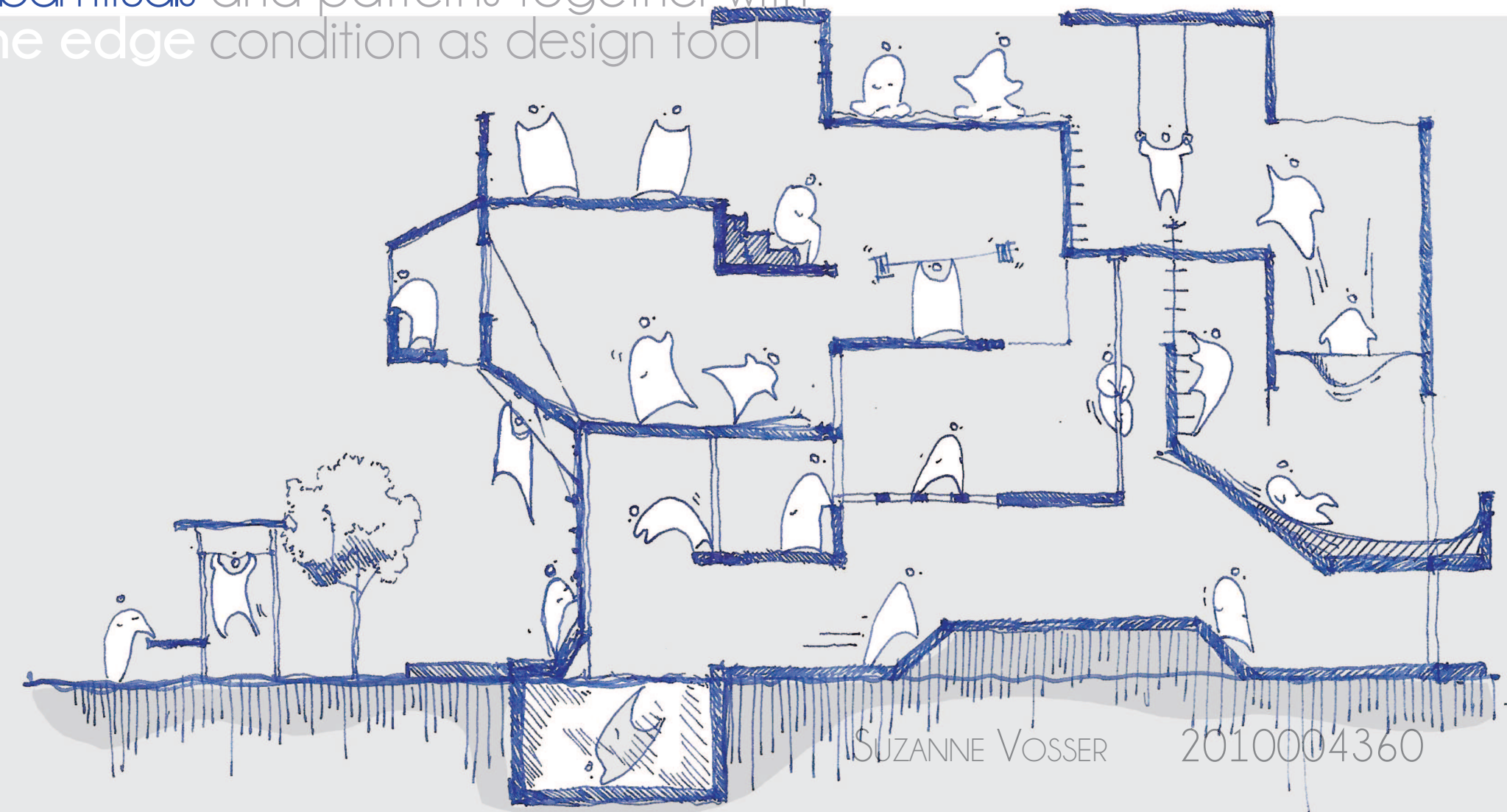
SPORT PERFORMANCE CENTRE

SPORT PRECINCT, PARK WEST, BLOEMFONTEIN

Exploring urban rituals and patterns together with the edge condition as design tool



SUZANNE VOSSER 2010004360

declaration

This dissertation is submitted in partial fulfilment of the requirements for the degree Master in Architecture (Professional) at the University of the Free State. Unless stated otherwise, the research in this document is entirely my own work.

Department of Architecture, Faculty of Natural and Agricultural Sciences, University of the Free State.
28 September 2015

Suzanne Vosser 2010004360

The work contained in this dissertation has been submitted for proof-reading and/or editing by Elri Marais.

Supervisors:
Prof. J.D. Smit, Messrs. J.W. Ras, H.B. Pretorius, J.I. Olivier, H. Raubenheimer

preamble

This dissertation sets out to investigate architecture as a host for physical performance, the importance of integrating separated urban environments and the activation patterns of a fluctuating, inanimate sport complex. The basis of this dissertation is a personal interest in sport performance and unfortunate injuries influencing daily activities. Sport instils determination and an urge to perform in every aspect of life. The race to succeed and perform beyond yesterday's limits is embodied in the design of a Sport Centre. Sport can also bring people together who normally would not coincide. Professionals, fans, physical enthusiasts and the physically disabled all have a position to fill in sport.

In order to regulate movement and maintain constant participation in the existing Sport Precinct of Bloemfontein, I propose a **Sport Performance Centre** with the aim to connect the Free State stadium, the athletics track and the existing (newly upgraded) public pool facilities in Att Horak Street. With the main purpose of activating the sport complex, the building welcomes all visitors through a programme of sport, social and cultural activities. The proposal becomes a catalyst for future development opportunities, making the site more accessible to all. The dissertation will start by focussing on the users of the facility by presenting the main typological, topological, morphological and technical parameters of the project (Part One). Further research of these four types of parameters (Part Two) will then initiate the design response (Part Three), and finally, a full evaluation of the process will be incorporated (Part Four).

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[DESIGN + CONSTRUCTION SYNTHESIS]

[REFLECTION + EVALUATION]

introduction

An academic architectural interest in urban patterns and zone-specific characteristics initiated the search for an urban development scheme. Upon the discovery of an inanimate sport precinct which should pronounce vitality and activity, the need for intervention became clear. Sport has always been a very important part of my life. I started as a young ballerina and continued to participate in various other forms of dance, as well as athletics and hockey, fostering the love for physical fitness and self-improvement. But recently, two major injuries prohibited me from continuing a physically active lifestyle. Thus, the knowledge that there is a need for such a versatile sporting facility within Bloemfontein originates from personal experience.

This design dissertation proposes a Sport Performance Centre to establish a connection between the existing sport facilities in the Sport Precinct of Bloemfontein and to link it to the urban environment in order to reactivate the area to be used by all. The proposed building involves aspects of performance, assistance, sport research and the improvement of its user's movement. Focussing on swimming, athletics and recreational basketball facilities, the Performance Centre will accommodate a gymnasium, a multi-purpose sports hall, medical facilities for rehabilitation and sport science purposes, as well as a new entrance to the existing swimming pools, accompanied by a food court and sport lounge. Accessibility will initiate the participation of all those interested, thus requiring an investigation into the morphological understanding of the participants' rituals and movement patterns.

This dissertation is set out in four successive parts: the statement of the main problem statements (design parameters) and aims to orientate the reader, research exploration and grounding, design and construction synthesis and, lastly, a reflection upon the development and outcome of the proposed building project. Part One and Two are then structured according to four terms: the *typology* (the type of building proposed, its users and the investigation of built examples in order to develop a building programme), the *topology* (the site proposed for the project through both a quantitative and qualitative analysis), the *morphology* (the unique approach of the project through a conceptual and theoretical underpinning) and the *tectonics* involved (regarding the structure development and the requirements of the proposed building). This structure helped to organise the investigation to clearly show the importance of each part within the proposal made in this dissertation.

[SPORT PERFORMANCE CENTRE]

Sport Precinct Bloemfontein

WHERE?? [topology]

Exploring Urban Rituals and Patterns together with the Edge Condition as design tool

[morphology]

dividing threshold

"the route is more important than any one place along it" Bernard Tschumi

Selborne Avenue

existing fan-walk

WHY??

need movement

∴PARTICIPATION

SPORT PRECINCT

CBD

fluctuation

Att Horak Street

First Avenue

HOW??

AIM?? TO ACTIVATE THE AREA

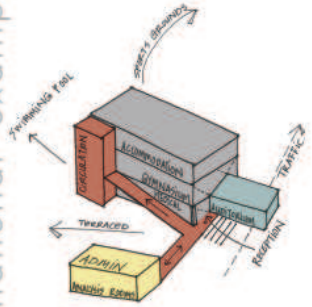
"Everything will flourish at the edge" Jaques Derrida

the client

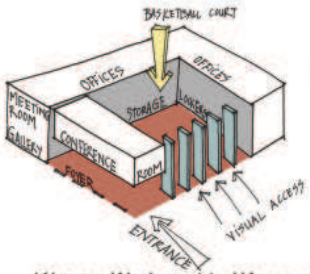
[typology]

WHAT?? precedent study & analysis

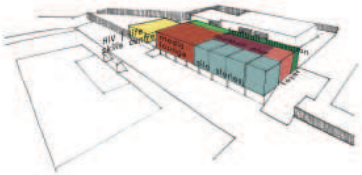
international & national examples



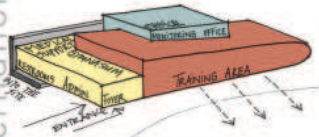
HPC, Pretoria



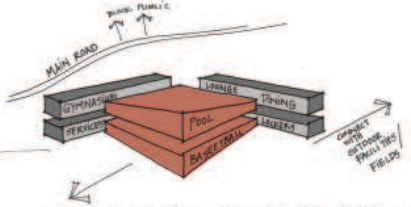
Khayelitsha Multipurpose Sport Centre



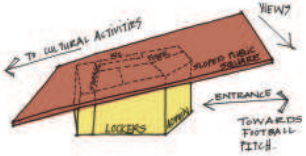
Football Training Centre Soweto



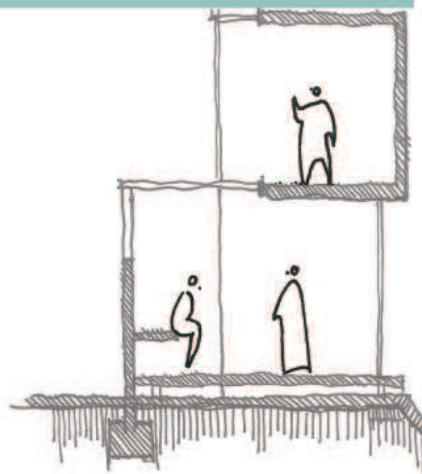
HPC for Athletics Portugal



University Sport Facilities Colombia



Homeless World Cup Center Rio de Janeiro



PERFORMER

DIALOGUE BETWEEN

SPECTATOR

of who??

HOW??

CHOREOGRAPHING OPPORTUNITIES FOR RITUALS TO ASSEMBLE

DESIGN THE EDGE

3 main conditions

the liminal
ease the transition between events

the narrative
sequence of events along a route

the fold
full integration of multiple events

[INVESTIGATION APPROACH]

research methods

Research is designed around the exploration of four broad problem statements – relating to the fundamentals of design:

What to design and for whom?
Where to design it?
How is the gestalt of the design influenced?
How to construct the design?

For the purpose of this paper, these questions will initiate an investigation into the logic of type (typology), topos (topology), form (morphology) and structure (tectonics). The research for this specific design project originated from an interest in the site and its fluctuation patterns, from which different sources of knowledge were explored in an attempt to develop a design methodology (mainly Part Two of this dissertation). The sources of knowledge employed include the following research methods:

As a Sport Performance Centre, with medical and recreational facilities, the typology proposed should be relevant to its surroundings to be able to activate the area identified as an environment of seclusion when there is no sporting event scheduled (see Part One). To initiate a project objective, a touchstone investigation was used to establish the essence of the project, which is represented through a built model. The outcome involves the improvement of the participant's movement, which indicated that the site's activities needed to be documented and pedestrians interviewed. Through quantitative site analysis of the site usage (all measurable aspects), movement patterns, different participants, activated spaces vs. lost spaces, street connections, etc., a focus group was set up.

To coincide with an understanding of the site's parameters, a precedent/ case study provided built examples to form an idea of the possibilities of what the building could become and accommodate for. In order to determine the appropriate scale for Bloemfontein, material usage, facilities' requirements, circulation patterns, basic geometry and orientation, both national and international and large to small scale examples were analysed critically according to key elements presented by Simon Unwin in his book, *Analysing Architecture* (2003).

A site exploration involves not only a rational approach to the context, but a cognitive interpretation as well (thus perceiving the phenomenological presence of the site). This personal interpretation is presented through **three** conceptual approaches, each identifying a significance of the site in order to see the concrete surroundings in a metaphorical/abstracted way. These qualitative understandings are then summarised within a conceptual framework, providing keywords to use during further morphological research (theoretical discourse). This type of research is grounded through a literature review, thus applying knowledge gained through published work of academics together with a personal interpretation.

The above-mentioned methods help to situate the proposal within an understanding of the whole human ecological environment, including all its aspects of the social, historical and present, ecological and man-made, and cultural landscape.

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user7
1.1 TYPOLOGY
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1.2 TOPOLOGY
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1.3 MORPHOLOGY
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1.4 TECTONICS

1



[PROBLEM STATEMENTS + ORIENTATION]

Part one introduces the client, the user, the site conditions, and the unique approach regarding exploratory research and technical resolution of the design project. The parameters are identified to guide the reader with regard to what can be expected of the exploration and grounding of research in Part Two of this dissertation.

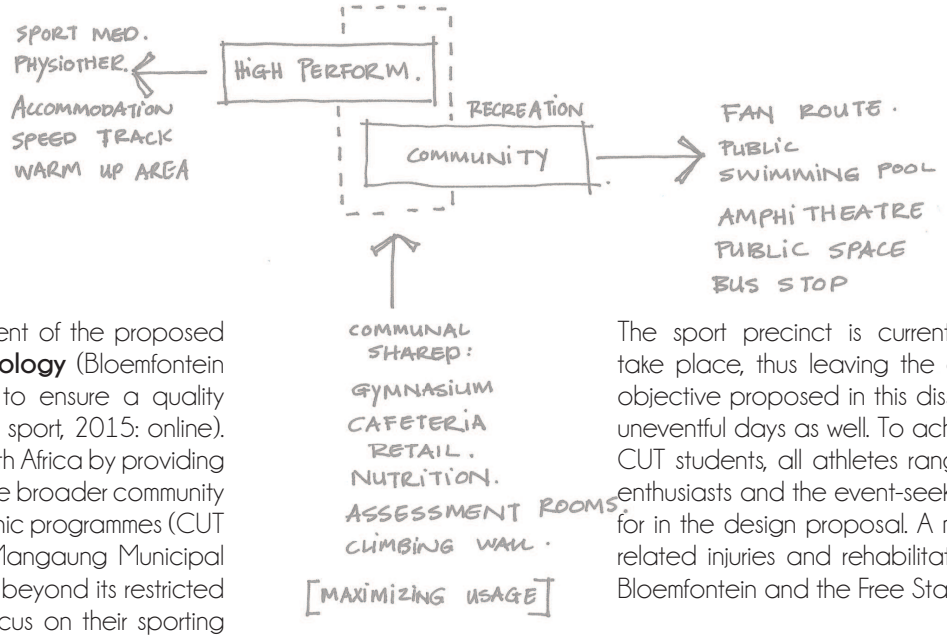
[CLIENT BRIEF]

1.1 typology

The Municipal Sport Precinct of Bloemfontein is centrally located within the urban landscape: to the south of King's park rose gardens and the Loch Logan Waterfront, stretched out in between Parfitt Avenue as the western boundary and First Avenue to the east. The southern edge of the precinct is identifiable as Park Road, which is also the main access route and host of the main entrance gate to the Central University of Technology (CUT). Due to the location of CUT in relation to the sport precinct, as well as the space for development within their sports programme, CUT presented itself as an ideal client and partial user of a top class training facility.



Figure 1 - Map of Bloemfontein for orientation



CLIENT

The main client and contributor to the management of the proposed sport facility is the **Central University of Technology** (Bloemfontein Campus). CUT provides world-class infrastructures to ensure a quality sporting environment for the Free State region (CUT sport, 2015: online). CUT focuses on opportunities that sport offers to South Africa by providing diverse sport programmes, facilities and services to the broader community in the form of development outreaches and sports clinic programmes (CUT sport, 2015: online). Through pairing up with the Mangaung Municipal Sport Precinct, CUT can extend its sport programme beyond its restricted borders and attract more students who want to focus on their sporting careers.

The main contributors to the proposed Sport Performance Centre for Bloemfontein will be:

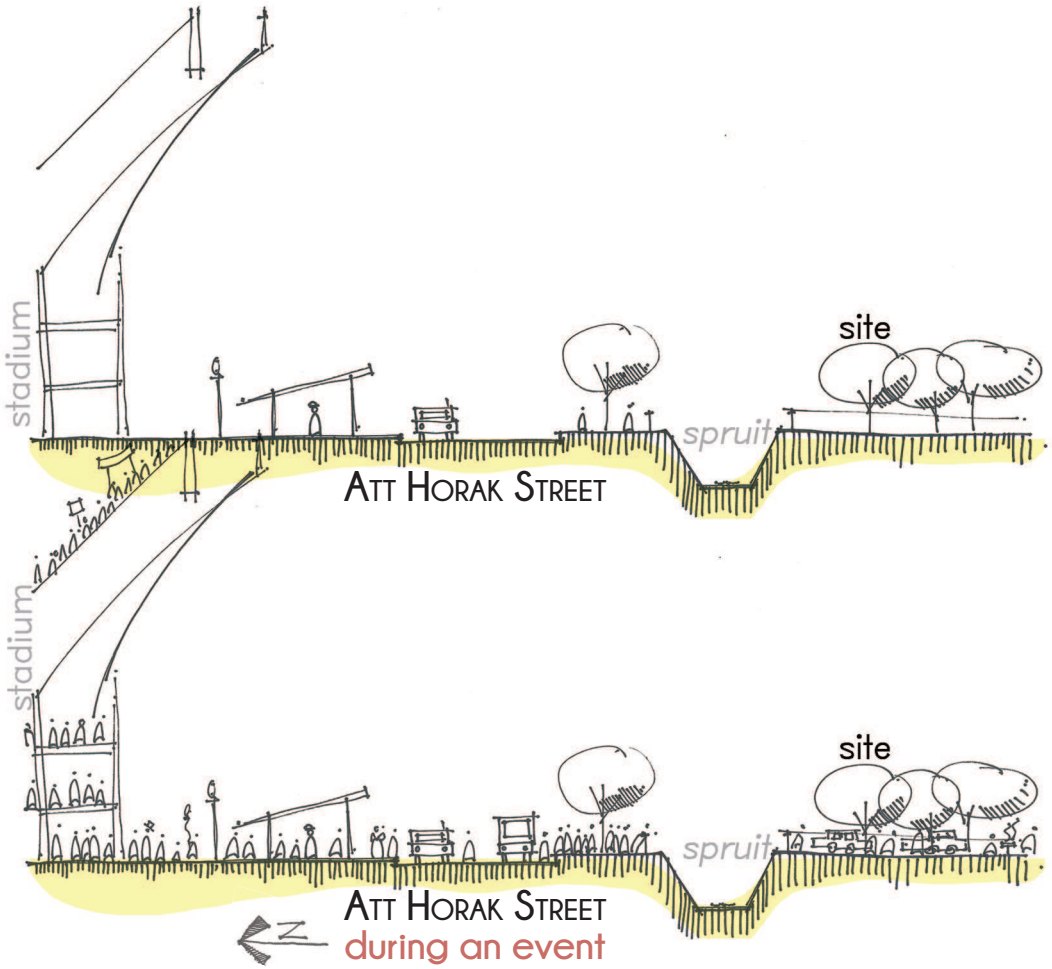
+ **CUT Faculty of Health and Environmental Sciences**
  (for research and sport sciences)
  Two departments are involved: The Department of Clinical Sciences [in association with somatology, as the science of the human body and the study of the substances, physics, chemistry and the biology of the body]; and the Department of Health Sciences [regarding radiography and emergency medical care (CUT departments, 2014: online)].
+ **Mangaung Municipality** (as site owner and facilities provider)
+ **Free State Department of Sport, Arts, Cultural and Recreation (SACR)** (involving sport recreation)
+ **University Sport South Africa (USSA)** (as sport organization)
+ **South African Sports Confederation and Olympic Committee (SASCOC)** (for future development and users)

USER

The sport precinct is currently only activated when sporting events take place, thus leaving the area lifeless in between events. The main objective proposed in this dissertation is to activate the precinct during uneventful days as well. To achieve this, every possible urban pedestrian, CUT students, all athletes ranging from professionals to entry-level sport enthusiasts and the event-seeking spectators should be accommodated for in the design proposal. A medical aspect is also important for sport-related injuries and rehabilitation in order to attract users from all over Bloemfontein and the Free State.

The main problem with Sport Performance Centres is that their location results in inaccessibility. Usually situated within a campus or privately owned sports fields, these typologies are not for public use and are only approached for rehabilitation purposes. The proposed Sport Performance Centre should inform the public about the importance of a healthy, physically active lifestyle and thus allow anyone to participate in the activities provided. Certain activities are needed to accommodate for the professional athlete while public involvement requires freely interactive spaces. These two realms are usually kept separate, but with this proposal, a communal quality is presented to facilitate meeting points. With visual connections and mutual access between the professionals and the public, all participants become part of the performance centre.

The typology in question should INTEGRATE THE GENERAL PUBLIC AND THE PROFESSIONAL ATHLETE because on the field, no distinction is made based on where you come from – what matters is the judgement of pure talent. This integration will make the community aware of the possibilities within sport and give a sense of pride and the satisfaction of participation. Talent and participation present the possibility of a professional career and a chance to change your circumstances.



[SITE CONDITIONS AND SURROUNDING CONTEXT]

1.2 topology

At the discovery of the site as possible host for the highly anticipated sport centre for Bloemfontein, the strong fluctuation of fans and vehicles between events was noted. The fluctuation between an instantly active site on weekends and opposing quiet weekdays is due to seasonal and event-related sport activities, which led to further interest in the site conditions and to the investigation of this topic. The fluctuation of site use, including the difficulty of accessing different facilities and orienting oneself between them, sets parameters for the design resolution.
Part Two of the dissertation contains a more in-depth investigation into the *macro*, *meso* and *micro* conditions of the site. After quantitative and qualitative analysis, the site presented far more complicated problems than initially perceived.

The existing sport fan-walk via Selborne Avenue, which connects the urban centre with the sport precinct, does not fulfil its purpose. The pedestrian lane suddenly ends when it reaches the edge of the athletics stadium in First Avenue. The pedestrian is thus exposed to high traffic volumes within a main road which is identified as a border street of the central business district (CBD) of Bloemfontein. No safe crossing into the sport precinct exists, which presented yet another aim for the design project. The arrival of the urban precinct design should be an extension of the fan-walk, to create a safe crossing for the high pedestrian flow of students and urban occupants going to and from work. The precinct will thus be publicly announced, initiating the reactivation of the area when events are not being hosted.

[UNIQUE APPROACH]

1.3 morphology

With the project aim indicated as the **activation of the sport precinct**, a more integrated design, well-grounded in between the existing sport facilities, is needed. The building should not become yet another huge, isolated structure left abandoned when the sporting event is absent. This led the building programme (usually just placed within a massive, open plan, shed-like structure) being pulled apart and grouping specific functions together while allowing some functions to operate on their own, if required.

To achieve this integration of the multiple facilities of the precinct, focus is firstly placed on breaking down physical boundaries in order to connect the street's pedestrian traffic with the sport facilities provided, and to create an in-between space (threshold/margin) for the participation of choice along a route of grouped activities. The aim is to determine which activities function together best and to group events accordingly, in order to easily guide the user through the extensive programme. In making use of the (extension of) the fan-walk along the building, the user becomes part of the movement within the building as well and experiences the differentiation of dynamic and static spaces. Both the dynamic and static are needed to accommodate the different participants involved, namely the performer and the spectator. The participants thus engage in each other's events within the careful choreographing of the liminal space, the host for rituals. The dynamic presence of the performer influences the ritual stage by visually and physically activating the space. This stage (liminal space) provides thus the opportunity for the spectator to join in the presented activity and to reshape the given activity according to his/her own preferences. The static presence of the spectator can also call for a pause space, a frame for observation and a space to introduce the non-participant to the variety of possibilities. Visual and physical connections between events thus allow the integration of rituals that are usually separated.

Events should not hide behind raised walls and be secluded from daily activities. Sport events, even in preparation phase, should be visible to the public because participation in sport is its best advertisement.

[TECHNICAL INTERPRETATION]

1.4 tectonics

The site for this dissertation's proposal is situated in a context of sport-related architecture which represents massive concrete structures with never-ending stairs and rows of seats. Because sport events are usually hidden behind these enormous structures and high fences, the aim of the structure became to lift the events – usually situated lower than their surrounding pavilions – off of the ground in order to expose the activities to its surroundings. This objective resulted in the use of a concrete mainframe to stabilise the movement within the buildings as well as the multiple facilities it should host.

The design requirements of a sport centre, with its specialised facilities and materials, form the research component in Part Two of this dissertation. Thus, a structural report places the focus on main structural challenges, how certain design elements developed through structural integrity and the use of built examples to determine what could be possible. These investigations are then applied to the design development, expressed in Part Three.

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2.5 METHODOLOGY



[RESEARCH EXPLORATION + GROUNDING]

This section contains a discussion of the process through which this study's exploratory ideas originated and how these ideas can be grounded through research. The use of a touchstone interpretation enables the essence of the project to be captured. The focus on what sport science entails, which users can benefit from it and how the typology of sport centres can be utilised to provide integrate a missing urban connection. The analysis of typologically applicable precedents developed an understanding of the extensive programme and functionality involved in the design. By referring to both national and international examples, the appropriate scale and building programme within the urban setting of Bloemfontein were identified.

This could not have been achieved without thorough rational and cognitive analysis of the proposed site. Conceptual interpretations developed from a qualitative site understanding, which specified the theoretical underpinning of the project. Together with these morphological studies, a conceptual idea of the structural objectives became evident. A structural report is thus provided, indicating certain elements that required further research. In the conclusion of Part Two, all of these investigations form part of the design methodology, which presents an overview in order to ground the research exploration within design.

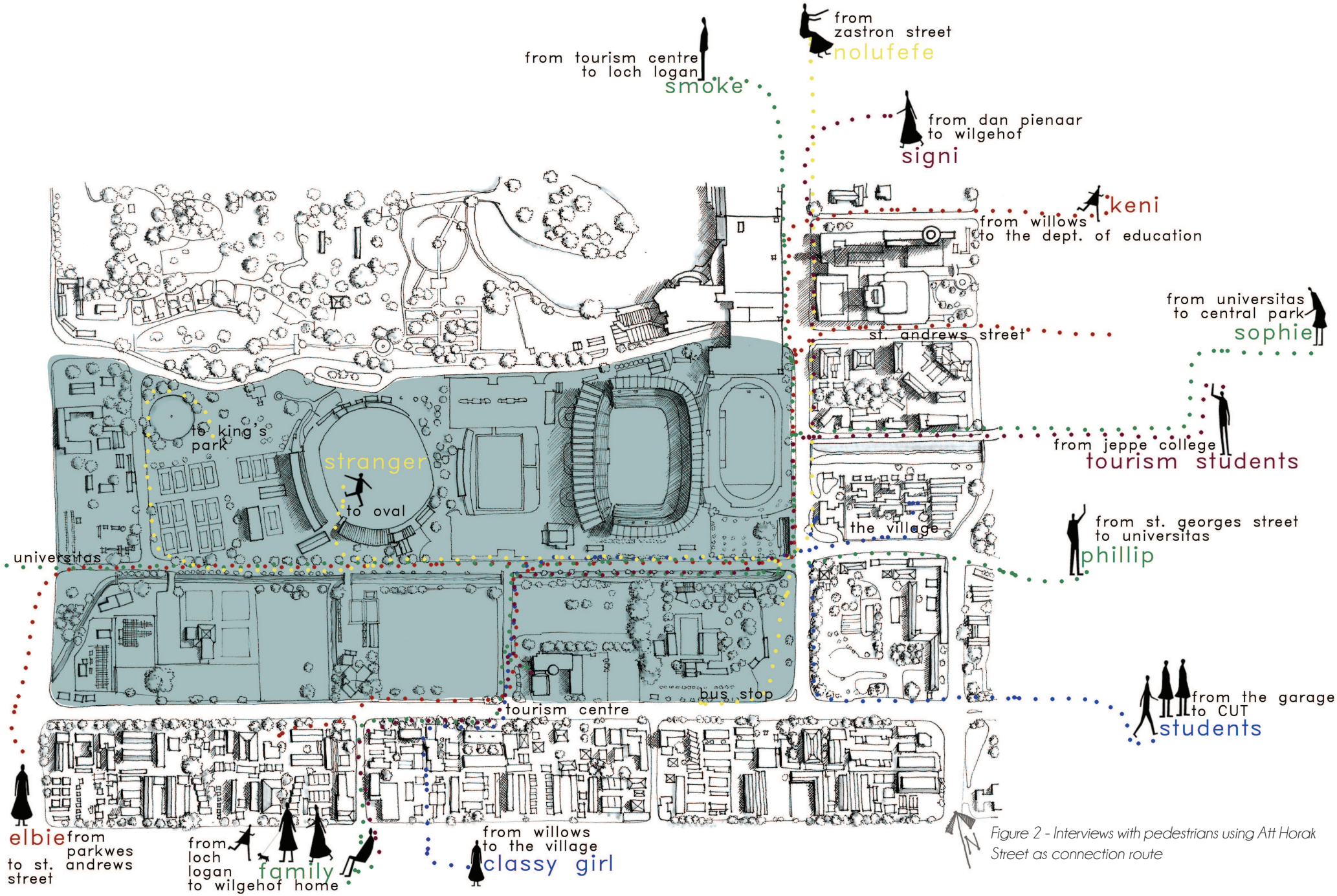


Figure 2 - Interviews with pedestrians using Att Horak Street as connection route

2.1 typology

Proposing the addition of a Sport Performance Centre to Bloemfontein's existing sport precinct, with the main facilitator being CUT, might raise the question of why the facility is not proposed on the centrally located CUT campus itself. The main objective of the proposed design is to **activate the existing sports precinct**, and the security barrier of the campus and the lack of available space contradicts this goal. In order to achieve this, the building cannot be constrained by security laws of an institution that only allows students to participate and not the general public. The sports precinct presents the optimal location with its multiple existing sport facilities already in place together with available space for development. Through careful site investigations and rational analysis of the precinct (see topology of Part Two), the main representatives identified on a daily basis were the students of CUT, the consumers heading towards the Loch Logan Waterfront, the working class on their way to the city centre, school sport teams for specific scheduled events and a few cyclists. This investigation showed that although the proposed centre is off campus, the students will still be the first (not only due to location but in quantity as well) to benefit from the development, and they thus took the role of main client, user, facilitator and beneficiary of the sport research programme.

A Sport Performance Centre will become a valuable asset, not only to CUT, but to all athletes ranging from professionals to entry-level sport enthusiasts. There is the common misperception that Sport Performance Centres only accommodate the professional athlete, but the purpose of these facilities is to assist the individual (professional or not) in the improvement of his/her sport performance or basic physical movement, to rehabilitate from a sport injury and to receive guidance on nutrition and exercise programmes through the help of sport doctors, physiotherapists, biokineticists, personal trainers, etc.

To fully understand the need for sport development through science is to acknowledge the on-going occurrence of our psyche to perform. Sport is performance driven within a linear process. The aim is to analyse, to document, to bring about improvement and to understand that the resilience and **effort of the input will determine the outcome**. This systematic approach relates to this project's essence, which will be discussed (in this chapter) through a touchstone interpretation, which established the conceptual objective of this project.

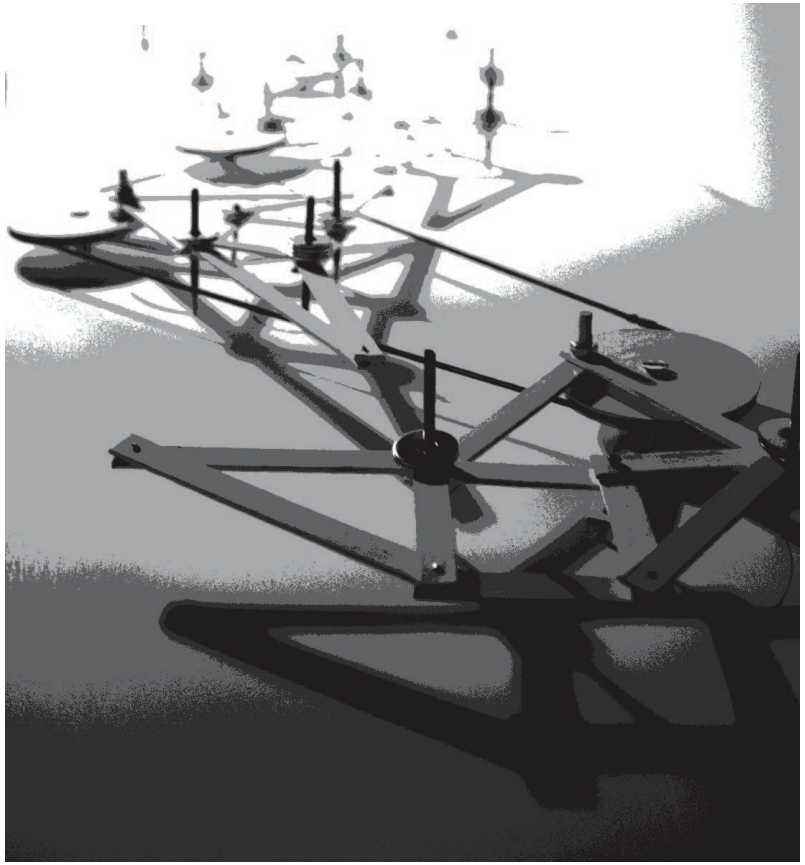
But firstly, what exactly does sport science entail? Looking at current research areas in the field, as done by the Sports Science Institute of South Africa (SSISA) at Newlands, Cape Town (Noakes, 2015: online), reveals that it includes topics such as:

+ the effectiveness of sport-specific training procedures and the predictability of an athlete's performance through monitoring his/her ability
+ managing metabolism and fluid balance during endurance and ultra-endurance exercise
+ controlling total energy balance through sport nutrition and physical activities
+ physical activities and health investigations in communities undergoing epidemiological transition
+ sports injuries and biomechanics
+ muscle structure, recruitment and the cause of muscle damage
+ genetic determination of athletic potential and the sensitivity to exercise-induced injuries
+ physical exercise as the prevention and rehabilitation of chronic disease states
+ investigating molecular mechanisms by which specific physical training increases the capacity to expend energy and improve endurance capabilities.

It is thus important to be aware of all the possibilities presented by the building programme of these multidisciplinary facilities and to orient all the different users through the centre's design. Looking at seven universal design principles developed by the Centre for Universal Design at North Carolina State University (Turman, 2009: 13), helps to identify appropriate aims for the design of a sport performance centre:

1. Equitable use	The design should be useful and accessible to people with diverse disabilities.
2. Flexibility in use	The design should accommodate multiple individual preferences and abilities.
3. Simple and intuitive use	The design should be easy to understand, regardless of the user's experience, knowledge, language skills, or current state of mind.
4. Perceptual information	The design should communicate necessary information effectively to the user, regardless of immediate conditions or the user's capabilities.
5. Tolerance of error	The design should ensure minimal hazards and the unfortunate consequences of accidents or unintended injuries.
6. Low physical effort	The design should allow for efficient and comfortable use with minimum physical exertion.
7. Size and space approach for use	The design should provide appropriate size and space for approach, reach, manipulation and use regardless of the participant's body size, posture, and mobility.

The purpose of these principles is to create a user-friendly approach to the facilities and a supportive environment for all people in the broadest context, including culture, language, size, age, weight, race, gender and physical ability (Turman, 2009: 13).



PARTICIPATION	=	ANALYSIS
ACTION	=	REACTION
ACTIVITY	=	RESULTS
INPUT + SCIENCE	=	OUTPUT + PROGRESS

TOUCHSTONE

Based on an understanding of the building typology, this project entails performance, assistance, sport research and the improvement of movement, directing the essence of the project towards *EFFICIENCY.*

The efficiency of a system can relate to the concept of fitness and has to do with the adaptability and progressive nature of a system (Conrad, 1983: 141). This enhancing quality, as a process, influences the system involved in its environment (Conrad, 1983: 142). The process output needs to accomplish a progressive ratio to the input. The least energy used, in relation to the most effective outcome, becomes the ultimate goal. The ability to accomplish a job within a minimum expenditure of time, energy and effort initiated the development of the touchstone.

A basic algorithm is used to explore the possibilities of a mechanism: its movement, connections within a system, ratios and the manipulation thereof, different rotation points (centres) and the different results they have on the path of regulated movement, weight application and tectonics, and the appliance of a main lever that will turn all the mechanisms (linked within a system) at once. The touchstone thus represents the efficiency of movement through the analysis thereof. To achieve an efficient outcome (through analysis), participation has to take place first.

Architecturally, THE HUMAN BODY IS GIVEN A FRAME TO IMPROVE THE FUNCTIONALITY OF ITS MOVEMENT throughout spaces that provide for ultimate outcome. The building should allow for optimal movement inside it, efficient energy use of its participants and the personal analysis of the athlete's improvements.

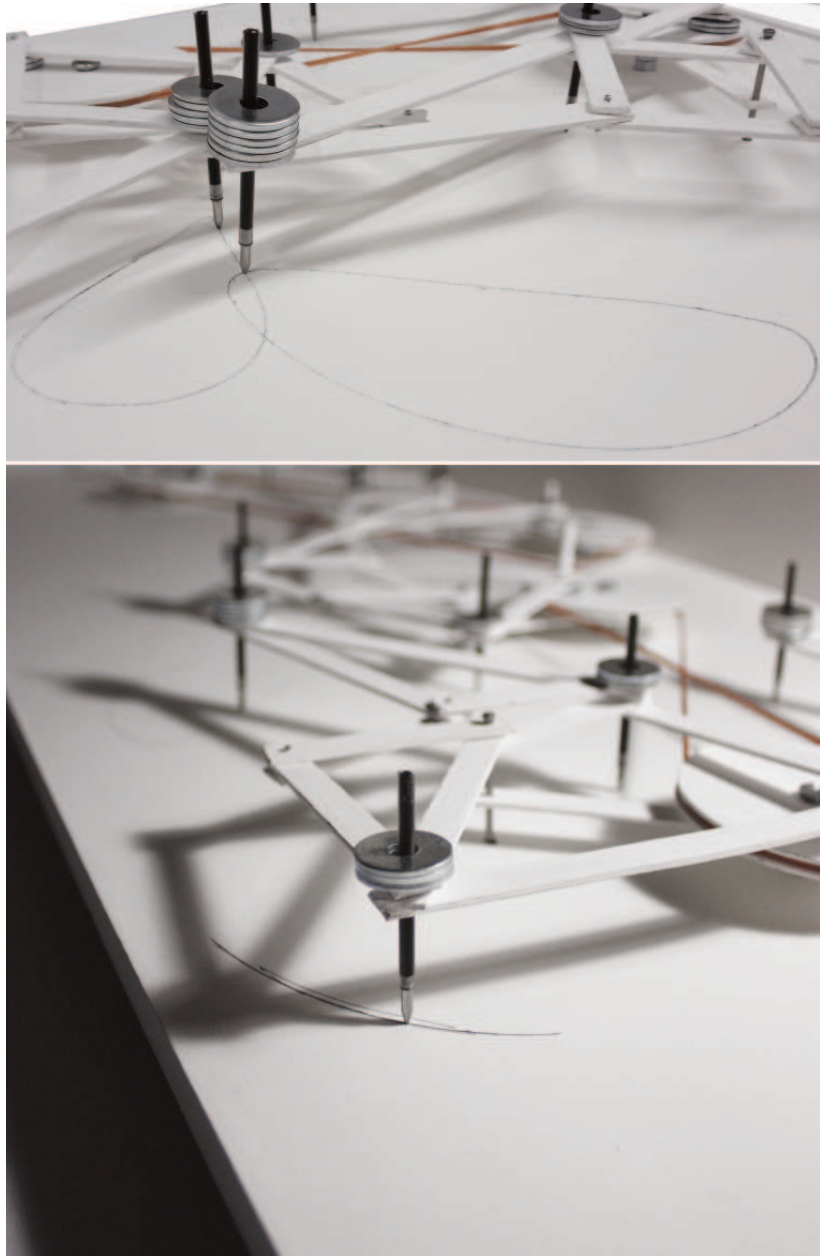


Figure 3, 4, 5 - Photographs of touchstone model

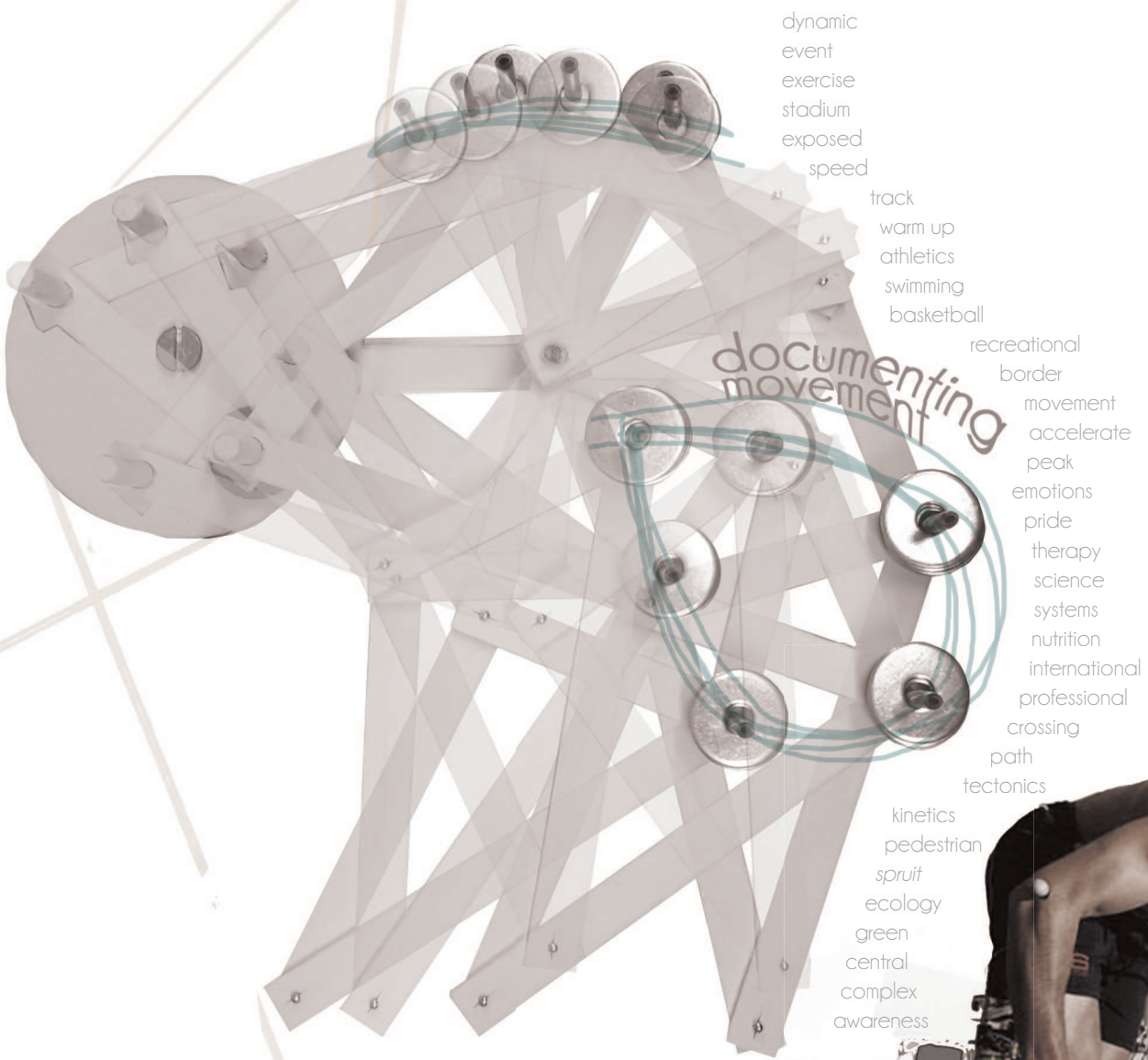
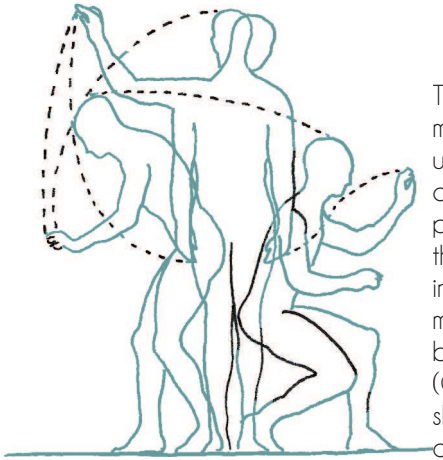


Figure 6 - Layered photographs showing the movement of the mechanism and the documentation of its path.



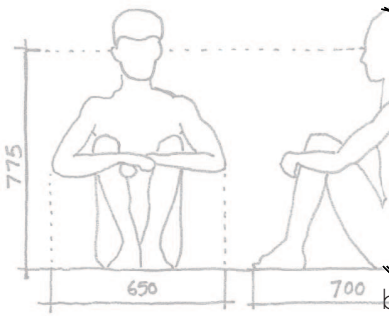
Figure 7 - An athlete's physical strength is analysed by professional sport researchers (Levy, 2013: online).

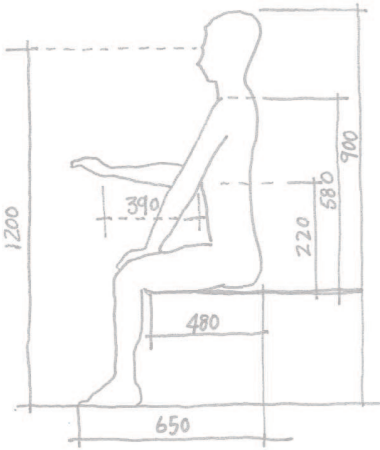


This idea of enhancing the participant's movement initially introduced the use of anthropomorphic design and consideration of how a sport performance building can benefit from this idea. Anthropomorphic design involves the measurement of the body's movement as well as the space the body needs to perform at its best (Ching, 2007: 326). The building design should thus start to question movement and challenge the participants with, for example, raising each step's height to just high enough to initiate more of an effort to climb the stairs and thus receive exercise unintentionally. In order to ensure efficiency and quality of life, all spaces and objects that humans engage with need to relate to their physical measurements, their ability to use those spaces and objects and the activity involved (De Villiers Morkel, 2015: 62).

The dimensions of the body also influence the volume of space needed for not only movement but for rest as well. The relationship between the form and dimensions of a space to the human body can be understood as a static, dynamic or socially appropriate relation (Ching, 2007: 328). The static can refer to when one sits in a chair or leans against a wall to rest, or to a balcony positioned for viewing the surroundings. The dynamic relation is the foyer of a building, the stairway or the circulation halls, for instance. The third type of relation comprises the space needed to maintain appropriate social distances and to have control over one's personal space (Ching, 2007: 328). All these relationships may vary, but the design should incorporate a strong interplay between dynamic and static spaces and should maintain social boundaries between public activities and private performance places.

Early in the twentieth century, the German artist and dramatist Oskar Schlemmer recognised that the human frame measures the world through movement and that it projects its measurement into the space around it (Unwin, 2003: 107). Unwin (2003: 108) further mentions that the body has six directions plus a centre: a front, a back, two sides, the ground below and the sky above. These six directions condition our perception of the world and how we relate to the space around us, in which each of us is our own movable centre. Architecture regulates this enclosure of its occupant and determines how formal or relaxed the interplay is with those in the room. A variety of participants need to be catered for.





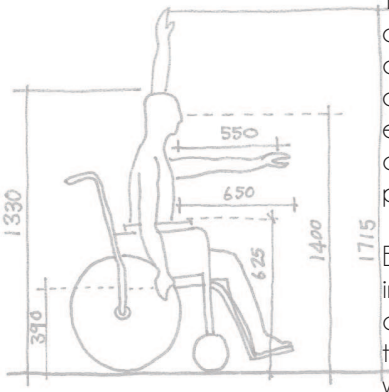


Fig. 8,9,10,11 (Adapted from Ching, 2007: 326).

The proposed centre will provide an opportunity for its users to train and participate at the highest level of competition, while allowing CUT to contribute to the upgrading of the neighbourhood's built environment to the benefit of the surrounding community.

This facility will be a catalyst, providing sport services to both novice and experienced athletes and to promote CUT's image as an attractive world-class institute.

The Free State currently loses athletes because of a lack of accessible sport facilities in the region. In order to enable the growth of sport, the athletes need a purpose to stay and represent their province.

The proposed centre could also incorporate other sports clients, athletics clubs, schools, etc. to ensure full usage and future development of the sports precinct.

Built examples are thus investigated in order to achieve a framework of what these facilities incorporate within their environment.

PRECEDENTS + CASE STUDY

Typologically applicable precedents assisted the investigation of the intricate building programme of a sport performance building. With inaccessibility due to site location and issues with orientation (to its user) identified as the main problems regarding these buildings, focus was placed on site orientation, access (control), context and the buildings' relationship with surrounding facilities. Ideas which were initially identified as important aspects to start off the investigation related to the exposure of movement on the facades, using the building as the performance platform, the multiple events for which to cater, circulation patterns between these events and the exposure to them. The study aimed to clarify how sports architecture could frame, accentuate and also resemble performance. With this typology presenting perception problems, the proposed facility should still provide space for the novice to participate in and feel that he/she has access to the presented opportunities.

To help with the understanding of the presented typology, Simon Unwin's book, Analysing Architecture (2003), identifies the following elements to use as analysing tools in the investigation:

+ basic architectural orientation elements (Unwin, 2003: 19)
+ basic geometries and lines of passage (circulation) (Unwin, 2003: 99)
+ modifying elements such as the importance of light, ventilation, textures and the application of scale (Unwin, 2003: 25)
+ the identification of single elements doing more than one thing (Unwin, 2003: 37)
+ the use of things that are already there (site specificity) (Unwin, 2003: 43).

The study of built examples indicated the possibilities the typology presents and by comparing national and international examples, the appropriate scale and building programme for Bloemfontein's urban setting were identified.

Comparisons were made between:

1. ***HPC Pretoria University*** (case study) and the ***Centre for High Performance Athletics*** in Lisbon, Portugal

   Relevance: for the professional athlete and sport science requirements; the medical aspect of sport; the multiple facilities needed; the importance of circulation and its success reflecting on the building's functionality; structural opportunities; open floor areas; mezzanine levels; specific views created; location in relationship to surrounding sport facilities.

2. ***Multipurpose Sport Centre*** in central Khayelitsha and the ***Universidad de los Andes Sport Facilities*** in Bogotá, Colombia

   Relevance: for community and student use; served and serving spaces in relation to main sport facilities; access control; facade design; material possibilities; height restrictions; open hall areas with long span roof structures; the location of certain facilities on specific floor levels.

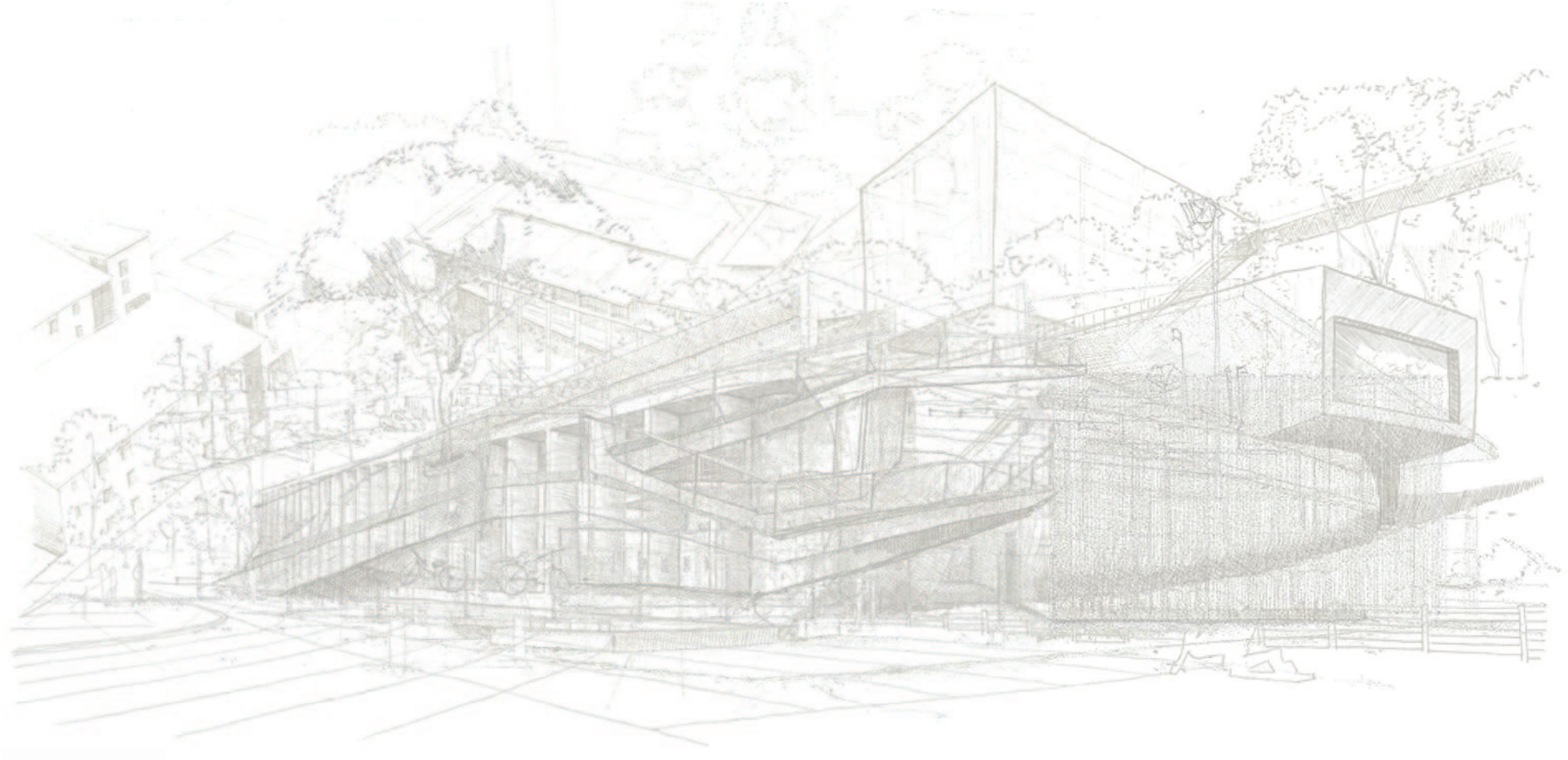
3. ***Soweto's Football Training Centre*** compared to the inspirational ***Homeless World Cup Legacy Centre*** in Rio de Janeiro, Brazil

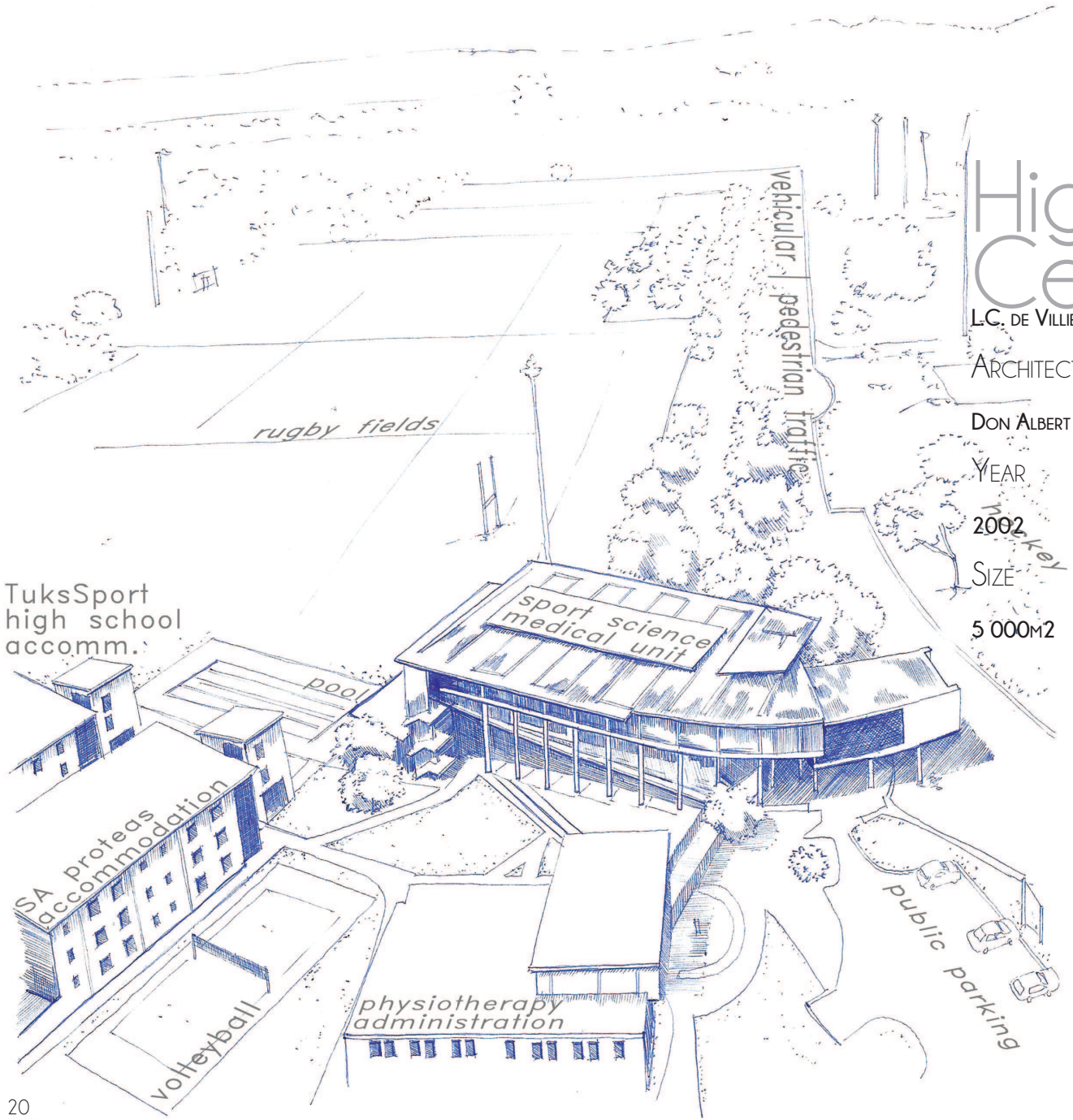
   Relevance: smaller scale, but it indicates the big impact that a sport facility can have on its serving community; the building becoming the sporting equipment; the public participating in the provided facilities; the players becoming spectators and the spectators exposed to participation in the movement; to provide a stage/platform for participation of choice.

Sport represents a symbol of hope and change for a country such as South Africa with its political scars. Proven by events such as the 1995 Rugby World Cup and the 2010 Soccer World Cup, sport "has the power to unite people in a way that little else can, [s]port can awaken hope where there was previously only despair", as stated by former President Nelson Mandela at the 2000 Laureus Sports Awards Ceremony (Williams, 2013: online). Sport and architecture can therefore come together to create an outstanding building type and an inspiration to the community.

As with architecture and all things modern, sport has become an intricate system or science of procedures to ensure progress and performance. New demands for better results develop daily, which results in these sport facilities inspiring the human spirit and creating environments for achievements (Shread, 2001: x), both at extraordinary levels and providing for those who do not aspire to become Olympic athletes but who also highly value physical activities and health.

THE AIM, WITH THE COMPARISONS MADE BETWEEN NATIONAL AND INTERNATIONAL EXAMPLES, IS TO UNDERSTAND THE POSSIBILITIES SPORT PRESENTS WITHIN DIFFERENT ENVIRONMENTS; TO ESTABLISH A REFERENCE OF WHAT COULD BE ACHIEVED; TO UNDERSTAND THE DIVERSITY OF USERS THE BUILDING SHOULD CATER FOR; TO MAKE THE FACILITIES MORE ACCESSIBLE AND USED ON A DAILY BASIS; TO INTEGRATE SUCH A FACILITY IN ITS SITE AND SURROUNDING SPORT FACILITIES; TO QUESTION THE LOCATION OF THESE FACILITIES AND THEIR RELATION TO THE PUBLIC; AND TO ACCOMMODATE FOR DIFFERENT OBJECTIVES OF PARTICIPANTS AND FOR THEM TO CIRCULATE SWIFTLY AND COEXIST WITHIN THE PROPOSED MULTIPLICITY ACTIVATOR AND CONNECTOR OF SEPARATED URBAN ZONES.





High Performance Centre CASE STUDY

L.C. de Villiers sports grounds at the University of Pretoria, Gauteng

Architects

Don Albert & Partners and KWP Architects & Landscape Planners

Year

2002

Size

5 000m2







Figure 12 - Adjusted Google Earth map of the site location, its context and boundaries involved.

Brief

The HPC operates together with the sport grounds of the university, offering a world-class training academy which attracts international athletes and local sporting bodies for training camps or specific goal preparation. The HPC is a centre for specialisation and sport-oriented research (University of Pretoria, 2011: online).

Figure 13 - The manipulation of the plane

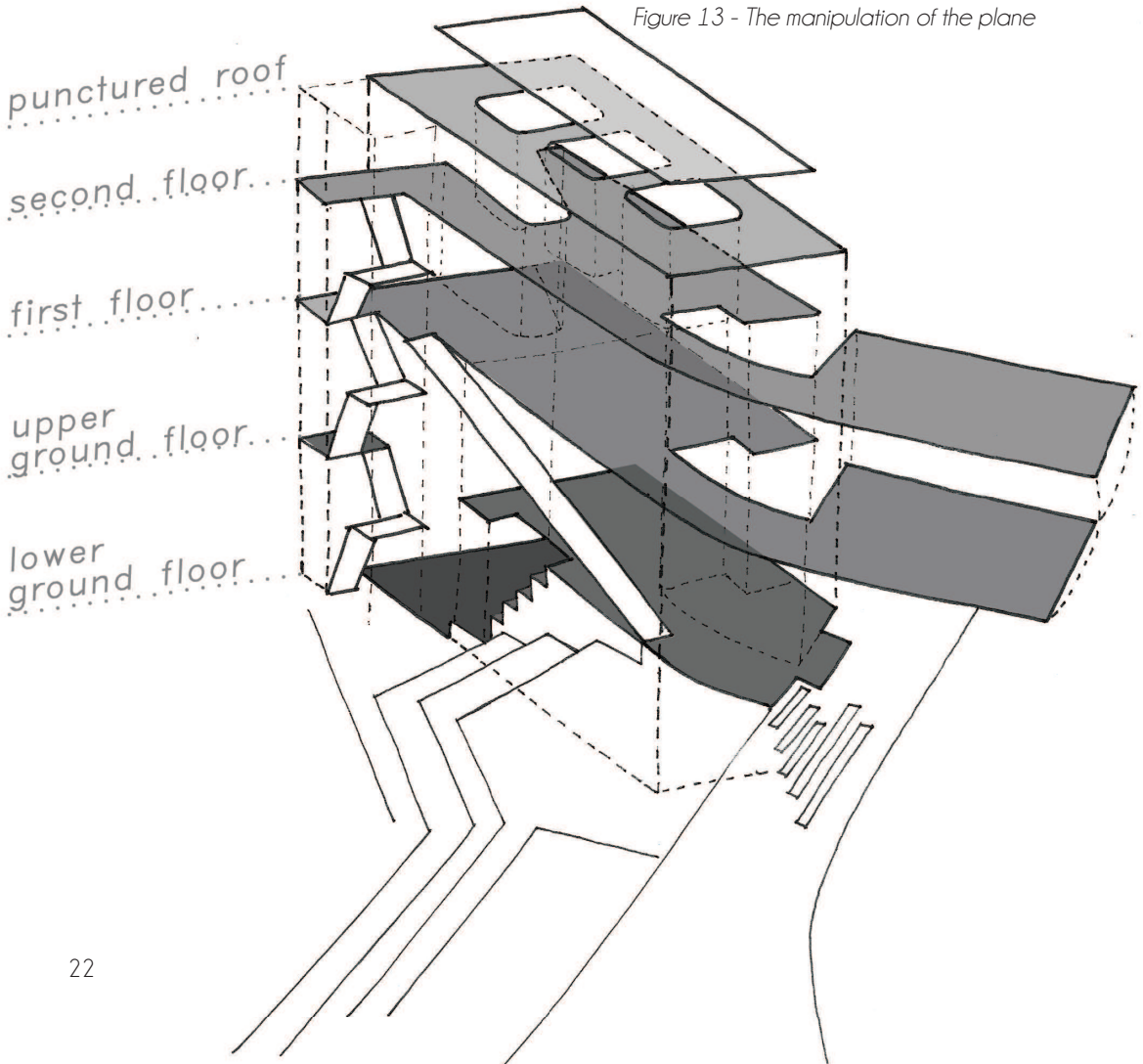
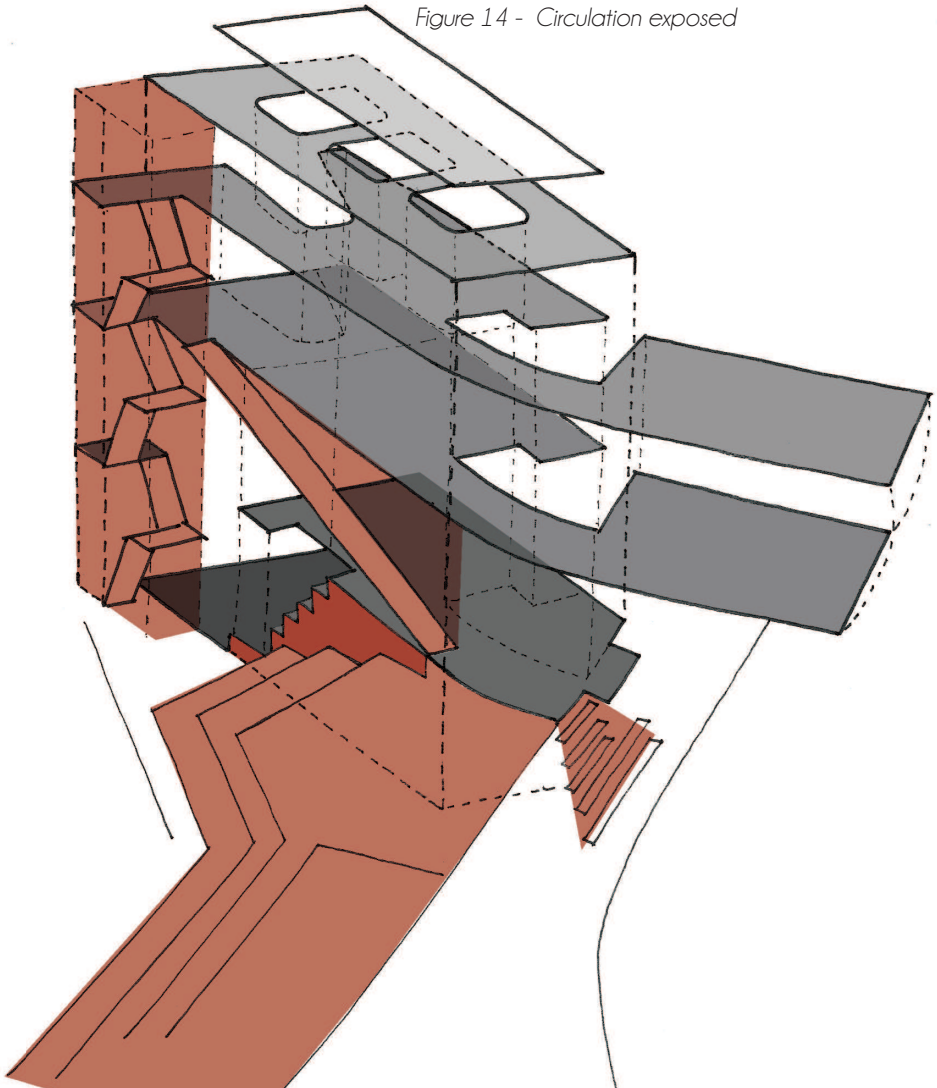


Figure 14 - Circulation exposed

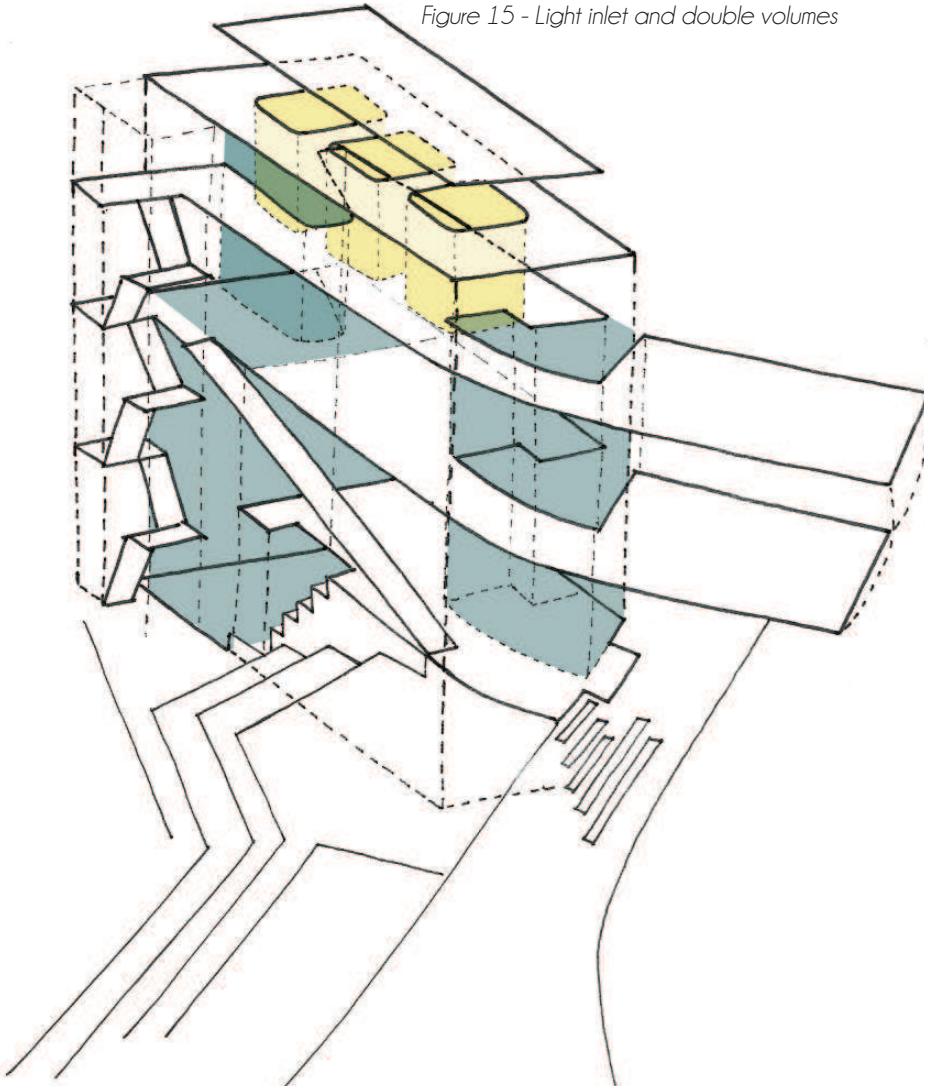


Building programme

Ground floor	dining, retail
First floor (public access)	foyer, main reception, medical facilities
Second floor	gymnasium, auditorium (as media aspect), changing rooms, shared lounge with third floor hotel
Third floor	accommodation (for visiting sport teams), private balconies for each room, central entertainment area for guests only

(Don Albert & Partners Homepage, 2014: online)

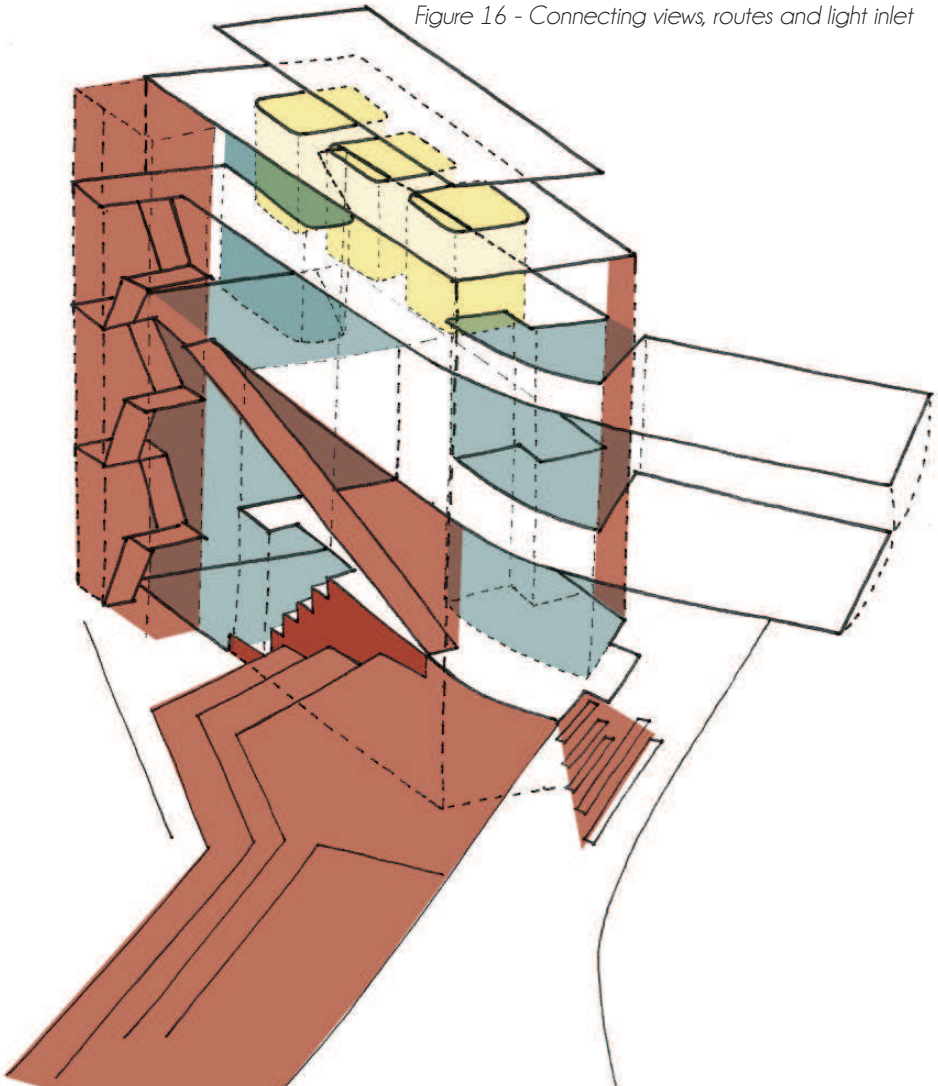
Figure 15 - Light inlet and double volumes

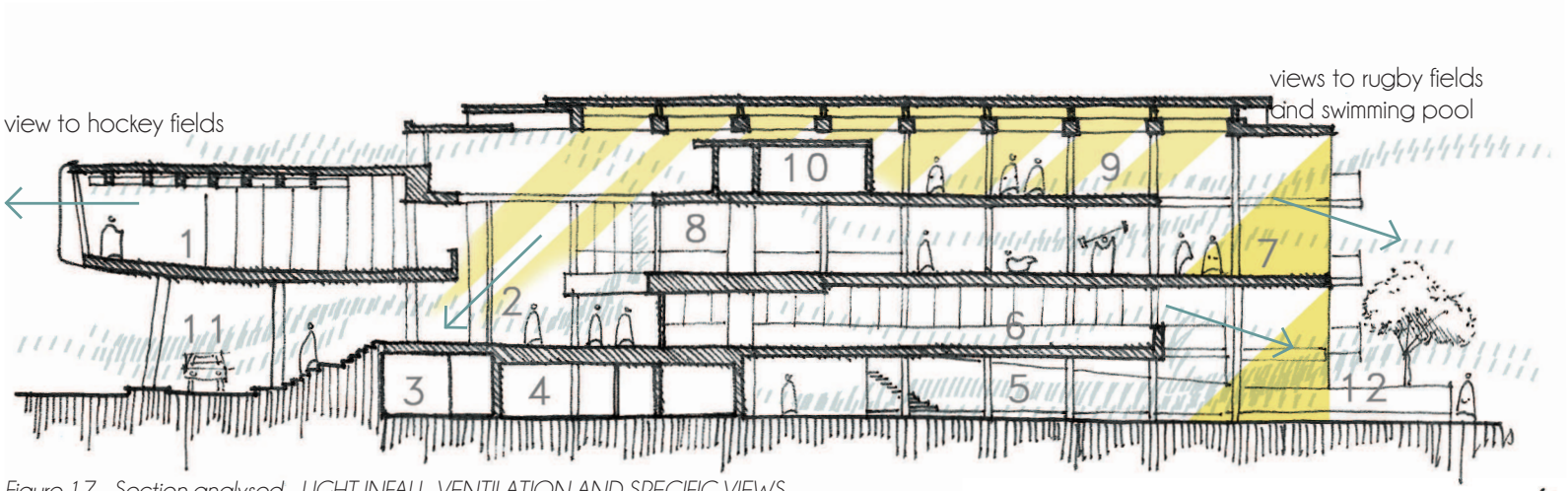


Site conditions

The site layout was organised to maximise the sense of arrival through its connection to the high traffic Hatfield road, creating a catalyst for movement from the boundary of a residential area into the sport grounds of the university (Don Albert & Partners, 2014: online). Yet the high level of security with strict access control opposes the notion of activation.

Figure 16 - Connecting views, routes and light inlet





1. Auditorium
2. Reception | foyer | retail
3. Storage
4. Kitchen
5. Dining
6. Medical suite
7. Gymnasium
8. Office
9. Boutique hotel
10. Bathroom
11. Drop-off
12. Deck

Figure 17 - Section analysed - LIGHT INFALL, VENTILATION AND SPECIFIC VIEWS.

Natural light from above was important as a conceptual modifying element to indicate and guide the journey to the top, a sport reference made by the architect (Don Albert & Partners, 2014: online). This conceptual approach was strengthened by creating double volumes at specific functions. The reception area's open volume cuts through all three floors above in order to see each level when entering the building. Two double volumes are positioned to the northern facade for optimal light penetration. The ground floor double volume accommodates the restful dining area, while the open volume above the gymnasium creates a higher ceiling for the sport activities. The gap thus created in the accommodation floor creates views of the athletes in training. This is an experiential and important part of training and performance, where the identification of competition and others' success helps with personal motivation. "The robustness of the building also evokes associations with the physical aspects of sport, exuding confidence and poise as one would expect from an athlete" (De Beer, 2009: 66).

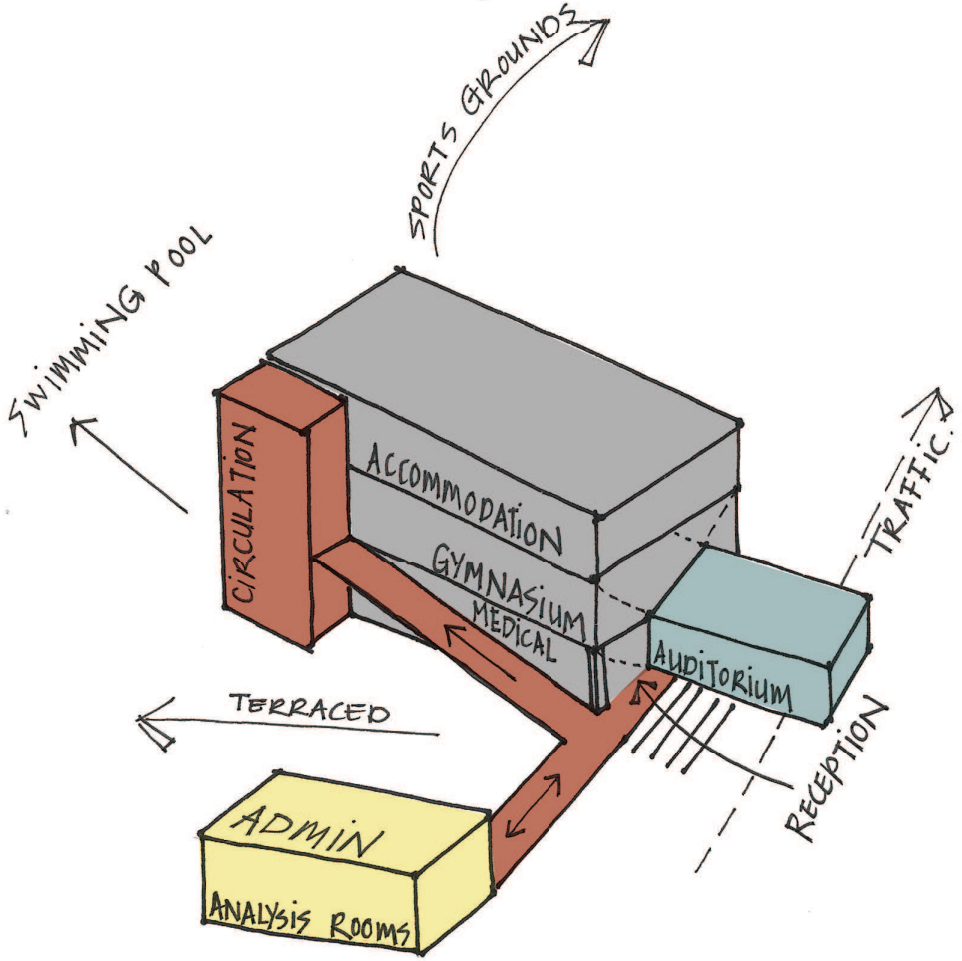


Figure 18 - Basic geometry analysed.

Basic geometry | Light | Spatial integration | Views | Frame | Circulation

The extension of the auditorium created a clear identification of the entrance foyer, with a vehicular/bus drop-off area for visiting sport teams underneath it. The administration building is kept separate as a private building functioning on its own. It is connected to the main building through a ground floor and elevated walkway. This creates easy access control of the public (with visual security as well) while closing off the terraced landscape which leads to the accommodation facilities of TuksSport high school and the sport facilities. The gymnasium and the sport sciences and medical units function simultaneously within one frame but on different floor levels. This was made possible by the manipulation of the plane by cutting the floor/roof elements to create certain views, volumes and ceiling heights.

1. Reception
2. Foyer
3. Medical reception
4. Shop
5. Male restroom
6. Female restroom
7. Storage
8. Consulting room
9. Kitchenette
10. Medical suite
11. Seminar room
12. Office
13. Physical analysis
14. Drop-off

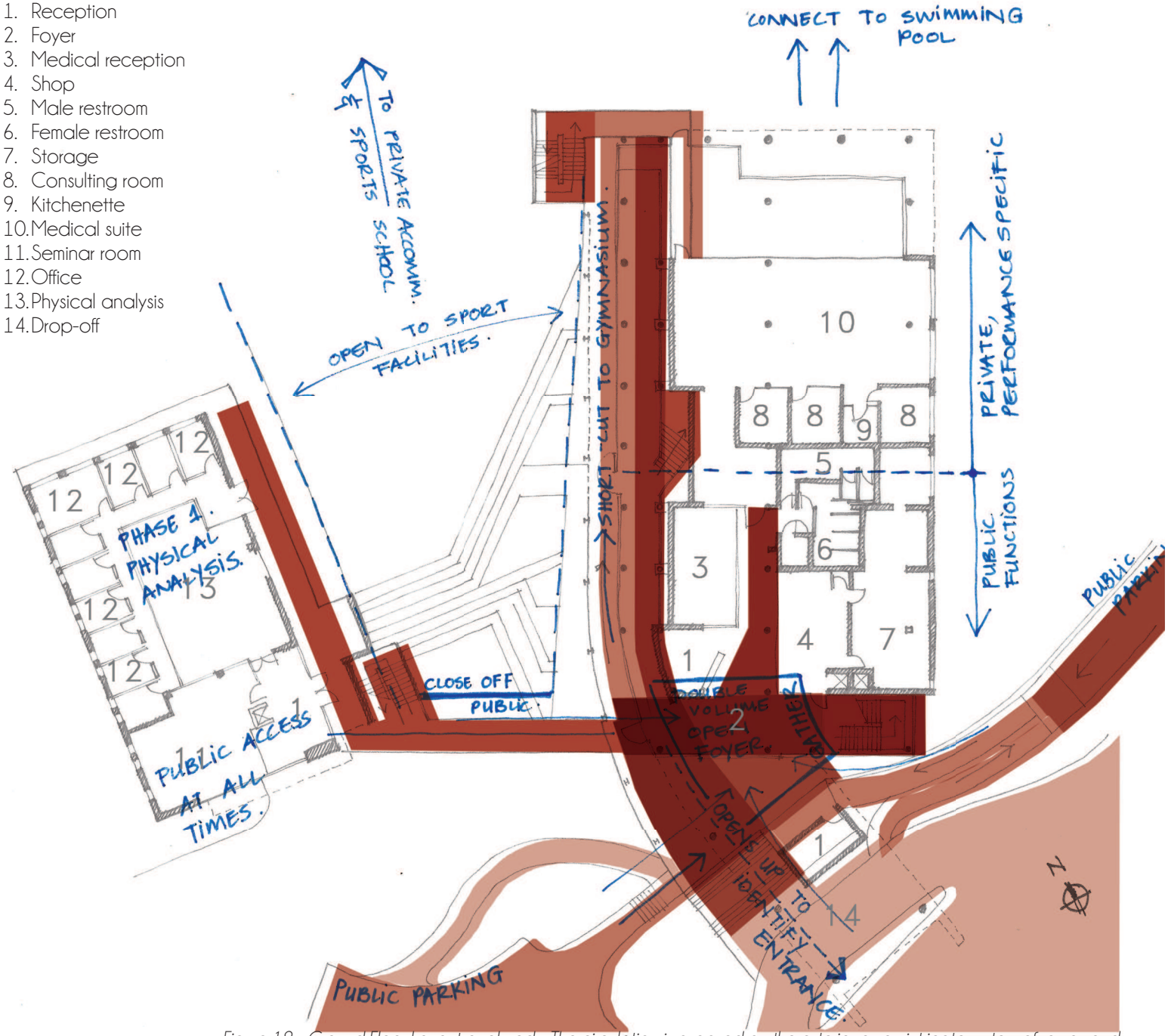


Figure 19 - Ground Floor Layout analysed - The circulation is exposed on the exterior as an intricate system of ramps and staircases for a dynamic representation on the facades

Centre for High Performance Athletics

Jamor Sports Complex, Lisbon, Portugal

Architects

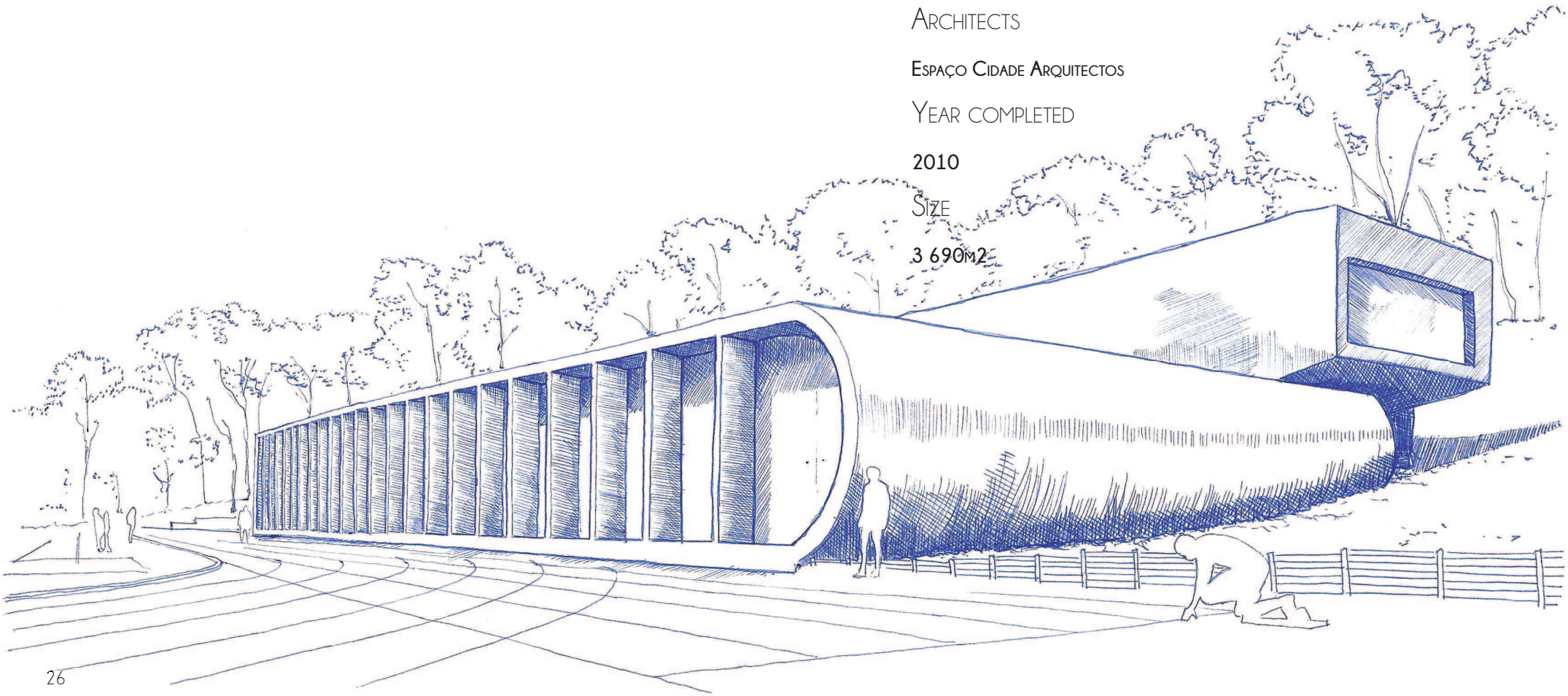
Espaço Cidade Arquitectos

Year completed

2010

Size

3 690m2



Site conditions

The building is implanted at the base of a slope, which not only affected the access to the building, but also the space available for the development of the building. This determined the stereotomic approach of the walls becoming the foundations for the building anchoring it into the site (De Freitas, Muralha, & Portela, 2013: online). The building is also in very close relationship to the tartan tracks.

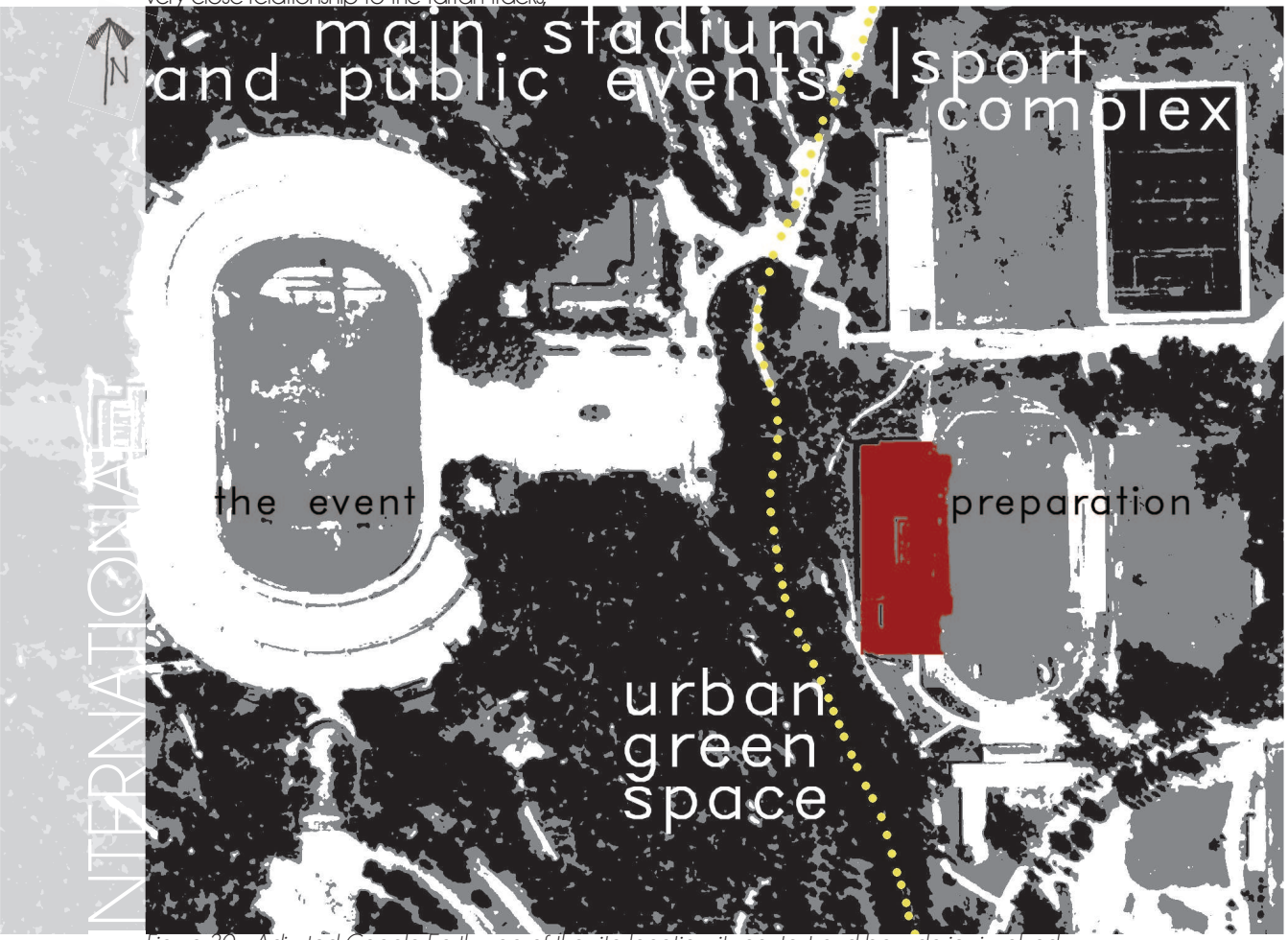


Figure 20 - Adjusted Google Earth map of the site location, its context and boundaries involved.

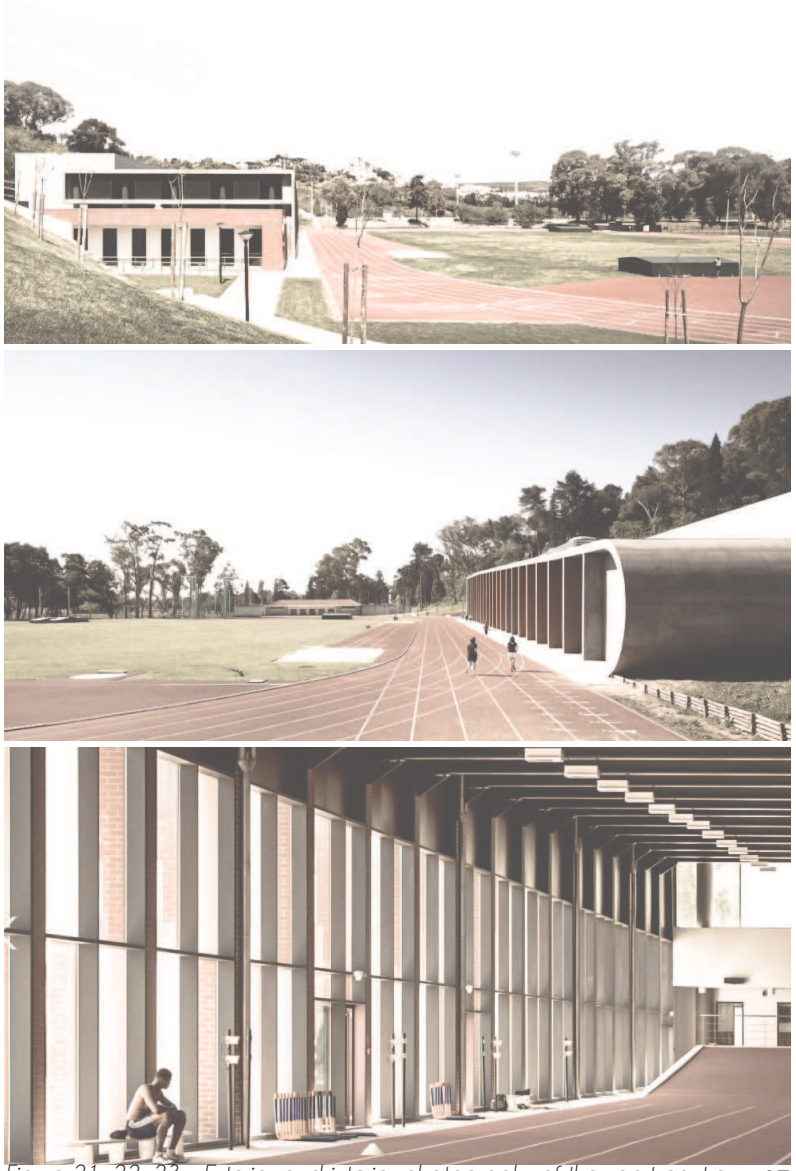


Figure 21, 22, 23 - Exterior and interior photographs of the sport centre (De Freitas, Muralha, & Portela, 2013: online).

Brief

The integration of the HPC into the sports complex of Jamor formed part of a series of interventions to create a green environment accessible to the public (De Freitas, Muralha, & Portela, 2013: online).

Building programme

Speed track with 6 lanes - 60 meters long
3 tracks for Long Jump and Triple Jump
Weight room
Social and medical support facilities
Administration office
Sector for pole vault, high jump, shot put and discus throw
Office for computerised physical monitoring and analysis
Space for the heating and recovery (aquatic)
Multipurpose room for theoretical work, meetings or training
Dining room
Locker rooms

Basic geometry | Hierarchy | Spatial volumes | Structure

The training area has the only curvilinear element in the entire design and is entirely function driven in that it helps the sprinters to come to a quicker and safer stop inside the building. The high ceiling was necessary to accommodate the sport activities within the building such as pole vault, high jump, javelin and discus throw (De Freitas, Muralha, & Portela, 2013: online). The interior is mainly free of vertical support to create an unhindered function-driven interior. The building became an enclosed space for outdoor activities without the limitations of being inside. On arrival, the foyer and reception area welcomes the public, assuming a more civic scale, and the use of different materials helps with the identification of the threshold.

Through hierarchical importance, the physical monitoring office is placed above the training ground floor, not only to create a better view of the performance on the indoor and outdoor tracks, but to conceptually represent the control over an athlete's movement (De Freitas, Muralha, & Portela, 2013: online). Through careful assessment and continuous evaluation, the athlete's performance is manipulated through science.

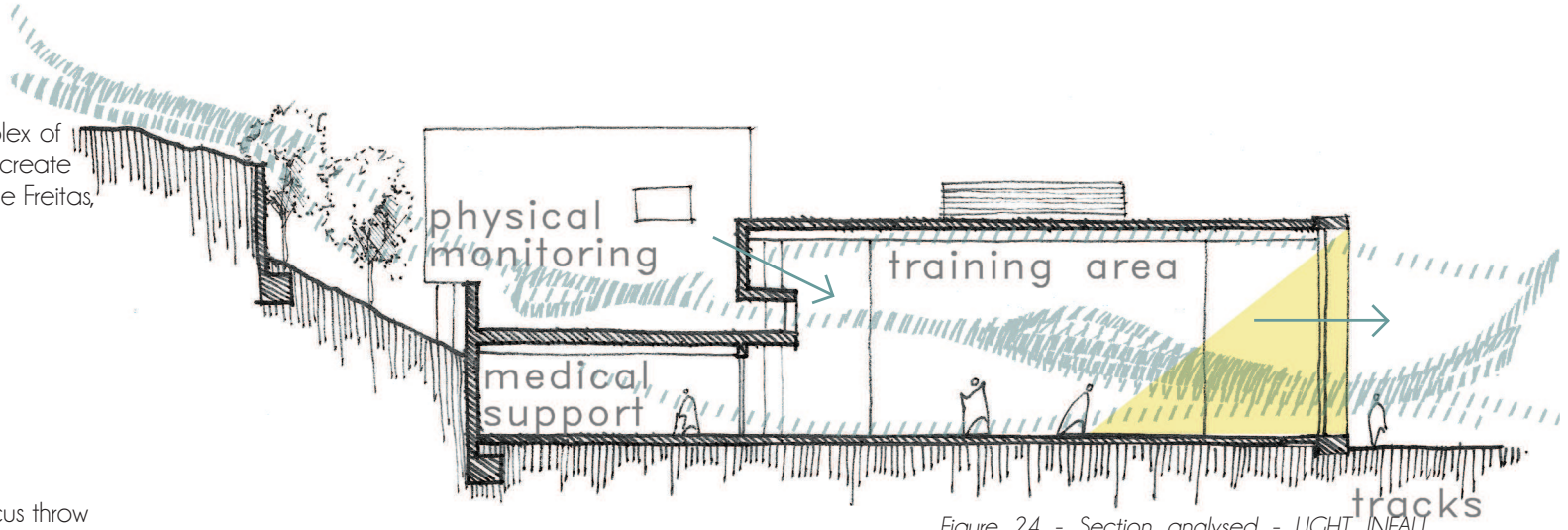


Figure 24 - Section analysed - LIGHT INFALL, VENTILATION AND SPECIFIC VIEWS.

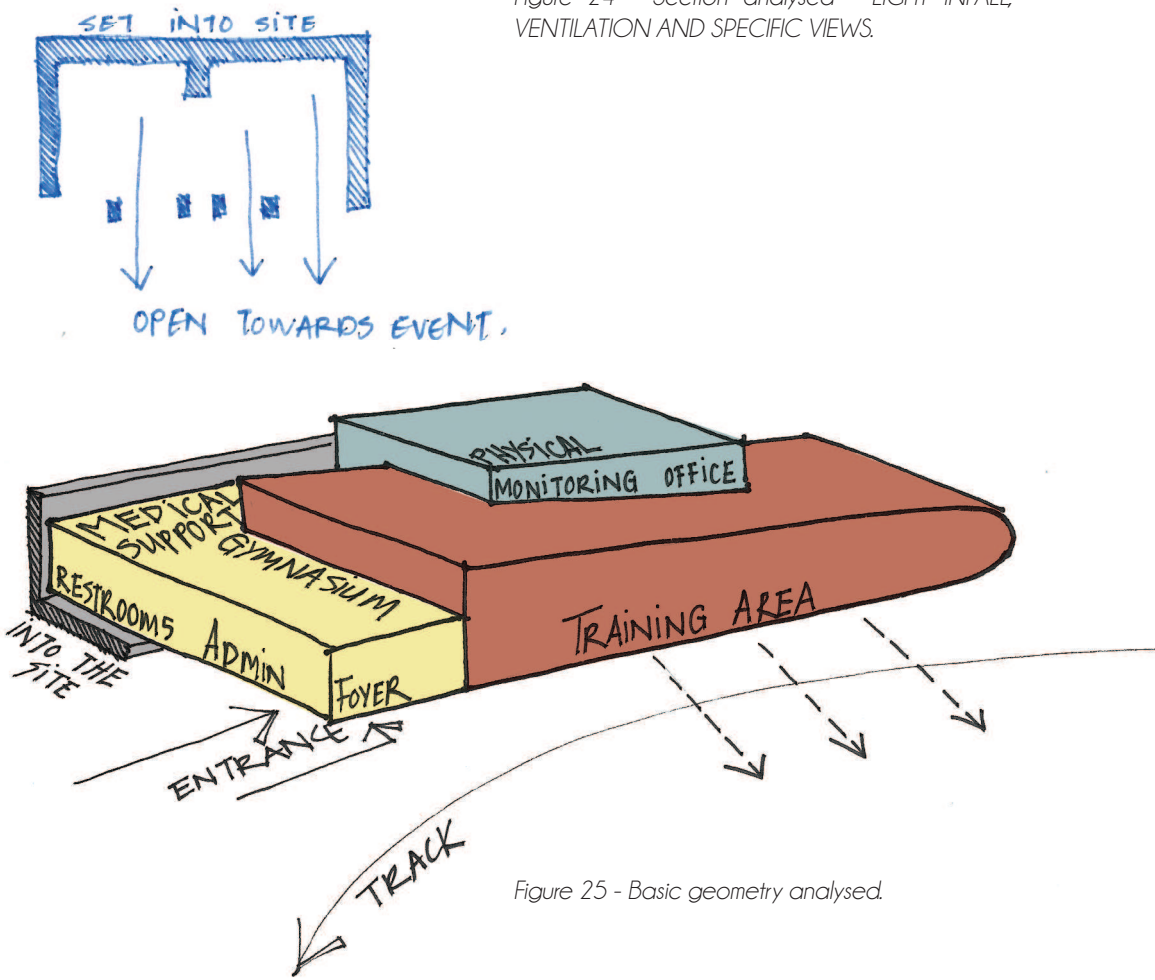


Figure 25 - Basic geometry analysed.

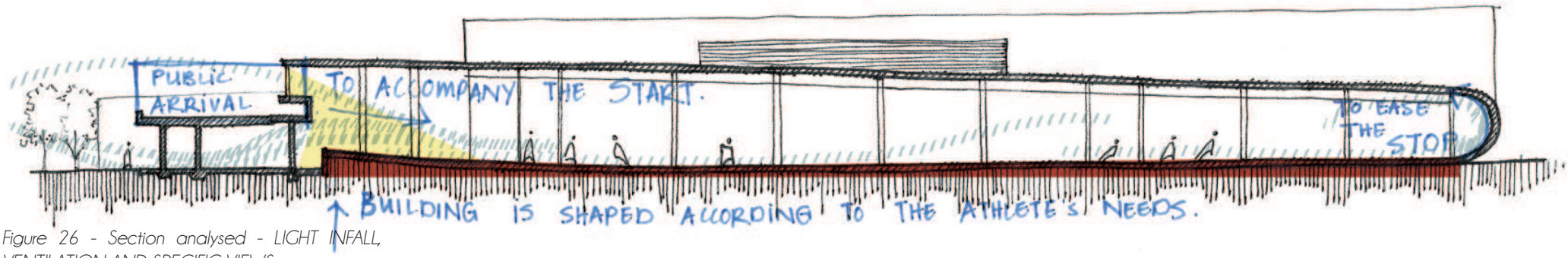


Figure 26 - Section analysed - LIGHT INFALL, VENTILATION AND SPECIFIC VIEWS.

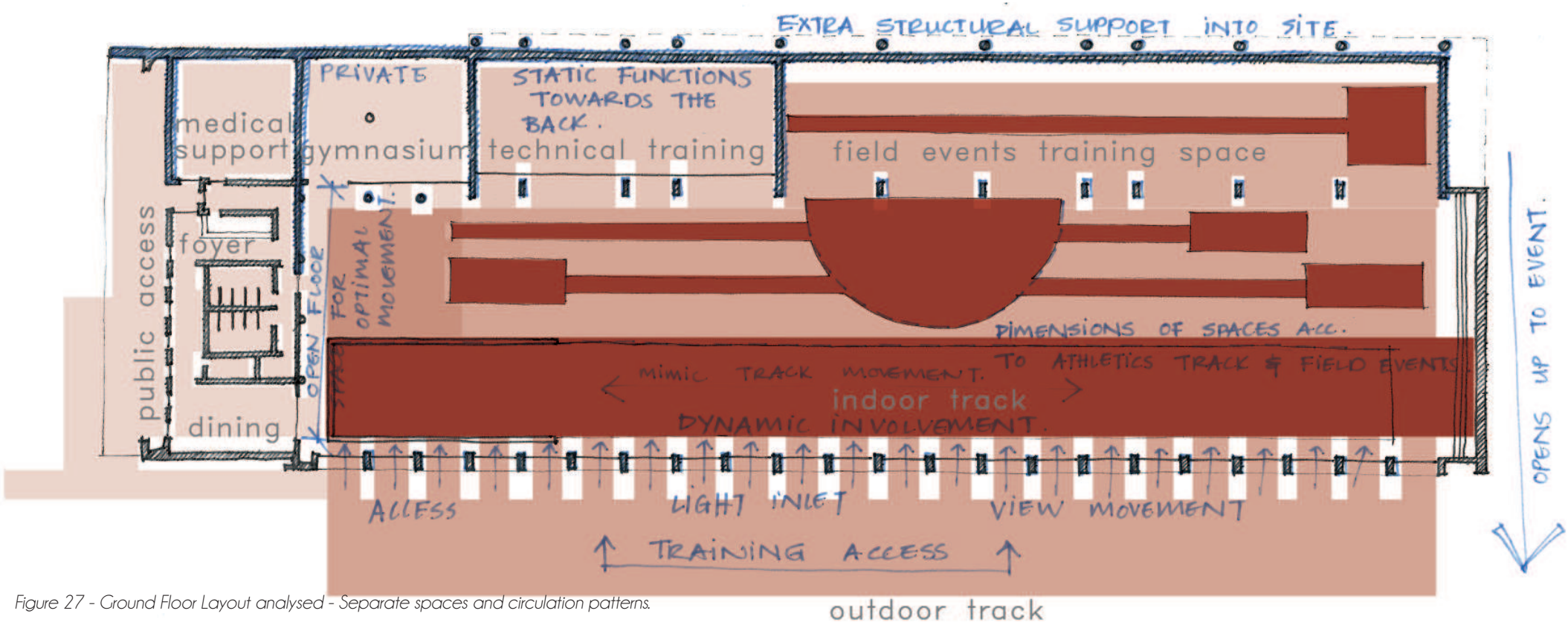


Figure 27 - Ground Floor Layout analysed - Separate spaces and circulation patterns.

