

# **Hi-Performance Sport Centre**

## Centurion

Pieter Steyn

Submitted in fulfilment of part of the requirements for the degree of  
Master of Architecture in the Faculty of Engineering, Built Environment  
and Information Technology, University of Pretoria, Pretoria.

2003

## Hi-Performance Sport Centre

Centurion

Pieter Steyn

Mentor: Clinton Hindes

Study Leader: Prof Schalk le Roux

The city of Centurion houses various sporting facilities such as SuperSport Park and Centurion Gymnastics Club as well as other training facilities. The proposed site for this thesis is on the edge of the Hennops River and forms part of the Lyttelton Agricultural holdings. It borders SuperSport Park as well as the Centurion Rugby club. The proposed site is located North of South Street in Centurion.

Currently there is only one Hi-Performance Sport Centre in South Africa. It is located on the Sports grounds of the University of Pretoria. This centre, although only one year old, is already fully booked well into the year 2004. The overwhelming response to this sports facility is a clear indication that centres like these are in great demand in South Africa. One of the main reasons for its popularity is our appealing weather that attracts many foreign athletes. Another reason is the diversity of sport in one complex and the highly equipped training facilities. The athletes can be monitored throughout training with the proper nutrition and medical support. It is the only facility of its kind, combining a training facility with accommodation.

This thesis proposes to provide the Centurion area with a similar centre and including improvements to the existing centre. According to the Centurion Integrated Development Framework the site and its surroundings should be used for sport development and recreational facilities. The surrounding sports grounds are another reason for the choice of site. The site is visible from the main road between Pretoria and Johannesburg (N1 Highway) which increases visibility. According to the Centurion Integrated Development Framework all the developments adjacent to the N1 highway should convey a hi-tech image.

This thesis evolved as a comprehensive reaction to the immediate site and the physical, social, cultural and technological conditions. It is the amalgamation of these concepts and ideas that serves as metaphor for the architectural response and process. Since the thesis deals with the professional sport industry and high technological precision research and training, so too does this project focus on presenting this idea of "precision" throughout the architectural-, space-, and tangible experience.

In totality, the proposed design is the synthesis of various interrelated influences. The product is site specific, individualistic and realistic.

## Hi-Performance Sportsentrum Centurion

Pieter Steyn

Mentor : Clinton Hindes  
Studieleier: Prof Schalk le Roux

Centurion huisves tans 'n verskeidenheid van sportfasiliteite soos SuperSport Park en die Centurion Gimnastieklklub. Die betrokke terrein soos voorgelê in hierdie tesis grens aan die Hennopsrivier en is direk Noord van Suidstraat in Centurion. Dit maak deel uit van die Lyttelton Landbou Hoewes wat aan SuperSport Park sowel as die Centurion Rugbyklub grens.

Daar is slegs een Hi-Performance sentrum in Suid Afrika, geleë op die sportgronde van die Universiteit van Pretoria in Hatfield. Hierdie sentrum is slegs een jaar oud en is alreeds volbespreek tot diep in die jaar 2004. Hierdie oorweldigende belangstelling toon dat dinamiese Sportsentrums in groot aanvraag in Suid Afrika is. Een van die hoofredes vir die belangstelling is ons aangename weer wat baie buitelandse atlete lok. Die verskeidenheid van sportsoorte sowel as die hoë tegnologiese apparaat dien as 'n verdere rede vir die belangstelling. Die atlete word regdeur oefenprogramme gemonitor en word voorsien van die regte dieet en mediese bystand. Die sentrum is ook die enigste van sy soort om verblyf met oefenfasiliteite te kombineer.

Hierdie tesis stel voor om die Centurion area te voorsien van 'n soortgelyke sentrum, maar met moontlike verbeterings. Die stedelike ontleding van die area het aangedui dat die terrein en sy omliggende gebied gebruik moet word vir sportontwikkeling en rekreasiefasiliteite. 'n Rede vir die keuse van terrein was die direk-aangrensende sportgronde. Die terrein is ook sigbaar vanaf die oorhoofse snelweg tussen Pretoria en Johannesburg. Volgens die Centurion Saamgestelde Ontwikkelings Raamwerk moet alle ontwikkelinge wat grens aan die N1 snelweg 'n "Hi-Tech" beeld uitdra.

Die uiteindelijke voorstelling van hierdie tesis is 'n samevatting van determinante in en om die voorgestelde terrein: fisiese-, kulturele-, sosiale en tegnologiese invloede. Die effektiewe voorstelling en samevatting van bogenoemde determinante dien as metafoor vir die konseptuele/argitektoniese ontwikkeling. Omdat hierdie tesis met die professionele sportindustrie sowel as die tegnologiese presisie navorsing daarvan te doene het, poog dit om die voorstelling van hierdie konsep ook konsekwent aan die argitektoniese-, ruimtelike-, en tasbare ervaring van die gebruiker bloot te lê.

