed for analysis.
In addition, experiments will be undertaken in an environmental chamber in which athletes will be subjected to simulated climatic conditions and where the effects of temperature, humidity and wind on their performance will be analyzed.
The two sections of the gymnasium are linked by a steel bridge over the swimming pool. From this bridge swimmers can be observed and filmed from the top. The first floor of the gymnasium has an indoor running track around the perimeter. Specialised floor finishes in the gymnasium and exercise hall have been laid to international standards and specifications

Conclusion

In the Sport Science Institute, a lot of high technology equipment that is not usually used has been utilized. Like the environmental chamber, the bio-mechanics laboratory as well as the force plates on the floor of the running track. All this equipment as well as more recent technology equipment can all be used to improve the athlete's performance as well put a HPC on the map as an up to date technological research laboratory. The three design principles in the SSI will also be taken into consideration in the new HPC in Centurion.



Australian Institute of Sport (AIS),1981, Canberra.

Background

The Australian Institute of Sport (AIS) leads the development of elite sport in Australia.It has been highly successful and is regarded internationally as a world best practice model for elite athlete development.

Australian Institute of Sport Fig 19

Achievements

Fig 20

The AIS made a significant contribution to Australia's tremendous efforts at the 2000 Sydney Olympic Games with 321 of the 620 strong team being currents or former AIS scholarship holders. Of the record 58 medals that were won at the Sydney Olympics, 32 came from current or former institute athletes. They won 8 gold, 11 silver and 13 bronze medals. It was a similar story at the 2000 Paralympics with just under half of the record 149 medals won by current or former AIS athletes. AIS Paralympians won 32 gold, 14 silver and 13 bronze medals.

Programmes

The AIS operates nationally from a 65-hectare site in Canberra.

It offers scholarships annually to about 700 athletes in 35 separate programs covering 26 sports, and employs around 65 coaches. Programs are located in most states as well as Canberra.

The AIS also operates an Athletes with Disabilities scholarship program which has set a benchmark for training athletes with a disability.

An indigenous athletes program is operated in conjunction with the Aboriginal and Torres Strait Islander Commission (ATSIC).

Facilities

The AIS is the pre-eminent elite sports training institution in Australia providing athletes with world-class training facilities, high performance coaching, state-of-the-art equipment, a world-class sports medicine and sport science facility as well as accommodation for 350 residents on site.

Fig.21

Support

Another support service to scholarship holders is the Athlete Career and Education(ACE) program, which was set up to enhance the personal development and performance of Australia's elite athletes through a number of career and education services. A national network of advisers helps athletes with educational guidance, career planning, job searching and personal development to make sure they plan for life after sport. The AIS also provides administrative, sport science and coaching services, as well as funding assistance, to state sporting institutes and academies of sport and to national sporting organisations. The AIS is at the leading edge of sport science and research developments through its Science and Sports Medicine division. The division comprises some of the world's leading authorities in physiology, biomechanics, psychology, nutrition and sports medicine.

Conclusion

This is probably the best example of a successful Sport Institute in the world. The AIS combines everything an elite athlete needs on one site. All the tracks, training, medical, research and nutrition facilities are within the athletes reach. This centre also only makes use of state of the art equipment and world class sport medicine. The positive results accomplished by this centre can only be a result of their strive to only use the best technology and really looking after the interests of their athletes. This centre also helps the athlete plan a life after sport through career guidance, training and job search. This positive and motivational attitude will be taken throughout the whole HPC in Centurion. Only the newest technology equipment will be used and the centre will strive to accommodate all types of sport. A variety of sport fields surround the site, and extra fields will be added with the development of the sports hub. Where it is not practically possible to accommodate a sport, arrangements like a shuttle service will be provided.