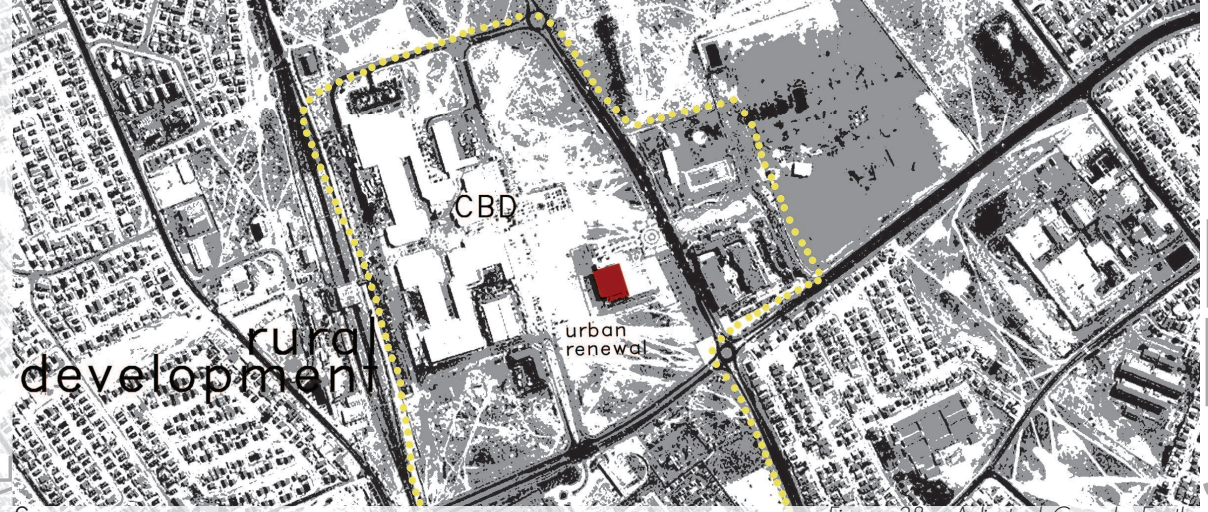


Figure 28 - Adjusted Google Earth map of the site location, its context and boundaries involved.

Khayelitsha Multipurpose Sport Centre

Khayelitsha, Western Cape

Architects

Makeka Design Laboratory

Year completed

2008

Site conditions

The context of the Cape Flats Townships is described as isolated events standing in space, with no contribution to defining streets or public spaces (Coetzer, 2009: 9). This result in a hostile environment to pedestrians, a condition the building design addressed with the use of a massive veranda overhanging the (imagined future) plaza. This provided accessible shade and a sense of arrival with the appropriate civic scale (Coetzer, 2009: 10). With all these aims for future achievement, the building still sits isolated from its context while waiting for further development.

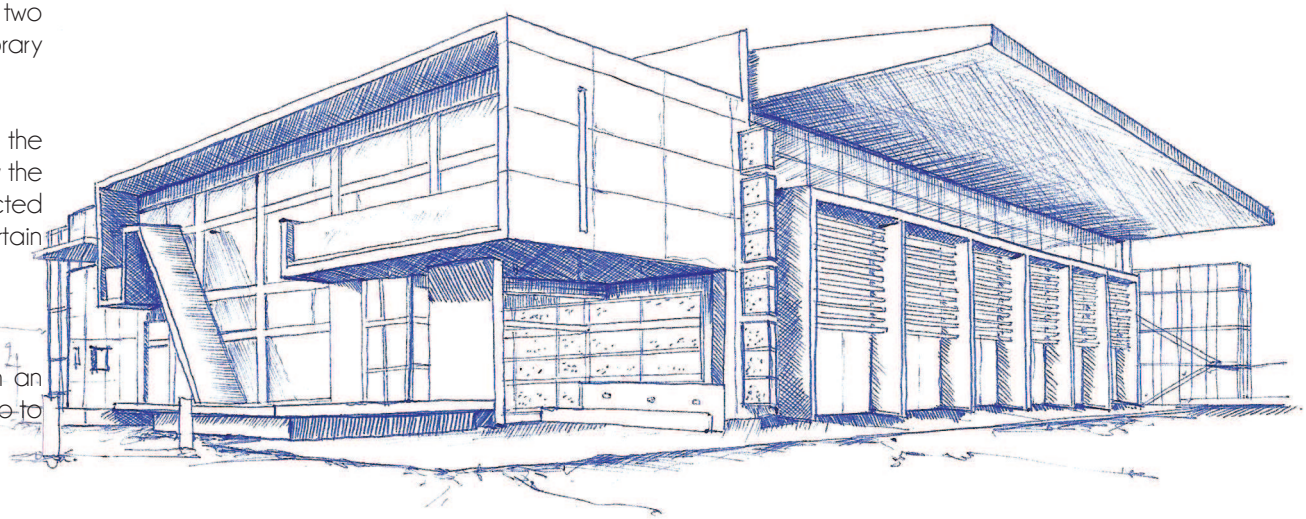
Brief

Khayelitsha Multipurpose Sport Centre (later named as Thusong Service Centre) forms part of a collection of buildings and spaces dedicated to the urban renewal of Khayelitsha since 2003. The sport centre was part of phase one, together with recreational components, while phase two includes an arts and culture component, municipal offices, and a library (Digest of South African Architecture, 2008: 112).

With the lack of civic infrastructure in the CBD of Khayelitsha, the development of a precinct (with future growth opportunities) will allow the site to be connected as a whole. The design of a sport centre projected a sense of civic pride and a defined presence within an uncertain landscape (Digest of South African Architecture, 2008: 112).

Project scope

The Sport Centre had to create a powerful urban statement within an area with no cohesion by relying on a strong outside/inside relationship to create a broader urban integration (Digest of South African Architecture, 2008: 113).



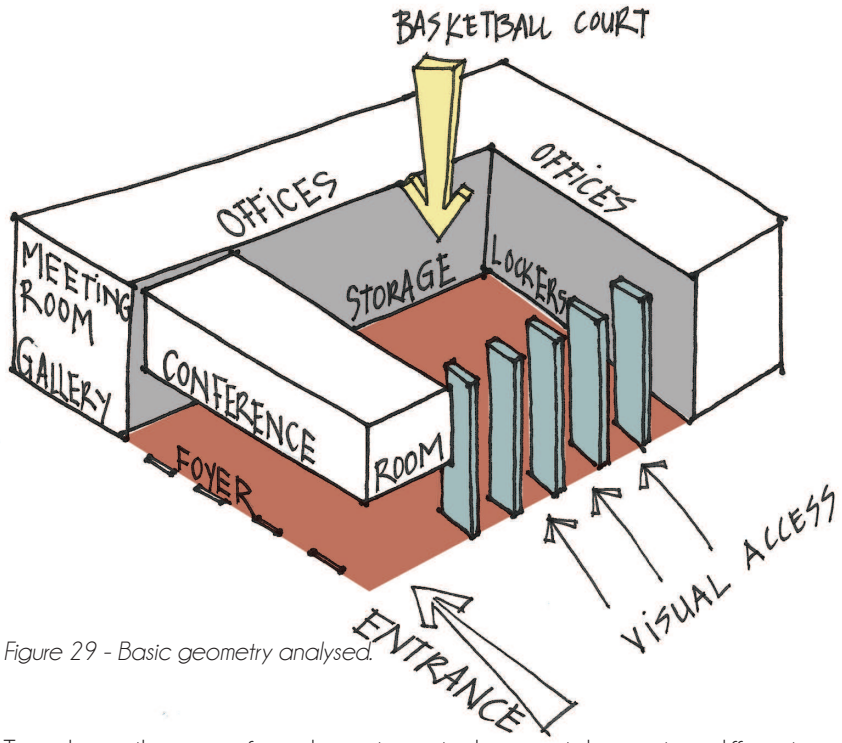


Figure 29 - Basic geometry analysed.

To achieve this, every facade is interpreted separately, creating different visual orientation elements specific to each direction of approach. With a limited choice of colours and materials, the building facades became dynamic through the effects of light, the level of detail in the design and the interplay between different textures (Digest of South African Architecture, 2008: 113). The building also presents a good example of efficient design, confirming the irrelevance of air-conditioning through the incorporation of an effective passive solar control system.

Basic geometry | Frames | Spatial integration | Views | Using things that are there | Textures

The whole building functions as a spectator to the basketball court. Folded around the court's boundary, the building frames the sport event. Sport within communities provides recreational opportunities and a sense of pride. Although the building encloses the events, the facades are handled in such a manner to create a strong exchange of activities between the interior and the exterior. Specific views are allowed to draw the community closer for interaction and participation. Regarding site specificity, the building is grounded by a gabion wall element filled with Table Mountain sandstone (Digest of South African Architecture, 2008: 113). By using materials from the context, the entrance foyer is distinctly separated from the concrete use of the rest of the building.

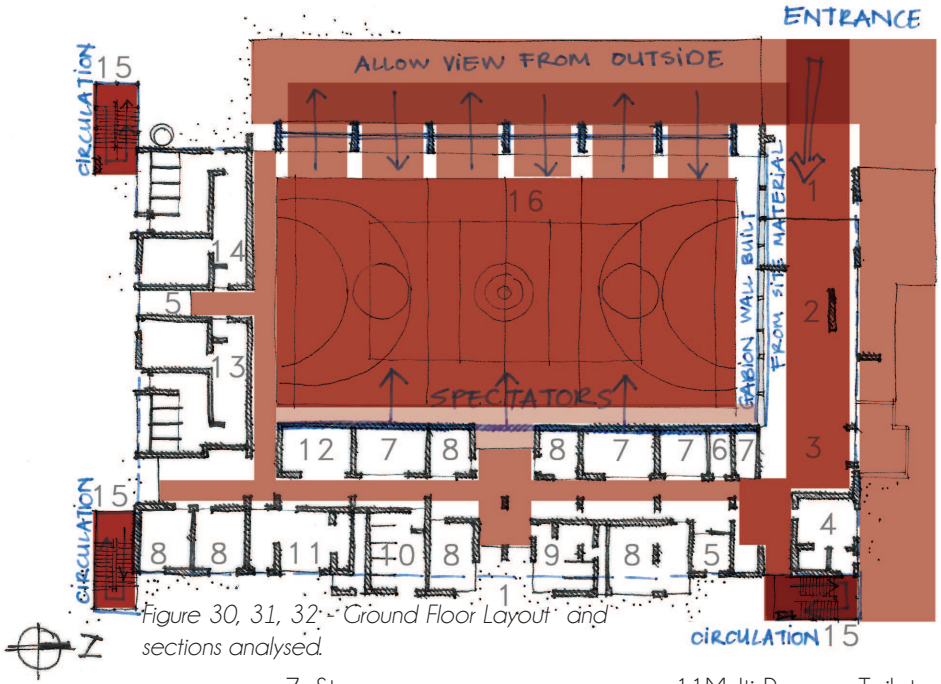
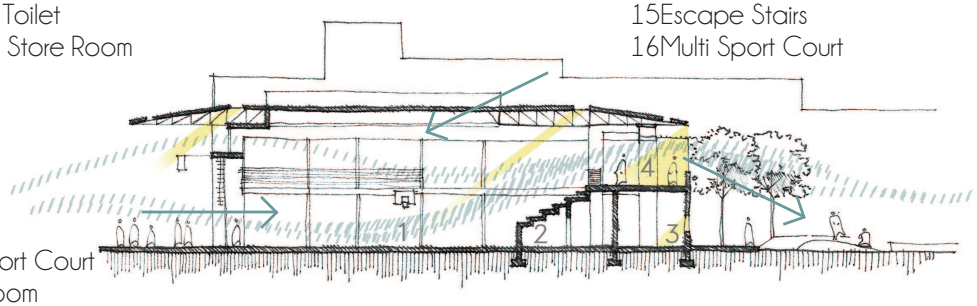
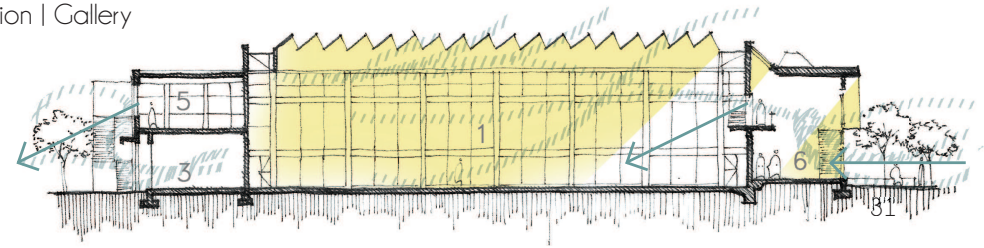


Figure 30, 31, 32 - Ground Floor Layout and sections analysed.

1 Entrance
2 Reception | foyer
3 Gallery Room
4 Staff Kitchen
5 Disabled Toilet
6 Cleaners Store Room
7 Storage
8 Office
9 Male Toilets
10 Female Toilets
11 Multi-Purpose Toilets
12 Plant Room
13 Female Shower Room
14 Male Shower Room
15 Escape Stairs
16 Multi Sport Court



1. Multi Sport Court
2. Store Room
3. Restrooms
4. Outside Space
5. Open Plan Offices
6. Reception | Gallery



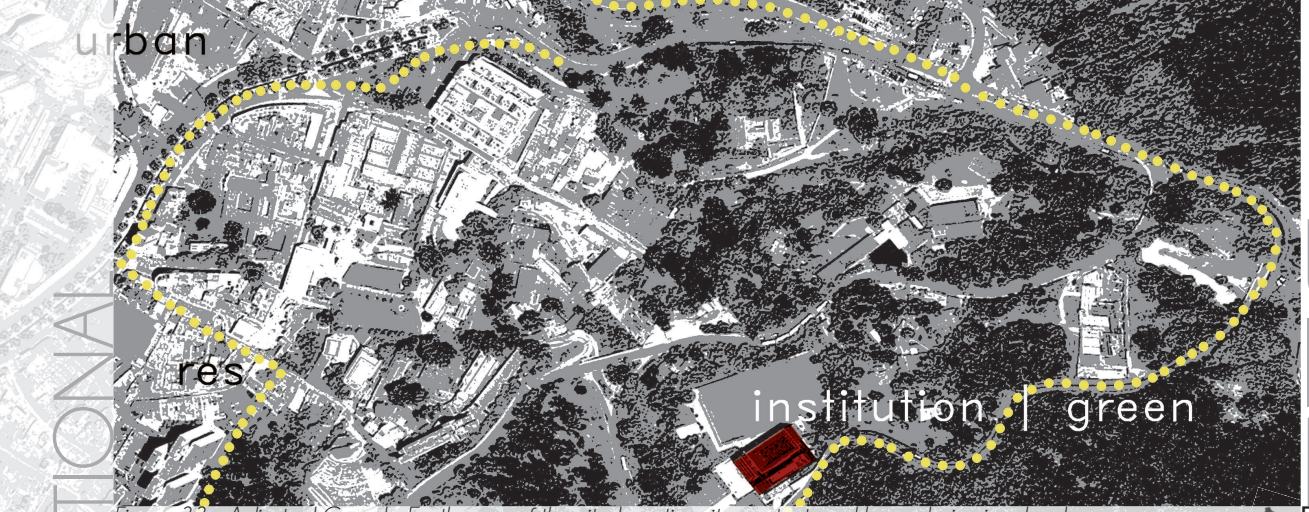


Figure 33 - Adjusted Google Earth map of the site location, its context and boundaries involved.

Universidad de los Andes Sport Facilities

Bogotá, Colombia, South America

Architects

MGP Arquitecturay Urbanismo | Felipe González-Pacheco Mejía | Álvaro Bohórquez Rivero

Year completed

2009

Size

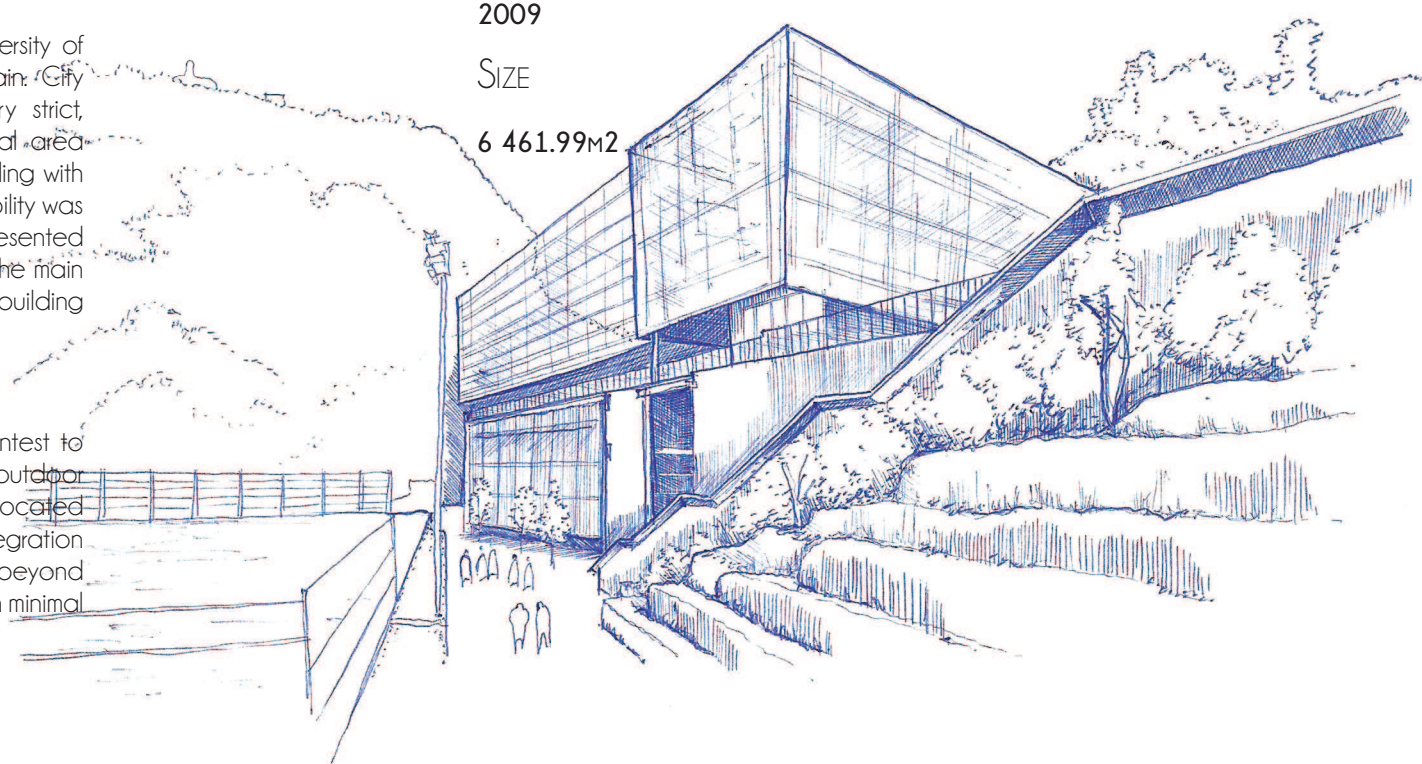
6 461.99m2

Site conditions

The given site for the project is at the highest part of the University of Los Andes, set in-between the city and the adjacent mountain. City development regulations regarding site occupation were very strict, permitting the project to only occupy five percent of the total area available (Gao, 2011: 204). This resulted in a compacted building with layered functions in order to achieve site efficiency. Structural stability was of utmost importance in a high risk earthquake zone, which also presented the opportunity of placing the pool on the upper level, above the main court, to absorb vibrations and stabilise the movement of the building (Gao, 2011: 204).

Brief

This sport facility was the winning project of an architectural contest to provide a host for indoor sport activities while blending into its outdoor surroundings (Gao, 2011: 204). Set within strict site regulations and located on the border of the university, the project had to achieve full integration between the interior and exterior to maintain visual connections beyond the facades of the building. The indoor facilities, compacted within minimal space, had to be experienced from the outside, and vice versa.



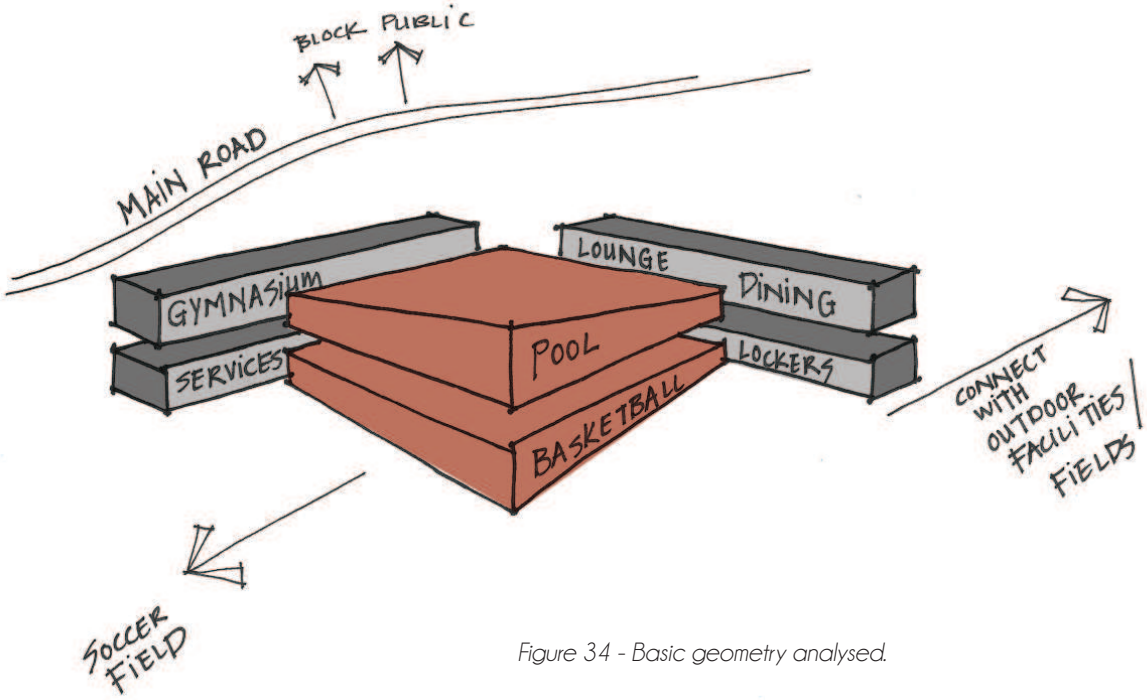
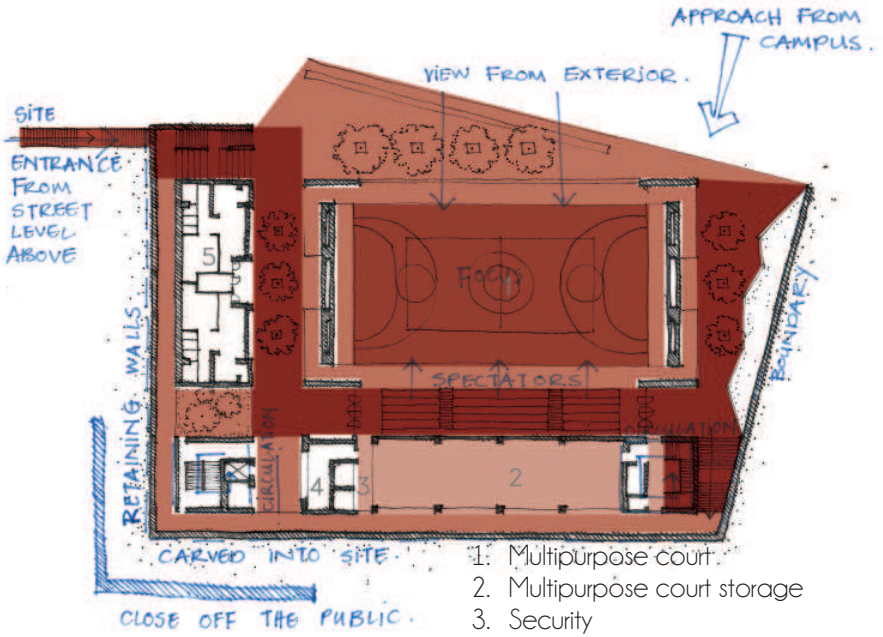


Figure 34 - Basic geometry analysed.



1. Multipurpose court
2. Multipurpose court storage
3. Security
4. Reception Area
5. Changing Room

Figure 35, 36, 37 - Ground Floor Layout and sections analysed.

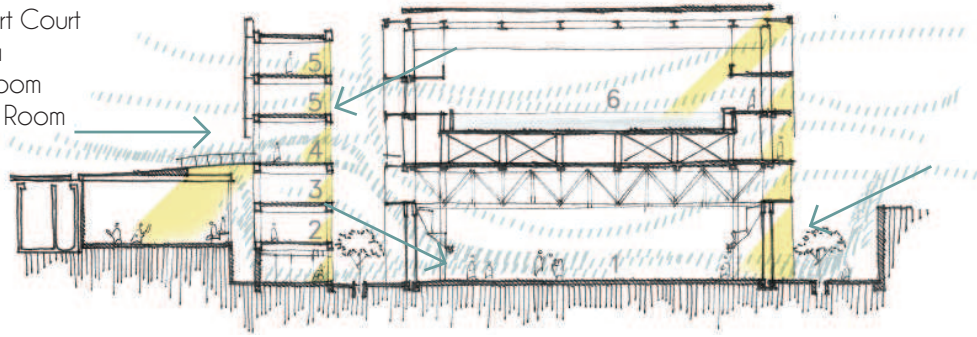
Project scope

The facades had to achieve total transparency in order for each activity to be seen by another. The building is designed for the athlete to practise sport in a safe environment, but also to see the practising thereof in order to encourage students to get involved and participate (Gao, 2011: 204). The circulation within and around the building was also an important design component, allowing connections between all the activities.

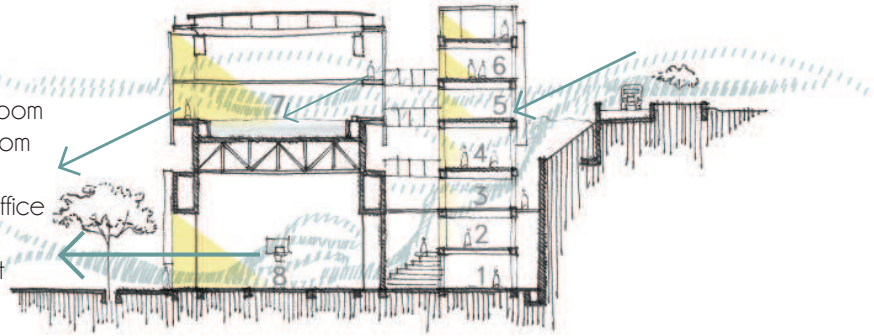
Basic geometry | Using things that are there | Frames | Transparency and views

The mountain, city and sky form a connection on the site and presented an opportunity to be linked through the building. With the use of six basic rectangular volumes, this was possible (Gao, 2011: 204). The building acts as a protective frame of the activities inside. Set into the site, the building folds around the basketball court and pool. Although the building encloses the events, the facades are completely transparent to erase the boundary between the interior and exterior. Views through the building draw the students closer and create interaction and participation. It was important to achieve visual connections between all the separate activities (Gao, 2011: 204).

1. Multi Sport Court
2. Cafeteria
3. Dance Room
4. Student's Room
5. Gym
6. Pool



1. Storage
2. Ping Pong Room
3. Board Games Room
4. Multipurpose Room
5. Gym
6. Administration Office
7. Pool
8. Multi Sport Court



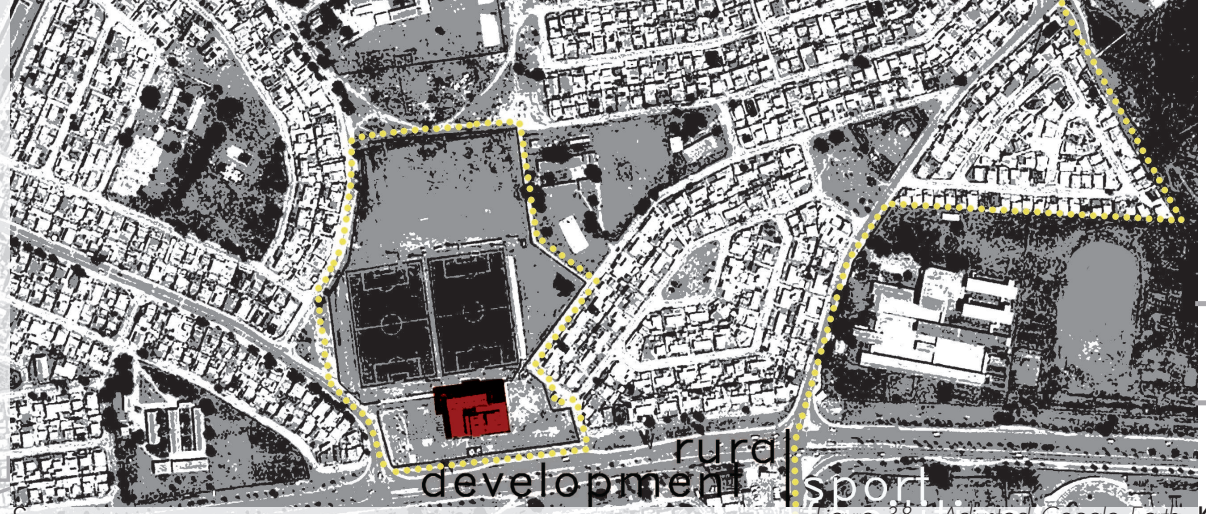


Figure 38 - Adjusted Google Earth map of the site location, its context and boundaries involved.

Site conditions

The new building is a two-storey structure that effectively exploits the slope of the site by cutting into it to create split-level activity spaces (Artefacts, 2010: online). The entrance to the site fits gently between the old and the new structure creating a courtyard as the foyer space. With the "Wall of Names" on the exterior against the new building, a connection with the existing building is reinforced through historical reference (Artefacts, 2010: online).

The Football Training Centre

Klipspruit, Soweto, Johannesburg

Architects

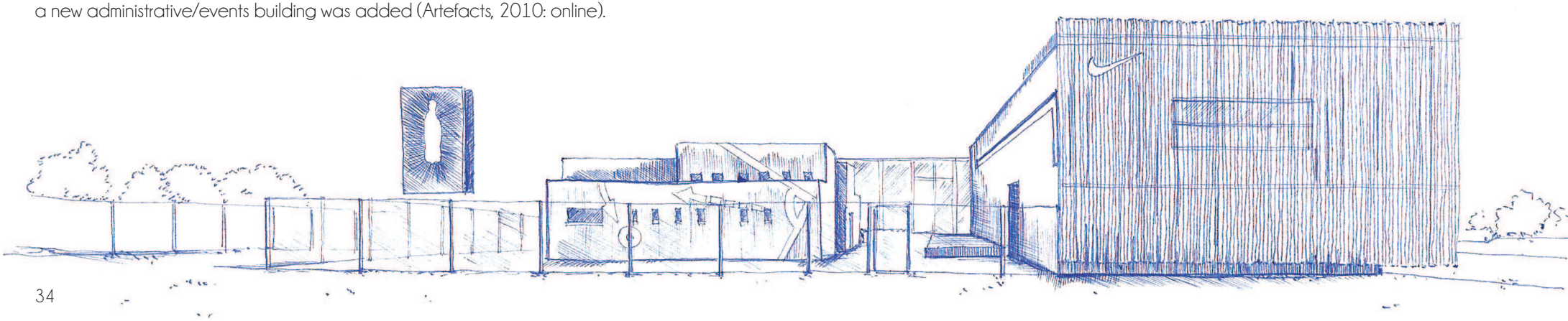
RUF project

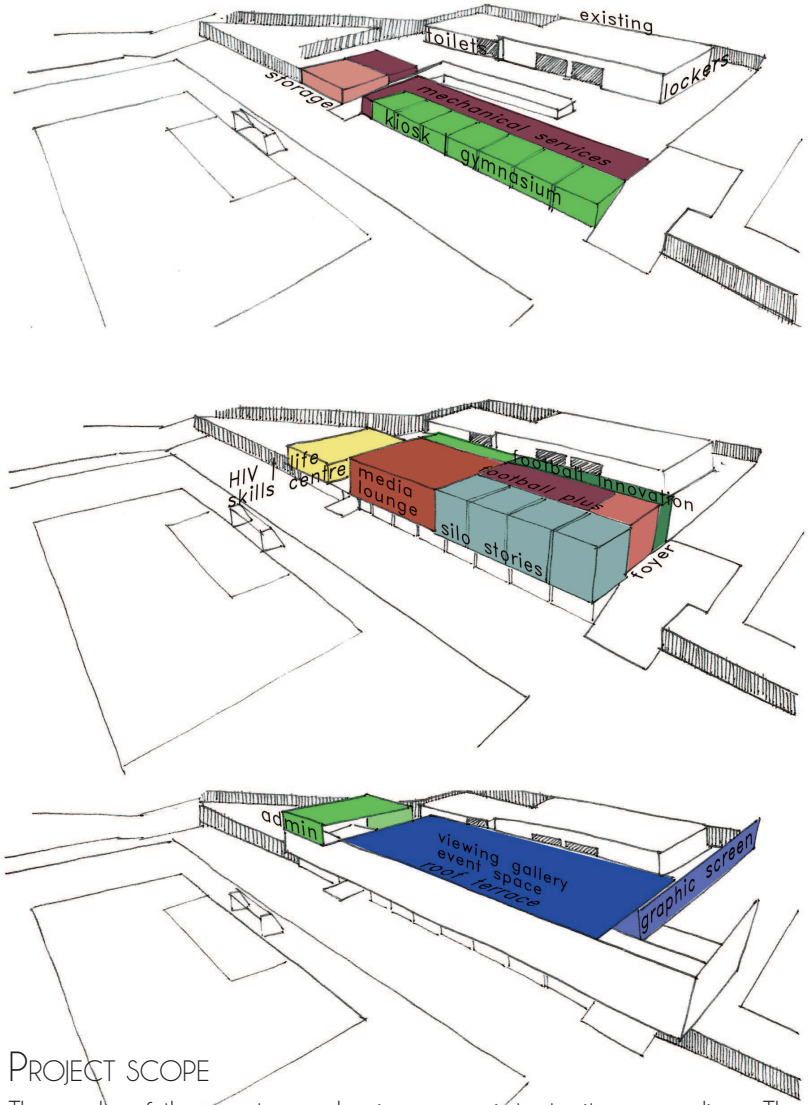
Year

2010

Brief

The Football Training Centre. Soweto (FTC.S) was an existing football training ground for approximately 1200 youth clubs under the administration of the Soweto Football Association. The objective of the project was to refurbish the centre and transform it into a state-of-the-art high-performance and life skills centre for the development of football, particularly for the youth in Soweto (Luyanda Mpahlwa Design Space Africa, 2010: online). The existing ablutions needed to be refurbished, and a new administrative/events building was added (Artefacts, 2010: online).





Project scope

The scale of the sport complex is appropriate to its surroundings. The addition was needed to organise the developing sport interest of the community. The facilities are used on a day-to-day basis with regular participation in main events, where altogether 1200 teams and about 20,000 footballers play each year. The complex consists of VIP lounges, physiotherapy and first aid treatment rooms, exhibition spaces, administrative offices, a meeting room, a rooftop entertainment deck, ablution, locker rooms, a cafeteria and an advertisement space for Nike Football. There is also a gymnasium tucked underneath the building with an open view over the playing fields (Artefacts, 2010: online).

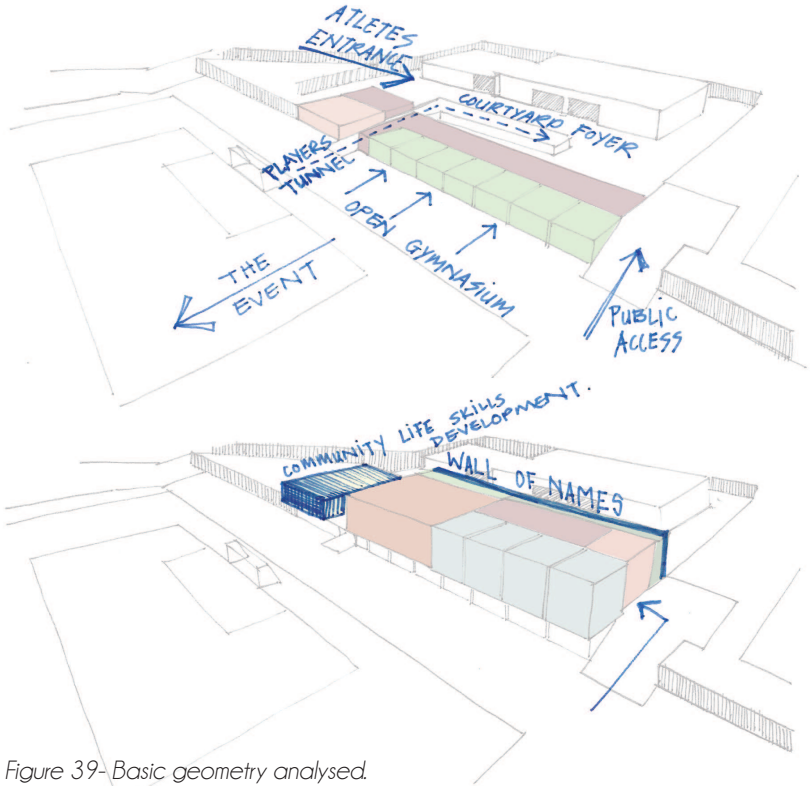
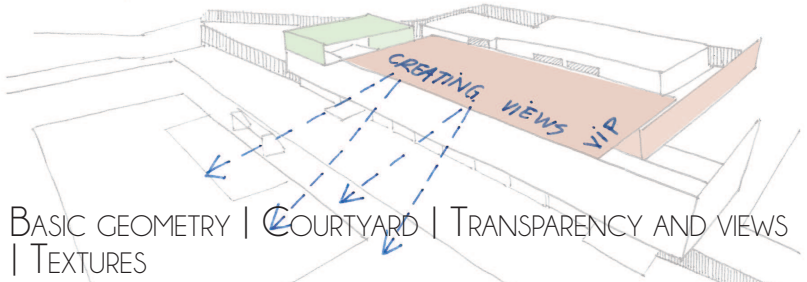


Figure 39- Basic geometry analysed.



Basic geometry | Courtyard | Transparency and views | Textures

The basic geometry entails two separate rectangular volumes. The new building is separated from the old, placed closer to the playing field, to create a private courtyard and entrance foyer in between. The new structure consists of stacking boxes of functions held together with a transparent skin. Each room has views to and from other areas of the building which creates a system of selective visual connections between functions. The roof is also occupied as an important viewing deck looking out over the surrounding sport. The building had to integrate into Soweto's environment and thus with the use of natural materials, a combination of sandstone cladding, gabion walls and timber, were found to be appropriate (Luyanda Mpahlwa Design Space Africa, 2010: online).



Figure 40 - Adjusted Google Earth map of the site location, its context and boundaries involved.

Homeless World Cup Legacy Center

SANTA CRUZ, RIO DE JANEIRO, BRAZIL

ARCHITECTS

LOMPRETA NOLTE ARQUITETOS, NANDA ESKES ARQUITETURA,

ARCHITECTURE FOR HUMANITY

YEAR

2010

SIZE

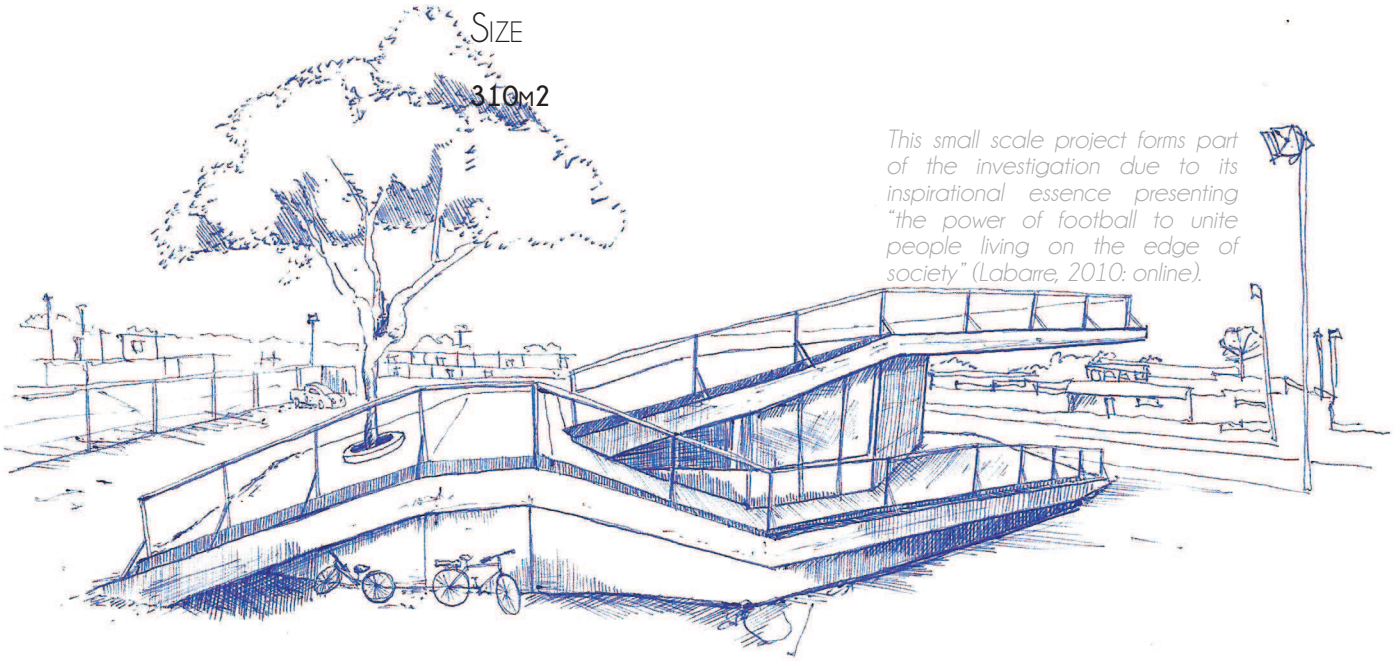
310M2

SITE CONDITIONS

The centre is placed within a high-density residential area of Santa Cruz, with only a few schools, commerce and poor public transit. The structure provides the community with a defined place to get children off of the streets and participating in sport (Labarre, 2010: online). From above the ramp, the community is given a new perspective of their environment and opportunities, a new perspective symbolising change with **sport as a social catalyst.**

BRIEF

The *Homeless World Cup* is an annual event in which teams, composed of homeless people from all over the world, meet to participate in a Football World Cup. The first tournament took place in 2010 in Rio de Janeiro, where the organising committee initiated a Legacy Centre. The objective of this centre is to create continuity in the work done with sport as a means for social change (ArchDaily, 2011: online).



This small scale project forms part of the investigation due to its inspirational essence presenting "the power of football to unite people living on the edge of society" (Labarre, 2010: online).

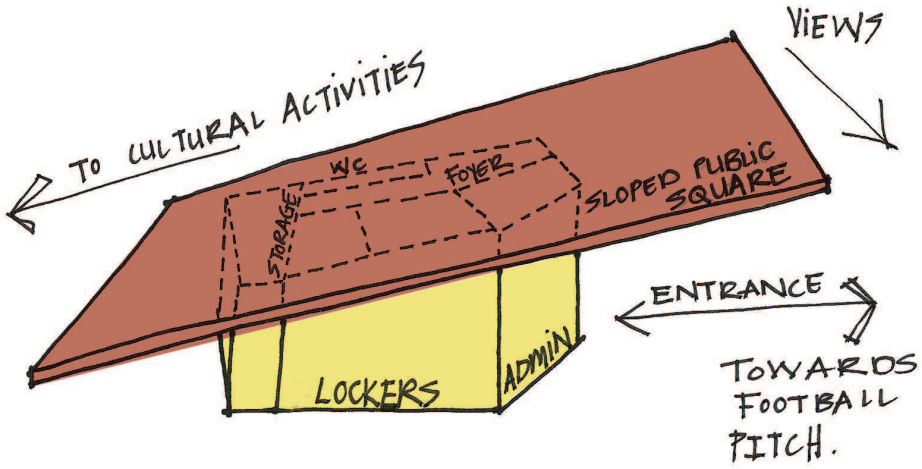
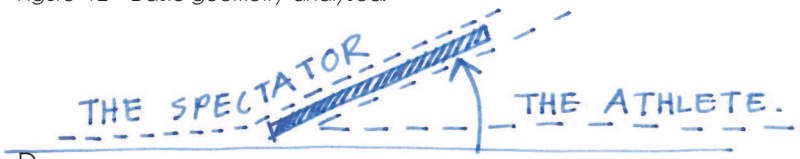


Figure 41 - Basic geometry analysed.

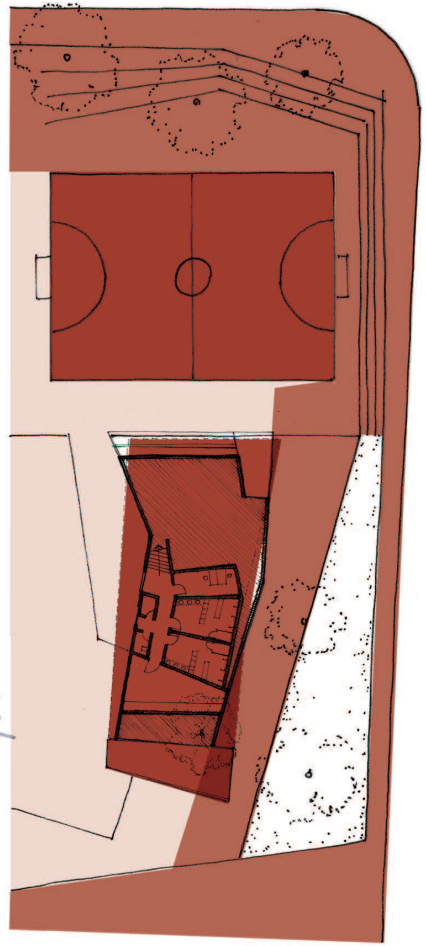


Project scope

The building takes the form of an amphitheatre-ramp, hosting a sloped public square with vegetation and seats (ArchDaily, 2011: online). The ramp also creates a stand for cultural activities and public shows. Situated underneath the ramp are locker rooms, restrooms, a classroom and seats to watch the football pitch. The entrance facade faces the football pitch and the roof-ramp faces the cultural activities (ArchDaily, 2011: online). When an event takes place, people gather all around the building and on top of it, activating the specific part of the community. This small building still awaits the arrival of a secondary phase, the *Institute Bola Pra Frente*, still to follow, which will be an educational building with classrooms, an administration office and four new football pitches (Labarre, 2010: online).

Basic geometry | Elements doing more than one thing | Frames | Views | Platform

The design works as one element where the floor, ramp, facades and ceiling represent a unity. The basic geometry consists of a diagonal platform as the host for the dynamic, irregular space underneath. For the spectator, the ramp lifts up from the ground, defining the space underneath and allowing two separate views of different activities on separate sides of the structure.



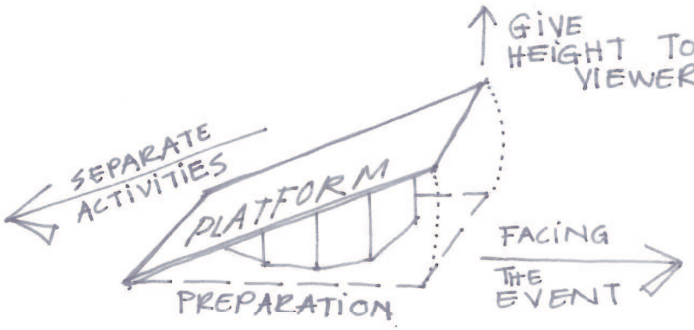


Figure 42,43 - Ground Floor Layout and section analysed.

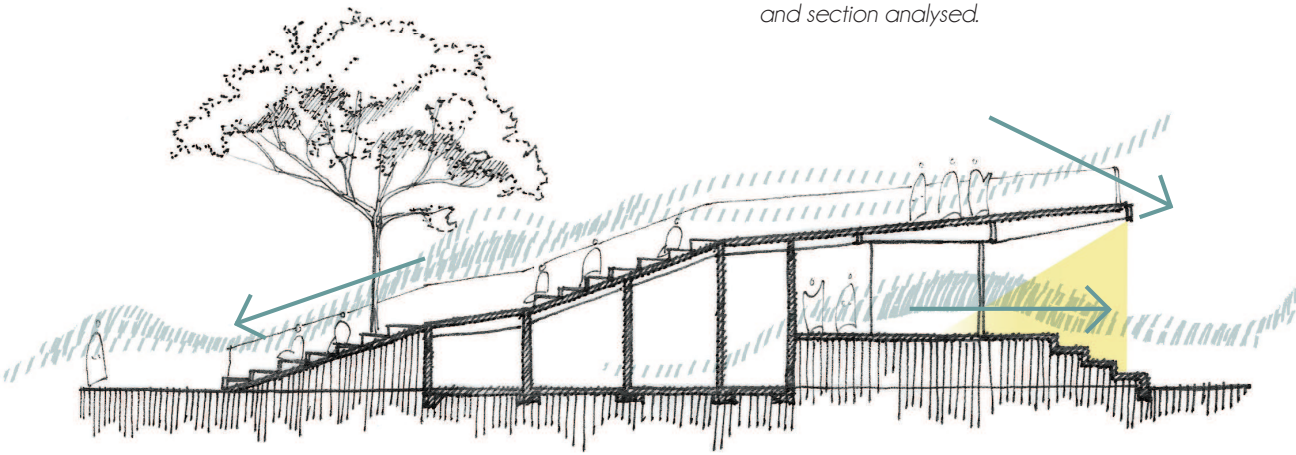
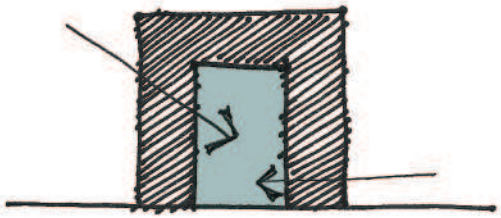




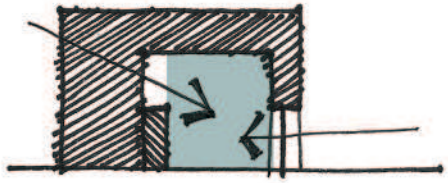
Figure 44 - Photograph of athletes performing.

national

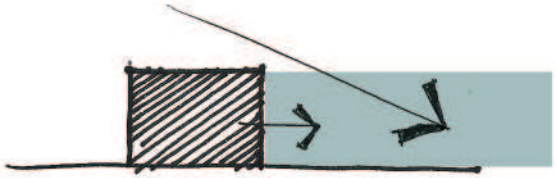
High Performance Centre Pretoria



Multipurpose Sport Centre Khayelitsha

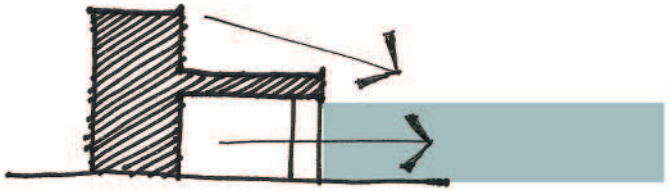


The Football Training Centre Soweto

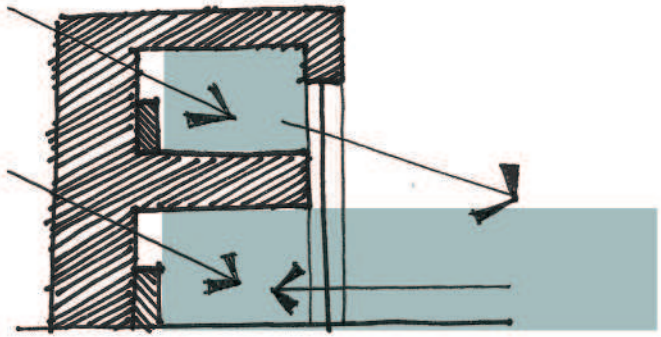


international

Centre for High Performance Athletics Portugal



Universidad de los Andes Sport Facilities Colombia

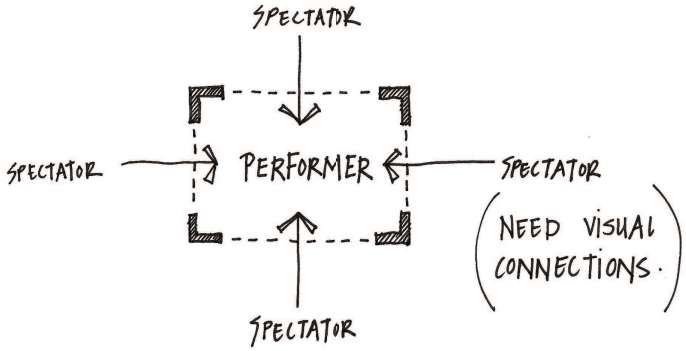


Homeless World Cup Legacy Centre Rio de Janeiro



Comparison

VIEWS TO THE **EVENT** | THE SPECTATOR | THE FRAME

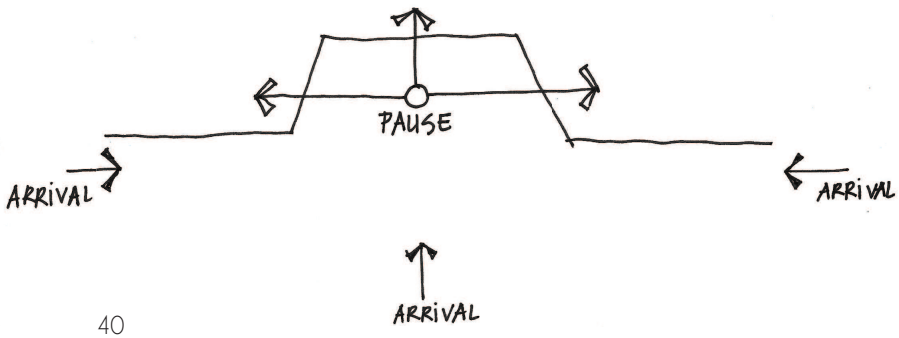


INVESTIGATION CONCLUSION

Part One identified the inaccessibility of sport centres as the result of their location within institutional environments, while the main objective of the proposed building is **to activate the existing sports precinct**. Below are a few design parameters to consider when designing a sport facility:

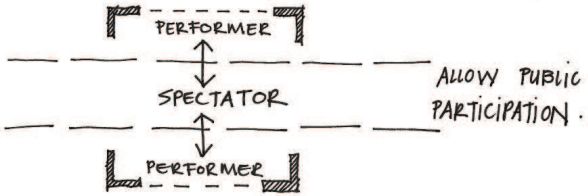
Although strict access control is very important regarding the typology, the proposed building should initiate **a closer relationship between the participant and the urban observer**. The sport building, within its urban framework, should address the street boundary, allowing public participation while regulating the participation in the private domains of the facility.

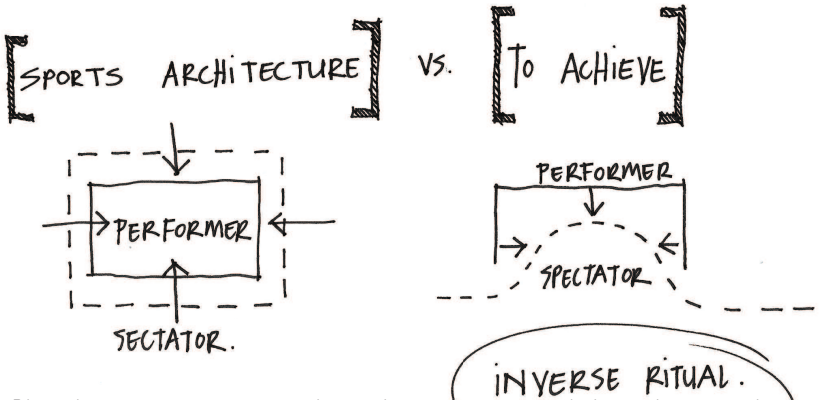
Self-orientation needs to be possible throughout the design. The extensive programme, as seen in some examples, requires up to three receptionists to guide the user through the facility, which is not necessarily the correct solution. One should rather try to create a central gathering point to control access and allow participants to be guided through the building from there onwards.



The participant's movement is considered more important than vehicular routes and is thus protected at all times. If vehicular routes prohibit safe pedestrian movement, a secondary route is provided for vehicles to maintain the direct access between the participants and the sport fields. Parking availability is usually a problem, especially during sport seasons when injuries also occur more often. Parking nearby is also needed for injured athletes or athletes with disabilities. Pedestrian ramps, disabled parking close by, ambulance drop-off, loading zones, even floor surfaces, hand rails, etc. should be incorporated into the design from the start.

Bold forms and heavy structures are usually identifiable in the typology. This does not mean that the material choice and structural composition cannot be questioned. Up to four or five floor levels are usually needed to accommodate the excessive building programmes. Double volumes and mezzanine floors are very important to facilitate a relationship between sport activities and aspiring athletes. These mezzanine levels accommodate for specific views of sport facilities and activities taking place. **The performer becomes the spectator as well**. Glass facades are always evident in the designs, not only for natural light, but to enable visual access to the sport fields outside, the sport fields where participants' preparation will be put to the test.





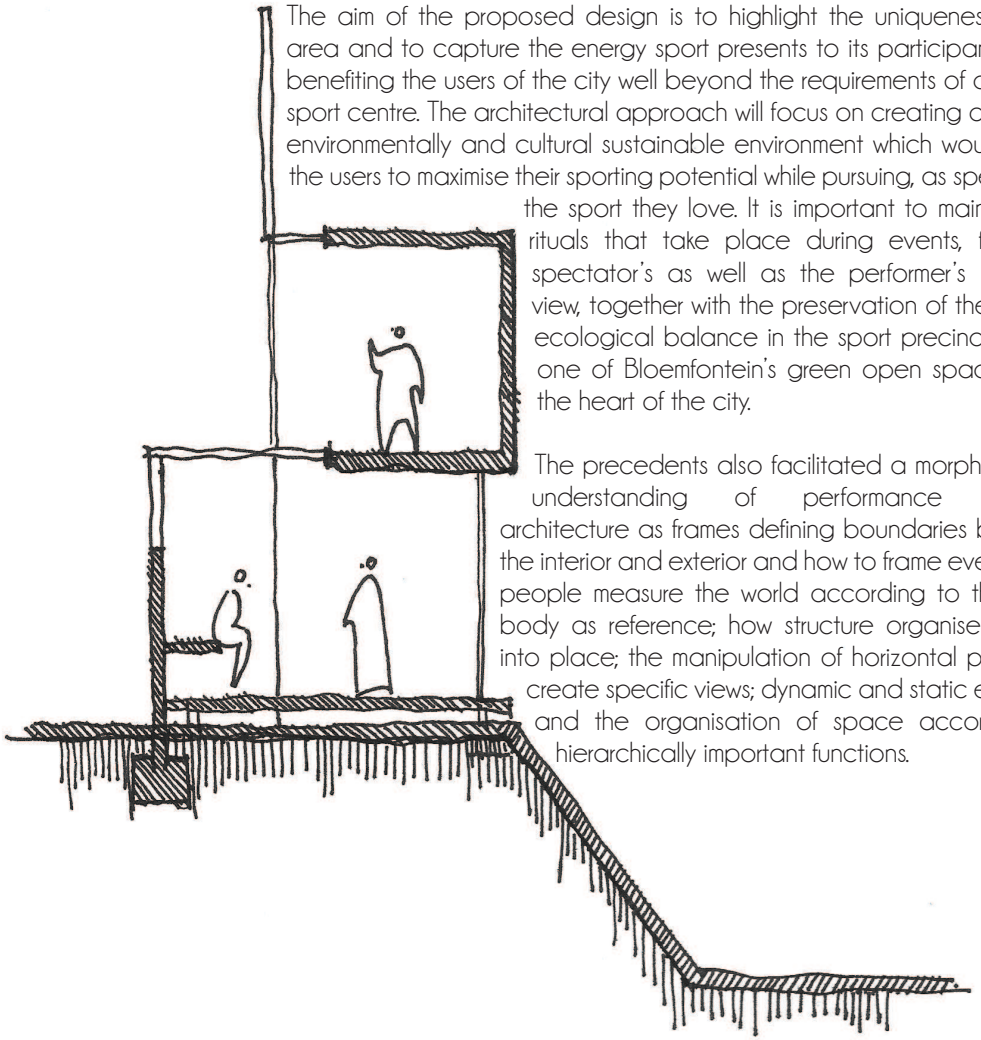
Playfulness of pure materials and textures is used throughout, such as cold, hard surfaces for endurance and soft colours and floor finishes for conditioning rooms. Each material creates a different approach to a space which reflects the activity that will take place in it. Sport does not only consist of physical fitness, but a very high psychological aspect as well. Certain routines and exercise patterns need to take place within certain spaces and at certain comfort levels. Material use, colour choice and light infall determines the success of these spaces to a great extent.

Exposed structure and pure materials are used throughout the design. Structure and the exposure of its assembly relates to the human body, its anatomy, its strength and weaknesses, its joints and its movement. With the strength in the structure, the adaptation and openness of internal spaces are possible, and are important to suit different activities. The building should accommodate multiple sport activities and should therefore be equipped with the possibility for change. This includes room sizes, ceiling heights, light infall, ventilation requirements, spectators' seating, access control and services needed. Private spaces are also needed when athletes need to meditate or participate in one-on-one sessions with trainers.

Size specifics, circulation patterns, ventilation and natural light infall, and the organisation of basic geometry to accommodate the variety of functions were the main ideas investigated. Preconceived ideas that the science of sport is only for the professional hold back participation in these centres. The medical facility can thus help to integrate private athletes with public visitors who need rehabilitation. To create awareness of the possibilities of sport lies with those already participating in it.

The aim of the proposed design is to highlight the uniqueness of the area and to capture the energy sport presents to its participants, whilst benefiting the users of the city well beyond the requirements of a private sport centre. The architectural approach will focus on creating a healthy, environmentally and cultural sustainable environment which would allow the users to maximise their sporting potential while pursuing, as spectators, the sport they love. It is important to maintain the rituals that take place during events, from the spectator's as well as the performer's point of view, together with the preservation of the natural ecological balance in the sport precinct, as it is one of Bloemfontein's green open spaces near the heart of the city.

The precedents also facilitated a morphological understanding of performance spaces: architecture as frames defining boundaries between the interior and exterior and how to frame events; how people measure the world according to their own body as reference; how structure organises space into place; the manipulation of horizontal planes to create specific views; dynamic and static elements; and the organisation of space according to hierarchically important functions.



120 ATHLETES
44 STAFF MEMBERS
60 MAX SEMINAR ROOM

BUILDING PROGRAMME

GROUND FLOOR

MAIN BUILDING

Medical and rehabilitation facilities, sport science, gymnasium, multipurpose sports hall

Medical facilities	**648**	Total
Foyer / Waiting area / Circulation	278	
Shop / Juice bar	90	
Reception	60	
File room / Server	32	
Consultation room [Sports doctor]	17	
Consultation room [Physiotherapist]	34	
Medical suite / Bio testing	112	
Restrooms	25	

Hydrotherapy	**101**	Total
Hydrotherapy room	86	
Dressing room	8	
Monitoring room	7	

Multipurpose sports hall	**862**	Total
Basketball court / Volleyball	643	
Gym	67	
Locker rooms	118	
Storage	34	

Gymnasium	**332**	Total
Spinning studio / storage	77	
Multipurpose studio	125	
Cardio circuit	88	
Restrooms / Cloak rooms	42	

Child care facilities	**351**	Total
Child care room	94	
Toilet	5	
Storage	31	
Indoor shallow pool area	163	
Locker room	37	
Storage / Plant room	21	

ENTRANCE TO SWIMMING POOL

Sports hall public foyer, sports lounge, food court

Sports lounge	**242**	Total
Sports hall foyer	67	
Restrooms	47	
Lounge area / Bar	128	

Food court	**211**	Total
Juice bar	28	
Kitchen	55	
Kiosk / Ticket office	52	
Office	20	
Cold room	12	
Dry storage	17	
Toilet	5	
Refuse area	22	
Circulation	**187**	Total
TOTAL GROUND FLOOR AREA	**2934m²**	

LOWER FIRST FLOOR

Public accessible floor and partially covered

Child care facilities	**227**	Total
Seating for shallow pool	227	
Multipurpose sports hall	**413**	Total
Roof terrace	95	
Viewing deck / Pavilion	318	
Food court	**250**	Total
Concrete roof terrace	250	
TOTAL LOWER FIRST FLOOR AREA	890m²	

FIRST FLOOR

Staff floor and seminar room

Main floor	**642**	Total
Waiting area	112	
Seminar room	104	
Storage	29	
Restrooms	44	
Cleaners staff room and toilet	25	
Storage	5	
Cloak rooms	35	
Board room	37	
Mechanical put for upper floor endless pool	63	
Staff lounge / Kitchenette	47	
Trainers computer room	29	
Office [Manager / COO]	18	
Office [Sports researcher]	36	
Office [Sports science doctor]	18	
Office [Dietitian]	18	
Roof terrace	22	
Circulation	**255**	Total
TOTAL FIRST FLOOR AREA	897m²	

SECOND FLOOR

Exercise and gymnasium area

Main floor	**1364**	Total
Training open area	409	
Equipment storage	17	
Restrooms	30	
Female cloak room and sauna	40	
Male cloak room and sauna	42	
Lockers	9	
160m Running / 60m Sprint track	**817**	
Sport science	**329**	Total
Bio studio / Testing	47	
Conditioning track	200	
Endless pool	82	
Circulation	**212**	Total
TOTAL SECOND FLOOR AREA	1905m²	



TOTAL FLOOR AREA 6626m²

EXTERIOR FACILITIES PROPOSED FOR PUBLIC PARTICIPATION:

Runners lane
Bicycle lane
Seating | Public pavilions for the pedestrian spectator
Public sports living room
Public gym | Exercise park
Play ground | Sports jungle gym
Bus stop | Bicycle stop
Climbing wall

Figure 45 - An example of outdoor equipment proposed for the public gym. These equipment uses the participant's own weight as force against him/herself. Thus lifting one's own weight, free exercise and outdoor entertainment is provided.

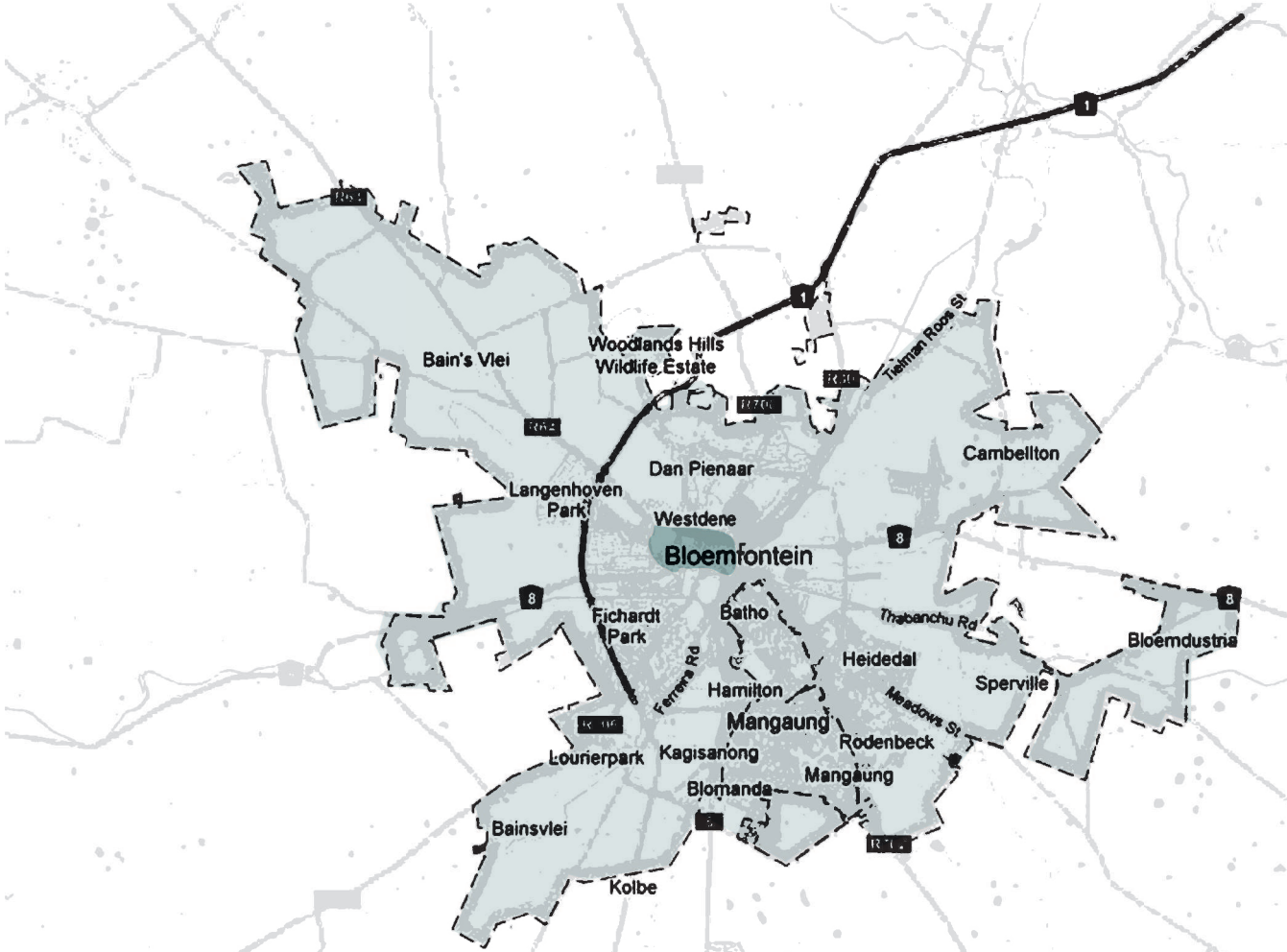


Figure 46 - Adjusted map of the boundary of Bloemfontein.

[SITE ANALYSIS]

2.2 topology

This chapter presents an analysis on the macro, meso and micro context of the proposed project. The concrete site investigation forms part of a *quantitative* site analysis, which is then further interpreted with an experiential understanding of the phenomena of the site, that is, the *qualitative* analysis (cognitive site interpretation). The experience of the site is then represented through three conceptual interpretations which are also divided into a macro, meso and micro understanding.

QUANTITATIVE ANALYSIS

The quantitative site study involved analysing the current situations of the proposed site on a macro, meso and micro level, as well as a historical element of Bloemfontein and future development plans.

This dissertation proposes a Sport Performance Centre for Bloemfontein, the capital of the Free State province. As one of South Africa's three national capitals (the other two being Cape Town and Pretoria) Bloemfontein is the only main city without a publicly accessible high performance sport institute to accommodate the region's athletes. With the existing sport precinct and all the necessary facilities needed in place, Bloemfontein presented the perfect host for a world-class training facility.

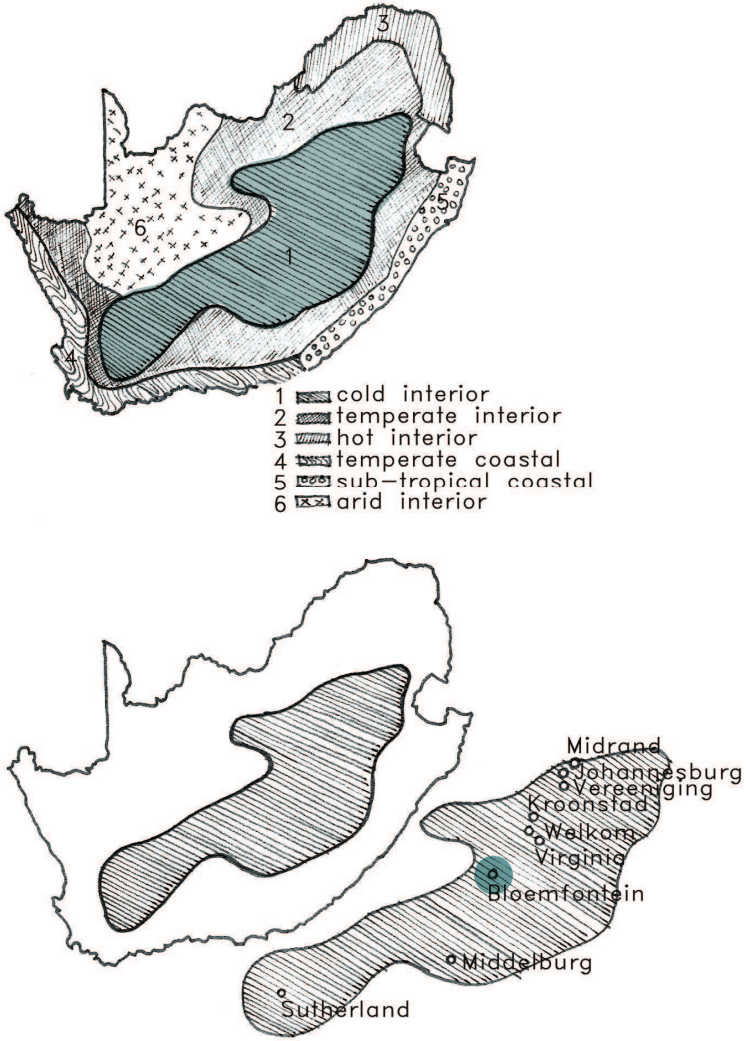


Figure 47, 48 - Bloemfontein climate zone (Adapted from Muller, 2013: 104).

CLIMATE

Bloemfontein is categorised under the **cold interior climatic zone** (1), according to SANS 204, a condition which needs to be incorporated in design considerations (see *sustainable considerations* - part 2, tectonics). Bloemfontein is thus characterised by certain aspects such as low humidity, high diurnal range, four distinct seasons (with summer and winter exceeding the human comfort range), cold to very cold winters and hot summers with rainfall (Muller, 2013: 105).

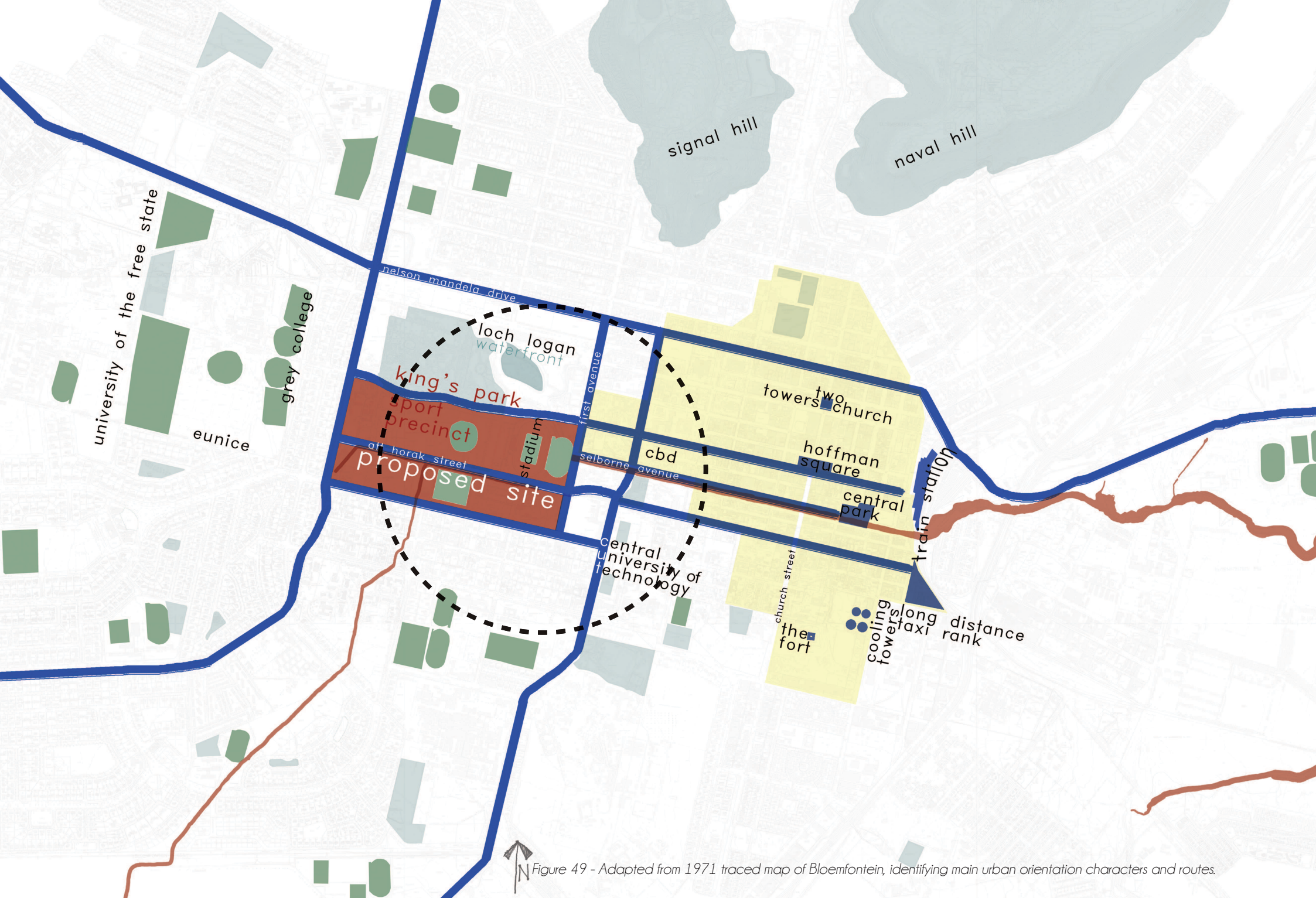
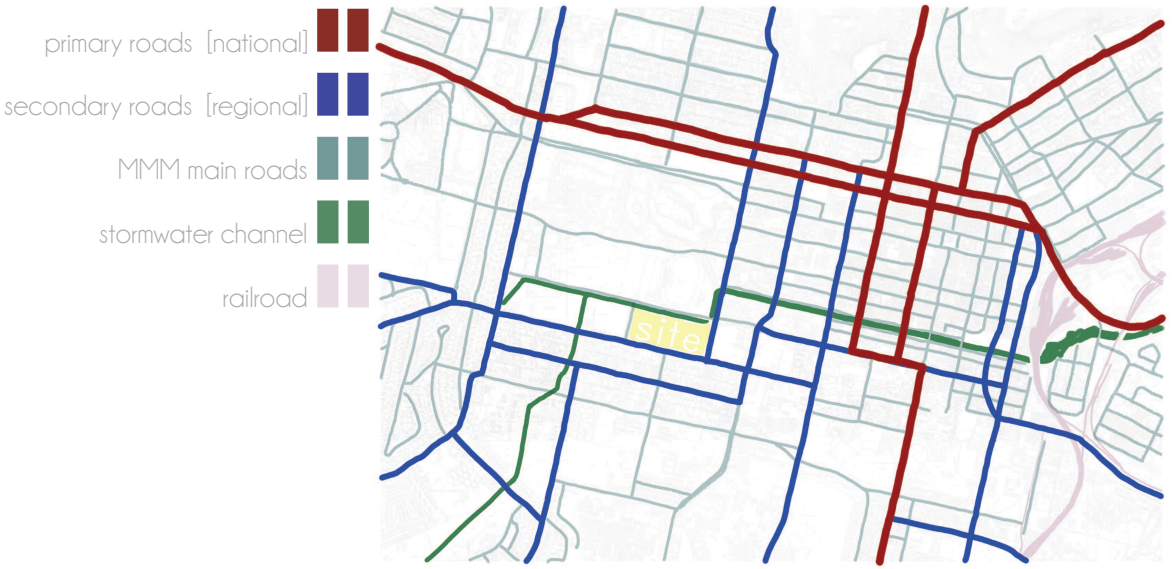


Figure 49 - Adapted from 1971 traced map of Bloemfontein, identifying main urban orientation characters and routes.

GRID LAYOUT + BLOCK SHAPES, SIZES



STREET NETWORKS

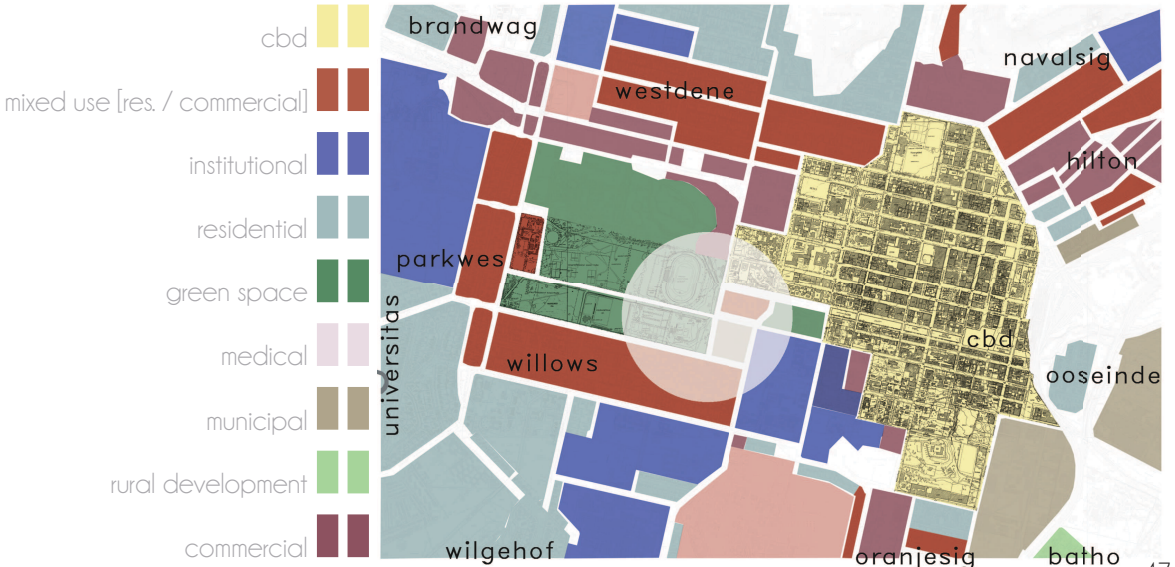


[MACRO CONTEXT]

The urban grid layout, main connection routes, the variation of zones, and the proposed site within its urban environment are the main focus and investigated here on a macro level analysis. The site has an important, but opposing, relationship to the edge of the CBD across a main network route (First Avenue). It has also the unique opportunity within its diverse surroundings (see figure # to the right) of green areas and sport structures to the north and west, commercial and residential activities to the south, and with municipal and institutional developments to the east.

Referring to figure #; the location of green areas (presented in blue) and sport fields (in green) are identified within the wider urban fabric. The stormwater channel (in red) forms an important site orientation element, making its way through the central business district. Important urban nodes are also identified in Bloemfontein for further orientation of the proposed site for the dissertation.

ZONING + DISTRICTS



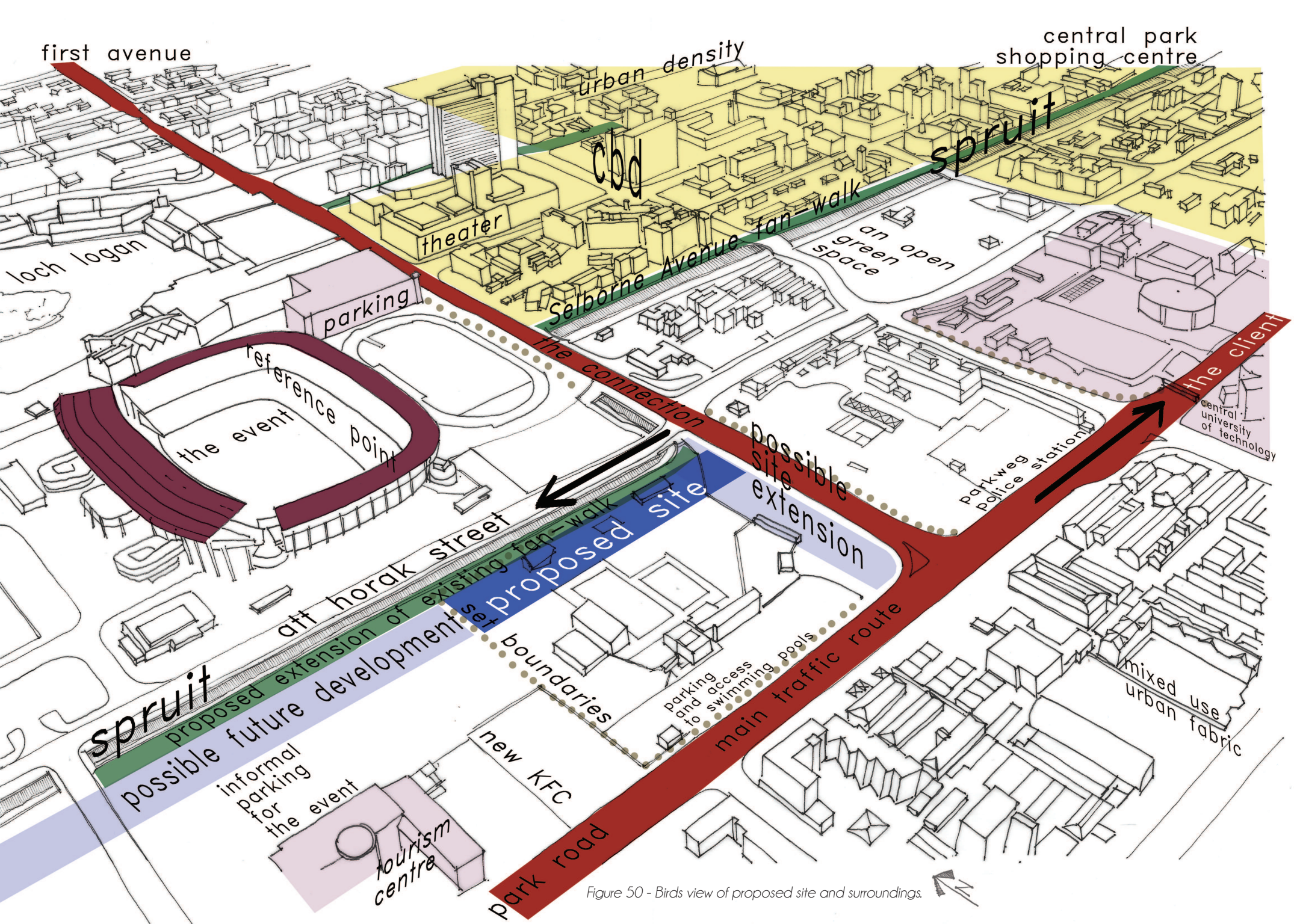


Figure 50 - Birds view of proposed site and surroundings.

Bloemfontein's Sport Precinct consists of vast open spaces for sport activities with only a few built structures on the sidelines. During preparation days, usually during the week, or during off-season months, the precinct is barely used with only a few cars passing through Att Horak Street precisely because of the quiet shorter route it provides.

[SITE RATIONALE]

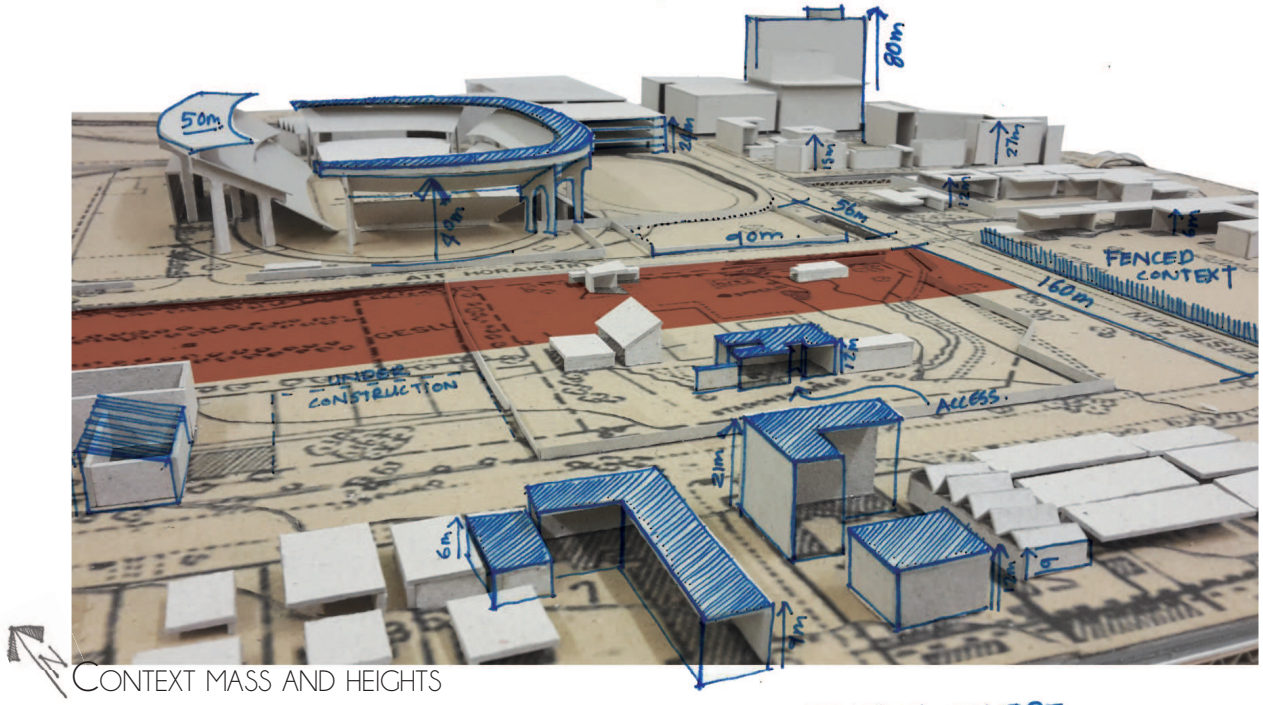
In the event of a privately organised athletics meet, Bloemfontein Celtic taking on the Kaizer Chiefs, or the Free State Cheetahs defending their honour on their home ground, the sports precinct becomes flooded with fans, vehicles and ritual activities before, during and after the event takes place. During these events, parking becomes a huge problem since every vacant piece of land near the stadium becomes occupied and normal traffic and pedestrian flow are hampered.

On a daily basis, CUT is the source of a high flow of pedestrians passing by and through the precinct to reach different destinations such as the Loch Logan Waterfront shopping mall, the tourism centre, Bloemfontein Central, the Willows residential area, etc. Bloemfontein's identifiable stormwater channel (locally known as the *spruit*) also accompanies Att Horak Street, creating an exposed bend on the corner with First Avenue, located further along Selborne Avenue where the existing fan-walk is found. This fan-walk was built for the 2010 FIFA World Cup and is still not quite utilised today. The fan-walk starts at Central Park shopping centre (with its bus terminal on the roof), located in Oos Burger Street, and stretches all the way to the athletics stadium in First Avenue. This pedestrian walkway was built over one lane's width, leaving the other lane for a one-way vehicular road. The walkway is built next to the *spruit*, consisting of designed pavement patterns, a line of trees, steel benches and colourful painted concrete spheres placed as a barrier between the walkway and the road, all of which became part of the urban corridor of 2010.

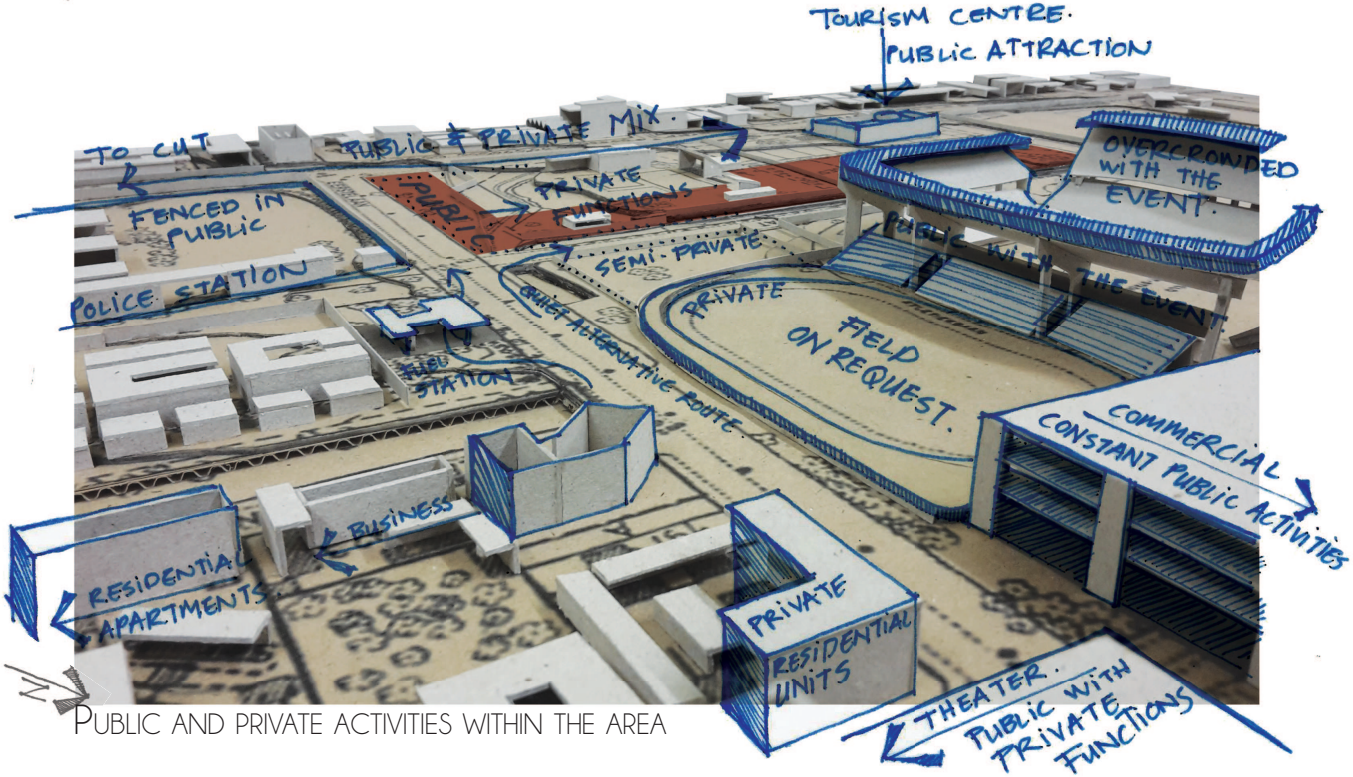
The sudden end point of the fan-walk in First Avenue is the first problem this dissertation needs to address. This problem also gave rise to the idea to activate the sports precinct, because the whole purpose of a fan-walk is to gather the spectators and lead them towards the game – precisely what is not achieved here due to the lack of a safe crossing and guidance into the precinct. To compound the problem, the sport facilities remain barely used because of high fences and brick walls. Strong barriers separate the performer from the spectator, while the goal should be to allow more spectators to enjoy the activities. Currently, the passers-by are prevented from experiencing the activities. In order to develop curiosity and encourage participation, a few viewpoints should be created in order to create awareness of sport.

The precinct is located on the edge of the CBD of Bloemfontein, no presenting a great deal of urban mass to respond to. Consisting of a huge rugby stadium and a few scattered pavilions, the morphology of the site presents a very uncomfortable scale to identify with. The design should incorporate a public interface to allow the user to feel more comfortable in participating in a new sport or exercise activity. The arrival design is crucial and needs to ease the transition from participants' public interactions to the centre's interior.

All the sport facilities are accessed from Att Horak Street, except the Municipal Swimming Pools, whose entrance gate is in Park Road. This necessitated a new entrance and public approach for the swimming pools from Att Horak Street, across the *spruit*, creating a better link with the athletics tracks. To create a bridge over the *spuit* is not unusual in this context because it would be used to reach other activities across the *spruit* in Att Horak Street. To integrate the multiple activities, the Sport Centre will extend across the harsh concrete boundary of the *spruit* to engage public interaction. The design thus works towards a north-south oriented linear extension along the *spruit*, opening up to Att Horak Street. The Sport Centre will not directly engage in Park Road and its commercial/ residential use, but will still allow accessed to be gained from all existing roads around the precinct.



CONTEXT MASS AND HEIGHTS



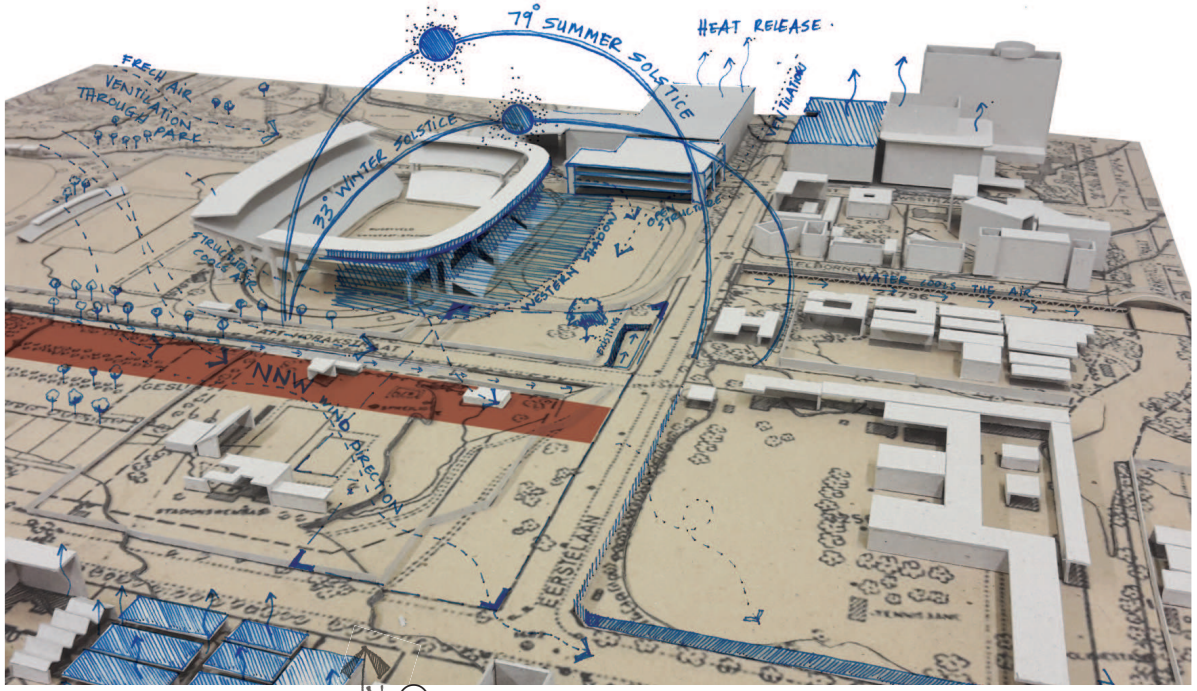
PUBLIC AND PRIVATE ACTIVITIES WITHIN THE AREA

[MESO CONTEXT]

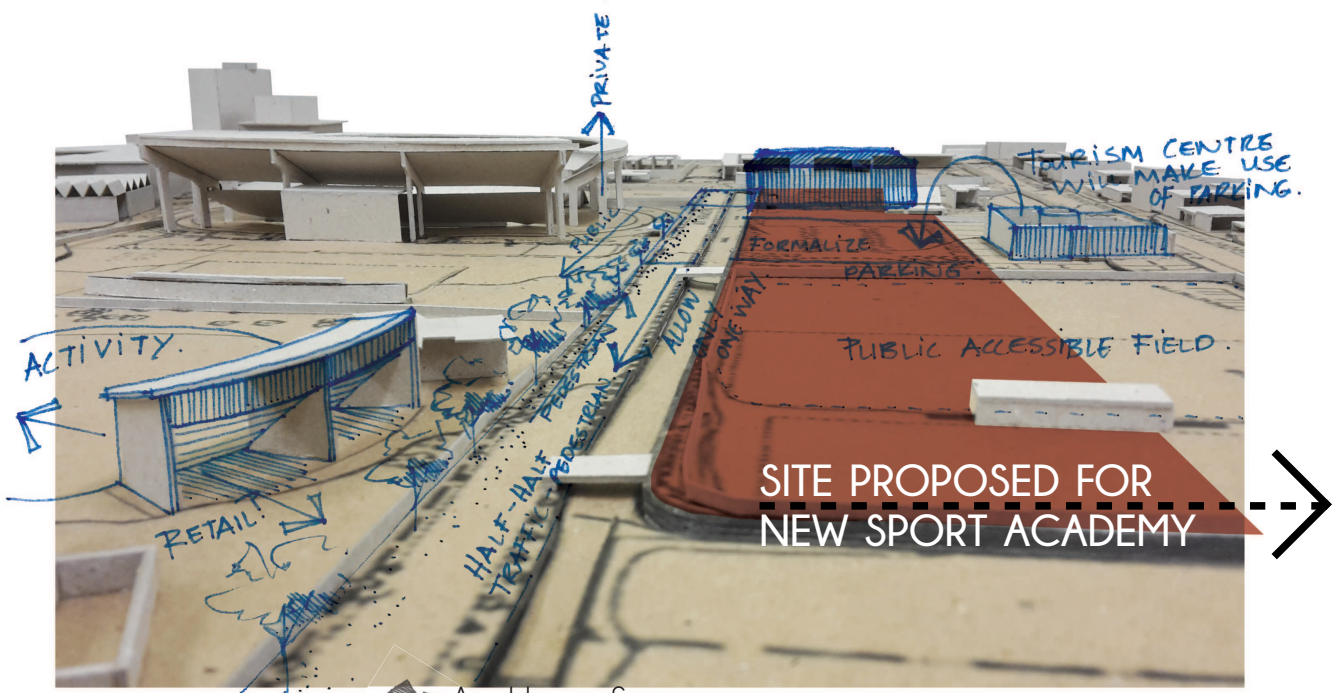
The meso site analysis involved the gathering of information regarding the sport precinct and its bordering context. This allowed an understanding of the area to help with specific site location decisions. The corner of Att Horak Street and First Avenue remained the optimal position for intervention. Connecting to the busy First Avenue, Att Horak Street should benefit from this, but the street remains underused. A lot of pedestrian activity is present due to the close situated Central University of Technology, but the activity remains within First avenue without accessing the sport precinct. As green environment, the precinct provides ideal opportunities for outdoor activities and social gatherings, but is only occupied when a big sporting event is organised.

Future development

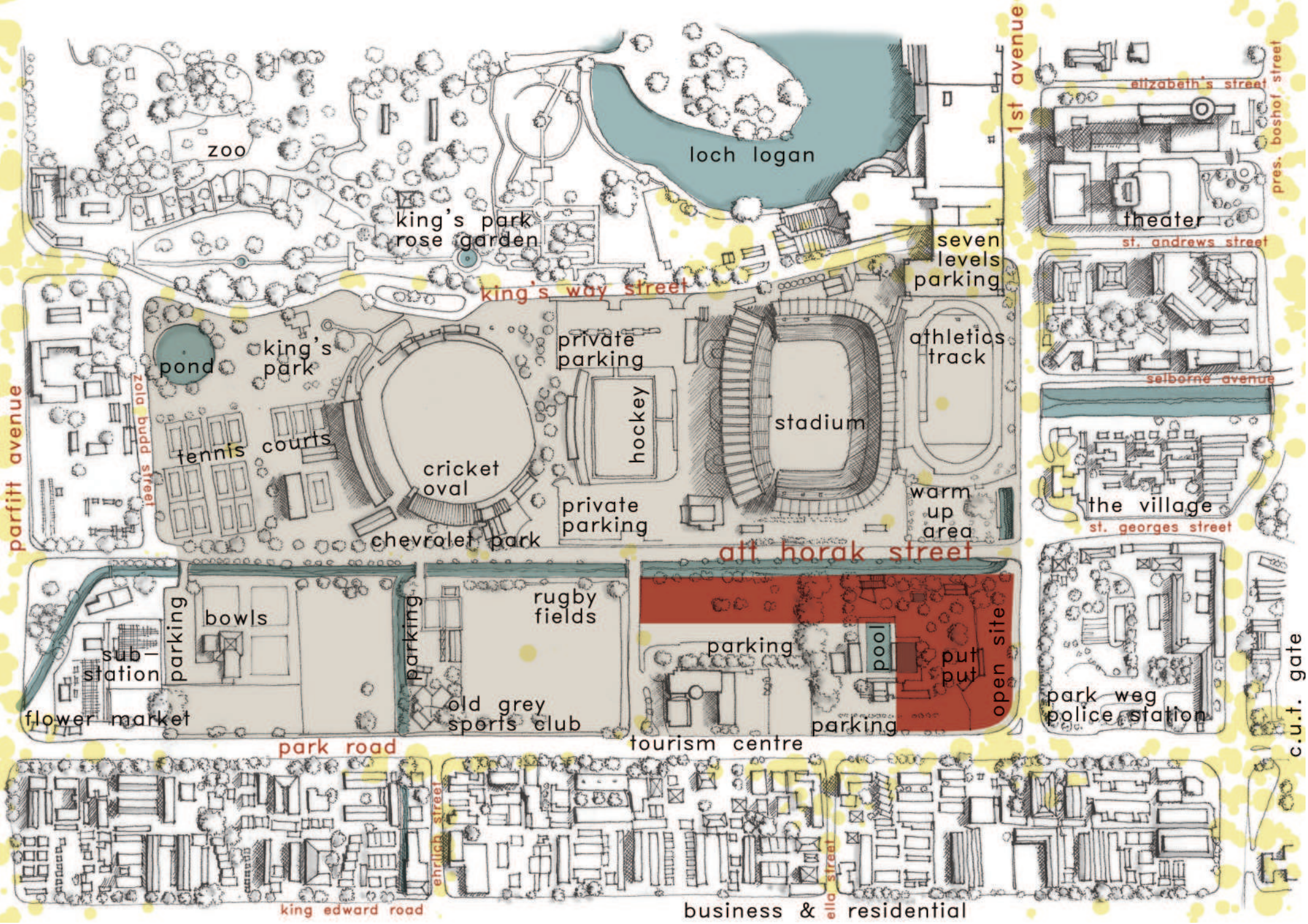
On the fourth of May 2015, the local newspaper, *Volksblad*, announced that Bloemfontein is receiving its own Sports Academy. Not only does this show the need for these facilities in Bloemfontein, but the academy will be located within the existing sport precinct. According to the news report, the academy will include up to 300 living units for athletes who are interested in competing in sports such as rugby, soccer, cricket and tennis. The academy will also incorporate an institute for higher education with sport-related programmes, short courses and degrees (Gericke, 2015: 1). The location of the academy is said to be next to the Old-Grey Sports club, across the cricket oval (Chevrolet Park). In light of this prospect, the proposed Sport Performance Centre will benefit greatly from a sport academy, considering that it will provide more users for the facilities and activate the area.



N Orientation; wind over site and sun solstice



Z Att Horak Street with proposed pedestrian route


zoo
loch logan
king's park
rose garden
1st avenue
elizabeth's street
pres. boshof street
theater
st. andrews street
seven
levels
parking
king's way street
pond
king's
park
private
parking
athletics
track
selborne avenue
parfitt avenue
zola budd street
tennis courts
cricket
oval
hockey
stadium
the village
st. georges street
private
parking
warm
up
area
chevrolet park
att horak street
bowls
rugby
fields
parking
parking
sub
station
parking
pool
put
put
open site
park weg
police station
c.u.t. gate
flower market
old grey
sports club
park road
tourism centre
parking
ehrlich street
ella street
king edward road
business & residential

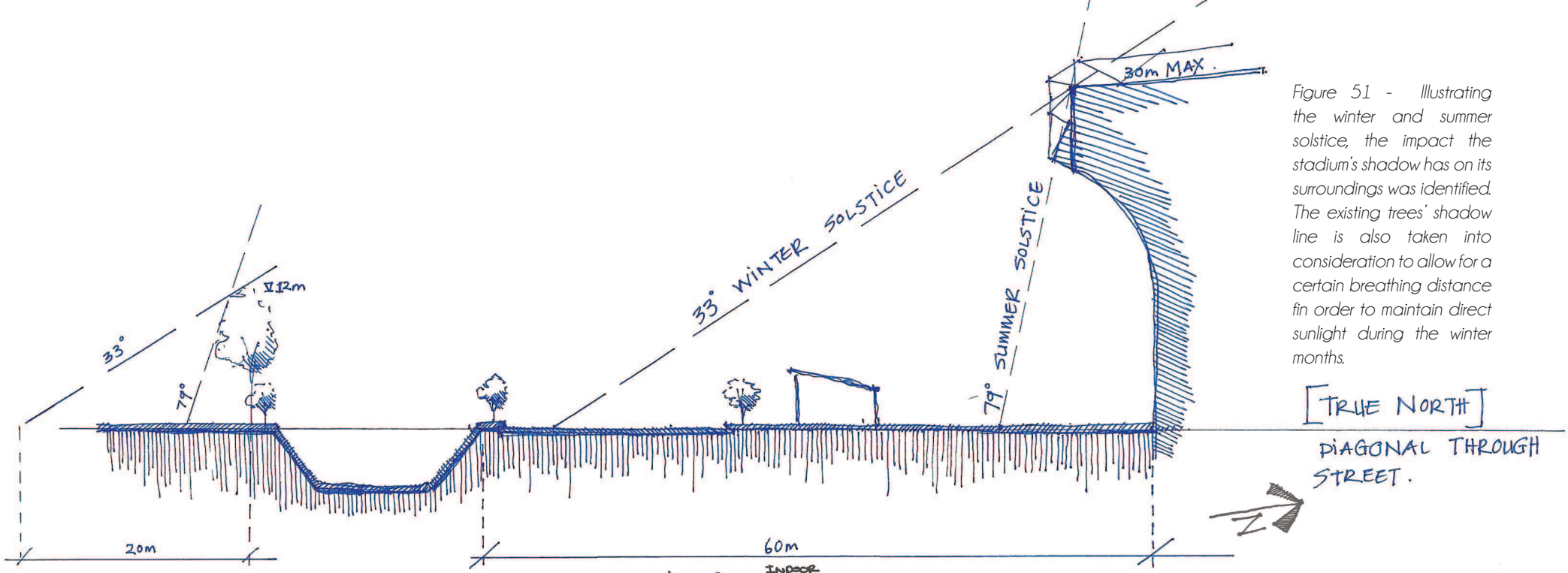


Figure 51 - Illustrating the winter and summer solstice, the impact the stadium's shadow has on its surroundings was identified. The existing trees' shadow line is also taken into consideration to allow for a certain breathing distance fin order to maintain direct sunlight during the winter months.