In die geheel gesien is die voorgestelde ontwerp die sintese van verskeie invloede wat onderling verbind word. Die produk is terreingebonde, individueel en realisties.

List of figures	_____	2
<b>Chapter 1: Context and Briefing</b>		
1.1 Client Profile	_____	3
1.2 Motivation for Project	_____	4
1.3 Briefing Document	_____	5
1.4 Precedent study	_____	6
1.5 Site analyses		
1.5.1 Location	_____	15
1.5.2 Topography	_____	19
1.5.3 Geology	_____	21
1.5.4 Hydrology	_____	22
1.5.5 Climate	_____	23
1.5.6 Vegetation	_____	25
1.5.7 Site description	_____	27
1.5.8 Detail vehicle circulation	_____	31
1.5.9 Centurion IDP Spatial Framework	_____	33
1.6 Master plan	_____	38
1.7 Accommodation schedule	_____	41
<b>Chapter 2: Baseline and technical documentation</b>		
2.1 SBAT Tool	_____	45
2.2 Social	_____	46
2.3 Economical	_____	67
2.4 Environmental	_____	80
<b>Chapter 3: Design discourse</b>		
3.1 The Hi-Performance Sport Centre	_____	92
3.2 Site selection	_____	93
3.3 The HPC as landmark	_____	94
3.4 Athletic structure of HPC	_____	95
3.5 Function and form of the different facilities in the HPC	_____	97
3.6 Final development	_____	108
3.7 To conclude	_____	110
Appendix 1	_____	111
Appendix 2	_____	115
List of references	_____	122
Acknowledgements	_____	123

- 1-2. <http://www.ais.org.au>
3. Digest of South African Architecture,2003, p49
4. Architectural Review. July-September 1998, p62
5. Architect & Builder. September 1995, p11
6. <http://www.ais.org.au>
- 7-9. Digest of South African Architecture,2003, p49,50
- 10-14. Architectural Review. July-September 1998, p65-68
- 15-18. Architect & Builder. September 1995, p11,12,14
- 19-21. <http://www.ais.org.au>
22. Photo of Centurion site model- by author
23. Arial photo of SuperSport park- Centurion City Council
- 24-26. Bryce rendering-by author
27. Contour Plan- Centurion City Council
- 28-29. Bryce rendering-by author
30. Scanned Flood line Plan- Centurion City council
31. Exel charts- by author
32. SketchUp models- by author
33. Arial photo of SuperSport park- Centurion City Council
34. Photographs of site- by author
35. Scanned Flood line Plan- Centurion City council
- 36-47. Photographs of site- by author
48. Photo of Centurion site model- by author
49. Photograph of Parking, 7 March 2003- by author
- 50-52. Photograph of Leonie street, 7 March 2003- by author
- 53-59. Centurion City Council Integrated development plan p35,43,58,66,84,98,110
60. Arial photograph- SuperSport park- Centurion City Council
61. Scanned Flood line Plan- Centurion City council
62. Exel chart- by author
- 63-72. AutoCAD drawings- by author
- 73-76. Photographs of site- by author
77. Bryce rendering- by author
78. Photo of Centurion site model- by author
- 79-80. AutoCAD drawings- by author
81. Exel spreadsheet- by author
82. GA Document 46.1997. P65
- 87-97. Bryce rendering-by author
98. AutoCAD drawing- by author
99. CorelDRAW 10 graphic
- 100-101. AutoCAD drawings- by author
- 102-105. Bryce rendering-by author
106. AutoCAD drawings- by author
- 107-109. Bryce rendering-by author
110. Exel chart- by author
111. Bryce rendering-by author
112. Scanned photo from Pretoria MapStudio, STREET GUIDE, 12th Edition
- 113-117. Bryce rendering-by author
- 118-119. [Http://www.hpc/video/analyze.com](http://www.hpc/video/analyze.com)
- 120-121. Bryce rendering-by author
122. AutoCAD drawings- by author
123. Bryce rendering-by author
124. AutoCAD drawings- by author
125. Bryce rendering-by author
126. AutoCAD drawings- by author
127. Bryce rendering-by author
128. AutoCAD drawings- by author
129. Bryce rendering-by author
- 130-131. AutoCAD drawings- by author
132. Bryce rendering-by author
133. AutoCAD drawings- by author
- 134-137. Bryce rendering-by author
138. AutoCAD drawings- by author
- 139-147. Bryce rendering-by author