Access to the existing sport facilities is strictly controlled: they are only to be used by professional sport teams or by appointment by schools/ universities/sport organisations, purposefully closing off the facilities for public participation. Within the precinct's central/commercial/institutional location, the interface between the facilities and the public needs to be addressed. The existing outdoor facilities comprise the Free State Stadium (formerly known as Vodacom Park), an athletics track, a four-lane 60m tartan track in the warm-up area, three rugby fields, an Astro turf hockey field (not in use), a cricket oval (Chevrolet Park), an Olympic swimming pool, a diving pool, a putt-putt course, three bowls courts, sixteen tennis courts and two netball courts.

These facilities do not accommodate for open public participation. Playing fields within sport grounds provide open spaces for direct active activities within an urban framework. These open spaces are important for improving physical health, on a weekly basis, but only to those who participate (Woolley, 2003: 74).

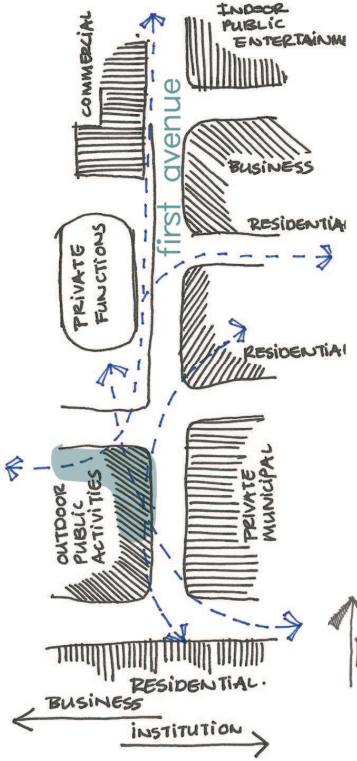
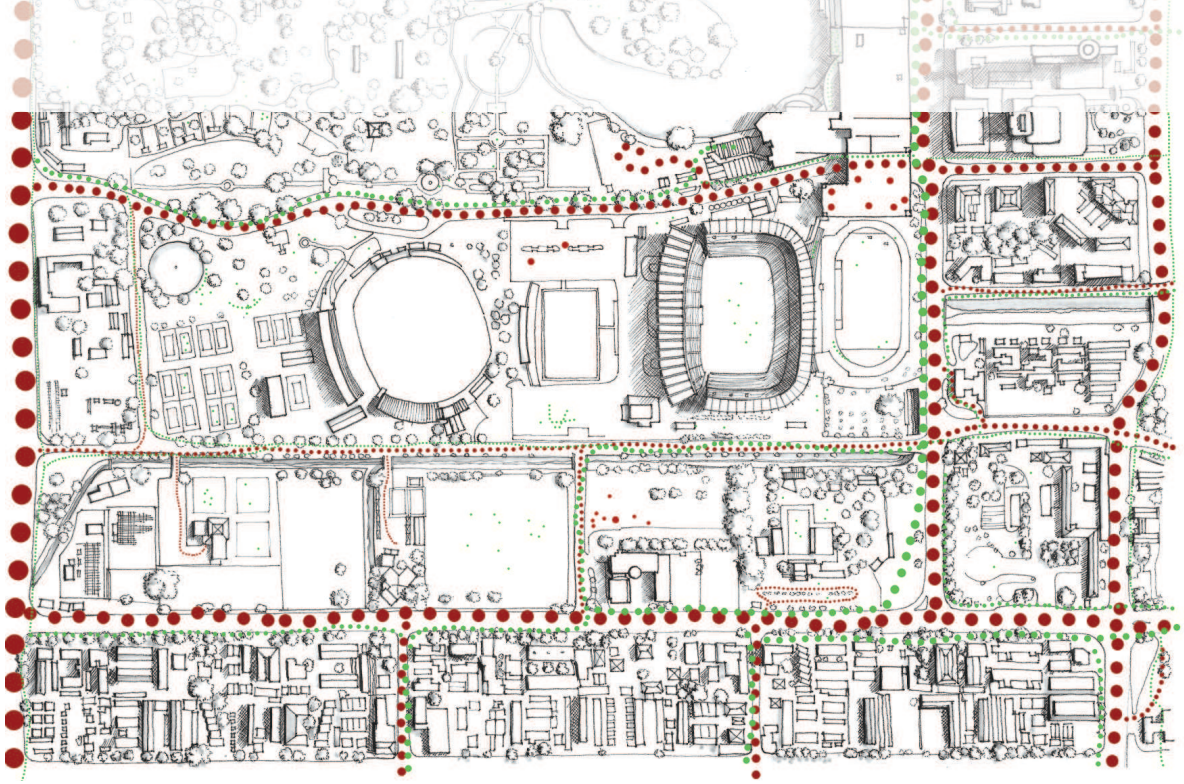


Figure 52 - Illustrating all the different zones involved with the corner site proposed for the project.





The image above illustrates the daily activities of Att Horak Street, while the next page shows how drastically these activities change and how quick the site can be (over)populated when a sporting event takes place.

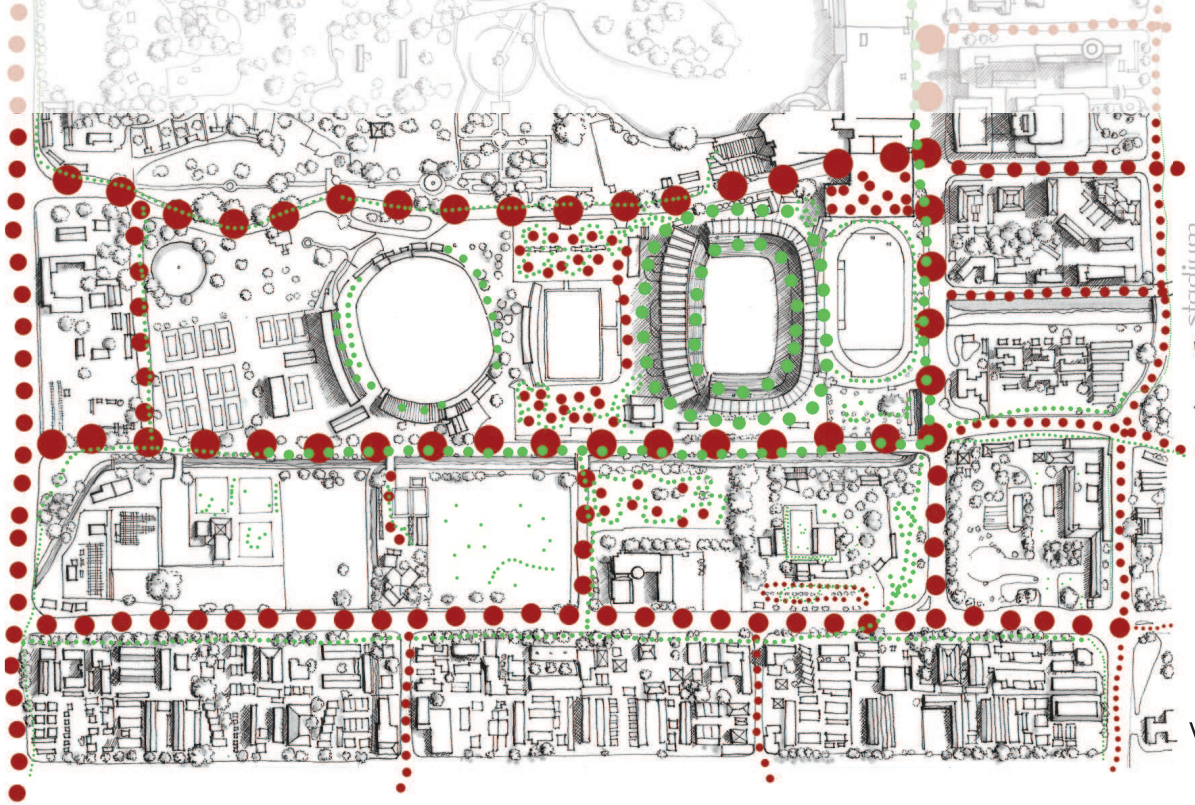
Vehicular activity **on a daily basis**

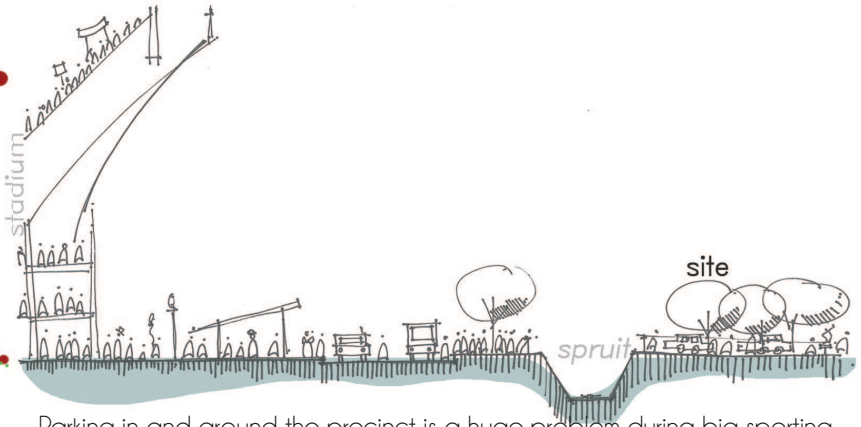
Att Horak St. quiet; at the entrance of the stadium and athletics track



Corner of Att Horak St. and First Ave.







Parking in and around the precinct is a huge problem during big sporting events. Every parking space is occupied in Att Horak Street and its surroundings. The streets overflow with hooting cars, bumper to bumper, trying to find parking in time. When the Free State stadium hosts an event, Att Horak Street is partially closed off with temporary barriers to handle the crowds of pedestrian flow and to control (paid) access to the facility.

VEHICULAR ACTIVITY **DURING AN** EVENT

A VIBRANT ATT HORAK ST.; AT THE ENTRANCE OF THE STADIUM DURING A RUGBY MATCH

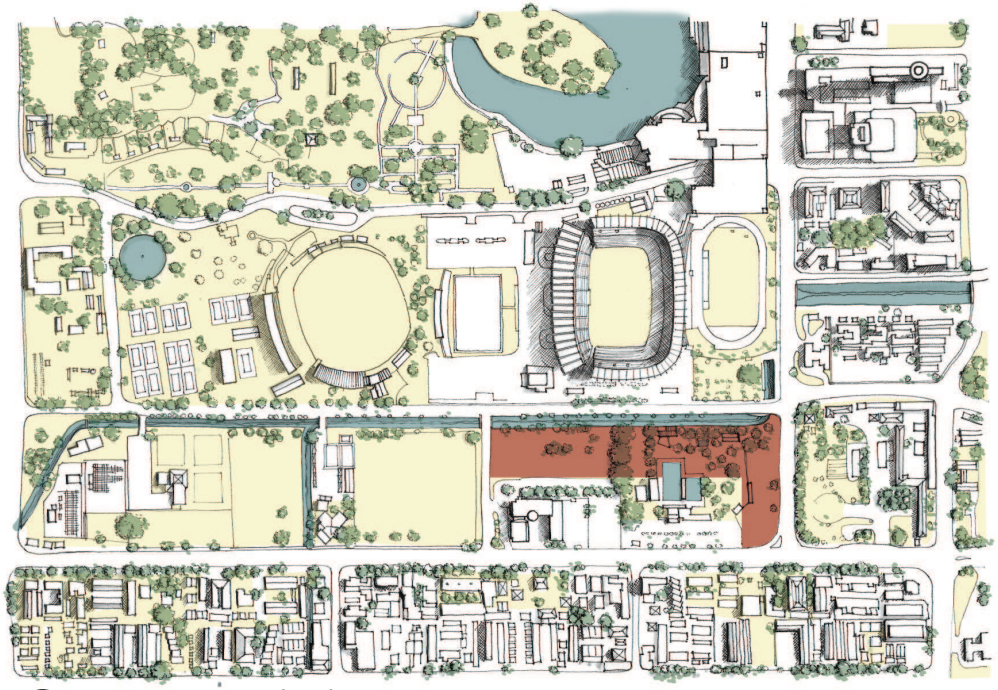


BUSY CNR. OF ATT HORAK ST. AND FIRST AV. DURING A SOCCER MATCH

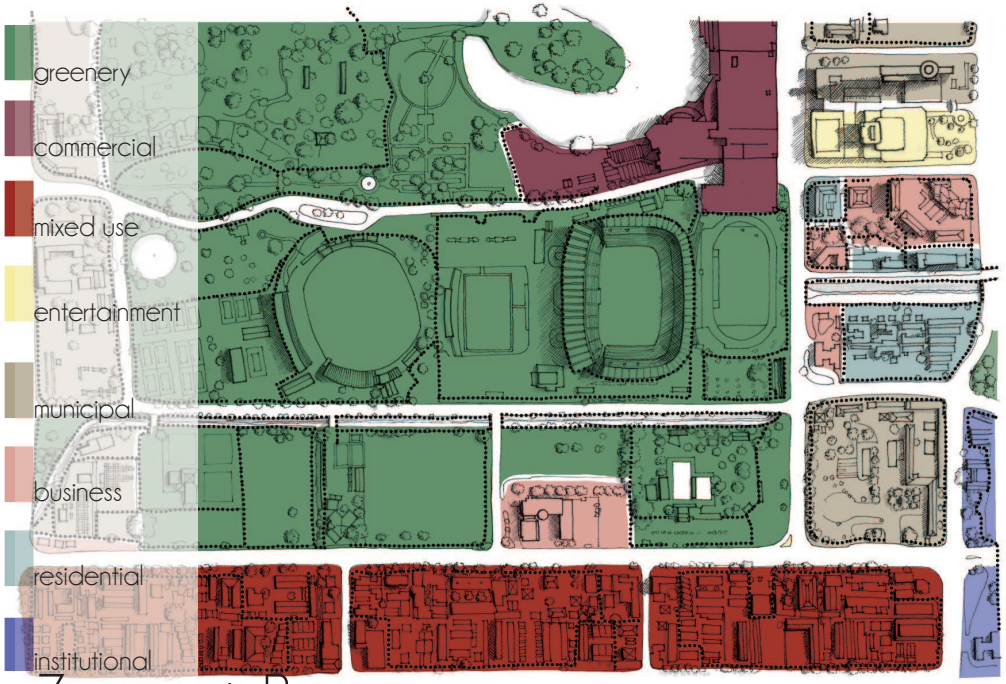




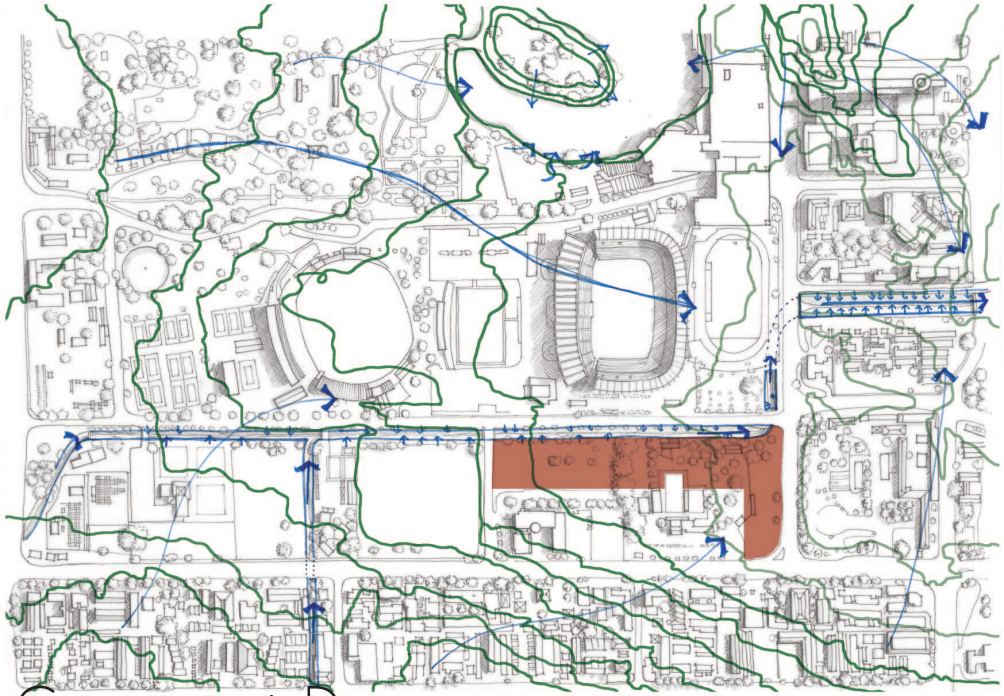
NOLLI DIAGRAM



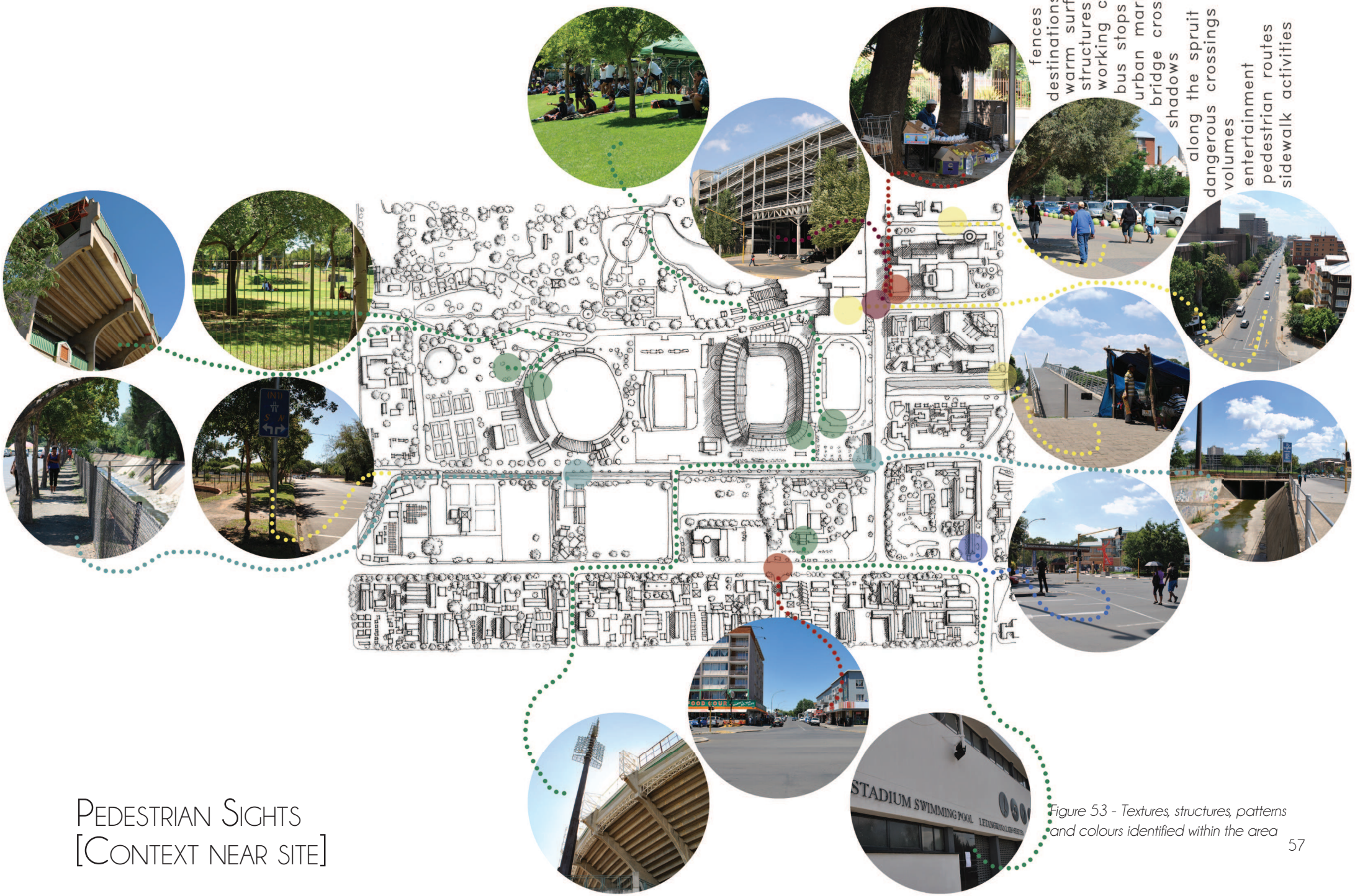
GREENERY + WATER BODIES



ZONING + BOUNDARIES



CONTOURS + DRAINAGE



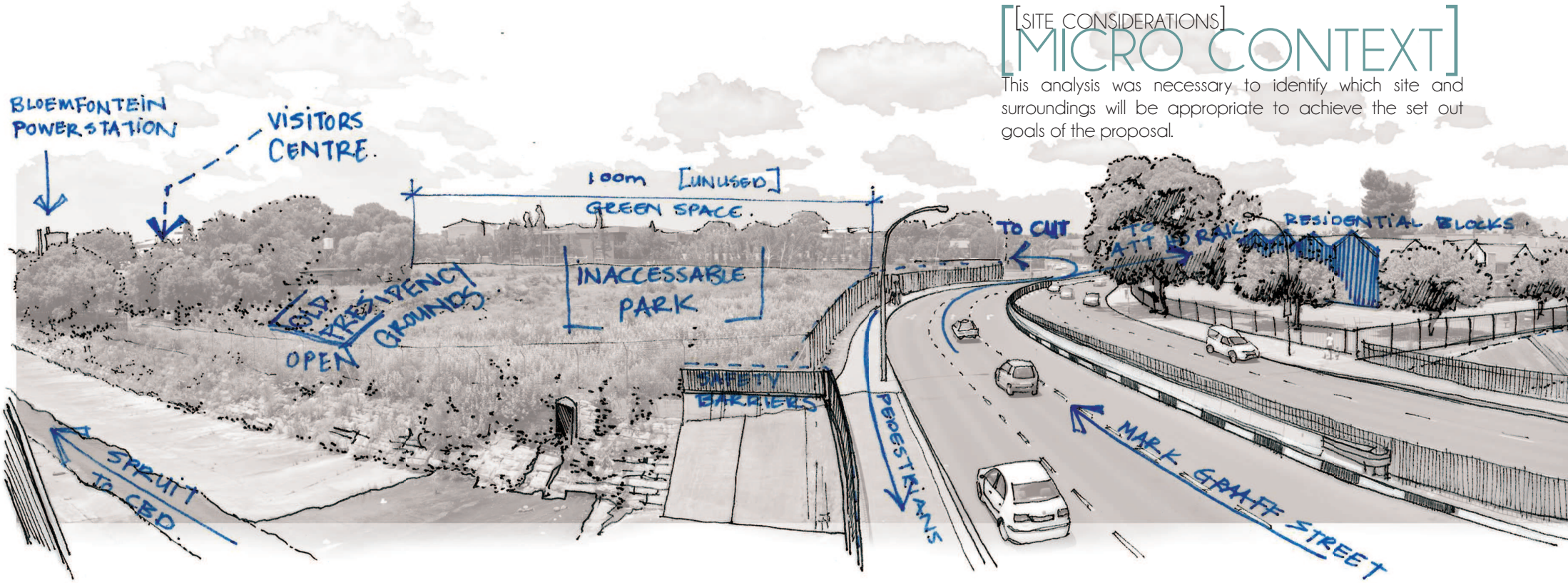
Pedestrian Sights [Context near site]

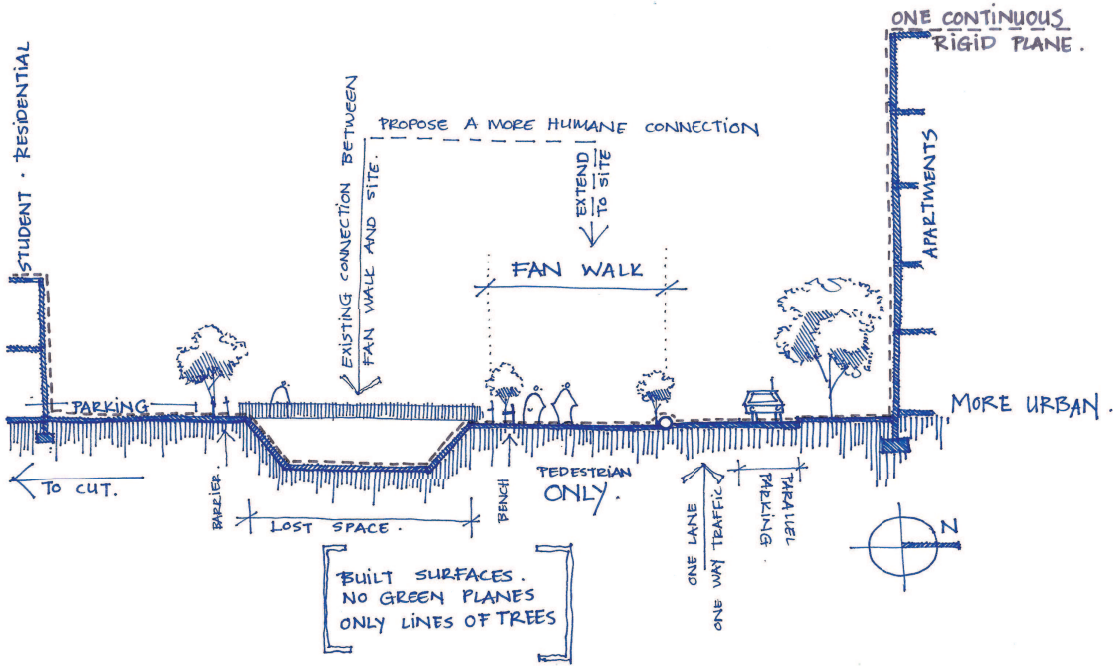
Figure 53 - Textures, structures, patterns and colours identified within the area

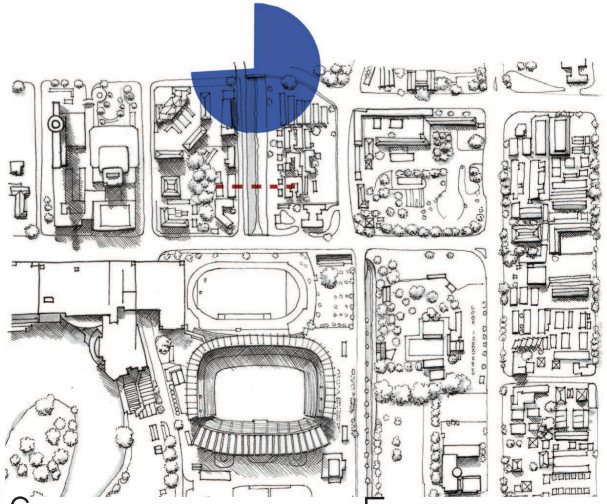
[SITE CONSIDERATIONS]

[MICRO CONTEXT]

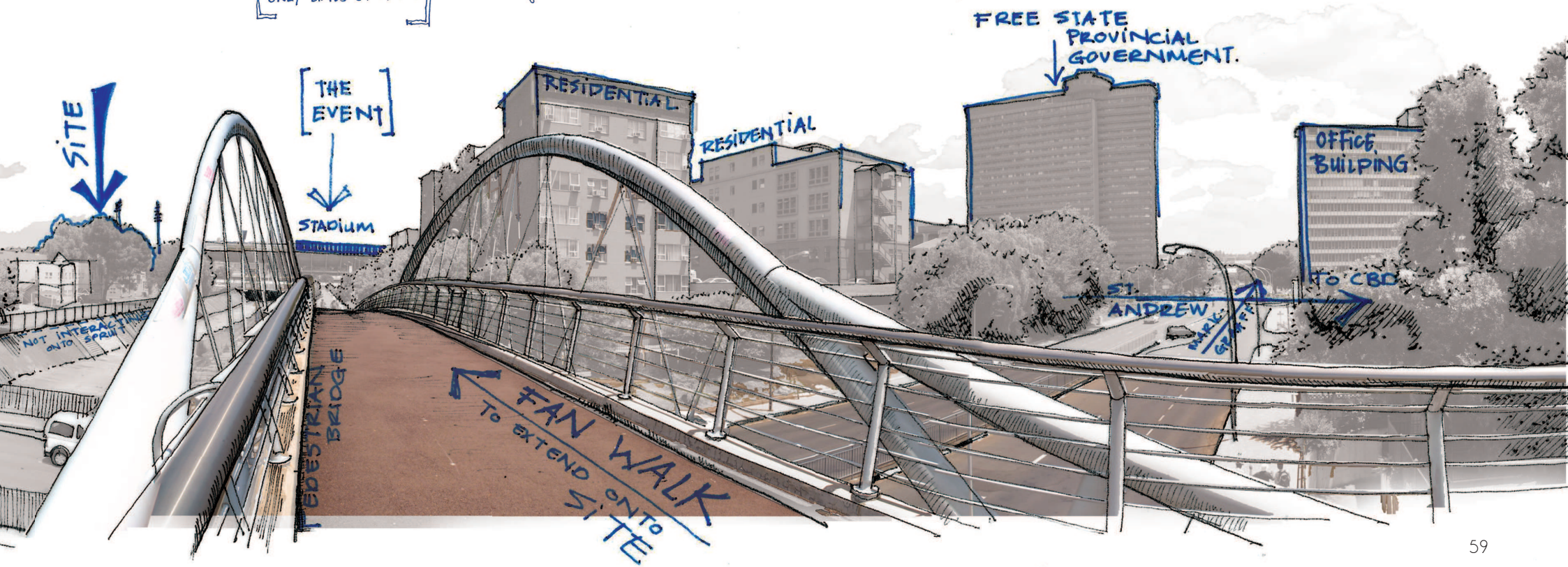
This analysis was necessary to identify which site and surroundings will be appropriate to achieve the set out goals of the proposal.





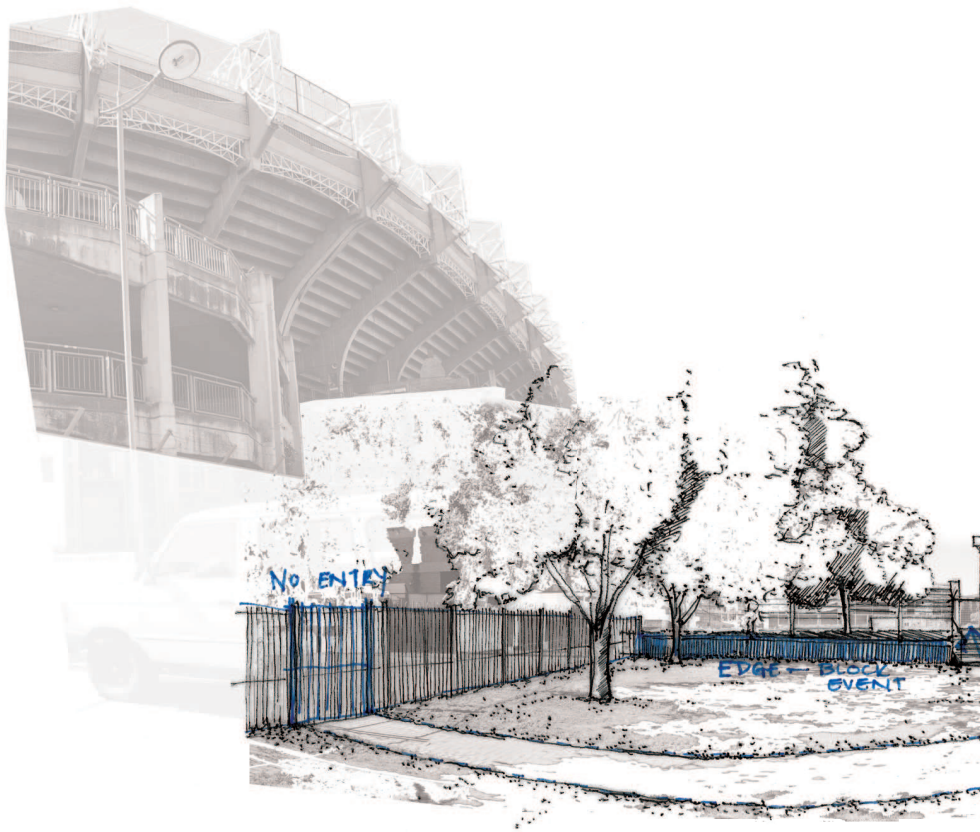


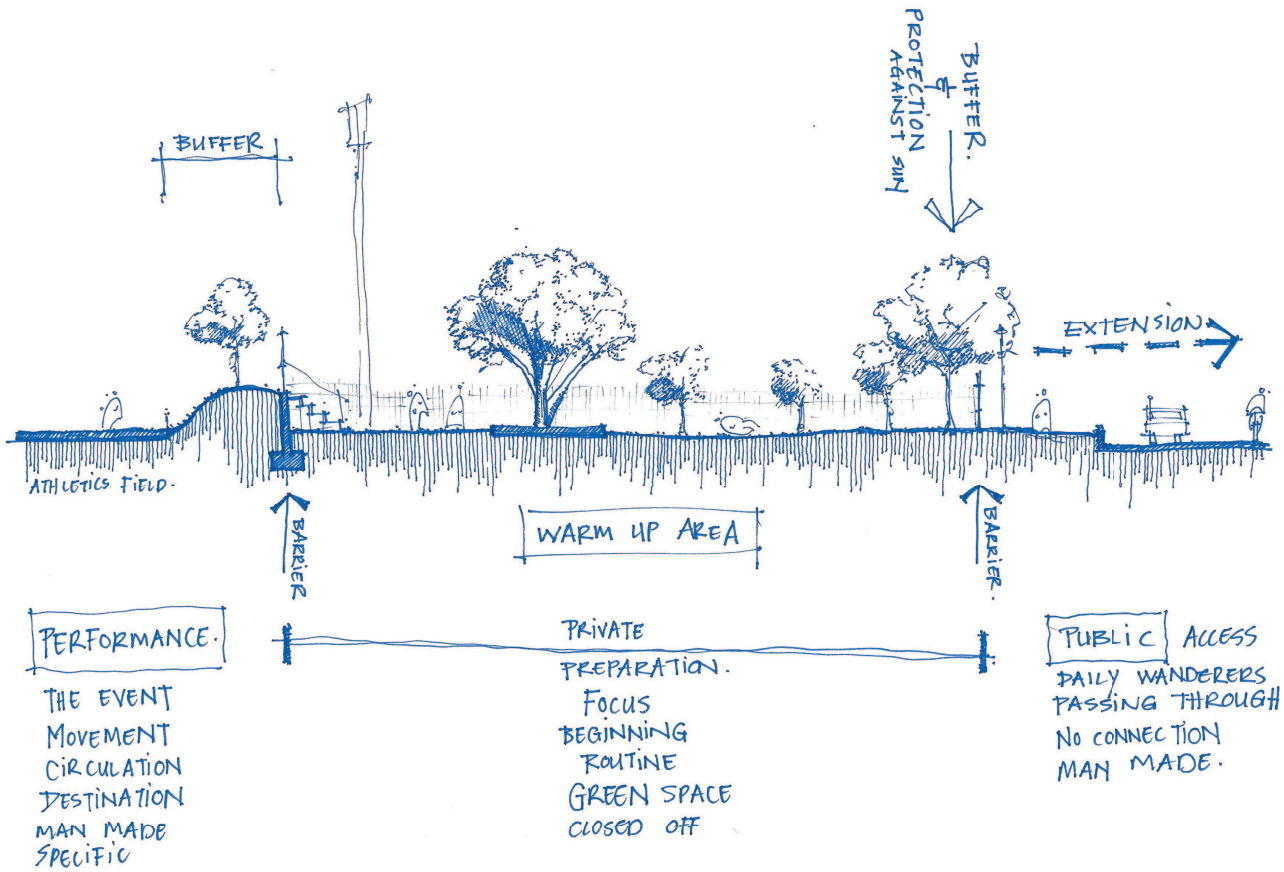
SITE APPROACH + FAN-WALK

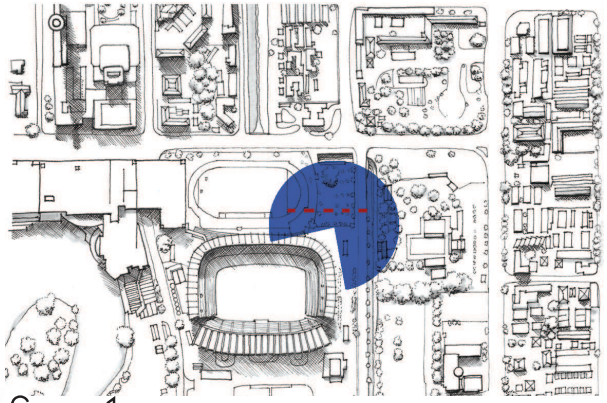


Site challenges

Size = 90m x 56m = 5 040m2
This site is in direct link with the athletics track and rugby stadium, which will work in close relation.
It is very important for the athletes to gain easy access in between outdoor exercises and specialised gym sessions.
If access is gained through the quiet Att Horak Street, how will the high traffic, during events, be handled?
Quiet site, within Att Horak Street rather than exposed to First Avenue, which is better for private activities.
Best orientation, north south exposed.
Takes away the only possible warm up area of the athletes will need to present an alternative.

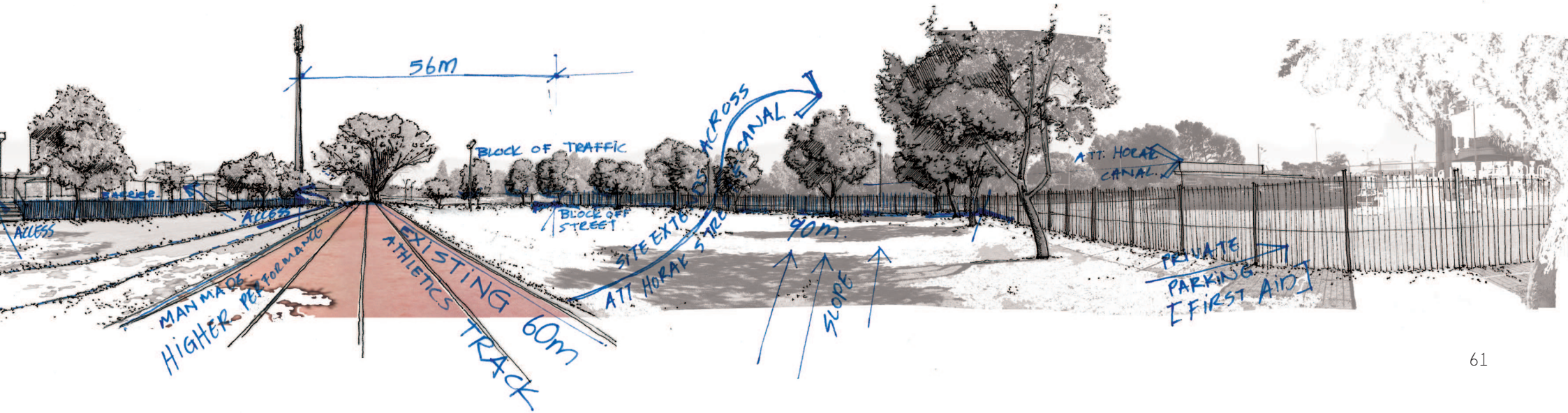


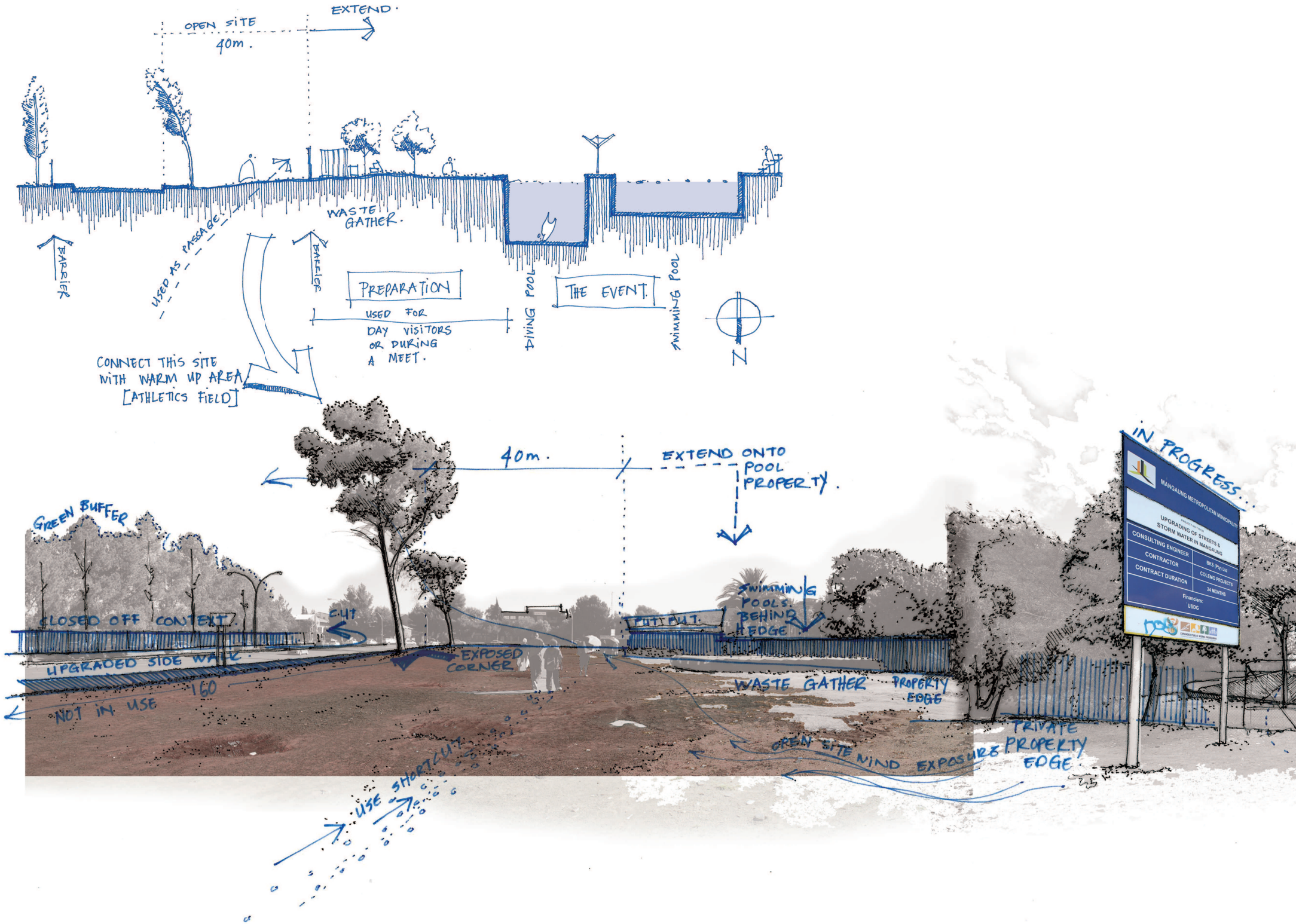


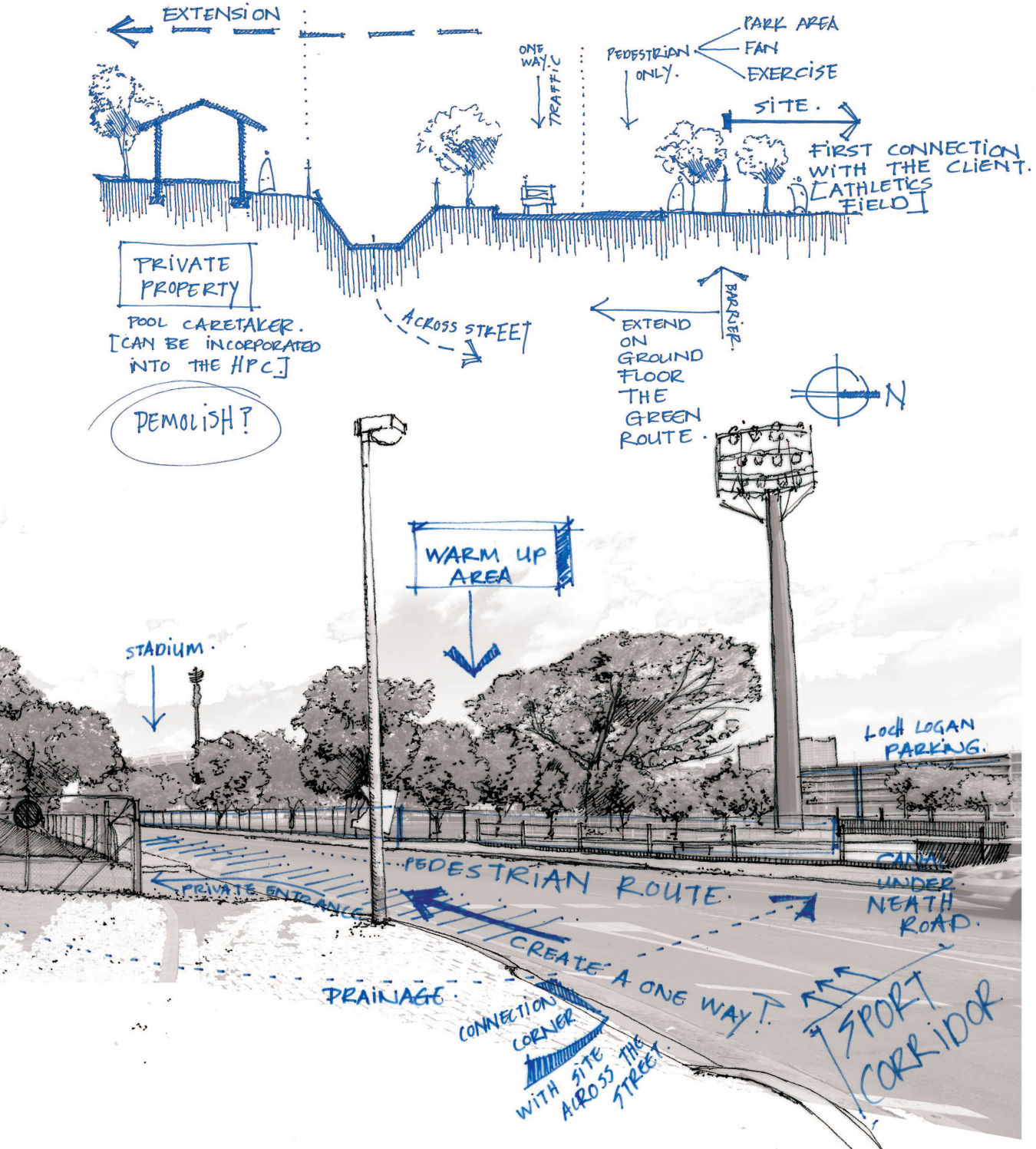


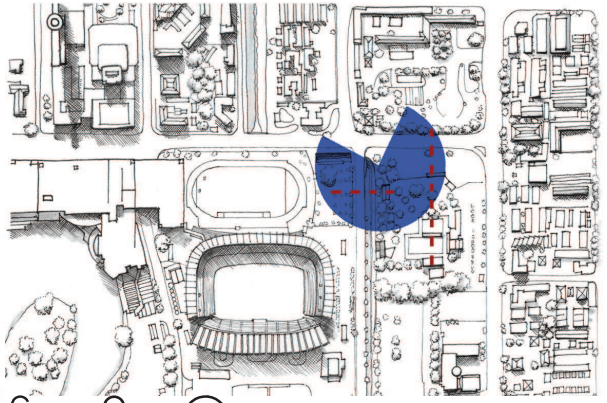
SITE 1 - ATHLETICS ENTRANCE

The project should highlight the uniqueness of the area whilst benefiting the users of the city well beyond the requirements of a private sport centre. The architectural approach should focus on creating a healthy environment which would allow the users to maximise their sporting potential. It is also important to maintain and preserve the natural ecological balance in the sport complex, as it is one of Bloemfontein's green open spaces near the heart of the city.




OPEN SITE
40m.
EXTEND.
WASTE GATHER.
BARRIER
USED AS PASSAGE
BARRIER
PREPARATION
USED FOR DAY VISITORS OR DURING A MEET.
DIVING POOL
THE EVENT.
SWIMMING POOL
N
CONNECT THIS SITE WITH WARM UP AREA [ATHLETICS FIELD]
40m.
EXTEND ONTO POOL PROPERTY.
GREEN BUFFER
CLOSED OFF CONTEXT.
CUT
EXPOSED CORNER
UPGRADED SIDE WALK.
160
NOT IN USE
SWIMMING POOLS BEHIND HEDGE
CUT OUT.
WASTE GATHER
PROPERTY EDGE
OPEN SITE WIND EXPOSURE
PRIVATE PROPERTY EDGE
USE SHORTCUT
IN PROGRESS...
MANGAUNG METROPOLITAN MUNICIPALITY
UPGRADING OF STREETS & STORM WATER IN MANGAUNG
CONSULTING ENGINEER
CONTRACTOR
BKS (Pty) Ltd
CONTRACT DURATION
COLEMO PROJECTS
24 MONTHS
Financiers:
USDG

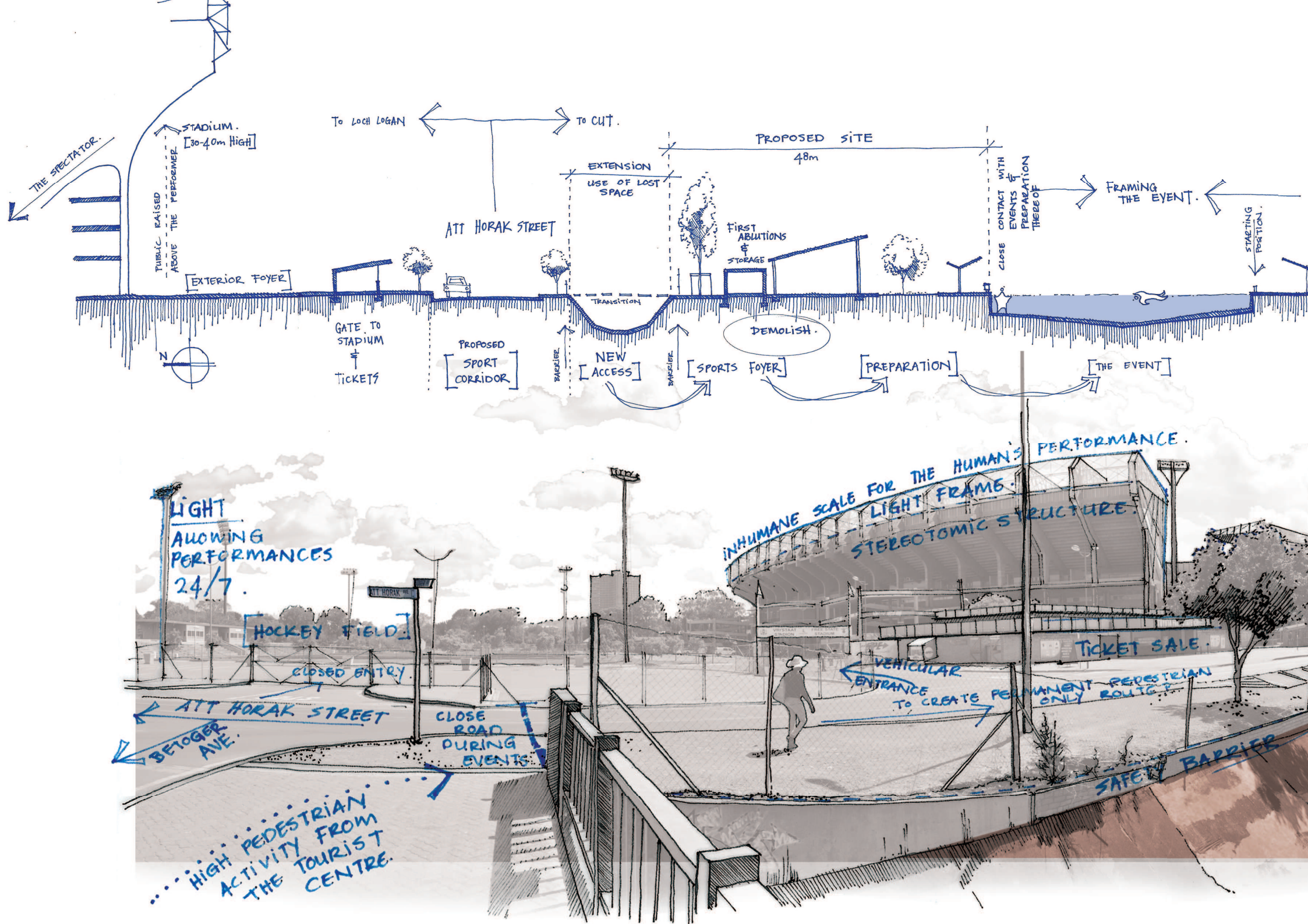




Site 2 - Open grounds

Site challenges

Size= 160mx50m= 6 400m2
The site extends over two corners.
Needs to address structural difficulties which will be created by the stormwater channel.
Dynamic street activity - high traffic of vehicles and pedestrians.
To create a visual link with the main entrance of the Central University of Technology (the client)?
Possible entrance from Park road, also receiving parking possibilities from the swimming pool parking area?
The site can extend towards the west and incorporate the swimming pool into the development.
Can remove or relocate the miniature golf course.
Not ideal orientation - Long eastern and western facades created on the elongated site.
Across the street from the athletics track, which will probably become the main exercise field, therefore a safe passage needs to be created / overhead walkway.

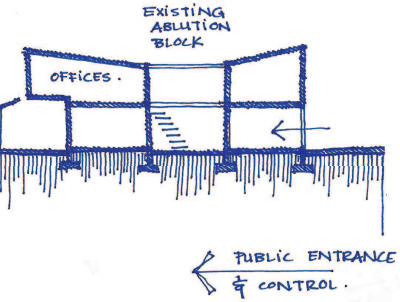

THE SPECTATOR.
STADIUM.
[30-40m HIGH]
PUBLIC RAISED ABOVE THE PERFORMER.
[EXTERIOR FOYER]
To LOCH LOGAN
To CUT.
ATT HORAK STREET
EXTENSION
USE OF LOST SPACE
PROPOSED SITE
48m
FIRST ABLUTIONS & STORAGE
CLOSE CONTACT WITH EVENTS & PREPARATION THERE OF
FRAMING THE EVENT.
STARTING POSITION.
TRANSITION
DEMOLISH.
N
GATE TO STADIUM
&
TICKETS
PROPOSED
[SPORT CORRIDOR]
BARRIER
[NEW ACCESS]
BARRIER
[SPORTS FOYER]
[PREPARATION]
[THE EVENT]
LIGHT
ALLOWING PERFORMANCES 24/7.
[HOCKEY FIELD]
CLOSED ENTRY.
ATT HORAK STREET
BETOGER AVE.
CLOSE ROAD DURING EVENTS.
HIGH PEDESTRIAN ACTIVITY FROM THE TOURIST CENTRE.
INHUMANE SCALE FOR THE HUMANS PERFORMANCE.
LIGHT FRAME.
STEREOTOMIC STRUCTURE.
TICKET SALE.
VEHICULAR ENTRANCE
PERMANENT PEDESTRIAN ONLY ROUTE
To CREATE
SAFETY BARRIER

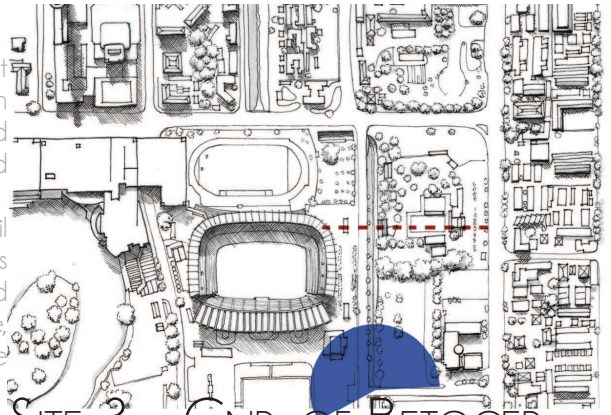
Site challenges

Size = 18 708m2

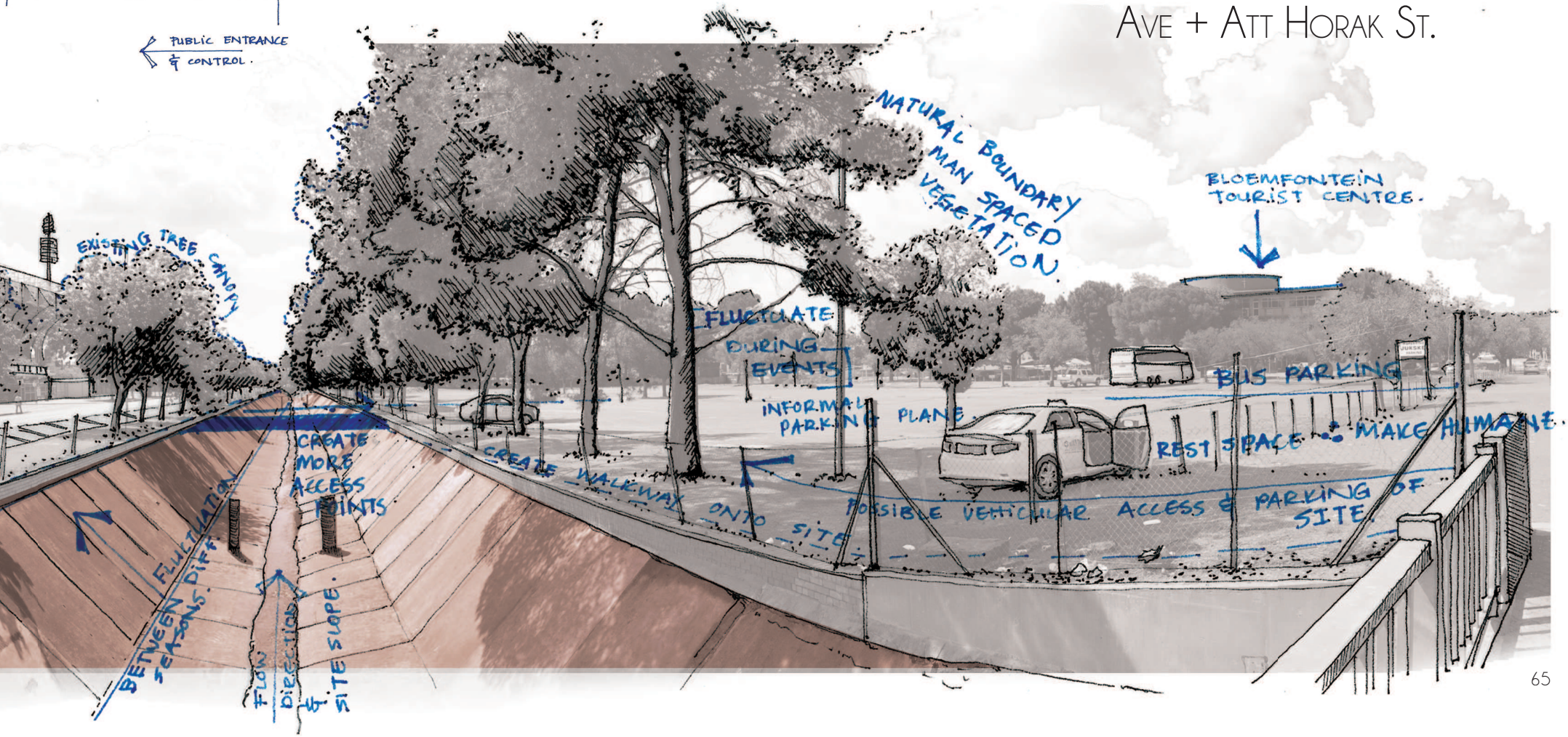
The proposal became more integrated within the area in which the site location shifted into Att Horak street, from east to west, stretched along the *spruit*. Not only was this shift for orientation purposes but it presented a closer relationship to the surrounding events. This location created a more specified field of interest for the sport centre as well, by linking the athletics field and municipal swimming pool - initiating a new entrance.

The client furthermore presented their need for basketball courts (O'Neill, 2015: e-mail conversation), which will then become part of the recreational aspect of the project. The site's access and parking will continue to offer problems during main events. Private parking should be provided with additional parking if Att Horak street is closed during events. Furthermore, pedestrian routes need to gain right of way, which will then determine which routes will be the best for creating paths or suspended walkways.





Site 3 - Cnr. of Betoger Ave + Att Horak St.





The Bridge near the Station which is being widened to cope with the Floods during the rainy season.

1904



Figure 54 (to the left), 56 (to the top) Photographs of destroyed bridges over the spruit. Photographer not known, 1904. Bloemfontein floods. [photograph] (Anonymous' own private collection).



SCENE OF DISASTER.

THE SHADED PORTION SHOWS DAMAGED AREA

The Bloemfontein Disaster.

JANUARY 17th, 1904.

Figure 55 - Newspaper article of 1904 flood of Bloemfontein (Photographer not known, 1904. Bloemfontein floods. [photograph]) (Anonymous' own private collection).

[SITE CHARACTER]

The spruit; then and now

With regard to the existing fan-walk next to the well-known *spruit* of Bloemfontein (as discussed in Part One: Topology), the images above show the location of the *spruit* through the (previous) town grid of 1904 and then the first signs of construction of a more permanent stormwater conveyance channel after a disastrous flood in 1904.

Today the *spruit* can be used as reference in central Bloemfontein because of its permanent presence throughout the development the city. The existing fan-walk, all along the *spruit*, in Selborne Avenue (which ends in First Avenue) is proposed as initiating factor for the lost connection into the sport precinct. Since the *spruit* bends in First Avenue to continue along Att Horak Street, an extension of the fan-walk is proposed to connect all the sport facilities (which can be accessed from Att Horak Street).



Figure 57 - Photograph of concrete stormwater conveyance channel today



2015



Figure 58 - Photograph showing the existing fan-walk to the Free State stadium which ends at First Avenue, without actually reaching the sport precinct in Att Horak Street.

Figure 59 - Photograph taken from First Avenue: the fan-walk built for the 2010 FIFA World Cup reaches all the way Central Park shopping centre, located in Oos Burger Street.

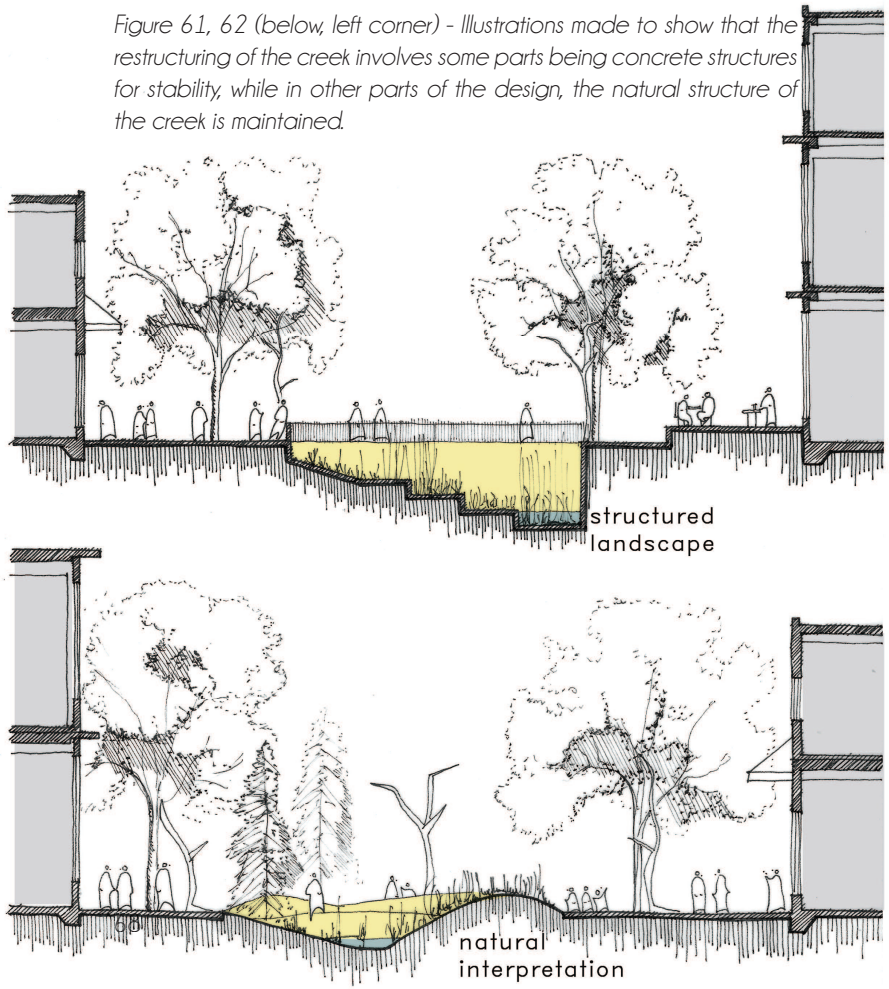


In proposing an extension of the existing urban corridor (2010 fan-walk), reference is made to a proposed plaza in a street of Berkeley, California. The Centre Street Plaza project is set to revive the heart of downtown Berkeley into a green environment. The winning proposal reintroduces the historic Strawberry Creek in the urban riparian corridor (Hood design studio, 2009: online). The design by Walter Hood (2009: online) was approved in 2010 but has not yet been implemented. The aim of the project is to create a safe, vehicle-free public gathering space, while accentuating Strawberry Creek by reintroducing landscape within the urban framework.



Figure 60 - Proposed plaza / pedestrian lane for Centre Street.

Figure 61, 62 (below, left corner) - Illustrations made to show that the restructuring of the creek involves some parts being concrete structures for stability, while in other parts of the design, the natural structure of the creek is maintained.



BERKELEY, CALIFORNIA

[URBAN CORRIDOR PRECEDENT]

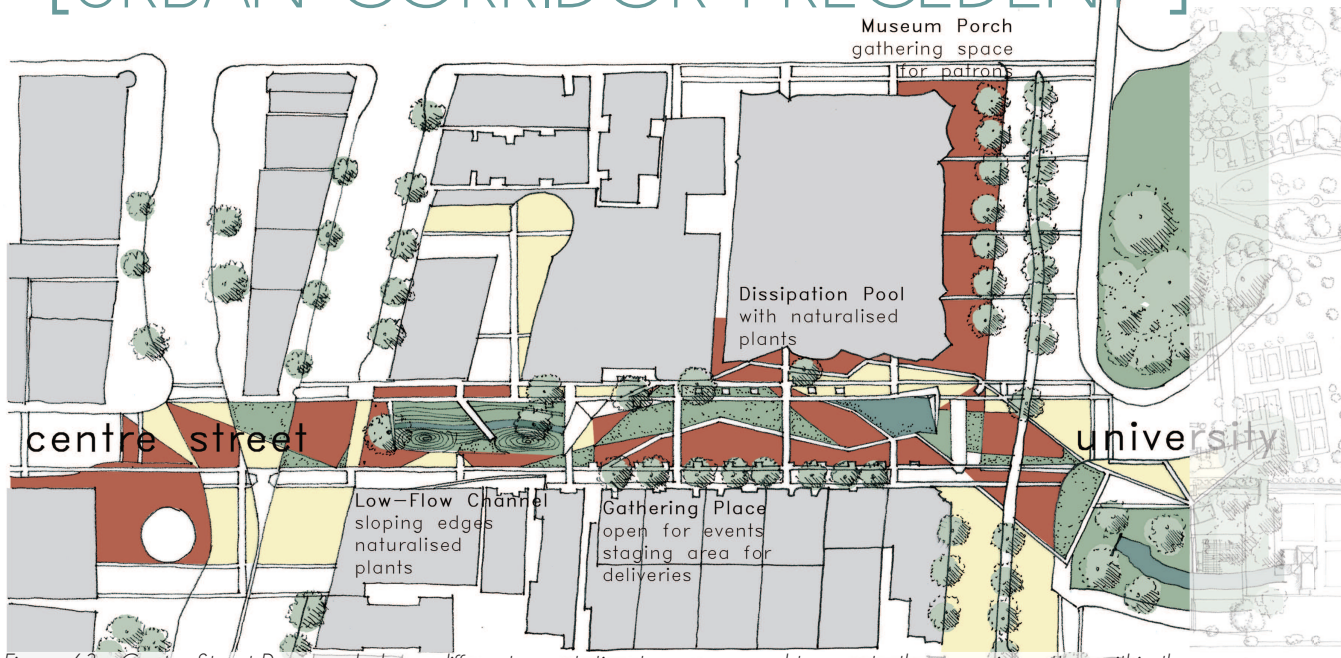
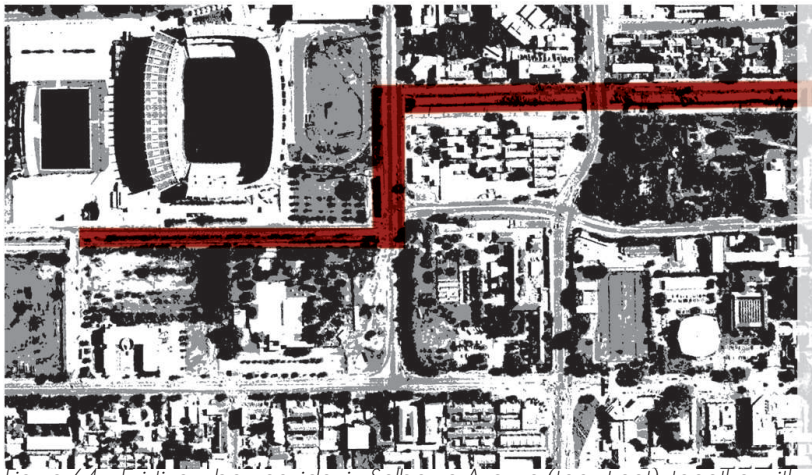


Figure 63 - Centre Street Proposed plaza; different vegetation types are used to create the organic pattern within the urban landscape.



SITE SECTION

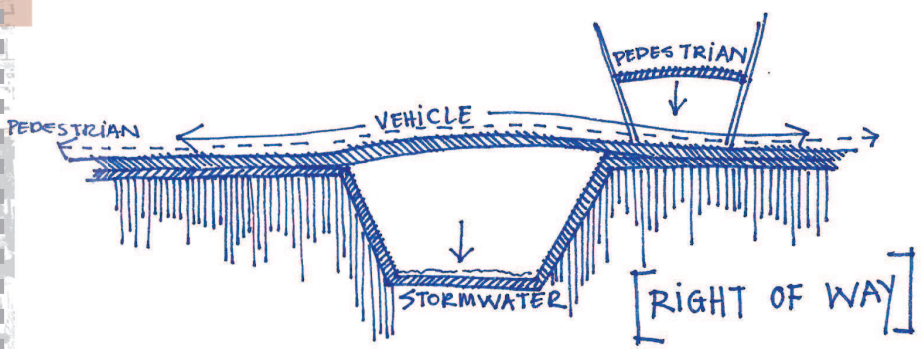


Figure 64 - Existing urban corridor in Selborne Avenue (top street), together with the proposed extension into Att Horak Street (street shown along the stadium).

BLOEMFONTEIN, SOUTH AFRICA CALIFORNIA

[PROPOSED PEDESTRIAN ROUTE]

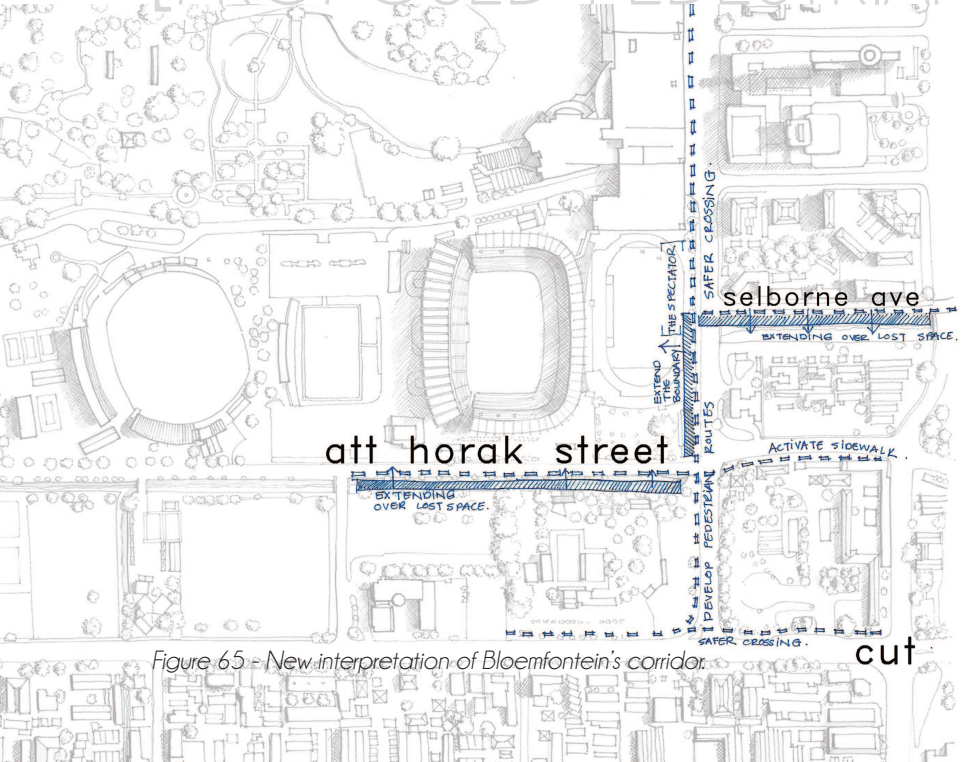
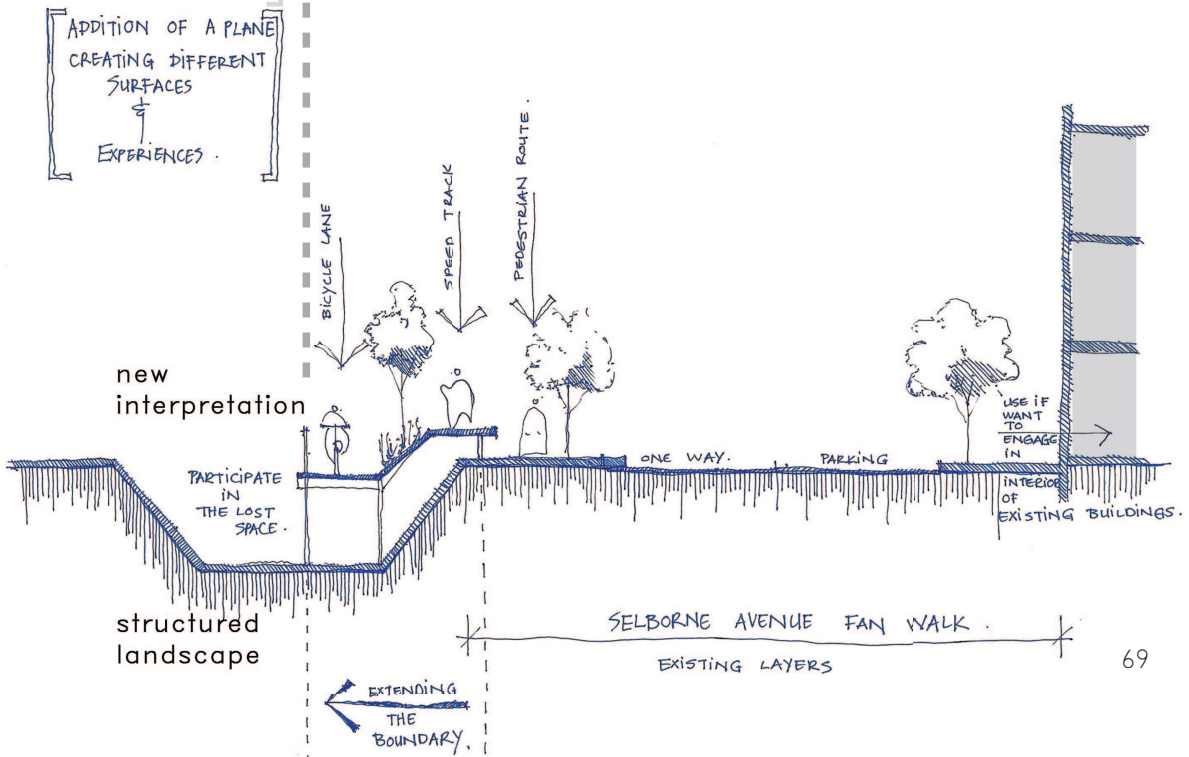


Figure 65 - New interpretation of Bloemfontein's corridor.





TEXTURES, COLOR, REPRESENTATIVES, BOUNDARIES, OBJECTS, SIGNS, SYMBOLS, MATERIAL





QUALITATIVE ANALYSIS

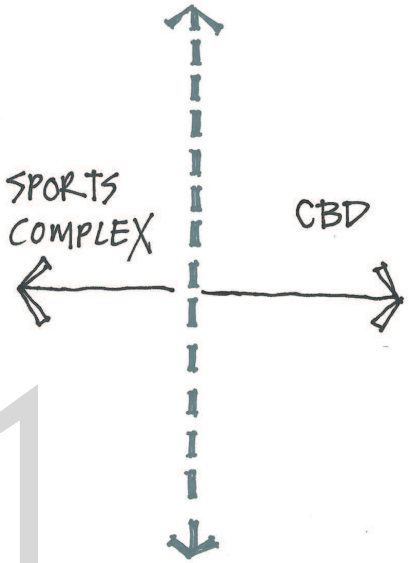
The site not only consists of a set of rational parameters, but also presents a conceptual, qualitative essence. The experience of the site during eventful and quiet days; the possibilities of the proposed project; and the participation of the fan-walk along the *spruit* all initiated three conceptual understandings of the genius loci.

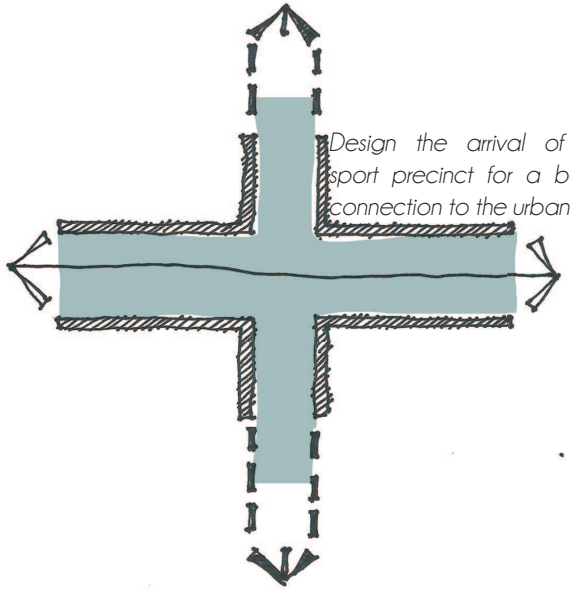
Intensive experiential analysis of the site revealed that the concepts represent a macro, meso and micro level of site interpretation and typological objectives. The concept models act as visual representations of how the experienced systems work.











Design the arrival of the sport precinct for a better connection to the urban grid

1 [MACRO] [CONCEPT]

CORRIDOR
REFOCUS
INVITE
REACTIVATE
ARRIVAL
PASSAGE
LANDSCAPE
URBAN DEVELOPMENT
CATALYST

Extending the Threshold

As already identified in the quantitative site analysis, there is a clear separation of the urban CBD and the sport complex, conceptually making reference to a threshold, and the resolution lies in the extension thereof. This entails an extension of each zone into all the others to achieve integration between them. Both domains represent themselves on the opposing side of the connection (the threshold). The transition from one domain to the next will thus be easier due to the shared characteristics of the domain that is being entered.

The built environment will introduce itself to the green sport environment, while the greenery introduces itself into the built cityscape by creating a green corridor.

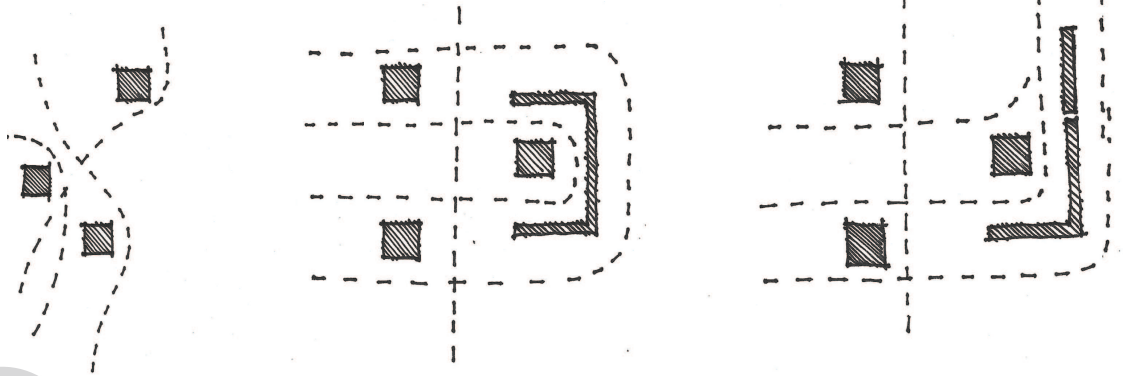


Figure 66 - Built model representing the characteristics of both sides of the threshold to reveal itself to their opposing sides.

Unorganised activities

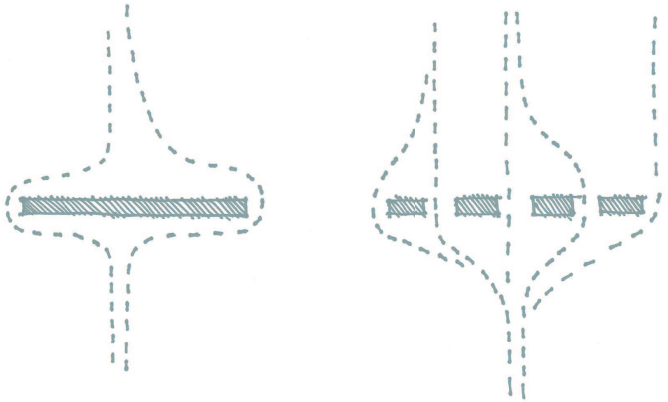
How to achieve better fluctuation :
organise activities to control fluctuation

alternative organising patterns adjusting to fluctuation



TO GIVE LIFE
INSPIRE MOVEMENT
MODIFY
ALTERATION
STABLE ACTIVITIES
REORGANISED
USE OF LOST SPACE
EFFICIENT USAGE
REVIVE
RESOLUTION

2 [MESO] [CONCEPT]

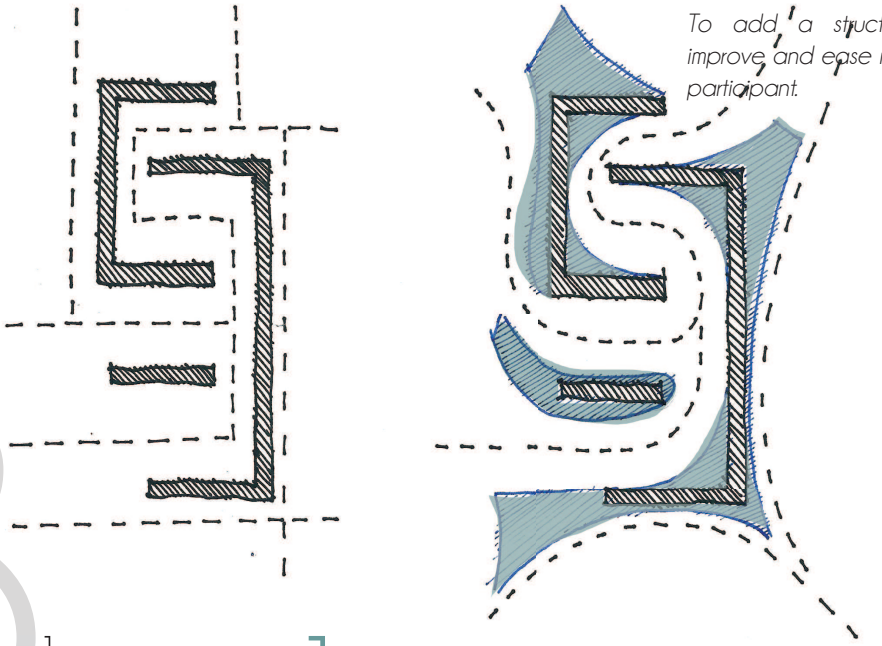


FLUCTUATION

The frequent alternation experienced on site between events that take place and leaving the area still and lifeless when the events end, initiated the second conceptual approach of animating. To animate means to give life, to inspire movement and to stabilise activities. This approach requires the control of movement by manipulating the fluctuation of activities in order to revive an area through continuous activities being present. The concept model represents the existing framework of the precinct, with the addition of platforms to accommodate for new activities that will fill in the "inanimate" moments of the site's fluctuation occurrence.



Figure 67 - Built model showing fluctuation and the possibility of change - Adjustable patterns / spaces for access control and regulating the animation on site.



To add a structure that would improve and ease movement of the participant.

EFFICIENT MOVEMENT
ADDITION
REACTS ON PARTICIPANT
AUGMENTATION
COORDINATE
REGULATE
FRAME
GUIDE
ALLOW

3 [MICRO] [CONCEPT]

Bionics

This conceptual approach focussed on the participants and how to augment their movement to achieve their full potential. Performance lies in the efficiency of movement, an idea which originated from the term *bionics*. Bionics is understood as the study of biological systems found in nature, which then gives rise to the design of engineering systems to electronically enhance the movement of the human body (Lauritsen, 2011: online).

The concept developed towards the addition of an outer frame or exoskeleton to assist, coordinate, regulate and enhance the participant's movement and relates back to anthropomorphic design as previously discussed in the development of a typological understanding. This conceptual approach enabled the design to be very specific according to the requirements of the sport facilities it needed to host. The aim is to create comfortable connections between the different facilities in order to achieve the best functionality and usage of the building. The size, volume and circulation patterns needed for the facilities (such as a basketball court, indoor swimming pool, running track, etc.) assisted in the design of the sport centre.

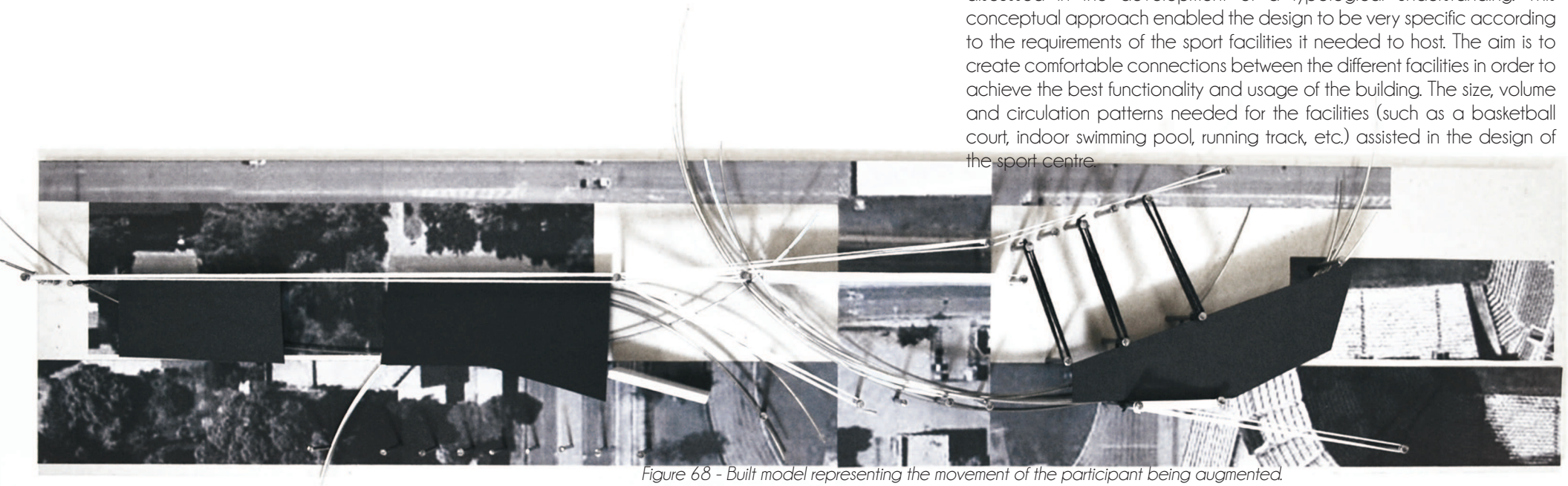


Figure 68 - Built model representing the movement of the participant being augmented.

THE SITE AND USER WERE IDENTIFIED IN TERMS OF THREE MAIN CONCEPTS:

EXTENDING THE THRESHOLD	FLUCTUATION	BIONICS
of the CBD border	site use	anthropomorphic
transition from urban to sport precinct	reactivate	active vs. pause
occupying lost space	events and movement patterns	participants
the edge at flux	to animate	guide movement
connection	sequences	manipulation
across boundaries	public to private	frame places of certain activities
[MACRO]	[MESO]	[MICRO]

CONCEPTUAL FRAMEWORK

On meso scale, as indicated in the site analysis of Part Two, the sudden end of the pedestrian route along the *spruit* needs to be extended to reach the actual entrance of the sport precinct in Att Horak Street. This lost connection also represents the strong threshold identified in between the CBD and the sport precinct. By designing the connection into Att Horak Street, this difficult crossover will be addressed. Once within the precinct, fluctuations between events occur because of the multiple facilities on site which requires spectators to instantly activate it on a large scale. This thus leaves the site overcrowded during events, but when the events are over, the site is left lifeless and inanimate. Because of its urban importance, the precinct needs an intervention, not only to request a building to incorporate all participants as equals and as activators of the area, but to connect all the facilities through the proposal of an extension of the existing fan-walk.

THE *SPRUIT*	concrete, man-built channel managing stormwater runoff
GENIUS LOCI	the experiential atmosphere or spirit of a place
FLUCTUATION	of usage | active and passive state of the area
EVENTS	sport related gatherings | activities | performances to observe or participate in
PARTICIPANTS	the performer | the spectator | the urban pedestrian | event seekers
URBAN RITUAL(S)	involved in the event of sport, rituals of the participants
BOUNDARY	physical barrier denying access | an established edge prohibiting participation of choice
THRESHOLD	space of transition | where two separate domains meet
LIMINAL	the in-between entity | space between two edges
THE FOLD	ease the transition over edges allowing rituals to meet
PROMENADE	route | process or sequence of events
SEQUENCE | PATTERNS	movement | joint | pause | rhythm
FRAME	collision point | framing an event or ritual
STAGE	assembly of people | where the ritual can take place
EDGE CONDITION	where edges or events overlap | continuous movement

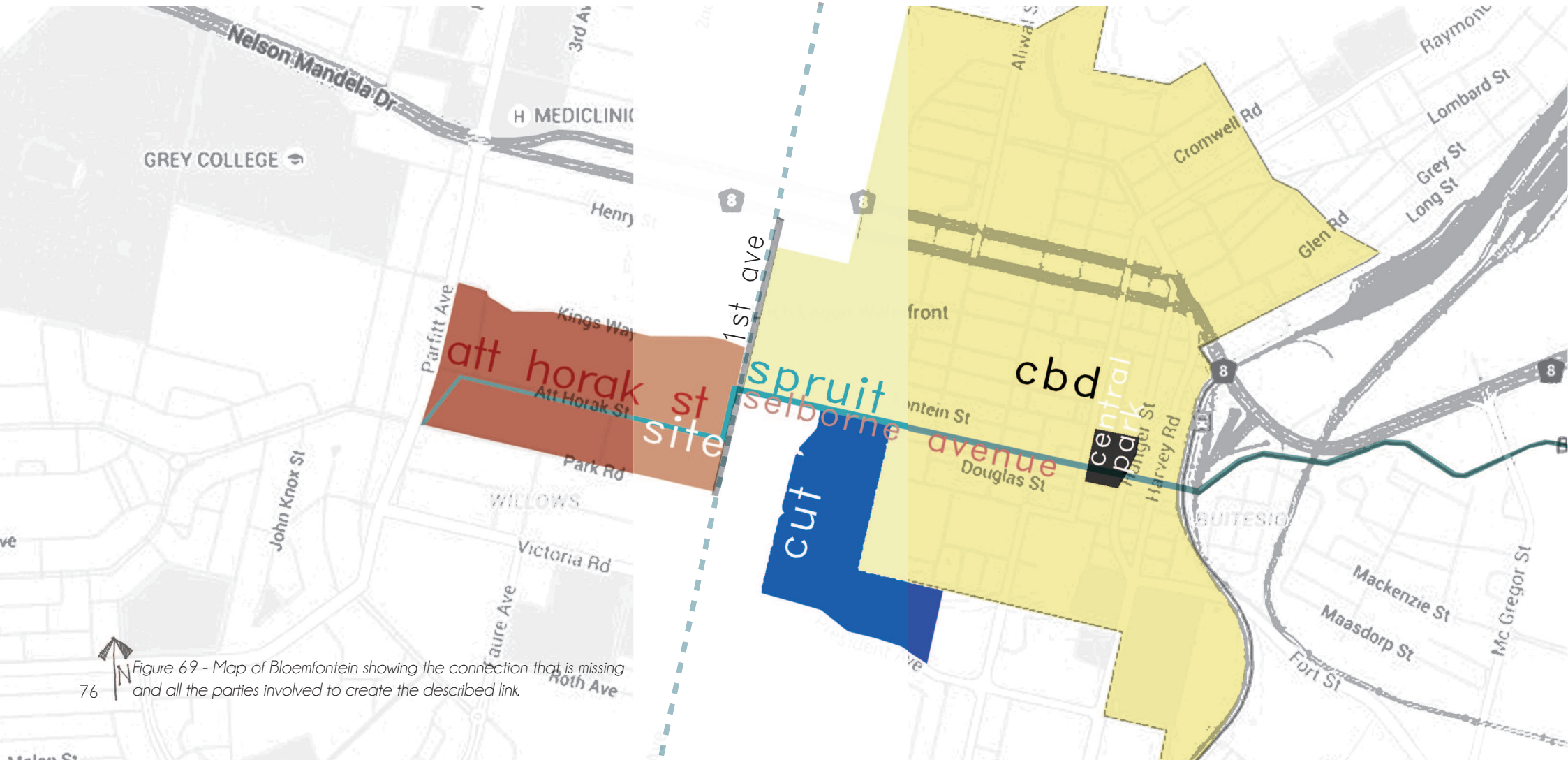
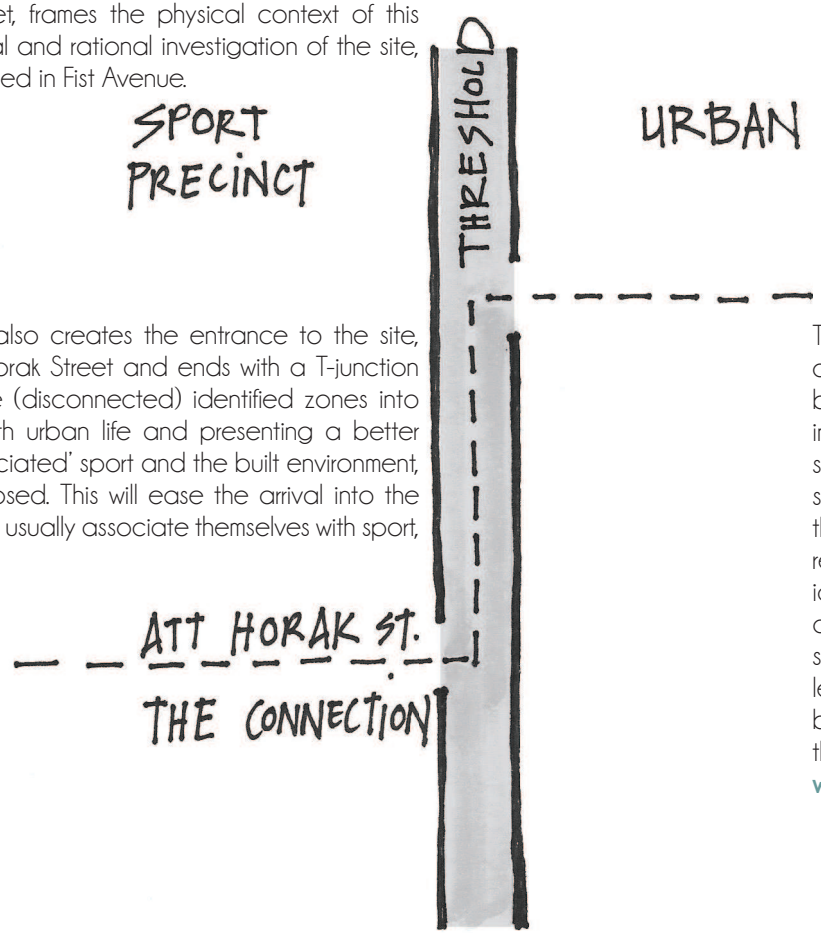


Figure 69 - Map of Bloemfontein showing the connection that is missing and all the parties involved to create the described link.

[THEORETICAL UNDERPINNING]

2.3 morphology

The existing Sport Precinct of Bloemfontein, situated on both sides of Att Horak Street, frames the physical context of this dissertation. Through a conceptual and rational investigation of the site, a dominating threshold was identified in Fist Avenue.

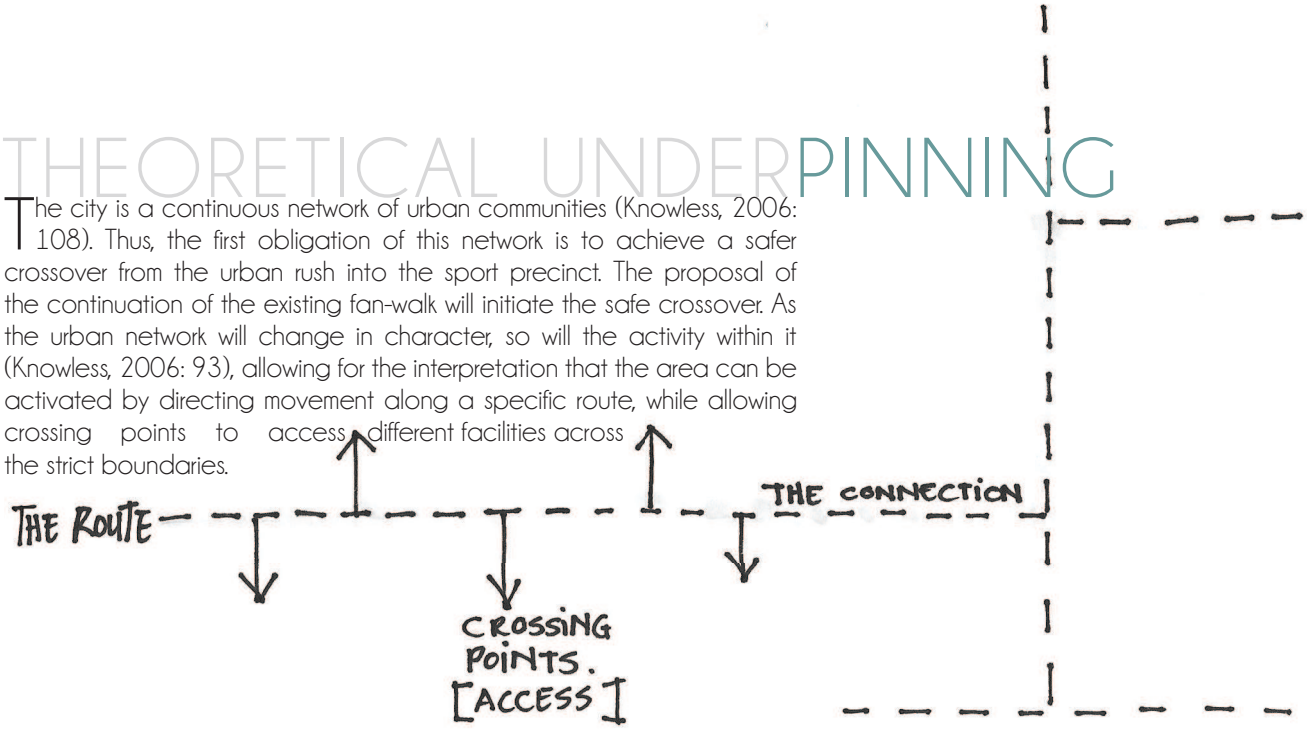


As the edge of the CBD, the strict threshold creates a difficult interaction between the urban built environment and the ecological sport precinct. It also creates the entrance to the site, which is stretched all along Att Horak Street and ends with a T-junction in Parfitt Avenue. To extend these (disconnected) identified zones into one another, integrating sport with urban life and presenting a better interaction between 'outside-associated' sport and the built environment, **a green sport corridor** is proposed. This will ease the arrival into the sport precinct to those who do not usually associate themselves with sport, in order to reactivate the area in times when events are still in preparation phase. A green corridor will also facilitate an easier connection and preferred crossover between the CBD and surrounding residential zones of the precinct.

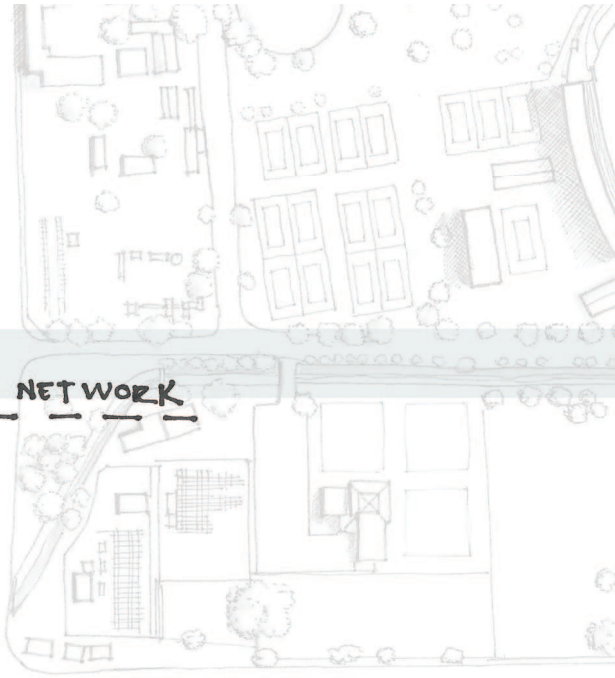
The site investigation identified the main crossover issue, along with several strict boundaries to deal with in order to achieve the integration of the sport facilities within the urban setting. People should be allowed to visit the sport fields, even if it is just the practice fields – the precinct is in a vital urban area and shouldn't remain in seclusion. With the main problem identified as the strict boundaries on site, the objective became the integration of private sport professionals, urban dwellers and entry-level sport participants (with the possibility of becoming tomorrow's professional athletes). The theoretical discourse **aims to create a place where rituals can meet**.

THEORETICAL UNDERPINNING

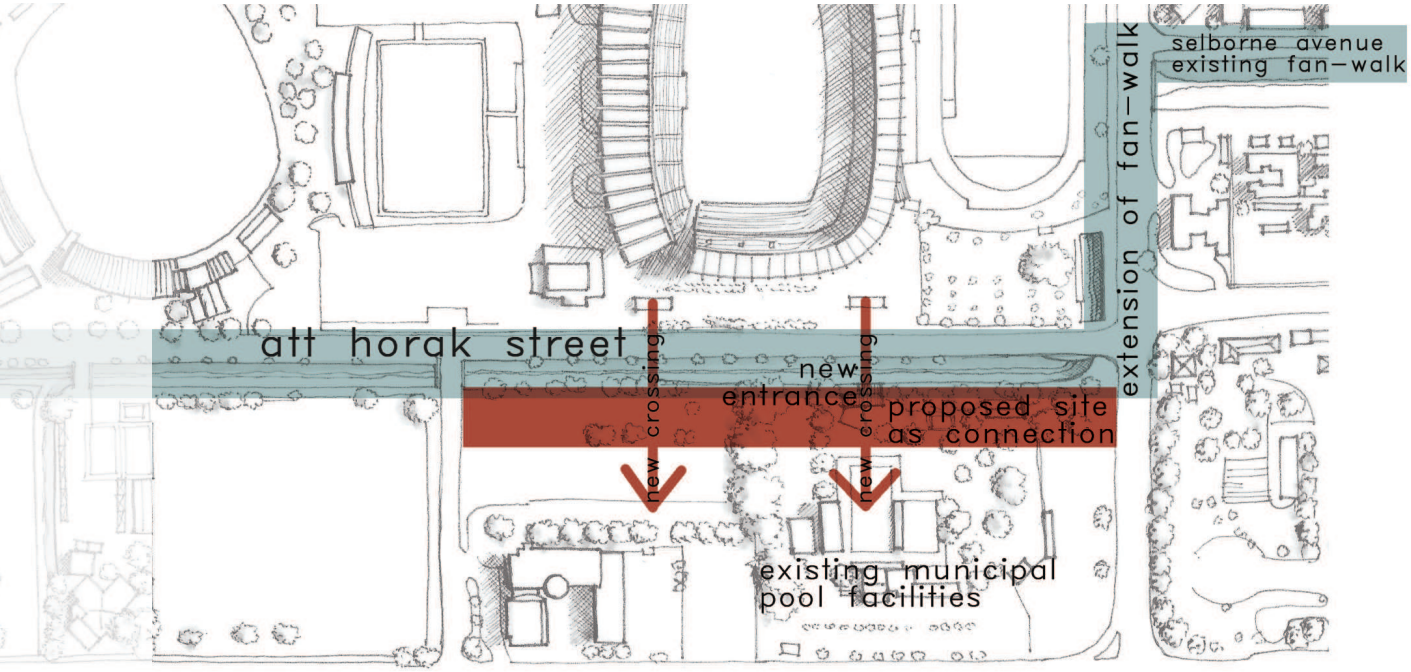
The city is a continuous network of urban communities (Knowless, 2006: 108). Thus, the first obligation of this network is to achieve a safer crossover from the urban rush into the sport precinct. The proposal of the continuation of the existing fan-walk will initiate the safe crossover. As the urban network will change in character, so will the activity within it (Knowless, 2006: 93), allowing for the interpretation that the area can be activated by directing movement along a specific route, while allowing crossing points to access different facilities across the strict boundaries.



How boundaries are perceived depends on whether or not they are self-imposed, understood and accepted (Knowless, 2006: 120). Cities impose boundaries for the common good of zoning (Knowless, 2006: 120). In William Mitchell's analysis of the phenomenon of the network (2003: 226), he announces that we have always been surrounded by multiple barriers accompanied by points of connections (joints) between them. Mitchell explains that boundaries and networks are structured duals of each other: where boundaries define a space and contain it in a place (the traditional domain of architecture), networks establish links and spaces that allow flows (Mitchell, 2003: 228). Walls, fences and skins divide, while paths, pipes and wires connect. The network becomes the access route to all facilities, puncturing through boundaries to allow easier access.



Distinct boundaries of the sport precinct not only cut off any involvement with the surrounding urban fabric, but also divide the complex into separate functioning bodies. The various boundaries are necessary for crowd control, public safety and the prevention of damages to expensive facilities. Each sport facility operates on its own with individual entrance points that spatially concentrate and control the inflows and outflows of people in the facility (Mitchell, 2003: 230). A better connection between these facilities is needed to attract and guide the urban pedestrian through the sport precinct, and while all the facilities (except one) can be accessed from Att Horak Street, the project's site location was identified to become the new access point and entrance to the existing municipal pool facility.

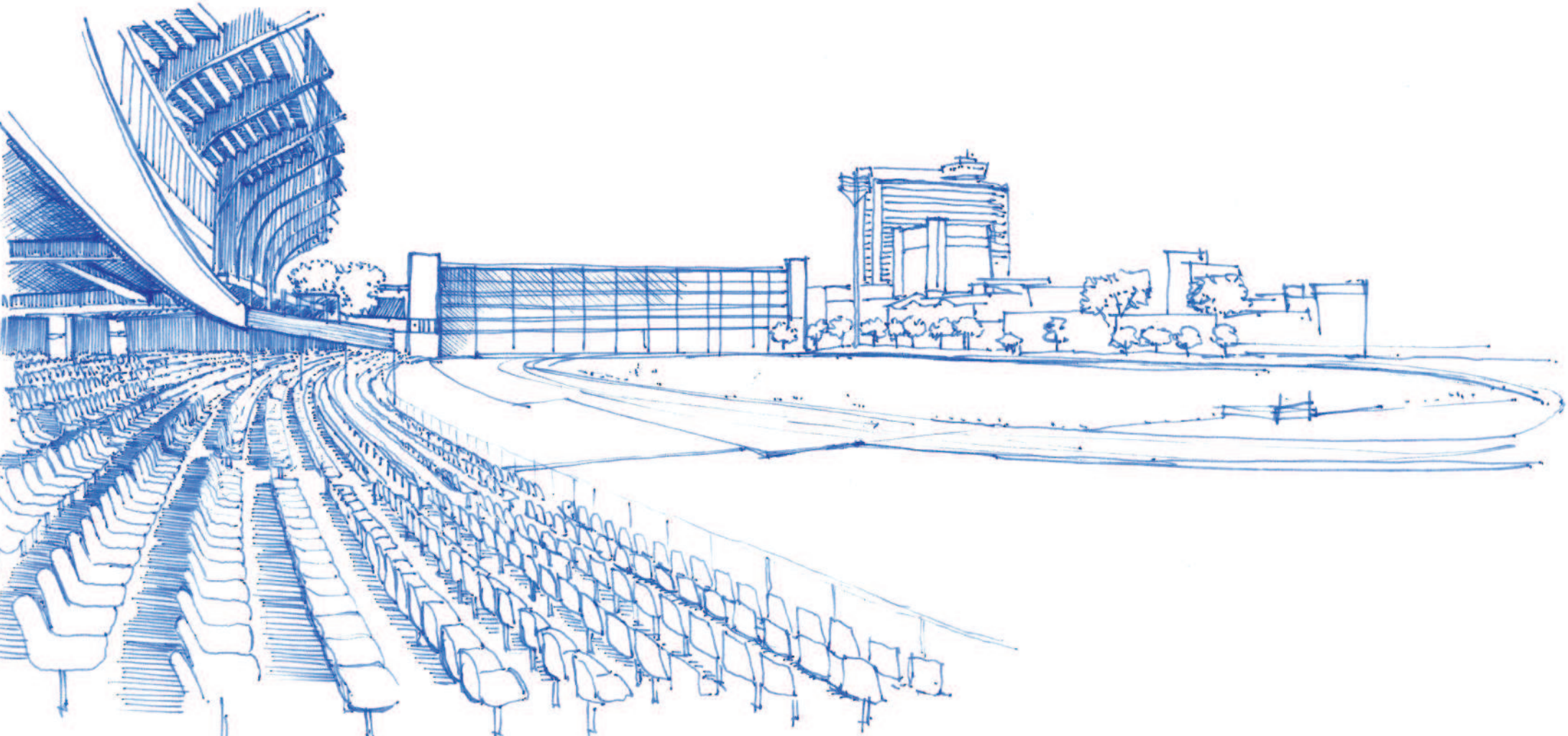




To achieve this access point, a lost space should first be crossed (i.e. the *spruit*, as mentioned in the quantitative site analysis). This initiates an open, harsh edge exposing the user to a mental boundary. In order to ease this transition, a threshold (margin) of fluctuating conditions is proposed where the user has a choice of participating in the presented events. The extension of the fan-walk becomes the threshold of choice, connecting all the facilities along the *spruit*. Mitchell makes reference to Charles Moore and how he understood our daily use of space: our habits no longer depend on single or adjacent enclosures, but have become fragmented and dispersed along networks. They are controlled along a continuous perimeter, but at separate and scattered access points (Mitchell, 2003: 239). Our domains of knowledge and participation cannot be constricted by fixed zones, but should rather be understood as dynamic, emergent, temporally fluctuating patterns of presence (Mitchell, 2003: 239).

The fluctuation on site, due to seasonal and event-related sport activities, gave rise to the topic of investigation. The fluctuation of the site usage between two main participants (the urban pedestrian and the sport candidate), including the difficulty of access across strict boundaries, are the main parameters set for the abstract interpretation.

Fluctuation involves the in-and-out migration of fans and athletes as events occur and end. To address this fluctuation in the design, all participants should be allowed to engage in and activate Att Horak Street during both quiet and eventful days. During big events, the building should allow people to participate and should be able to operate separately if needed, while allowing the activity to take place with all its rituals and preparations intact. In order to reactivate the area, the initial main problem stated, the design aims to create a link for urban participants and athletes to use the facilities simultaneously.



PARTICIPATING RITUALS

In this urban and sport-related setting, the rituals involved are not usually identified as ritualistically influenced practices. Some activities have inherent ritualistic qualities and connotations, such as a rite of passage or a sacred ceremony, but not all rituals have to originate from a sacred concept. Ritual activities can be part of our everyday lives, originating even from the simplest of actions, as long as it is embedded with meaning (Pawson, 2002: 21). For instance, the simple task of morning coffee, which is repeated daily, can symbolise a gesture of signifying a new day and thus becomes an important ritual at the start of every day.

The appropriate rituals identified within the urban setting of the sport precinct involve two main participants:
the Performer (the sport participant) and **the Spectator** (the urban participant).

+ The Performer's rituals entail private activities and procedures he/she follows as preparation methods. Each performer has a personal view of what should be done to achieve optimal focus and maintain the preferred energy level. These rituals include superstition, repetition and determination. The focus is on personal achievements, goals and how to act upon your opponents.

+ The Spectator's rituals work with cultural background and social obligations. They consist of interaction with friends and co-fans around the *braai* or next to each other cheering for the same team, or against each other just to create rivalry. The aim is to place focus on someone else's performance and enjoy the activity and energy the performer presents. Behavioural patterns of spectators are influenced by performers. Future participation also depends on the performance.

The athlete and the urban pedestrian should both be accommodated for within Att Horak Street in order to create constant presence. This dissertation investigates how architecture can set the scene for different rituals to meet, and create a preferred space for people to gather in dialogue.

Sport as ritual gathers similarities between non-related participants. Tali Hatuka and Rachel Kallus (2008: 87) identify the assembly of people as a crowd, where the participants as a group share characteristics most likely different from those of the individuals composing it. Within the sport precinct, this gathering of individuals has a time aspect to take into account, and the design of new structures (in scale and accessibility) should thus accommodate for two types of crowds: the present and the absent crowd. A present crowd of mass congregation becomes the space's feature especially because of its scale, which transforms the individual into an anonymous participant (Hatuka & Kallus, 2008: 87). In contrast, the absent crowd leaves the site unpopulated, causing the scale and physical features of the enormous stadium and empty pavilions to project power and monumentality. The emptiness, as constant reminder of the absent crowd, sustains the notion of an imagined crowd (Hatuka & Kallus, 2008: 87). Thus, the imagined crowd, causes the site, with its incommunicable scale, to remain inactive.

Daily activities should be guided into the unused area in order to reinstate its use by all, and not just during an event. The participants should become the event in itself, occupying the area and controlling a more constant fluctuation on site.

Architecture and rituals

Architecture can incorporate these daily rituals by evoking communicable meanings within the basic habits of its participants (Okumura, 1983: 126). Julia Bourke (1983: 5) explains that in architecture, ritual presents a matter of choice to the participant, but ritual can only take form through actual participation and use. Regardless of the type of ritual being performed, a ritual is an action and cannot occur without movement. Rituals can be guided through architecture in order to create an environment where participants will want to assemble and feel comfortable enough to participate in the presented possibilities.

Tadao Ando, in an interview with Toshio Okumura (1983: 126), explained that there are two types of confrontations with which he is concerned: the meeting of man and nature and the meeting of man and man. To him it is important to create these joints where people emerge from their private spaces to encounter one another. A building should provide a ground on which the individual can carry on the irregular patterns of daily existence, while pausing to reflect upon his relation to nature and to society (Okumura, 1983: 126). The meaning of architecture is thus not in the floor, walls or ceiling, but in the world captured within these elements (Okumura, 1983: 129). The area proposed in this dissertation needs to incorporate both sport and urban rituals and not only fluctuate as host between the two separately. Participants in both these types of ritual should be able to perform their daily rituals within a safe environment. To allow both types of ritual within a constructed space provides the chance for the different participants to meet and form an integrated ritual to which both groups of participants can relate and with which they can interact.

The purpose of architecture is the construction of place, which indicates that architectural elements can encourage this interaction between different rituals. In architecture, the use of stairs rather than an elevator, with people going up and people going down, creates the possibility of a meeting (Okumura, 1983: 134). Bourke (1983: 6) extends this idea, stating that architecture should create the framework for a dialogue or an event that might just happen. Architectural elements and furnishings all contribute to ritualising certain activities. Raised stages, altars and staircases help to achieve hierarchical importance within a space, and on city scale, plazas, squares, and monuments help to achieve expression (Janson & Tigges, 2014: 258). Even the crossing of an everyday threshold effects change, causing insecurities regarding the passage into an unknown space, or the entrance of unknown individuals into a safe space (Janson & Tigges, 2014: 256).

Architectural settings thus **achieve spatial expression through the process of rituals overstepping boundaries**. The movement through the boundary should be ritualised, involving the control of admission, greeting, reception and buffer spaces between the separate domains (of urban fabric and sport facilities). With the current issue of the strict boundaries prohibiting the movement of the participants, the edge (discussed below) should be designed to accommodate a better fluctuation and assembly of the urban participant (the spectator) and the sport participant (the performer). The edge condition will provide the opportunity for rituals to meet, but since an edge functions as a separating element between different spaces, an extension/intermediate space or margin should be created for the ritual to take place.

Research Question: Can architecture choreograph opportunities for multiple rituals to take place and facilitate meaning within an urban context?

Designing the edge condition

The edge of Att Horak Street, accompanied by the *spruit*, provides the host for the project. The *spruit* presents a division medium to protect the building from overexposure to main sporting events in the street and the opportunity to allow certain access points (crossings/bridges over the *spruit*) to direct pedestrians towards selected events within the building. In order to accommodate the multiple events and the fluctuation between them, the edge should be designed. **Three main conditions of the edge are presented as choreographing entities to create opportunities for rituals to assemble**: The provision of liminality, as the space where rituals take place, presents the first condition, and the organisation of multiple events and ritual spaces (along a route) establishes the second. The final condition (not predominantly used) is the full integration of adjacent events through the use of the fold, in the Deleuzian sense. These three conditions are all incorporated to achieve the complexity needed to host the multiple urban rituals.

What is an edge?

"*Everything will flourish at the edge*" Jaques Derrida (Casey, 2008: 1).
The edge brings difference into being since an intersection is required to separate different domains. The edge thus allows change to occur, according to Dr Chris Brisbin (2011: 1), lecturer at the School of Art, Architecture and Design (University of Australia), who introduces edge-ness as an inter-relationship between the physical and metaphysical, between the animate and inanimate, between people, buildings, landscapes, concepts and emotions. The edge represents the joint between the object and the event, between the physical attribute and the phenomenological experience, and thus the meeting point of opposite sides is constructed. Brisbin uses the example of two sides of a sword's blade meeting at an edge to explain the manifestation of the edge design as ritual initiator: The edge embeds the animate capacity of the intended action – its function and ability to cut, maim and kill. The edge thus brings the embedded ritual and function of the blade into being (2011: 1).

Casey also describes two kinds of edges: the mental and the visual (Casey, 2008: 1). Edges of mental space occur intuitively, where the mind surrenders to something that is *preconscious*[1], to a memory or an emotion that has not been repressed – an emotional boundary. The second type of edge involves the spatial quality, the place or locus which sets forth the opportunity for difference through the use of a strict boundary (Casey, 2008: 2). In the context of this dissertation, these two edges can both be experienced on site: the visual edge separates the urban participant from the sport facilities, and the mental edge being the preconceived ideas that only professionals or sport teams can participate in the activities of the sport precinct, and that spectators may only participate in the area when a sport event invites them to. Both these edges should be addressed in order to achieve a dialogue between the rituals involved.

Architecture can redesign the visual edge to allow participation and access to events, which, in time, can then influence the mental edge. With a physical edge, a scene can be established to determine where what is happening. The edge allows for existence and orientation, in order to be able to say that in that place, the event is happening now (Casey, 2008: 2). But edges separate difference while, in this context, a bringing together of difference is the aim. The first edge condition to address is to ease of the transition between the separate domains (urban and sport). To make this transition possible, the threshold should be extended to become a spatial volume of possibilities, a margin for participation. The space in between the domains thus presents the opportunity for different rituals to meet. A second edge condition will allow fluctuation between events and the connection of rituals along a route, while a third and final edge condition proposes a full integration between separate events and spaces to achieve a continuous, uninterrupted, infinite flow of movement.

[1] *A memory or emotion that have not yet been repressed and can thus be recalled (from the part of the mind below the level of immediate conscious awareness.)*

1 [EDGE CONDITION]

[THE LIMINAL – EASE THE TRANSITION]

Identifying a threshold

On a threshold, one is neither inside nor outside – this is how Alban Janson and Florian Tigges describe the moment of realising the existence of the in-between (2014: 331). A threshold is thus the separation element of two identifiable domains, and as a definite in-between space, it also differs (Janson, & Tigges, 2014: 332). Heidegger noted this significance of difference: "[A] boundary may also be understood as a threshold, i.e., as an embodiment of a difference" (Norberg-Schulz, 1996: 429). A threshold is a place, a boundary, a transition and an obstacle simultaneously, and by overcoming an obstacle one is aware of the boundary being crossed (Janson & Tigges, 2014: 331). An actual obstacle is not even needed – just the slightest difference in character can distinguish two spaces apart, and the place where these different characters meet is where the threshold exists.

Why do thresholds prevail?

Thresholds exist in various types and intensities and can expand into spatial volumes, allowing the existence of an intermediate space that plays an important role in architecture (Janson & Tigges, 2014: 332). A threshold is necessary to announce the arrival at or exit from of a space and to create clear distinctions between public and private domains. This intermediate space can become a stopping point where one hesitates, experiences and observes before entering the next space. Upon crossing, the threshold sometimes provokes a change in behaviour, one that depends on the character of the space entered, showing the threshold's dependence on the spaces that surround it (Janson & Tigges, 2014: 333). The impact of the threshold can also be reduced by means of uniform floor levels or with similar floor finishes between spaces (Janson & Tigges, 2014: 332). In some cases, special thresholds with non-traditional crossings are needed, such as the crowd-control barrier of a stadium, the counters in banks or the check-out point of a library (Janson & Tigges, 2014: 334). Access can thus be controlled through a definite threshold, presenting a space where all are allowed but controlled from there onwards. Since the stairs or corridor is the most public space, it becomes the place for ceremony, the place where people meet (Okumura, 1983: 126). Stairs and corridors can thus represent extended thresholds by collecting movement from adjacent spaces and fixing them onto circulation patterns throughout a building (Okumura, 1983: 131).

The essential effect of the threshold lies in the overcoming thereof, the movement through it, which heightens the experience between spaces. By experiencing this transition, the strength of the edge is then in turn revealed as its dynamism and its embodiment as a site of flux and indeterminacy (Brisbin, 2011: 1). The threshold requires movement (thus also recalling Bourke's statement that ritual cannot occur without movement) which becomes identifiable when we are in the midst of an activity, acknowledging that we are in between edges (Casey, 2008: 2). To be able to experience the in-between, its relationship with the edges surrounding it should be understood.

The edge with the in-between

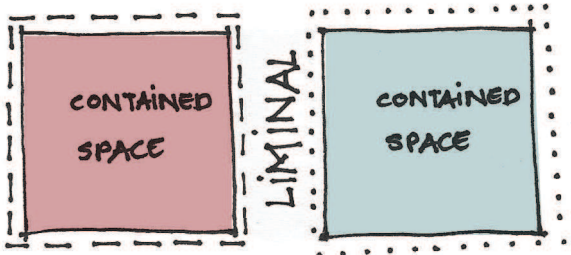
Edward Casey explains that "[e]dges and the in-between are active presences for one another" (2008: 6) and thus require each other: "Without edges, there is no *in-between*; without an *in-between*, edges would not be able to distinguish one object or event from another" (Casey, 2008: 6). One should understand that edges supply the boundaries to the in-between, as porous edges which take in as well as give out (rather than a border which provides distinct limits), and that the in-between then provides the matrix for edges, as concrete nexus in which the edges are located: a field, a place if not a space (Casey, 2008: 6).

Casey thus provides us with two rules to remember when one tries to understand the co-existence of the edge and the in-between: Firstly, there is no final edge, and one edge only allows for the starting point of a new edge, layer upon layer, out and out and out, unending (Casey, 2008: 6). Secondly, the in-between also has no ending because of the difficulty of determining its distance of existence. It has no definite centre point, nor does it rely on a surface to exist. It has its own depth, width and height and cannot be confined by literal surfaces (Casey, 2008: 7). The in-between thus signifies two things: (only) the impression of a measurable distance and the presence of juxtaposition (Casey, 2008: 3). You can be aware of your surroundings, but the in-between is still difficult to determine, since you find yourself *somewhere* between two distinct positions (edges, activities or happenings) (Casey, 2008: 3). The edges are easily identifiable while the in-between space (the liminal) is somewhat uncertain. This is why the liminal depends on the condition of the edge.

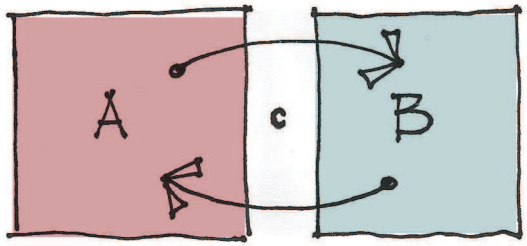
Liminal as space of interpretation

The relationship between edges and the liminal space is thus understood as a matter of dynamic becoming, the liminal being in a measureless productive interplay with its identifiable surrounding domains (Casey, 2008: 7). Casey advises one to always be aware of the edges involved while designing and that one should navigate between edges in order to design in between them (2008: 1). The edge should thus not be considered as the point where an activity stops (Casey, 2008: 1). Rather, its presence should be allowed far beyond the physical boundary, on into the threshold phase where it can collide with elements of the adjacent activity's edge to ease the transition between two different realms or activities.

In the attempt to establish the in-between, one can start by understanding that the *in* used here is not related to containership, but refers to the fact that the in-between is in direct contact with the outer surface of the item, activity, event or space being contained (Casey, 2008: 3). The characteristics of the liminal space are determined through the involvement of the spaces surrounding it. The following illustrations indicate how to extend edges far beyond their physical boundary in order to experience the liminal:

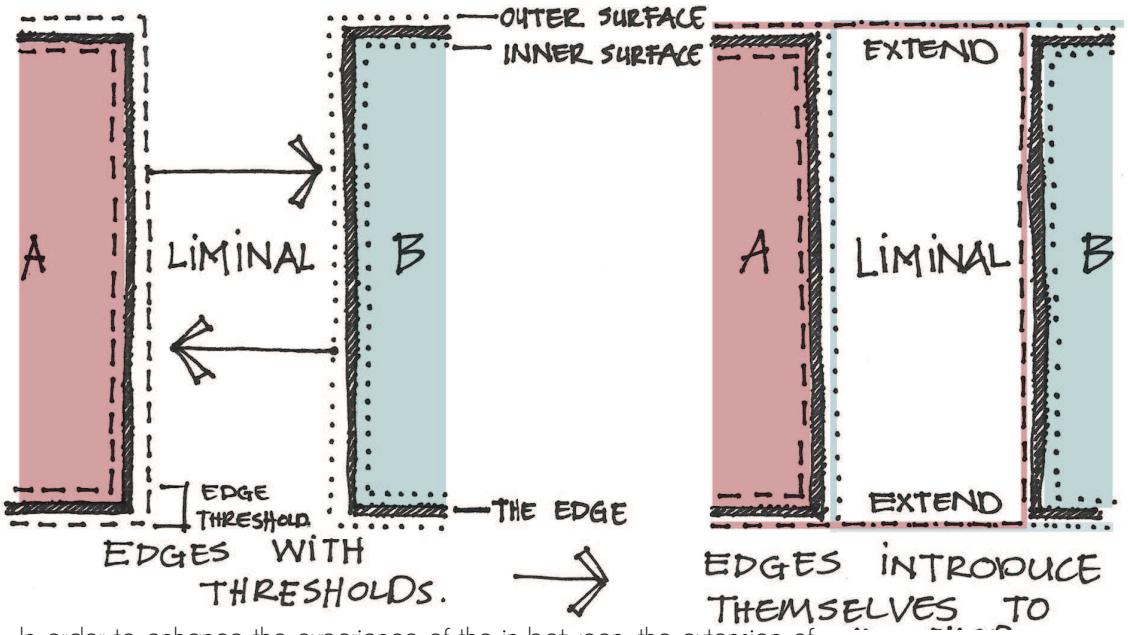


The liminal space exhibits characteristics of the outer surfaces of both edges involved.



The liminal space can only be identified by the cross-over between adjacent activities. It is here that it comes into existence. Through movement from A to B, C is discovered.

The liminal space becomes active through the experience thereof, thus our bodies need to be in that space (Casey, 2008: 4).



In order to enhance the experience of the in-between, the extension of both opposing domains is proposed. By combining the characteristics of the two adjacent spaces, the liminal space will introduce the two spaces to each other, exchanging characteristics in order to ease the transition between the two domains. Since the edge is considered to be unmovable (Casey, 2008: 3), the inner and outer surface (as the threshold of an edge) should acquire the function of introducing the contained space to its changing surroundings within the liminal space. The liminal thus creates the platform for different activities to meet (Casey, 2008: 1). As previously mentioned, First Avenue presents a difficult crossover from the urban grid to the sport precinct, which could thus be connected through the extension of each domain's main characteristics into the opposing domain. This representation of opposing features within different domains will facilitate an easier crossing. This should also be applied on a micro scale to accommodate the different sporting events hosted by the building; and an in-between space (between different events) should be provided where characteristics of each event could meet and integrate. The edge provides the provisional structure which opens up for emerging activities (Casey, 2008: 1), and since ritual gains its power from the act of performance, it can be staged through the structural support of the edge, within the participant's own preferences.

Liminal space as architectural platform for ritual

In designing the edge, by using specific architectural elements, particular sequences of places and experiences can be framed, creating the possibility for rituals to take place (Agrest & Gandelsonas, 1983: 87). Framing a space indicates to the participant that there is something beyond the space in which he/she finds himself, something or someone to look upon. According to Diana Agrest and Mario Gandelsonas (1983: 87), this is why ritual can relate to both film (where meaning is generated through a sequence of frames) and to theatre (where meaning is created in a symbolic performance). Victor Turner (1990: 8), a cultural anthropologist, also suggests a connection between ritual and theatre and their involvement as liminal events within the processes of a social narrative.

breach | crisis | redress | reintegration or division

Just like the course of a social drama, a ritual also develops through four phases, as described by Turner (1990: 8). A ritual thus emanates from a *breach*, where a participant deliberately breaks a rule within a specific setting. Then follows the *crisis*, in which conflicts between individuals or events reveal hidden clashes of character (Turner, 1990: 8). The crisis will continue to develop unless it is sealed off by a *redressive* action, which takes the form of a ritual (Turner, 1990: 8). The ritual thus exists in order to resolve a problem or to address an incident. The redressive phase carries the significance of the process, since the ritual will enable either a certain resolution, reintegration or division of the parties involved, the result of which forms the last phase of the social drama (Turner, 1990: 8). It is thus within the liminal phase where events such as ritual and dialogues between participants take place.

The liminal presents a threshold of being in-between the past and the future (a type of no-man's-land removed from one's usual setting), containing the promise of a ritual act (Turner, 1990: 11). Liminality provides a platform for unique structures of experience and chaos, and for a threshold of possibilities (Turner, 1990: 12). Ritual and theatre, described as liminal events, both allow for the reinterpretation of oneself and of the world, providing one with a heightened awareness of being within a certain

setting (Turner, 1990: 13). Architecture becomes the host for rituals by providing liminal spaces for participation in specific rituals.

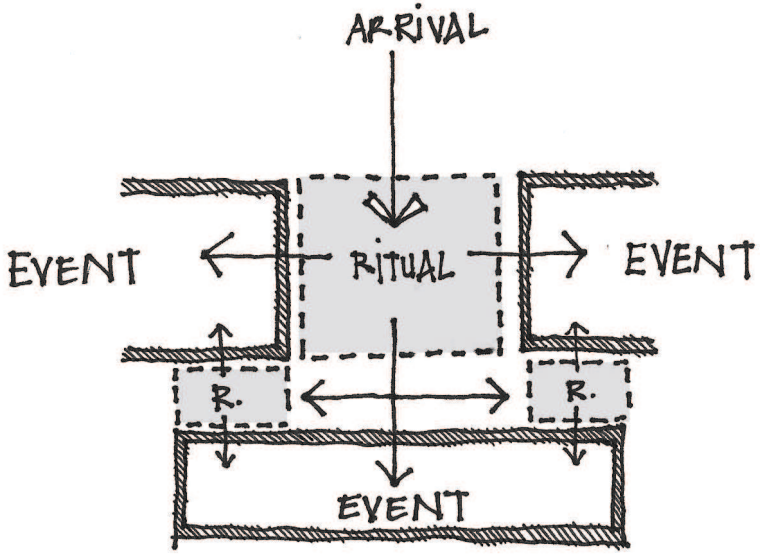
Culture affects the structure of a social drama (Turner, 1990: 9), indicating that rituals depend on the participants of the activity. Ritual thus allows for a free interpretation within a framed programme, according to Fernando Montes (1983: 28). Within different classes, regions, neighbourhoods and among people of different ages and genders, each participant has a different interpretation of how to attach meaning to a particular crisis scene within his/her own society (Turner, 1990: 17). A ritual act keeps on developing towards the participant's specific need. Each ritual performance of resolution (in the redressive phase) becomes a record or a memory of explaining certain events throughout life (Turner, 1990: 17). Rituals evoke the act of occupying or inhabiting space, or experiencing space and form, and if ritual is the performance then **architecture becomes the stage** (Agrest & Gandelsonas, 1983: 87).

Staging liminal events

In order to accommodate the specific rituals of the spectator and the performer, there must be an expression of spatial orientation. Architecture presents the staging of rituals to orient the participants (Graves, 1983: 52). The rituals may present the general narratives or aspirations of society and performing them can lead to the exposure of different rituals through a fragile composition (Graves, 1983: 52). In staging rituals, the liminal space is required, and thus the in-between moment of separated activities or domains should be facilitated. Tadao Ando explains that there should firstly be a fundamental division between adjacent spaces (domains) in order to celebrate the joint, which becomes the point of interest, the unexpected space which should support the interaction between A and B (Okumura, 1983: 128). The joint becomes the intermediate (liminal) space where the dialogue should take place.

The joint can exist in many forms within architecture: as a courtyard, a platform, a staircase or any intermediate space serving as a cross-over between events or domains. With the use of these liminal spaces, the transition between public and more private spaces can be regulated to form a degree of closure, a semi-public space intended for the community to meet (Janson & Tigges, 2014: 55). When entering such a space, the individual appears publicly as if he/she walks onto a stage, provided that the architecture supplies an appropriate frame (Janson & Tigges, 2014: 101). To achieve this sense of arrival, Janson and Tigges propose the following architectural resources to consider: the correct presentation of a staircase within a room, the manner in which they lead into other spaces, the positioning of pedestals, spatial guidance through volume differences and the use of axes, paths and frames (Janson & Tigges, 2014: 102).

During events, the outdoor sport field, court, pool or track usually represents the stage for the athlete, where he/she goes to perform his/her ultimate best, while the spectators gather (in groups of interest) to witness the performance. In the proposed Sport Performance Centre, the building should organise multiple sport activities according to a strict programme to achieve the best functional use and integration. To ease the transition between these events, intermediate spaces are needed. These joints become the meeting place of the spectator and the performer, where they can both interpret their own rituals accordingly and decide whether to participate in the events or not. These joints become the places of interaction where the performer spectates and the spectator participates in the performance.



THE PARTICIPATION OF CHOICE.

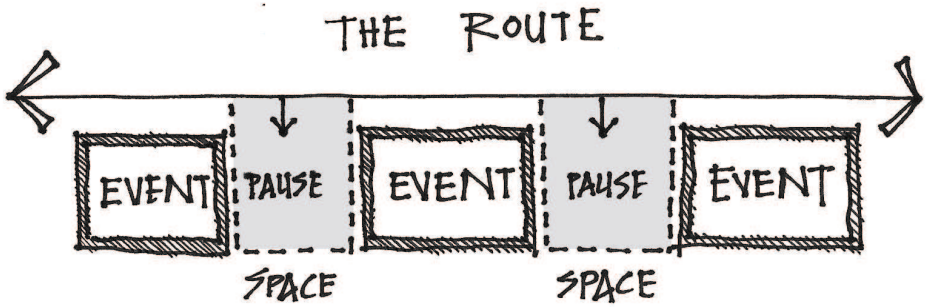
2

[EDGE CONDITION]

[THE NARRATIVE - THE ROUTE AS INITIATOR FOR THE ASSEMBLY OF RITUALS]

Since ritual gains its power from the act of performance, it requires movement, just like in the case of thresholds.
Designing this second edge condition firstly involves the arrangement of spaces and architectural elements to facilitate movement through a series of the thresholds (Agrest & Gandelsonas, 1983: 92). By participating in and moving through these thresholds, rituals present themselves as a process (Turner, 1990: 12). An expressive and versatile space is thus required that does not constrain and dictate movement, but rather provides a frame of possibilities in which the participants can establish their own ritual process. Through the use of these framed spaces, meaning is confirmed, making **ritual a narrative of entry, procession, and centring** (Bourke, 1983: 5).

Ritual thresholds should not limit where activity must stop or begin, which requires these liminal entities to be arranged through the careful choreographing of a sequence of events and spaces. Bernard Tschumi describes sequences of space and sequences of events as independent systems, but the use of the "narrative" causes these two systems to intertwine and define each other. The aim, according to Tschumi, is to "maintain these contradictions in a dynamic manner, in a new reciprocity and conflict," (1983: 29). Ritual, as understood by Tschumi, is thus a pre-determined form of narrative with an exaggeratedly structured programme in order to arrange events, movements and spaces into a single progression. The programme either combines or parallels divergent systems. The dominance of this programme overshadows the particular character of the spaces and events it comprises, thus stating that "*the route is more important than any one place along it*" (Tschumi, 1983: 29).



[SEQUENCE OF EVENTS AND SPACES]

A linear sequence of space, aligned along an axis, is an architectural organisation method to alternate between pausing and spatial points along a route of continuous movement (Tschumi, 1983: 31). The fluctuation of different spaces accommodates the wide variety of movement taking place within a sport building. Architecture can thus convey suggestions of movement by offering openings and passages, and this movement can be increased or reduced through the widening or narrowing of these passages (Janson & Tigges, 2014: 203). Movement is the connection necessary to experience the difference between pausing and spatial points. Through repeated experience and familiarising oneself with the route, movement then becomes meaningful, producing a bodily experience which can be recalled, and thereby providing a basis for the rituals of our everyday actions along an urban route (Janson & Tigges, 2014: 205).

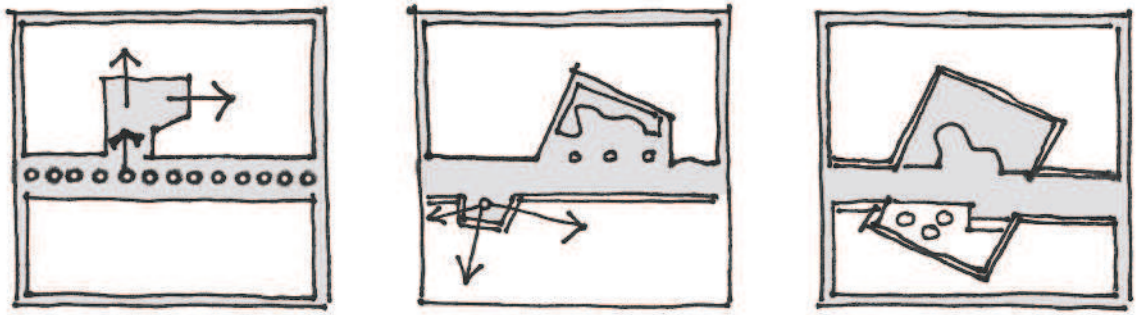
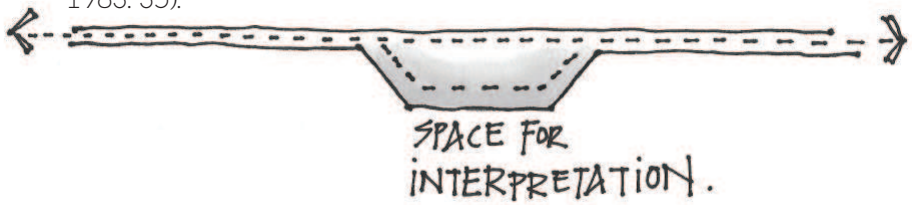


Illustration showing how architectural elements can choreograph different sequences on a route (Ching, 2007: 283).

The meaning of any sequence depends on the relationship between spaces and events and the movement between them (Tschumi, 1983: 33). The composition of these three elements breaks the linearity of the primary sequence. Tschumi distinguishes between two types of sequences involved in ritual space: the contracted and the expanded sequence. The contracted sequence involves the fragmentation of space into individual discrete segments and distant actions. The expanded sequence, the type presented in the present design proposal, creates a place in the gap between spaces. The gap becomes an entity of its own (a corridor, an activity, a threshold), a meaningful character between two events (Tschumi, 1983: 35).



Architecture can serve as reinforcement of such ritual actions, for example, in the design of the sequence of supports along a procession route, in the dramaturgical potential of the Baroque staircase and in the stop-and-go character of the approach to the Acropolis via the Propylaea (Janson & Tigges, 2014: 120). The *spruit* along Att Horak Street presents the connection axis of all the facilities of the sport precinct. Accompanying the *spruit* with a defined, covered path (promenade) naturally encourages forward motion and accommodates alternating spaces along a route. The path can thus be enlarged by merging with the spaces it passes by, spaces of events, pausing, resting or viewing opportunities (Ching, 2007: 283). The promenade stages rituals along the route to allow for different purposes of being on it. The route becomes the threshold between public and private domains, prohibiting access to some spaces or allowing participation in others. The promenade thus presents the unfolding of ideas within a linear perspective, discovering pause spaces and eventful places along the narrative of the route (Graves, 1983: 54).

Ching presents three arrangements of events and spaces along a route: to pass by spaces, to pass through spaces or to terminate into a space (2007: 278). The route intended for this proposal does not terminate into a space so the focus is on passing by and through spaces:

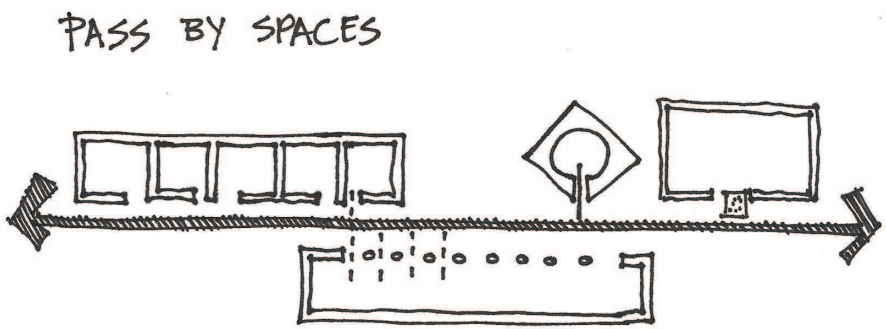


Figure 70 - To pass by spaces, the integrity of each space is maintained through the flexible configuration of the path (Ching, 2007: 278).

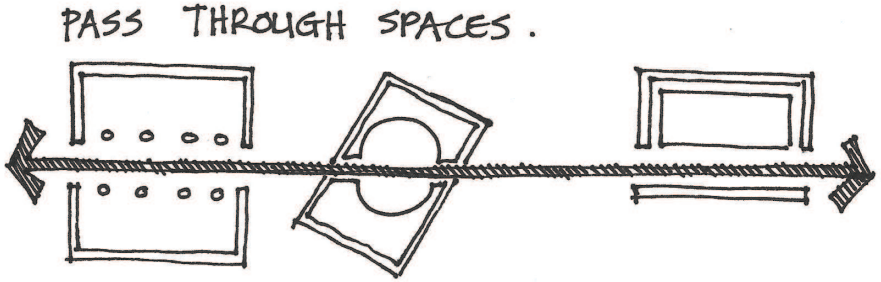


Figure 71 - The path may pass through spaces axially or indirectly, cutting through. The path creates patterns of rest and movement within it (Ching, 2007: 278).

The path proposed for this project passes by different spaces as well as through others. A margin is thus provided between the spruit and the building in order to allow space for participants to interpret their own experience. Sophia Vyzoviti refers to Sanford Kwinter, who states that architecture can be understood as a system of forces that give shape and rhythm to the everyday life of the body, and that an object is not defined by its appearance, but rather by its practices: "those it partakes and of those that take place within it" (Vyzoviti, 2008: 42).

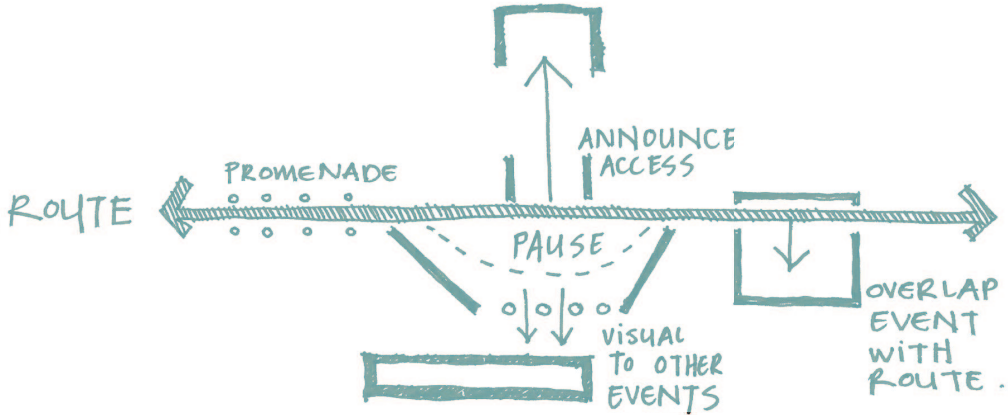


Figure 72 - The route proposed is a combination of the two arrangements that is presented to the left.

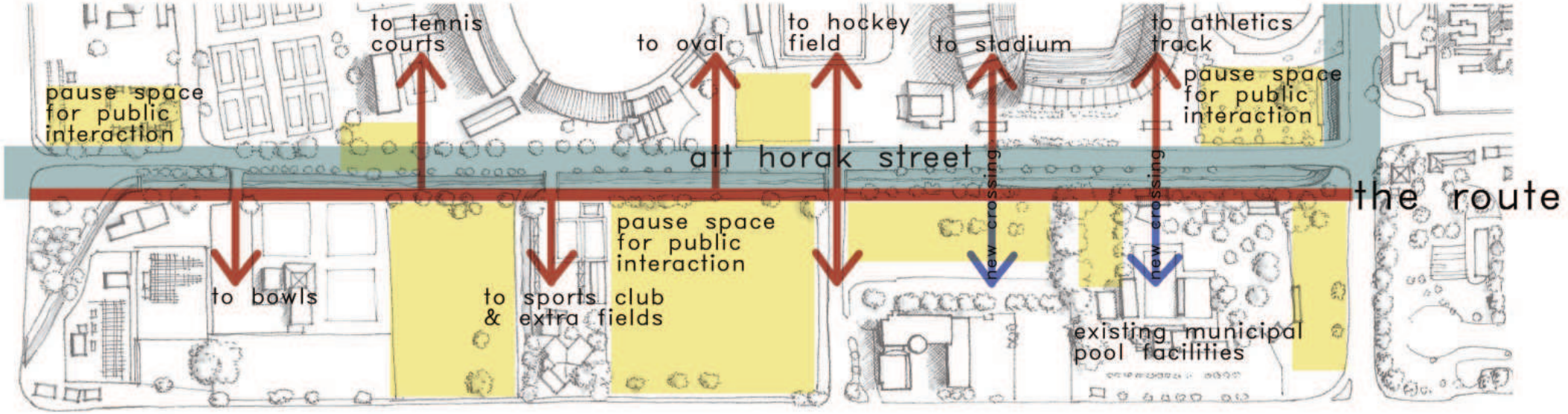
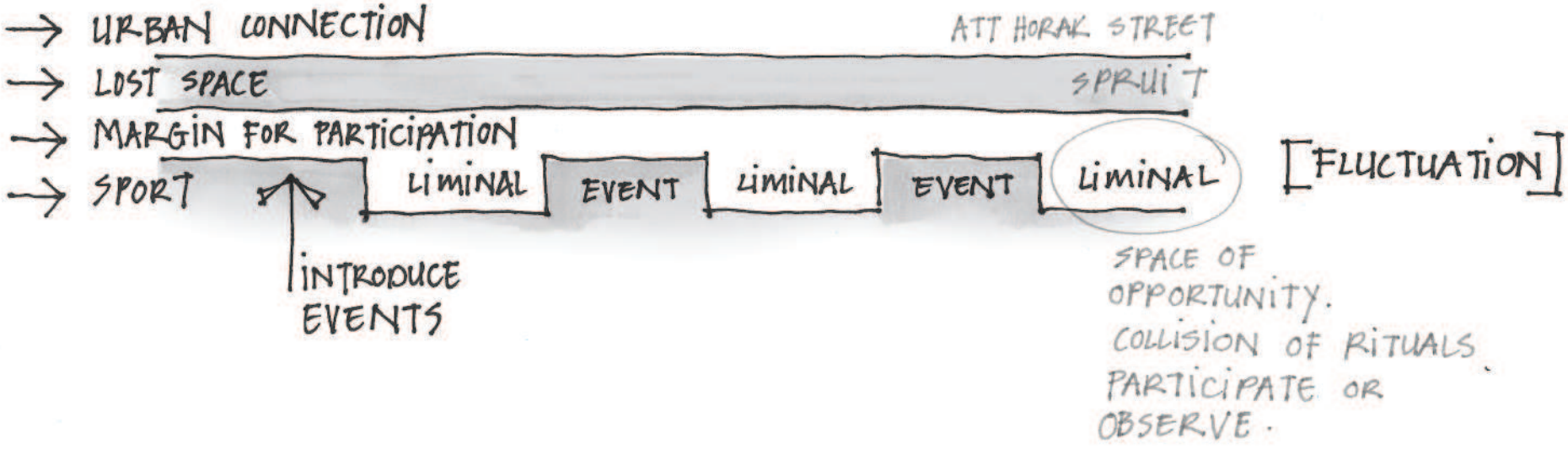


Figure 73 - Att Horak Street already presents a connection route between existing facilities, but with the new proposed pedestrian walkway, access should be allowed to all activities together with the availability of pause spaces to allow for rest.

[THE EDGE CONDITION]

The second edge condition thus requires the grouping of events with liminal entities along a route in order to manage the fluctuation of rituals and multiple activities involved in the building programme. The sequence of events and spaces determines a frame for ritual interpretation but leaves a margin for the participant to initiate his own narrative. The narrative embodies the interdependence of events and the liminal, establishing meaning through movement and thus the experience thereof.

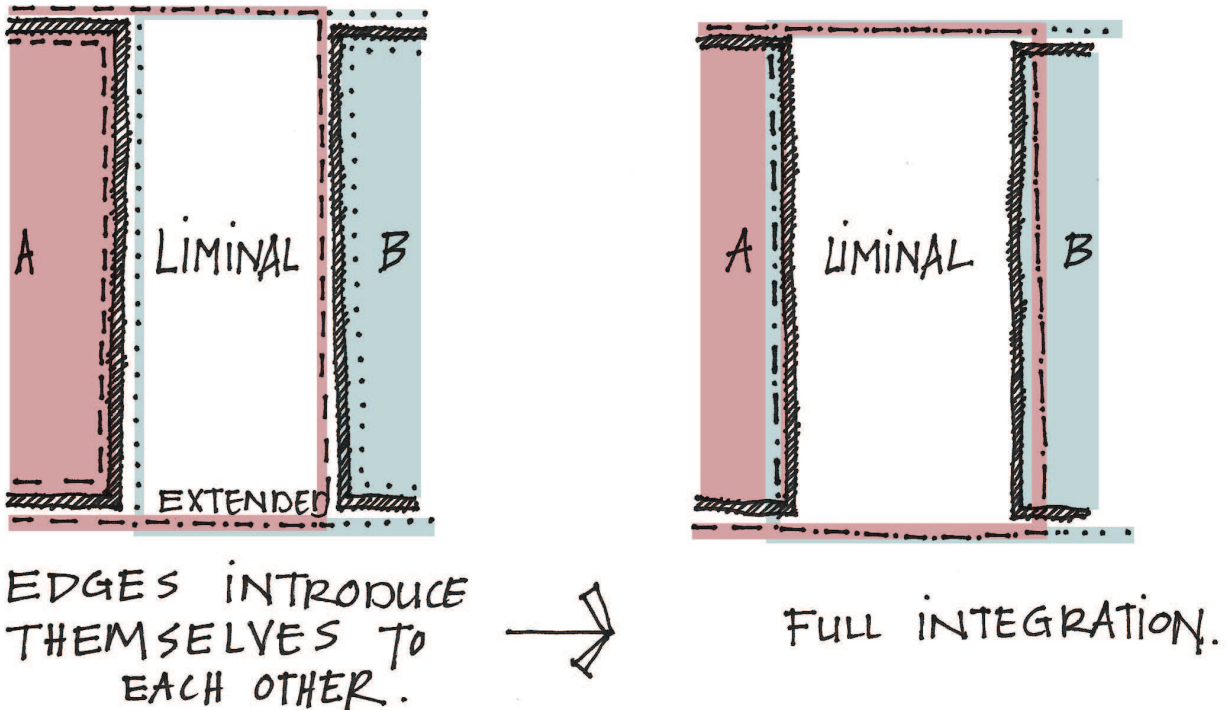


3

[THE FOLD - FULL INTEGRATION OF EVENTS]

[EDGE CONDITION]

Agrest and Gandelsonas (1983: 87) explain that "meaning [in architecture] is derived from the relationship between objects rather than from a single object". This relationship, to a great extent, can then introduce a full integration between events and spaces, across edges, where the overlapping of conflicting partis can generate new situations in their effect on each other (Agrest & Gandelsonas, 1983: 87). Relating back to threshold and the liminal space created for rituals to emerge, this is the overlapping of the liminal with the contained space to achieve full integration between all events and spaces. Thus the adjacent events are not only incorporated into the liminal, but the liminal is also incorporated into the event space. The liminal space achieves its own threshold of interpretation.

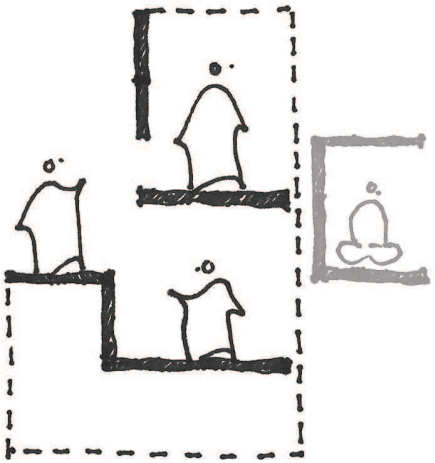


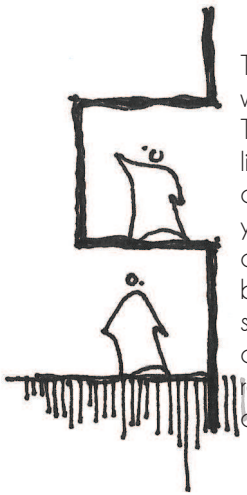
Space is no longer contained within strict enclosures, resulting in spaces and events being infused in one another and their surroundings, and thus space is allowed to continuously flow into the next space (Janson & Tigges, 2014: 122). The flow of space provides an expressive quality of movement to a sequence, which can only be experienced within the flow of our own movements through it (Janson & Tigges, 2014: 122). Personal boundaries then tend to dissolve when our movements are not restricted by spatial limitations (Janson & Tigges, 2014: 123). This continuous flow of movement proposes a spatial inversion where a space can be folded and everted within itself, presenting the fold. Folding can, in essence, be appreciated as a dynamic experiential method of complex layered design, which means that it not only indicates the manipulation of the surface but the activities as well (Vyzoviti, 2008: 39).

The Fold, by Deleuze

Gilles Deleuze considered the spatial realm of the fold after exploring Gottfried Leibniz's notion of a monad through the concept of folding (Deleuze, 1993[2008]: 541). Leibniz's concept cannot be understood outside the curvilinear or involuted shapes of the Baroque era (Deleuze, 1993[2008]: 541). Deleuze thus also explains the fold with reference to Baroque architecture. He states that Baroque did not invent, but rather produced endless folds coming from the East, Greek, Roman, Romanesque, Gothic and Classical times (Deleuze,1993[2008]: 3). The Baroque trait twisted and turned its folds, fold over fold, one upon the other, pushing them to infinity (Deleuze, 1993[2008]: 3). Baroque differentiates its folds in two ways, as if infinity were composed of two floors or stages: the first floor level (the below) as the pleats of matter, and the second level (the above) as the folds of the soul (Deleuze, 1993[2008]: 3). The pleats of matter represent the first type of fold, organised according to the parts which it develops (a joining but also a division of matter) (Deleuze, 1993[2008]: 541). While the soul above follows its own folds without developing them completely, this level stretches out infinitely (Deleuze, 1993[2008]: 3).
These two levels become connected, with the soul projecting down below and pleats moving upward to simultaneously envelop the soul (Deleuze, 1993[2008]: 4). The spaces thus project into each other, creating a **continuity of movement**.

Mallgrave and Contandriopoulos (2008) explain this phenomenon of continuity by referring to matter as a fluid entity. They state that matter tends to spill into space, where the pleat causes a compressive force which provides portions of matter to the surrounding areas, inverting into adjacent spaces, determining its curvature (Deleuze, 1993[2008]: 542). Matter thus offers an infinitely porous, spatial texture without emptiness, as it contains the possibility of dividing endlessly into smaller and smaller vortices, a continuum on which the spaces involved still touch one another (Deleuze, 1993[2008]: 542). This continuum is achieved by integrating events completely, causing a continuous movement. It relates back to the conceptual understanding of the fluctuation on site and the aim to revive the sport precinct. Easing the movement between events will inspire a constant flow and thus stabilise activities in the area, **animating a continuous presence**.



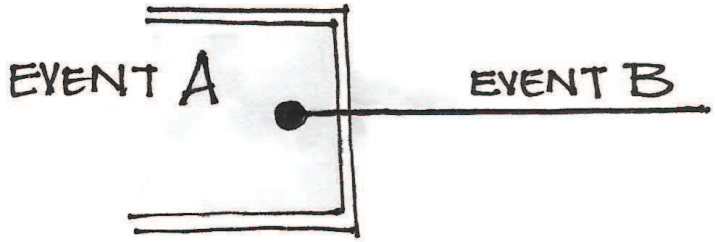


The manipulation of the surface

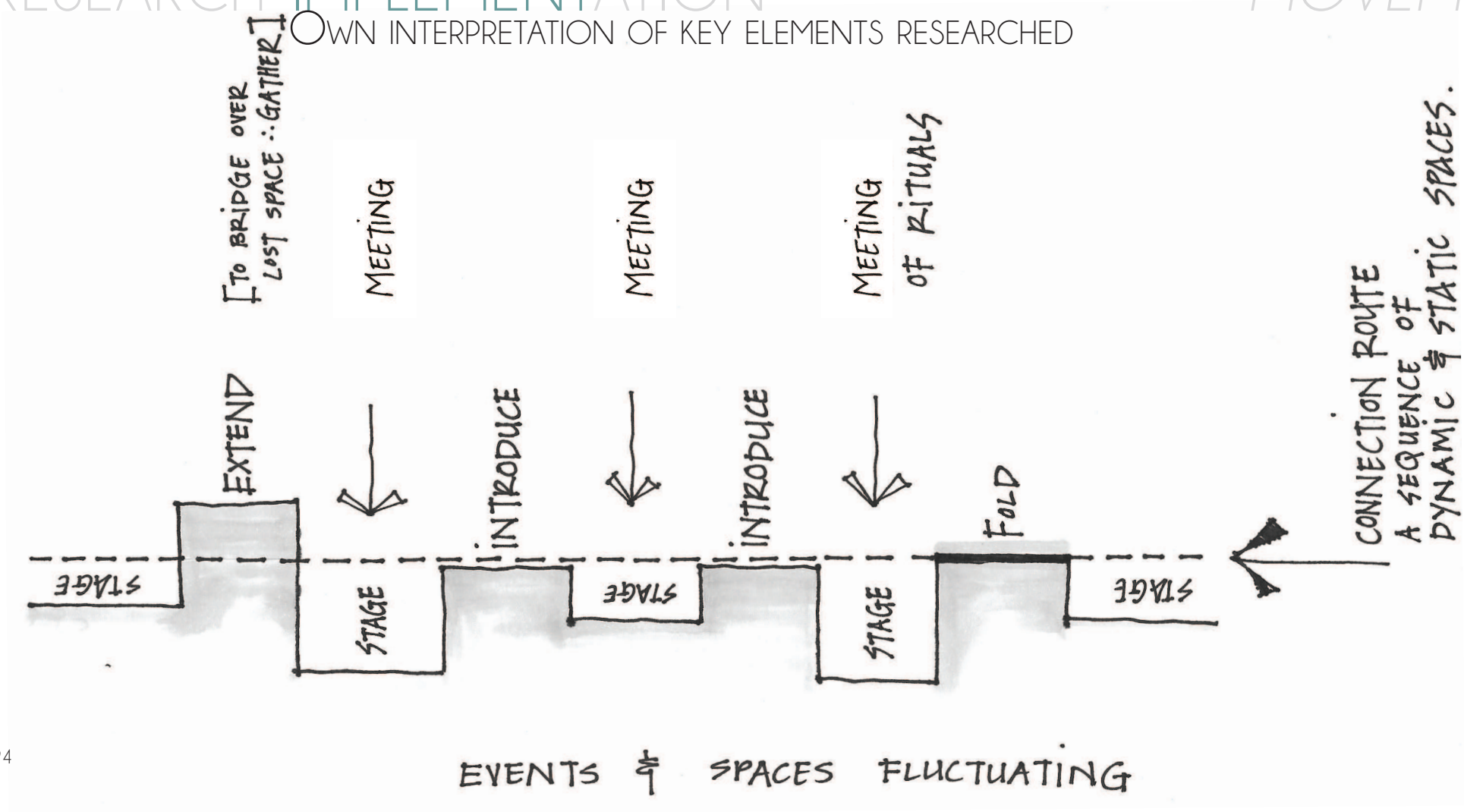
To fold a surface means that one side is reversed onto the other, and with this, a certain volume of space is folded (contained) into it (Janson & Tigges, 2014: 123) Folding as a process is understood as the continuous linking of inside and outside or above and below by means of a folded dividing surface (Janson & Tigges, 2014: 123). In the spatial fold, you find yourself within a zone which projects itself into an adjacent space without actually belonging to it (Janson & Tigges, 2014: 124). The relationship between these adjacent spaces allows for continuous movement and secures flowing transitions between them. A building does not have to be a continuous surface folding itself from a floor into a wall and becoming a roof, but it can frame dynamic conditions in order to display the flexibility of folds in an abstract way.

Events fold

The architectural focus of the finite object (or space) has shifted to the manufacturing of processes which allows for an infinite condition of variability while maintaining cohesion (Vyzoviti, 2008: 39). The outcome is an event-assuming place within a continuum of variation. If the fold is perceived as a process, it is expressed through the use of different scales, speeds and vectors, which determine and materialise the transition (Vyzoviti, 2008: 40). The continuous fold caters for the transition of events, rather than a visual fold. The end result involves the sharing of topological characteristics in the continuous spatial fold to achieve a continuation of movement (Vyzoviti, 2008: 41). The fold is always composite, alternating between events (domains), not indicating the beginning or the end. Every event then originates from within a previous event. The transition between domains becomes intertwined, eliminating the experience of a threshold and creating a constant overflow into the next domain, which started in the last phases of the current domain. The events fold, not the architecture.



OWN INTERPRETATION OF KEY ELEMENTS RESEARCHED



BETWEEN EVENTS IN A BUILT EXAMPLE

THEORETICALLY APPLICABLE PRECEDENT

UNIVERSITY OF CAPE TOWN SPORTS CENTRE, WESTERN CAPE

by Roelof Sarel Uytenbogaardt in 1977

The building introduces itself to the street with an arrival promenade. Indicating an alternative route, the promenade allows public interaction while serving as sidewalk. By using the covered walkway, one becomes part of the building's dynamism as well as a participant of the guided route. Without feeling obliged, the user becomes aware of events being presented to him/her, but the choice of participation is still his/hers to make.

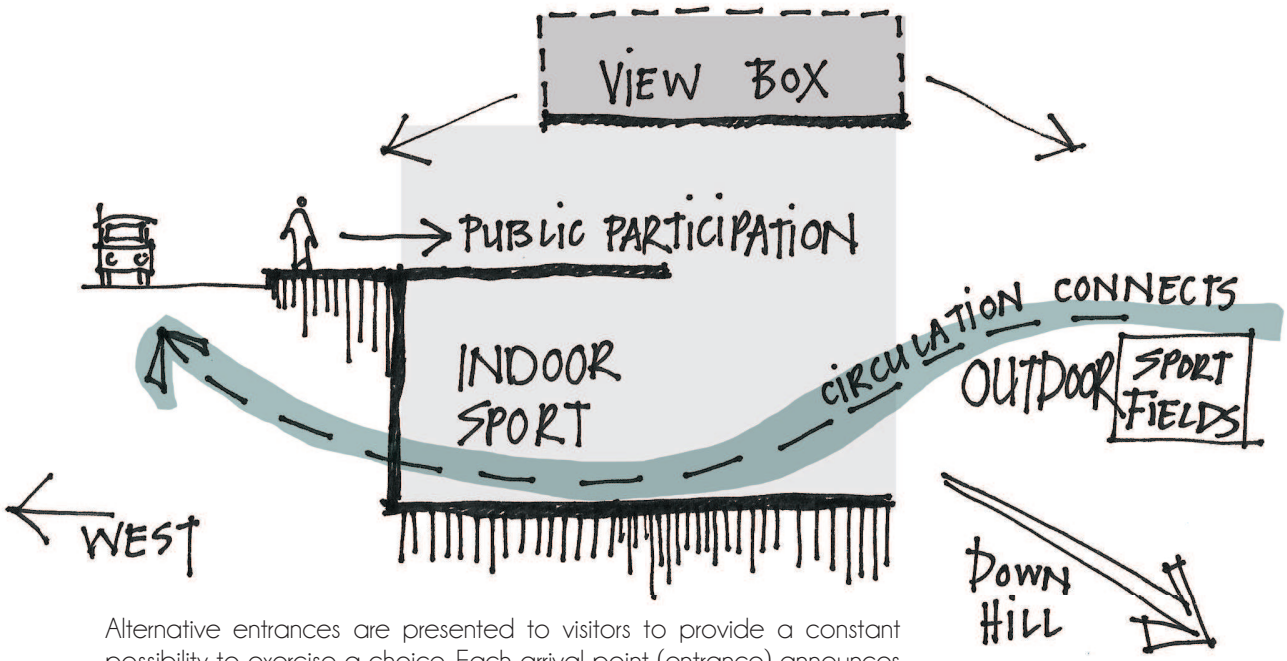


Figure 74 - Photograph of the corner arrival of the Sport Centre (Bell, 2012: online).

The building is situated close to the sidewalk of Rugby Road within the UCT campus. The street facade is in close relationship to vehicular activity and also allows public participation (pedestrians) to activate movement on the facade. The facade promotes a uniform movement, revealing a continuation of spaces
in the interior.



Figure 75 - Photograph of the street view of the Sport Centre (Bell, 2012: online).



Alternative entrances are presented to visitors to provide a constant possibility to exercise a choice. Each arrival point (entrance) announces that some event is about to start. The building frames specific views, happenings and even the scenery beyond. The participant is always aware of an upcoming event which creates the integrated over-fold of events into each other. Not really certain where an event begins or ends, the participant becomes part of both.

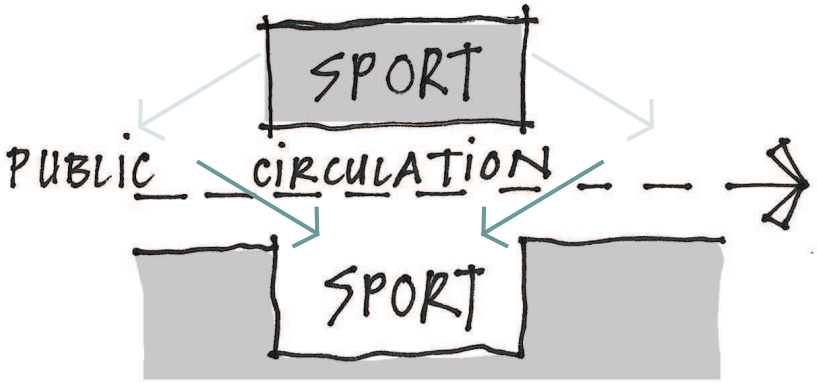


Figure 76 - Photograph of the entrance from the Sport fields (Bell, 2012: online).

Some spaces are lifted from the ground to allow for free-moving public participation underneath as well as for nature to proceed along its course. The raised activities allow for visual connections to the public and for all sporting events to be seen.



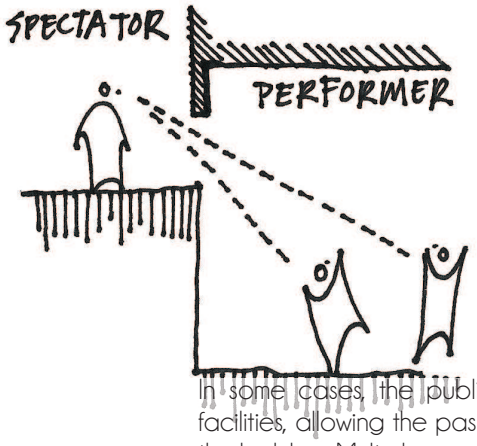
Figure 77 - Photograph From the back of the building up towards the street (Bell, 2012: online).



The overlapping of events (activities/spaces) and walkways also adds to the participant's awareness of what is happening around him/her and beyond the space in which he/she finds him/herself. Circulation is important in achieving this continuum of events, which makes space and the movement through it dependent on each other. Movement throughout the building is expressed through the fluidity of the materials used. Organic and free-flowing surfaces guide the participant along the restrictions of sport facilities and indoor courts. As with the interior, the exterior facades also indicate access and circulation through curvilinear surfaces.



Figure 78 - Photograph of interior showing circulation paths indicated through structural elements (Bell, 2012: online).

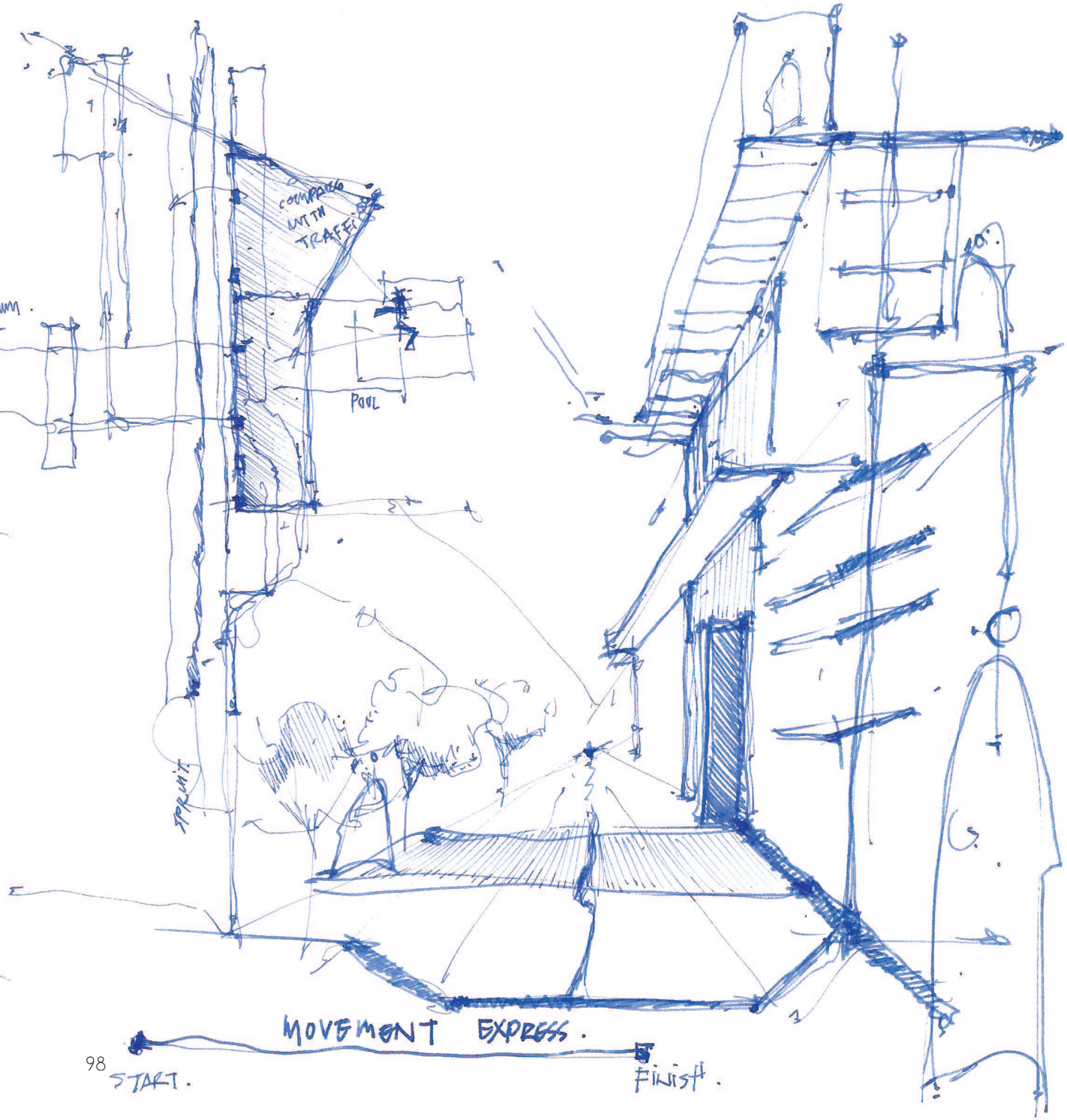


In some cases, the public walkways are higher than the indoor sport facilities, allowing the passer-by to become a spectator without entering the building. Multiple circulation routes and walkways through and around the building allow the participant to experience part of the movement a performance presents.

Although this sport centre is despised by some and purposefully neglected (Bell, 2012: online), the continuous flow of movement the building presents relates to the aim of the present theoretical discourse.

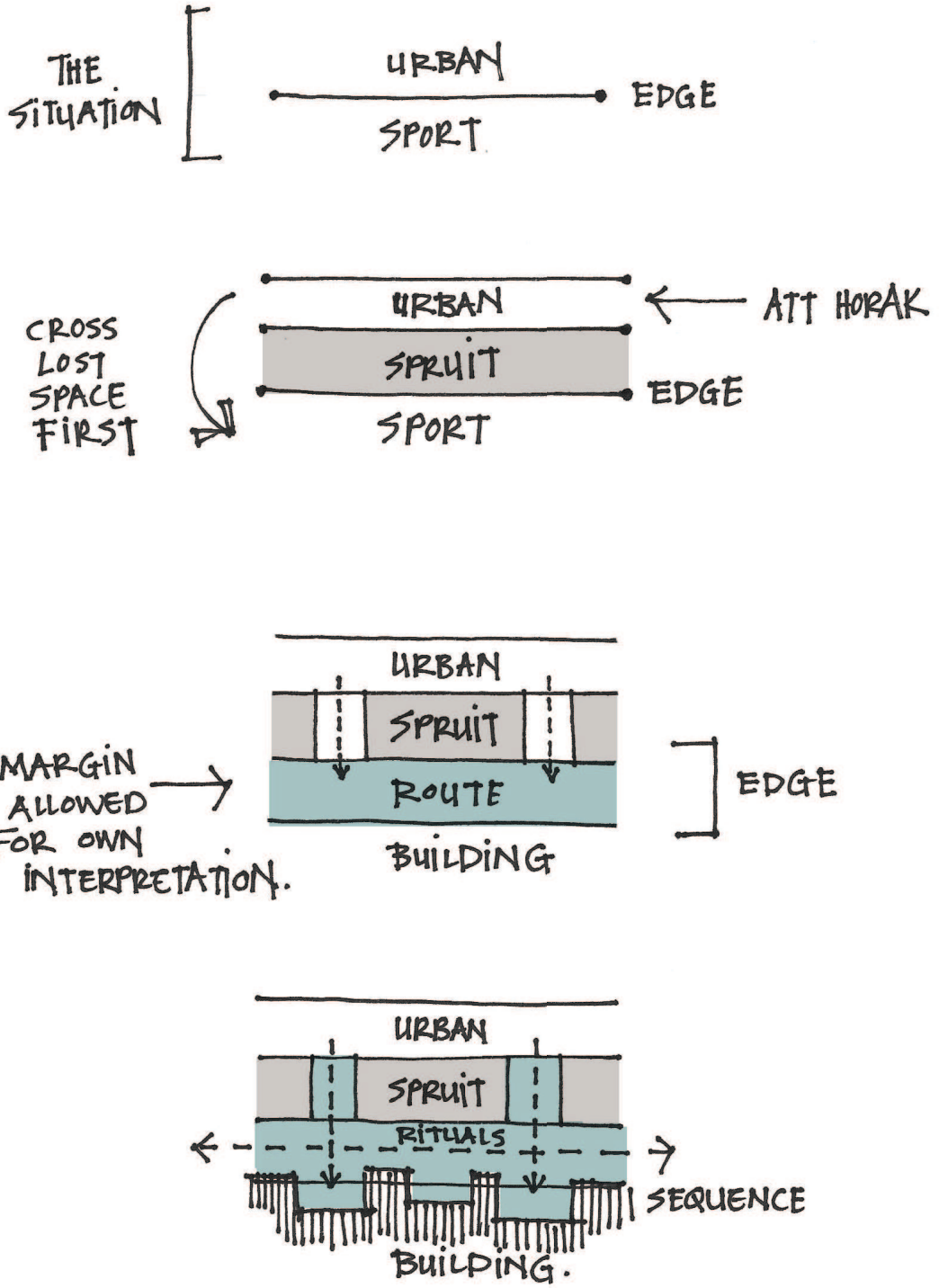


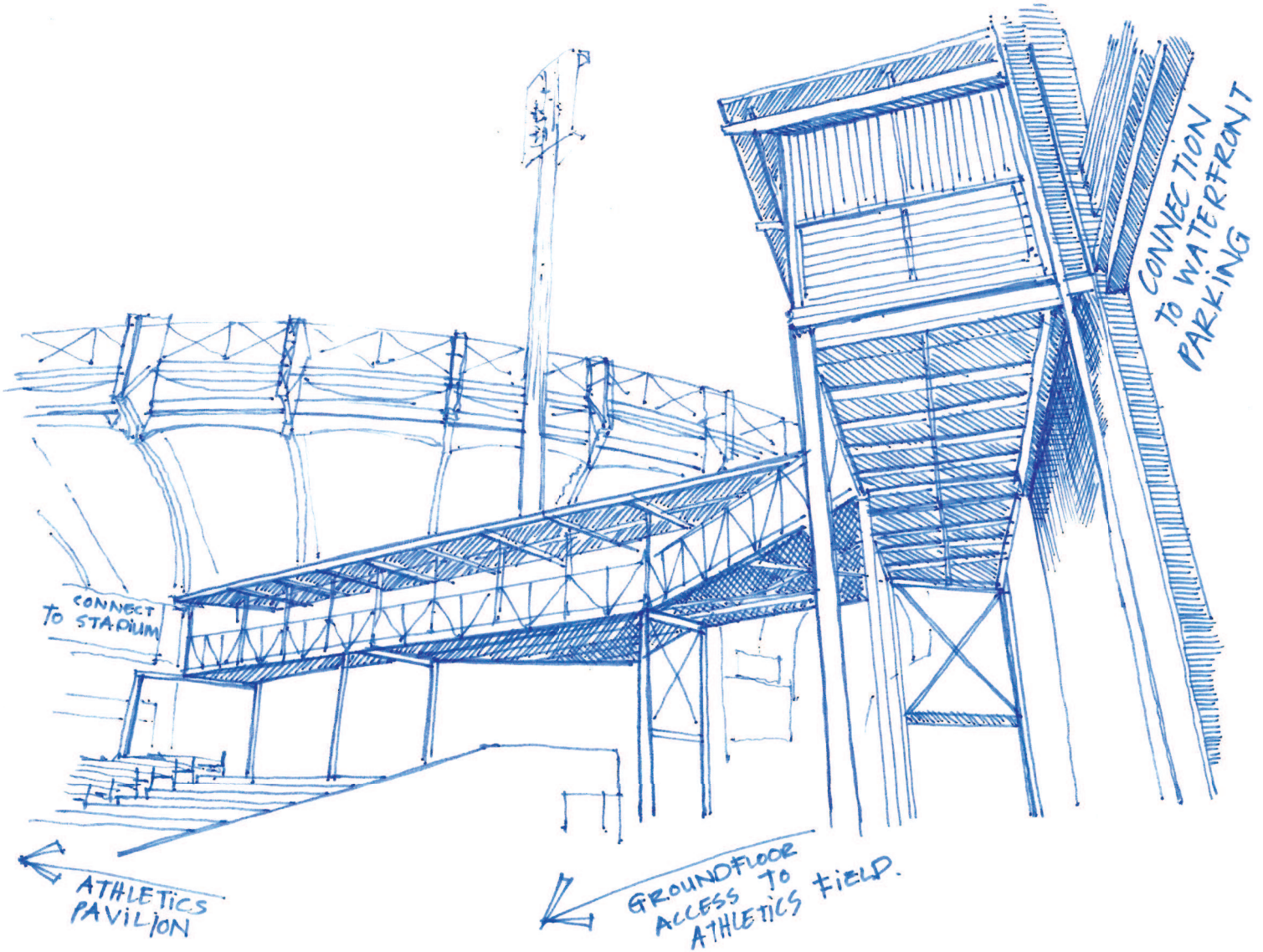
Figure 79 - The facility is set below street level (Bell, 2012: online).


COMPARED WITH TRAFFI
POOL
SPRUNT
MOVEMENT EXPRESS.
START.
FINISH.

DESIGN APPLICATION

In conclusion, to accompany all the different events and layers of participation, the edge condition needs to be designed. Within Att Horak Street specifically, a route is used to accommodate for a sequence of events and spaces, alternating between them to allow for the assembly of multiple rituals. In the proposed building, sport-related events can be celebrated by separating them with the provision of a liminal space. Liminality provides a space for different participants (the performer and the spectator) to meet in observation or contemplation on whether to participate in the presented events (of the building) according to personal ritual interpretations. And in some cases, where there are too many events involved within a moment of dialogue, the final edge condition presents the full integration or merging of events. The fold thus achieves a continuous flow of movement because the event already started at the end of the previous event, **integrating the participation of the usually separated participants**.




CONNECT TO STADIUM
CONNECTION TO WATERFRONT PARKING
ATHLETICS PAVILION
GROUNDFLOOR ACCESS TO ATHLETICS FIELD.

[TECHNICAL RESOLUTION]

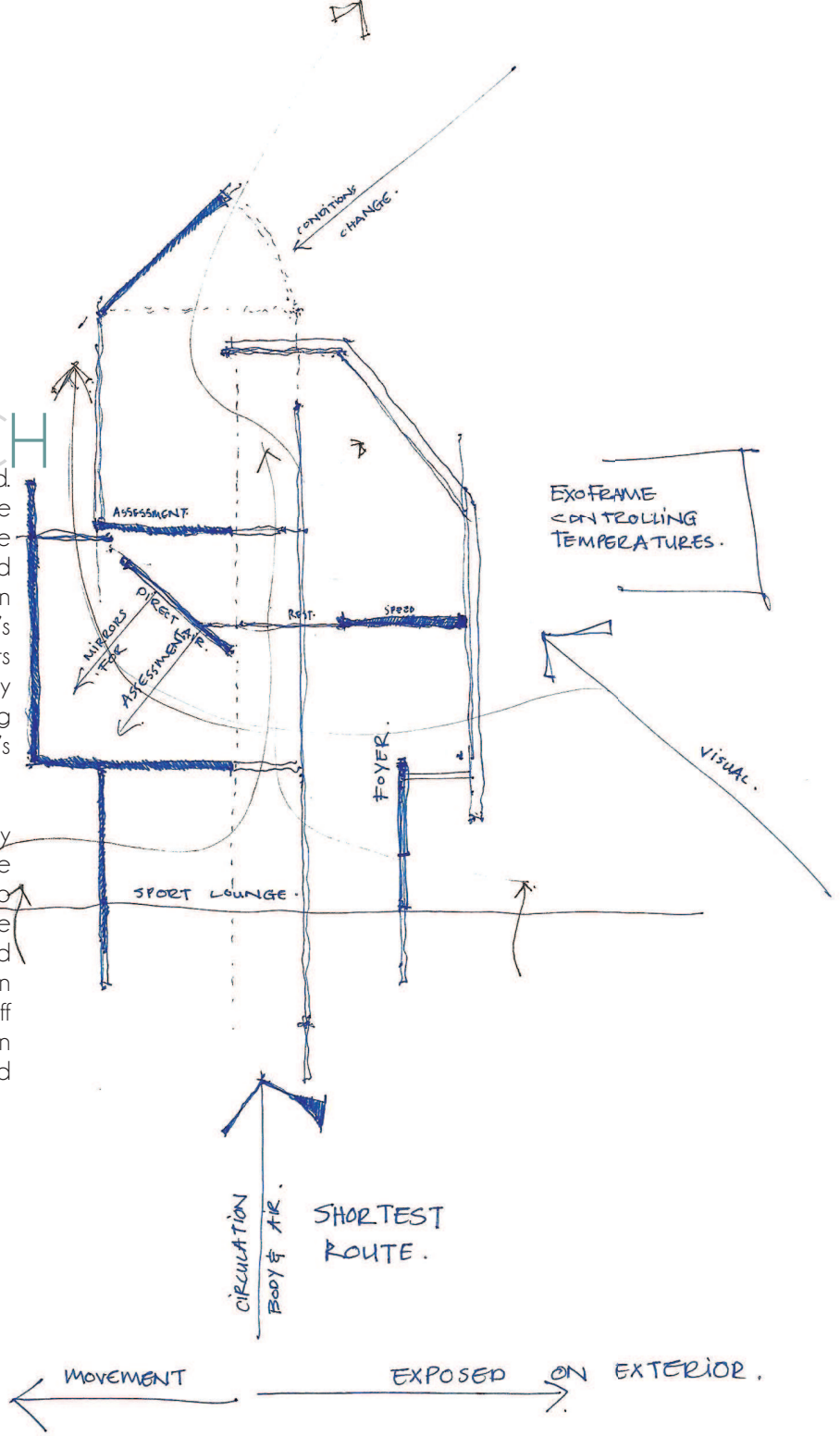
2.4 tectonics

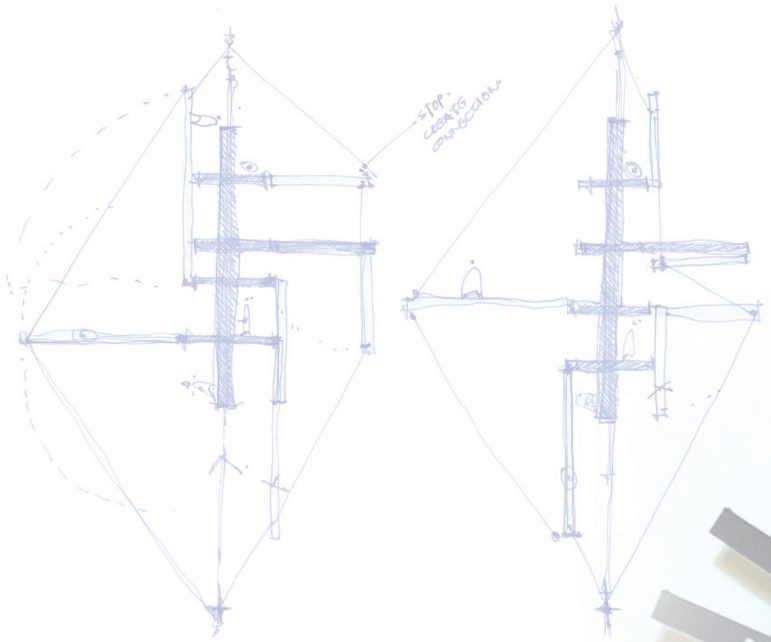
This section focuses on the importance of the structural development that should accompany the design process. As with the above investigations, the structural ideas and objectives were also developed through a process of conceptual interpretations, structural characteristics identified within the proposed context, the study of built examples, sport-specific requirements with regard to spatial specifications, and how the structure can guide the movement of the participant and thus become the exercise equipment itself.

CONCEPTUAL APPROACH

Initially, to start the design process, a structural concept was proposed. It indicates the main ideas of adjusting the structure according to the movement requirements of the activities within the building and the importance of space being multi-purposed. In reference to the third conceptual approach, bionics (as discussed in the topology investigation earlier in Part Two), the building should become the extension of the body's movement, allowing it to function according to its preferences and to its full potential. In order to achieve the best possible exercise opportunity within the shortest time spent, the design of the exercise and conditioning spaces should thus suit the movement of its participants, within the design's own dynamic and static requirements.

A main frame of concrete with masonry infill represents durability and permanence, and is proposed to give stability to the multiple functions hosted by the building. This base structure will also need to counterbalance the addition of the users' movement that will fluctuate with participation. With the base frame in place, light frame structures and transparent surfaces are proposed to form the exoskeleton (roof and skin facades) which becomes the flexible structures (but still dependant off the main frame) that make provision for climate requirements, ventilation regulations, natural light infall, vertical circulation, overhead coverings and the exposure of interior activities on the facades.





[MODEL INTERPRETATION]

[BASIC FRAME + EXOSKELETON]

STABILITY	EXTENSION
PERMANENT	DYNAMIC
SPECTATOR	PERFORMER
CONNECTION	STAIRS
CIRCULATION	OPEN
VERTICAL	COLUMN | BEAM
ELEVATOR	INFILL PANELS
CLOSED	LIGHTWEIGHT STEEL
COLUMN | BEAM	ALLOW MOVEMENT
LOAD BEARING	FUNCTIONS EXPOSED
CONCRETE	OUTWARD FOCUS
MASONRY	TO THE EVENTS

Figure 80 - Layered photographs showing the movement of the built model.

EXISTING SITE STRUCTURES

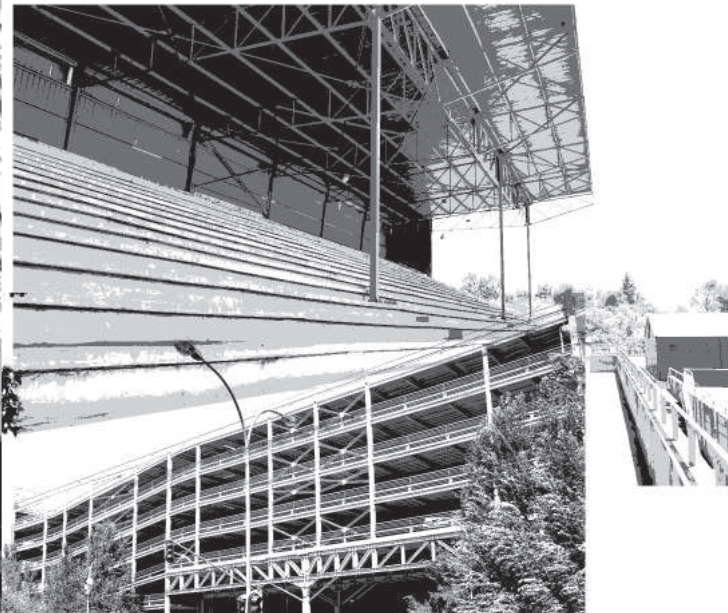


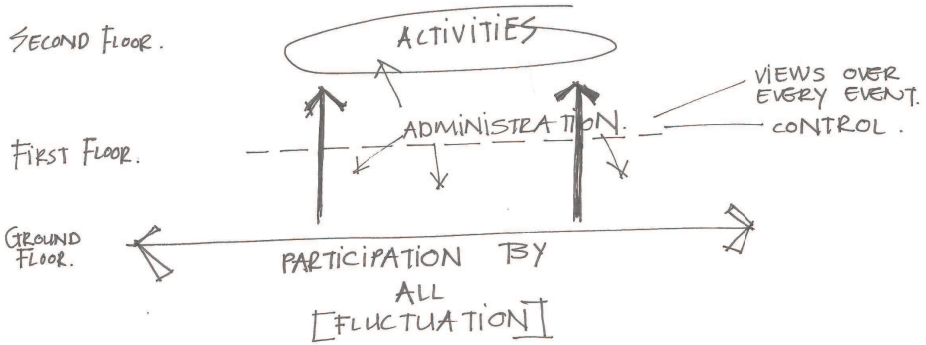








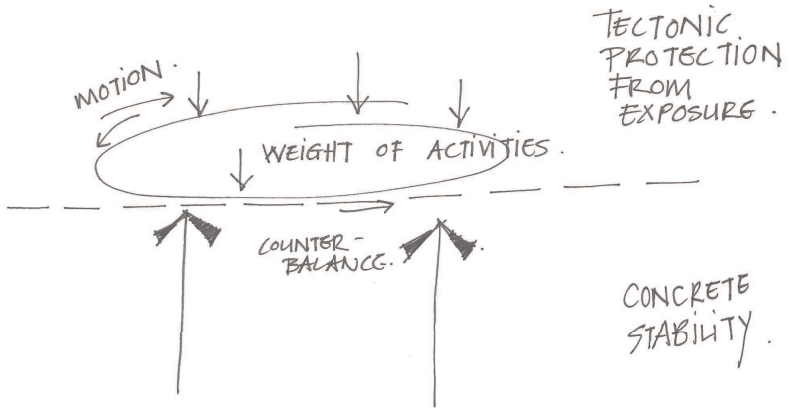




STRUCTURAL ORIENTATION

The design of the sport centre focuses on the facilitation of movement and the improvement of all participants' performance. The project itself becomes the host for movement, allowing the body to participate in its own preferred movement while pushing the boundaries of its abilities. The design should thus not only accommodate for a daily walk-sit-stand notion, but rather for a run-stretch-rest-sprint notion. With the essence of the project expressed through the term *efficiency*, the design should allow multiple events to take place simultaneously and all to be aware of one another. Mezzanine levels, courtyards, overlapping functions with specific views, exposed circulation and double volumes are all design methods which will help to achieve this outcome.

A sport building design should be dynamically oriented through circulation patterns and intensive physical training, but with the support of static spaces for treatment that will heal injuries and allow users to recover as well. With the aim of displaying the movement of participants both within the building and beyond the facades, a design approach was developed of layering main functions vertically, overlapping and integrating into one another to create visual connections between all the participants and the observers on the outside. To achieve full functionality in both the extensive building programme and in access control and the self-orientation of its participants, the project design incorporates a layering of events and facilities.



Ground Floor

By lifting the private sport facilities up from the ground, the ground floor becomes more open for public interaction, not only as spectators, but also as participants in group sports and recreational activities. The medical facilities (for all sport-related injuries) should also be housed on ground floor level to ensure easy access to all patients.

First Floor

The first floor (mezzanine) accommodates the administration staff and trainers who become actively involved in the different activities hosted by the building. Therefore, placed in between the public ground floor and training facilities on the top floor, full control over the events and circulation throughout is provided with this in-between layer.

Second Floor

With the performance-orientated facilities on the top floor, the structure needs to provide stability for these dynamic-intensive functions. The main element of the design is a 160m sprint track on the top floor level. Considering the impact of the athletes on the running surface, as well as a conditioning pool on this level, concrete became the structural material to counterbalance the participants' weight as well as that of the pool.

STRUCTURAL INVESTIGATION

Involves specific research to resolve structural challenges and unique requirements in the design of a sport centre. Reference is made to main structural design elements and materials proposed for the project.

Specific research is grounded within the **structural challenges due to a 25m span of the proposed running track**:
Illustrated to the right, is a proposal for the bridge structure of the running track (tube). The base concrete structure provides the stability and counterweight for the athletes' movement, while a light frame structure, anchored onto the beam, will enclose the track for the 25m free span over the entrance courtyard (see part three).

Not only does the concrete structure allow for the track to cantilever 4m off the building perimeter, but it allows the achievement of a freestanding span of 25m. The building should pronounce efficiency, performance, high levels of strength and support, which persists the achievement of this structural design challenge.

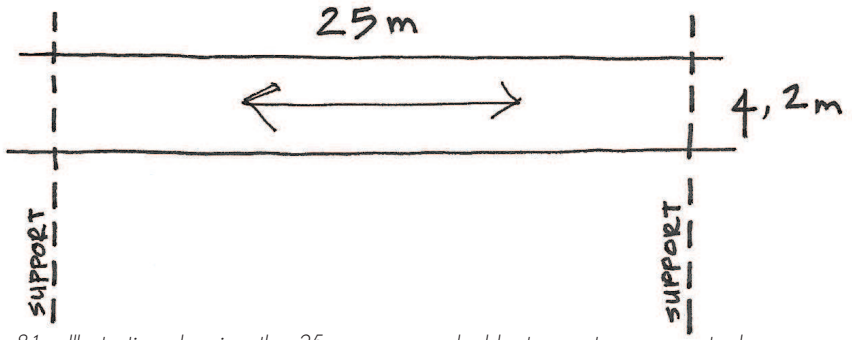


Figure 81 - Illustration showing the 25m span needed between two separated parts of the building, across the entrance courtyard.

DESIGN PARAMETERS SET BY THE SPRINT TRACK:

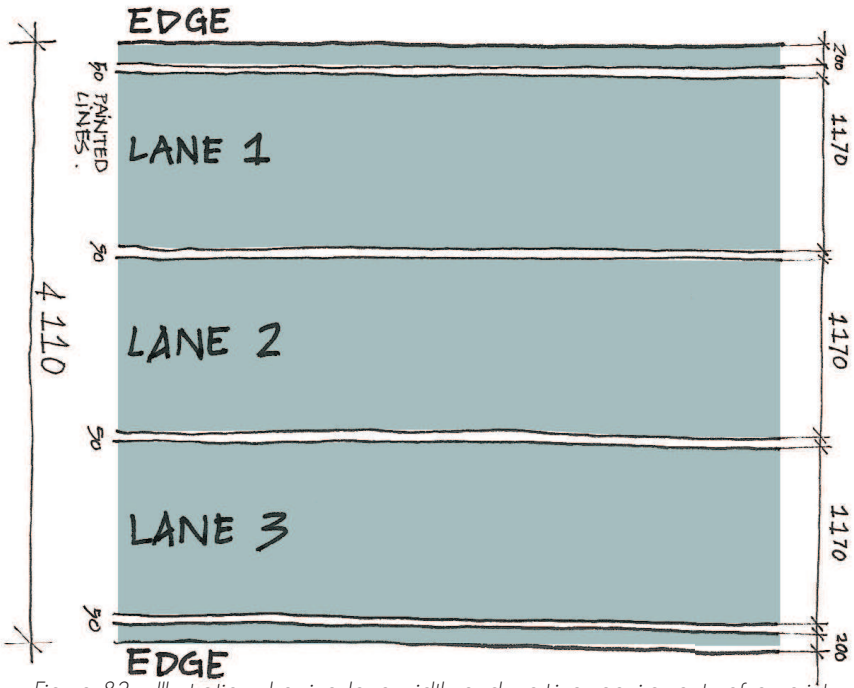
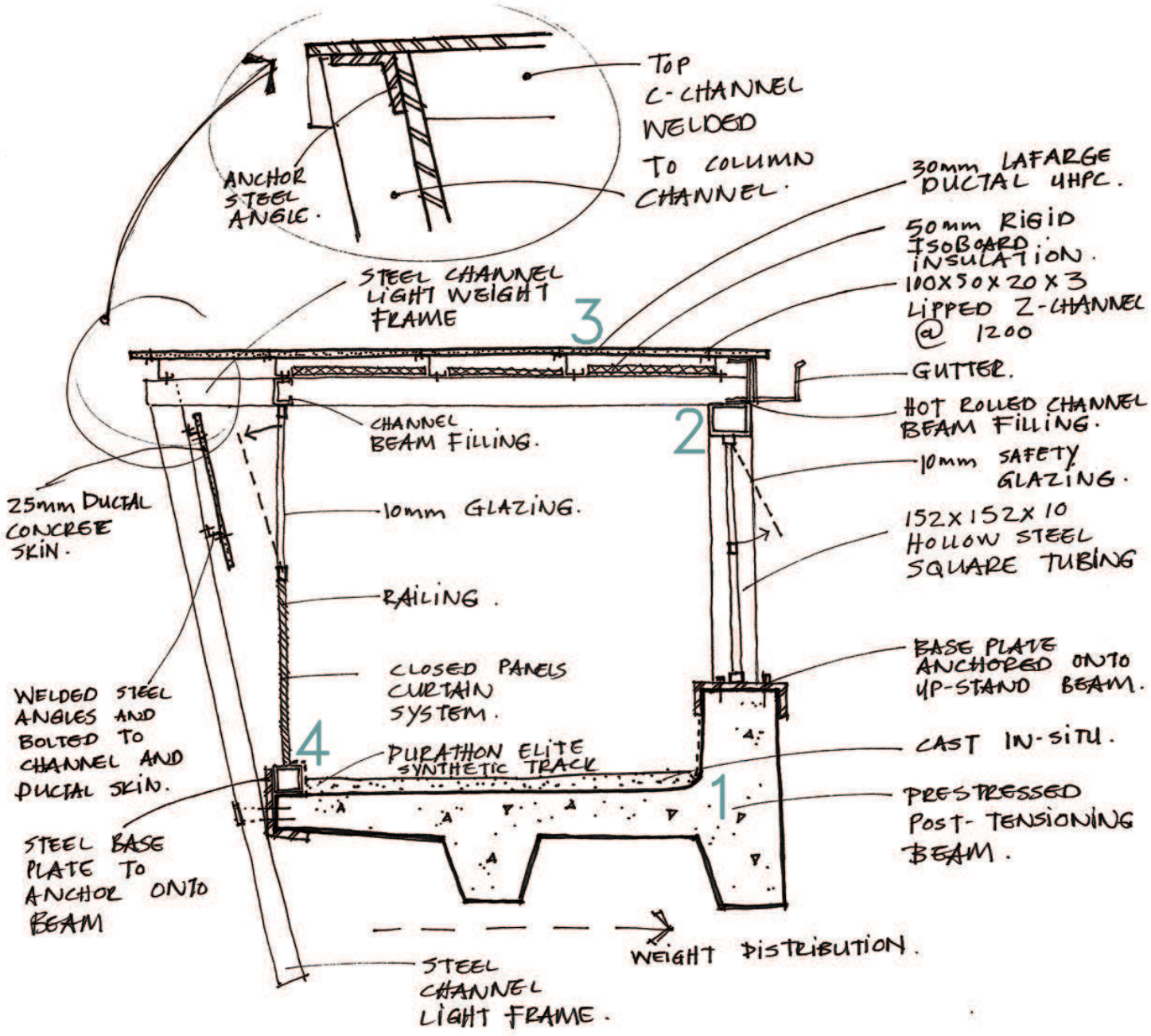


Figure 82 - Illustration showing lane width and marking requirements of a sprint track (IAAF Athletics, 2008: 90).

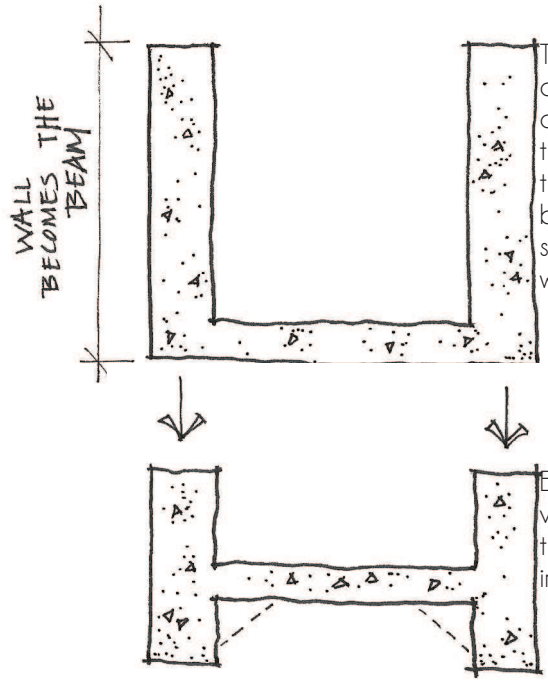


Four structural components will be discussed, as indicated in the illustration.

1

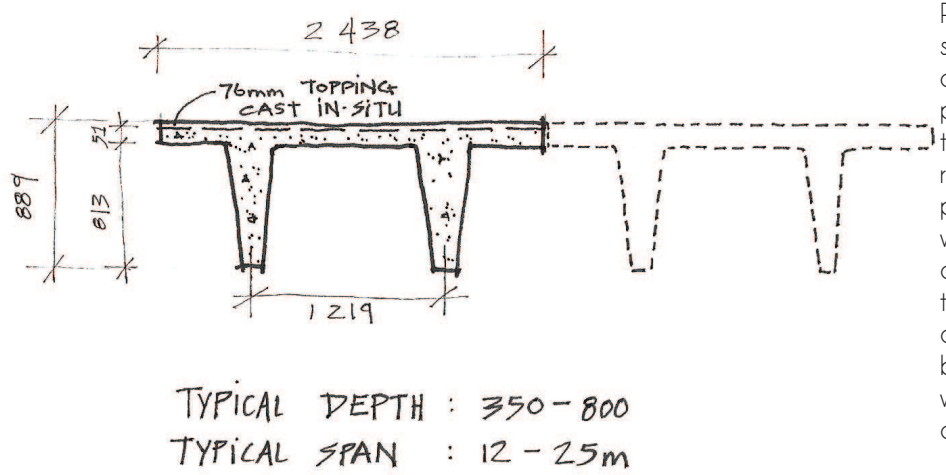
[PRECAST, PRE-STRESSED CONCRETE BEAM]

[COMPONENT]



The investigation started with a conversation with a structural design engineer who described the project as easily possible through the use of an up-stand beam. The wall becomes the structural support to carry its own weight for 25m.

But with high up-stand beams, visual access of the sprinters on the track will be prevented, thus initiating further investigation.



Research into alternative long span systems resulted in the consideration of pre-stressed, precast double T-beams which typically span up to 18m. But the running track width will need two pre-stressed beams, with a typical width of 2.438m each, in order to achieve the 4.2m requirement. Thus this design did not yet provide a direct solution because a custom beam would have to be made with specific measurements to accompany the 25m span.

Further span structures presented themselves as solutions and thus directed the research towards bridge construction.

The cantilever bridge system presented the use of precast, pre-stressed concrete girders which are placed on either sides of a central support to use their own weight to cantilever to both sides at the same time (Ledesma, 2012: 40–48). Each side counterweights the other. (For example, in the construction of the Gautrain bridge).

The concrete girders are pre-stressed, interlocking precast elements which are connected on site with the use of post-tensioning. The interlocking formwork can span up to 54m but results in a thick structural appearance (depth) (Ledesma, 2012: 10).

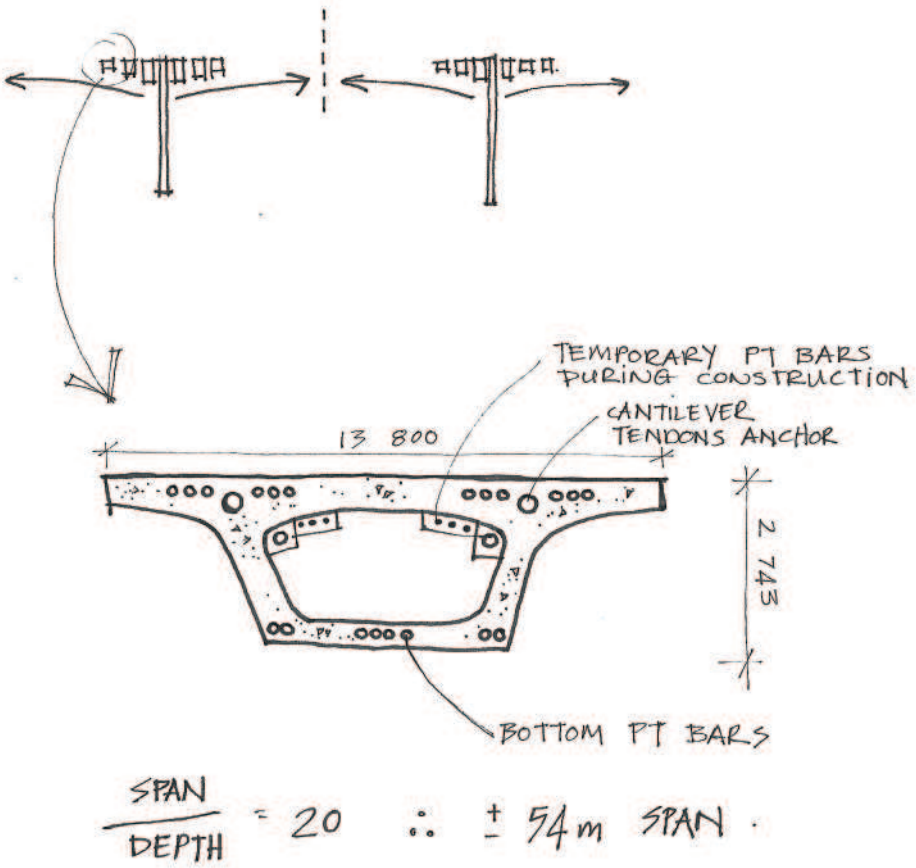
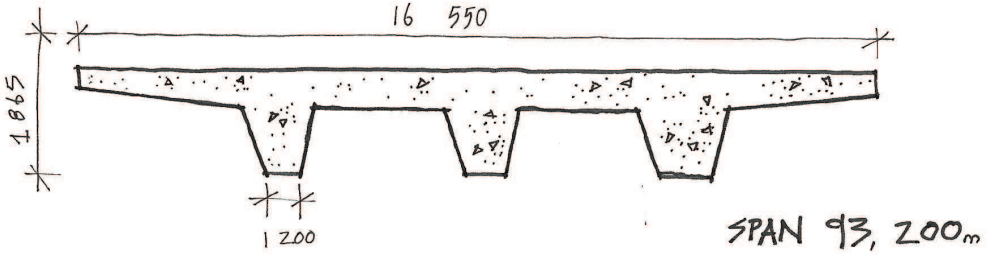


Figure 83 - Cantilever precast concrete girder (Adapted from Ledesma, 2012: 65).

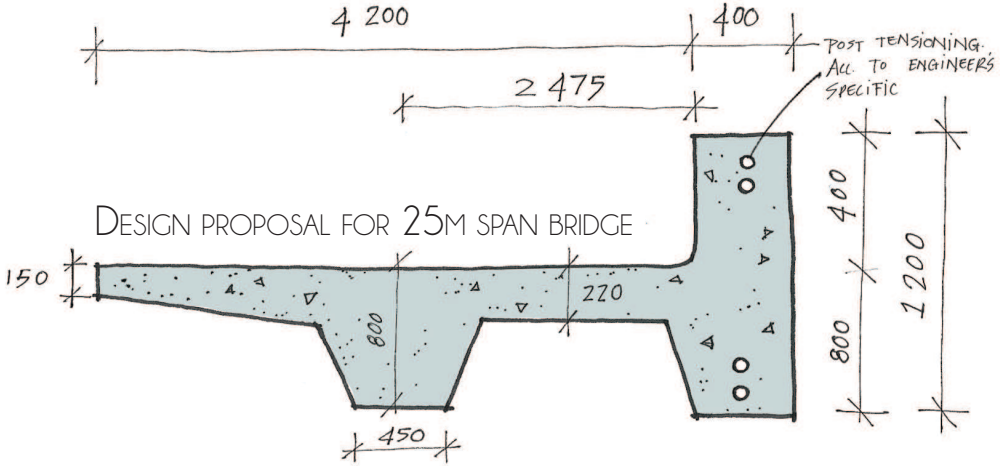
This resulted in focussing on post-tensioning, which is locally possible and more applicable to the project size. Post-tensioning is a method of reinforcing (strengthening) concrete with high-strength steel strands/tendons (Post-tensioning institute, 2000: 1). Post-tensioning allows construction that would normally be impossible due to either site constraints or structural difficulties. This method is often used in large buildings, bridges, sport stadiums and soil anchoring. A post-tensioning tendon is stretched by hydraulic jacks and held in place by wedge-type anchoring devices (Post-tensioning institute, 2000: 1).

The reason for proposing post-tensioning is due to concrete's strong compression strength but low tension abilities, given the requirement to span 25m. Post-tensioning will prevent the beam/slab from sagging and will allow for a longer span, thinner slab and fewer beams (Post-tensioning institute, 2000: 1). There are two main types of post-tensioning: un-bonded and bonded (grouted). For the bridge system required, the bonded type is proposed:

Two or more strands are inserted into a metal or plastic duct that is held in place while the concrete is cast around it. The strands are stressed with a large multi-strand jack and anchored in a common anchorage device. The duct is afterwards filled with grout that provides corrosion protection to the strand and bonds the tendon to the concrete surrounding the duct (Post-tensioning institute, 2000: 2). Although this system requires specialised knowledge and expertise to fabricate, the concept is proposed for the 25m span running track (bridge).

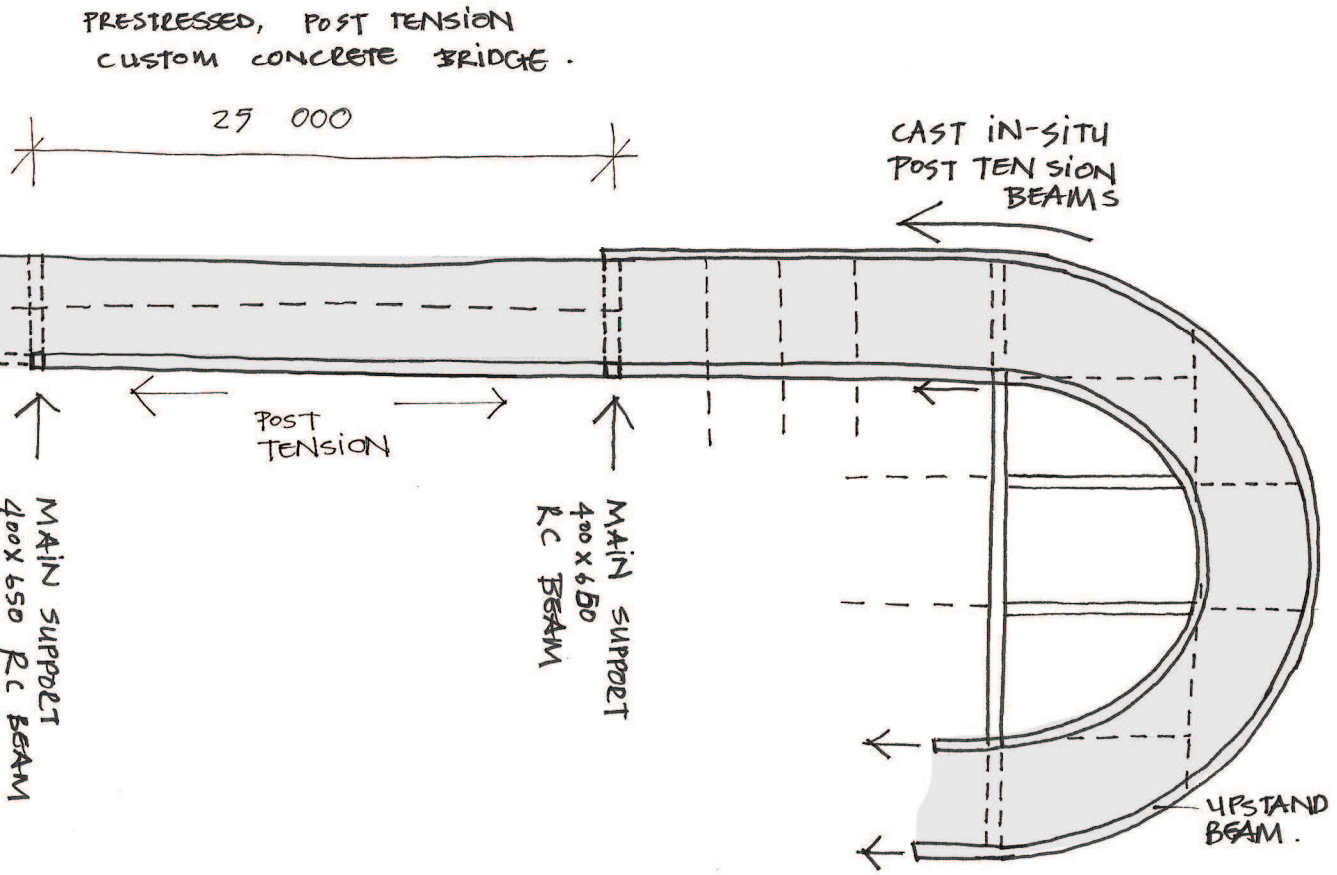


Reference to a built example of post-tension tendon construction (illustrated above and adapted from Dlouhy, 2012: online) shows that in relationship to its span over depth, a custom pre-stressed slab and beam structure can be designed. With a total depth of 500mm it will achieve a span of 23,3m.



For this project, a custom pre-stressed beam is designed only as representative, and it will need to be approved and the measurements calculated by a structural engineer.

With all these systems and structural methods in mind, a custom precast, pre-stressed concrete bridge should be constructed and erected on site with the use of post-tensioning to anchor the bridge between the vertical supports, which are 25m apart. The bridge concept does not end here, for it continues onto further support and onto adjacent beams to help carry the weight. The rest of the track will be cast in-situ to apply post-tensioning in the direction of the pre-stressed structure in order to achieve the cantilever system so that the extended front curve of the track can counter balance the 25m free span. The track structure is pulled together on site through post-tensioning.



Built example

The Glenmore/Legsby Pedestrian Bridge (Canada) is an applicable example for a precast girder constructed from Lafarge's *Ductal* structural concrete (refer to component three below).
The bridge spans up to 33.6m with a girder depth of 1.1m and a 3.6m wide deck.

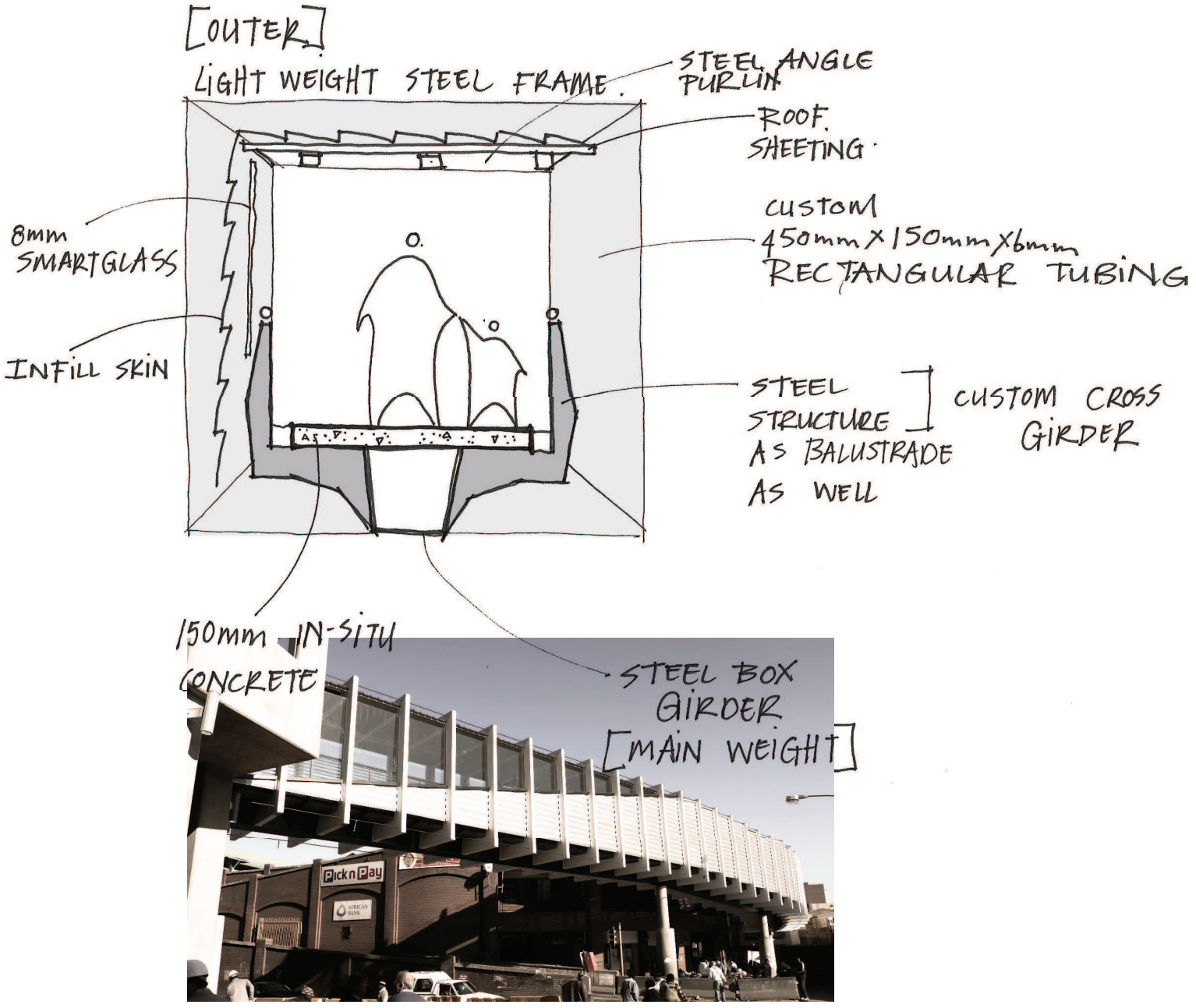




Figure 84, 85 - Photographs of the pedestrian bridge of proposed material to use, across a 33.6m span (Lafarge, 2015: online). Edited by author.

2

[LIGHTWEIGHT BRIDGE COVERING] [COMPONENT]



A STUDY OF THE SKYWALK, BY INCLINE ARCHITECTS (BLOEMFONTEIN CBD)

Although this example is a steel structured bridge, the structural understanding and design is applied to a concrete system for the proposed building. The light-weight steel frame of this bridge, creating the bridge tube, enabled the light frame used for the proposed bridge. The frames, which are spaced at different intervals, create a rhythm and dynamic facade which could enhance the visual connection of the athletes' movement on the running track.

3

[PROPOSED LIGHT-WEIGHT CONCRETE SKIN]

[COMPONENT]

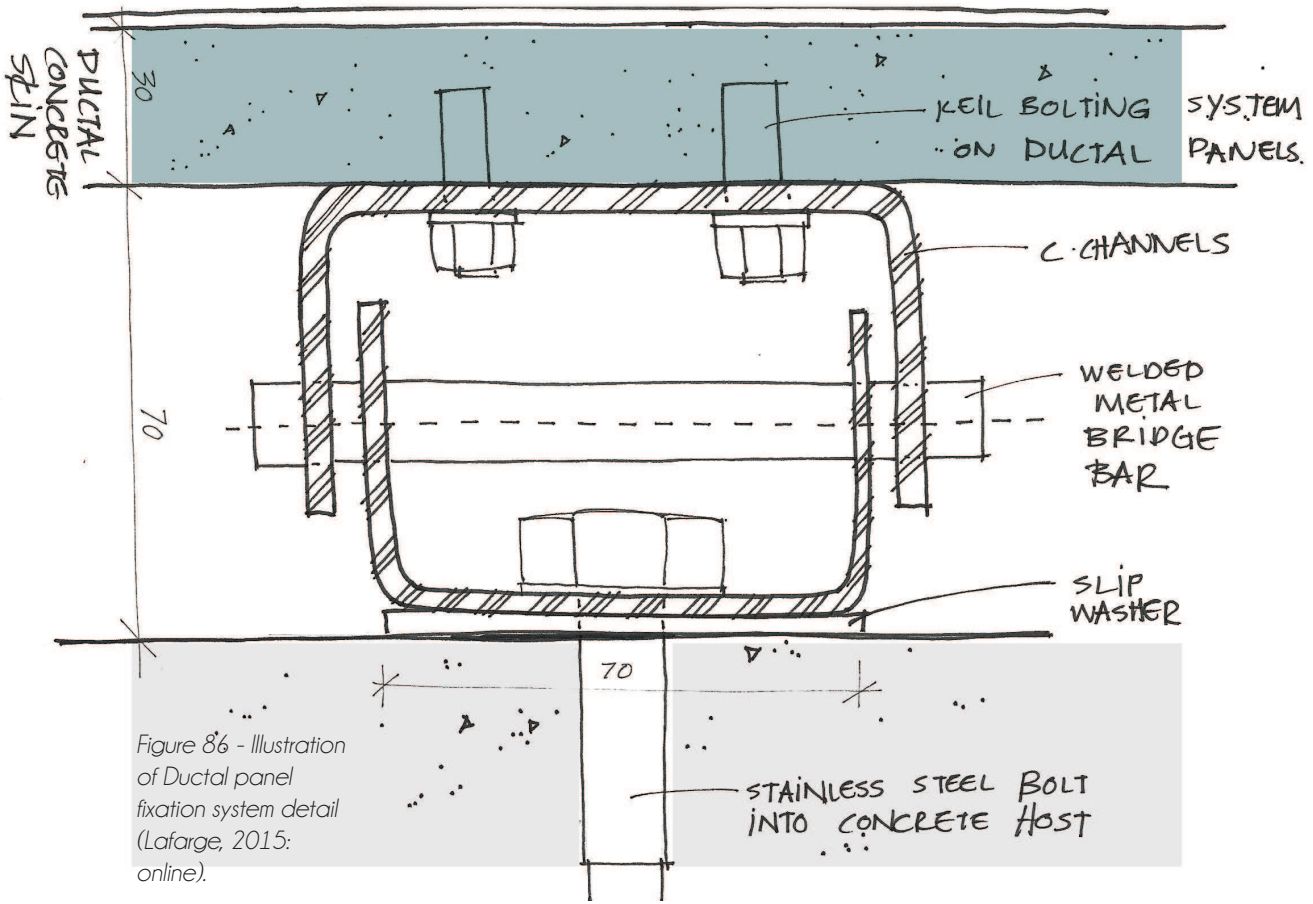


Figure 86 - Illustration of Ductal panel fixation system detail (Lafarge, 2015: online).

The track, which creates a tube between the main building and the multipurpose sports hall, should be covered in order to achieve a closed building with a controlled ventilation system. The roof structure of the bridge is a steel tubing framework anchored onto the concrete beam and covered with Ductal, a light-weight concrete cladding material, manufactured by the locally known Lafarge group.

Ductal is considered an ultra-high performance concrete (UHPC), reinforced with metal fibres to ensure the ductility of the material (Lafarge, 2015: online). It is resistant to external aggressions such as pollution, weathering and scratching, achieving unmatched qualities of durability and aesthetic possibilities. It is proposed in this project as facade skins, as thin as 25mm, as well as for the bridge construction because of its structural strength of up to eight times greater than that of conventional concrete (Lafarge, 2015: online). The diagram above shows a connection detail of a Ductal concrete skin onto a concrete structural element.

4

[INDOOR RUNNING TRACK FLOOR SYSTEM] [COMPONENT]

The primary object in the design and construction of a suitable surface for indoor running is to provide a uniform competition-quality surface complying, as far as possible, with the specifications of the IAAF Track Facilities Testing Protocols (IAAF Athletics, 2008: 282). Modern running tracks, outdoor and indoor, consist of synthetic surfaces laid on top of a solid foundation. These synthetic surfaces are high-performance systems formulated to be durable and are designed to achieve superior dynamic characteristics together with minimal maintenance (IAAF Athletics, 2008: 90).

There are two different construction solutions, namely permeable and non-permeable, and a number of acceptable synthetic surfacing system types (IAAF Athletics, 2008: 91). For the design of an indoor running track, the non-permeable construction method is proposed:

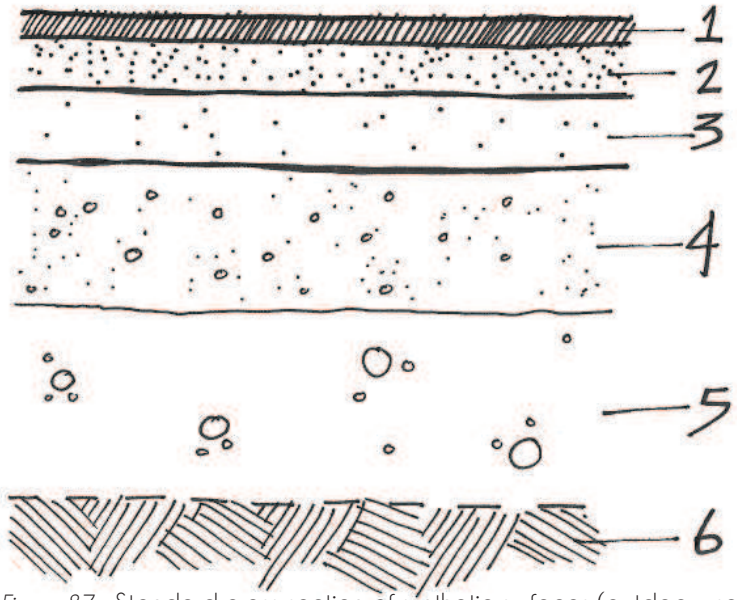


Figure 87 - Standard cross section of synthetic surfaces (outdoor use) (IAAF Athletics, 2008: 92):

1. Elastomer (polymer/rubber)
2. Dense grade asphaltic concrete finishing layer
3. Dense grade asphaltic concrete finishing layer
4. Base (crushed stone or gravel)
5. Sub-base (crushed stone or gravel)
6. Select fill or sub-grade

Structural details of the synthetic surface of an oval indoor running track should apply to the same specifications of an outdoor track (IAAF Athletics, 2008: 276). The thickness of the synthetic material of permanent oval tracks should not be less than 13mm. The example above is used for outdoor running tracks, but the same top three layers apply for indoor tracks, with the fourth layer being the concrete surface slab. There are multiple synthetic surfaces available on the market, but in order to achieve performance requirements, the chosen rubber compound needs to meet the IAAF tensile properties requirements (IAAF Athletics, 2008: 92).

The synthetic surface proposed for the indoor track is a cast in-situ product laid as free-flowing liquid polyurethane (IAAF Athletics, 2008: 94). Manufactured by Robbins, and a material certified by the IAAF, the Durathon ® Elite Track is a high performance rubber track built up from a concrete base with a Durathon Elite heavy duty adhesive (layer nr. 2; see figure below) and topped off with the Durathon Elite track dual performance layer (layer nr. 1; see figure to the right).

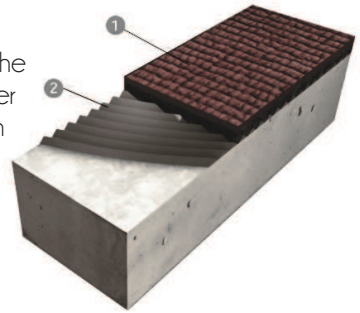


Figure 88 - Standard build up of Durathon Elite Track (Robbins, 2012: online).

Indoor running track requirements

For the design of a 160m lap indoor track, a radius of between 11m and 19m is required for the curves, which should also receive an angled banking up to a maximum of 15° (Tukuafu, 2010: 29). In the proposed design, an 11m inside radius is used together with a 5° bank incline on both curved edges.

The accompanying walls of the running track should have no projections and should have closed, non-splintering and smooth surfaces. All doors, sports equipment, fixtures and installations (hinges, door handles, pipes, etc.) should therefore be mounted flush with the wall to prevent injuries caused by protruding parts (IAAF Athletics, 2008: 283).

The banked bends should have a safety zone of minimum 200mm wide measured from the outer edge of the outer lane marking. The outer edge of the safety zone should be provided with a protective railing from the beginning of the curve throughout the bend up to the beginning of the next straight (IAAF Athletics, 2008: 276). The use of concrete up-stand beams (on the outer edge) will accommodate this protective railing. The design of a permanent running track has the advantage that it can be laid on a solid concrete base which ensures uniform resilience throughout (IAAF Athletics, 2008: 274) (see technical drawings for further illustration and detail).

Structural proposal for interior sprint track

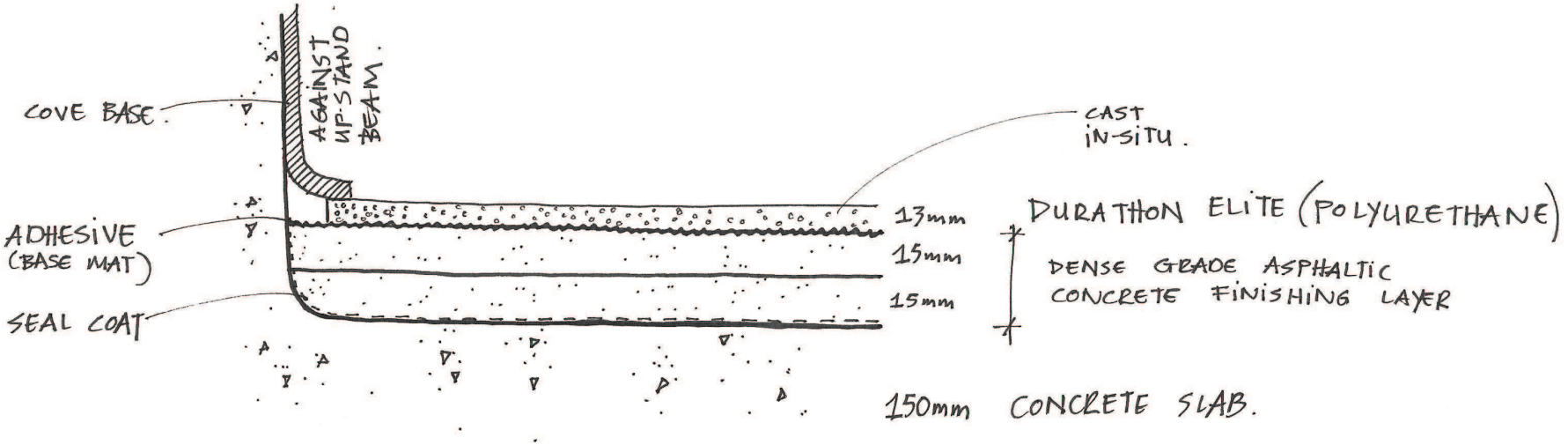
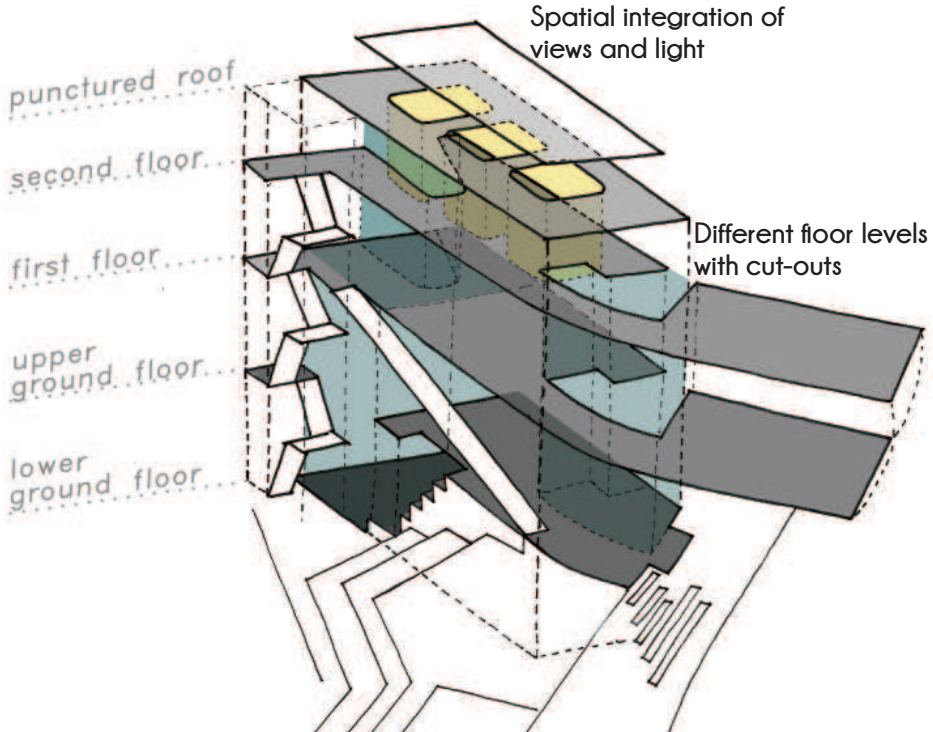


Figure 89 - Detail of proposed layers (Adapted from Robbins (2012: online) IAAF Athletics (2008: 92)).

BUILT EXAMPLES

The following are examples of structural elements and design considerations from previously analysed precedents, to be applied to the final design:

[HIGH PERFORMANCE CENTRE, UNIVERSITY OF PRETORIA]
[MANIPULATING THE PLANE]



The gymnasium, sport sciences and medical units function simultaneously within one frame, but on different floor levels. This was made possible by the manipulation of the plane. By cutting the floor/roof elements, certain views and volumes are created for specific functions, while allowing better light infall from above as well. This is an important experiential part of training and performance where the identification of competition and others' success helps with personal motivation.

The material use of concrete opposing steel also indicates the strength the building needs to provide for the heavy equipment and movement within the building.

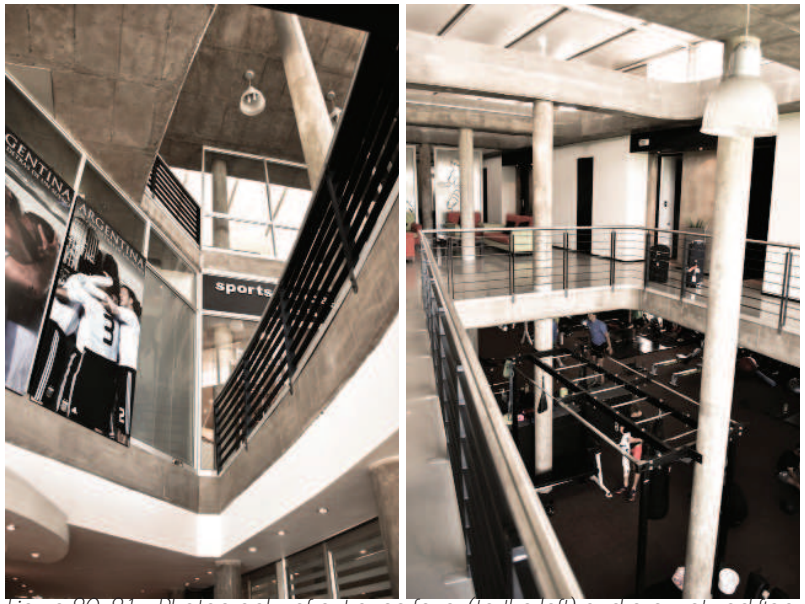


Figure 90, 91 - Photographs of entrance foyer (to the left) and a punctured floor (to the right).

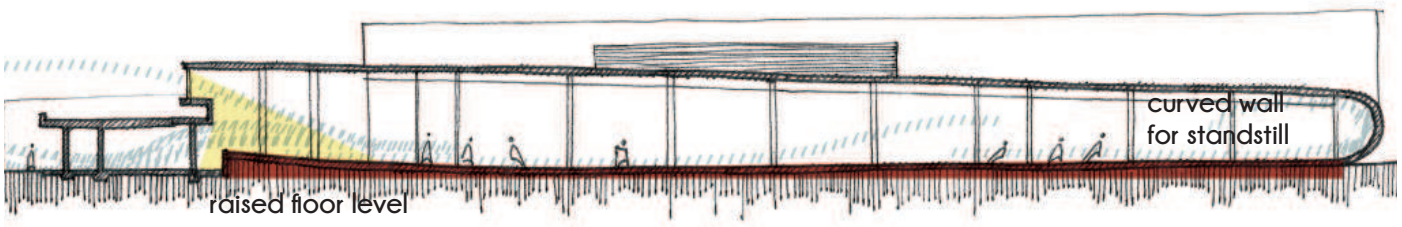


Figure 93 -Long section indicating lifted floor accommodating athletes' movement (Adapted from De Freitas, Muralha & Portela, 2013: online).

The high ceiling was necessary to accommodate various sport activities inside the building such as pole vault, high jump, javelin and discus throw, all of which should be incorporated into the design's ceiling height.

The interior is mainly free of vertical support to create an unhindered, function-driven active space. The building became an enclosed space for outdoor activities without the limitations of being indoors.

[CENTRE FOR HIGH PERFORMANCE ATHLETICS, PORTUGAL]
[MANIPULATING MOVEMENT]



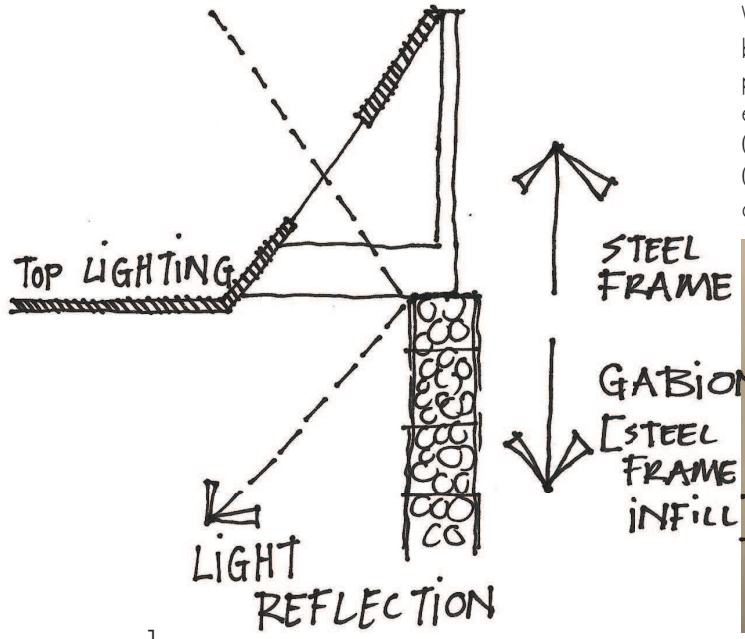
The interior of the building indicates its structural approach accompanying the body's movement in order to allow for optimal and efficient performance during a workout. The building needs to become the training machine to help with the athlete's performance. The training area has the only curvilinear element in this entire design and was sport-driven, helping the sprinters to come to a quicker and safer stand-still inside the building.

Figure 92 - Photograph of curved wall element to assist the athlete to come to an easier and quicker stand still (De Freitas, Muralha & Portela, 2013: online).



Figure 94 - Photograph of interior open space.

[MATERIALS]



Within its rural context, the material choices in this example were made based availability and durability. While seeking to achieve a civic presence, the design created a sense of enlightenment, with natural light entering through the saw-tooth roof, the dramatic light shutters to the west (next to the entrance), white-walled interiors and punctured facades (Digest of South African Architecture, 2008: 113). Thus, with a limited choice of colours and materials, the building facades became dynamic through the effects of light, the level of detail in the design and the interplay between different textures (Digest of South African Architecture, 2008: 113).



Figure 96 - Alternative infill into the steel frame (Makeka Design Lab, 2015: online).

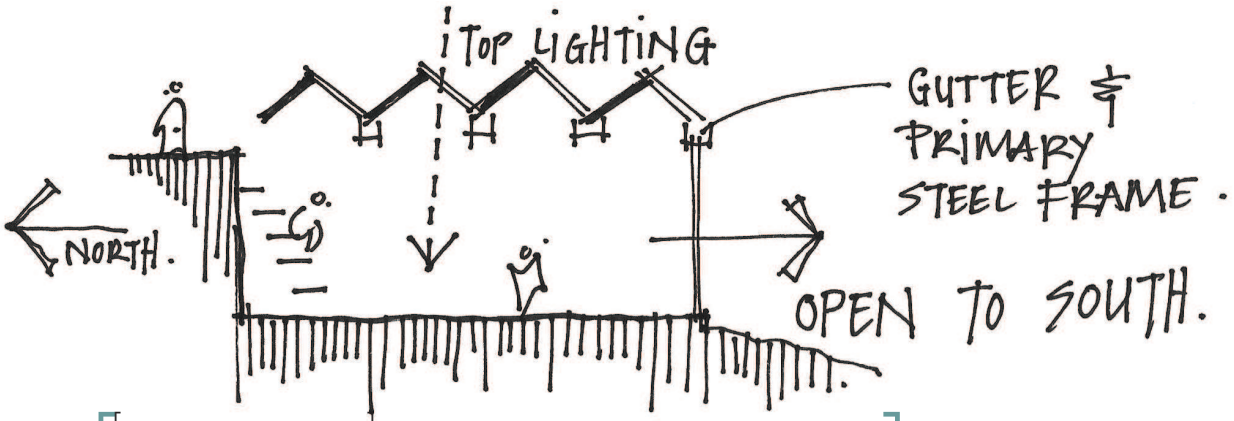


Figure 95 - Approach facades (Makeka Design Lab, 2015: online).

The building is grounded into the site by a gabion wall filled with Table Mountain sandstone (Digest of South African Architecture, 2008: 113). By using materials from the surroundings, the entrance foyer is distinctly separated from the concrete used for the rest of the building. The structural interplay appears in reverse, with the steel structure as main frame and the concrete cladding and elements on the exterior. The interior climate relies on the durability, thermal conductivity and large overhangs of the heavier material on the exterior.



Figure 97 - Sport hall lit from above (Makeka Design Lab, 2015: online).



UCT SPORTS CENTRE

[STRUCTURAL FRAMING]



Figure 98 - Circulation around the sports hall, only allowing certain views while exposed to the exterior through the glass facade (Bell, 2012: online).

The exposed structure and honest use of materials clearly indicate each material's strength and connection details. Heavy concrete mass is used as main frame while openings are filled with glass curtain walls to create specific views of the indoor activities.



Figure 99 - Concrete provides the stability into the ground while the roof structure is light and allows for natural light infall from above (Bell, 2012: online).

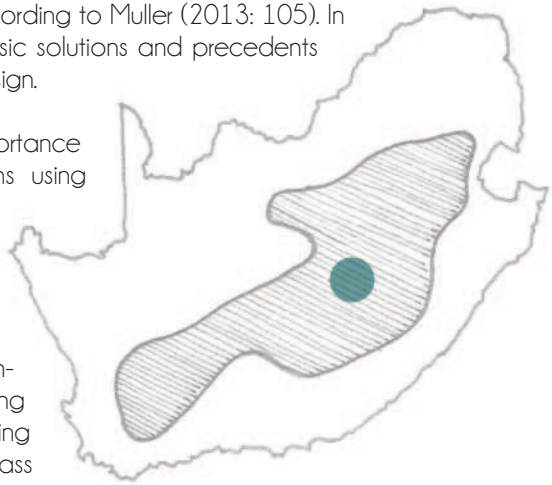
With the facilities set lower than the front street level, as illustrated earlier, light from above was important to achieve a naturally lit hall. The concrete walls and base of the building sets into the surrounding, with steel frames used for the roof structure (Bell, 2012: online).



Figure 99 - Significant top lighting through the roof design (Bell, 2012: online).

SUSTAINABLE CONSIDERATIONS

As already mentioned with the quantitative site analysis (within *topology* of part two), the identified *Cold Interior climate zone* of Bloemfontein thus implies a few design responses, according to Muller (2013: 105). In addition, reference will be made to basic solutions and precedents which should be incorporated in the design.



Firstly, Muller (2013: 104) states the importance of passive solar heating, which means using solar energy to warm up the interior of a building without the reliance on additional mechanical devices (Ching, 2008: 1.16). There are two essential elements of passive solar heating (Ching, 2008: 1.16): The first is maximising north-facing walls and using double glazing with insulating frames (especially for living areas) and then assuring high thermal mass for heat collection, storage and constant distribution thereof throughout insulated floors and walls. Reflective insulation can also help as an addition to keep out the heat in summer. Thermal storage materials include concrete, brick, stone, tile, rammed earth, sand, water and other liquids (Ching, 2008: 1.16).

It is thus important to develop the design proposal according to basic sustainable design principles from the start in order to accommodate for Bloemfontein's hot summers with low humidity.

The second element of passive solar heating is minimising east, west and south-facing glazing and orienting the length of a building north-south. When east and west facades are exposed, additional methods such as screens, louvers or adjustable shading devices should be used to minimise light inlet (see the figure below for passive strategies to reduce daylight into interior spaces).

SHADING DEVICES

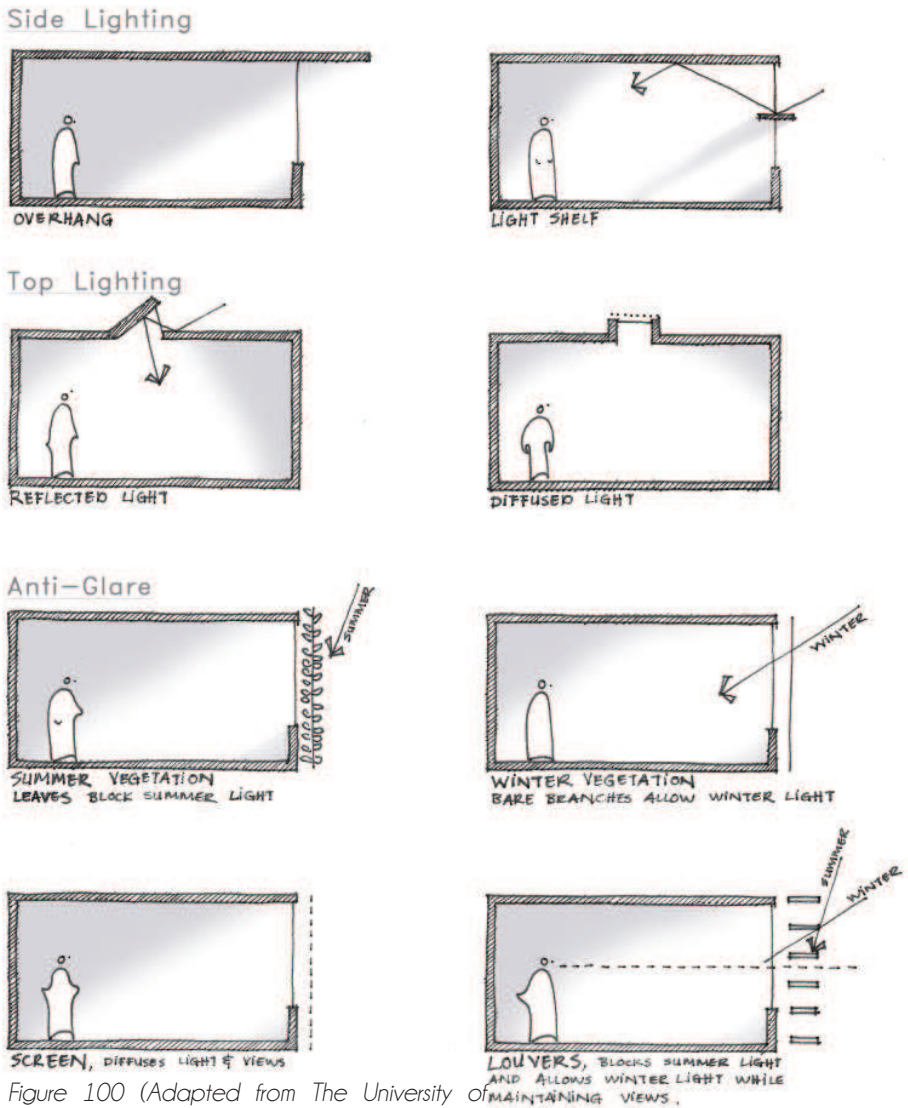


Figure 100 (Adapted from The University of Tennessee, 2015: online)

Muller (2013: 105) furthermore explains that draught seals and airlocks are very important at all openings and that additional auxiliary heating should be installed in extreme climates, but with the use of renewable energy sources.

Facade design possibilities

Using a tree in front of east or west-facing windows will allow the sunlight to filter through during summer months and provide good light quality while reducing glare and heat gain.

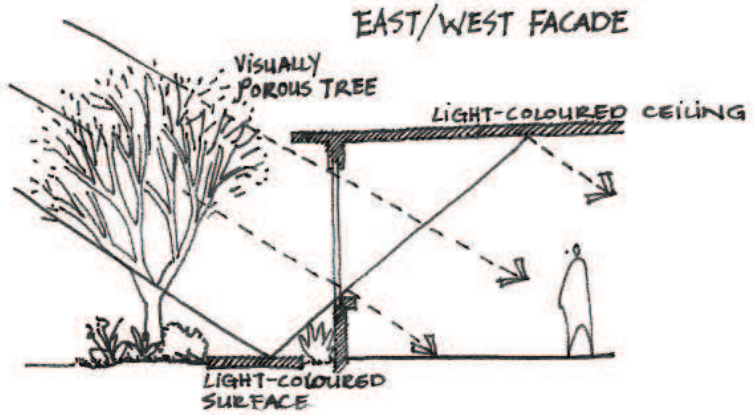


Figure 101 (Adapted from Theron & Bothma, 2009: 71).

For north-facing windows, providing a large overhang will prevent direct sunlight, while using light-coloured surfaces to reflect sunlight into the building creates diffused light throughout the interior.

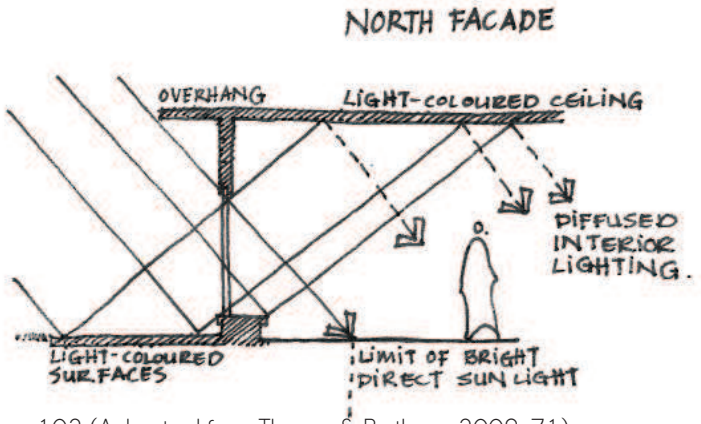


Figure 102 (Adapted from Theron & Bothma, 2009: 71).

Regarding ventilation, openings should be placed specifically to enable cross ventilation throughout the building to create a passive cooling system during summer. New buildings should be placed on site in places where they will receive protection from cold winds, for instance with the use of large trees, but with access to cooling breezes during summer months.

Evaporative cooling investigation

Evaporative cooling is a climate-response strategy which makes use of recycled or harvested water. The evaporation process of water to vapour uses up heat which in turn cools down the air, allowing cooler air to drain through the interior (Theron & Bothma, 2009: 73). This method of cooling is specifically suited for areas with arid climates, whereas Bloemfontein is classified as semi-arid (Bothma, 2010: 59). The location of the water feature is important to allow the air to cool before it enters the building. The enclosed courtyard is ideal for the water feature to be shaded, cooling the surrounding air. The courtyard is furthermore also important for storing cool night air and releasing it during the warmest part of the following day (Theron & Bothma, 2009: 73). The surrounding rooms receive diffused light and cool air from the courtyard (see figure below).

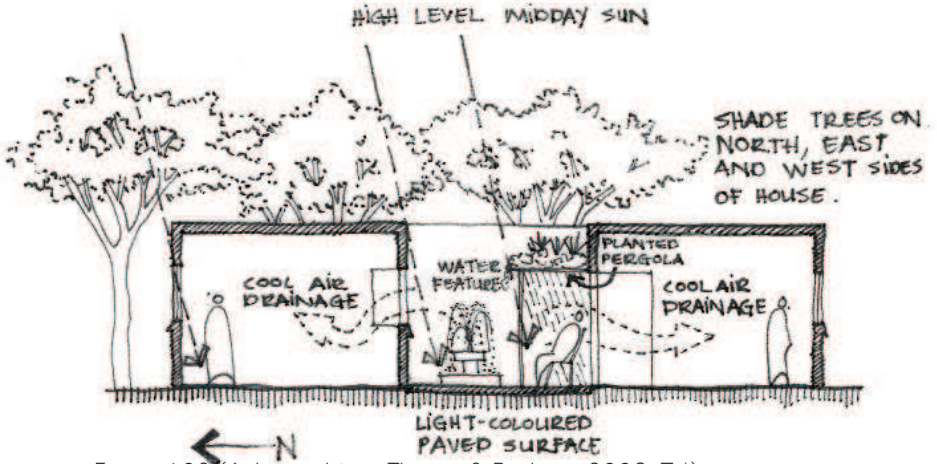


Figure 103 (Adapted from Theron & Bothma, 2009: 74)

Passive design study

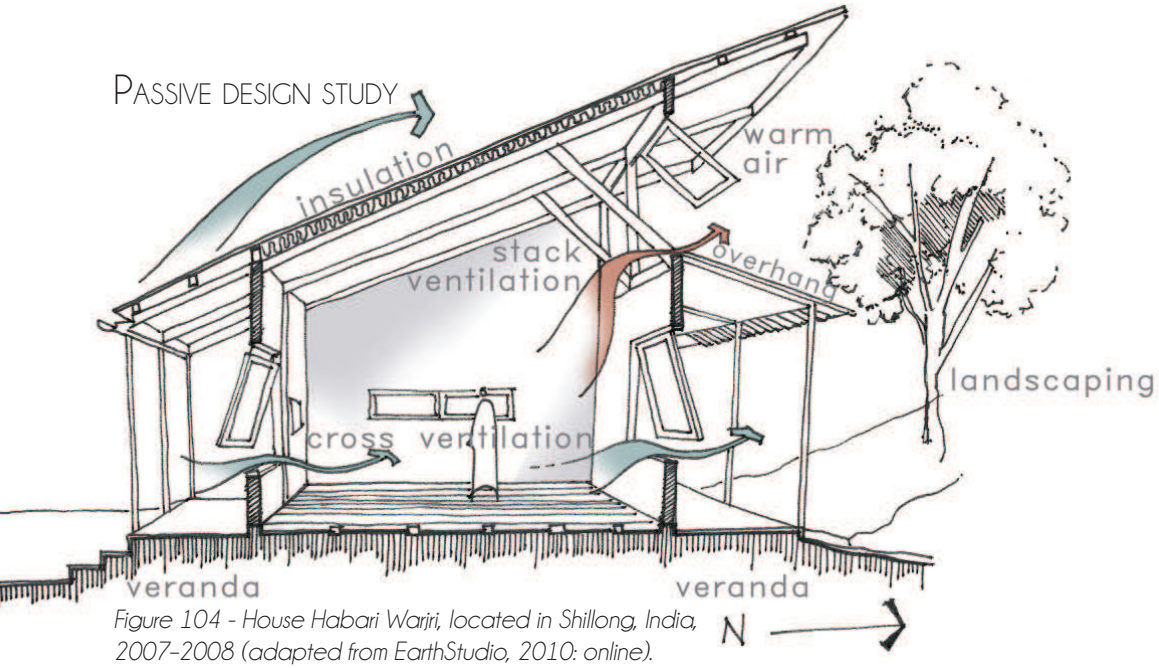


Figure 104 - House Habari Warjri, located in Shillong, India, 2007–2008 (adapted from EarthStudio, 2010: online).

This passive house design, done by Earth Studio, showcases how a single family residential building can be environmentally adaptable on its own. By referring to a few design strategies, the importance of passive design is expressed as follows: Using the surroundings to orient the building according to the existing landscape can help block off direct southern (in Bloemfontein's case northern) sunlight. Creating shaded living areas (verandas) on both sides of the building can also help to cool the surrounding air which would then in turn cross ventilate through the interior. With the use of stack ventilation, a high point is created by wind preassure to direct warmer air to the outside. By closing the windows, cross ventilation will not take place and the building will capture the interior warmth during the night.

In the house depicted above, fibre-wool insulation was needed to maintain interior temperatures as well as to keep the rising temperatures of the solar hot water system on the roof (consisting of flat-plate collectors) separate from the interior. This heat system preheats water before it is supplied to geysers in the house, speeding up the process (EarthStudio, 2010: online). Rainwater is harvested for washing and toilet flushing demands, with the use of gutters lining the roof and channelling the water into an underground storage tank, from where the water is then again pumped into an overhead tank for flushing and irrigation purposes (EarthStudio, 2010: online).

Thermal mass principles

Thermal mass, also a passive design concept, is incorporated in the material choice of the building to regulate the temperatures in the interior. Thermal mass is thus the ability to absorb and store heat energy for later release when the immediate surroundings' temperature is reduced (Oosthuysen, 2013: 128). The correct use of thermal mass will delay heat energy transfer through the building by almost a day (Oosthuysen, 2013: 129). The purpose is to balance indoor day and night temperature extremes and create a more constant desirable temperature.

Insulation is very important where there is a desire to contain heat or to restrict heat from entering into a space (Oosthuysen, 2013: 128). Insulation should thus be used with thermal mass to regulate different temperatures throughout the building. With the design of a sport centre, different temperatures for different activities are very important to achieve the athletes' best performance.

Thermal mass, specific insulation and passive design strategies should be used together to achieve the best possible climate for exercising. Essential considerations include:

+ the appropriate placement of glazing and the ratio of window to floor area
+ the correct orientation of openings for effective sun exposure where desired
+ appropriate shading to consider seasonal changes
+ the use of different insulation to achieve preferred temperatures
+ the precise positioning of thermal mass and its collaboration with the correct insulation (Oosthuysen, 2013: 128).

Thermal mass material should be high in density, have good thermal conductivity and low reflectivity (Oosthuysen, 2013: 129). These thermal materials will be applied to the floor, wall and roof construction, all of which envelop the space of the climate-controlled area.
Not only sunlight affects thermal heat, but any external energy resource such as air movement, seasonal changes and regional climates (Oosthuysen, 2013: 131). The correct use of thermal mass is thus very important in the Bloemfontein area with its cold winters and the great difference between day and night temperatures.

Ventilation / HVAC - system

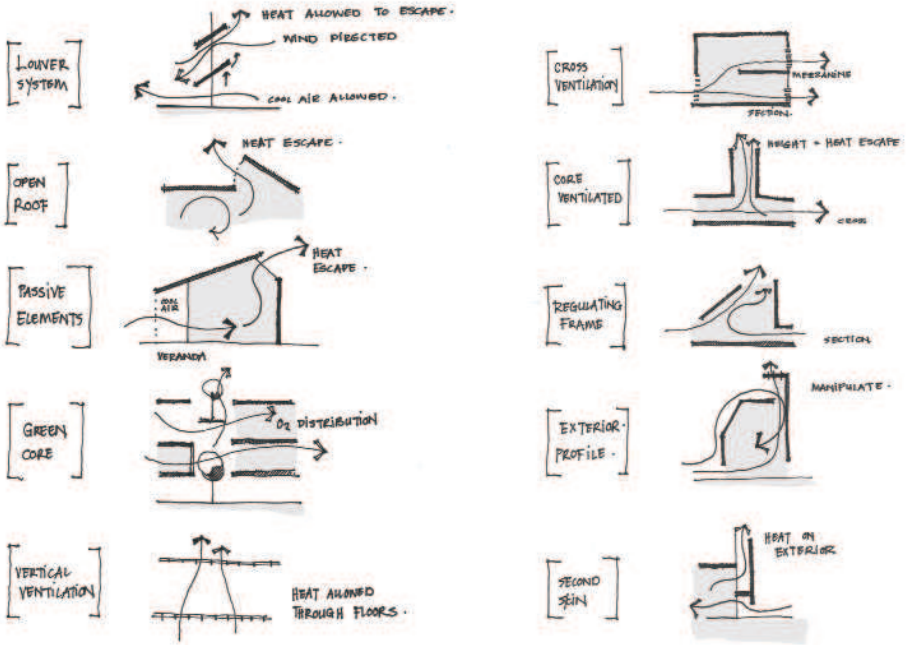
All athletics and sports halls should be heated in moderate and cold climatic zones. Panel heating, infrared radiation or fan-coil systems (mechanical ventilation of heating and cooling) or even a combination of these systems can be used (IAAF Athletics, 2008: 287).

The heating and ventilation system should be able to ensure the following room temperatures:

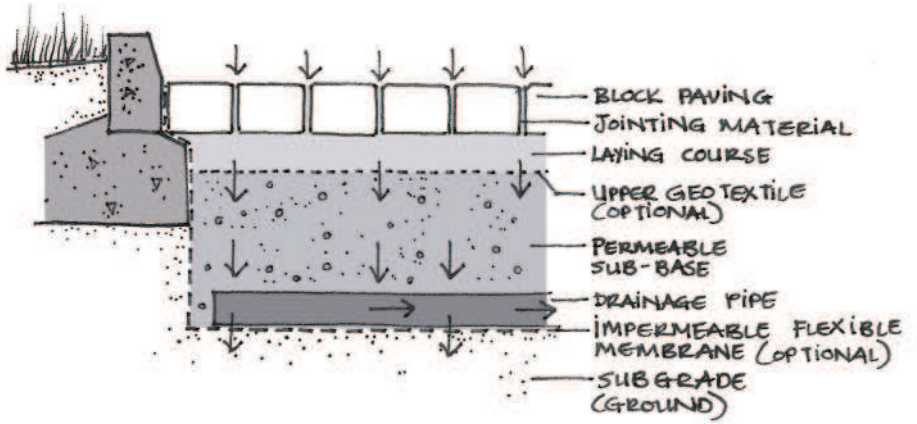
ROOM	TEMPERATURE °C
Athletics hall/Gymnasium floor	16–18
Changing room	22
Cloak rooms/Restrooms	24
Medical rooms	22
Other training halls	12–16

(IAAF Athletics, 2008: 287).

Not only is an active ventilation system needed, but natural ventilation is still very important for all types of sport halls, especially during long periods of non-use, in case of possible break-downs of the mechanical ventilation system and in a fire emergency (IAAF Athletics, 2008: 287).
Here follows a view design possibilities explored:



Stormwater | Drainage | Greywater | Rainwater harvesting



One of the most affordable and effective ways in managing water runoff in the urban environment is through permeable paving. The example presented above is known as permeable concrete block paving (PCBP) and is a green alternative to conventional paving (Laing, 2012: 136). The diagram demonstrates a PCBP system in which water filters through the pavement and permeable sub-base into the ground below. If the ground is not capable of absorbing all the water, an additional outlet pipe is added to allow excess water to be drained into other drainage mechanisms such as stormwater pipes (Laing, 2012: 137). If the water should not filter into the ground, an impermeable flexible membrane is added underneath the sub-base to create an effective storage tank (Laing, 2012: 137).

In the case of this design, the membrane will not be added in order to allow water to filter into the ground below as it is supposed to do this in its natural way. A second method can also be considered, namely the use of green streets (Laubscher, 2013c: 160). The idea is, instead of having a series of kerb inlets, to develop a series of planting areas along the road edge that have a very strong porous nature which will allow a certain amount of stormwater to infiltrate.

TECHNICAL SPECIFICATIONS

Here follows a few important technical aspects to keep in mind when designing a sport centre. These decisions have to be made before hand in order to design according to the right measurements, functional and space requirements.

Indoor hydrotherapy pool



Figure 105, 106, 107 (from top to bottom) - Photographs showing activities involved with the HydroWorks pool - Manufactured by HydroWorx, USA (Hydroworks International, Inc., 2015: online).

Product description:

The HydroWorx 2 000 Series pool consists of prefabricated stainless steel wall panels (waterproofed by an extra applied layer of hard PVC), an adjustable pool floor, resistance jets and an underwater treadmill. The adjustable floor offers the possibility of variable water depths and safe access without the need for ladders or steps. The patients can simply walk (or are wheeled) onto the floor, which is then lowered to a desired depth (Hydroworks International, Inc., 2015: online). The tank walls, support structure and pool components are located below the floor surface in the lower level mechanical room (Hydroworks International, Inc., 2014: 1).

Installation:

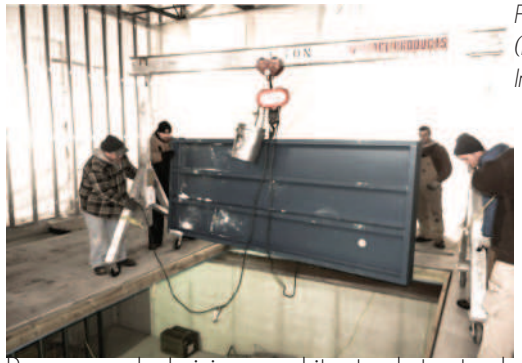


Figure 106 - Pool installation (Hydroworks International, Inc., 2014: 5).

Recommended minimum architectural, structural, mechanical, electrical and plumbing design criteria must be maintained according to the supplier's installation guide and specifications. The contractor will be responsible for preparing the site prior to the installation of all utilities (power, water, sanitary, etc.) (Hydroworks International, Inc., 2014: 2). The external pool equipment in the mechanical room should be set in place first according to the mechanical layout, and then the tank walls should be assembled according to the pool room layout (Hydroworks International, Inc., 2014: 4). The pool is delivered on site as separate wall panels. Upon completion of assembly, the contractor must ensure that there is no standing water in the mechanical pit at any time (Hydroworks International, Inc., 2014: 4).

The mechanical pit design must include unobstructed access to the pool tank, accessory equipment (filter, pumps, heater, etc.) and the electrical control panel (see technical drawings below for specifications). The steel pool tank and all its equipment must be grounded with a bonding wire of appropriate thickness, in order to efficiently conduct electricity away from the device in the event of a short circuit (Hydroworks, 2015: 8).

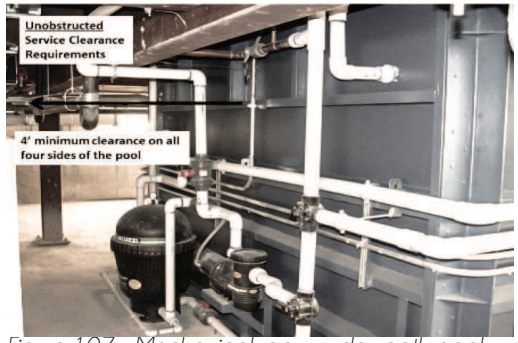


Figure 107 - Mechanical room underneath pool surface (Hydroworks International, Inc., 2014: 1).

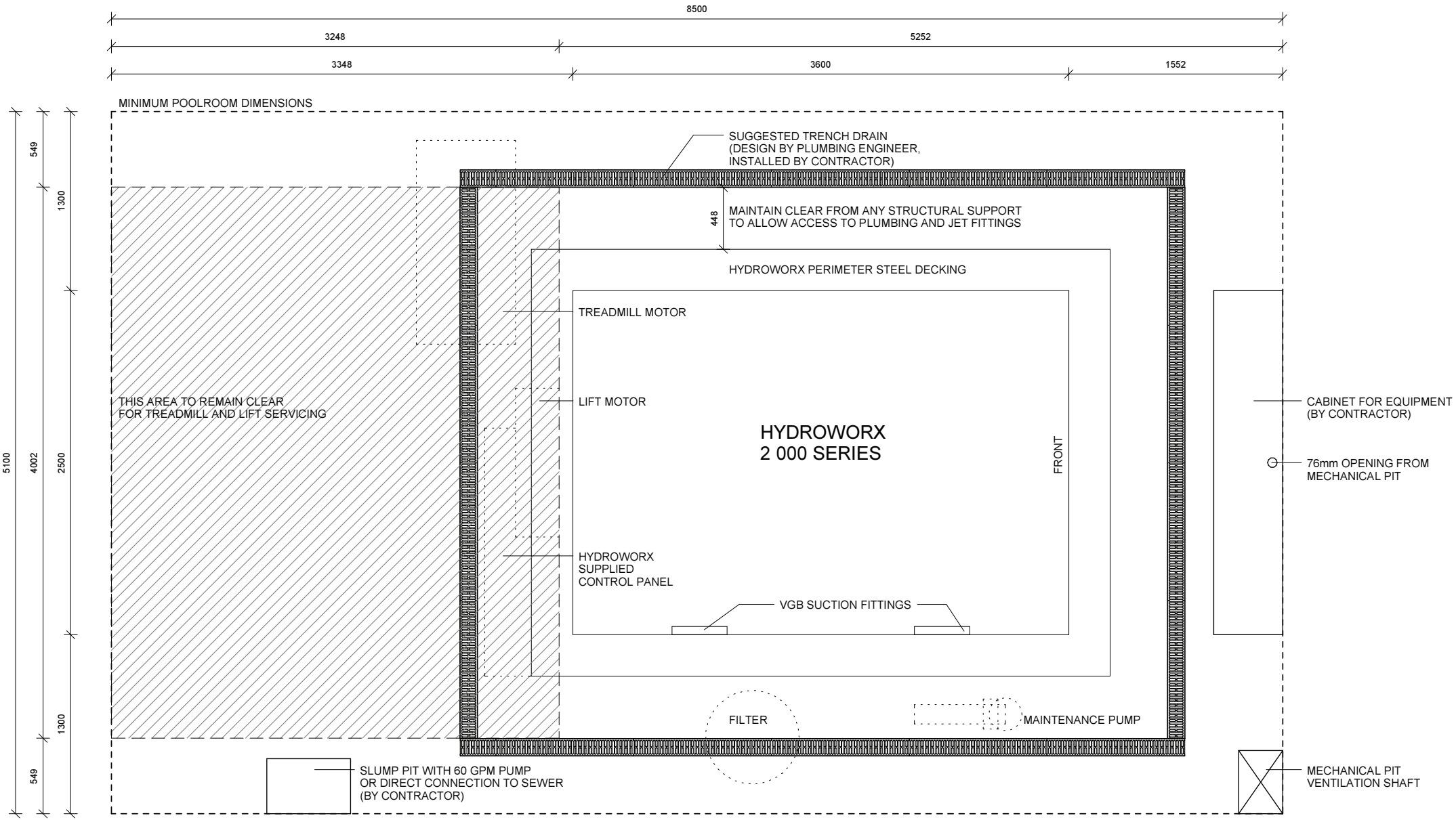
The pool's structural weight, together with the weight of the water, can measure up to 16 tons. This weight will be placed on the mechanical pit floor. A structural engineer should be consulted to determine final structural requirements for the floor (Hydroworks, 2015: 2).

Perimeter drains should be incorporated into the design of the pool area. The HydroWorx pool is drained via a gravity drain and two PVC side suction/drains. The drains will be connected to a sump pit or drain so that the water can be discharged during normal maintenance.

The pool room and pool requirements:
(see technical drawings on following page)

The pool/treatment area is designed to accommodate one or two patients/athletes per session. The dimensions of the hydrotherapy poolroom should not be less than 5.1m by 8.5m and 3m high, allowing adequate installation and future service space around and above the pool (Hydroworks, 2015: 2).

Adequate airflow, temperature control and dehumidification in the poolroom are required primarily to maintain a comfortable temperature. The water temperature is generally kept at a temperature of 33–34°C, with the poolroom temperature kept at 29°C to keep variance between the pool water and ambient air temperature to a minimum (Hydroworks, 2015: 2). The poolroom requires space for monitoring equipment such as a computer and a control pendant for underwater video monitoring system.



NOTE:
1 - POOL SHOULD BE SET ON CONCRETE SURFACE BED
2 - THE TREADMILL MOTOR SHOULD BE LEVEL WITH THE BOTTOM OF THE POOL
3 - ALL EQUIPMENT MUST BE LOCATED IN THE MECHANICAL PIT AS INDICATED IN THE DRAWING

THE DESIGN AND INFORMATION ON THIS DOCUMENT ARE RECOMMENDATIONS ONLY - CONFIDENTIAL - AND DISCLOSED TO YOU ON THE CONDITION THAT NO FURTHER DISCLOSURE OR USE IS MADE BY YOU WITHOUT AUTHORIZATION FROM HYDROWORX INTERNATIONAL, INC.

Figure 108 - Floor plan layout of proposed pool (Adapted from Hydroworks International, Inc., 2014: 19 - 36).

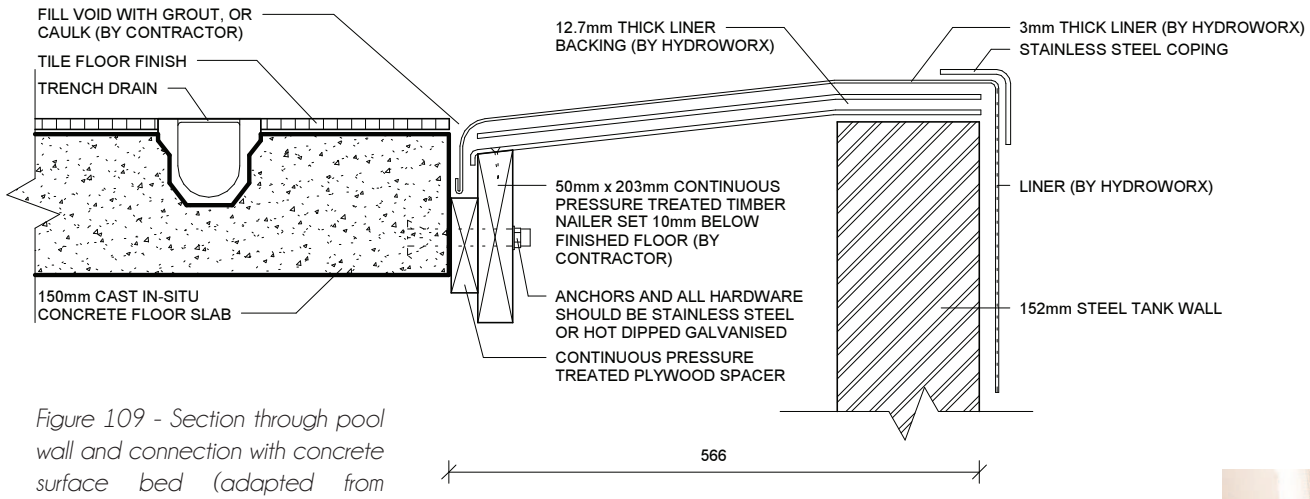


Figure 109 - Section through pool wall and connection with concrete surface bed (adapted from Hydroworks International, Inc., 2014: 19-36).

Indoor endless pool/resistant pool

Specialised for the competitive swimmer, the pool recreates a swim current that provides resistance against the swimmer, causing him/her to remain in one place while swimming. The current is adjustable, allowing trainers to maintain control over the athlete's exercise and effort level (Endless pools, 2015: online). The purpose of this pool is to allow a trainer to be actively involved in and document the swimmer's progress, to constantly help with stride improvements and to enable one-on-one conditioning. This type of exercise apparatus will only be used by experienced and professional athletes with the assistance of a personal trainer or sport science researcher.

The installation follows mainly the same principles as the HydroWorx pool (as previously discussed), with prefabricated modular steel parts to be assembled on site according to an Elite Endless pool specialist/ mechanical engineer. A few specifications that differ from the hydrotherapy pool are: Dimensions of 2.4m by 4.2m are required for the swimming area (of at least 1.2m deep), and a high-efficiency circulation pump is required together with a 7.5-hp, two motor, two-propeller swim current generator to create the resistance current needed (Endless pools, 2015: online). For special features, floor and backstroke mirrors are added.





Figure 110, 111 - Illustrations showing athletes swimming against a motorised current, with a trainer on the side to assist (Endless pools, 2015: online).

Indoor multipurpose sports halls

[Basketball | Volleyball | Gymnastics]

This section indicates the main dimensions and specifications for the design of a multi-purpose sports hall. The court configurations mainly follow the specifications for a basketball court, which requires a larger floor space than the volleyball court, and will thus also provide sufficient space for gymnastic activities.

The space required for any sports hall depends on the standard of play, meaning the higher the standard, the more specific regulations should be adhered to and the more additional clear space should be provided (SRSA, 2010: 102). For the proposed hall, a club standard will be appropriate for the level of competition at the facility, that is, for the primary purpose of team practices/exercises and multi-purpose indoor activities. The club standard regulations state that the safe distance around the court's outlines, before any form of obstruction may occur, is a minimum of 1.05m on all four sides (compared to national and international standards of a 2.05m safe zone distance all around the court). The height requirement of open space above the finished floor level of the court is set at 7m minimum (club and national/international standard) (SRSA, 2010: 103).

The overall construction of a multi-purpose sports hall requires a building structure that would cater for larger spans over the open floor space of the court. The vertical structure for the proposed sports hall consists of H-section steel frames and masonry infill to support the deep steel trusses needed to achieve an 18m span (width of 15.24m plus safety zones). The truss depth, according to *span length* over *depth ratio* requirements, must be equal to or between 10–18 (Laubscher, 2013a: 314), and thus need to be at least 1m. Further design development of the final roof structure is discussed in the *tectonic* section of Part Three.

The sport performance qualities of the court surface should relate to the specific sport played and the interaction of the ball and/or player with the surface (SRSA, 2010: 110). The levels of vertical and angular rebound and spin characteristics of the appropriate sport type require the surface level to be made of specialised material. It is very important to provide an even, flat and consistent surface area (SRSA, 2010: 110). When selecting a surface for multi-sport playing requirements, it is important to prioritise the presented events, during which the surface should be able to withstand loading from both the users and the equipment needed. The floor type

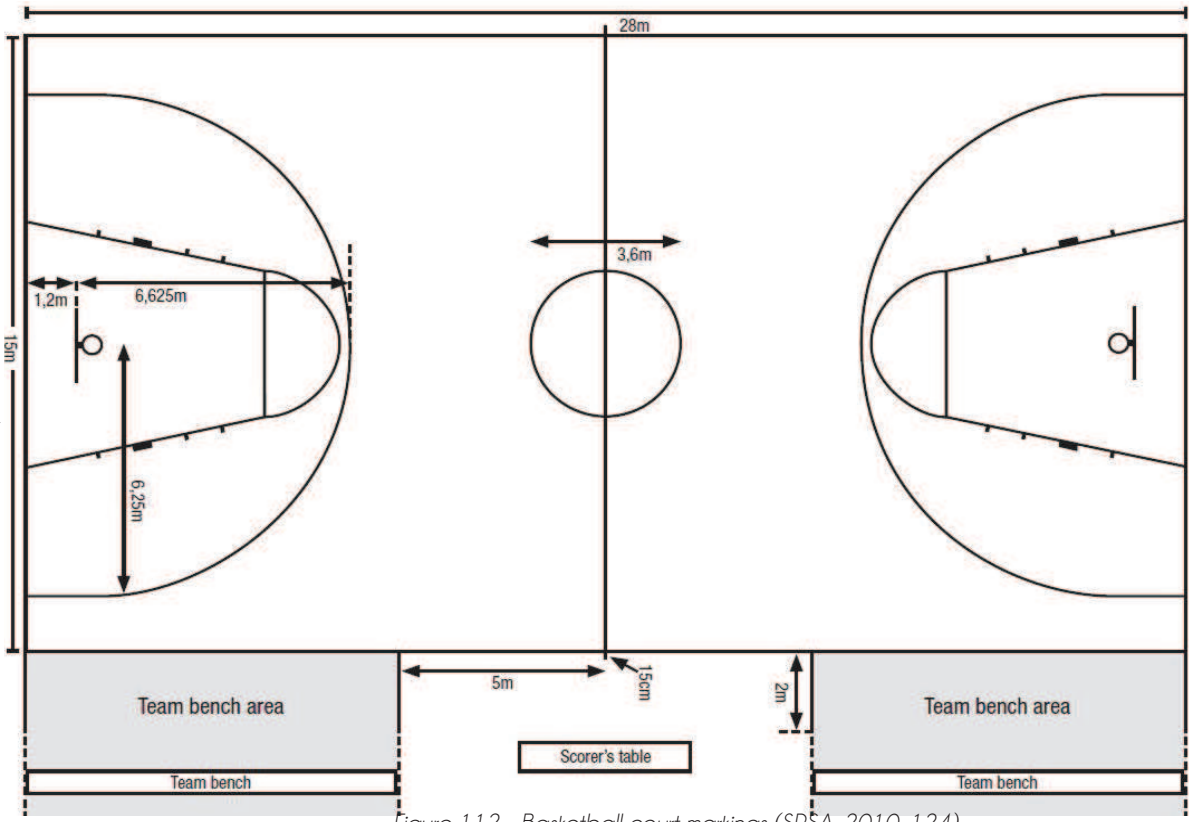


Figure 112 - Basketball court markings (SRSA, 2010: 124).

should prevent injury as far as possible while achieving the correct levels of friction, stiffness and shock absorbency for each of the multiple activities hosted (SRSA, 2010: 110). A further important factor is that the floor should not release any toxic or carcinogenic substances which could cause health risks (SRSA, 2010: 110).

In line with the project's aim of allowing the participation of a variety of users, the sports hall should also be used for other, non-sport-related activities. The Central University of Technology (project client) can benefit from a rentable space off-campus for functions such as school assembles, group activities, examinations, social functions, exhibitions, dances and community activities (SRSA, 2010: 111). For this dual purpose to work, additional restrooms and refreshment possibilities should be provided.

There are various floor types available for multi-purpose halls, thus it is important to consider construction costs, maintenance (durability of the products, hygienic characteristics, free from vapour and abrasion and easy to clean), and the restoration in terms of costs and time constraints (SRSA, 2010: 111).

Three main floor types were considered:

Timber flooring : It is widely used and available in strips, blocks, composite boarding (such as plywood) and as composite tiles (SRSA, 2010: 111). The timber floor may be fixed directly to the concrete or screed floor, according to the specific manufacturer's instructions, or to an additional patent sprung flooring system (SRSA, 2010: 111). It should also be taken into account that the availability of timber will determine which type of timer will be used and that expansion gaps need to accommodate any lateral movement due to varying humidity levels (SRSA, 2010: 112). The top timber layer should be sealed to ensure that the play area is durable and cleanable (SRSA, 2010: 112).

Sheet flooring : Vinyl, linoleum, rubber and fibre polyurethane floor sheets can also allow for sufficient elasticity and shock absorbency needed for sport activities (SRSA, 2010: 113). In some cases, these sheets (or tiles) are backed with shock absorption cellular plastic or rubber. The specified floor finishes can be applied directly onto a floor's screed/concrete surface bed and even additionally onto sprung floor systems (SRSA, 2010: 113).

In-situ polymeric flooring : This polyurethane floor is mixed on site and porously applied on top of a cellular plastic, prefabricated sheet or concrete floor (SRSA, 2010: 113). The finish thickness ranges from 1–4mm. This synthetic material can even endure spiked shoes (SRSA, 2010: 113), which indicates the method applicable for the indoor running track, as previously discussed.

To best suit basketball, volleyball, gymnasium and other group activities on an equivalent level of performances, a timber sprung arena floor system is proposed for the multi-purpose sports hall. This floor type will provide appropriate resilience and shock absorbency to assist the participants in their choice of activity and effort level. This floor structure comprises a timber framed layering system in which timber battens are piled in opposing directions (perpendicularly) to create a void that allows movement when pressure is applied on the playing surface (Medowen, 2015: online). The frame is fixed to the concrete surface bed which needs a moisture barrier to prevent water penetration (SRSA, 2010: 112). The impact on these floors causes the air pressure to increase inside the frames, thus requiring ventilation gaps for the air to escape and allow the structure to spring back into its original shape. The skirting board component should also allow movement. Sprung solid floors (removing one layer of timber runners) can also be used in studios specifically for dance, aerobics, Pilates, yoga, and other gymnasium activities.

THE IN-SITU POLYMERIC SYSTEM IS PROPOSED FOR THE GYMNASIUM FLOORING:

This proposed flooring will be used in the gymnasium on the second floor as an impact and shock absorbent layer on top of the 150mm concrete slab.

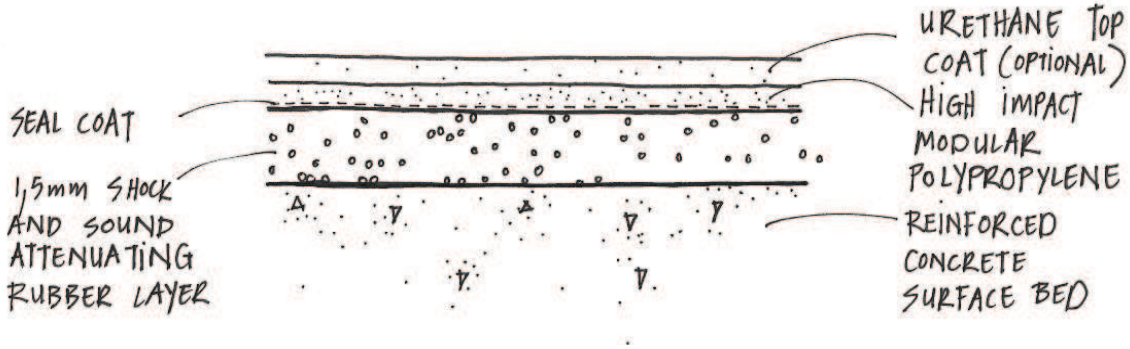


Figure 113 - Detail of proposed layers of the general indoor gymnasium flooring (Adapted from Advantage Sport (2015: online) and Janse van Rensburg (2013: 560)).

VENTILATED TIMBER SYSTEMS IS PROPOSED FOR THE SPORTS HALL FLOORING:
(see following page)

The illustrations below indicate two proposals to consider regarding the construction layering for the sports hall:



Figure 114 (Resilient flooring, 2012: online).

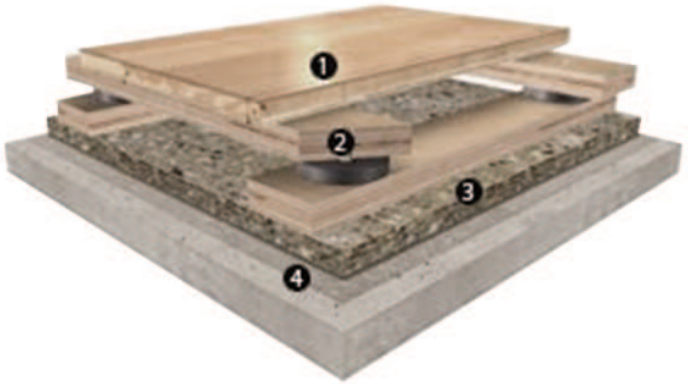
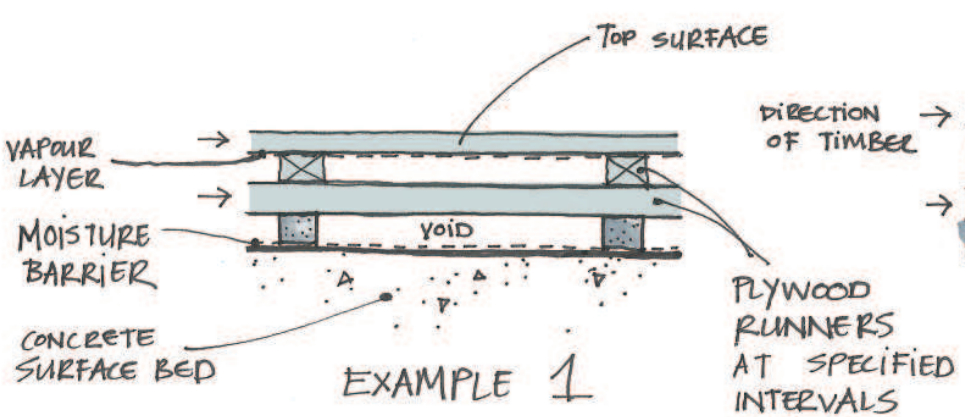
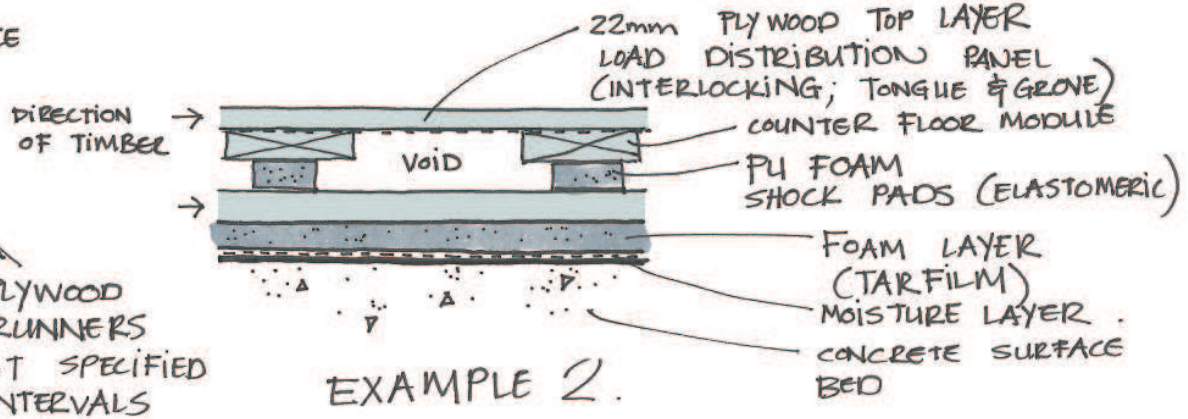


Figure 115 (Floors international, 2015: online).





This example of layering only applies shock absorbent pads in-between the concrete surface bed and the first frame of plywood runners, allowing the second layer of runners to be placed directly onto the first frame. This option will have less absorbance than example two but is efficient enough with a thinner floor thickness.

This example (by Floors International (SA)) provides an extra foam layer of Tarfilm on top of the concrete surface bed, together with placing the shock pads in between the separate levels of plywood runners.

Outdoor multipurpose combination court

[Netball / Volleyball / Basketball]

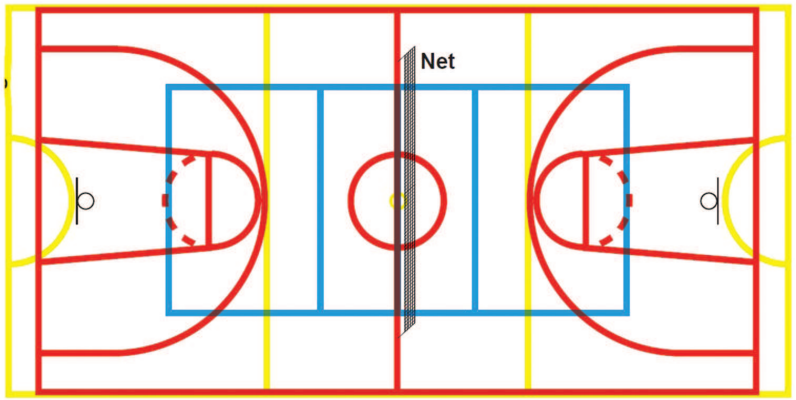


Figure 116 - Combination court markings (Tenecon, 2015: online).

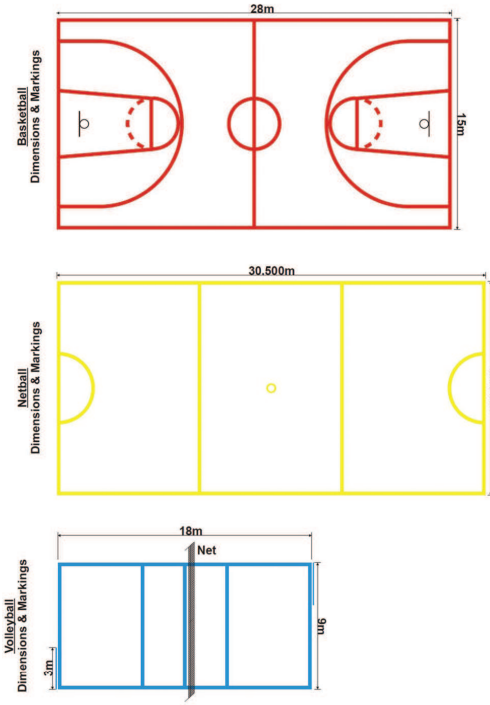
Suppliers: Tenecon Sport Surfaces
South African based

Yellow lines – Netball
Red lines – Basketball
Blue lines - Volleyball

Outdoor court surface layers:

A – Lines
B – Filler coat / Bitumen and sand
C – 9.5mm Roadstone
D – Bitumen or fibreglass mesh cloth layer
E – Base 100mm G2 / Crusher run (Dense grade aggregate)
F – Reinforced plastic P.V.C. / anti-water and movement resistant bottom
G – Compacted sub base
H – Third all weather surface (Tenecon final green coat)
I – Second all weather surface (Black coat)
J – First all weather surface (White coat)
(Tenecon, 2015: online).

Dimensions and markings individually:



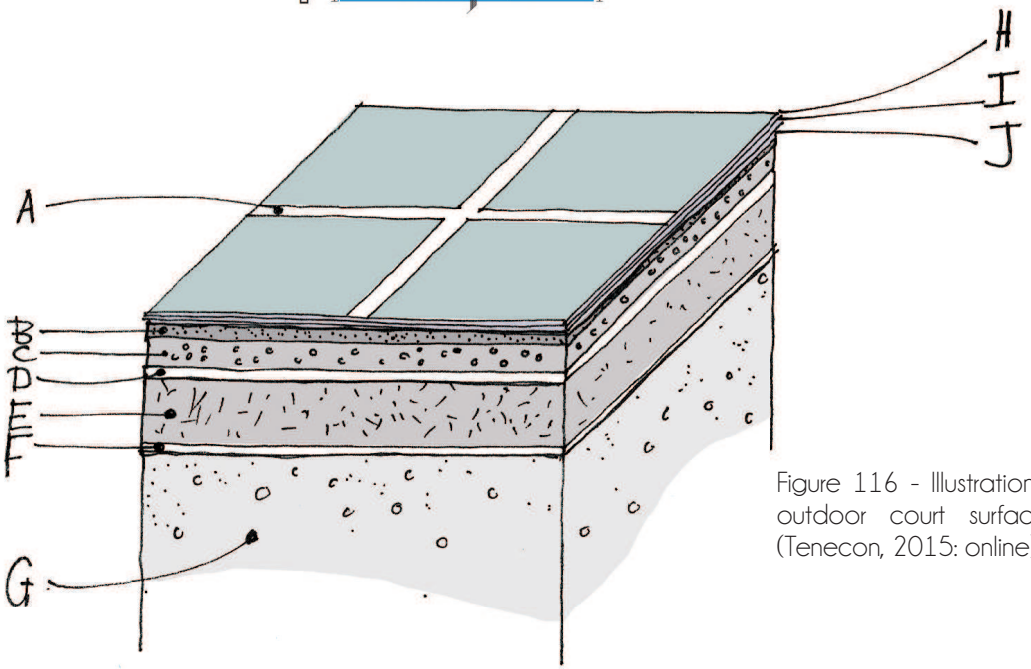
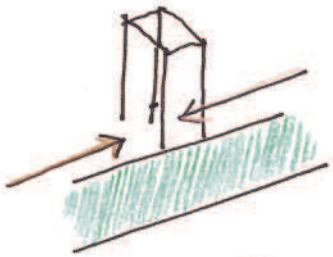


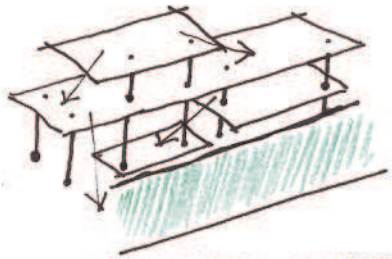
Figure 116 - Illustration showing outdoor court surface layers (Tenecon, 2015: online).



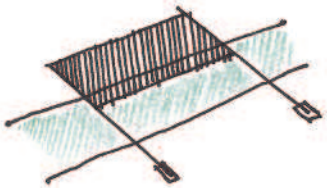
PASSIVE POINTS



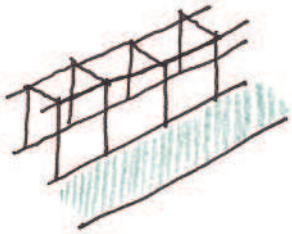
INTERLUDE



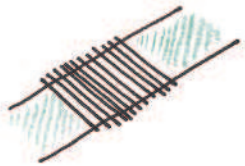
CONNECTING PLANES [ACTIVITIES]



EXTENDING THRESHOLDS



PROMENADE



CONNECTION OF RITUALS ALLOWED

[THE EDGE AT FLUX]

WHAT NEEDS TO HAPPEN

[TOWARDS A DESIGN SOLUTION]

2.5 methodology

Below are but a few ideas to conclude on all the information gained through the research done in part two:

Regarding the user

The proposal caters for a variety of users with different reasons for visiting the site in which the design should thus orientate the individual, from the point of arrival, towards his/her destination. With the aim of activating the area, different circulation patterns of users onto the site, as well as within the building, need to be addressed. To achieve multipurpose importance of fluctuating events, separate activities should be allowed to function on their own while still maintaining a link with adjacent functions. Parts of the building should thus be able to close off or extend into adjacent spaces to accommodate various functions and events.

To incorporate the public within the proposed typology and specific context, a public interaction is very important to initiate participation. For personal medical appointments a private approach is also essential with the need of nearby and available parking. Access and parking can thus relate to the different functions with private and public separations. The spaces of redress / ritual spaces (see morphology) should allow for public interaction, whether it is a park, an outside basketball court, a park gym or just seating. The public should be allowed here unconditionally.

Regarding the site challenges

As mentioned with the topology investigations, when an event takes place within the sport precinct, Att Horak Street is closed off completely for vehicles to accommodate the arrival of fans, therefore the building will have more than one arrival point and a secondary parking area to allow for constant participation opportunities. The site proposed for the building extends over two corners (the area First Avenue and Betoger Avenue, along Att Horak Street) which will allow access from both sides through a pedestrian walkway (as the proposed extension of the fan-walk). The building should be reachable at all times to address the fluctuation effect on site. With a site extension over two corners, up to 370 meters, the design will need to define the arrival point of the building as well as develop the entire block as public interface - which will involve a promenade/public walkway along the *spruit* with pavilions, seating, public gym equipment, a playground, a fan park, retail activities and a food court. With this route located close to the *spruit*, it is important to acknowledge the structural challenges it will impose.

Regarding morphology

The building outcome should resemble a dynamic design with the specified measurements of sport facilities incorporated. The movement of the user should determine how functions are organised and how circulation is guided through different spaces. These spaces should also incorporate different stages of movement and the opportunities of rest throughout the layout. The dynamic design leads the pedestrian on a route, whether participating in sport or not. The user becomes active and moves at a regulated/certain pace. The spectator becomes a performer by simply participating in the movement throughout the building.

Regarding tectonics

Within the sport precinct, the proposal should fit into its context of exposed structural elements and the purity of materials. The building should resemble strength and stability to assist and support the user's movement. A variety of material types, sizes, and span requirements can all aid in achieving an urban related, sport orientated, publically participating and interactively approachable building.

first phase 138
site connections investigation
second phase 140
first connection along the spruit
third phase 142
connecting att horak street and the existing fan-walk
fourth phase 144
functions placement
fifth phase 146
relating to stadium scale
sixth phase 148
providing space for participation
seventh phase 152
defining place for participation
eighth phase 156
defining place for participation
ninth phase 162
reinterpreting transition
tenth phase 174
circulation elements

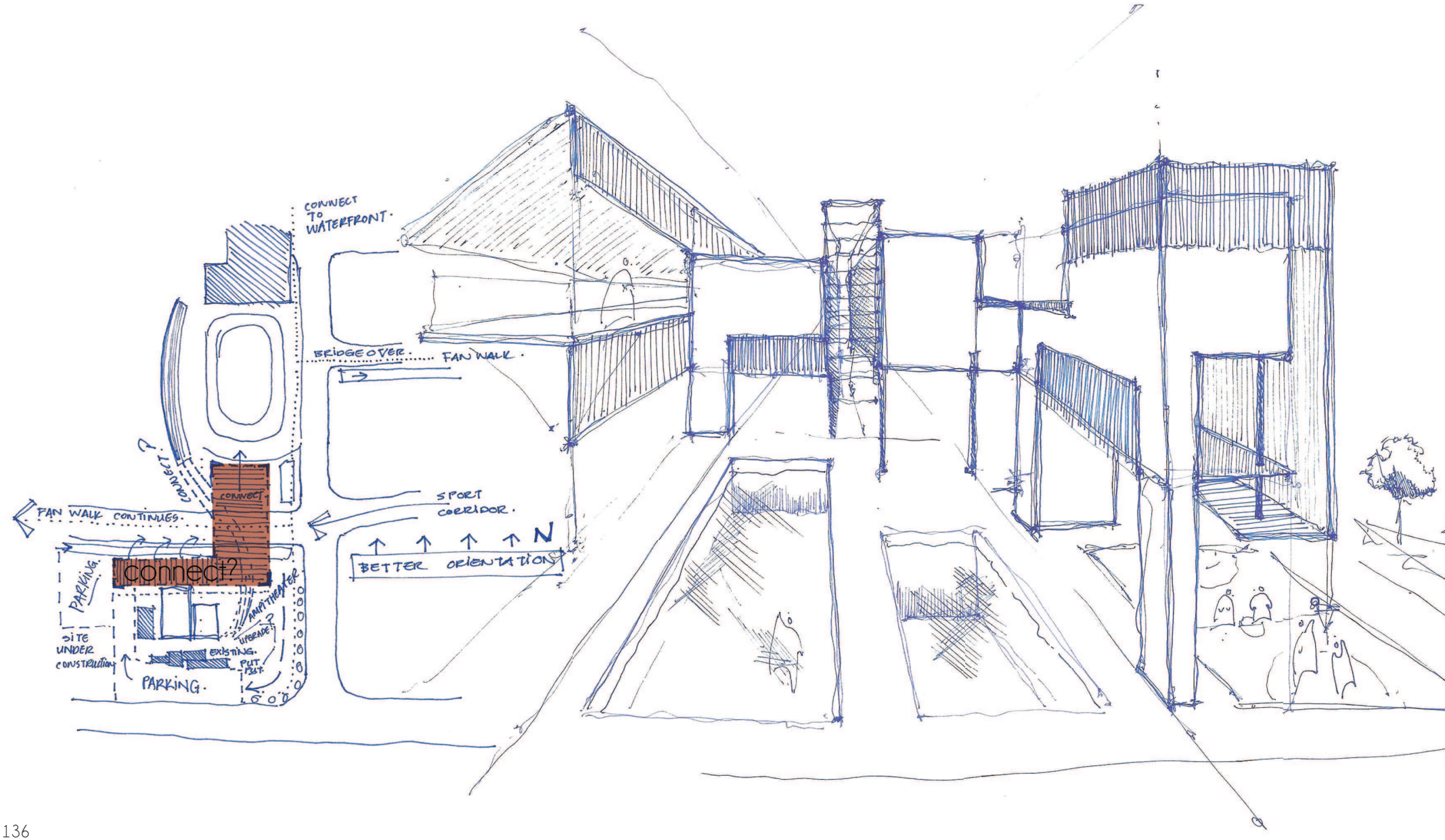
3.1 DESIGN DEVELOPMENT

179 3.2 SYNTHESIS



[DESIGN + CONSTRUCTION SYNTHESIS]

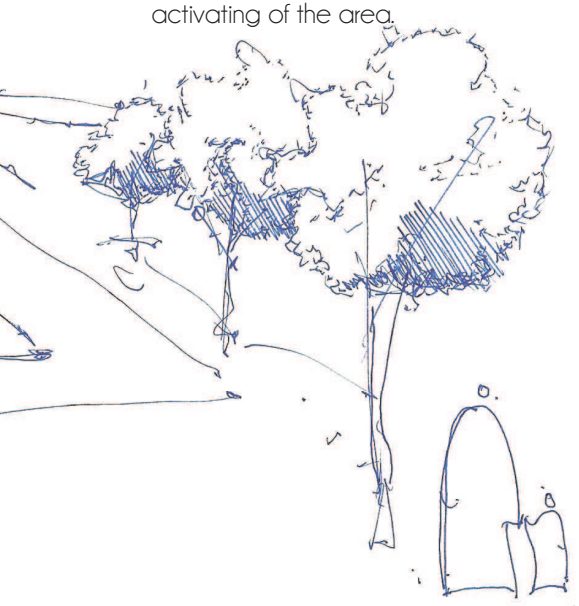
This section involves the design and structural development of the proposal through the implementation of the information gathered in part two. Proposed as different phases, the development process identified (increasingly) more parameters than originally set out. With each phase new challenges became evident requiring further investigation and significant changes to incorporate. This process works towards the final project proposal of a Sport Performance Centre for Bloemfontein's sport precinct.


CONNECT TO WATERFRONT.
BRIDGE OVER.
FAN WALK.
CONNECT
FAN WALK CONTINUES.
CONNECT
SPORT CORRIDOR.
N
BETTER ORIENTATION
connect?
PARKING.
AMPITHEATER
UPGRADE
SITE UNDER CONSTRUCTION
EXISTING.
PUT PUT.
PARKING.

[DESIGN + TECHNICAL PROCESS]

3.1 design development

The design process, in six phases, is presented in the following section through illustrations, built models and conceptual interpretations. Each phase will be discussed in order to assist the reader in understanding the transition in between the stages towards the final outcome. A difficult challenge of the proposal was to find the suitable site for the building; in order to become the link in between the existing, unconnected sport facilities. Once the site location was set as arrival of the sport precinct, the organising of functions required a lot of effort to achieve one entrance for such an extended building programme. Circulation is a very important aspect throughout to achieve functionality within the layout as well as easy self-orientation. The spatial volumes relates to the specific sport functions it hosts as well as achieving visual access to adjacent activities. The project proposed one continues linkage of events to introduce different participants to one another, in the aim of activating of the area.

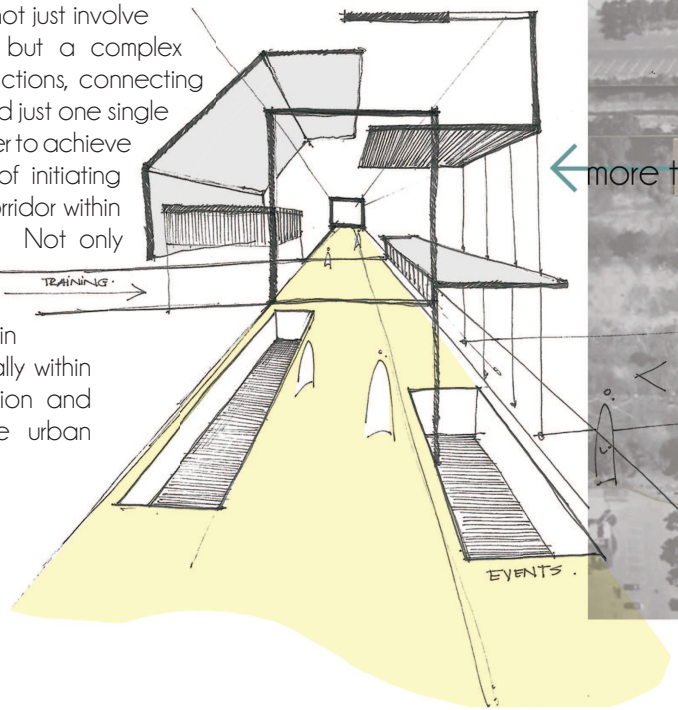


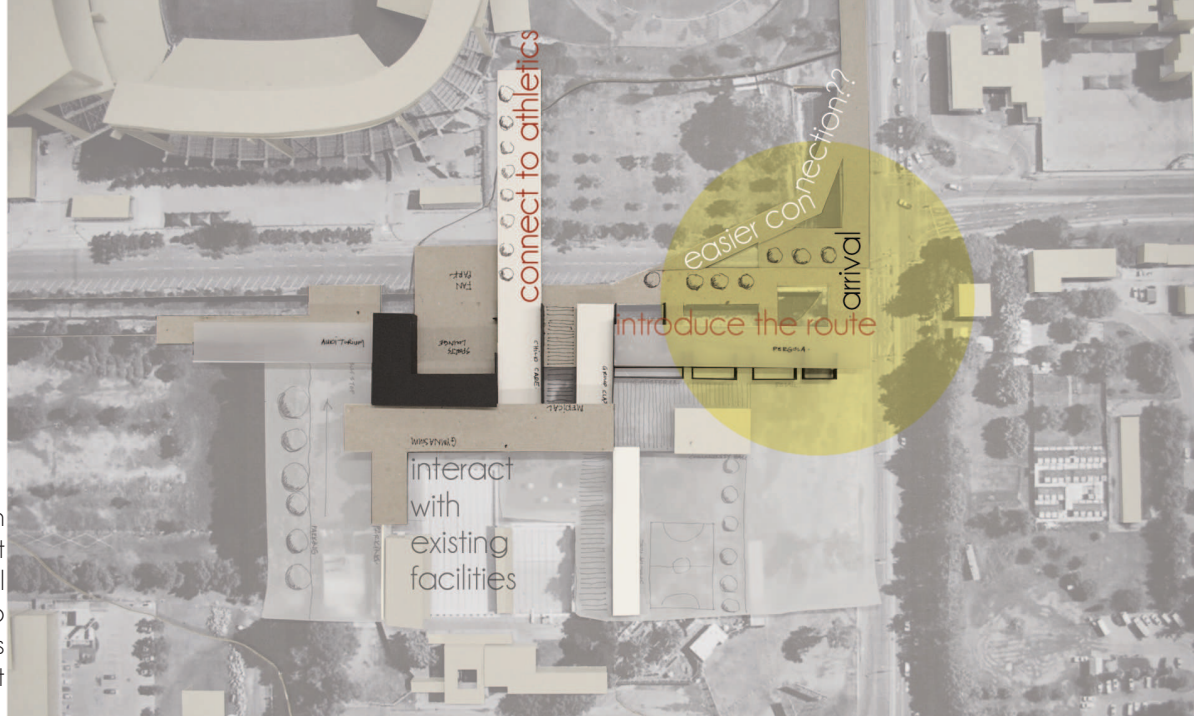
PHASE 1 [SITE CONNECTIONS INVESTIGATION]

After the quantitative and qualitative site analysis, as presented in topology of part two, a physical model was used to investigate lost connections on site. Not to scale, these models incorporated conceptual aims of threshold extensions and physical boundaries that needed to be crossed. An initial idea of site location and function organisation is presented together with possible access points. These examples represent the importance of integrating the proposed building within the context.

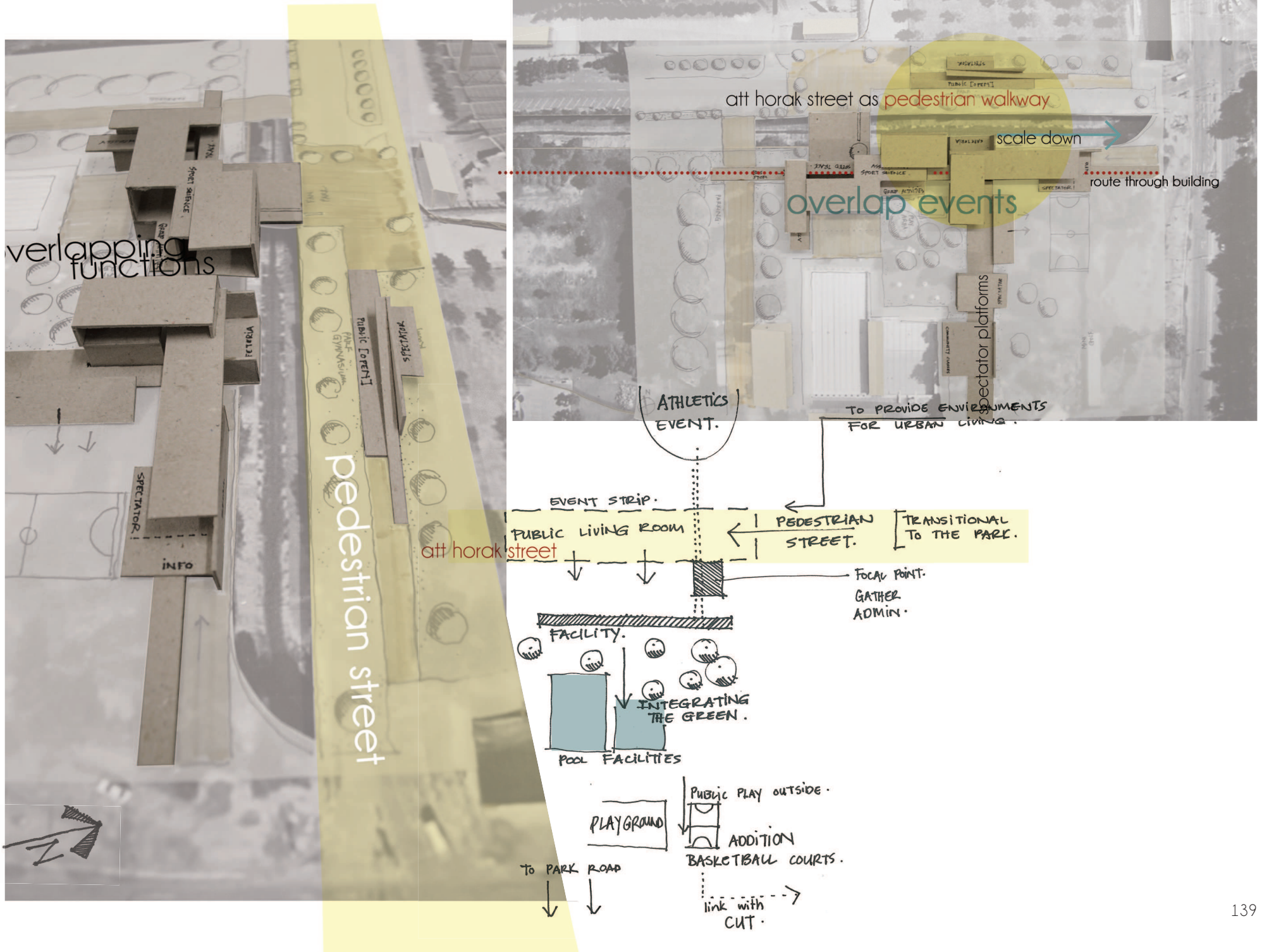
Events started to overlap in order to maintain a visual connection between separated functions; even between indoor and outdoor activities; all in order to activate its surroundings.

The proposal did not just involve a single building, but a complex organisation of functions, connecting activities far beyond just one single site location, in order to achieve the set out goal of initiating an urban green corridor within the sport precinct. Not only professional athletes should be involved within the area - especially within its important location and relationship to the urban (CBD) edge.





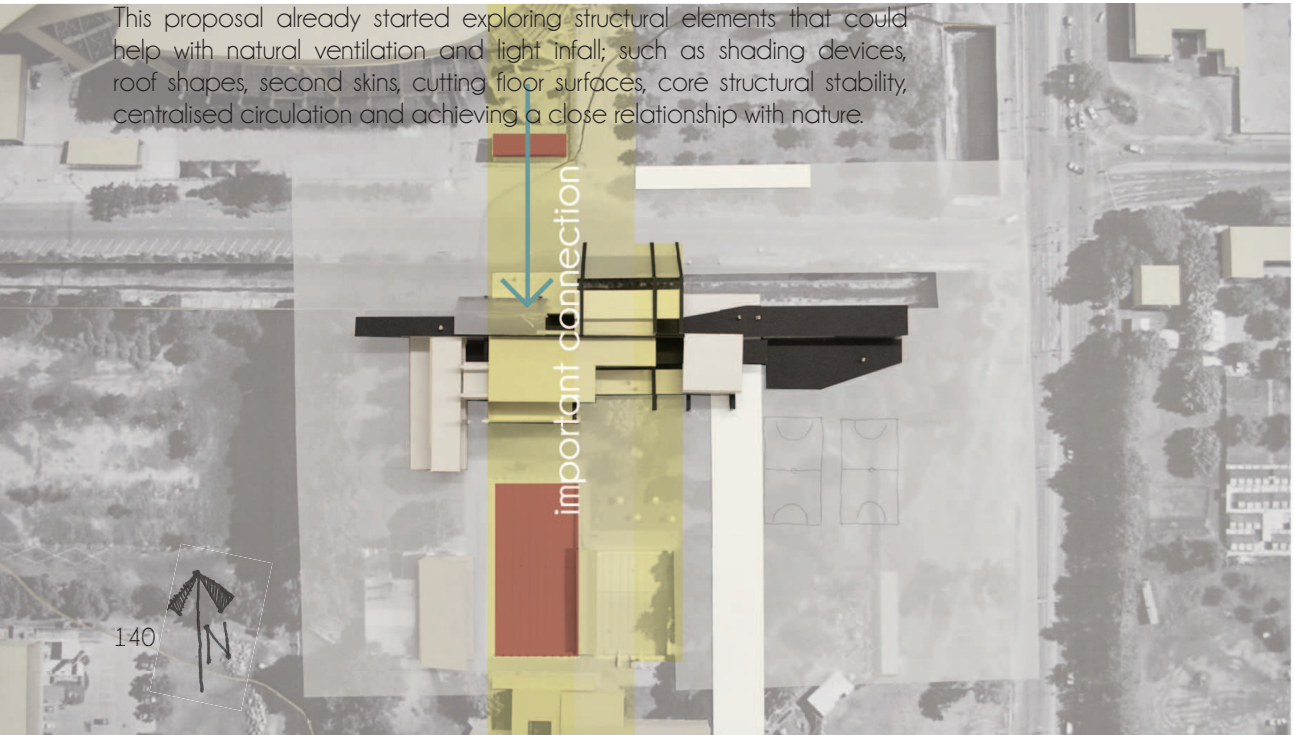


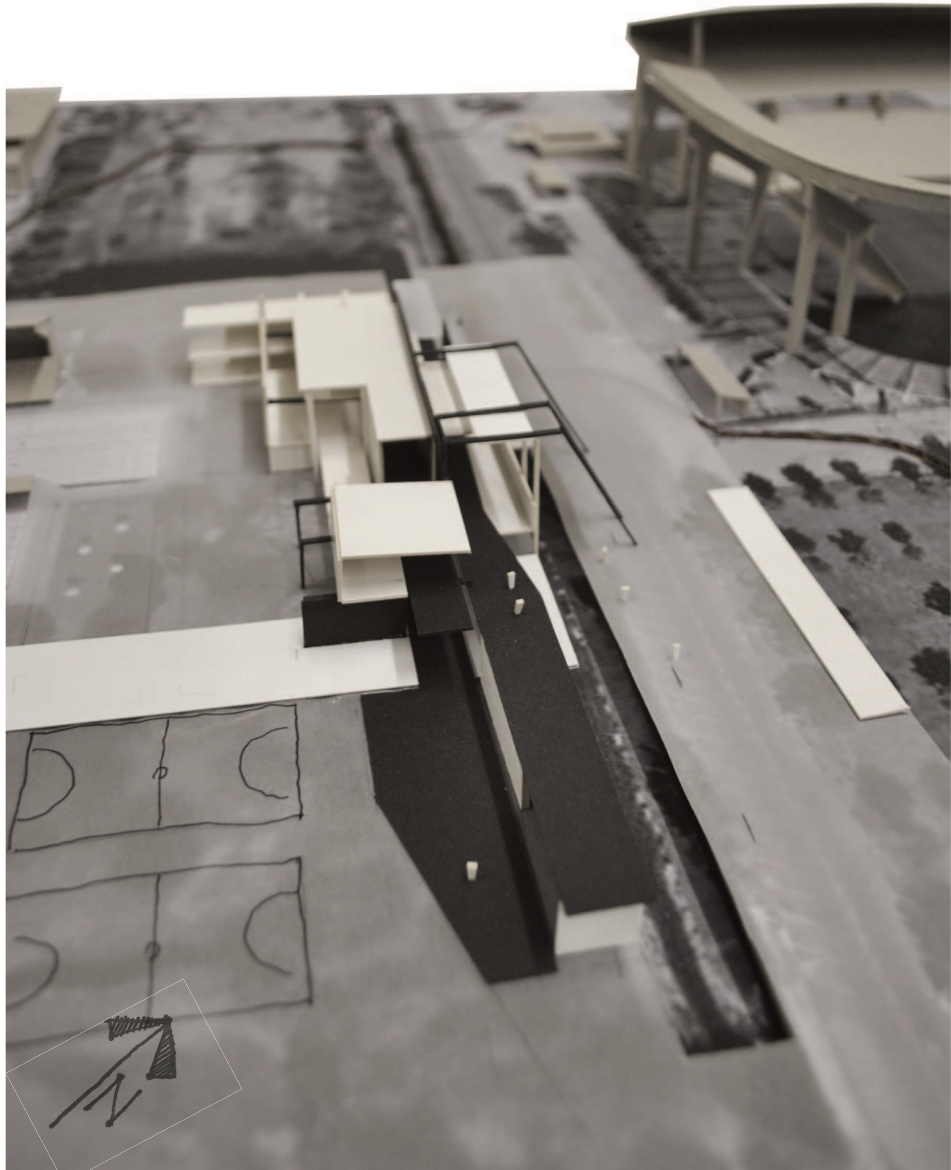

overlapping functions
pedestrian street
att horak street as pedestrian walkway
scale down
route through building
overlap events
spectator platforms
ATHLETICS EVENT.
TO PROVIDE ENVIRONMENTS FOR URBAN LIVING.
EVENT STRIP.
PUBLIC LIVING ROOM
PEDESTRIAN STREET.
TRANSITIONAL TO THE PARK.
att horak street
FOCAL POINT.
GATHER
ADMIN.
FACILITY.
INTEGRATING THE GREEN.
POOL FACILITIES
PLAYGROUND
PUBLIC PLAY OUTSIDE.
ADDITION
BASKETBALL COURTS.
TO PARK ROAD
link with
CUT.

PHASE 2 [FIRST CONNECTION ALONG THE *SPRUIT*]

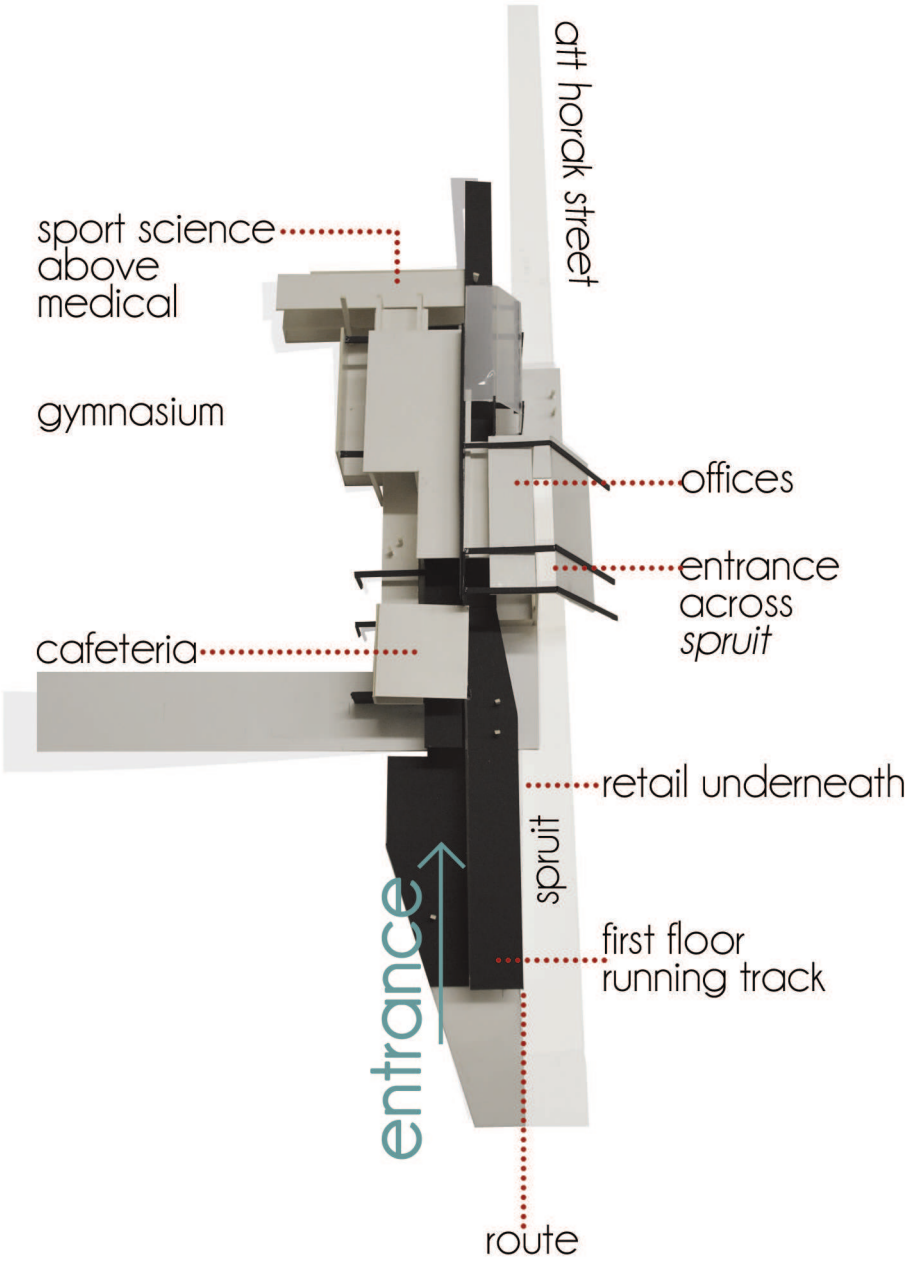
The importance of a pedestrian walkway, which is in close relationship with the front (northern) facade of the building, became evident. The building will host this urban walkway and allow the public to be guided within the sport precinct - and activate Att Horak Street. This proposal also indicated the need for a new entrance to the existing swimming pool facilities (which is the only sport activity not receiving access from Att Horak Street). There is an important line up identified between the eastern entrance (within Att Horak Street) of the stadium/athletics field entrance and the new proposed access to the pool facilities, bridging over the *spruit*.

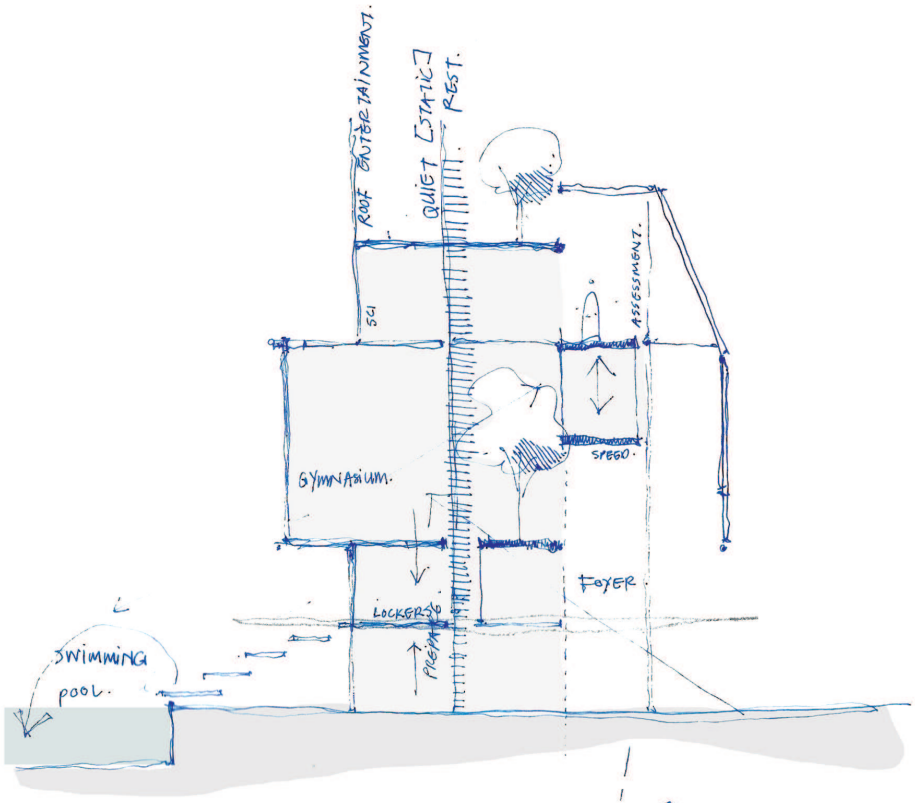
This proposal already started exploring structural elements that could help with natural ventilation and light infall; such as shading devices, roof shapes, second skins, cutting floor surfaces, core structural stability, centralised circulation and achieving a close relationship with nature.

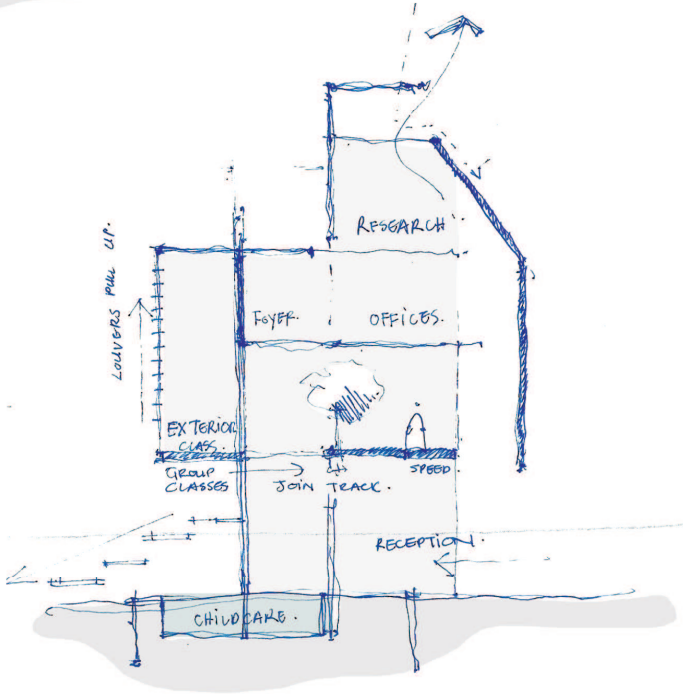




SECTION INVESTIGATION





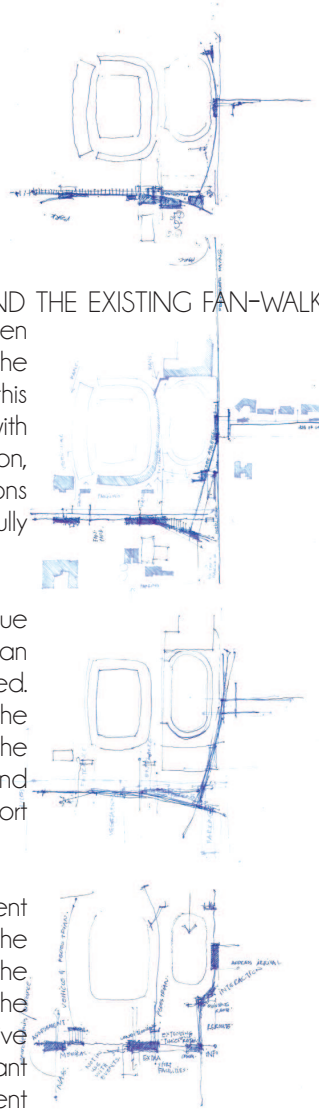


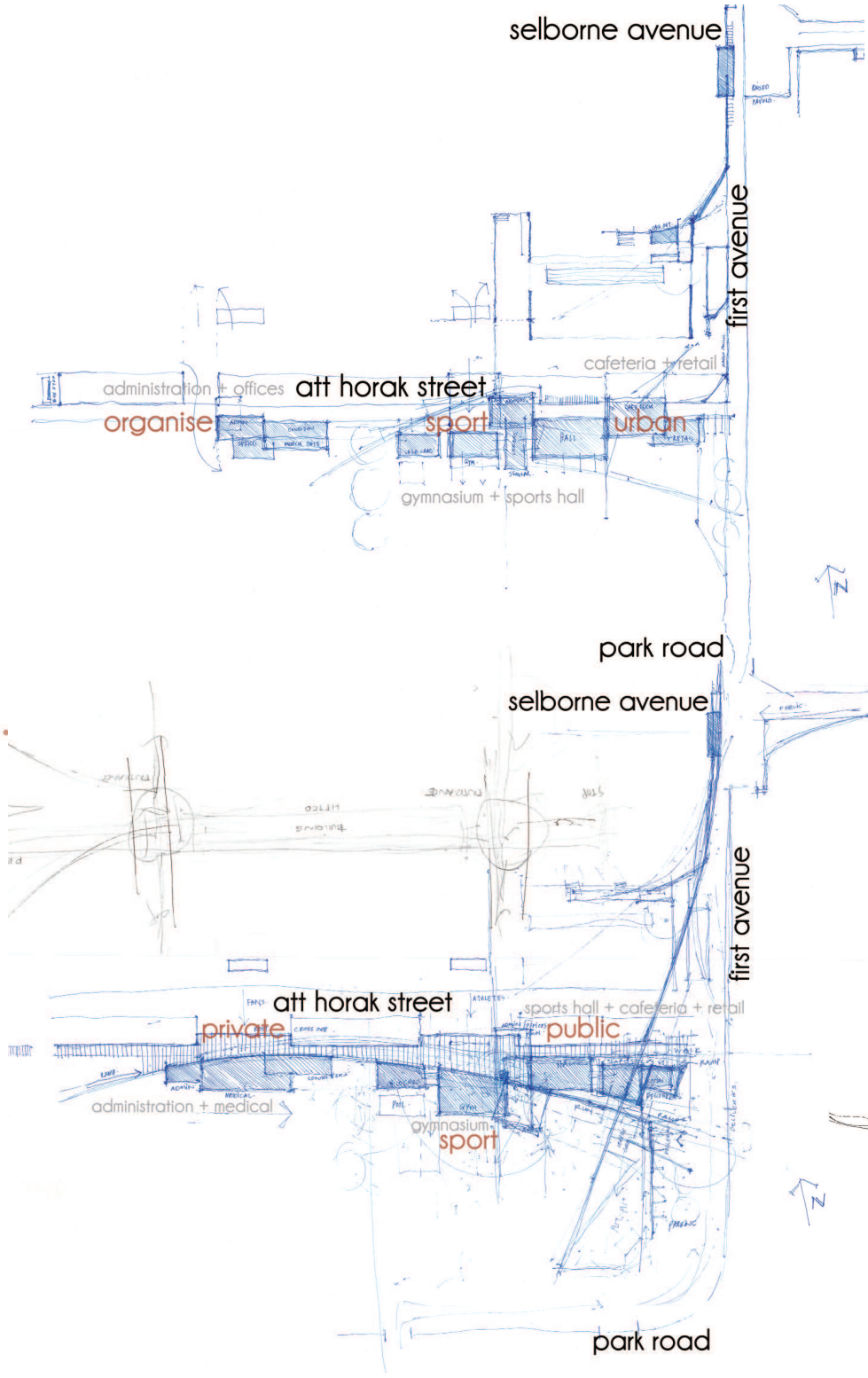
PHASE 3 CONNECTING ATT HORAK STREET AND THE EXISTING FAN-WALK

After the review of above two proposals, the connection between Selborne Avenue and Att Horak Street was appointed as the anchoring element of the proposal. It was important to investigate this missing link on an urban level; in order to identify what could be done with the existing context to achieve a safe cross over with minimum intervention, and what spaces were available for change. Only once these decisions were made, could the design of the building proceed in order to fully integrate with the urban green corridor.

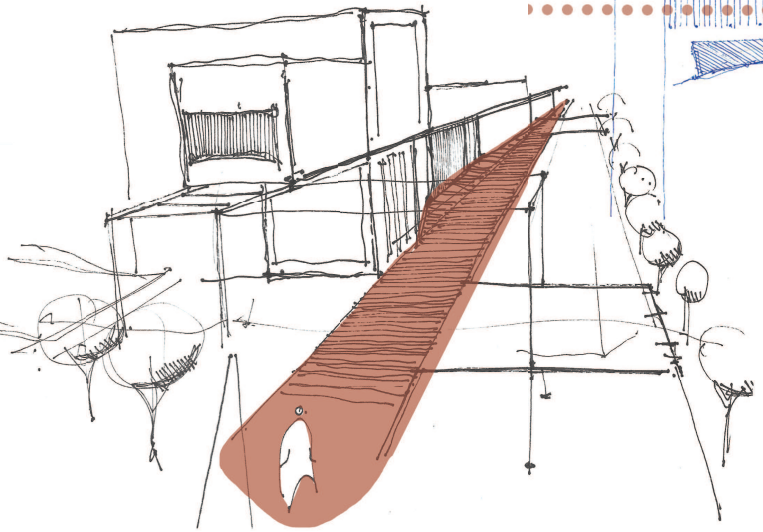
The building placement extended along the *spruit* between First Avenue and Betoger Avenue, stipulating a distinction between public/urban functions; private/medical functions and the sport activities presented. These main functions where organised along a route, to initiate the connection between the urban participants from Selborne Avenue, the students from the Central University of Technology (CUT) in Park Road, and the main pedestrian traffic from First Avenue, all to be guided into the sport precinct through Att Horak Street to initiate participation.

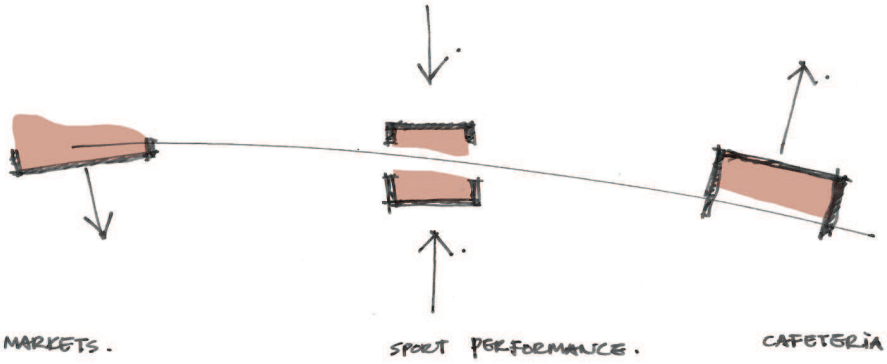
The layout created openings where there was none, allowing movement through the different functions while being actively involved with the outdoor pedestrian walkway. But this layout was not suitable within the objectives of the proposal allowing integration of all events. With the aim of connecting sites, the building would have become a massive and exhausting extension of functions which would make the constant movement between events from one building to the next an inefficient design. Coherence between the building placement on site and its relationship to the proposed walkway needed to be achieved.

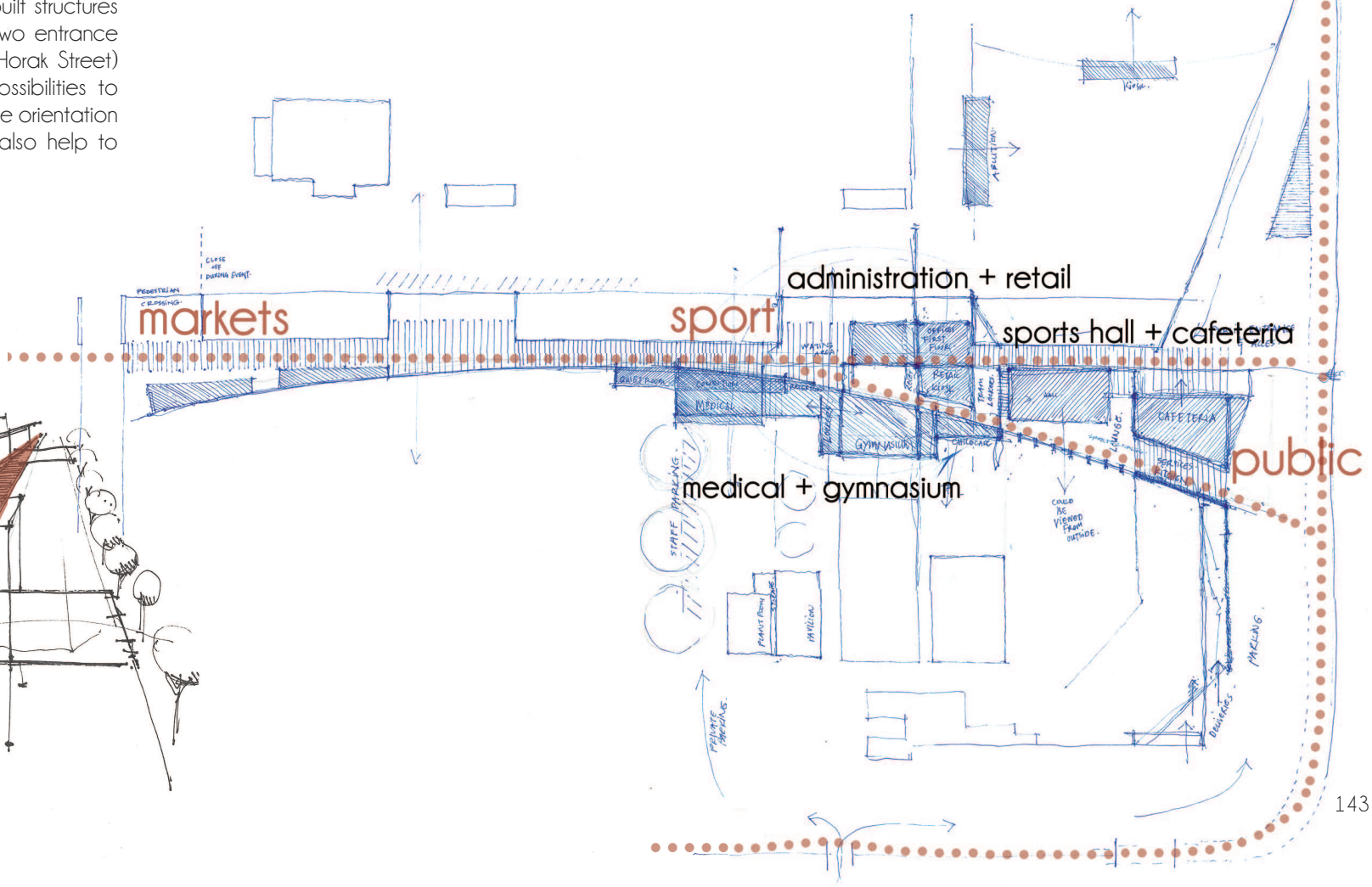




Furthermore, due to the lack of urban representatives and only a few built structures in the context to relate to, the two entrance gates of the stadium (within Att Horak Street) provided important reference possibilities to work from. These entrances provide orientation to visitors of events and could also help to regulate movement onto the site.



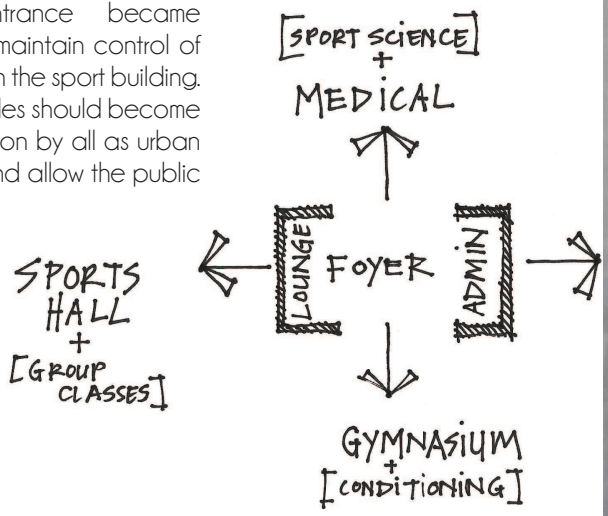


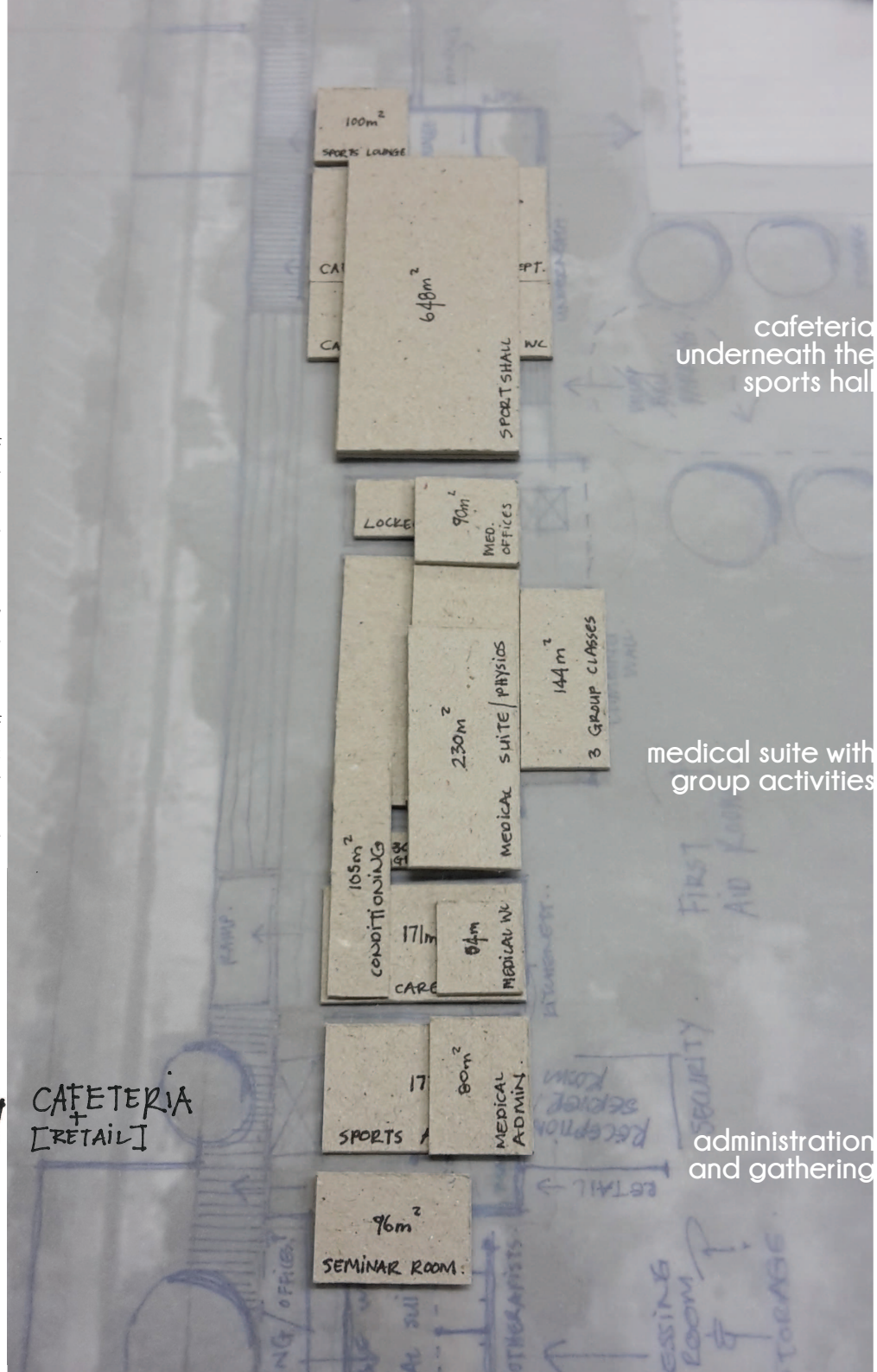


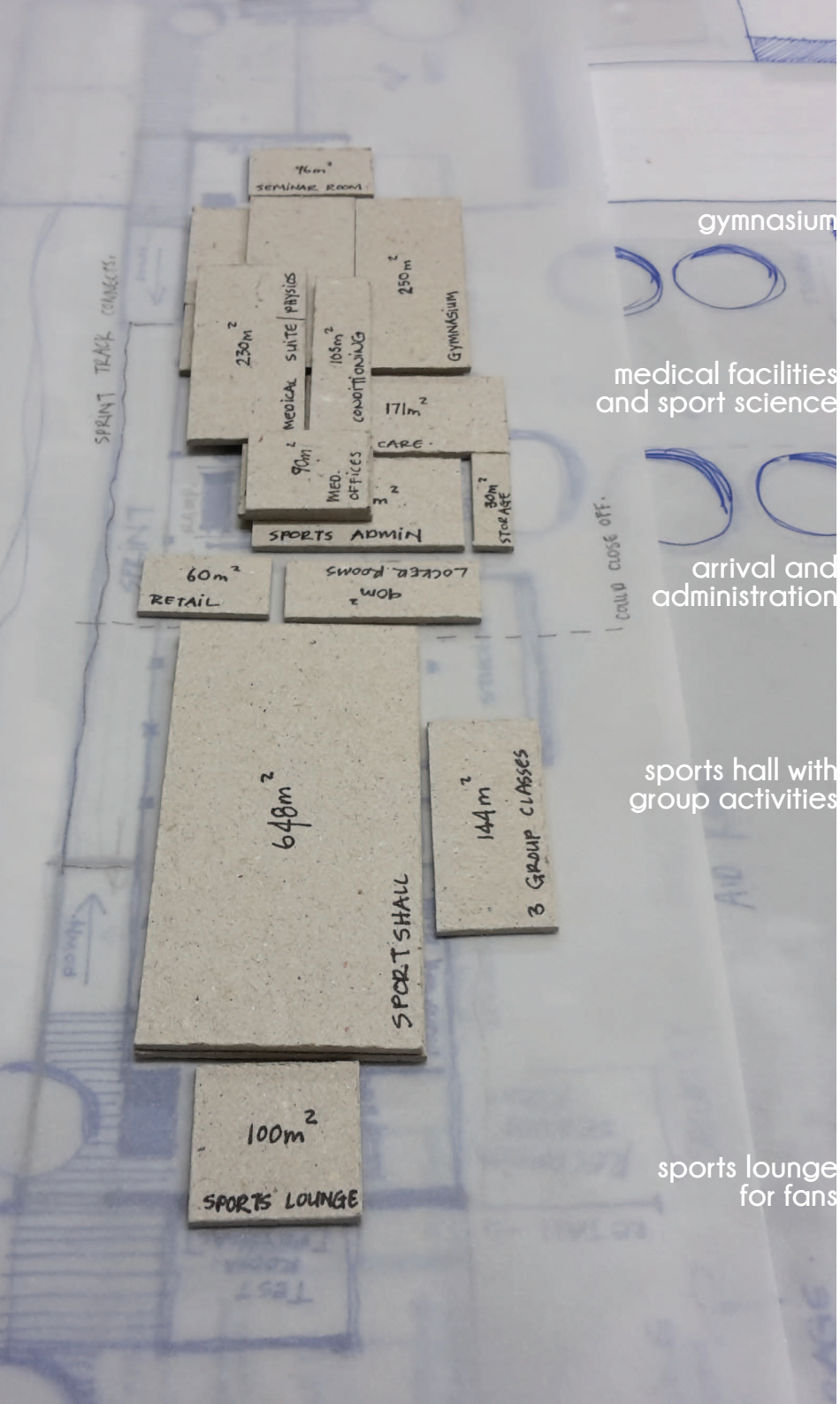
PHASE 4 [FUNCTIONS PLACEMENT]

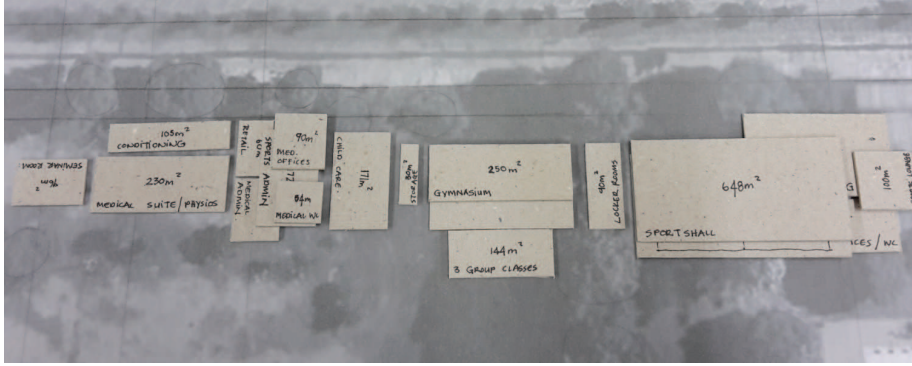
Directing the placement of the building more towards the center of the site, the functions had to be distributed according to efficient use and functional placement. The building maintained a linear proposal in order to extend along the route while accommodating the extensive programme. Chip board cut outs were used to organise the functions accordingly and maintain an all through minimum width of the proposed sports hall. Functions were fittingly grouped together and layered to allow vertical movement as well as horizontal placement along the route of the spruit.

The accommodation and flow between functions required a lot of investigation. A sport building comprises of a lot of functions with specific requirements and by adding an urban aspect and public interface (not associated with these typologies usually hosted by security controlled complexes) progressed the building programme to become more extensive. The importance of a central foyer/entrance became clear in order to maintain control of participation within the sport building. The exterior facades should become free for participation by all as urban representatives and allow the public to become aware of the activities presented by the proposed building.

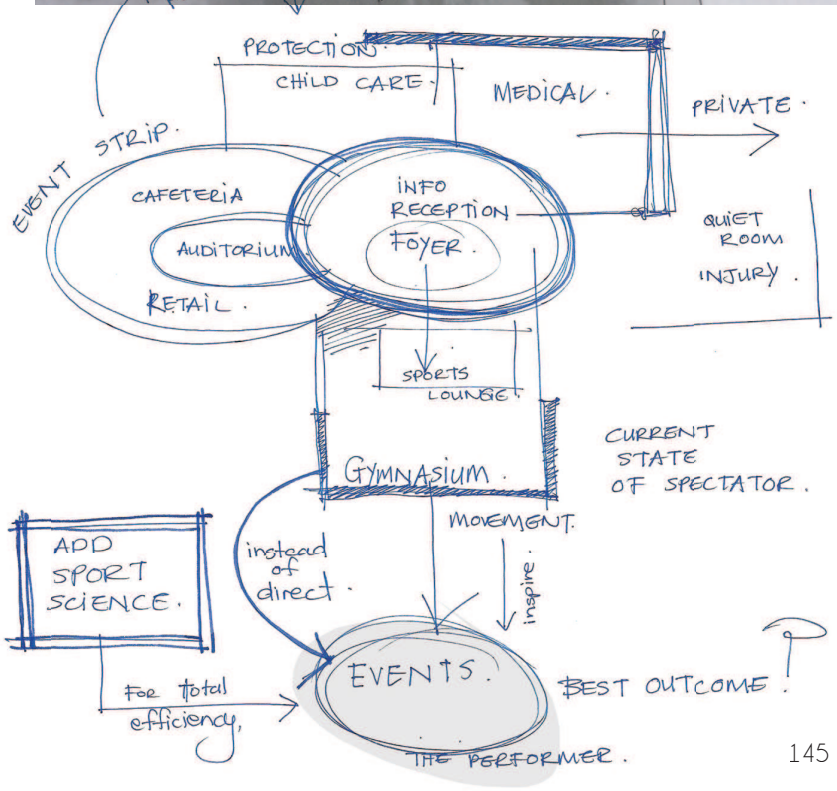





gymnasium
medical facilities
and sport science
arrival and
administration
sports hall with
group activities
sports lounge
for fans
SEMINAR ROOM
GYMNASIUM
MEDICAL SUITE / PHYSICS
CONDITIONING
CARE
MED. OFFICES
SPORTS ADMIN
STORAGE
RETAIL
SPORTSHALL
3 GROUP CLASSES
SPORTS LOUNGE


GYMNASIUM
MEDICAL SUITE / PHYSICS
SPORTSHALL
3 GROUP CLASSES

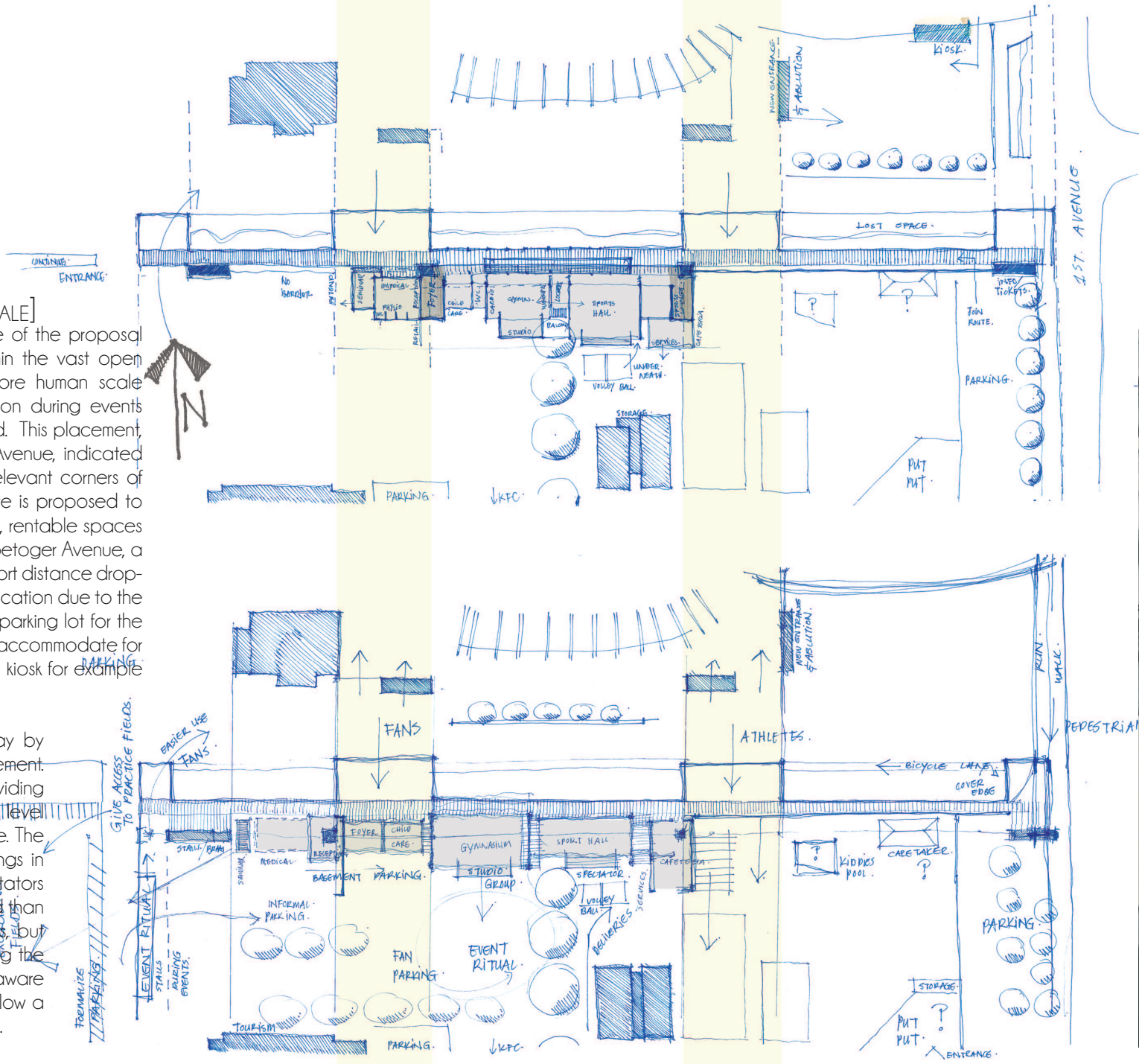

GYMNASIUM
SPORTSHALL
3 GROUP CLASSES


BUT AVAILABLE TO THE PUBLIC.
PROTECTION.
CHILD CARE.
MEDICAL.
PRIVATE.
EVENT STRIP.
CAFETERIA
AUDITORIUM.
RETAIL.
INFO RECEPTION
FOYER.
QUIET ROOM
INJURY.
SPORTS LOUNGE.
GYMNASIUM.
CURRENT STATE OF SPECTATOR.
MOVEMENT.
ADD SPORT SCIENCE.
instead of direct.
inspire.
EVENTS.
BEST OUTCOME!
For total efficiency,
THE PERFORMER.

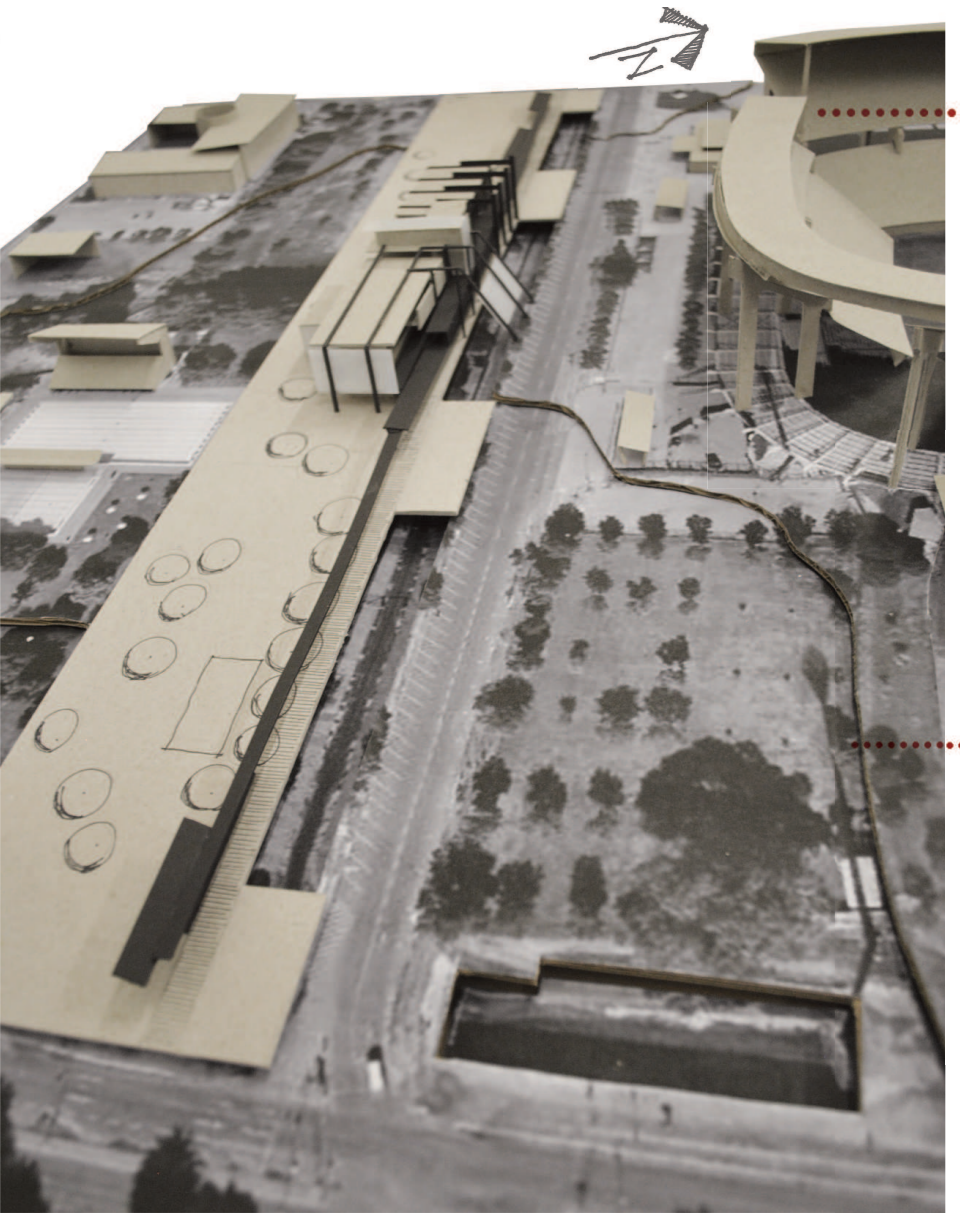
PHASE 5 [RELATE TO STADIUM SCALE]

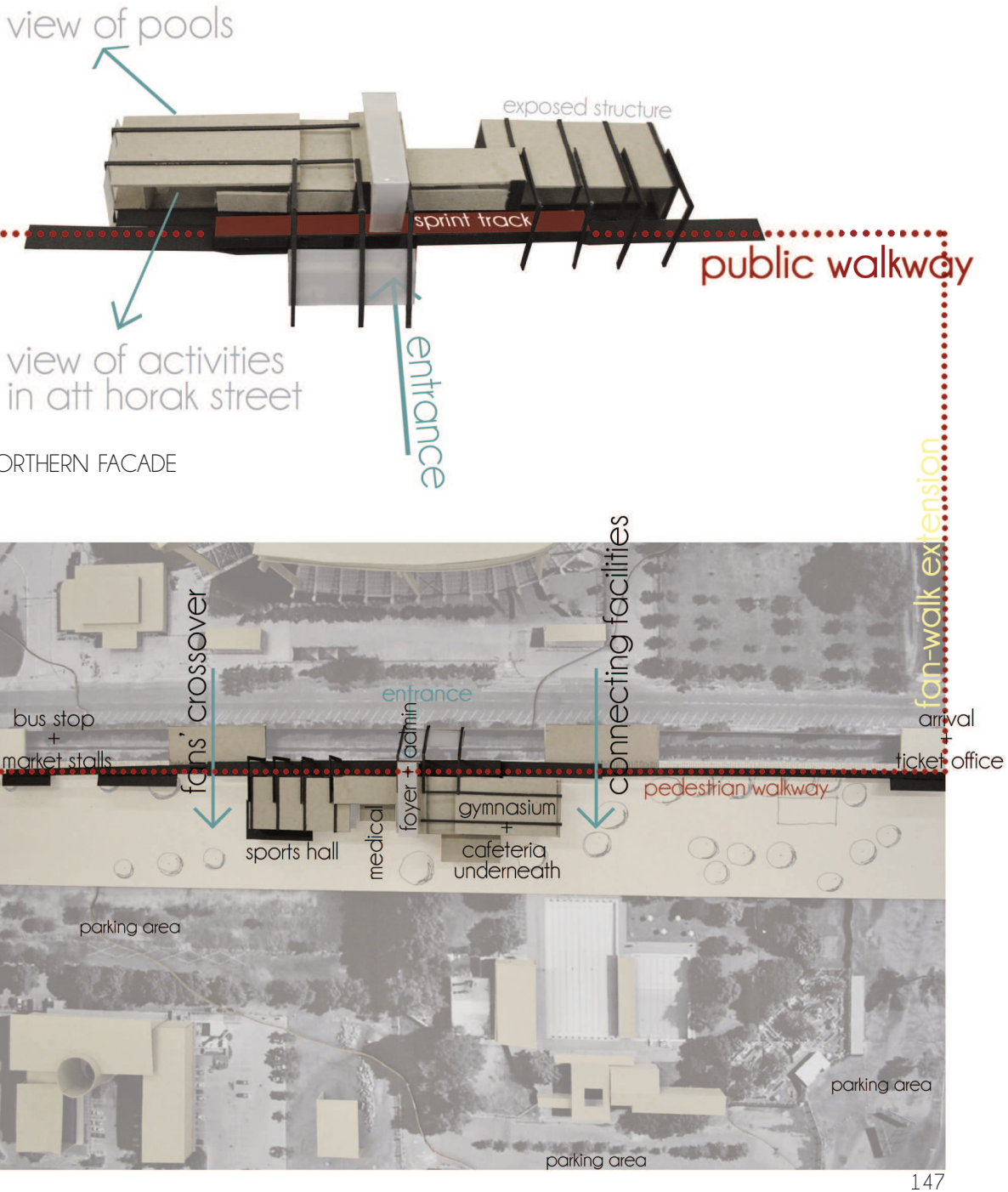
The two Southern entrances became the main frame of the proposal and help to orientate the building placement within the vast open surroundings. The building could also allow for a more human scale approach towards the stadium, regulating participation during events and allowing more activity when the event is has ended. This placement, more centralised between First Avenue and Betoger Avenue, indicated the importance of providing arrival structures to the relevant corners of Att Horak Street. Within First Avenue, a info box/structure is proposed to help answer any questions regarding scheduled events, rentable spaces and locality maps of the facilities. On the other end, in Betoger Avenue, a formalised bus stop is proposed to accommodate for short distance drop-offs and long distance busses. This is suitable within its location due to the open field next to the Tourism Centre, used as informal parking lot for the long distance busses. The proposed bus stop can also accommodate for market stalls which could be used on a daily basis as a kiosk for example or during events for selling supporters' gear.

The proposal highlights the use of the public walkway by placing a sprint track on top of it to encourage movement. The elevated sprint track will help the objective of providing space for the public to be involved on ground floor level while exposing the athlete's movement within the facade. The sporting events should be presented to the surroundings in order to achieve visual connections between spectators and performers. The spectator is usually higher elevated than the performer, with reference to stadiums and pavilions, but the building proposes the staging of events by allowing the performers to be placed higher up and to become aware of their surrounding spectators. This inverse ritual can allow a change in prejudices and create a will for participating.

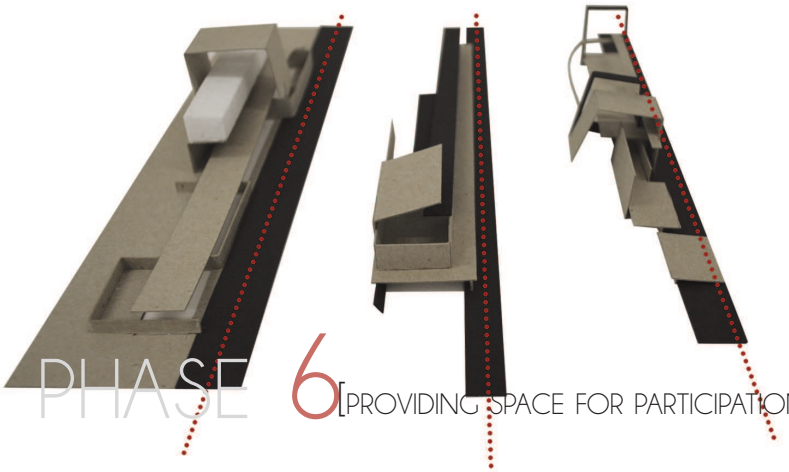


In relevance to the stadium, exposing the structure became more important and was situated on the exterior. But this proposal still lacked a sense of movement and the support thereof; in which it did not yet represent a sport building.

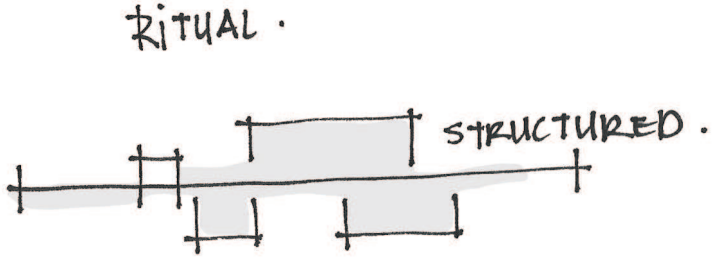


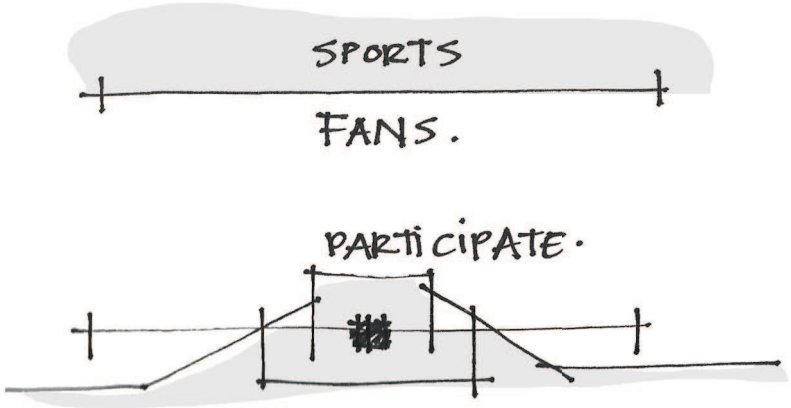


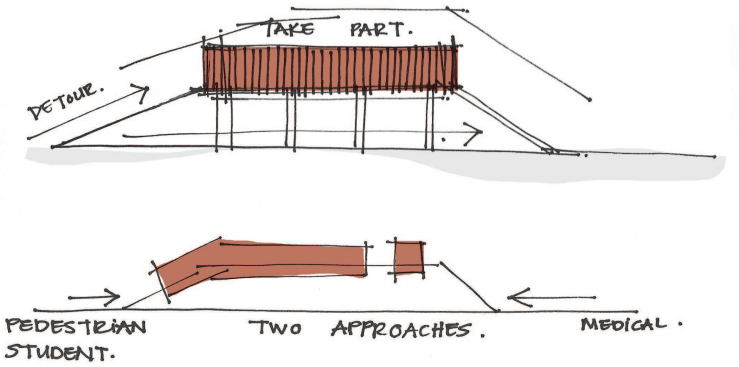
NORTHERN FACADE

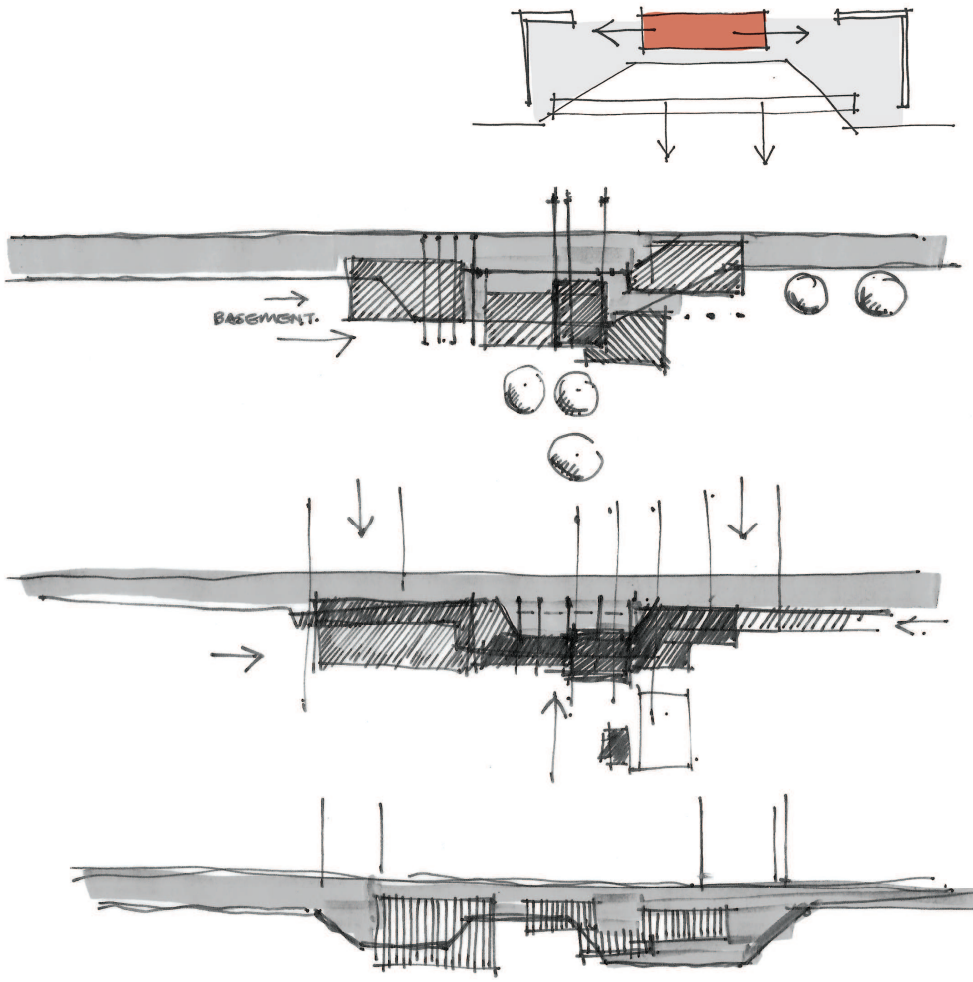


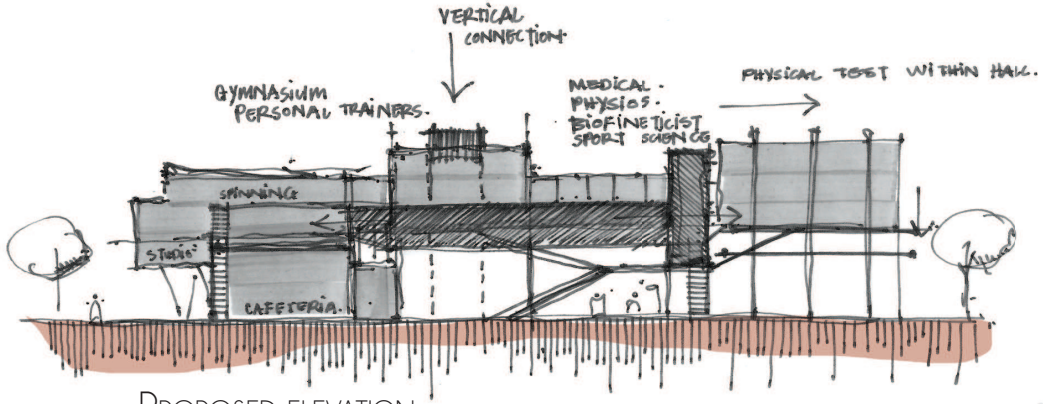
PHASE 6 [PROVIDING SPACE FOR PARTICIPATION]



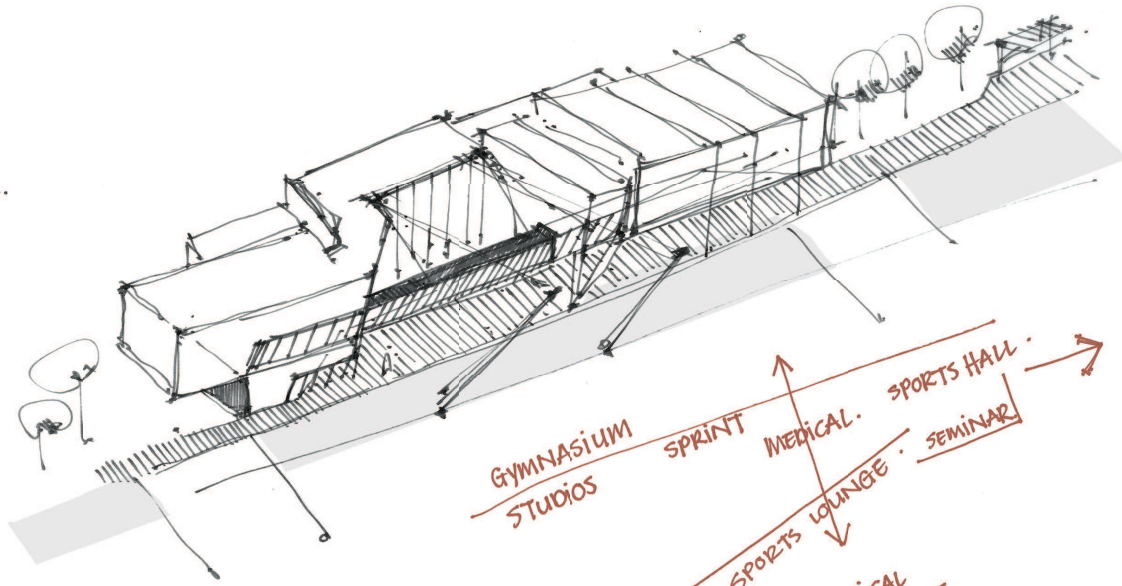




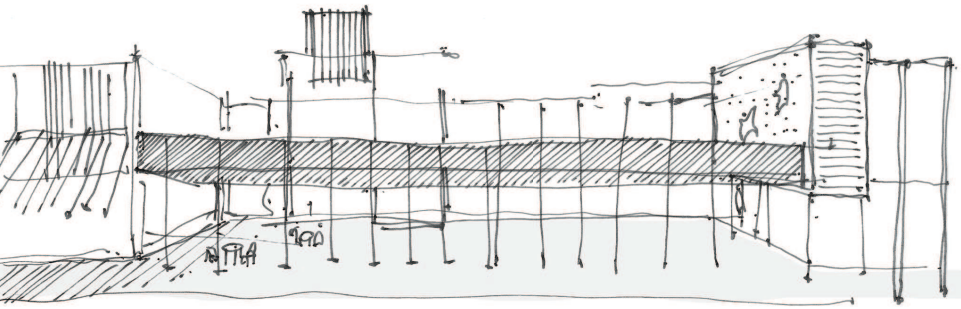




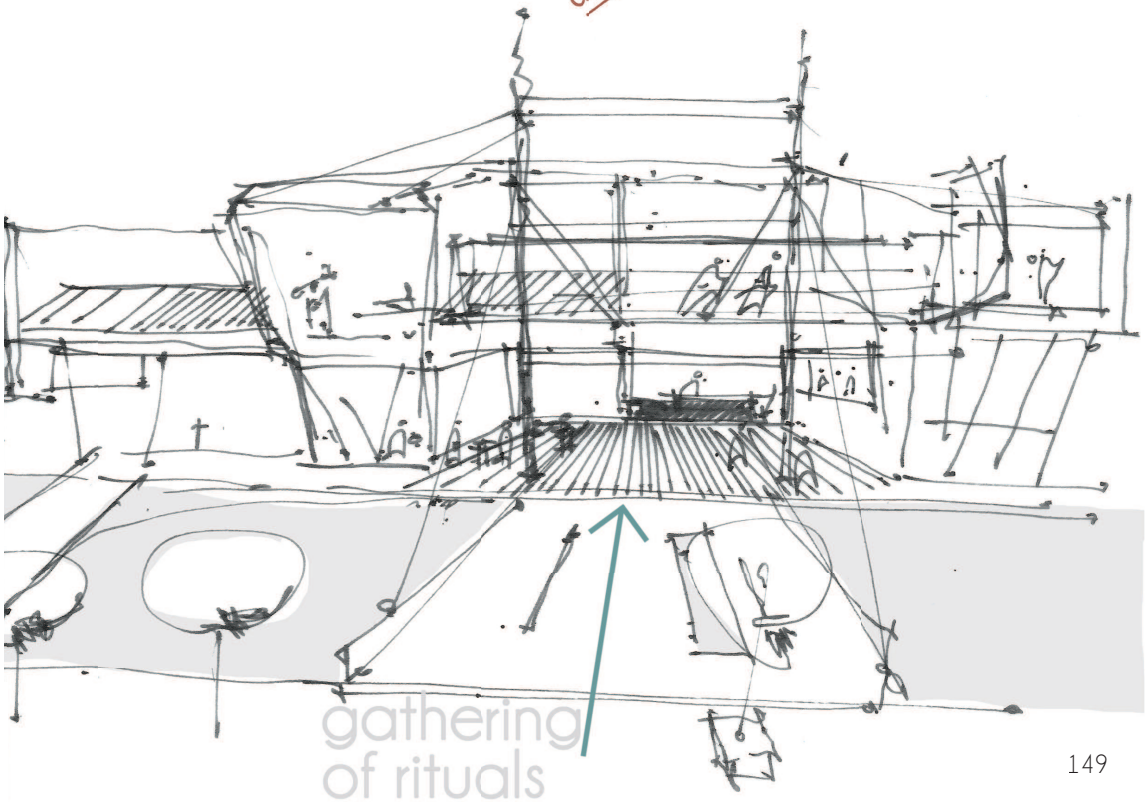
PROPOSED ELEVATION

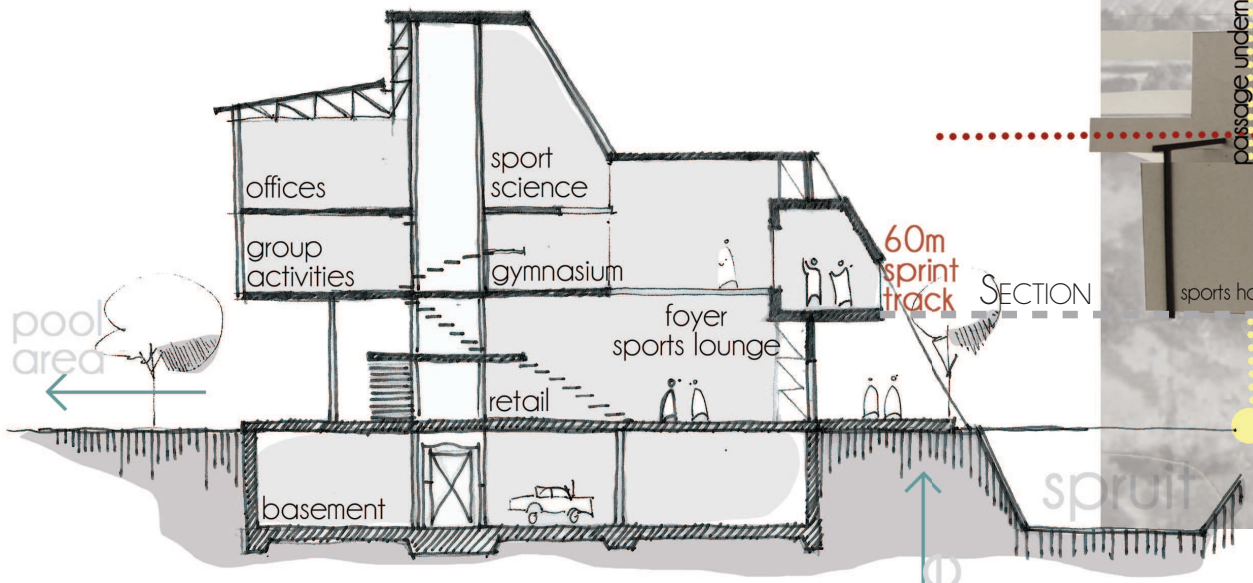


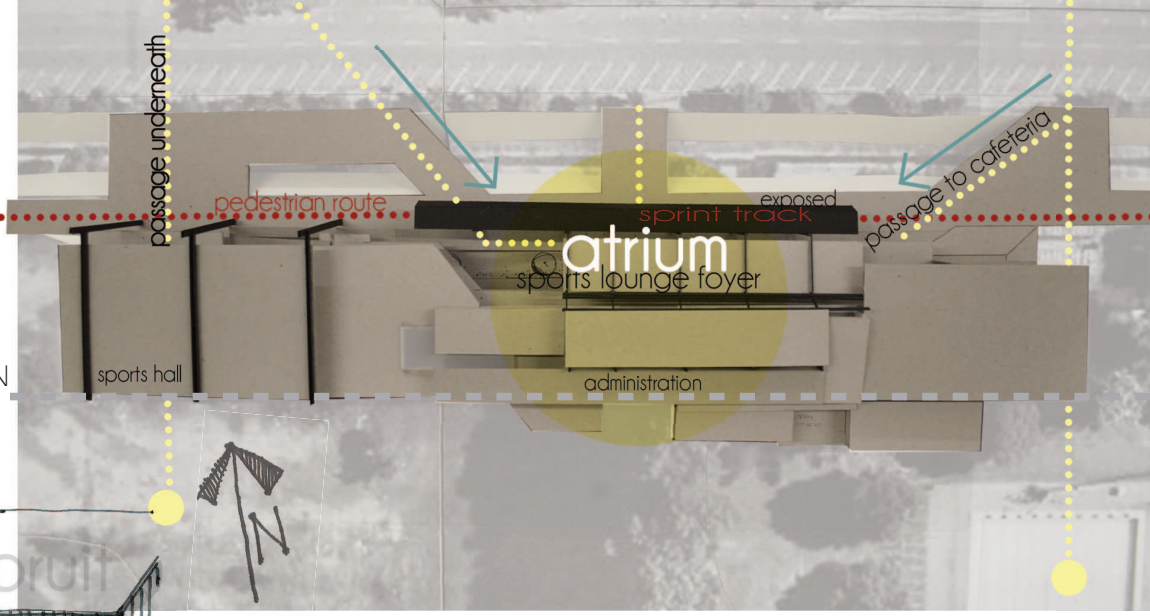
The previous proposal did not yet allow participation of the public accept for the incorporated walkway underneath the sprint track and the elevated sports hall to provide space for a public basketball court. This initiated the design towards creating a definite space for participation. This space can become the integration space of athletes and urban participants where both can meet in dialogue. This space became the entrance foyer which indicates access and invites the passerby into an intermediate space before he enters the building. A transitional space is proposed through the use of an open atrium. Covered, the open space allows for multiple participants to meet, either within the cafeteria, sports lounge, or even the outdoor (but covered) basketball court.



NORTHERN FACADE



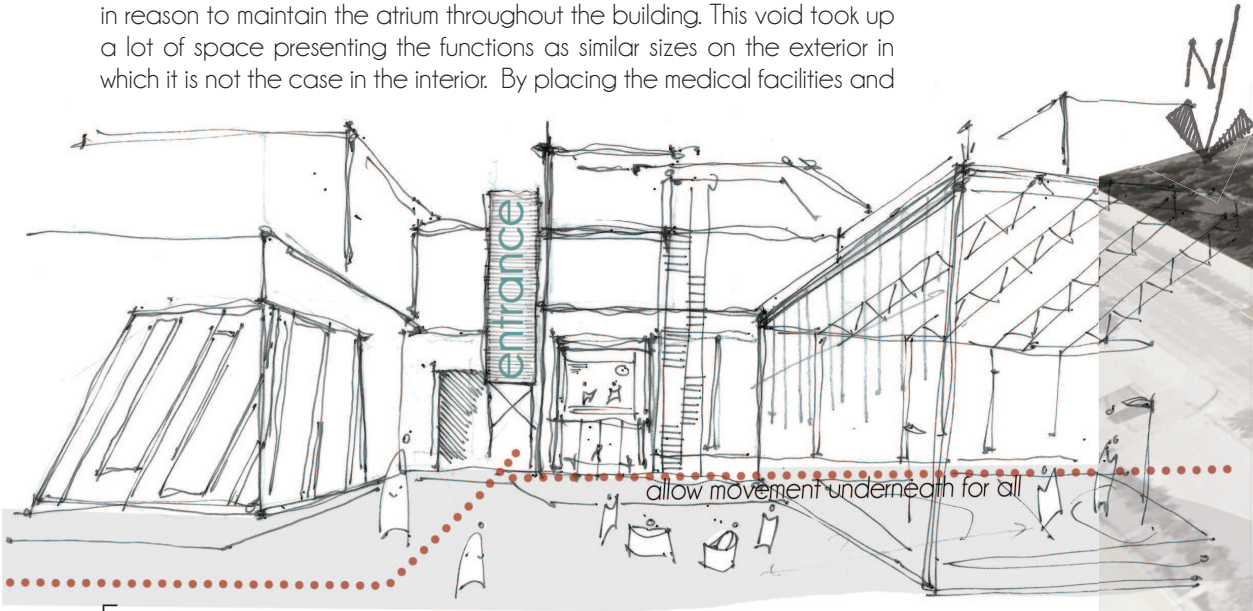


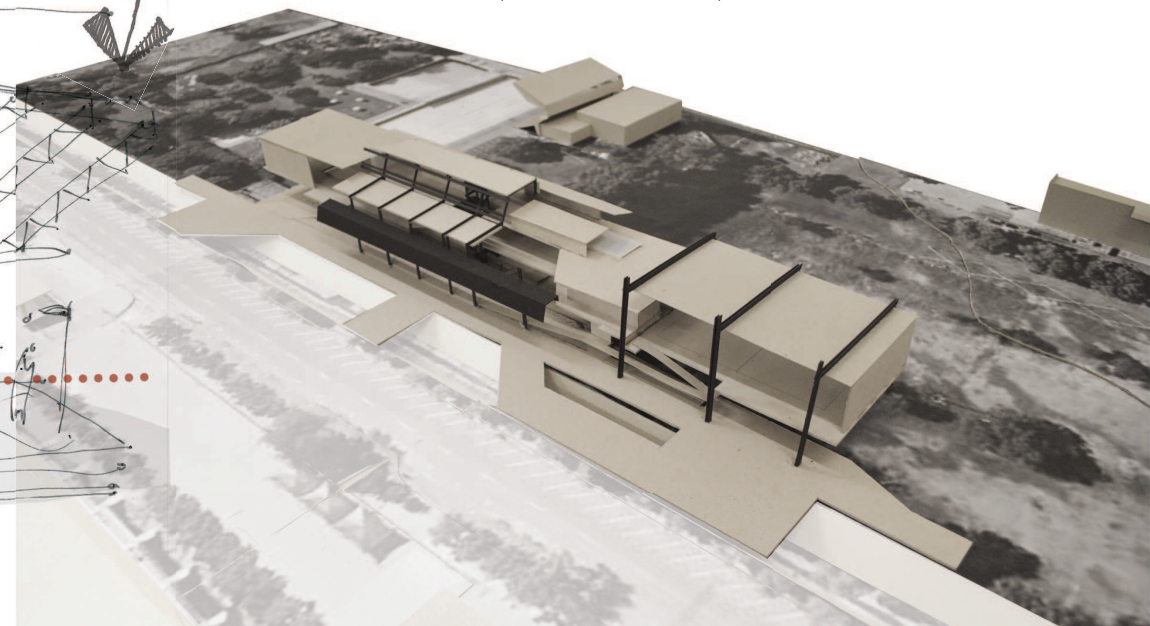


Proposed section

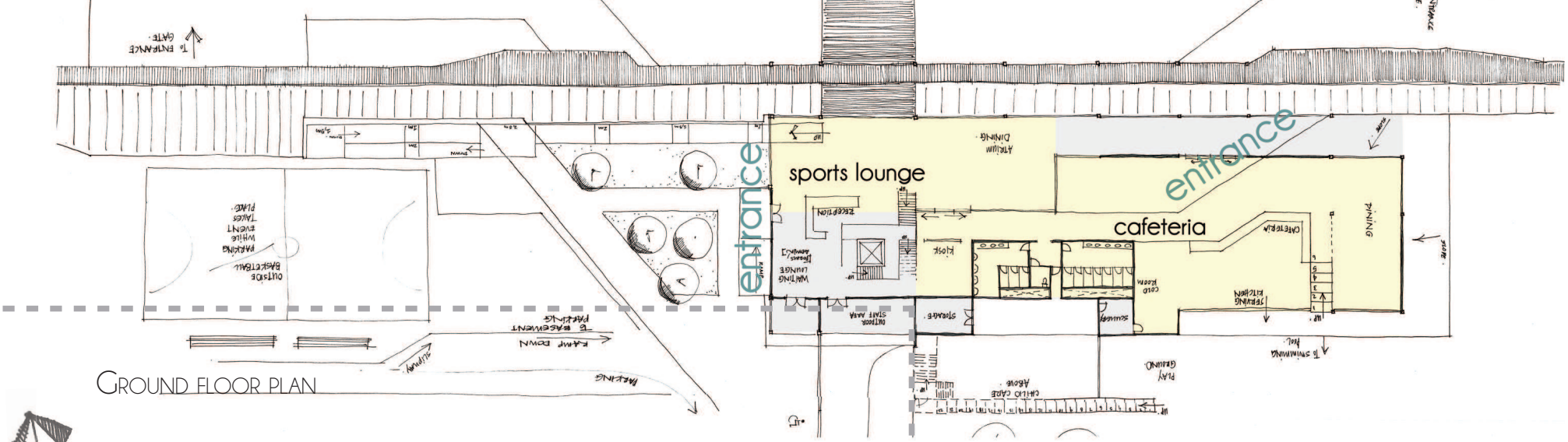
With centralised entrance and circulation, the atrium allowed every level to be seen from within the atrium, exposing the events to those who want to participate within the building. The sprint track remained in the front facade but did not achieve integration with the main building volume, all in reason to maintain the atrium throughout the building. This void took up a lot of space presenting the functions as similar sizes on the exterior in which it is not the case in the interior. By placing the medical facilities and the multipurpose sports hall on the first floor required not only a lift but also a ramp for alternative circulation. To comply with requirements, this ramp also took up a lot of space with the area beneath it being lost.

Although the participant gained status and exposure due to the atrium, the building did not yet provide the idea of activation, movement, strength and excitement, all notions presented through sport itself.

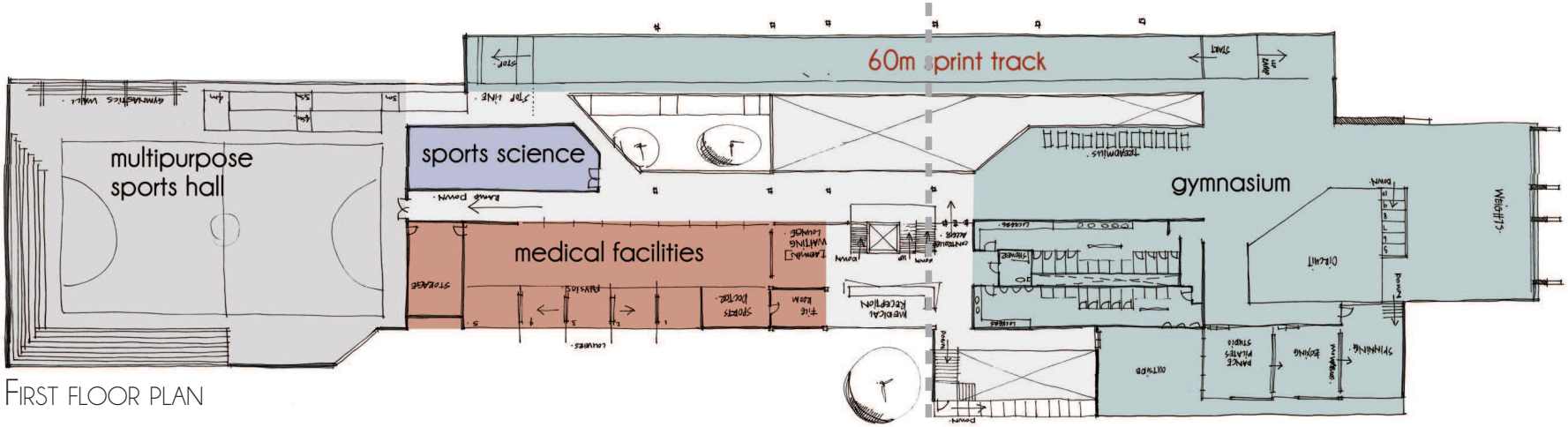




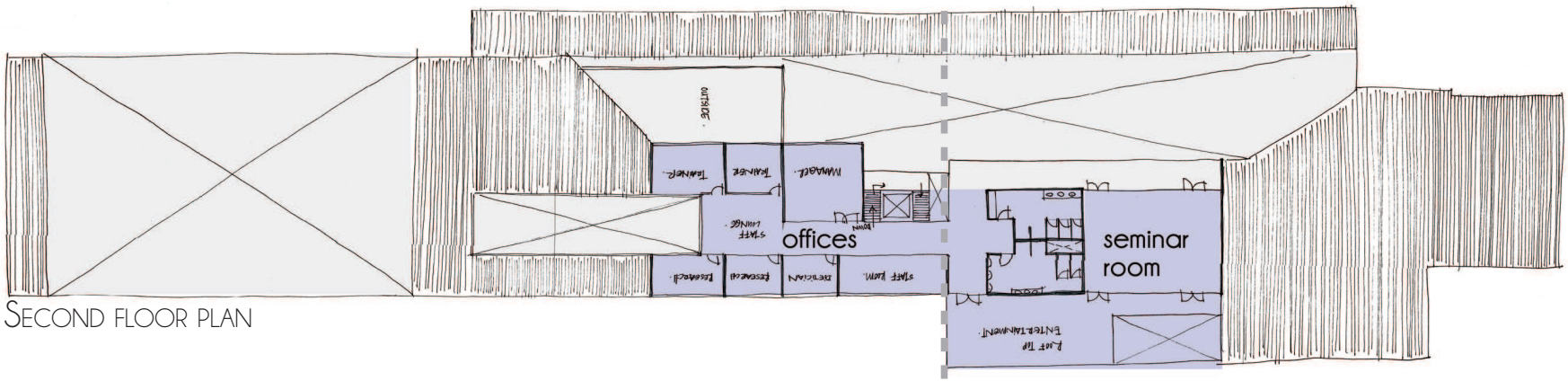
Entrance proposal



GROUND FLOOR PLAN



FIRST FLOOR PLAN

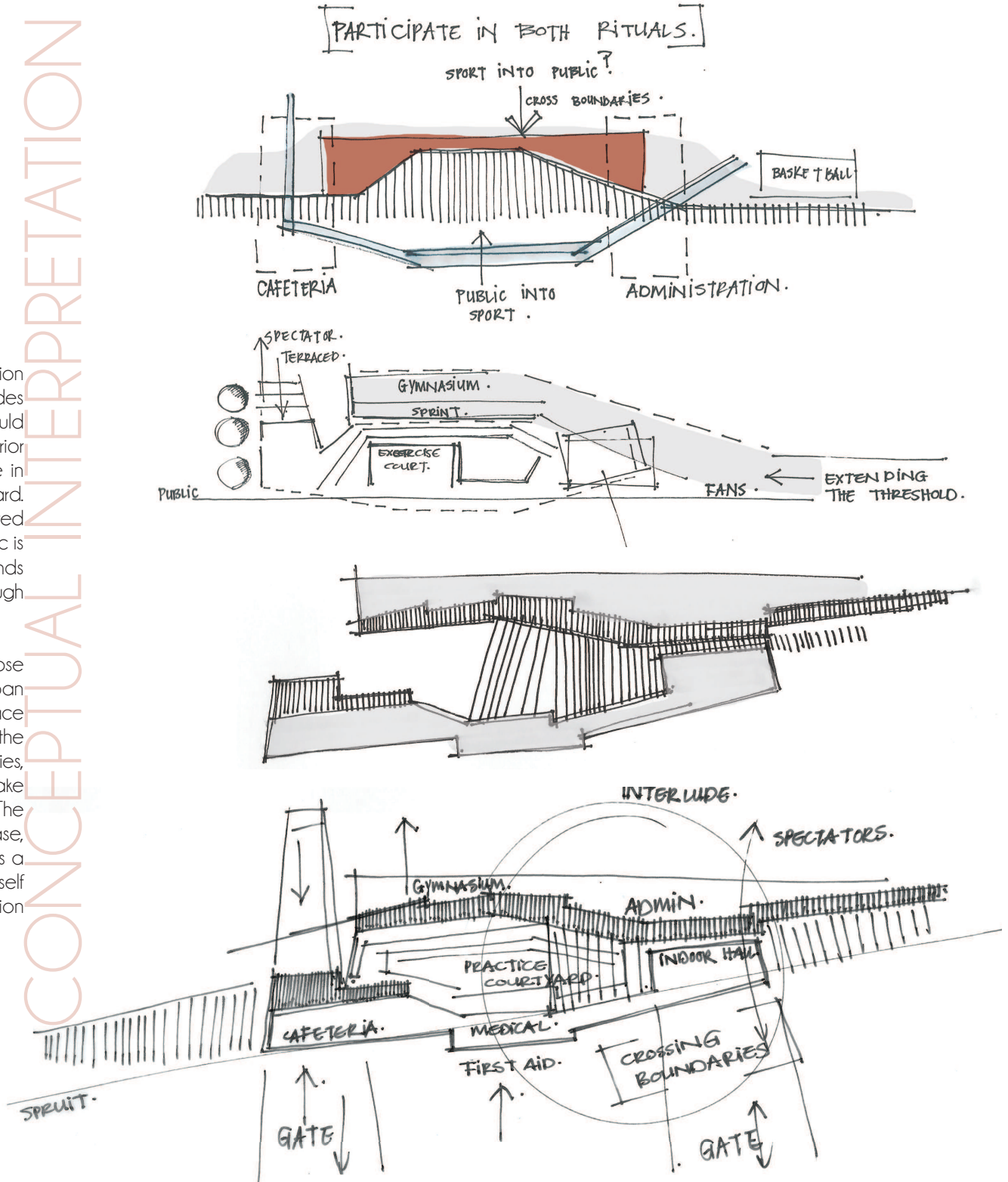


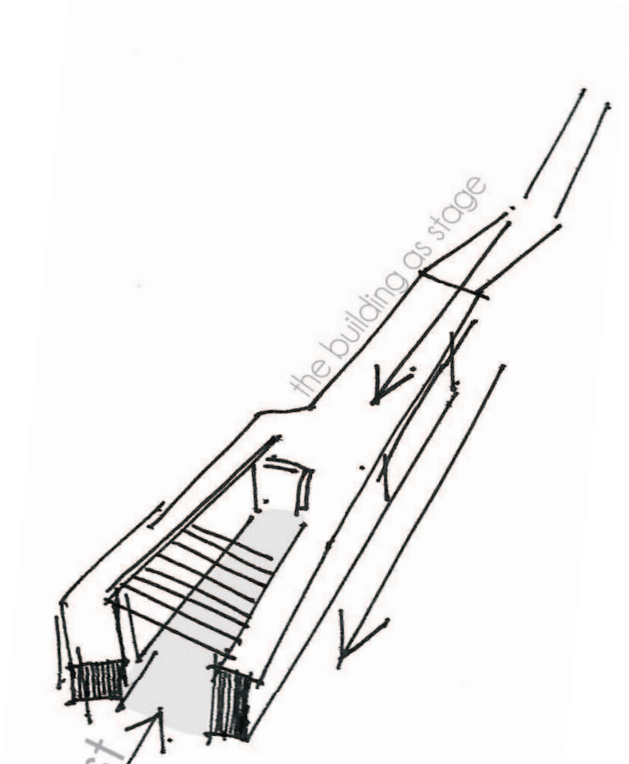
SECOND FLOOR PLAN

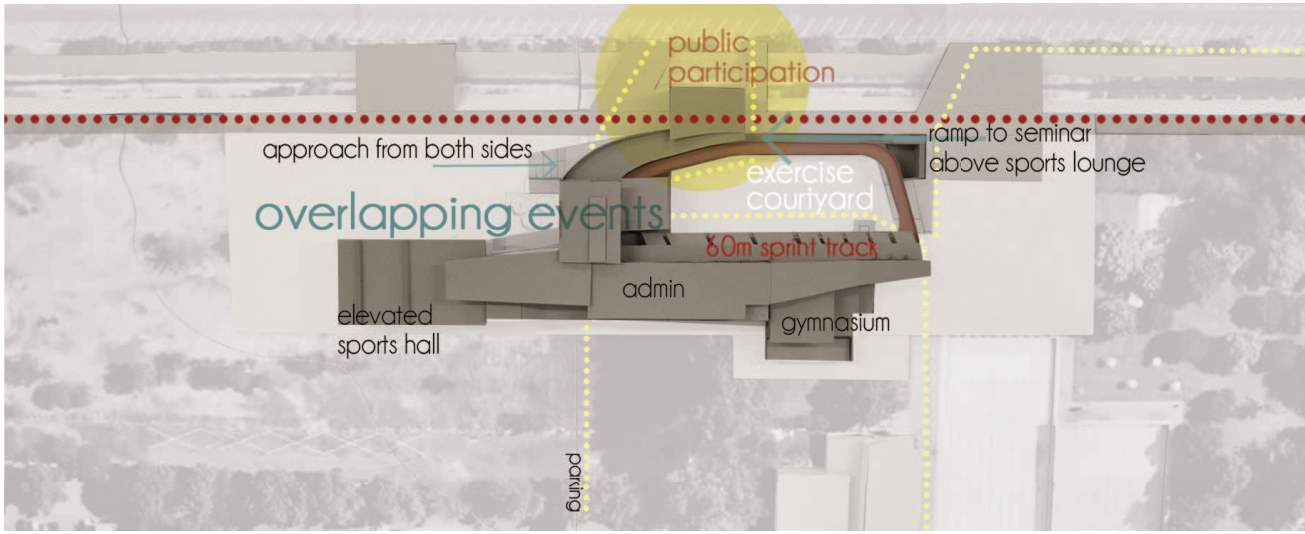
PHASE 7 [DEFINING PLACE FOR PARTICIPATION]

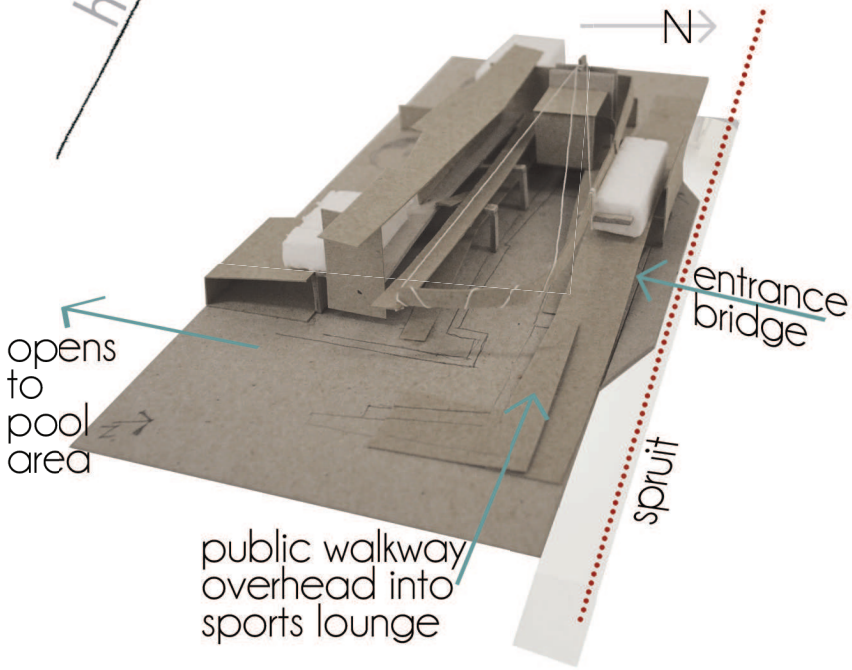
The atrium proposal did not yet present enough choices of participation and the movement would only be visible once the passer-by decides to enter the building. The facades and happenings on the exterior should invite the pedestrian and expose more of the events on the exterior so that no confusion will occur regarding who is allowed to partake in the activities. The atrium progressed into the proposal of a courtyard. Creating an open atrium, surrounded by activities to be actively involved in and surrounded by events. Through the use of a courtyard, the public is allowed to use the space, and due to the fact that the building surrounds a space of nature, maintains the idea of an outdoor event although hosted on the interior.

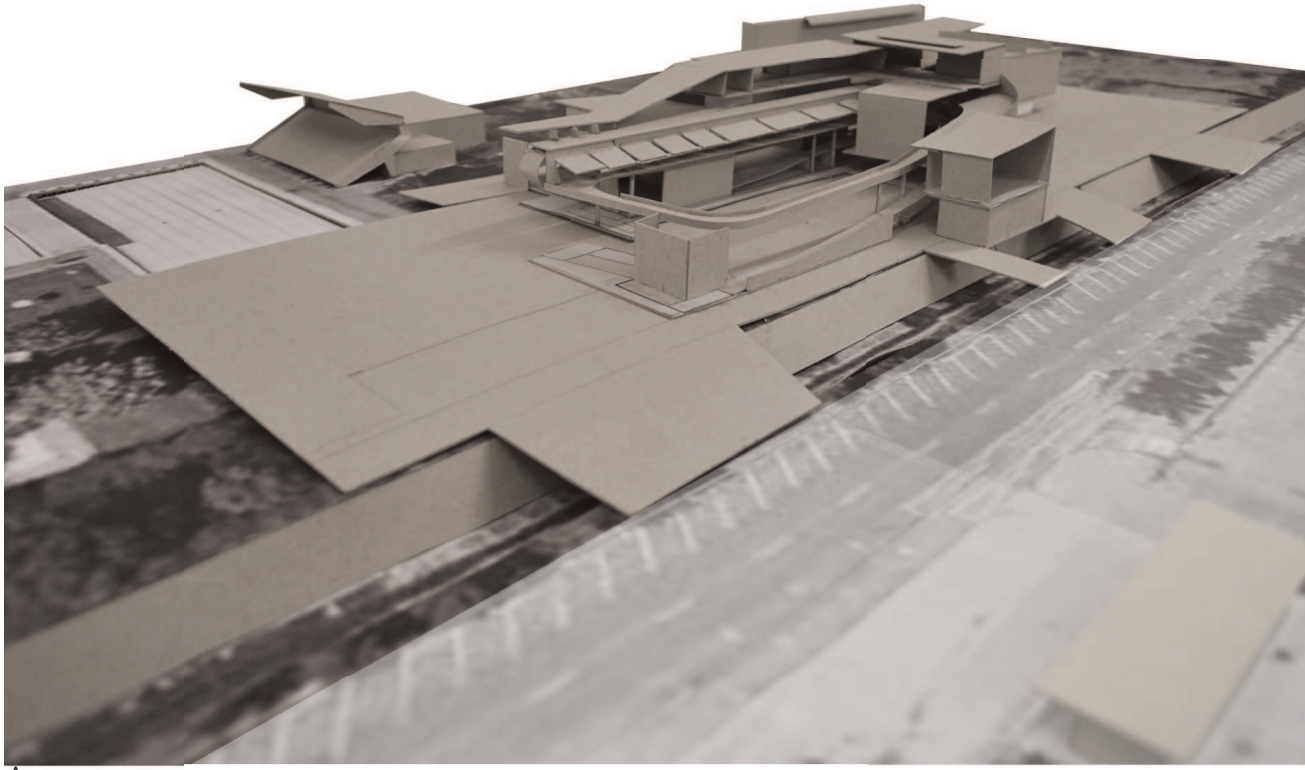
The courtyard presents the stage which becomes contained by those usually on the stage. The performers become involved with the urban spectators' movements and activities within the courtyard. This space will become a public exercise courtyard where anybody can use the permanent equipment installed within the space. The medical facilities, on the ground floor, become more accessible to all and will also make use of all the ramps within the courtyard for rehabilitation purposes. The performer and spectator meet once again. As seen in the previous phase, with the ramp taking up a lot of space, this proposal uses the ramp as a feature for movement. Rather than hiding the ramp and overlapping itself according to minimum requirements, the ramp here invites participation and access to the upper level's seminar room for public use.



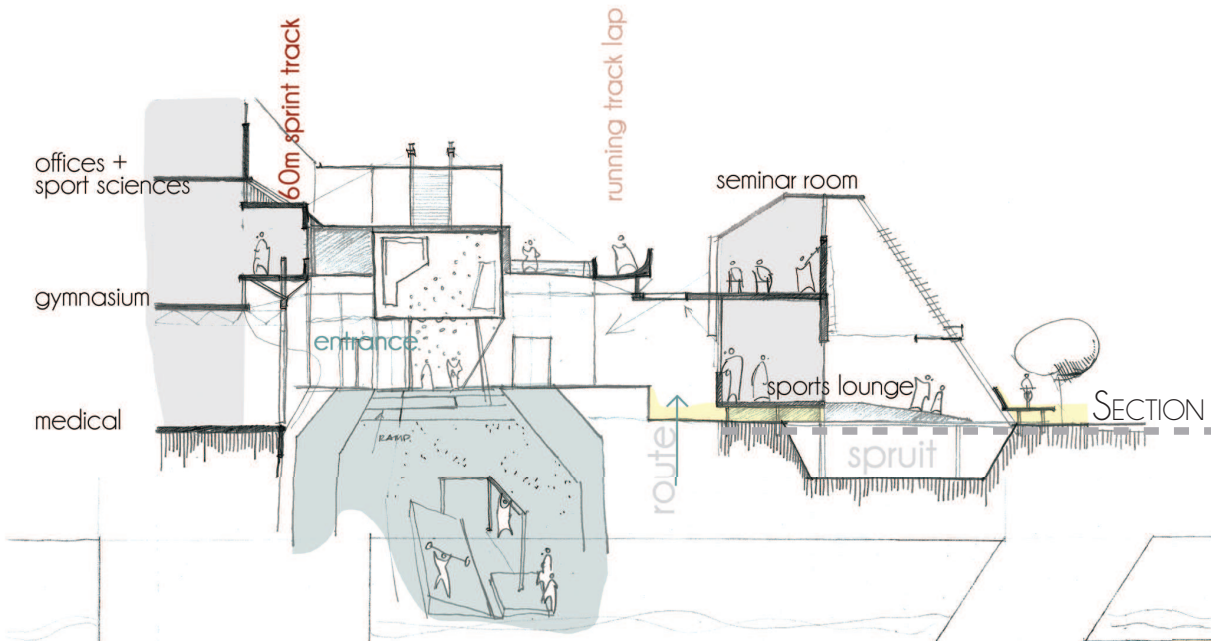

the building as stage
host


public participation
approach from both sides
ramp to seminar above sports lounge
exercise courtyard
overlapping events
60m sprint track
admin
elevated sports hall
gymnasium
parking

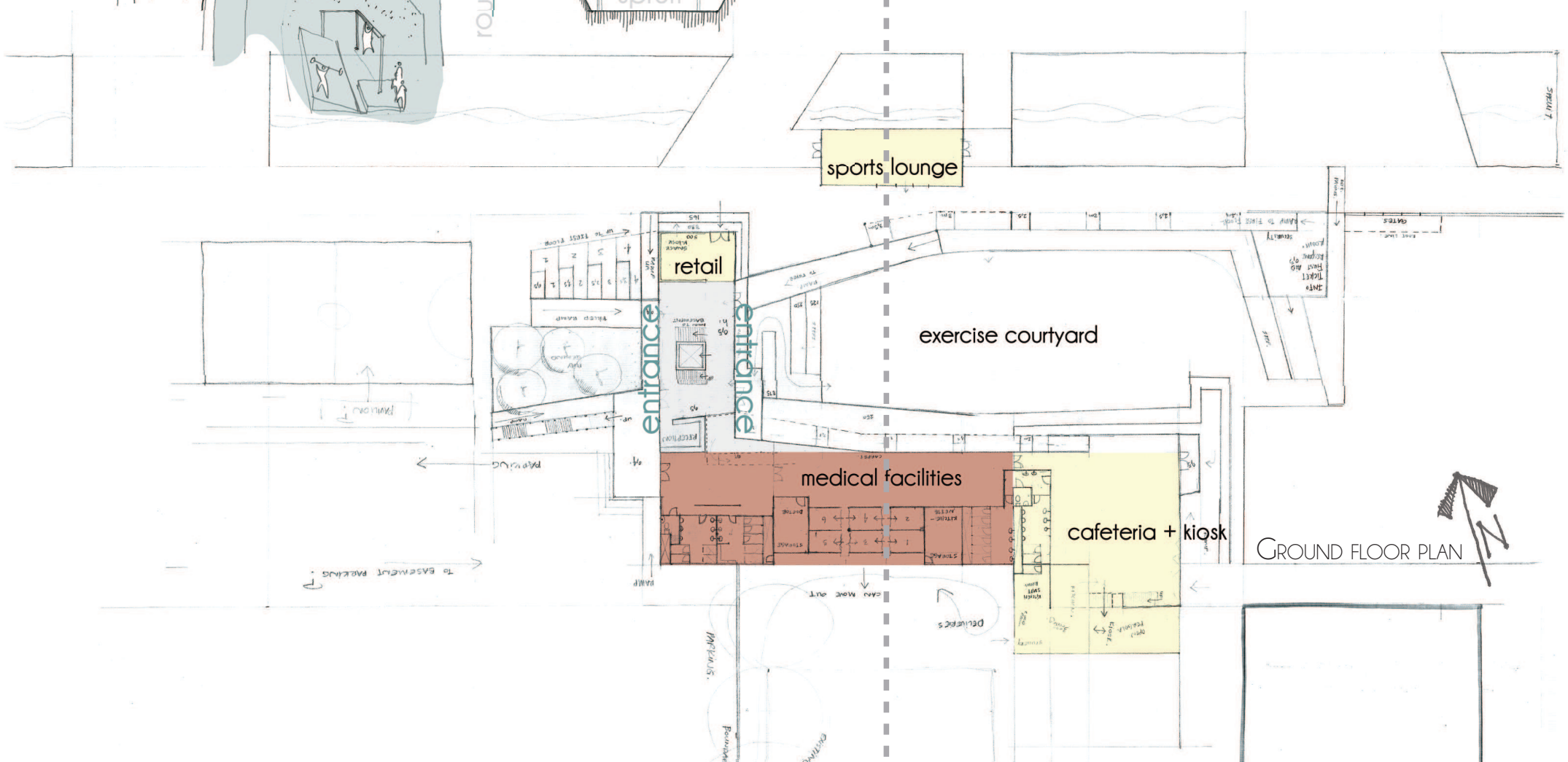

N
entrance bridge
opens to pool area
public walkway overhead into sports lounge
spruit



With a centralised entrance, the building is still accessible from both sides of the walkway to allow easy participation or circulation past the building. It becomes the barrier between the public and the municipal swimming pool facilities which requires membership or daily usage fees. The northern extension of the oval initiates a connection with the *spruit* by sitting on the edge; it also becomes the bridge across. This close relation to the *spruit* might not be the best interaction due to sanitary conditions.

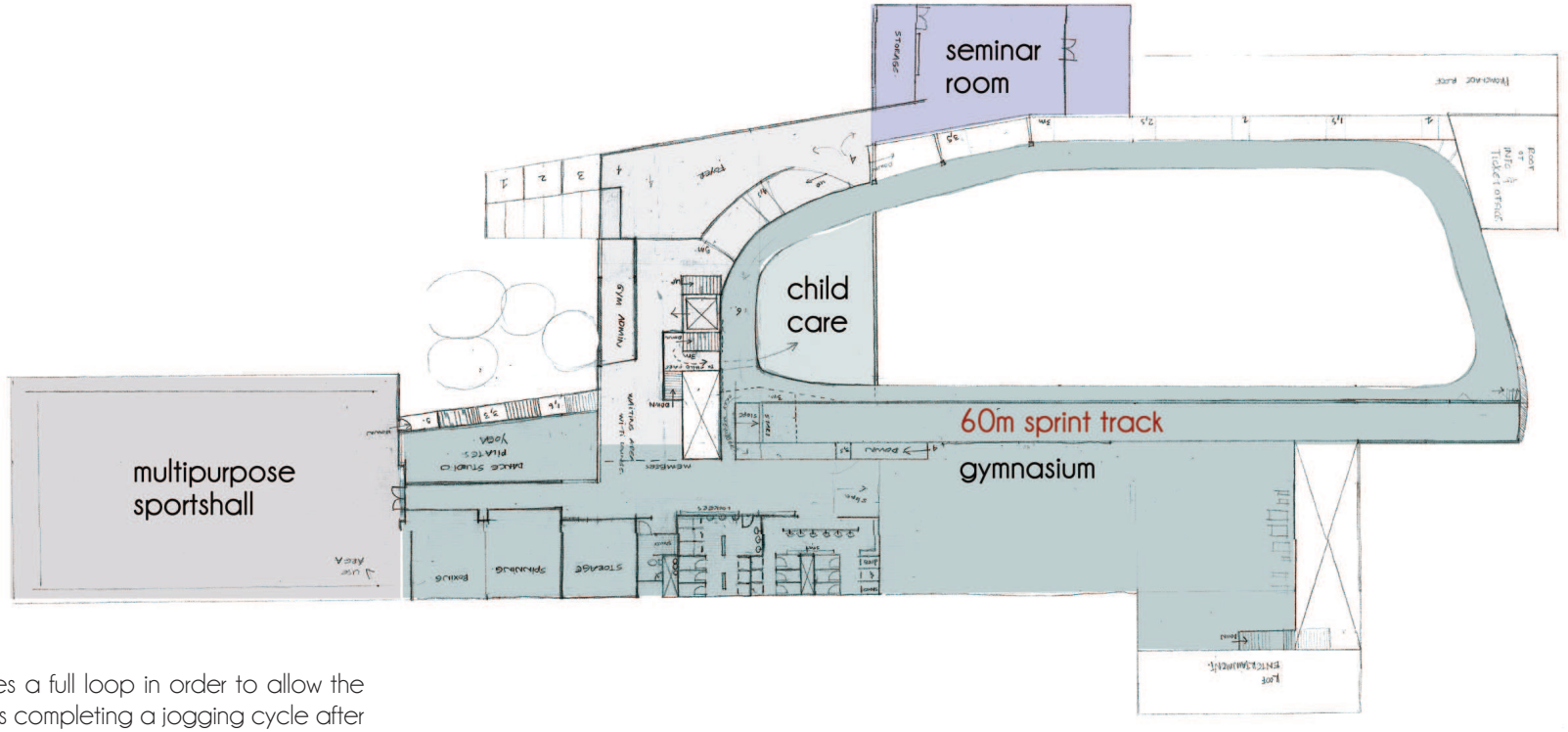


SECTION



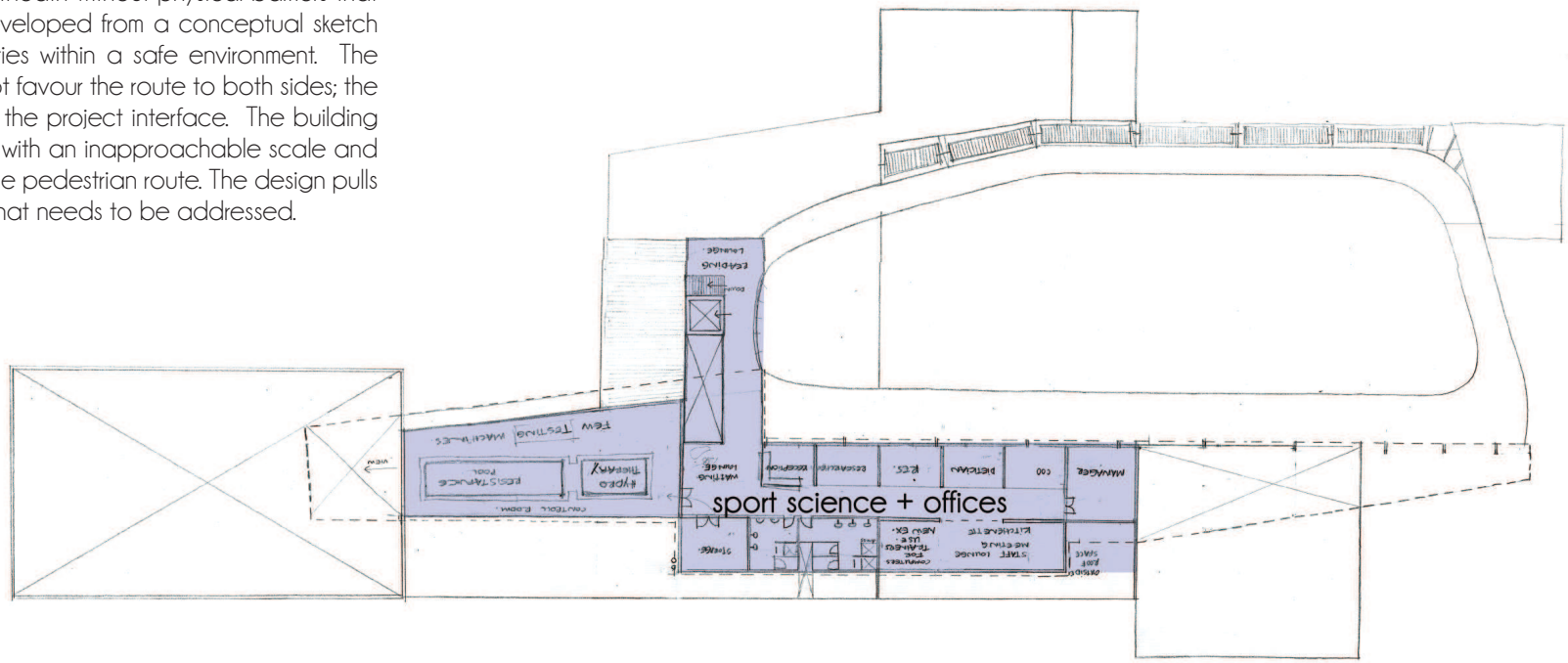
GROUND FLOOR PLAN

First floor plan



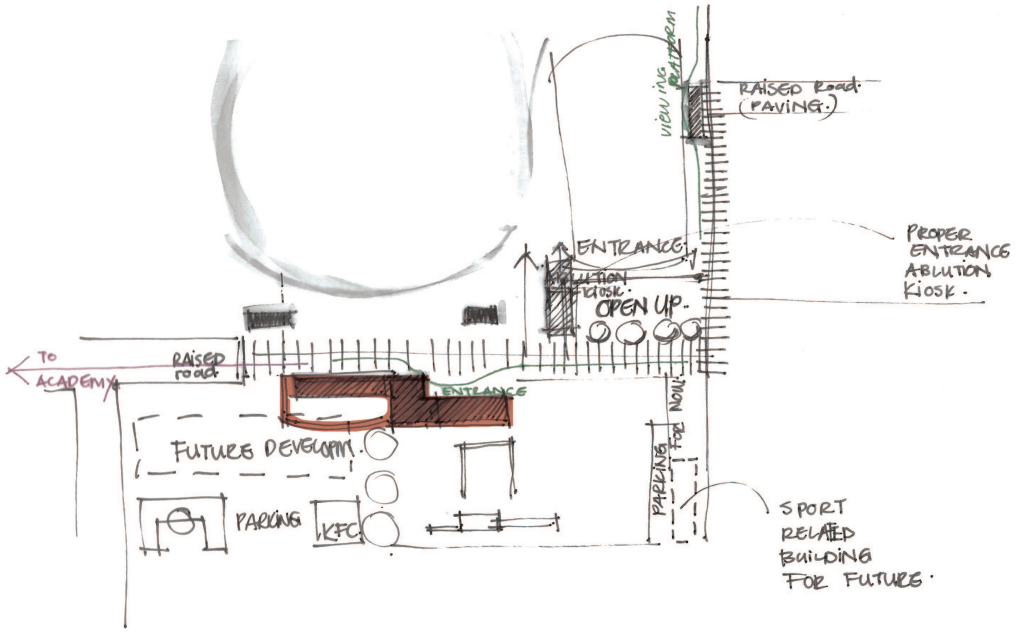
On the first floor, the sprint track creates a full loop in order to allow the athletes to run a warm up lap as well as completing a jogging cycle after the straight sprint. This continuation of the track indicates the outer line of the courtyard creating a place underneath without physical barriers that prohibit participation. The design developed from a conceptual sketch and understanding of hosting activities within a safe environment. The courtyard opening to the east did not favour the route to both sides; the route which should be the initiator of the project interface. The building only opens to the urban environment with an inapproachable scale and high elevated sports hall away from the pedestrian route. The design pulls away from the edge and boundary that needs to be addressed.

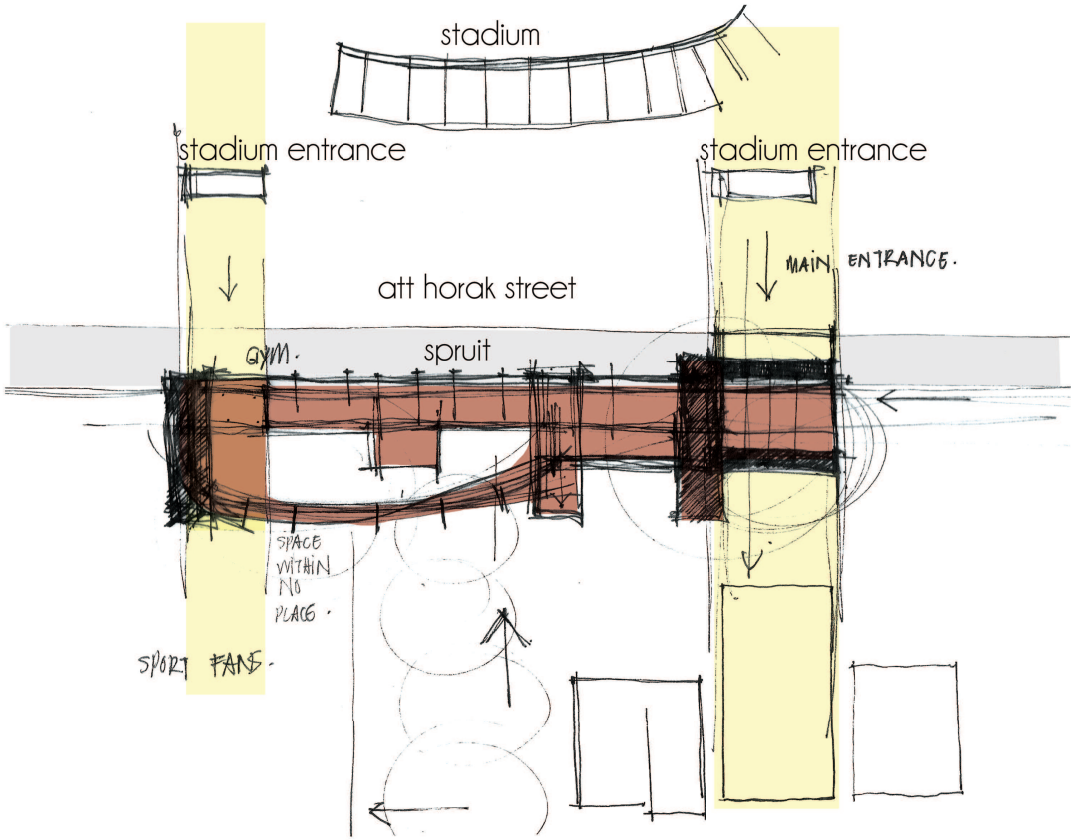
Second floor plan

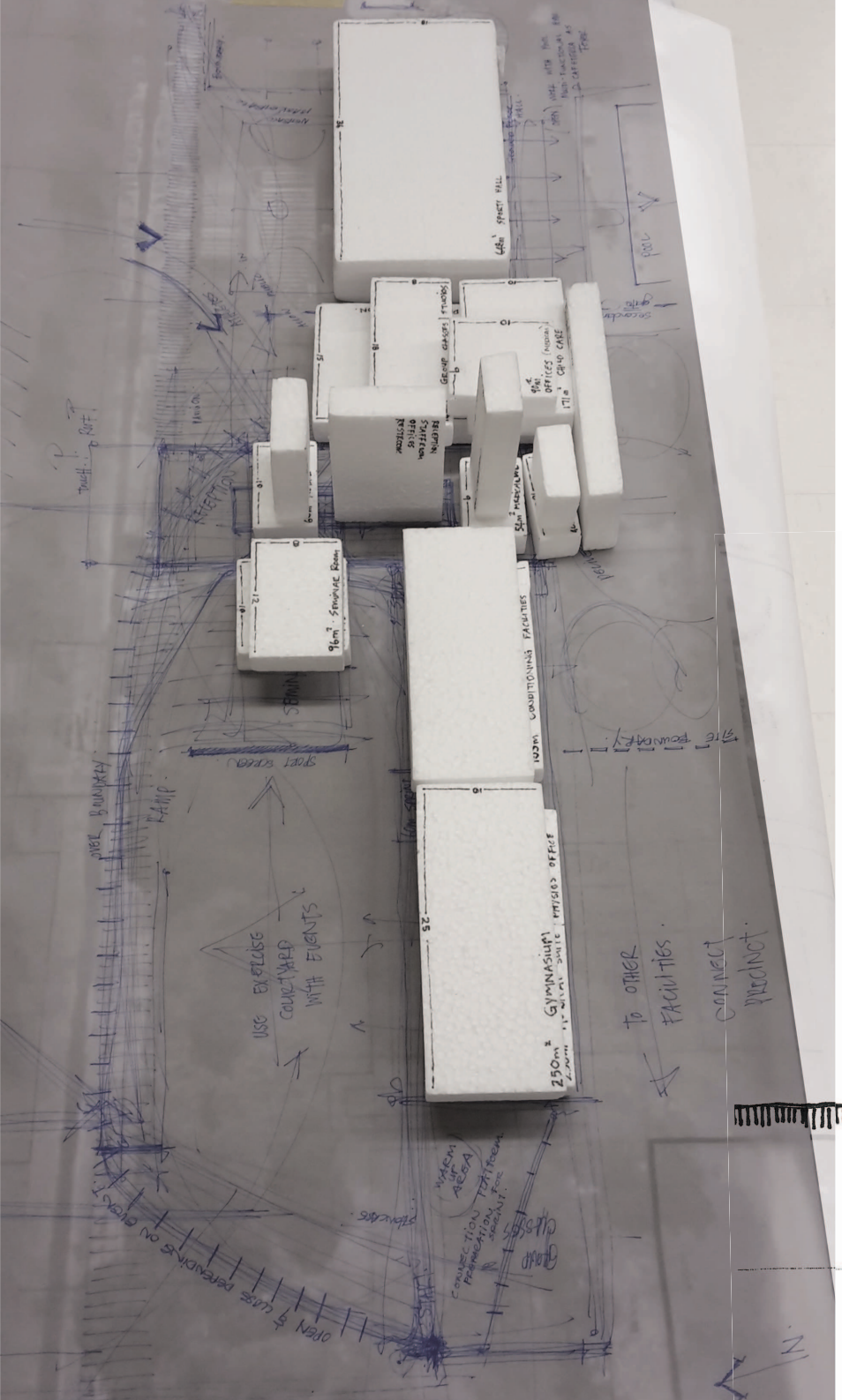


PHASE 8 [RE-ADJUSTING]

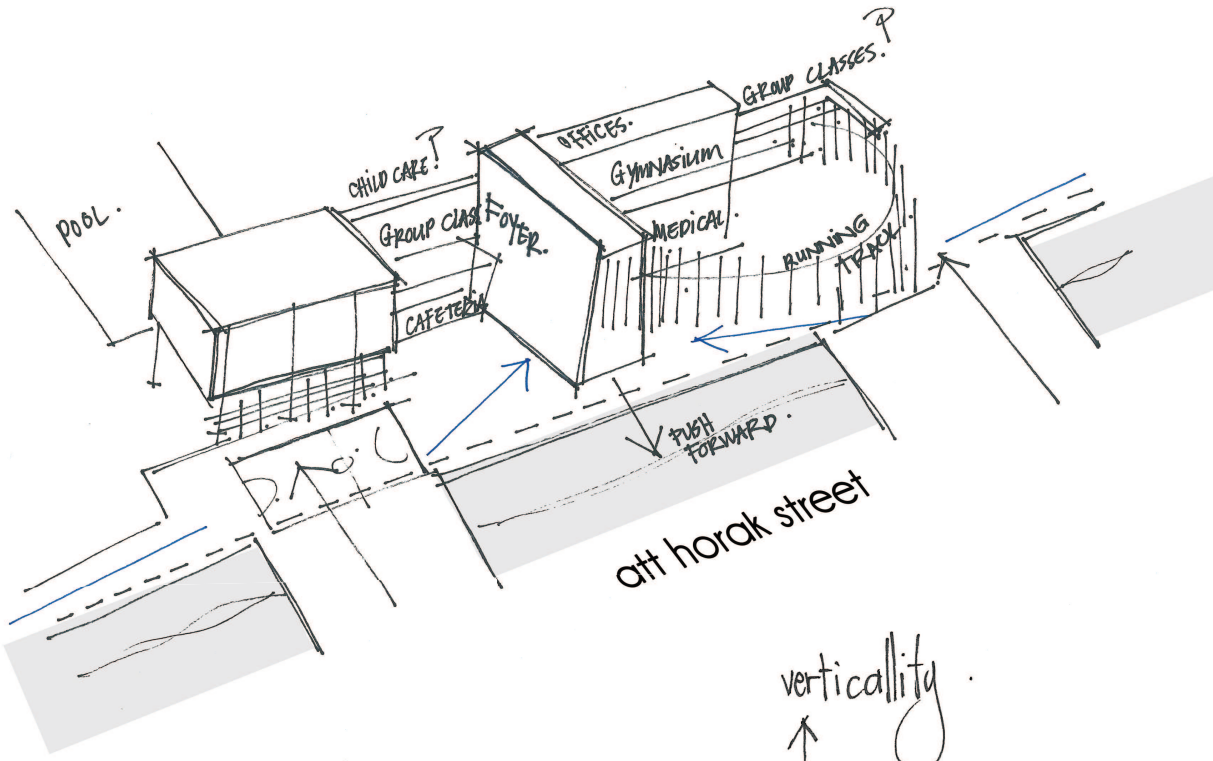
The sprint track as circular element became the main feature of attraction in which the decision of placement will be crucial. All the options were advised in which the North-eastern placement would provide the best qualities. Not that the sprint track needs sun light, but the courtyard hosted by the elevated sprint track requires optimal temperatures. The building needed to engage in the edge of the *spruit* once again, but with the sprint track not leaning over the *spruit*, for structural and health reasons.



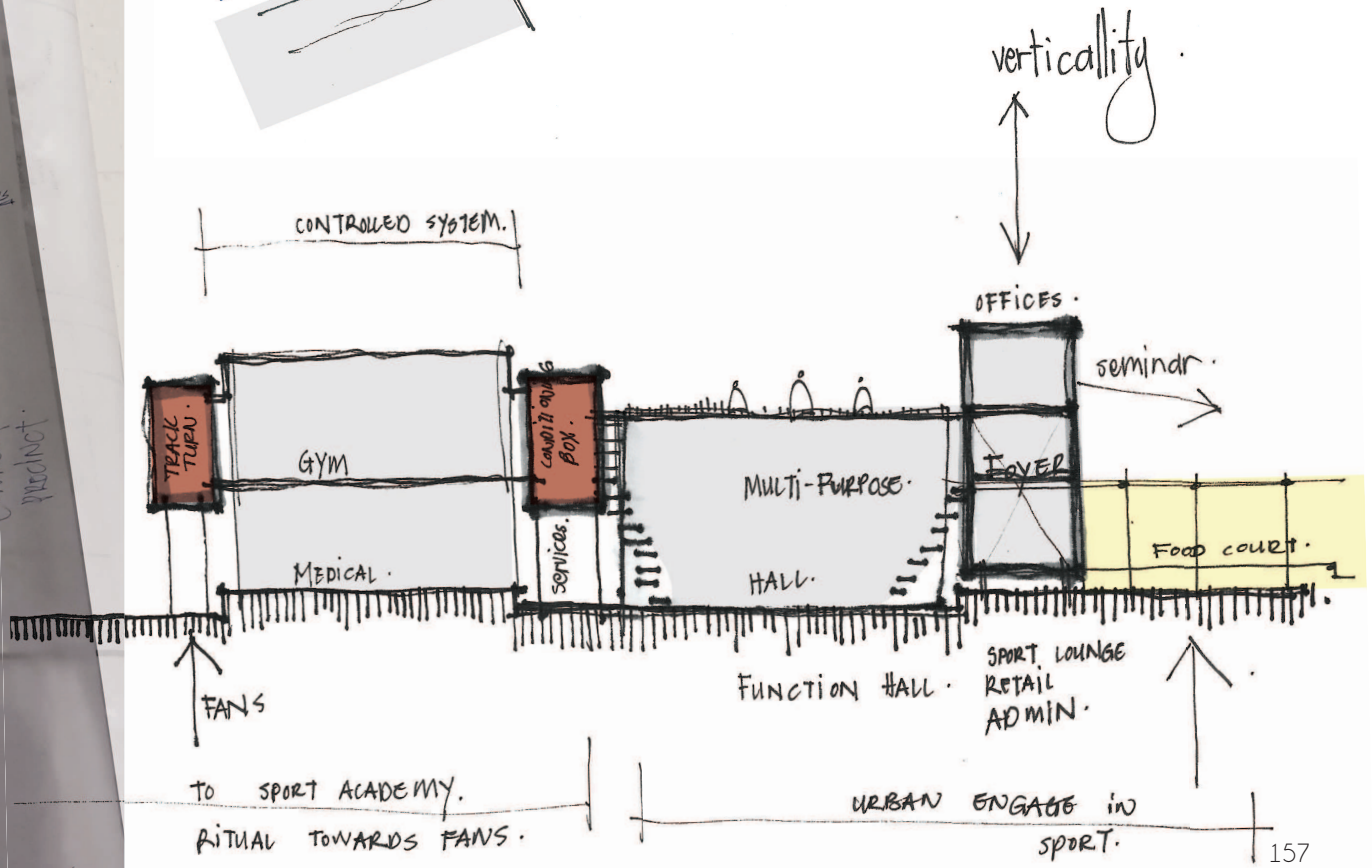




USE EXERCISE COURTYARD WITH EVENTS
TO OTHER FACILITIES
CONNECT PRECINCT



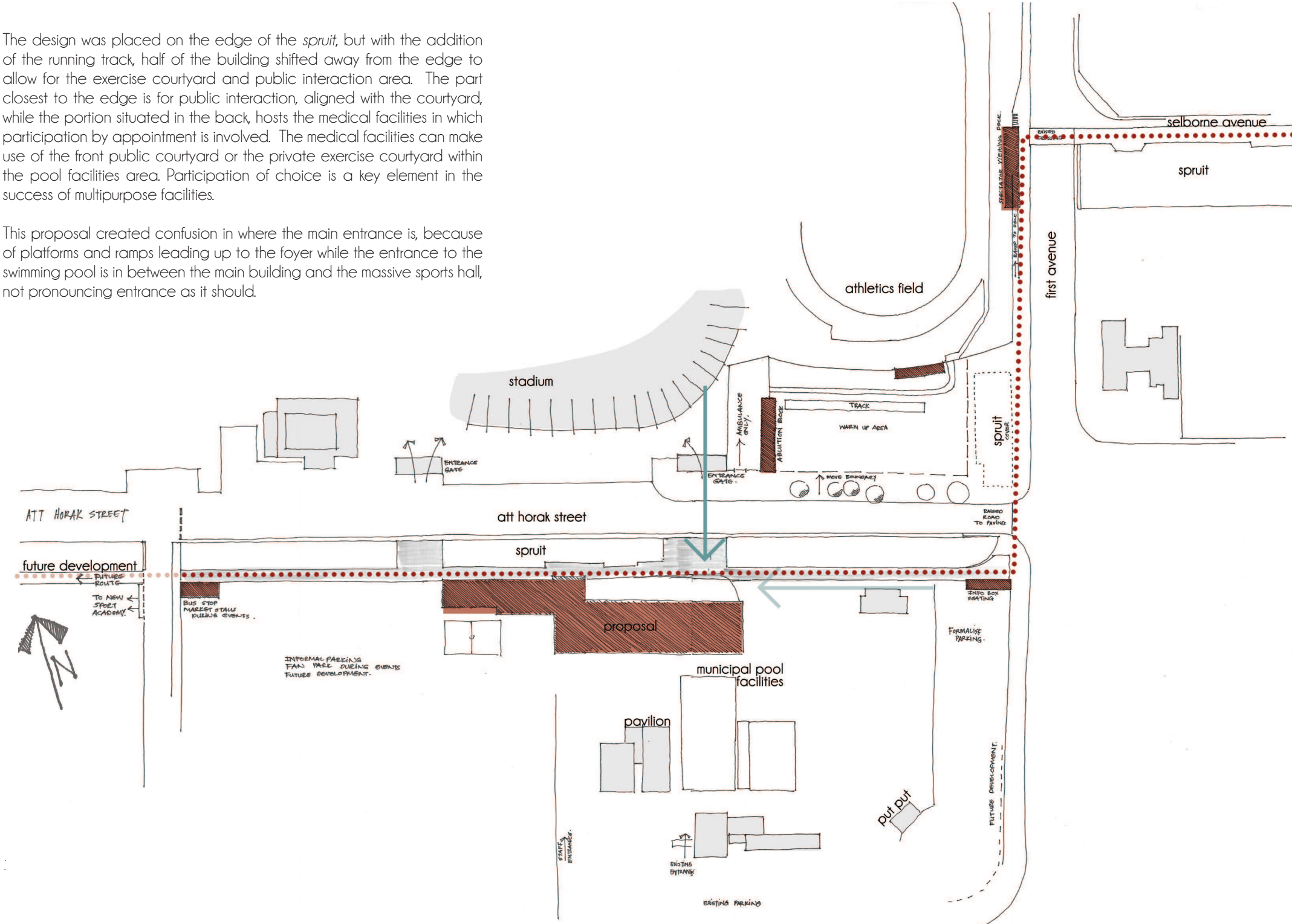
POOL.
CHILD CARE?
GROUP CLASS
FOYER.
CAFETERIA
OFFICES.
GYMNASIUM
MEDICAL.
GROUP CLASSES.?
RUNNING TRACK.
PUSH FORWARD.
att horak street

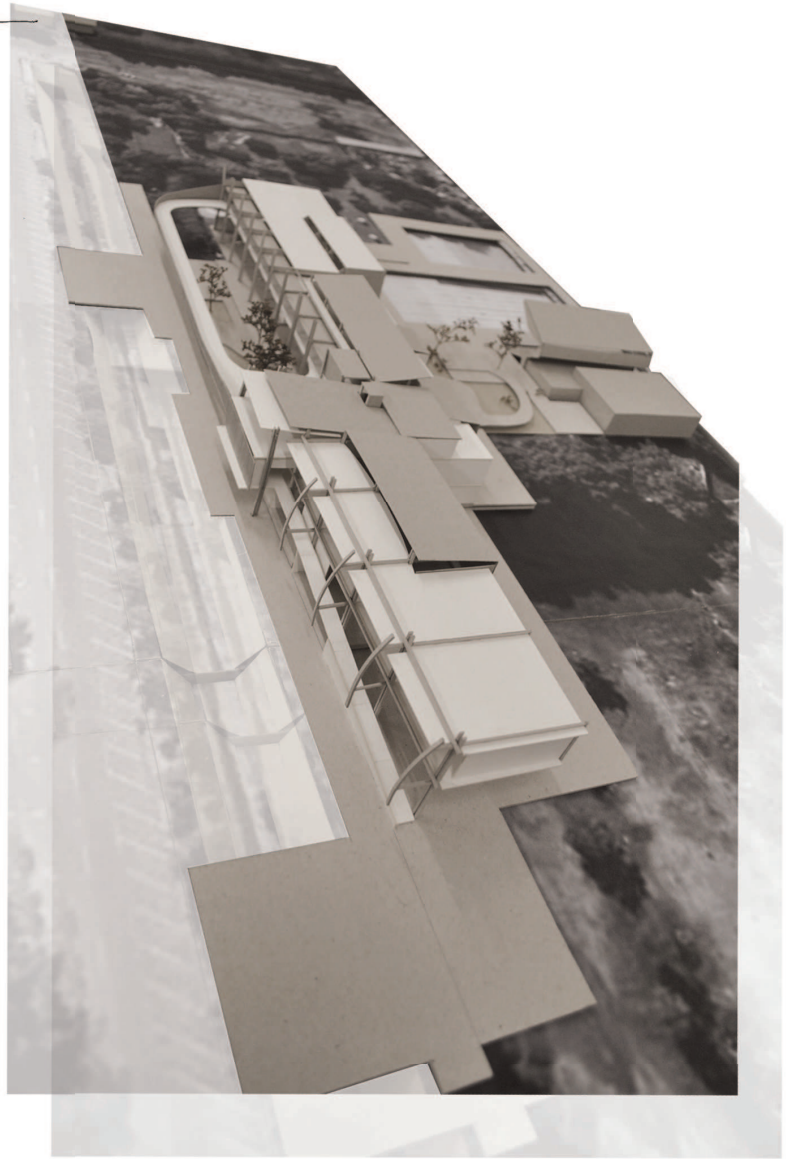


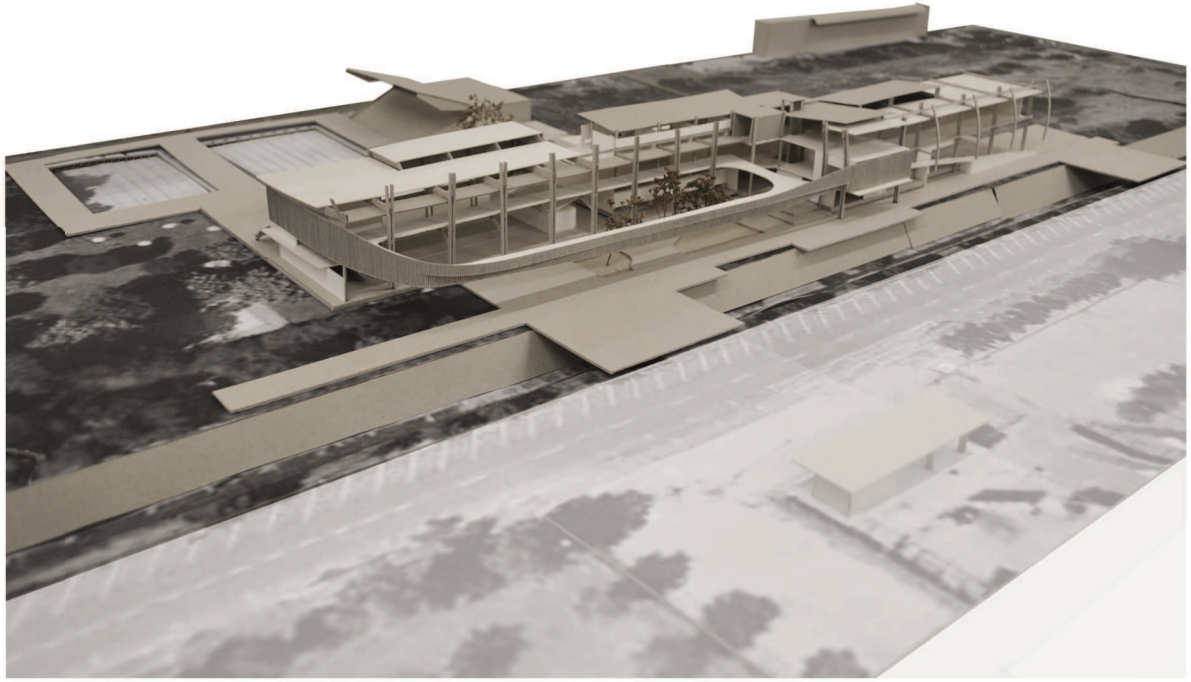
verticallity.
CONTROLLED SYSTEM.
OFFICES.
seminar.
TRACK TURN.
GYM
CONDITIONING BOX.
MULTI-PURPOSE.
FOYER
MEDICAL.
services.
HALL.
FOOD COURT.
FANS
FUNCTION HALL.
SPORT LOUNGE
RETAIL
ADMIN.
TO SPORT ACADEMY.
RITUAL TOWARDS FANS.
URBAN ENGAGE in SPORT.

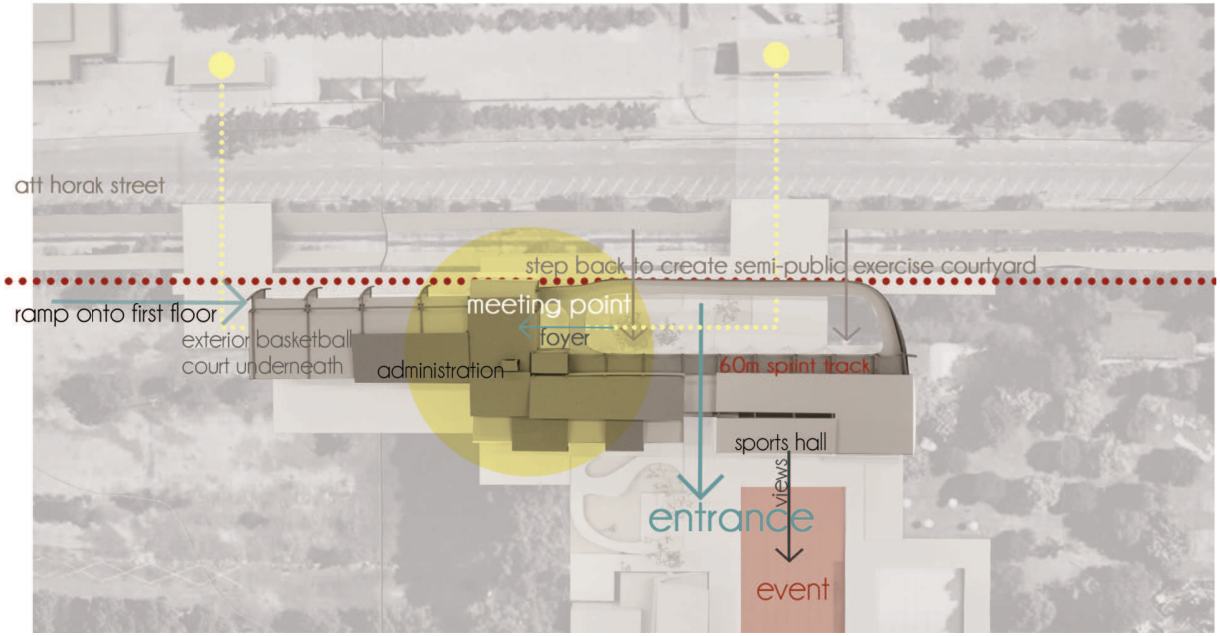
The design was placed on the edge of the *spruit*, but with the addition of the running track, half of the building shifted away from the edge to allow for the exercise courtyard and public interaction area. The part closest to the edge is for public interaction, aligned with the courtyard, while the portion situated in the back, hosts the medical facilities in which participation by appointment is involved. The medical facilities can make use of the front public courtyard or the private exercise courtyard within the pool facilities area. Participation of choice is a key element in the success of multipurpose facilities.

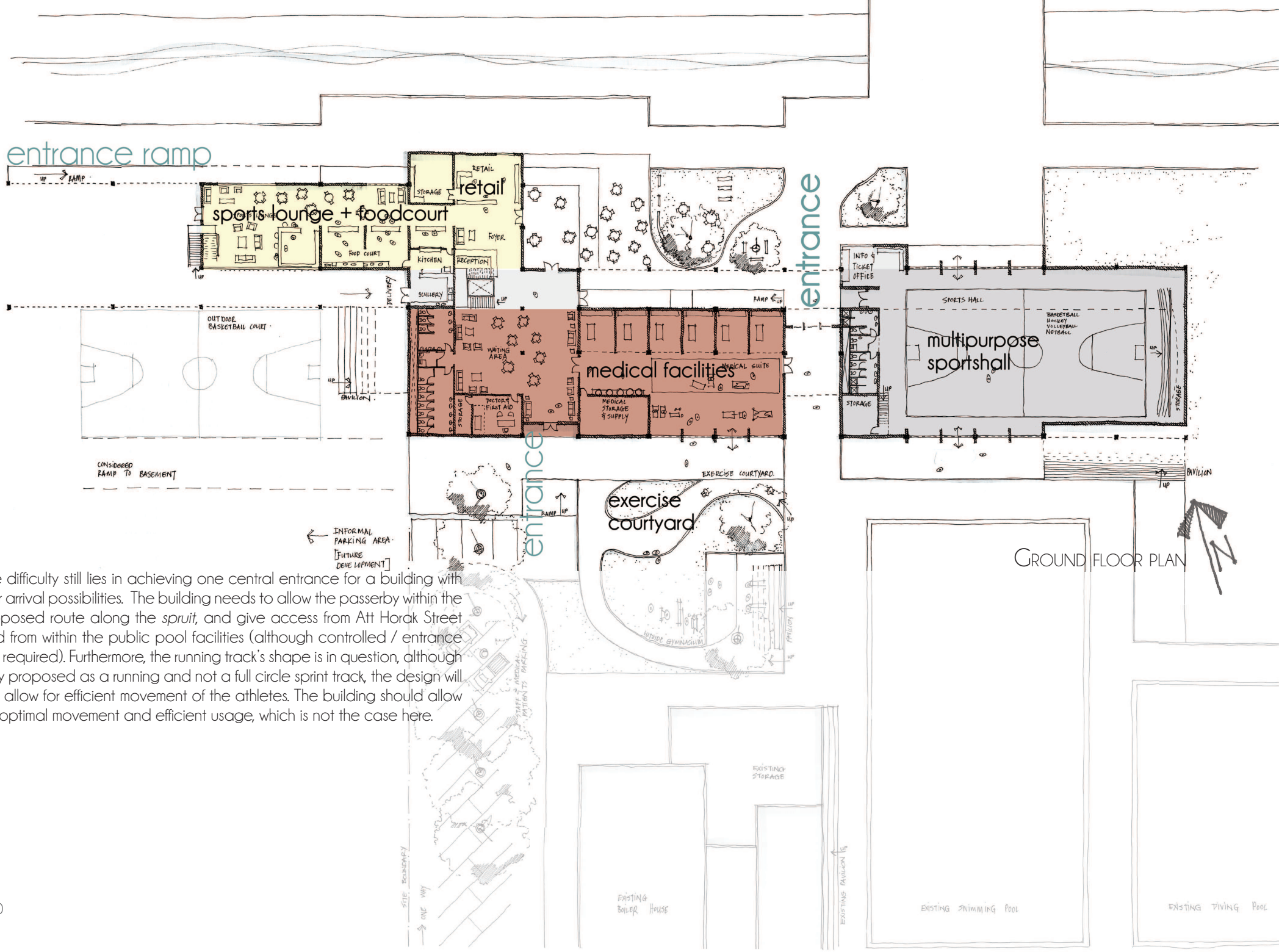
This proposal created confusion in where the main entrance is, because of platforms and ramps leading up to the foyer while the entrance to the swimming pool is in between the main building and the massive sports hall, not pronouncing entrance as it should.



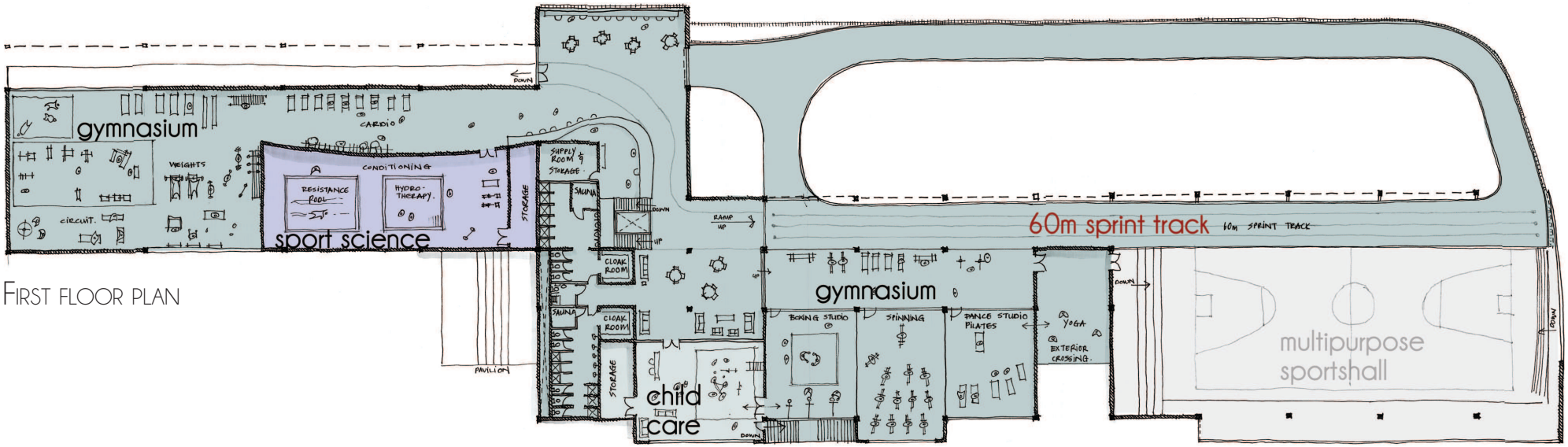




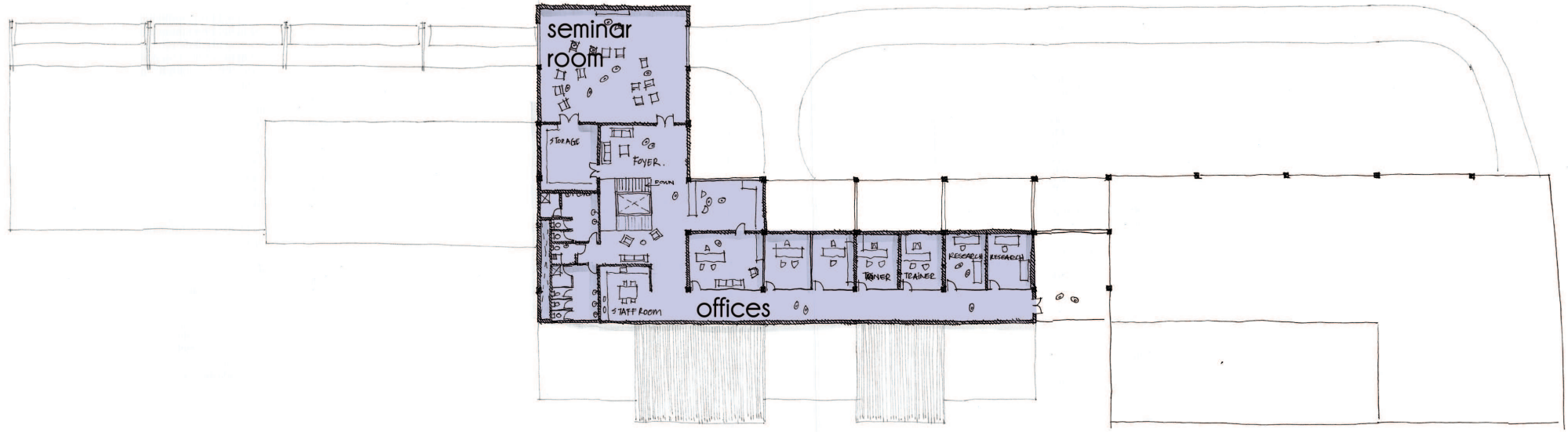

att horak street
step back to create semi-public exercise courtyard
ramp onto first floor
exterior basketball court underneath
meeting point
foyer
administration
60m splint track
sports hall
views
entrance
event



The difficulty still lies in achieving one central entrance for a building with four arrival possibilities. The building needs to allow the passerby within the proposed route along the *spruit*, and give access from Att Horak Street and from within the public pool facilities (although controlled / entrance fee required). Furthermore, the running track's shape is in question, although only proposed as a running and not a full circle sprint track, the design will not allow for efficient movement of the athletes. The building should allow for optimal movement and efficient usage, which is not the case here.



First floor plan



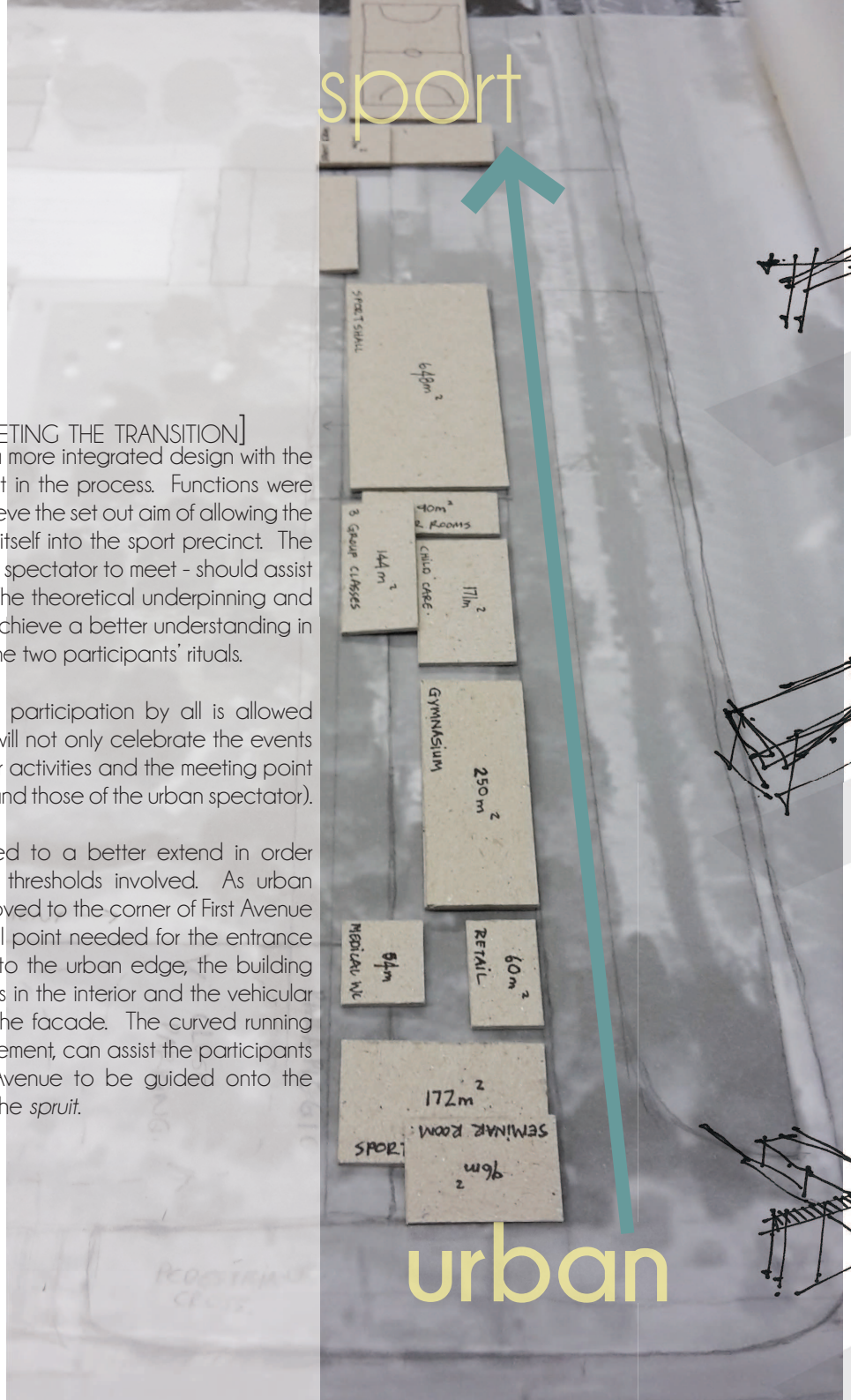
Second floor plan

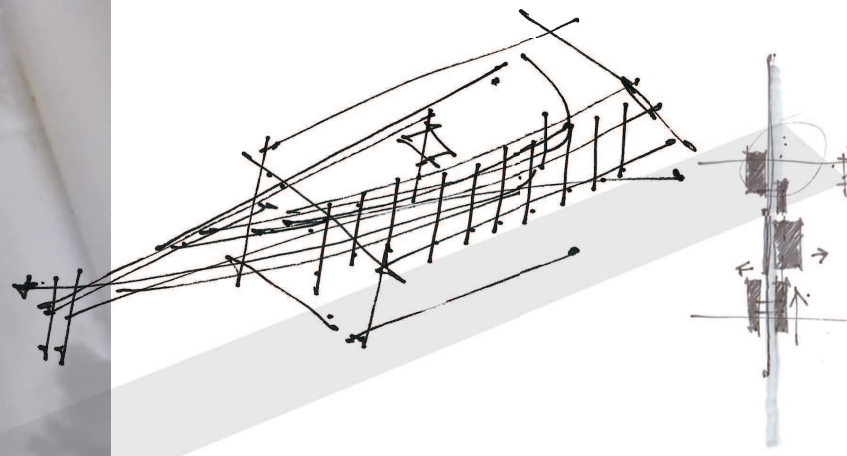
PHASE 9 [RE-INTERPRETING THE TRANSITION]

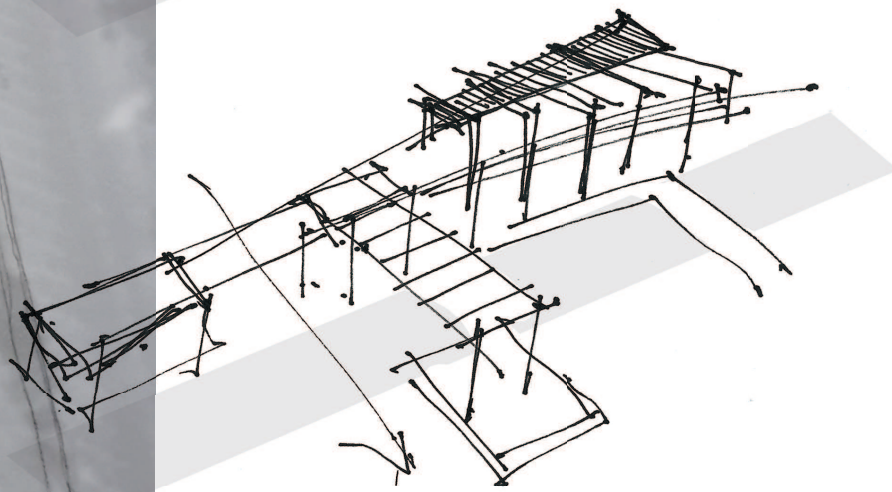
The site was reinterpreted in achieving a more integrated design with the facilities once again, which became lost in the process. Functions were grouped together again in order to achieve the set out aim of allowing the urban environment to gradually present itself into the sport precinct. The objective to allow the performer and the spectator to meet - should assist the layout to accommodate for both. The theoretical underpinning and research done (in part two) helped to achieve a better understanding in achieving this meeting place between the two participants' rituals.

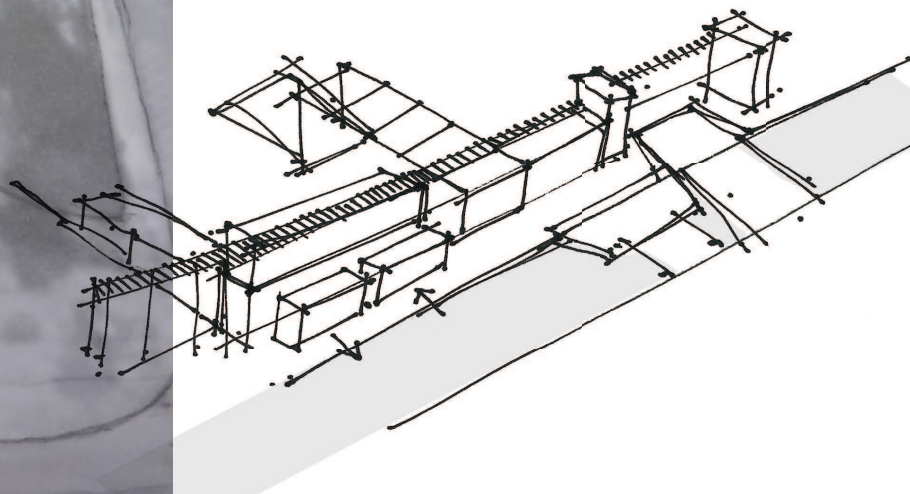
A breathing space is proposed where participation by all is allowed between events. This breathing space will not only celebrate the events that surround it but will provide space for activities and the meeting point of multiple rituals (those of the performer and those of the urban spectator).

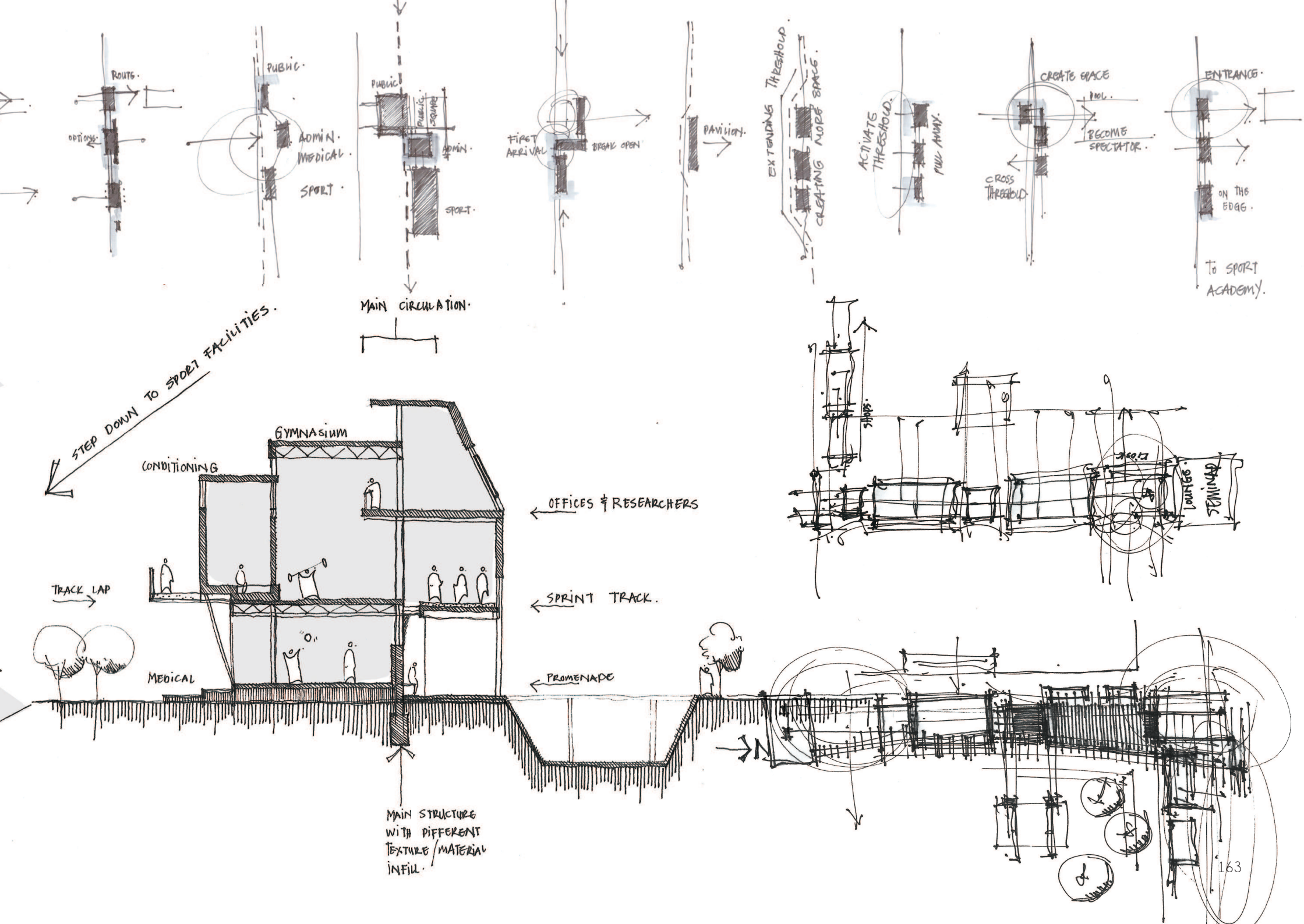
The edge condition is also investigated to a better extend in order to understand the multiple layers and thresholds involved. As urban representative, the building's location moved to the corner of First Avenue and Att Horak Street, initiating the arrival point needed for the entrance of the sport precinct. Introducing sport to the urban edge, the building relies on the movement of its participants in the interior and the vehicular traffic (around the corner) to activate the facade. The curved running track, exposed and elevated as main element, can assist the participants approaching from both sides of First Avenue to be guided onto the pedestrian walkway along the edge of the *spruit*.



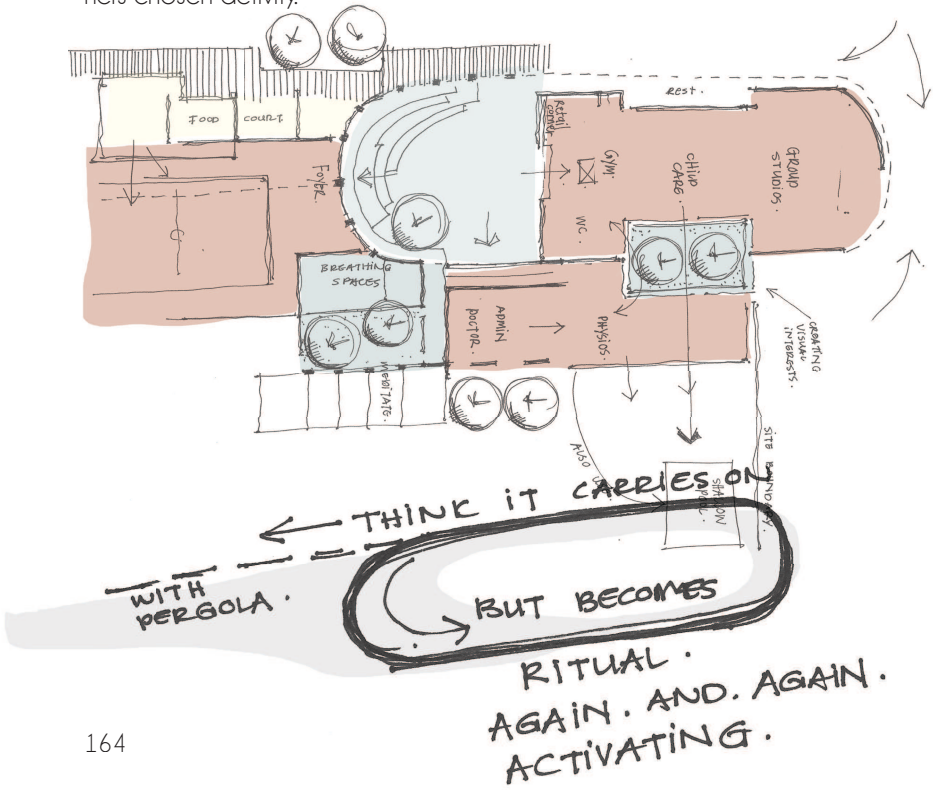


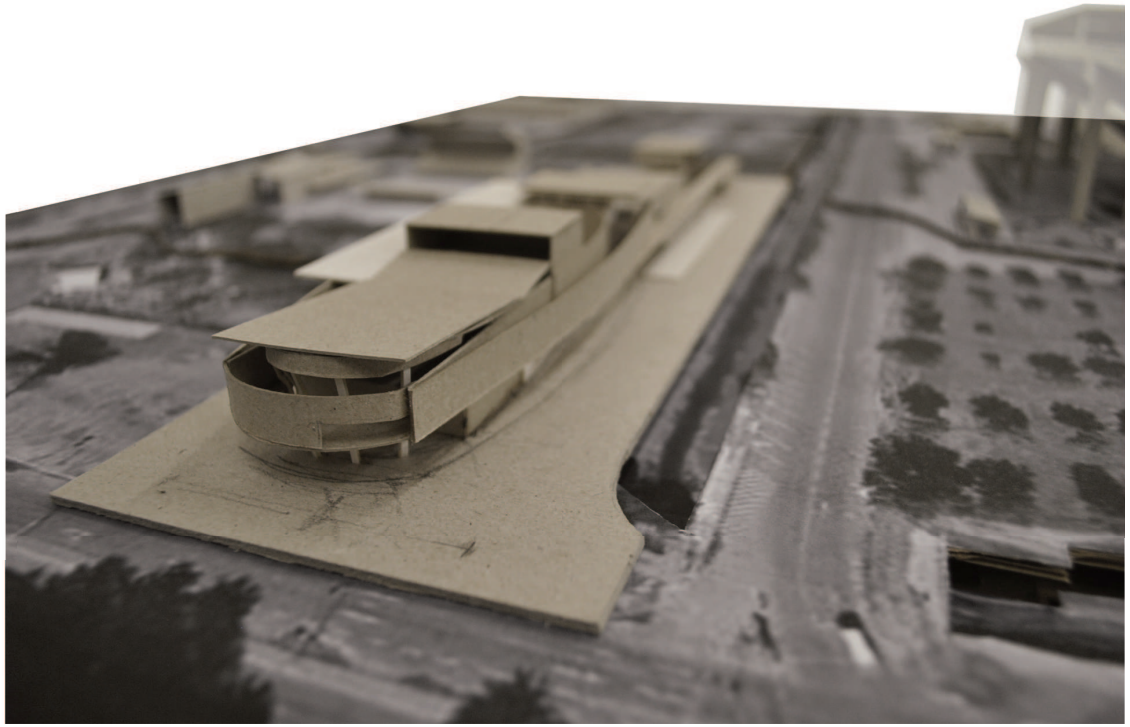




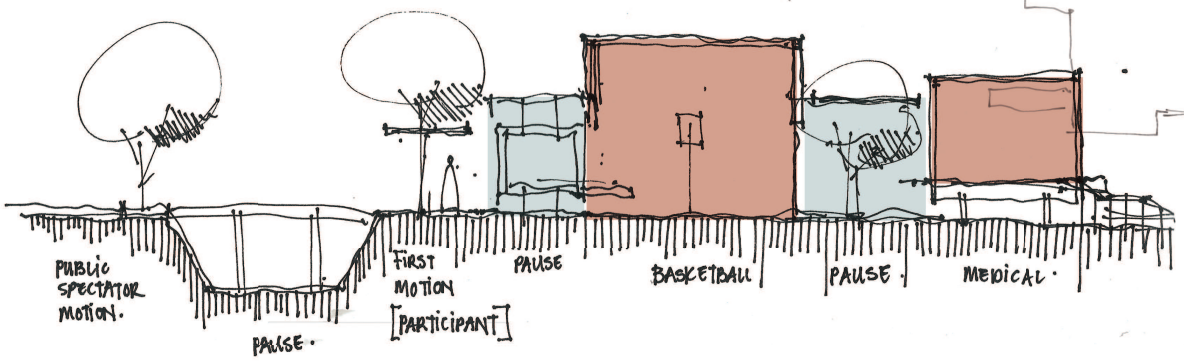

ROUTE.
OPTIONS.
PUBLIC.
ADMIN.
MEDICAL.
SPORT.
PUBLIC.
PUBLIC SQUARE
ADMIN.
SPORT.
MAIN CIRCULATION.
FIRST ARRIVAL
BREAK OPEN
PAVILION.
EXTENDING THRESHOLD.
CREATING MORE SPACE.
ACTIVATE THRESHOLD.
PULL AWAY.
CREATE SPACE
POOL.
BECOME SPECTATOR.
CROSS THRESHOLD.
ENTRANCE.
ON THE EDGE.
To SPORT ACADEMY.
STEP DOWN TO SPORT FACILITIES.
GYMNASium
CONDITIONING
OFFICES & RESEARCHERS
SHOPS.
LOUNGE.
TERMINUS
TRACK LAP
SPRINT TRACK.
MEDICAL
PROMENADE
MAIN STRUCTURE WITH DIFFERENT TEXTURE / MATERIAL INFILL.
N

The new site location addressed the initial objectives of creating a new entrance to the municipal swimming pool facilities while also creating the transition between the urban environment and the sport facilities. Both of these objectives required a sense of arrival that would lure participation in order to activate the area. Two courtyards are proposed to regulate the public participation and present liminal (intermediate) spaces where the participant can orientate him-/herself first before proceeding with his/hers chosen activity.

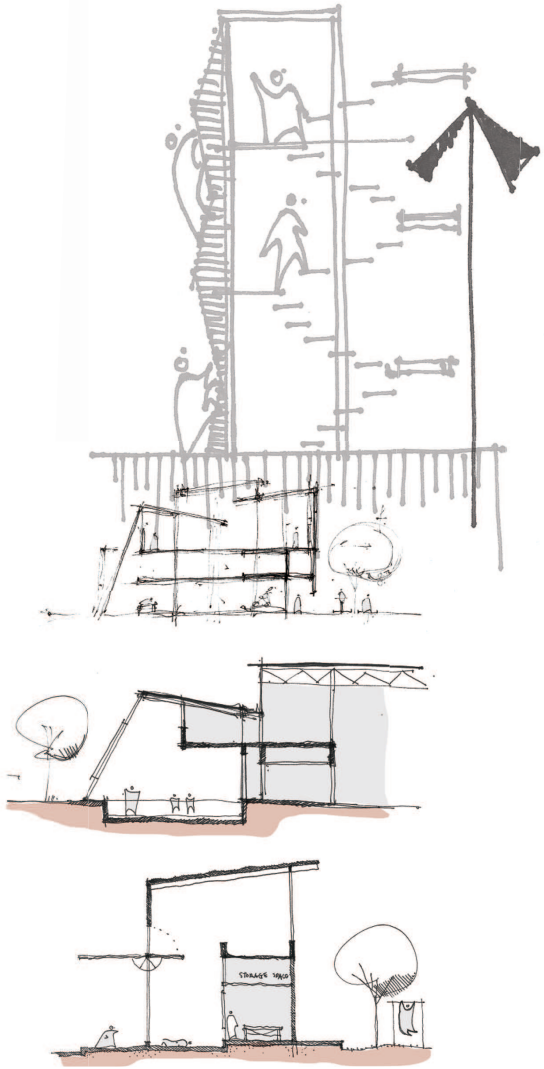


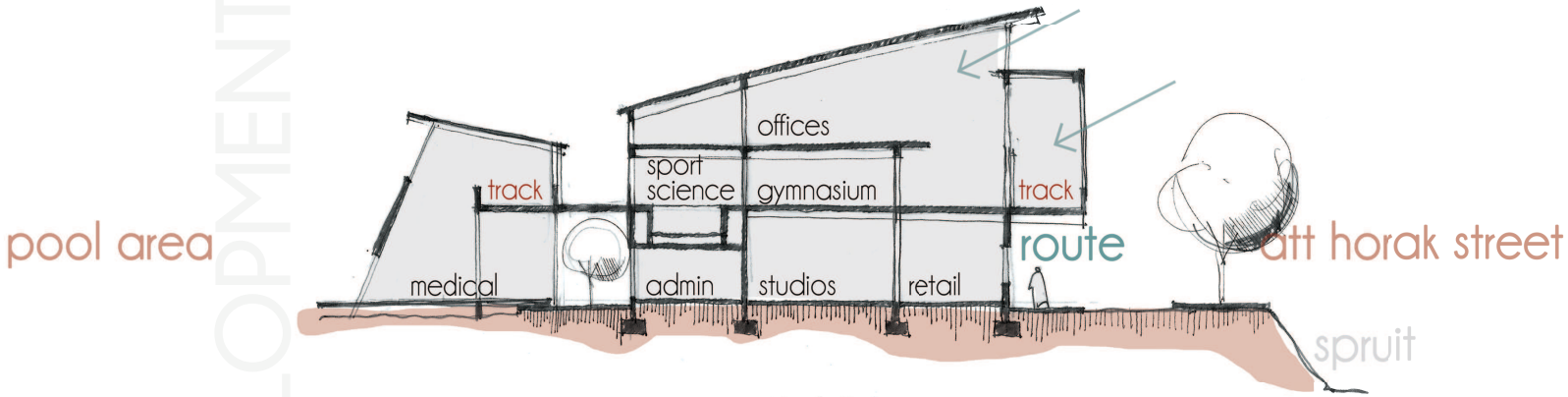


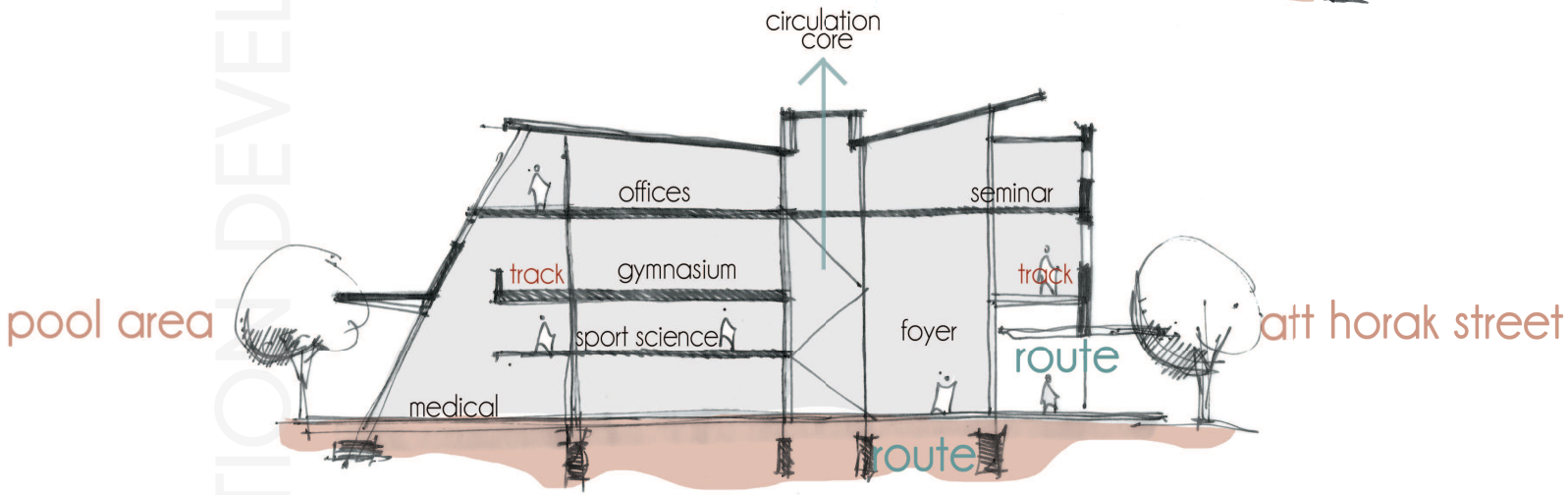
THRESHOLDS
EDGES
EVENTS
PAUSES

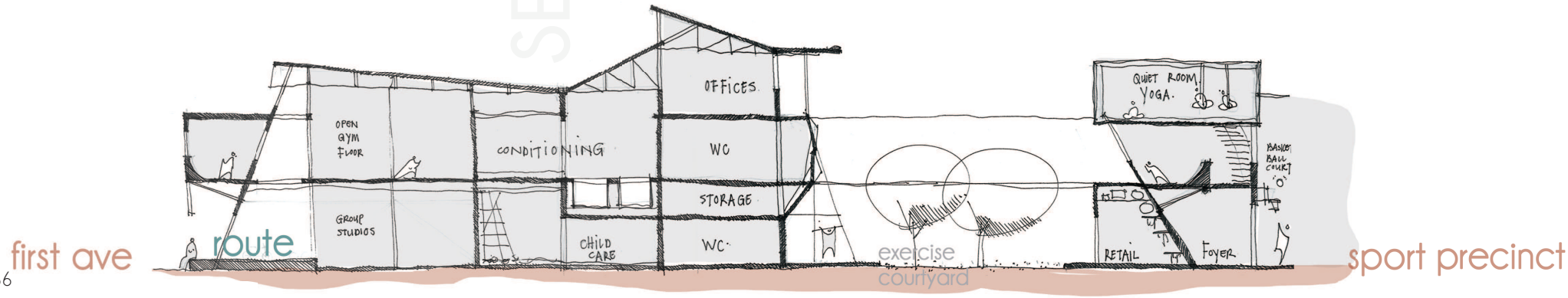


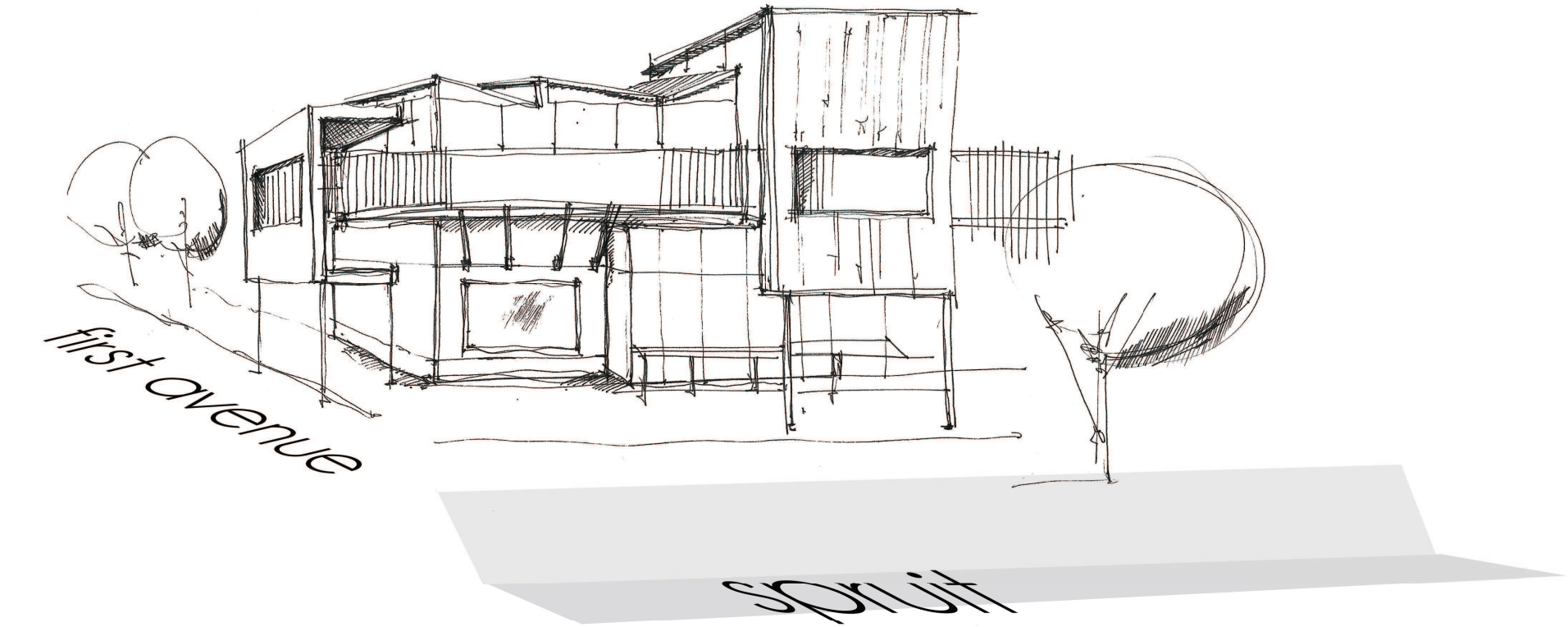
SECTION DEVELOPMENT

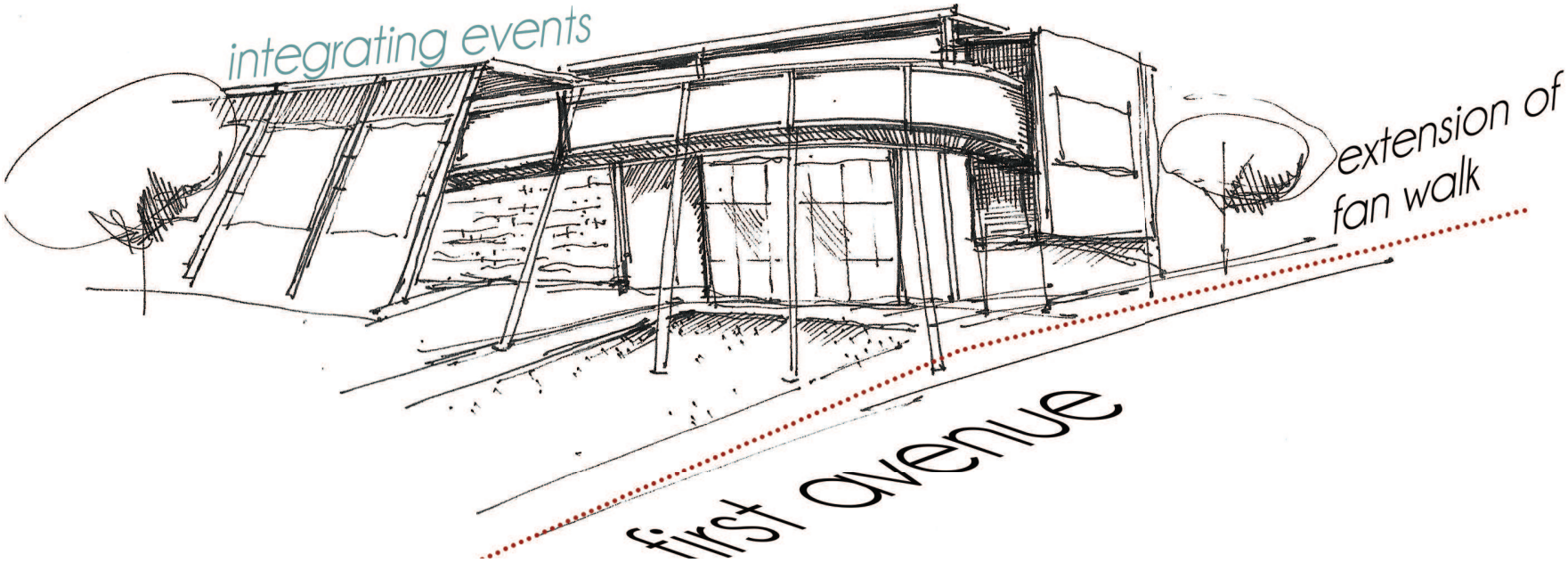


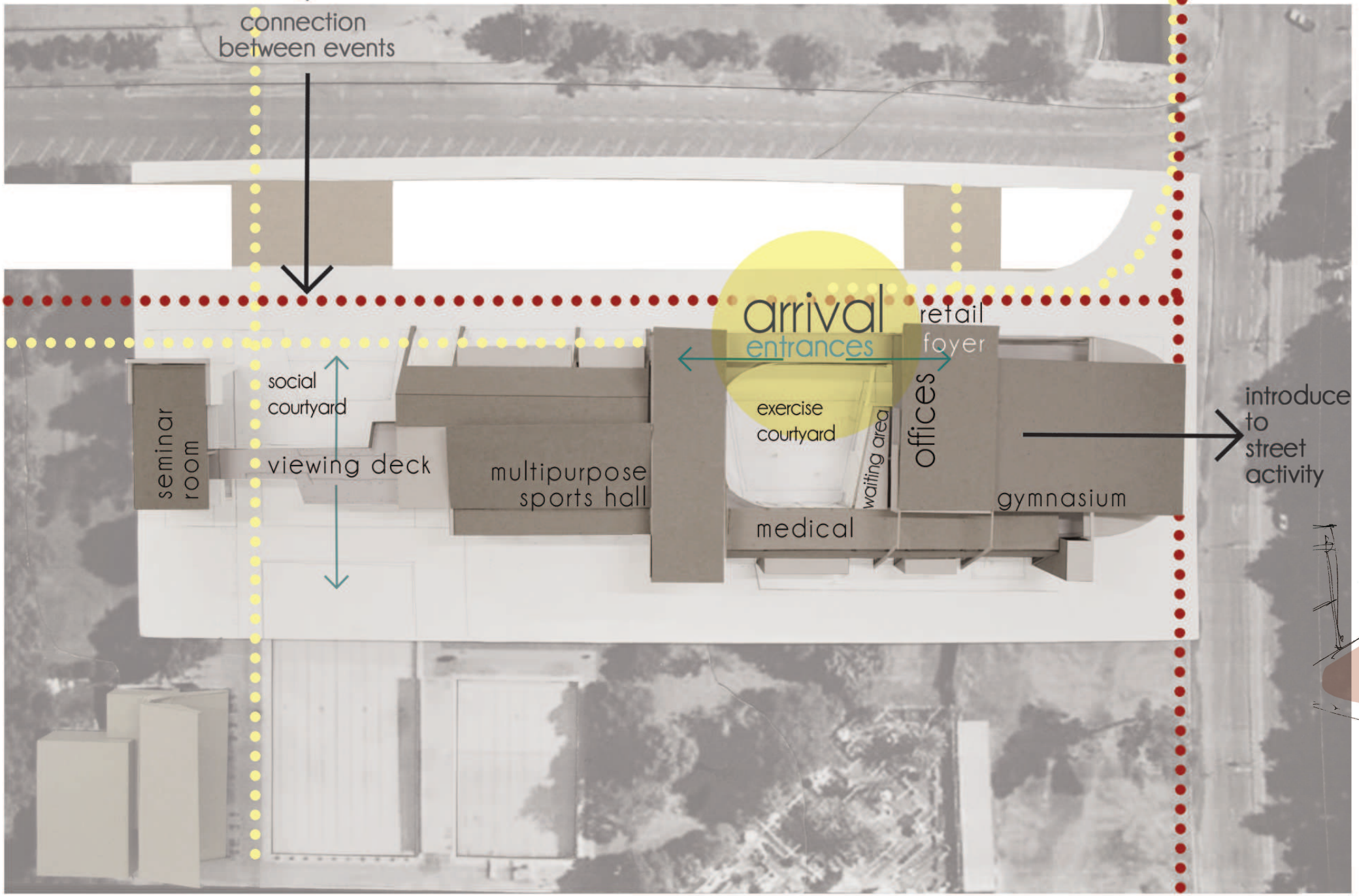






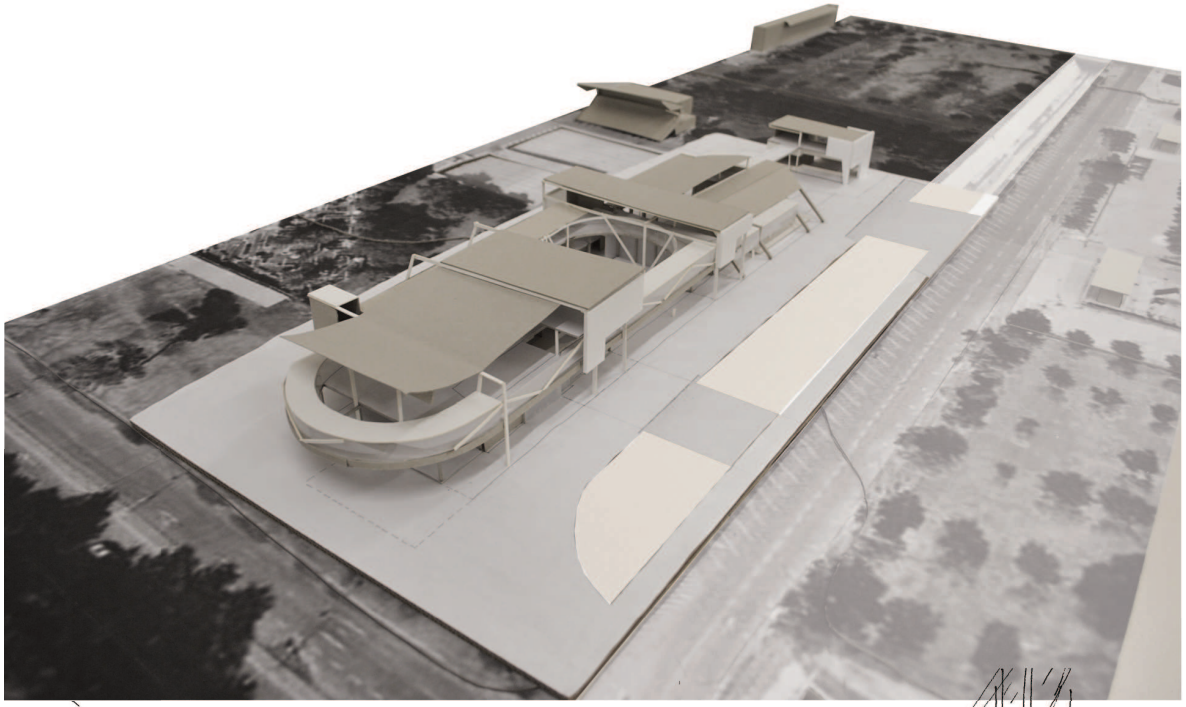

first avenue
sprint

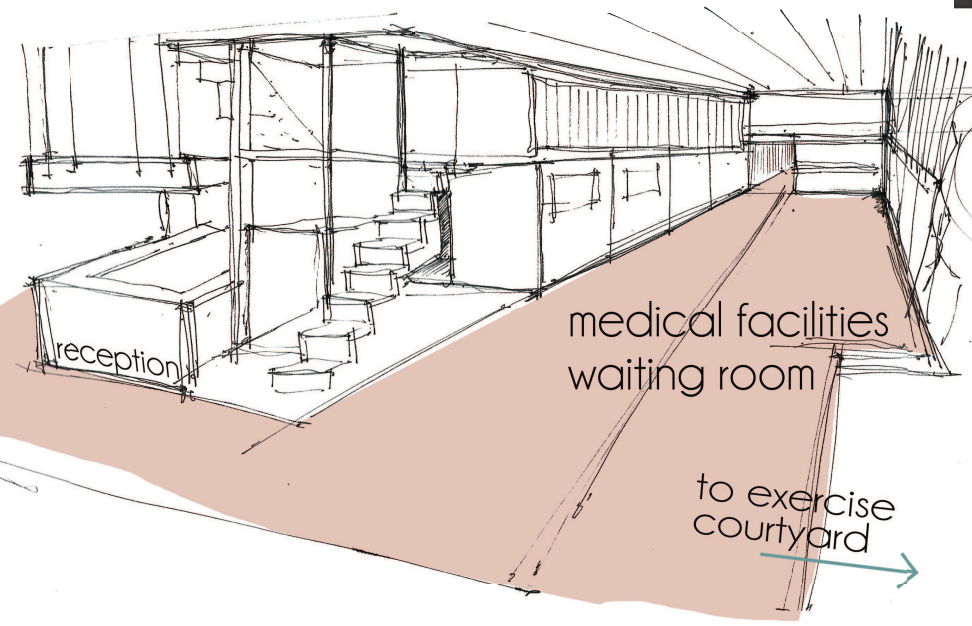

integrating events
extension of
fan walk
first avenue

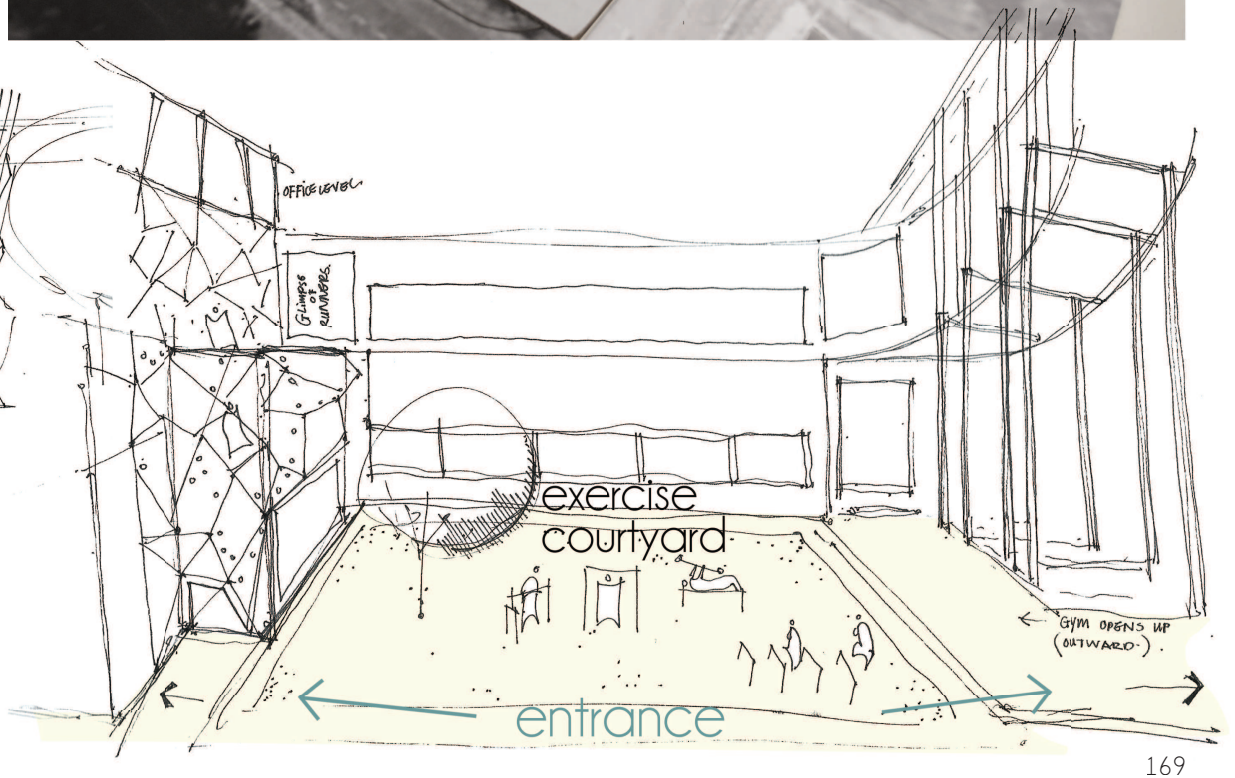

new entrance
+
connection
between events
arrival
entrances
retail
foyer
offices
exercise
courtyard
waiting area
social
courtyard
seminar
room
viewing deck
multipurpose
sports hall
medical
gymnasium
introduce
to
street
activity

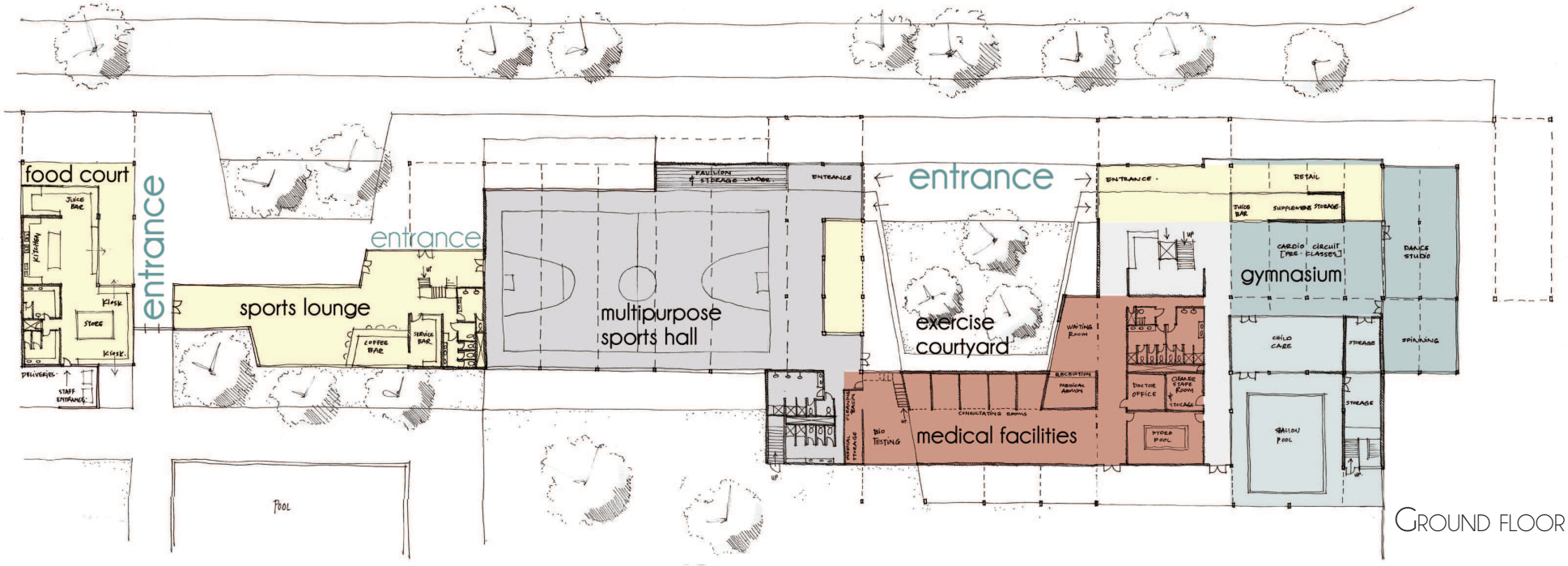
An exercise courtyard is proposed as the main entrance, allowing participants entering the building to be exposed to movement and the possibilities sport presents. Within this space, the participant will be able to see multiple events happening around him/her, with the aim to initiate interest. This courtyard is revealed as a layering of events and activities, exposing themselves to one another and being the spectator as well as a performer.

The second, and smaller courtyard, presents a social approach through gathering all who partakes as spectators of any kind, to meet at the sports bar, to enjoy a healthier option at the food court or to meet new people through the enjoyment of watching a practice match of basketball, volleyball or even gymnastics. This social courtyard will also host the entrance of the public pool facilities, which could also use the kiosk and food supplies with the occasional swimming meet. This food court will also accommodate for other events taking place within the precinct for example healthier food options for the athletes during the day of the event.





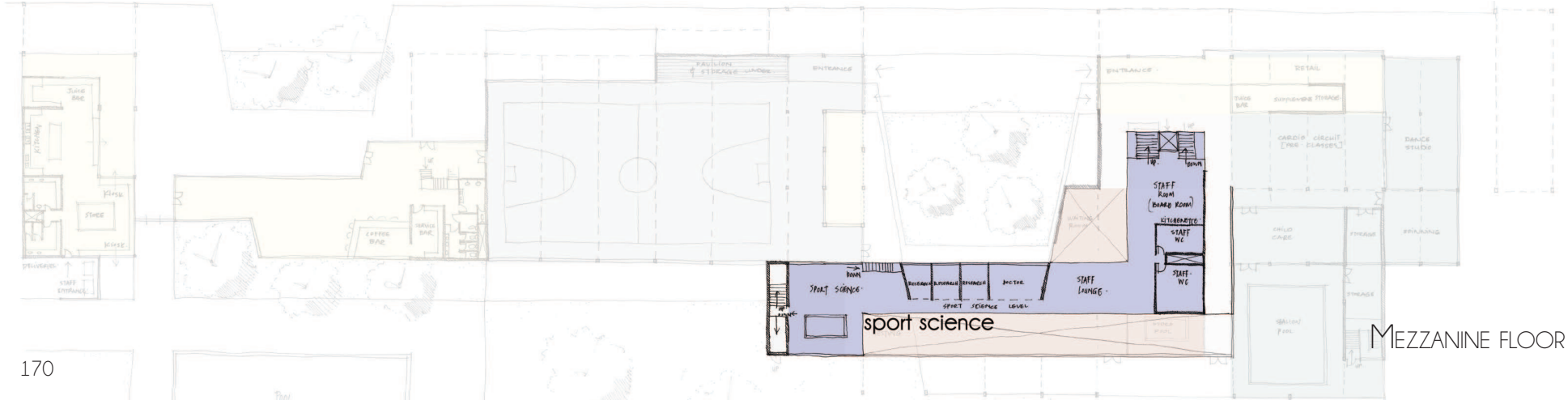




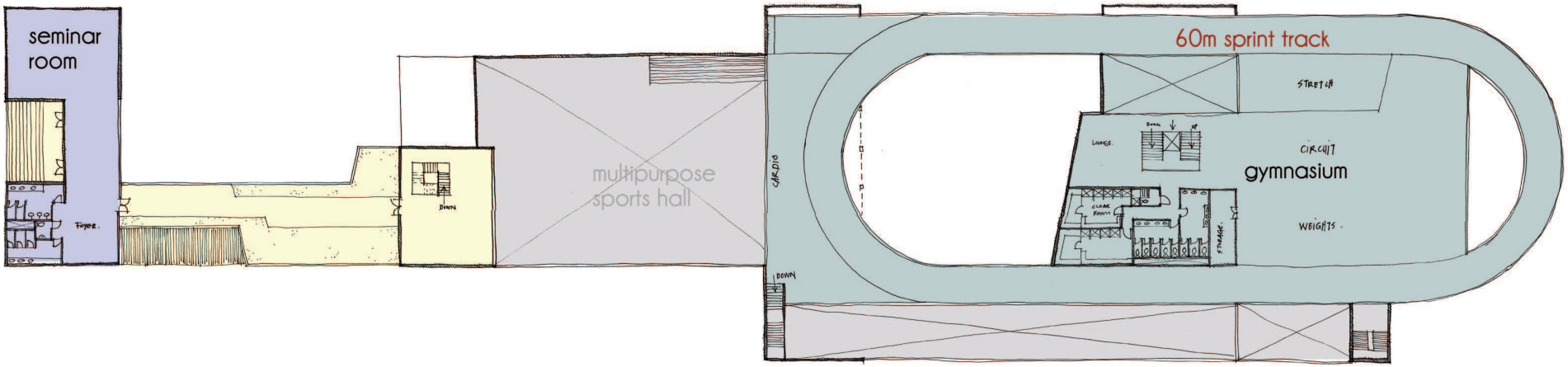
GROUND FLOOR PLAN

The entrance courtyard did not achieve full function and may end up unused because of the entrances situated at the immediate arrival of the courtyard. This initiated the arrival into the courtyard as presented in the following and last stage before the final proposal.

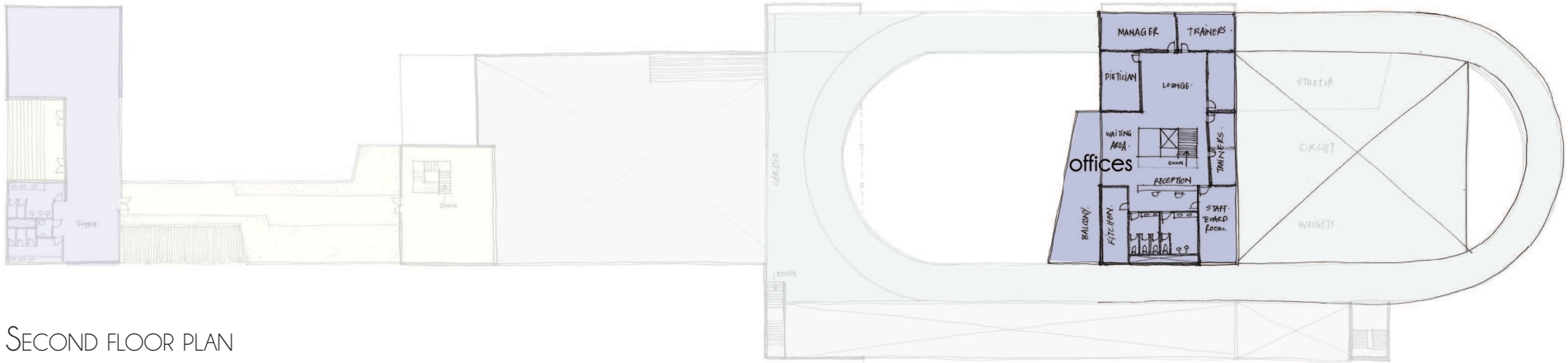
The spatial organisation and sizes relates to the specific location on site, to align with the existing buildings, to create views over the surrounding activities and to be in close relation with the existing swimming pools. It has been proven that the site, the building programme, the conceptual approach, sport facilities requirements and functional organisation all accompanied the development of a complex resolution. With the challenges and aims set out to be achieved along a route, as the initial idea and starting point of the design, the building had to step back from the *spruit*'s edge to allow for a breathing space of participation and for the continuation of the fan walk.



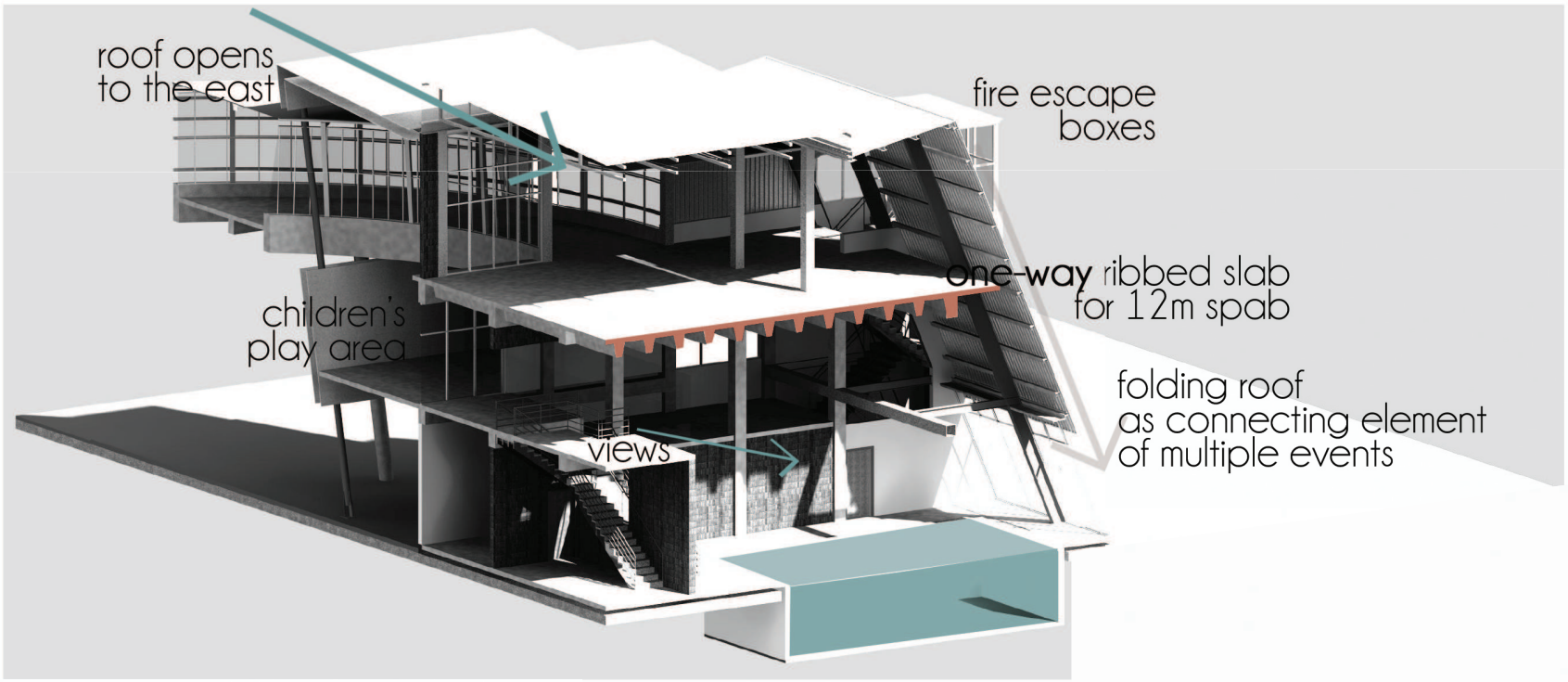
MEZZANINE FLOOR PLAN



First floor plan



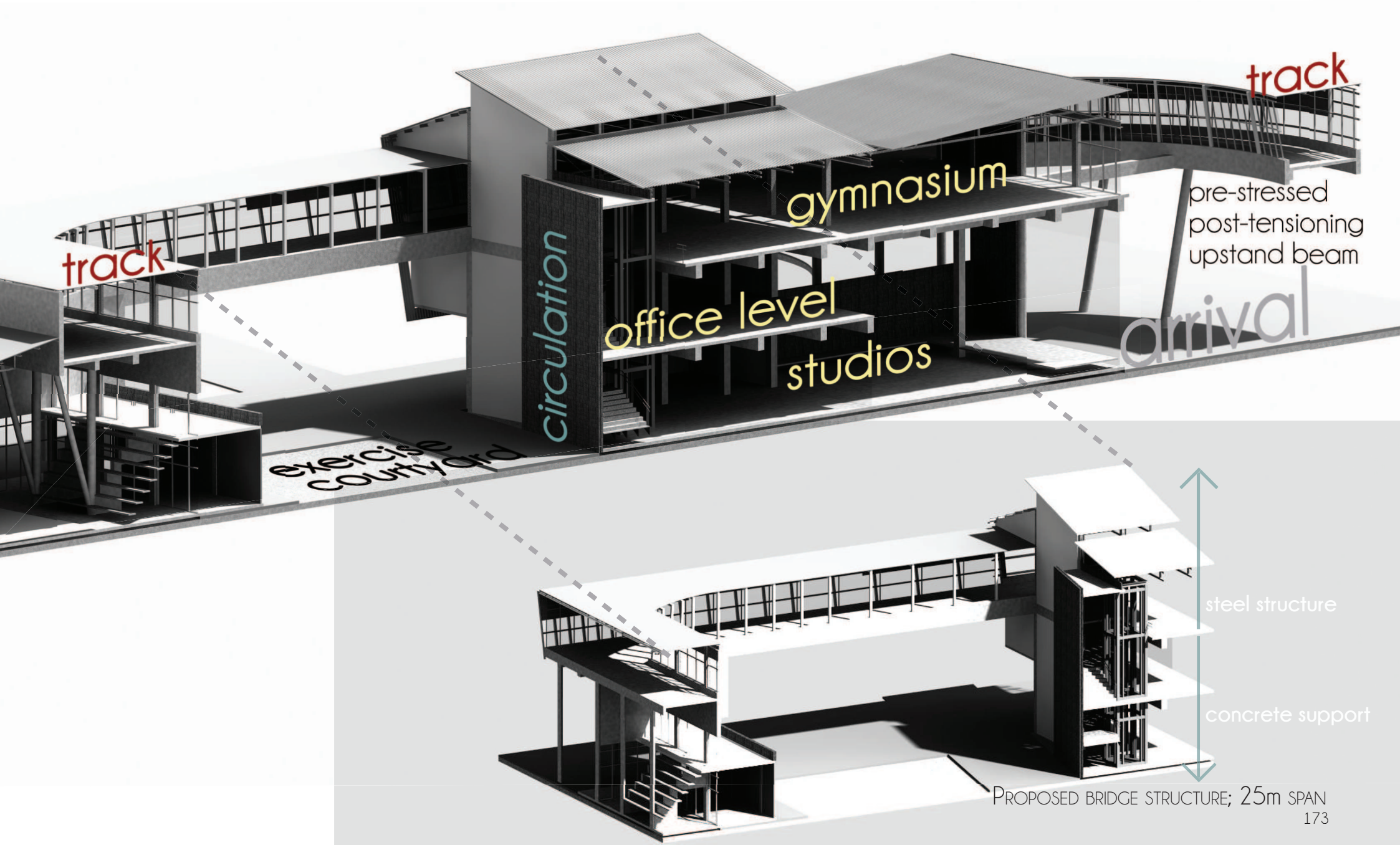
Second floor plan



[STRUCTURAL DEVELOPMENT]



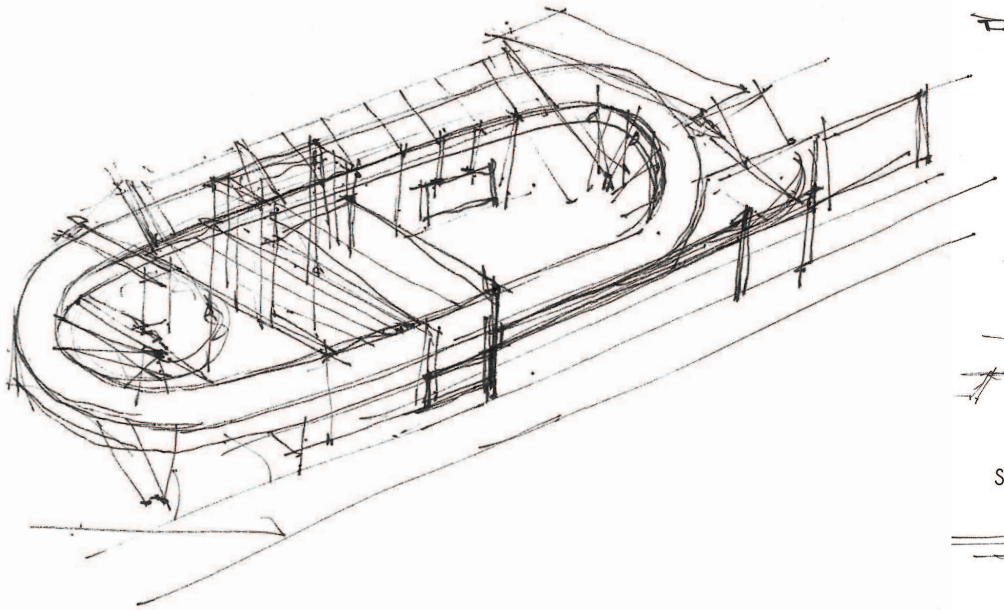
LONGITUDINAL SECTION THROUGH COURTYARDS

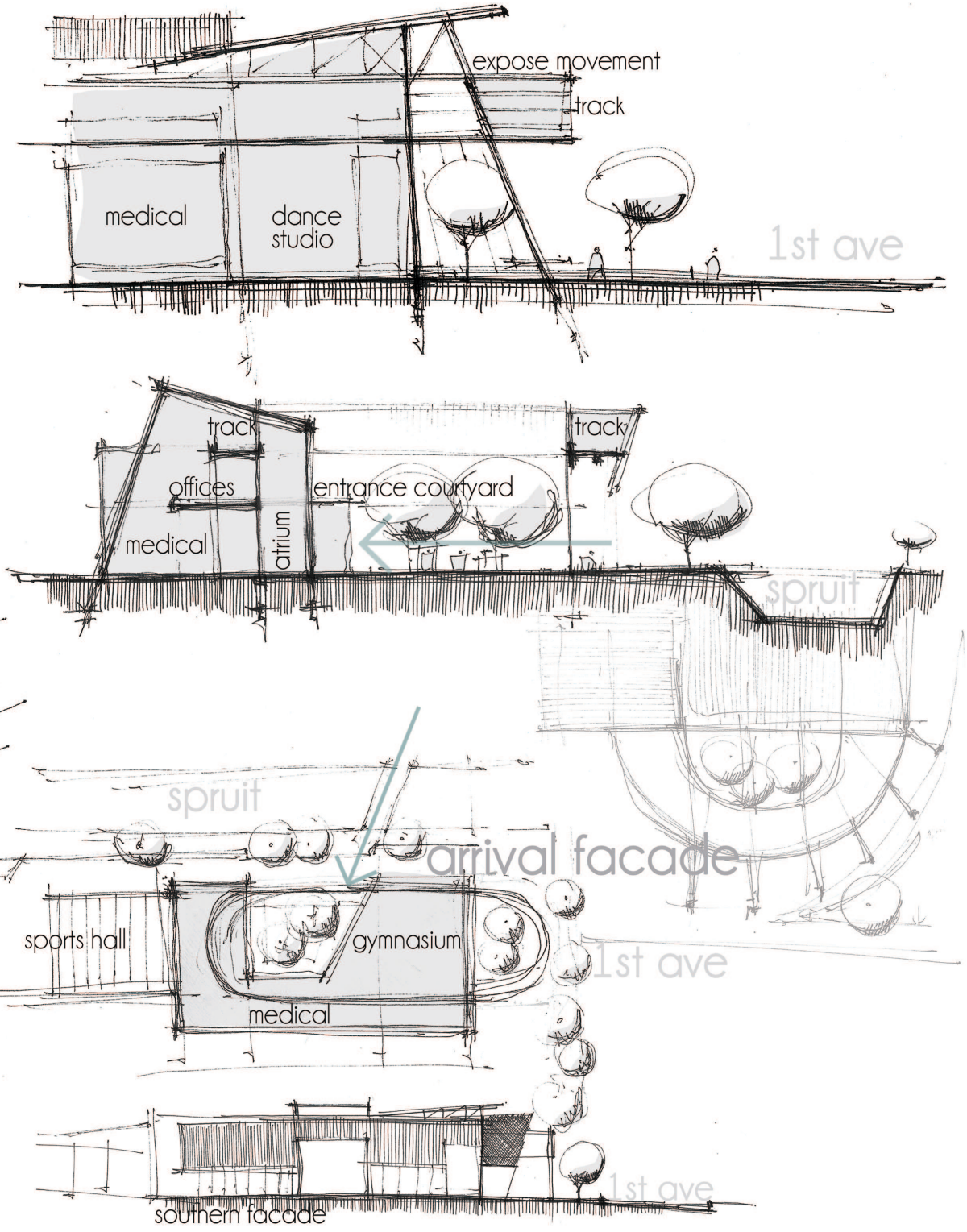


PROPOSED BRIDGE STRUCTURE; 25m SPAN

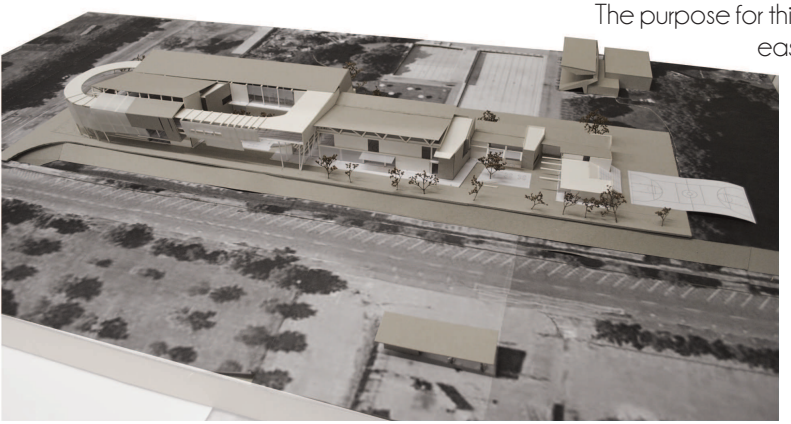
PHASE 10 [CIRCULATION ELEMENTS]

This is the last phase before the final design proposal (which will be discussed in synthesis - part 3.2) and presents a close representation of the end product.

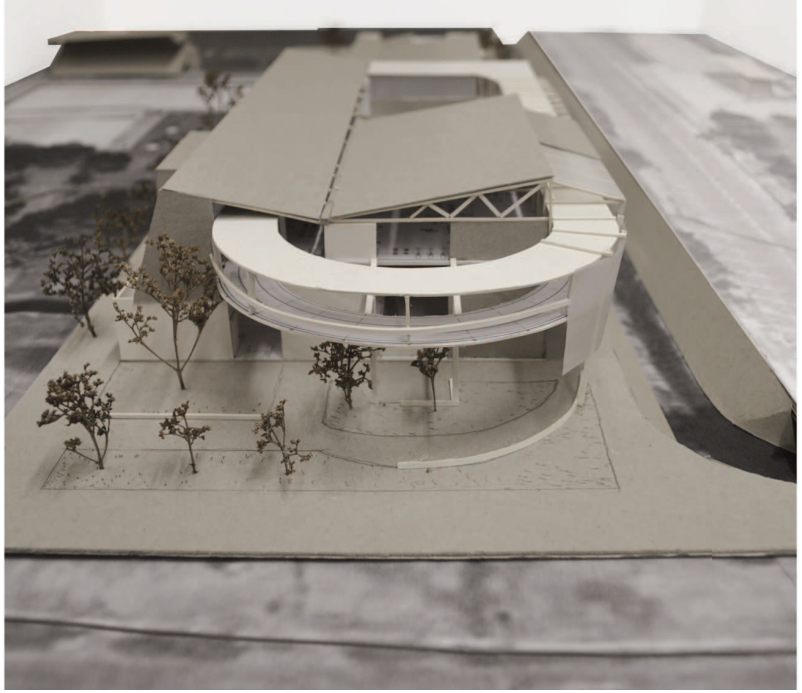


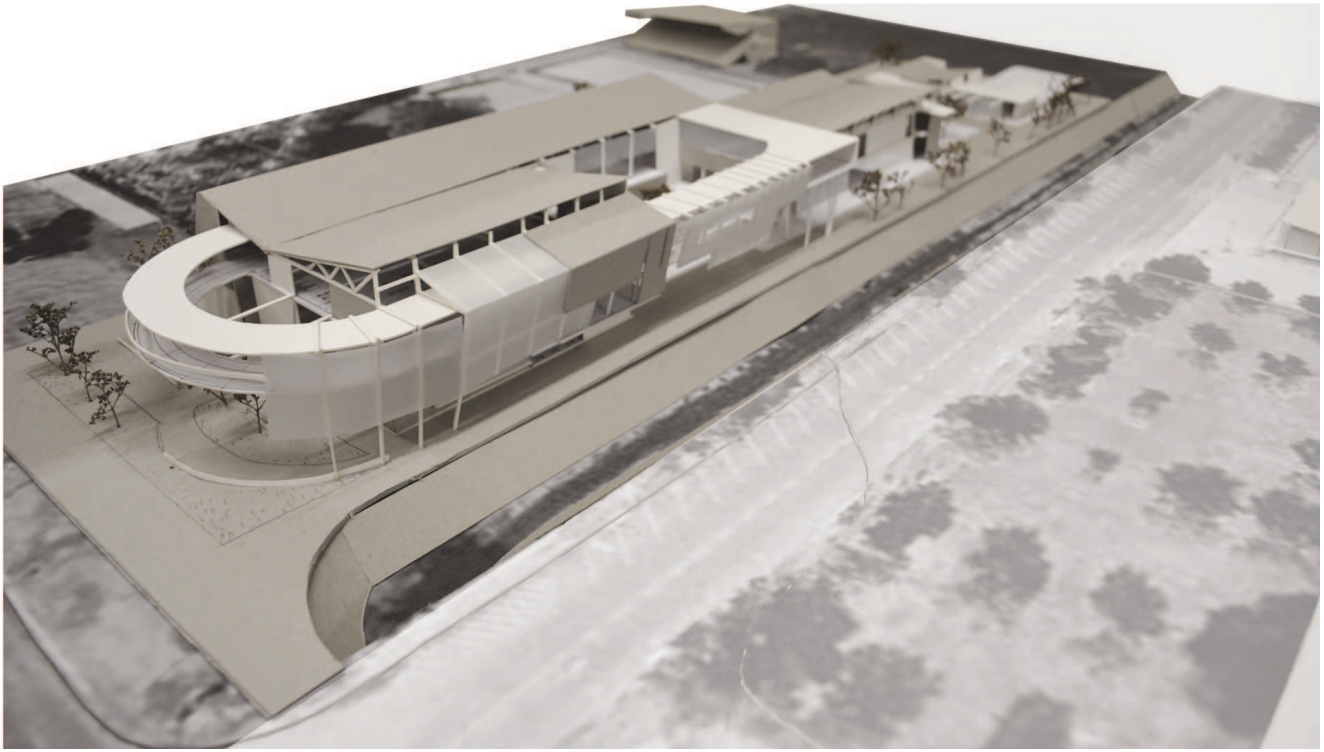


The development from the previous proposal involves the resolution of the clustered plan layout. Although the conceptual objective is to overlap events and functions, to allow them to integrate, the plan's functionality may not suffer from this conceptual interpretation.



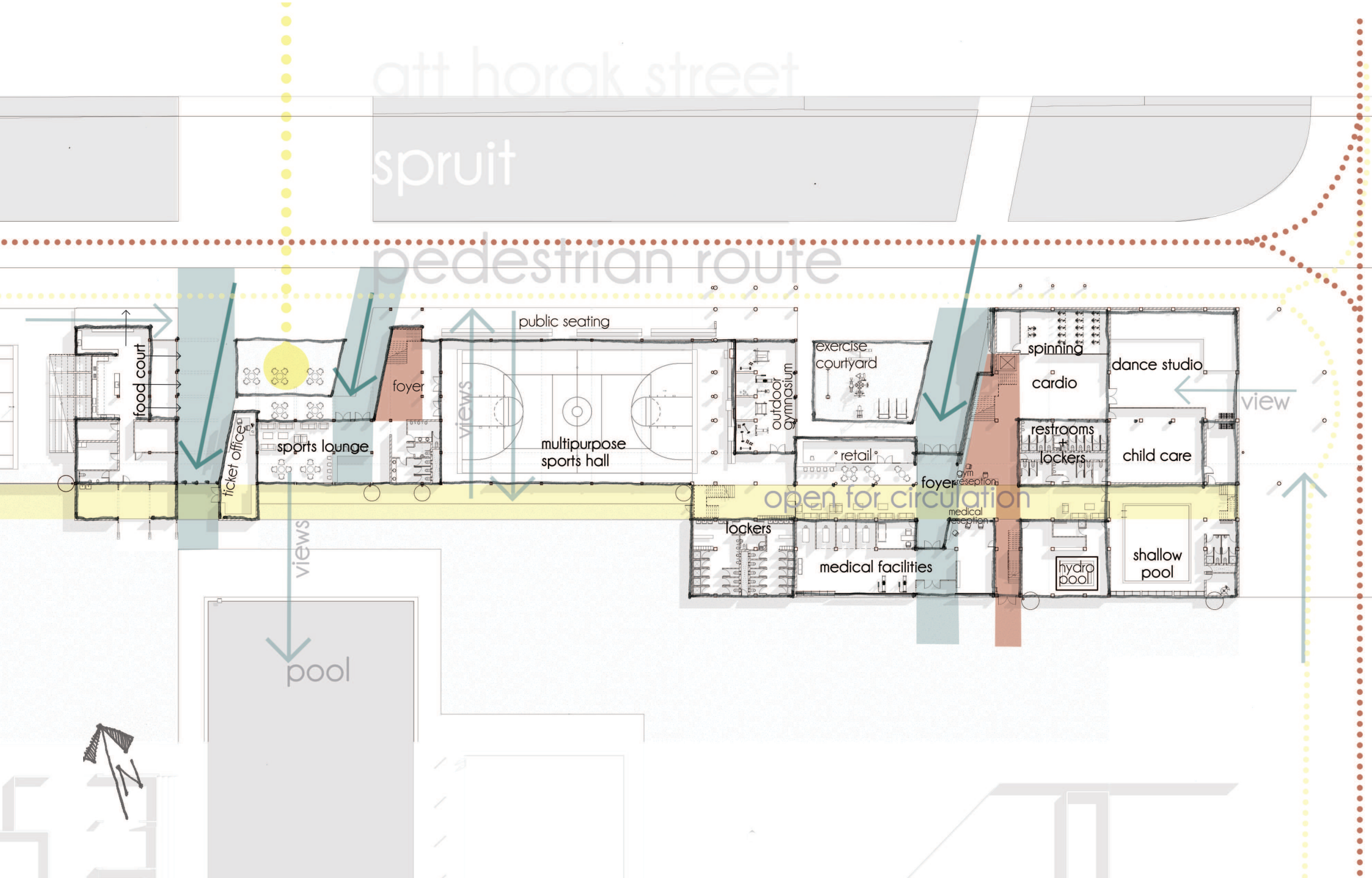
The purpose for this step was to develop the plan in order to create easier circulation routes and guidance throughout the building. The sprint track presented the solution for the clustered layout problem, allowing the space underneath to remain open and available for circulation. All events are connected through the track and provide the ideal connection element and circulation guide. The users can just follow the exposed sprint track structure to guide them towards their destinations. Entrance foyers and vertical circulation points also needed clearance. Upon arrival, the user will identify immediately where to go for assistance.

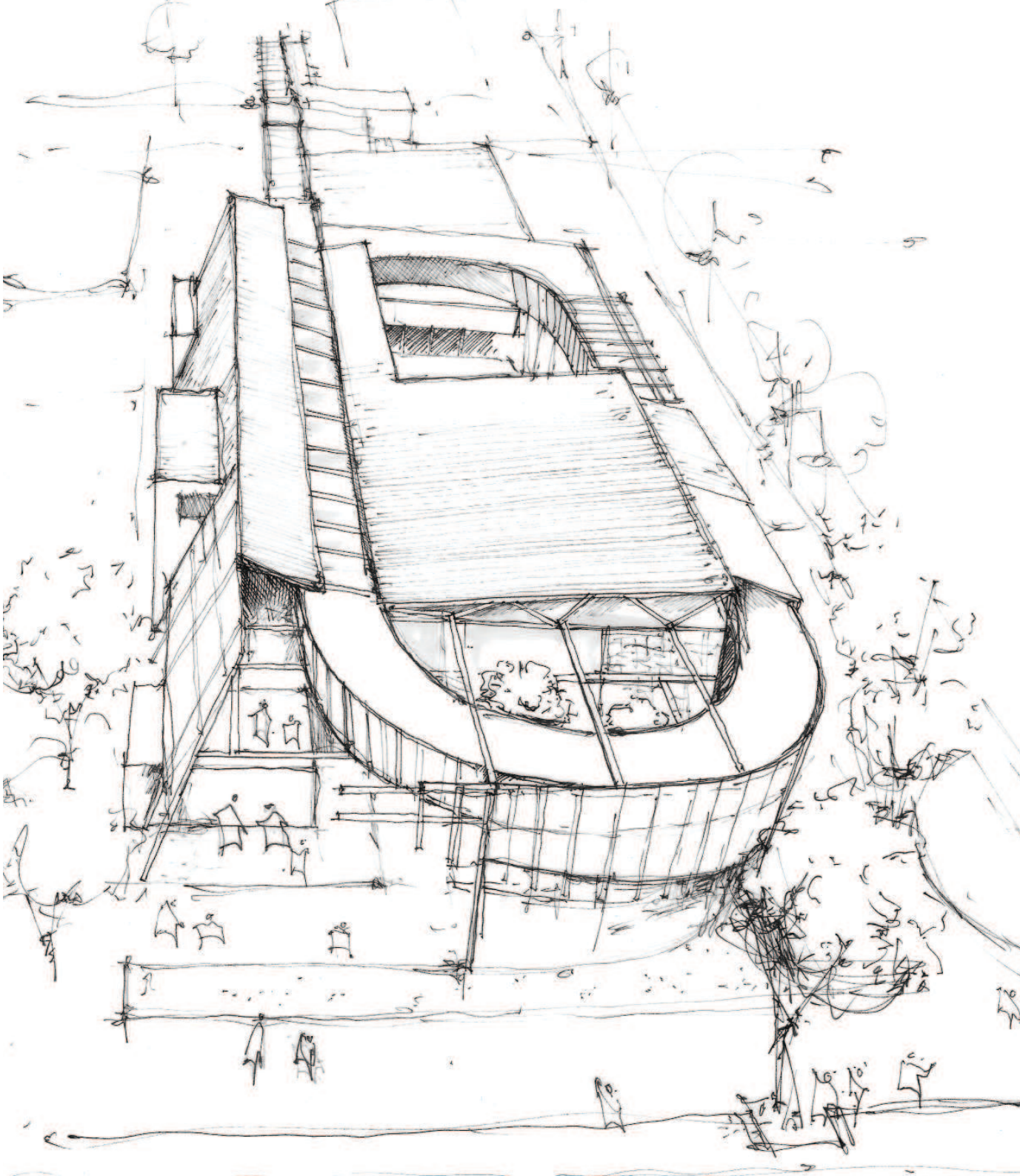







entrance of
stadium + athletics field
att horak street
the route
proposal continues for
entire att horak street
allow view into
spruit
accelerating rhyt h m
60m sprint track
extension of existing fan-walk
first ave
entrance
entrance
multipurpose sports hall
retail
arriva
gymnasium
offices + medical facilities
shallow pool + child care
conditioning
access to
pool facilities
new
proposed
entrance
of
municipal
swimming
pools
connection
to client

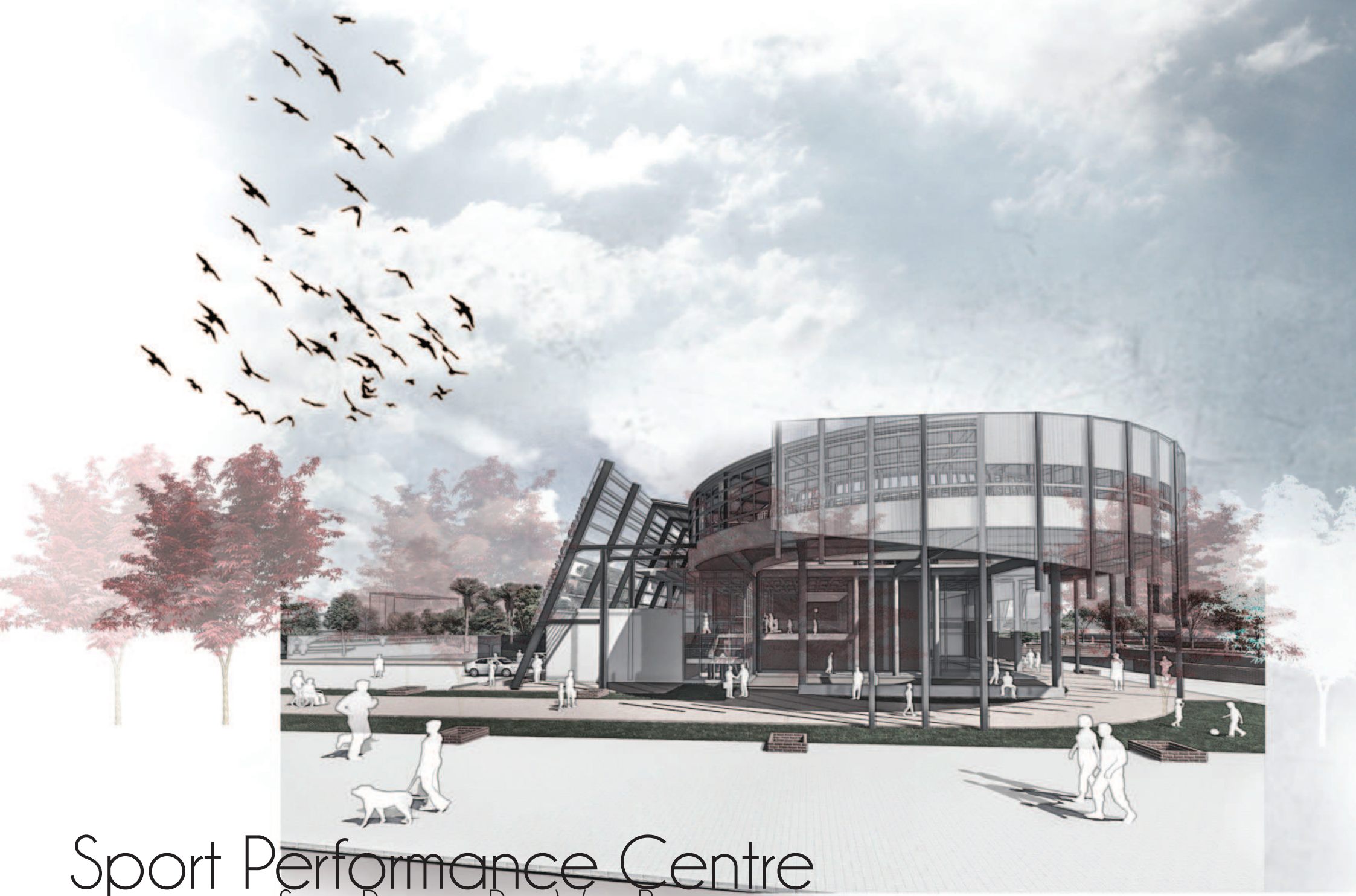

att horak street
spruit
pedestrian route
food court
ticket office
sports lounge
foyer
views
public seating
multipurpose
sports hall
outdoor
gymnasium
exercise
courtyard
retail
foyer
gym
reception
medical
reception
lockers
medical facilities
spinning
cardio
dance studio
view
restrooms
+
lockers
child care
hydro
pool
shallow
pool
open for circulation
views
pool
N



[FINAL DESIGN PROPOSAL]

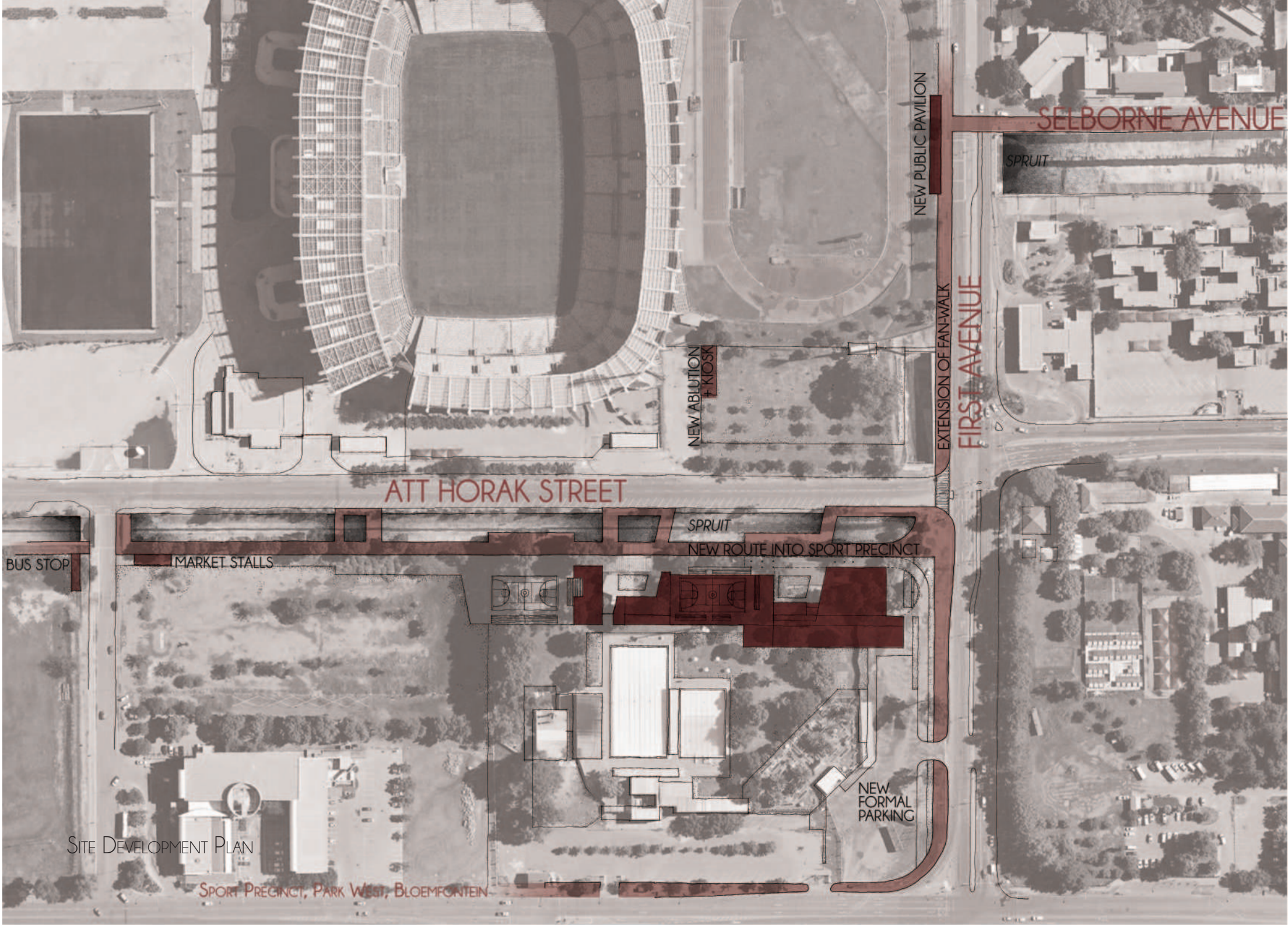
3.2 synthesis

The final product resembles main features of previous proposals but also allowed drastic changes that could assist the achievement of set out goals such as connecting the existing facilities, allowing participation of choice, presenting opportunities for the public to partake in sport activities. This is achieved by activating Att Horak Street and creating the link as transitioning character between the urban environment and the sport precinct through the proposed extension of the existing fan-walk. The proposal developed into a complex interpretation of a collaboration of events and happenings which allowed the design to intervene on a large scale and occupy a route all along the *spruit*.



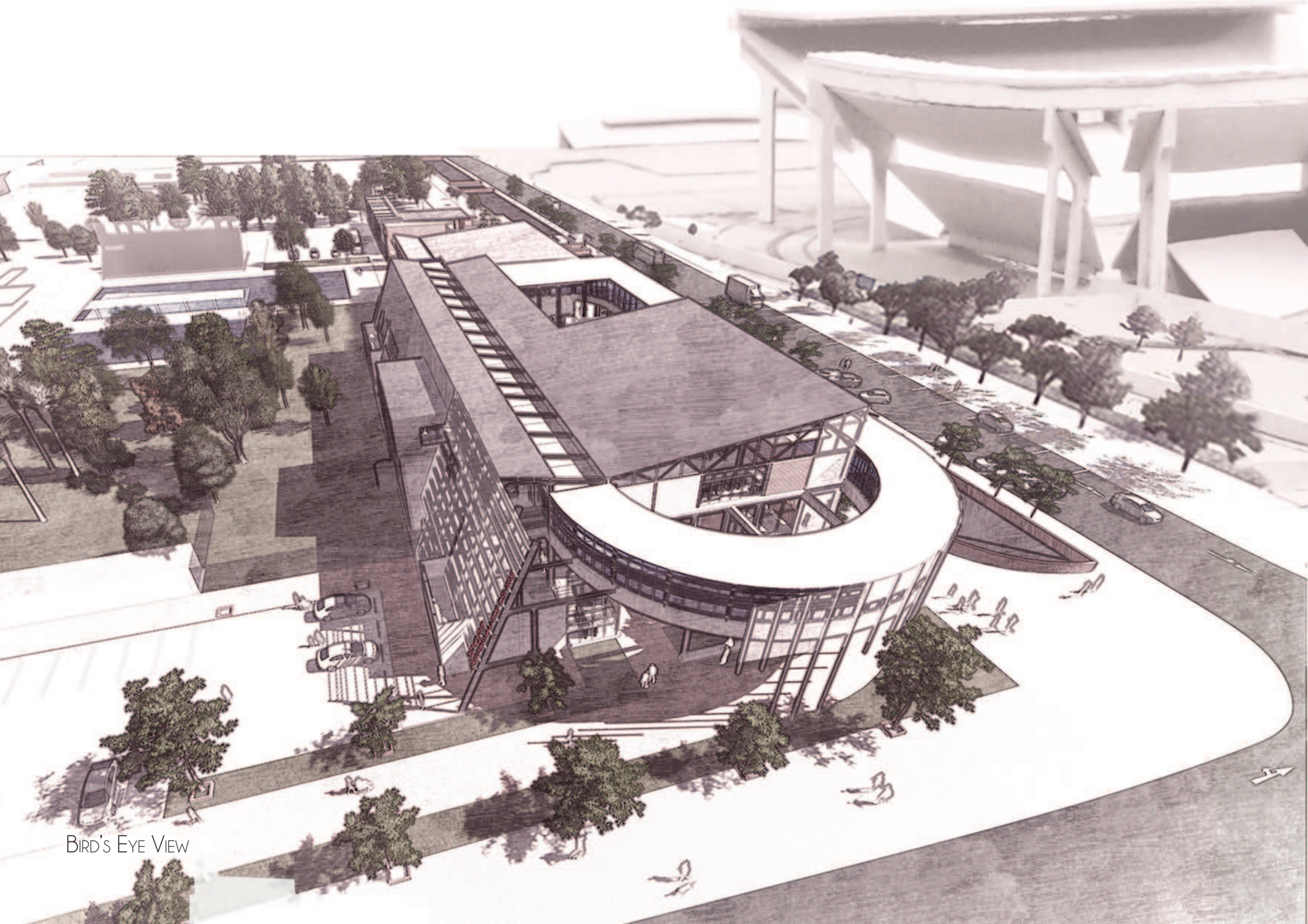
Sport Performance Centre

Sport Precinct, Park West, Bloemfontein

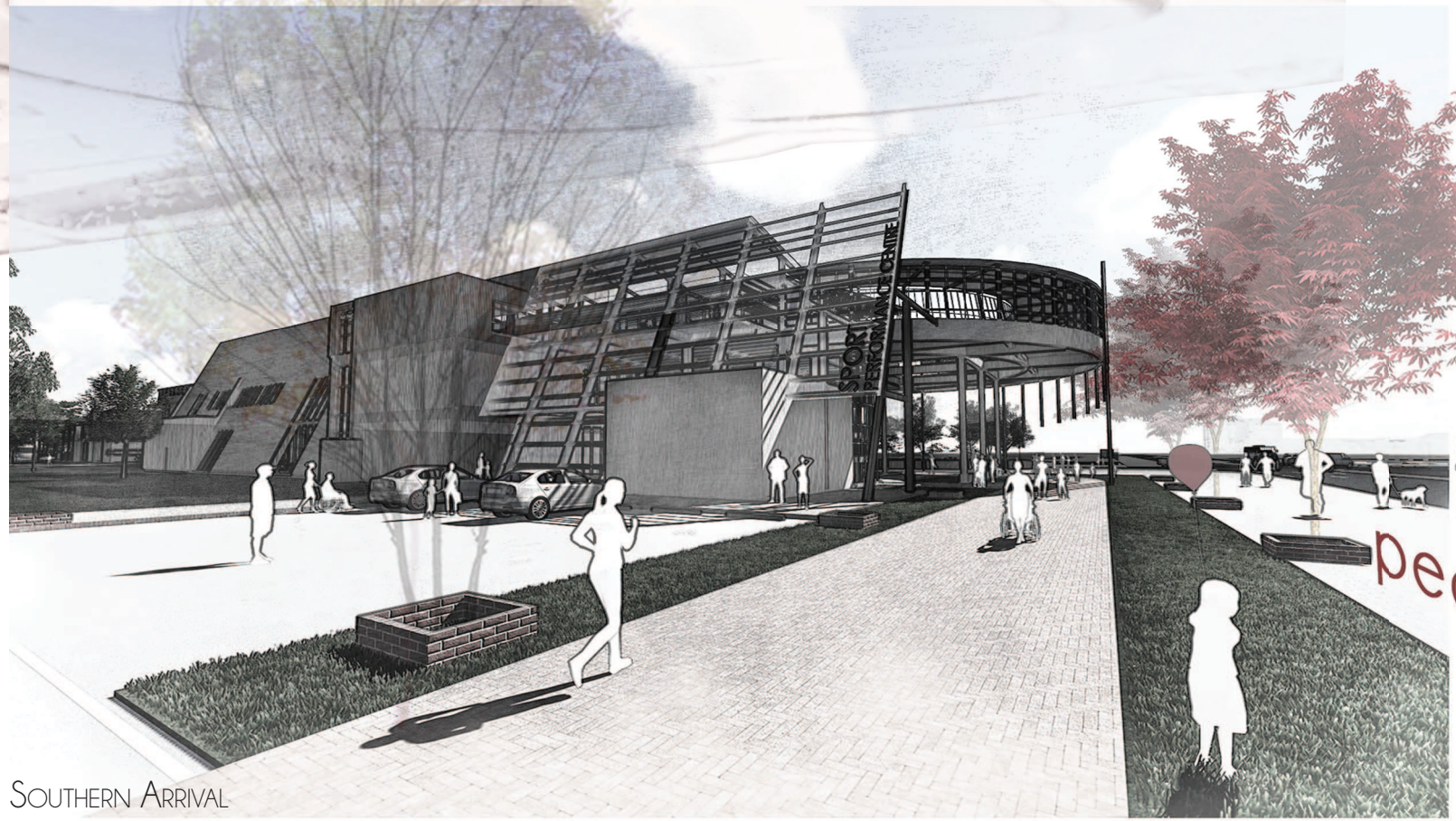


Site Development Plan

Sport Precinct, Park West, Bloemfontein

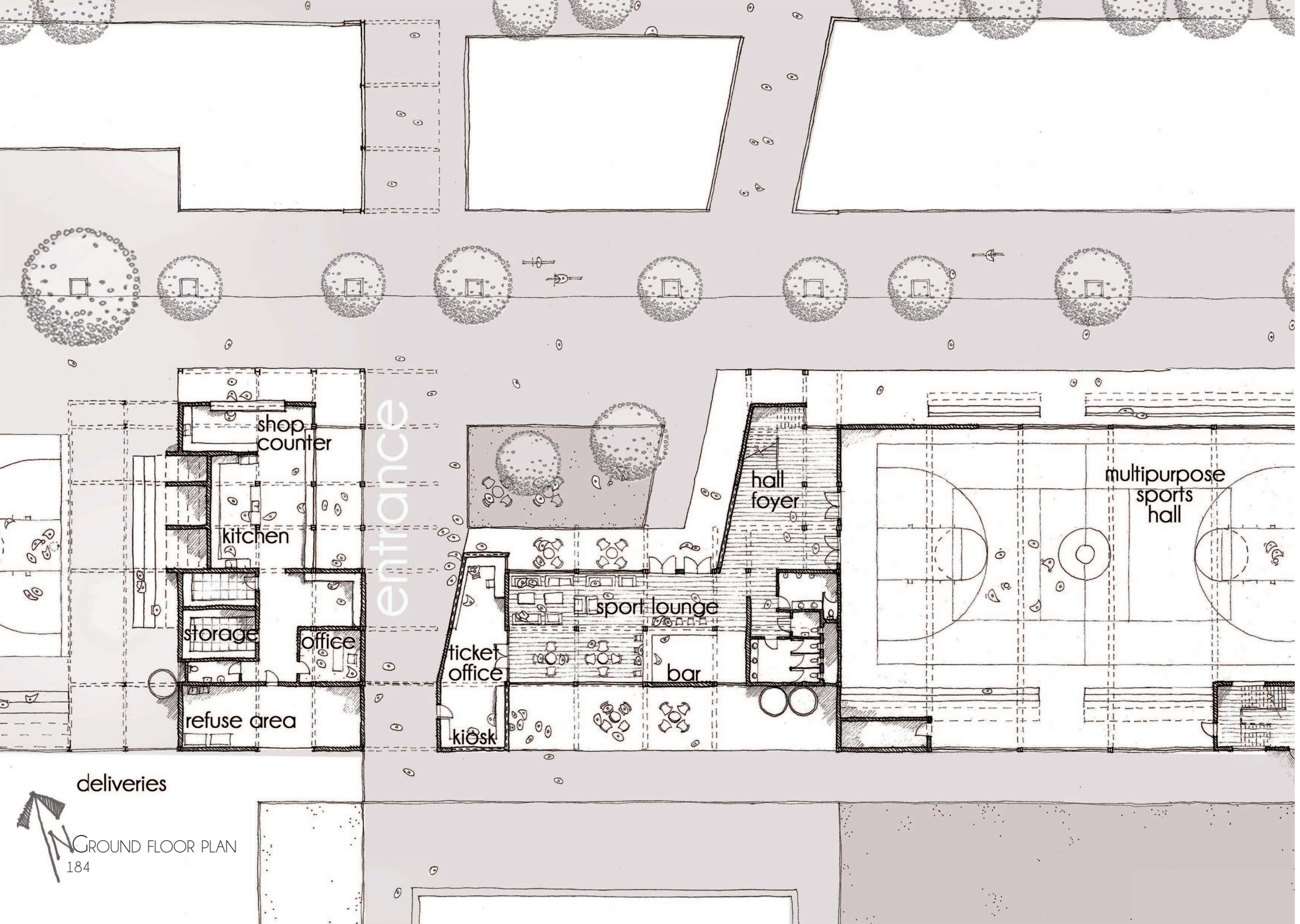


Bird's Eye View

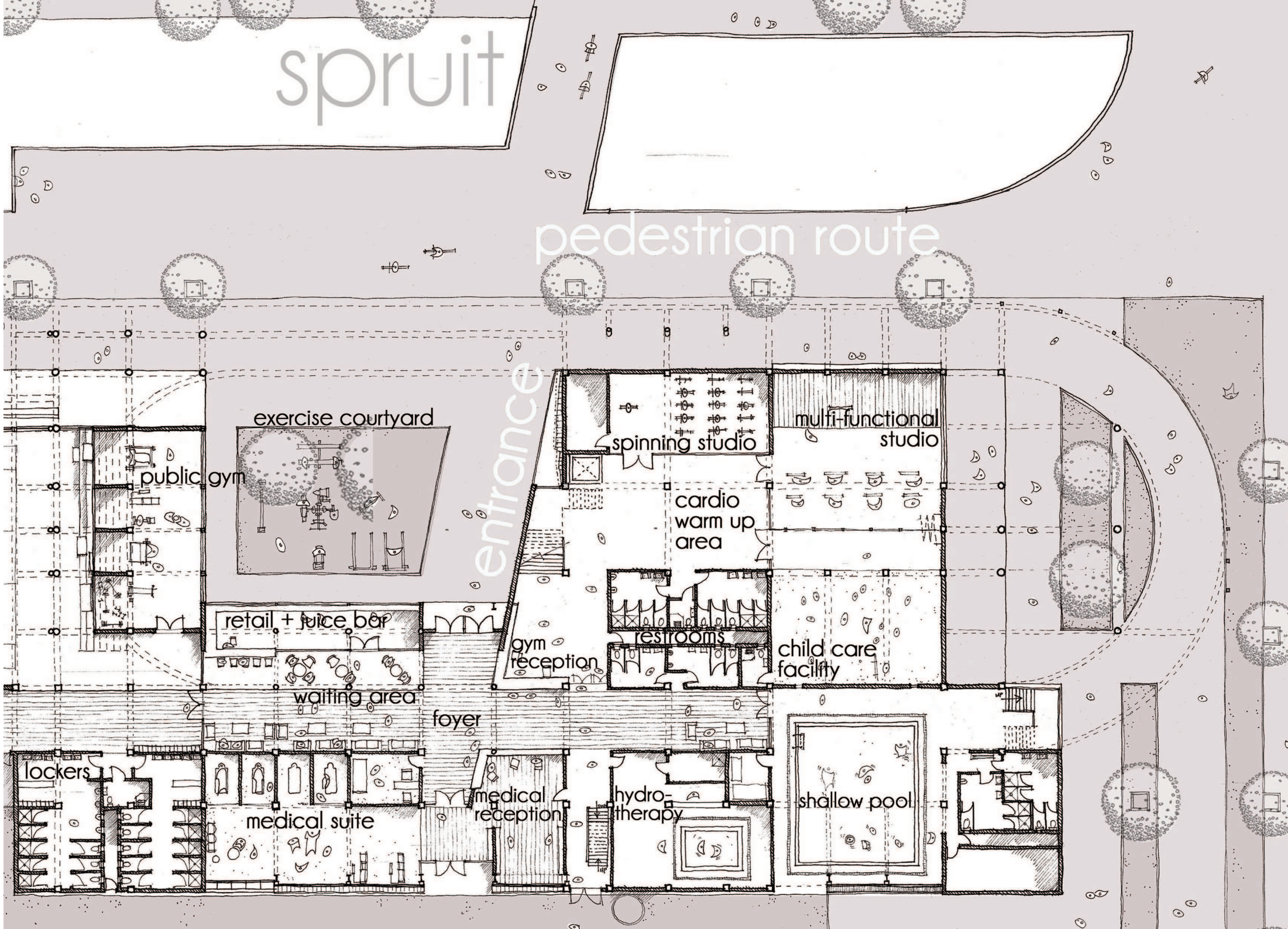


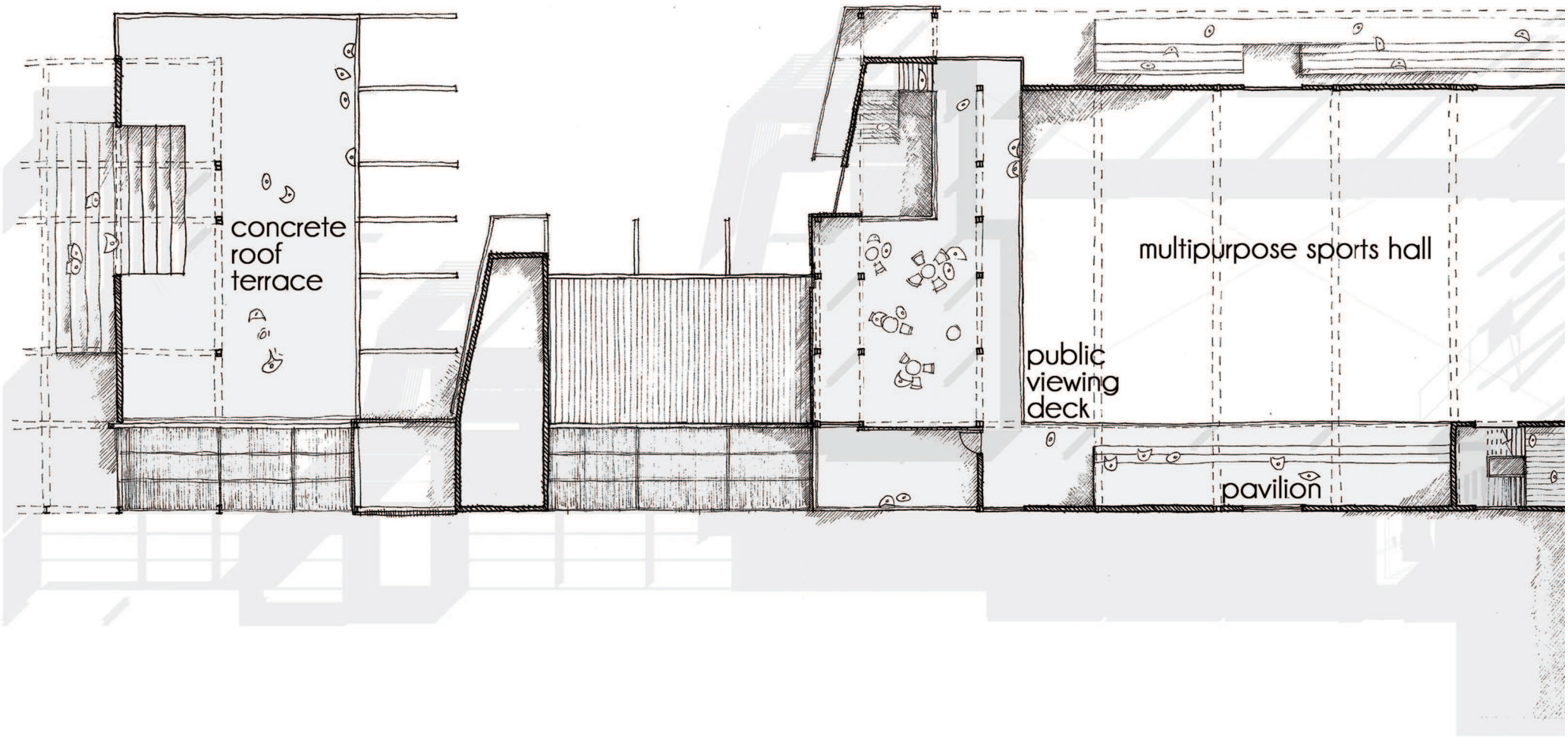
Southern Arrival

first avenue
pedestrian route

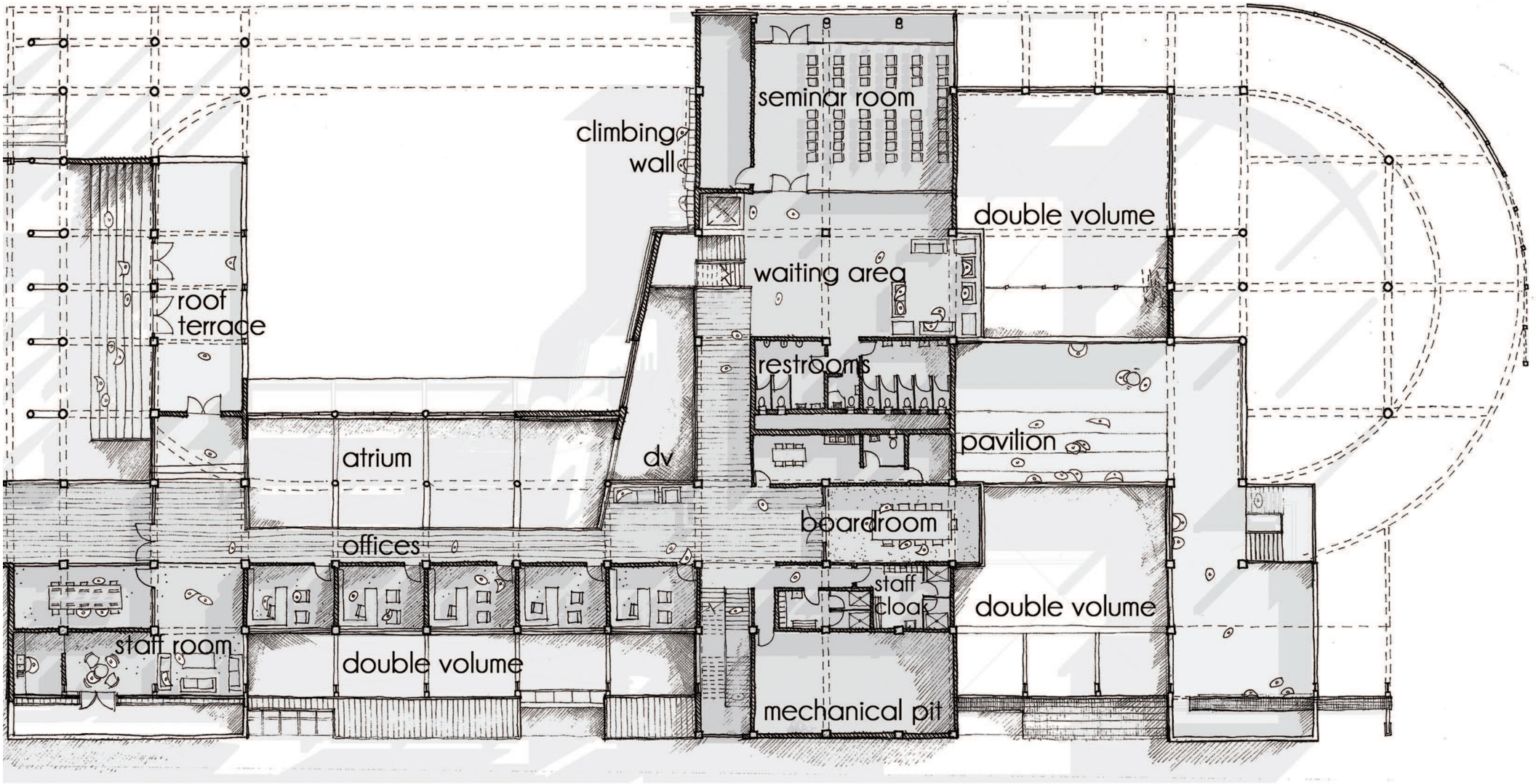


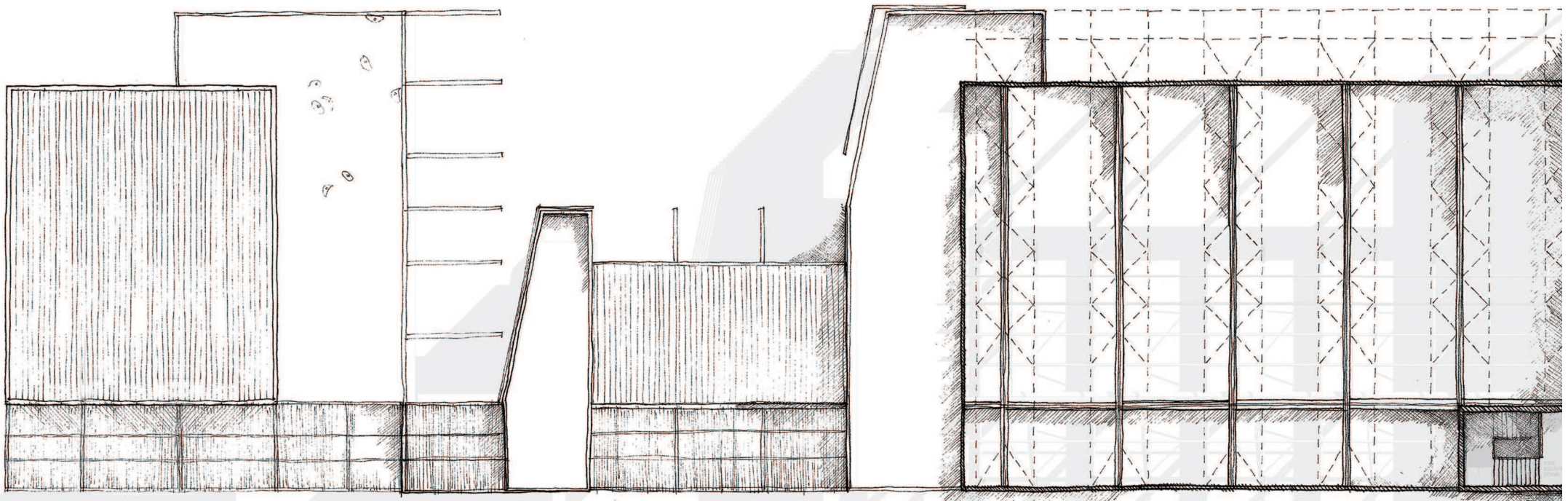
GROUND FLOOR PLAN


spruit
pedestrian route
entrance
exercise courtyard
public gym
spinning studio
multi-functional studio
cardio warm up area
retail + juice bar
gym reception
restrooms
child care facilty
waiting area
foyer
lockers
medical suite
medical reception
hydro-therapy
shallow pool

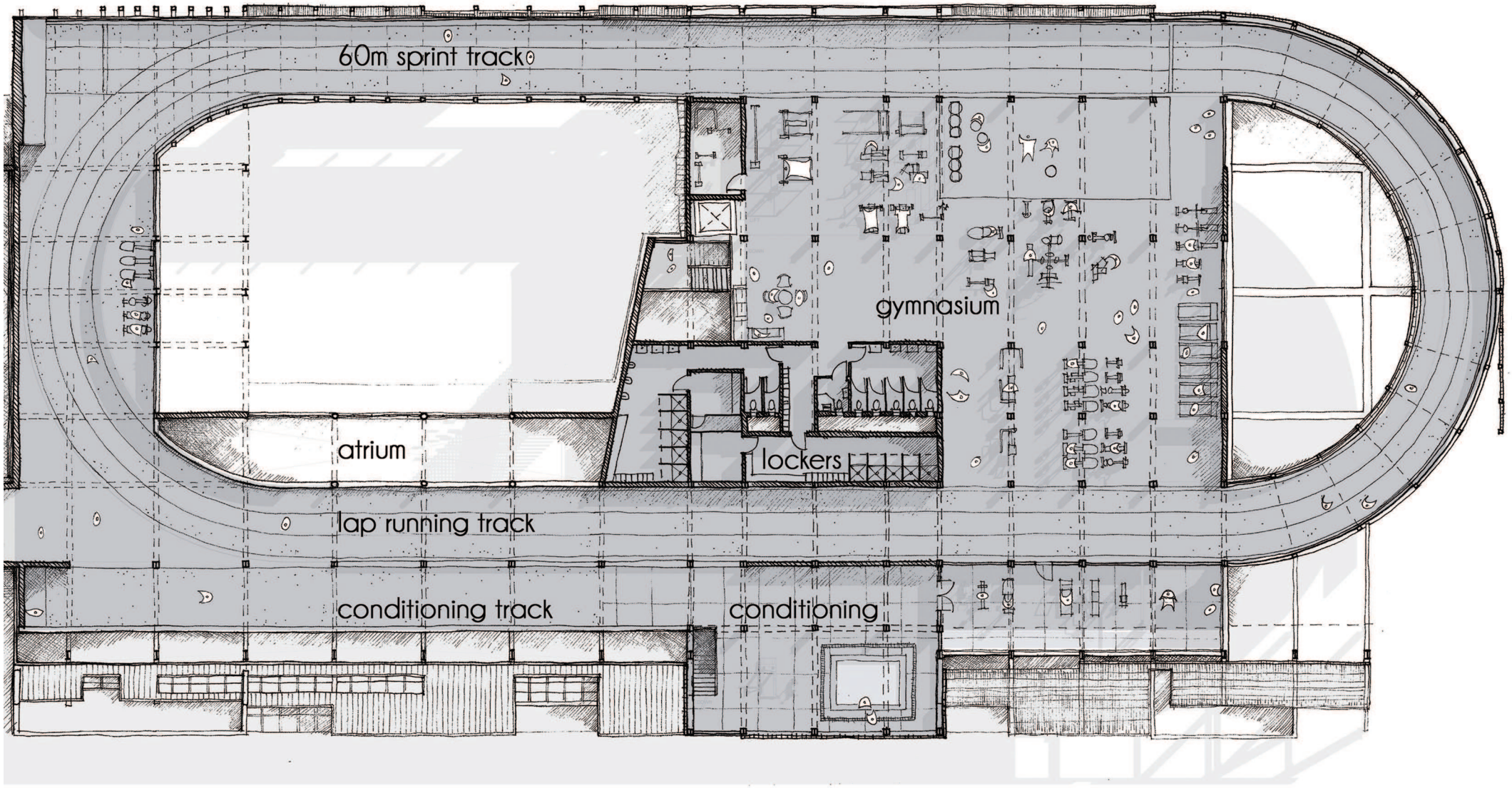


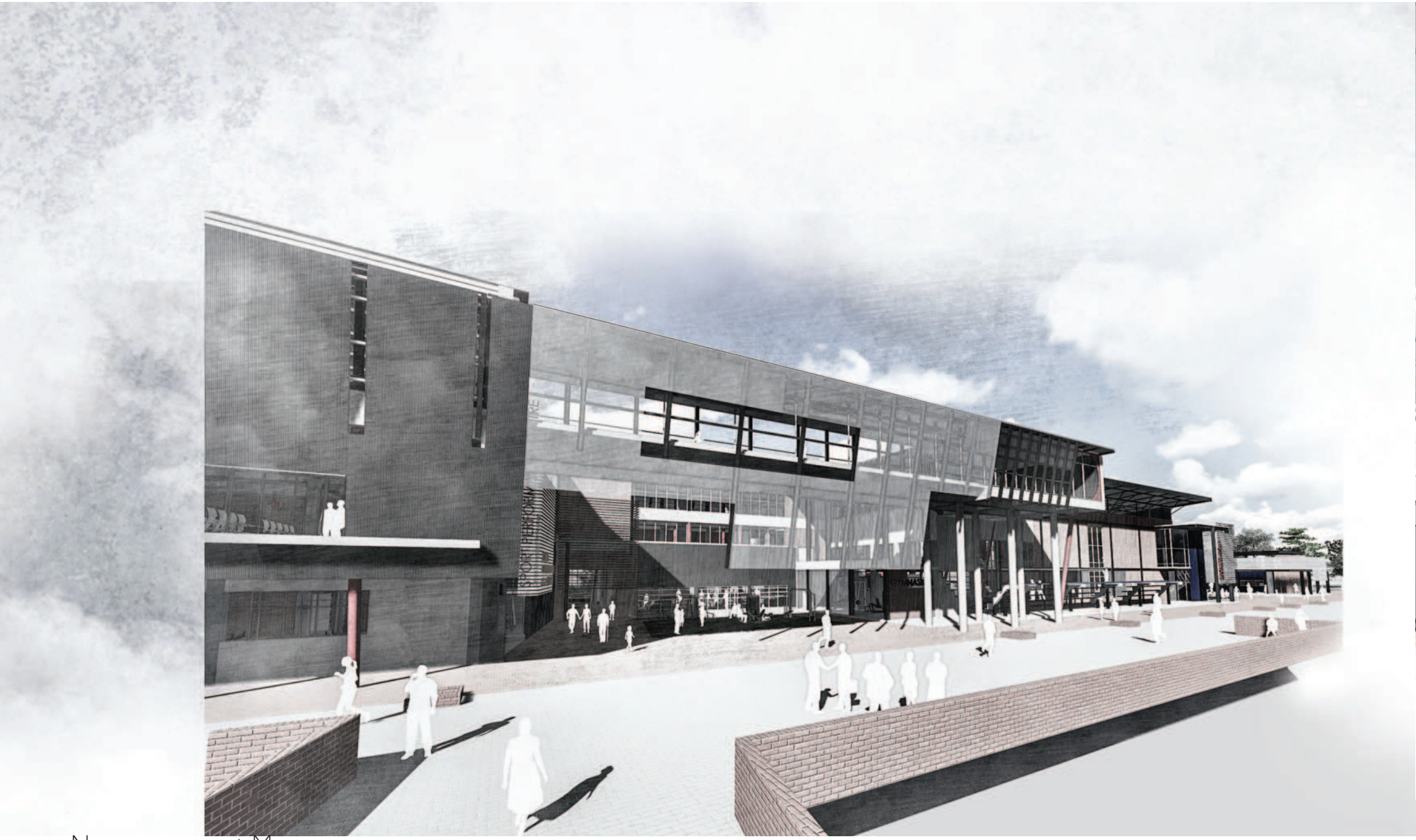
Lower first floor + First floor plan


seminar room
climbing wall
double volume
waiting area
root terrace
restrooms
atrium
dv
pavilion
boardroom
offices
staff cloak
double volume
staff room
double volume
mechanical pit

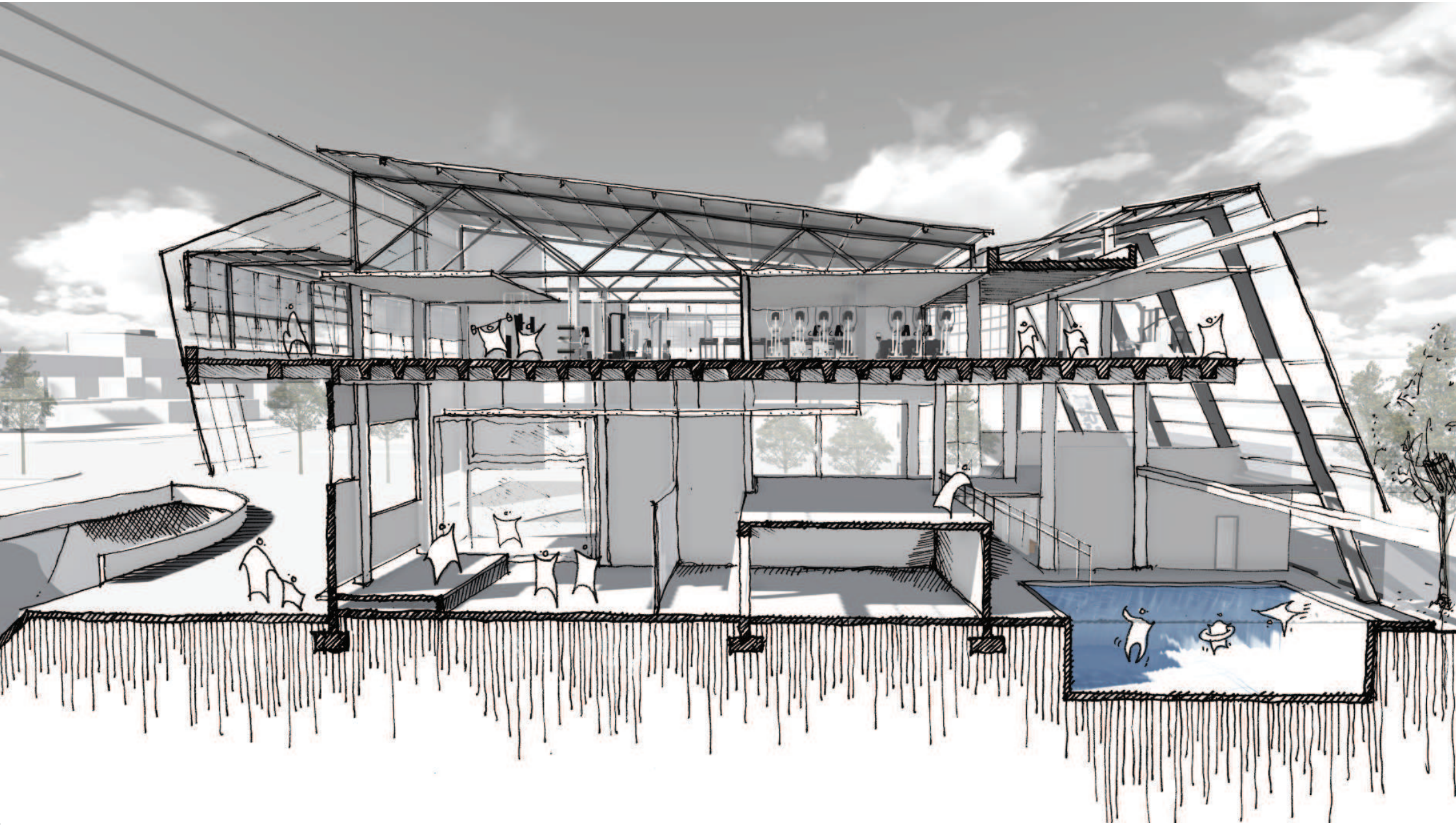


SECOND FLOOR PLAN

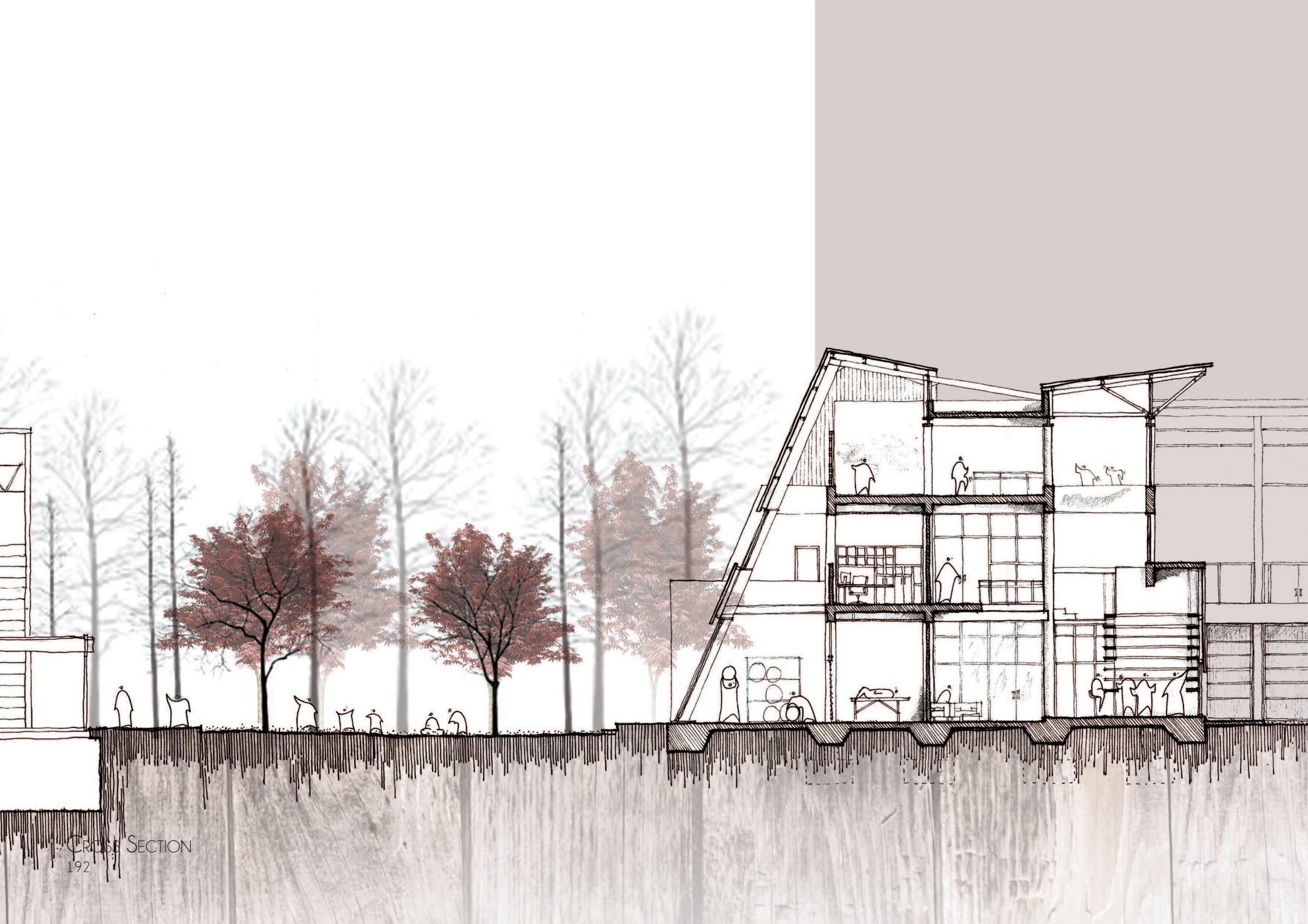

60m sprint track
gymnasium
atrium
lockers
lap running track
conditioning track
conditioning



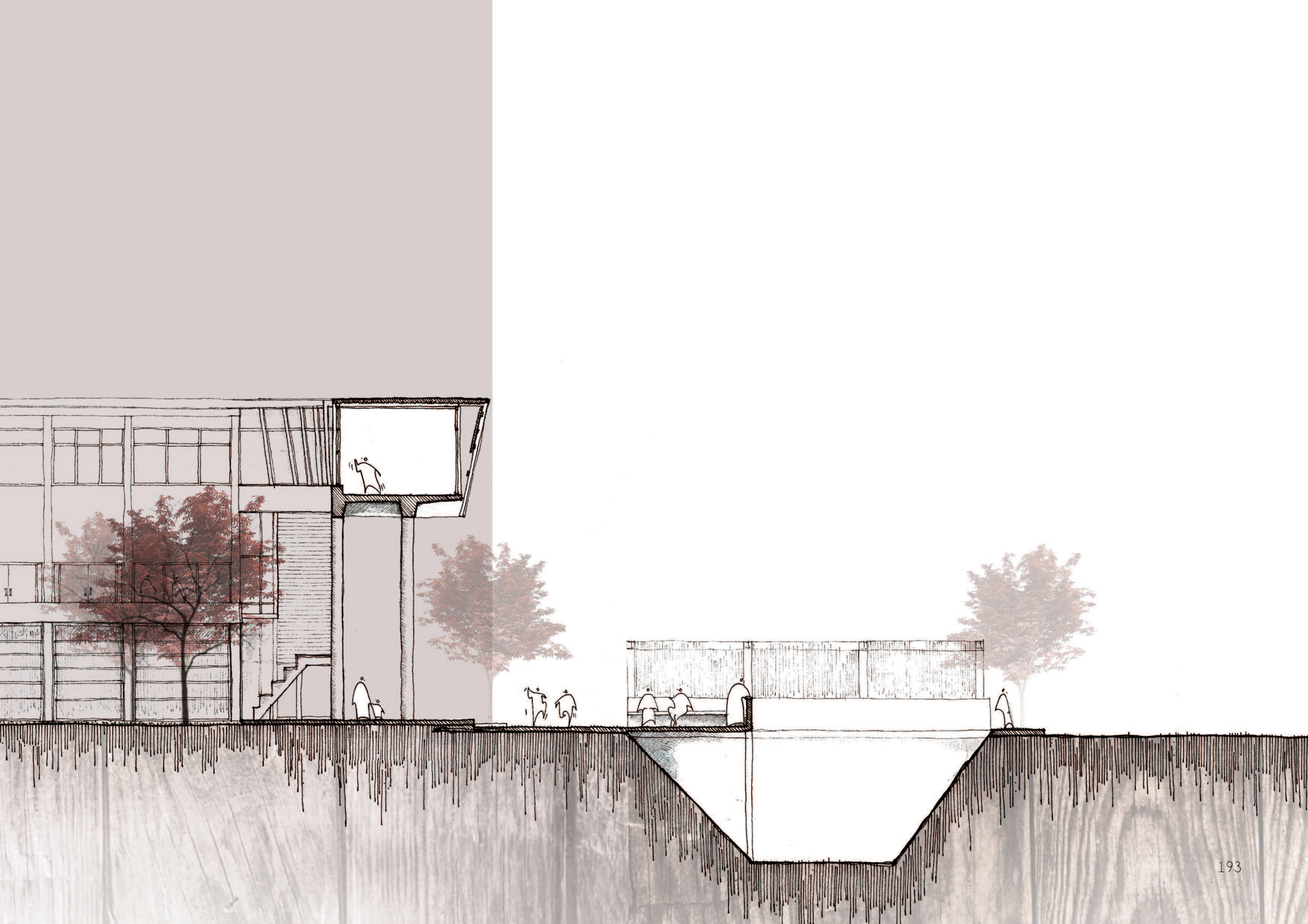
Northern facade + Main entrance

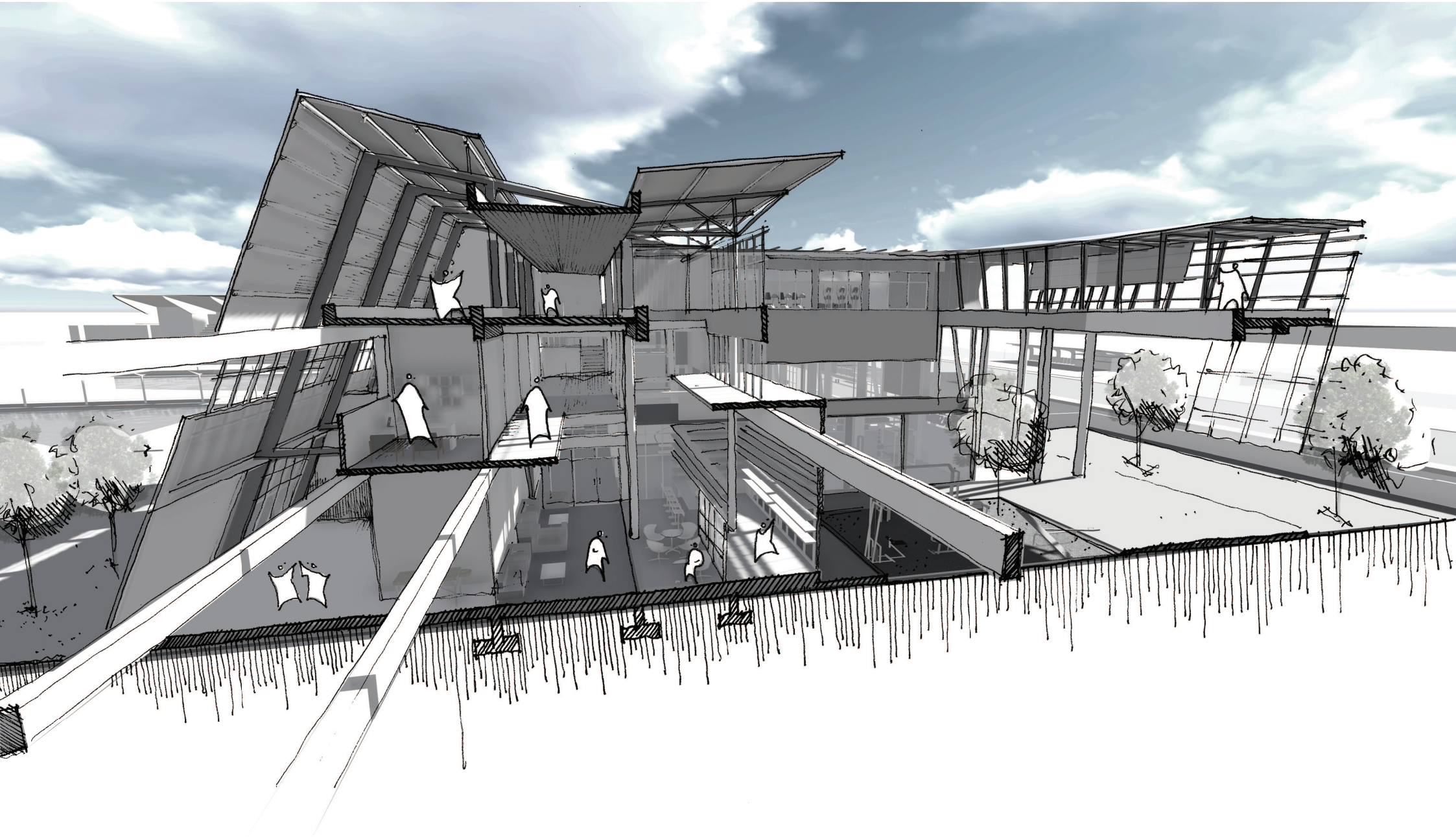


Section through gymnasium



Cross Section
192

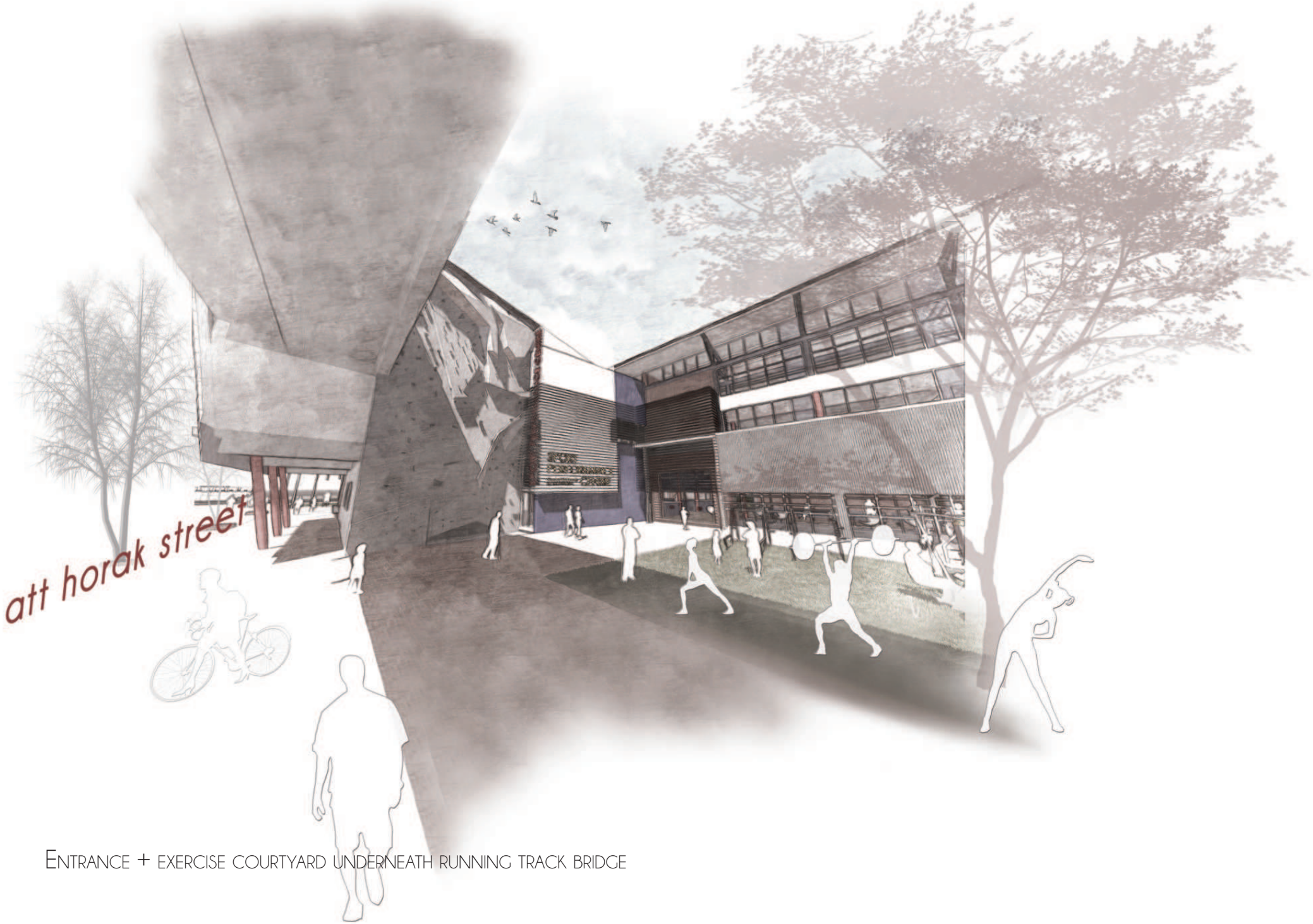




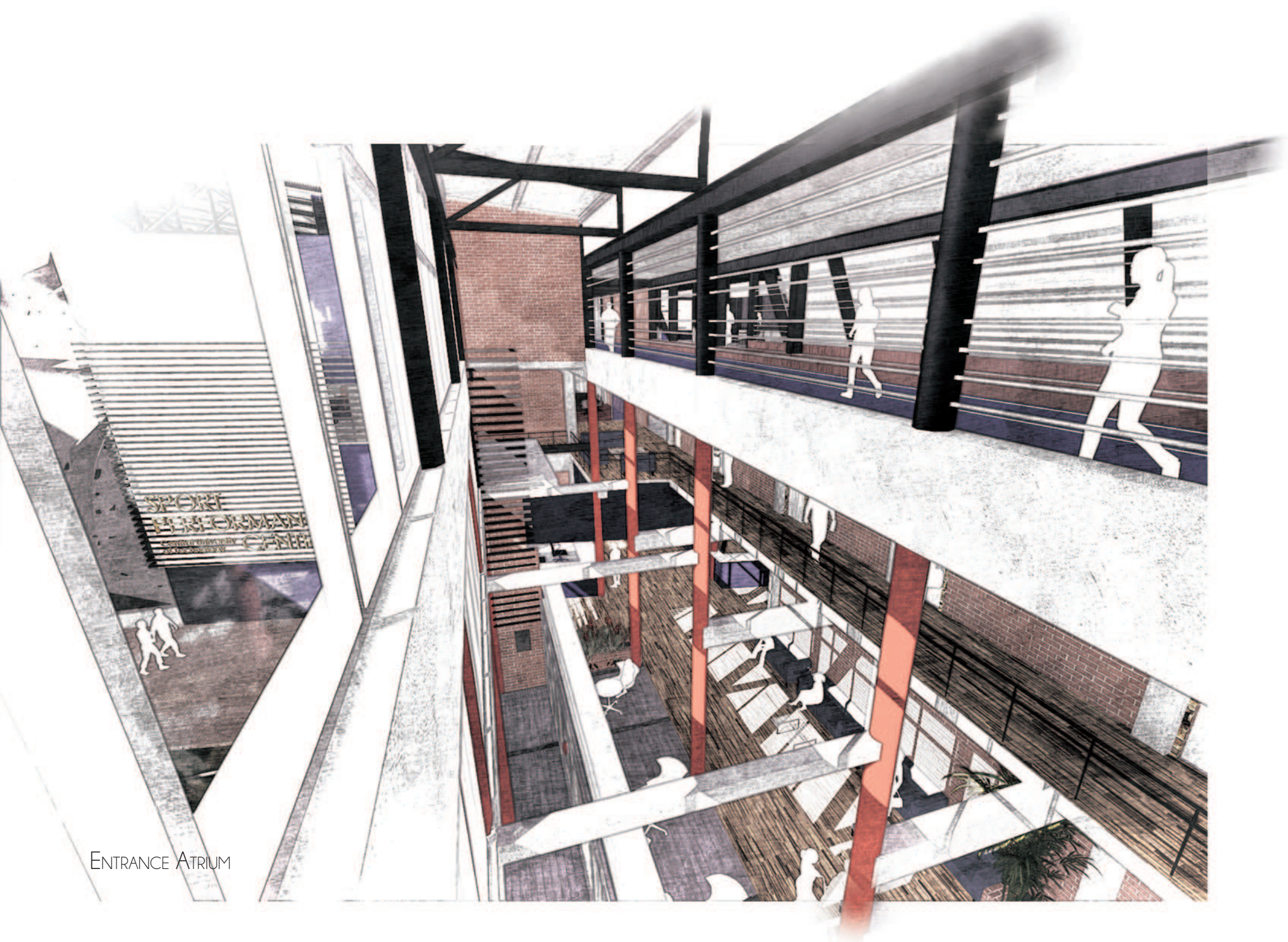
SECTION THROUGH MEDICAL FACILITIES, THE EXERCISE COURTYARD AND THE BRIDGE STRUCTURE SPANNING 25m.



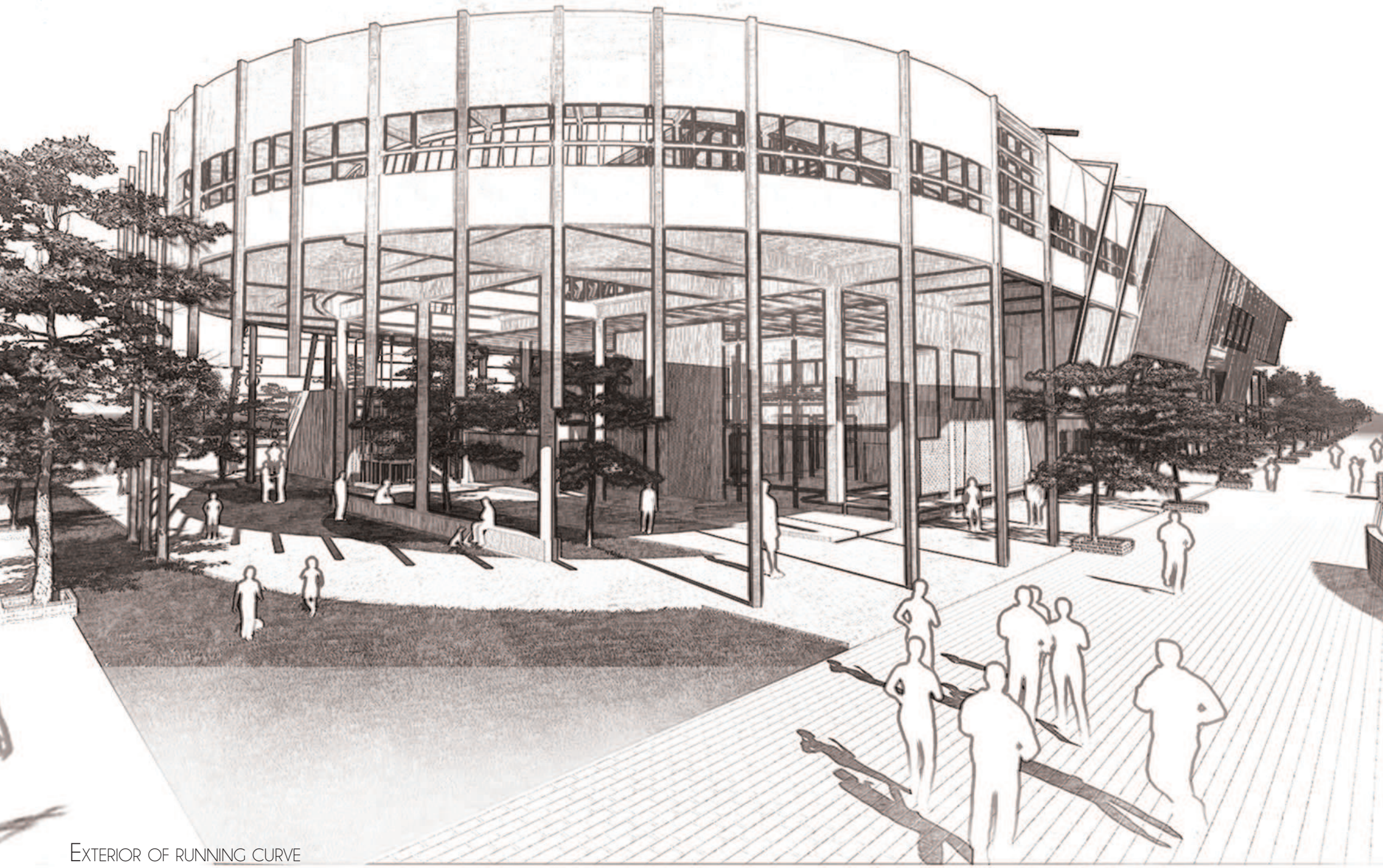
Reception + Foyer



ENTRANCE + EXERCISE COURTYARD UNDERNEATH RUNNING TRACK BRIDGE

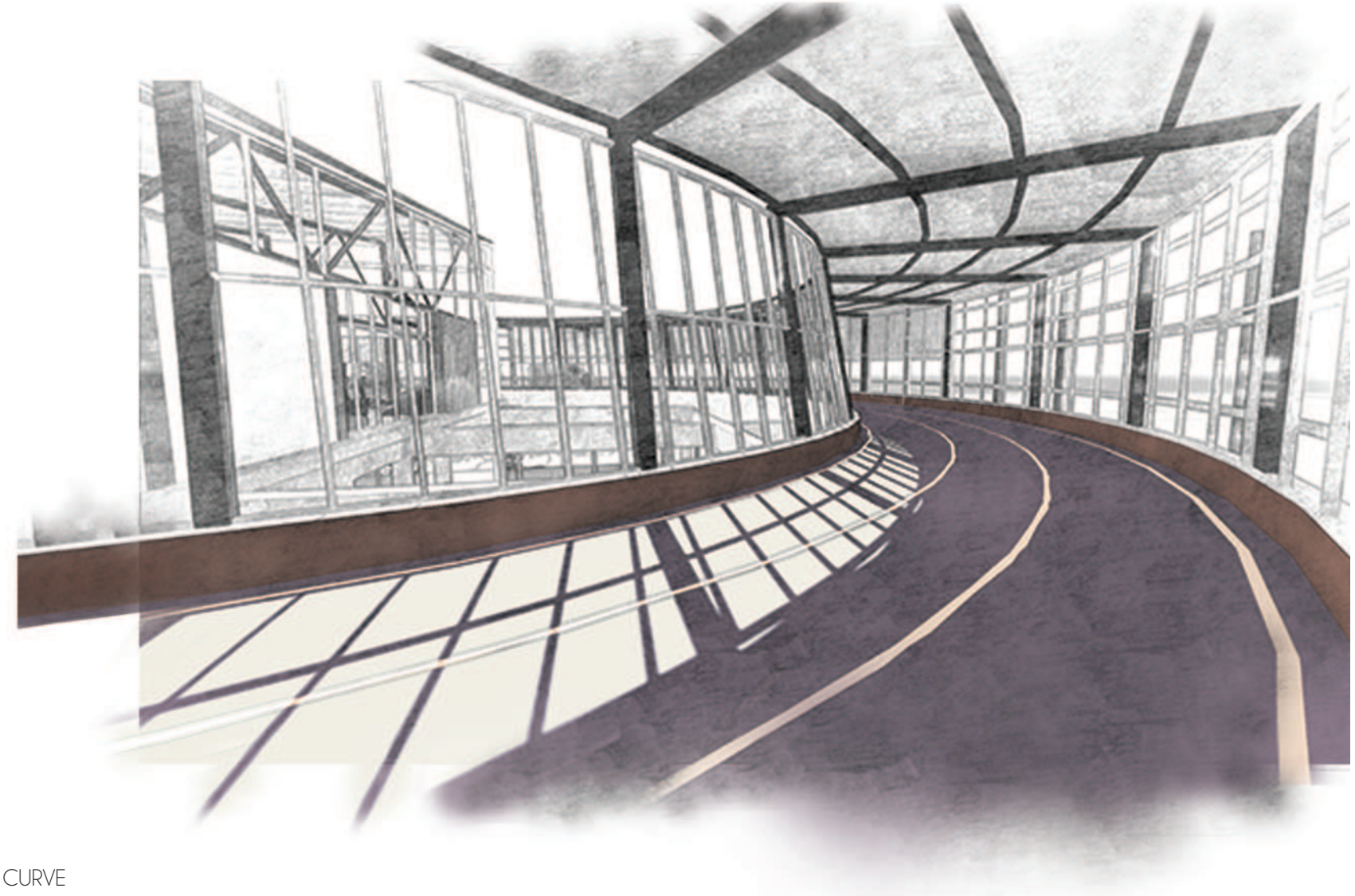


Entrance Atrium



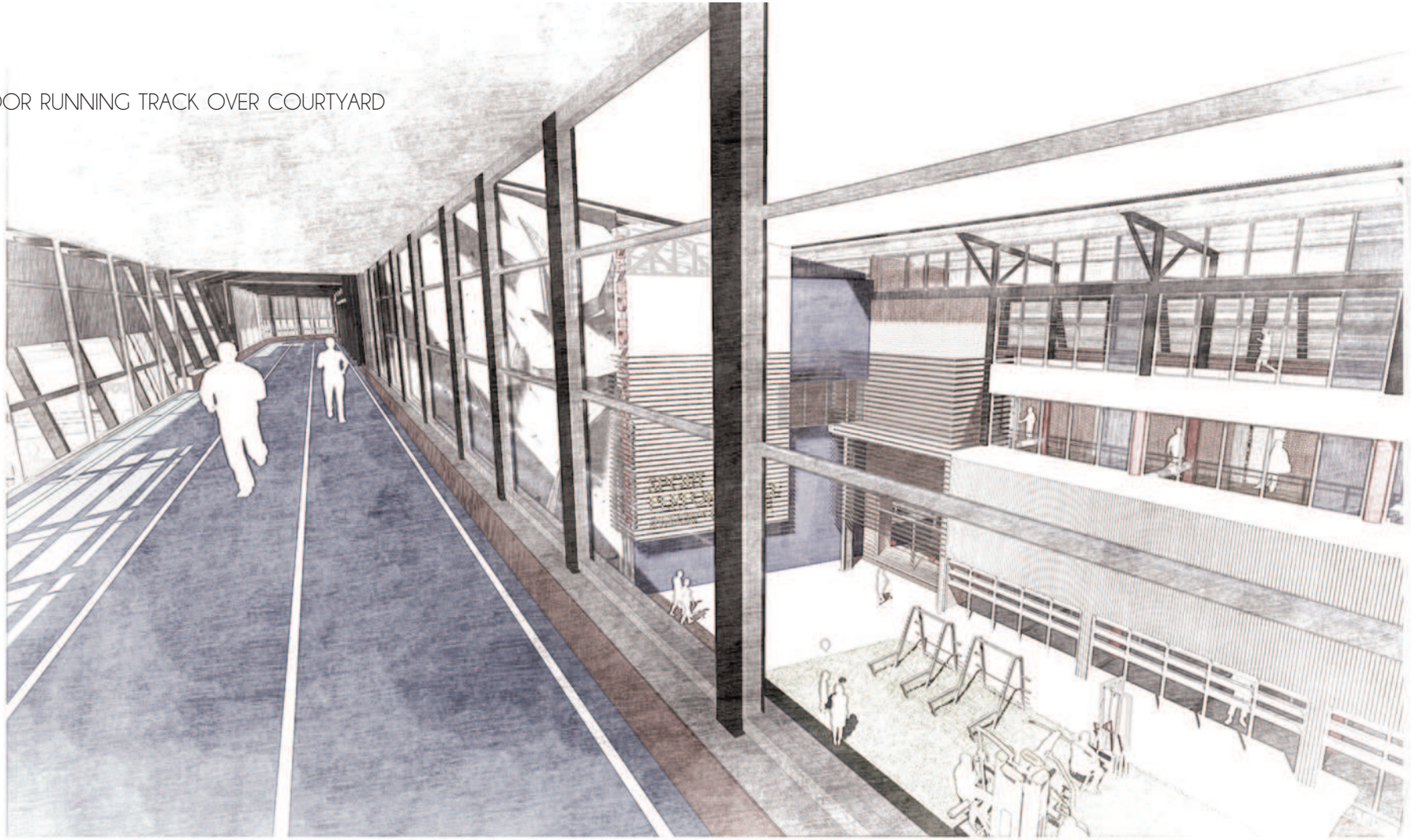
Exterior of running curve



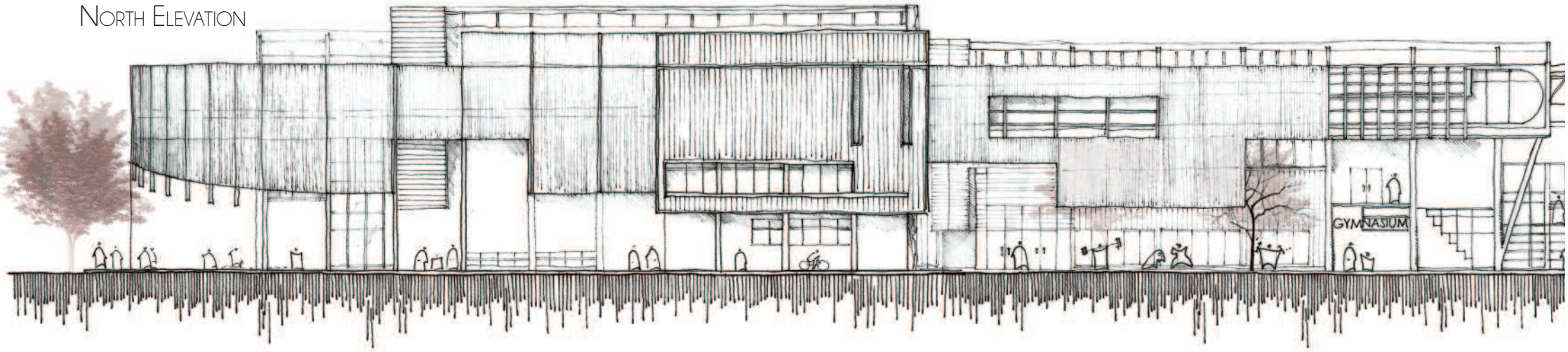


Interior of Running curve

Indoor running track over courtyard

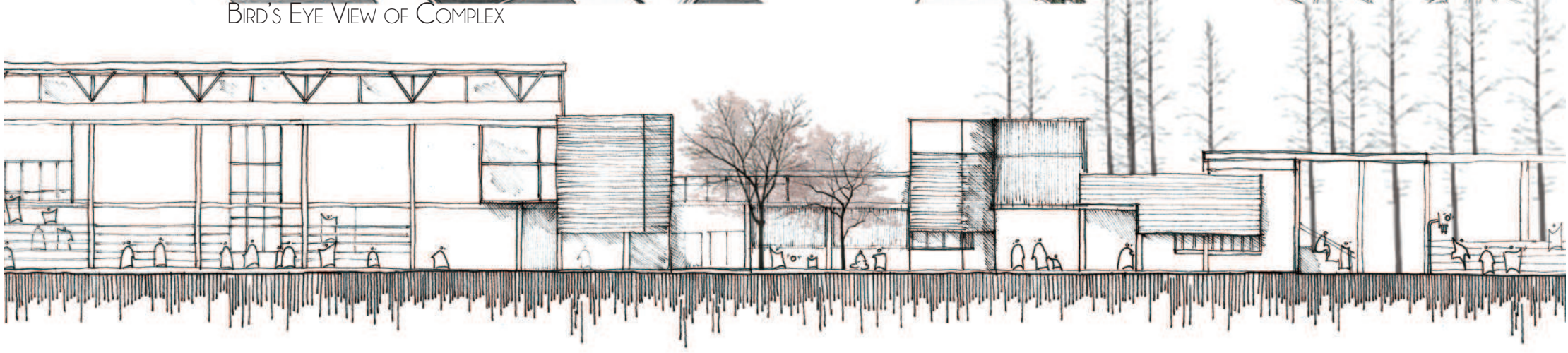


North Elevation

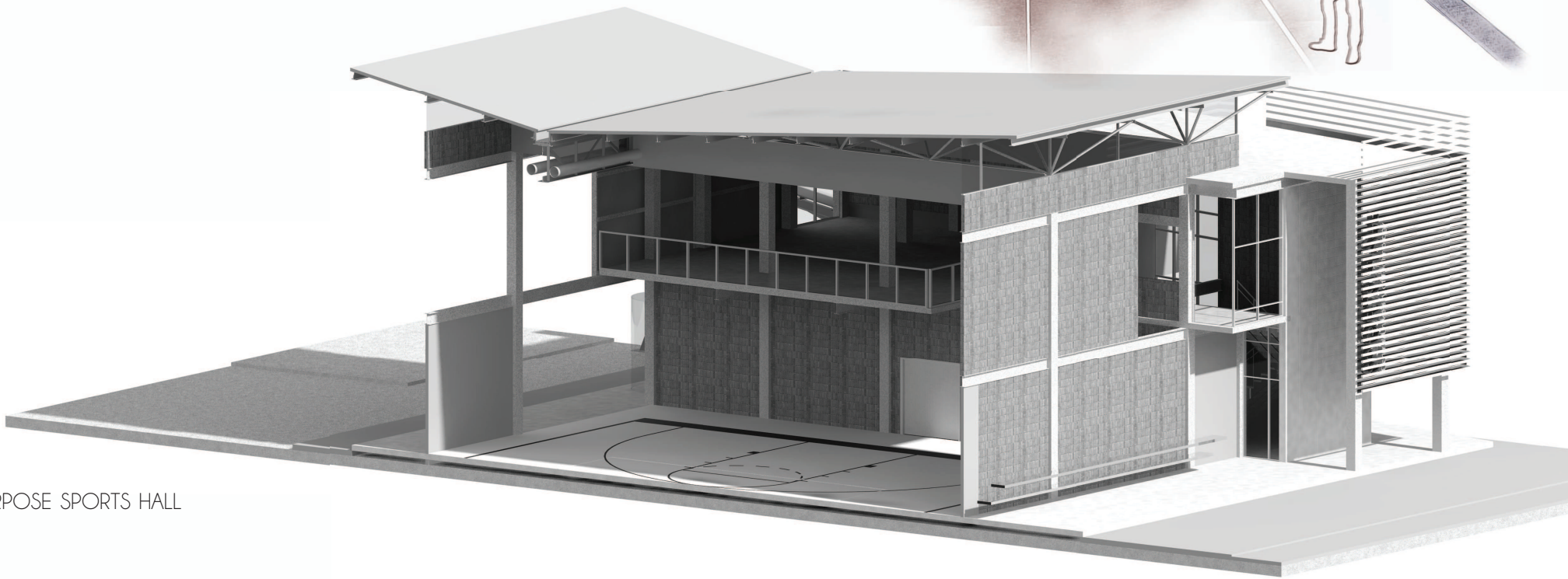




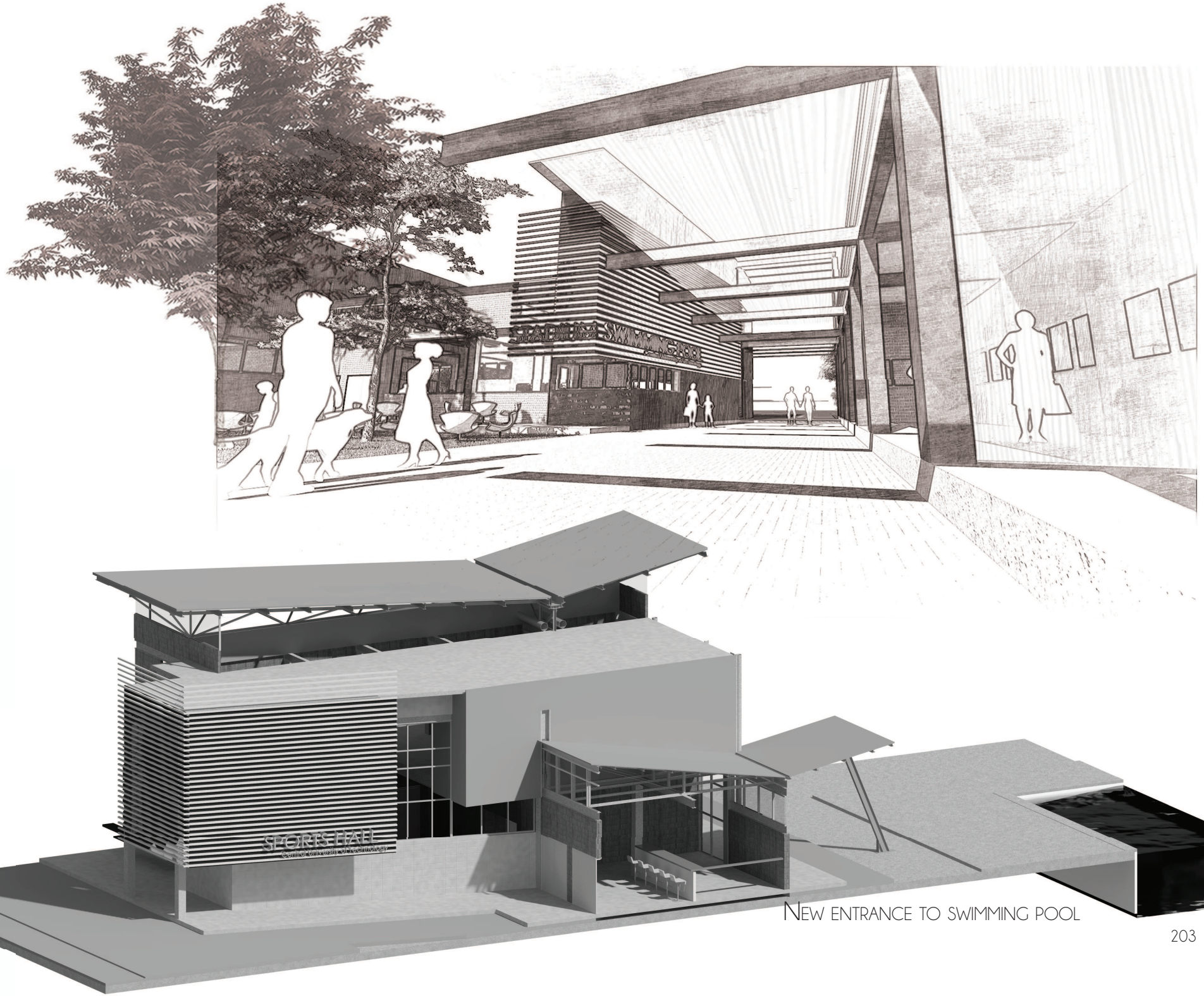
Bird's Eye View of Complex







MULTIPURPOSE SPORTS HALL



New entrance to swimming pool

[CONSTRUCTION SYNTHESIS]

Here follows a summary of the final construction elements used within the design:

SUPER-STRUCTURE

1. **Concrete column and beam structural main frame**

+ a concrete frame (a two-way slab and beam system on a basic grid of about 8m by 8m) is used for the ground and first floor structure, and solid 225mm concrete slabs are combined with one-way ribbed slabs where a 12m span were required (to achieve column-free space for the indoor pool)
+ masonry or concrete walls, infill together with glazed curtain walls
+ movable partitions (drywalls) for interior possibilities
+ suspended ceilings for services/ventilation
+ atriums/mezzanine levels are used throughout to allow certain views

2. **Steel column and beam frame for top floor and steel trusses for roof support**

+ the trusses are mostly exposed, also hosting the structural component and space for services/mechanical ventilation

3. **Free span (25m) structure for indoor running track on the second floor**

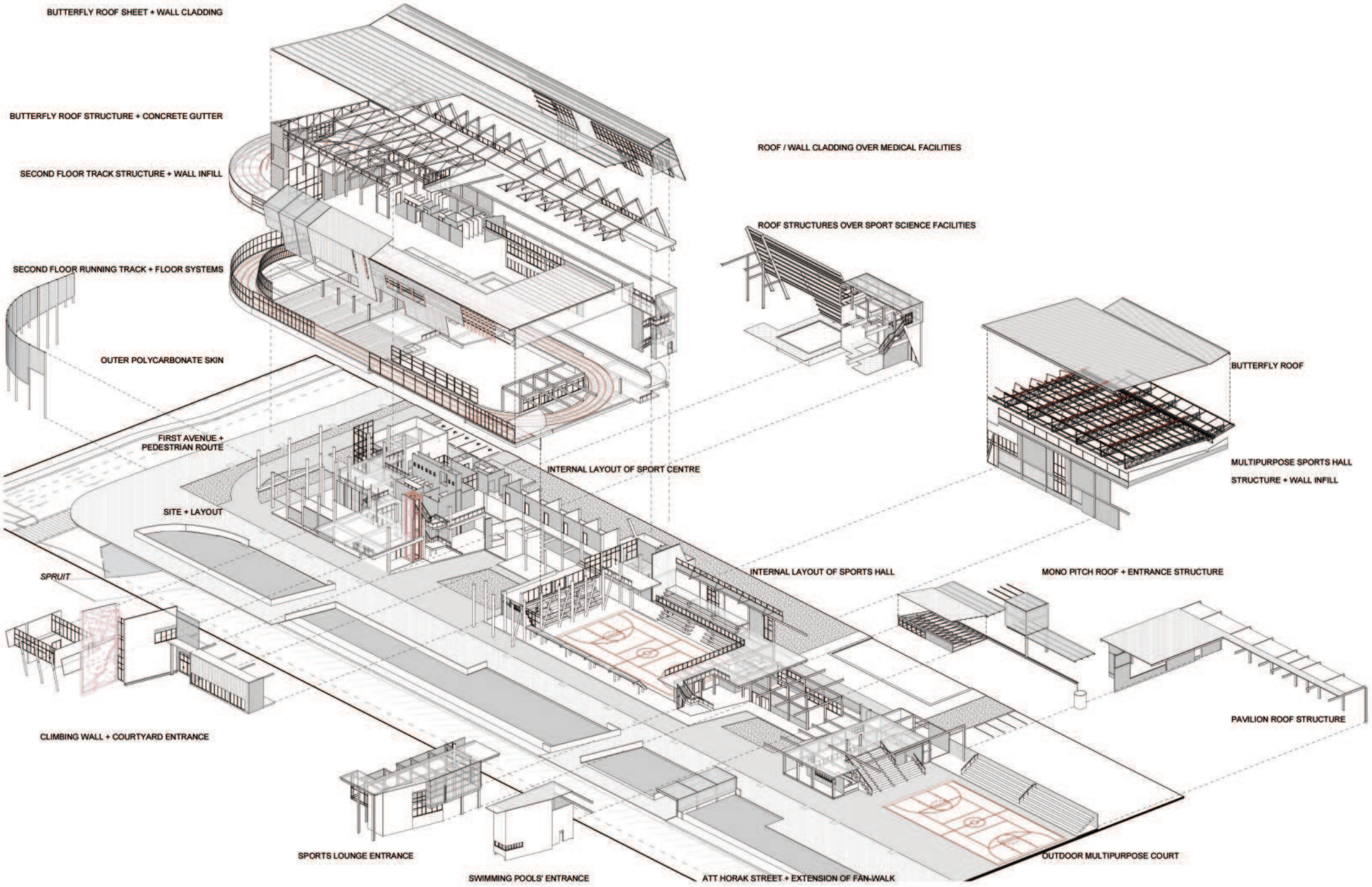
+ sprint track structured around main entrance and courtyard space
+ a custom precast, pre-stressed concrete bridge is proposed and erected on site with the use of post-tensioning to anchor the bridge between the vertical supports
+ the bridge structure is designed only as representative, and it will need to be approved and the measurements calculated by a structural engineer

4. **Skin on steel frame and facade/roof panels**

+ transparent skin to allow movement on the interior to be seen from the outside as well
+ polycarbonate used as double skin to allow light infall as well as creating an air buffer between glazing and the polycarbonate sheets
+ steel frames are also used for some facades which becomes roof structures (as shading devices through mechanical operation)

SUB-STRUCTURE

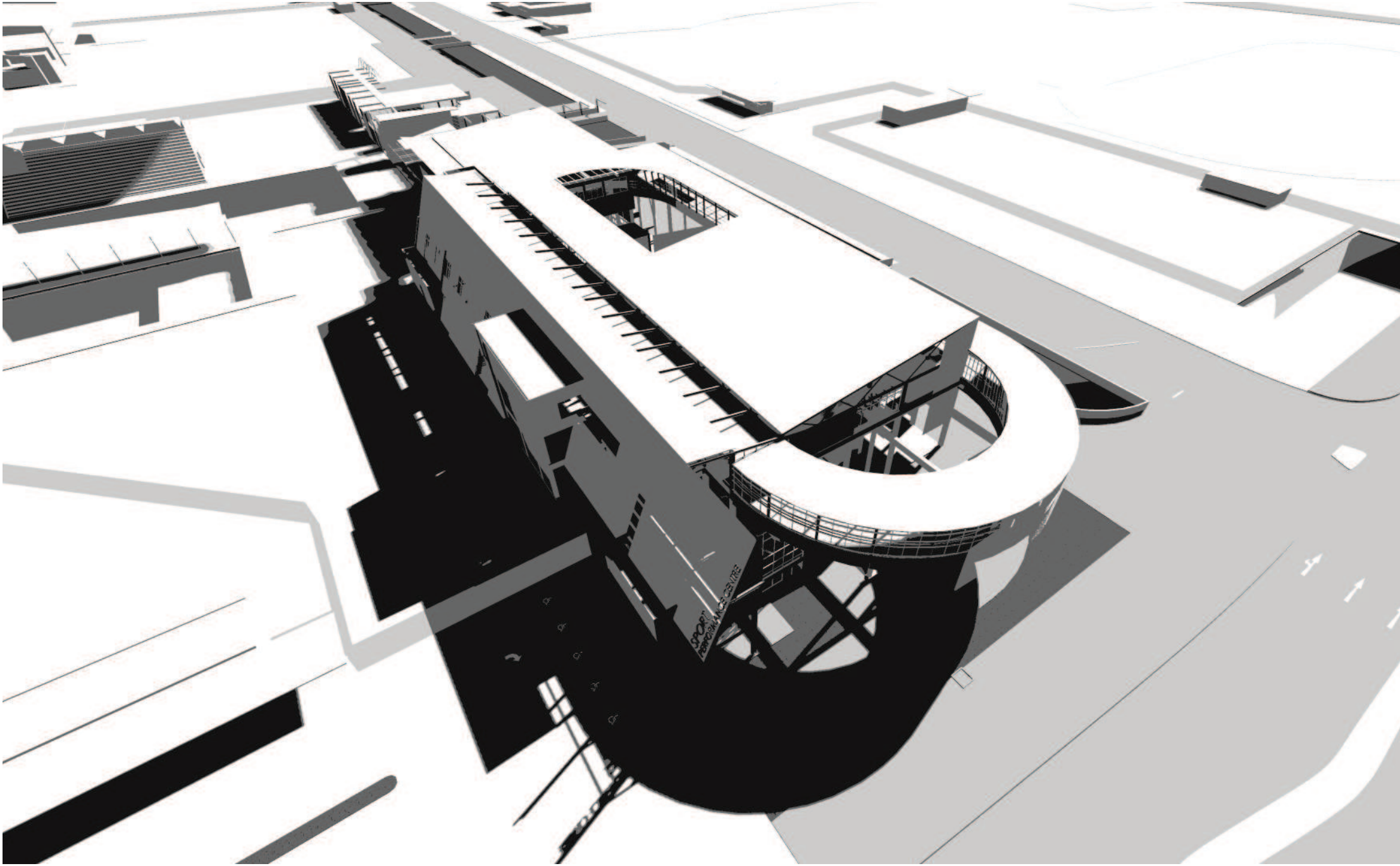
The proposed design reaches up to a maximum height of 16.5m. Situated within Bloemfontein, which contains areas where some movement has been recorded due to expansive soils (Laubscher, 2013b: 160), indicating the probability of clay soil conditions. With the height and concrete super-structure that needs support, together with transferring the load onto deeper, stronger soil, deep pad foundations will be required. The site location next to the *spruit* also increases the necessity for deep foundations to stabilise the weight.

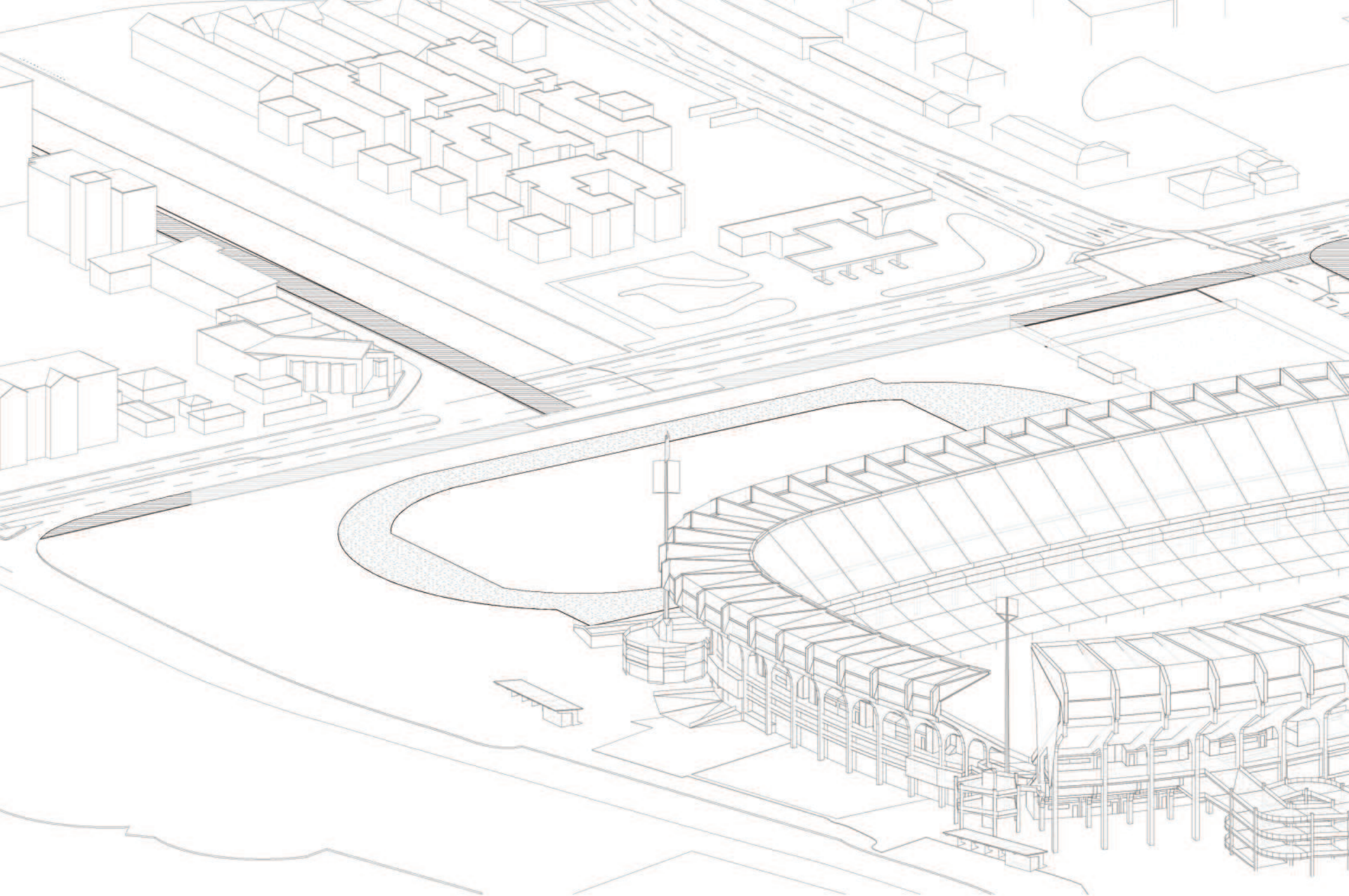

BUTTERFLY ROOF SHEET + WALL CLADDING
BUTTERFLY ROOF STRUCTURE + CONCRETE GUTTER
SECOND FLOOR TRACK STRUCTURE + WALL INFILL
SECOND FLOOR RUNNING TRACK + FLOOR SYSTEMS
OUTER POLYCARBONATE SKIN
FIRST AVENUE + PEDESTRIAN ROUTE
SITE + LAYOUT
SPRUIT
CLIMBING WALL + COURTYARD ENTRANCE
SPORTS LOUNGE ENTRANCE
SWIMMING POOLS' ENTRANCE
ATT HORAK STREET + EXTENSION OF FAN-WALK
INTERNAL LAYOUT OF SPORT CENTRE
INTERNAL LAYOUT OF SPORTS HALL
ROOF / WALL CLADDING OVER MEDICAL FACILITIES
ROOF STRUCTURES OVER SPORT SCIENCE FACILITIES
BUTTERFLY ROOF
MULTIPURPOSE SPORTS HALL
STRUCTURE + WALL INFILL
MONO PITCH ROOF + ENTRANCE STRUCTURE
PAVILION ROOF STRUCTURE
OUTDOOR MULTIPURPOSE COURT

TECHNICAL DOCUMENTATION

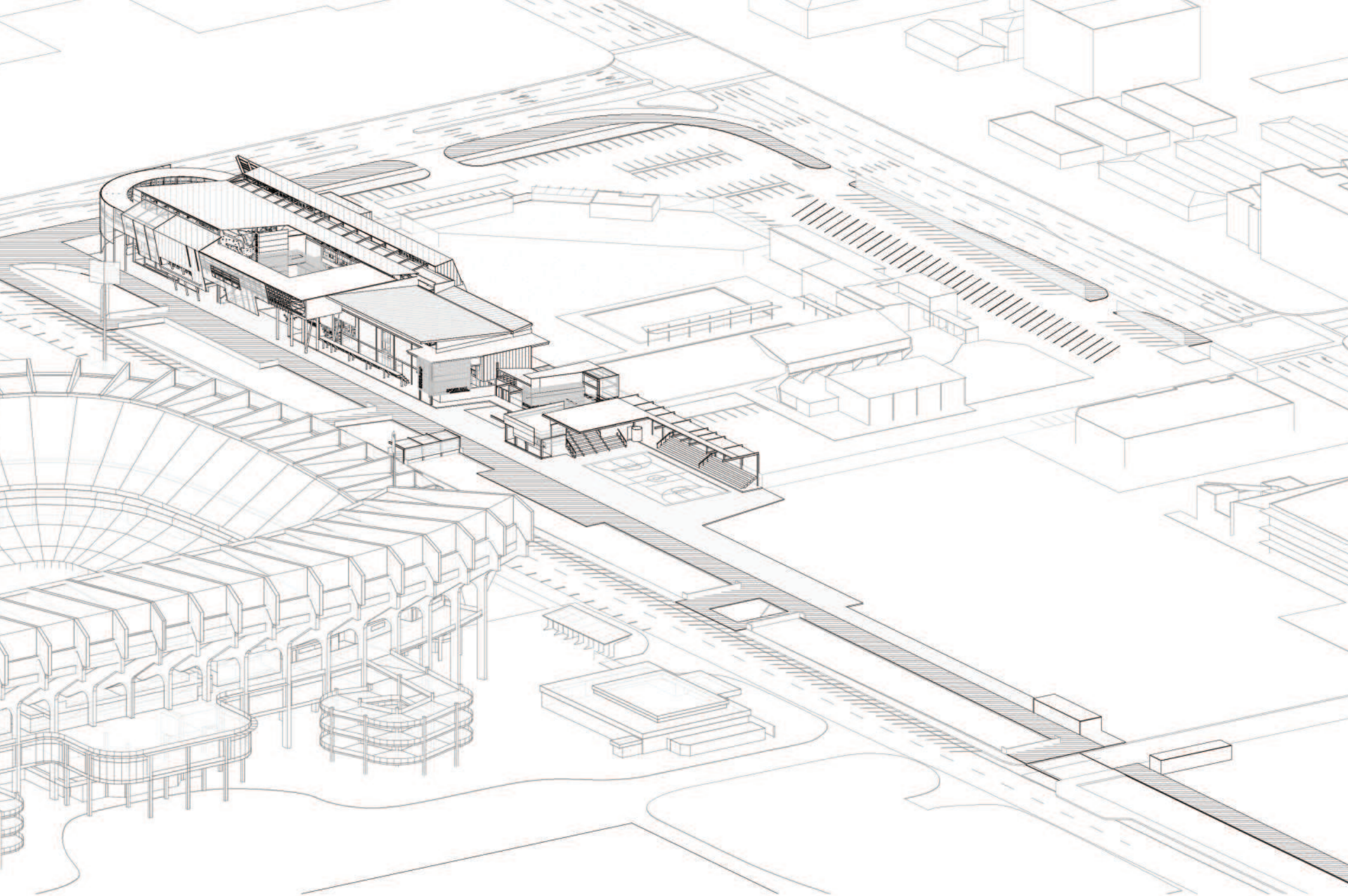
The following documents were presented within the final examination:

+ Locality plan	[1:20 000]
+ Area plan	[1:2 000]
+ Site plan	[1:500]
+ Axonometric	[1:200]
+ Ground floor plan	[1:100]
+ First floor plan	[1:100]
+ Second floor plan	[1:100]
+ Roof plan	[1:200]
+ Basement plan	[1:50]
+ South elevation	[1:100]
+ North elevation	[1:100]
+ East elevation	[1:100]
+ West elevation	[1:100]
+ 3D Longitudinal Section AA	[1:100]
+ Cross section BB	[1:50]
+ Cross section CC	[1:50]
+ Multiple exploded 3D sections	
+ Multiple detail drawings	


SPORTS
PERFORMANCE CENTRE

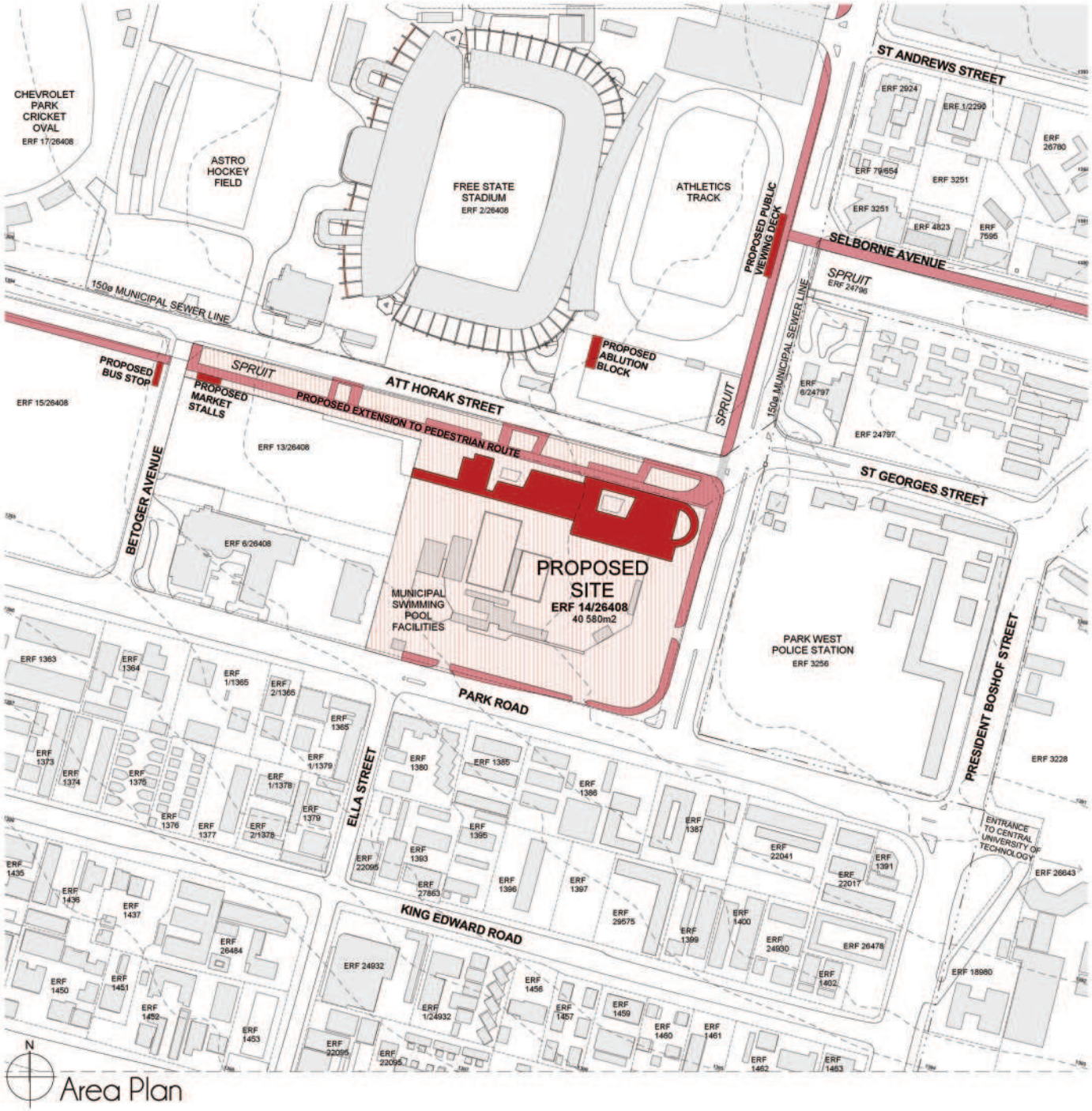


Perspective View of the Proposed Sport Performance Centre





Locality Plan scale 1:20 000


CHEVROLET PARK CRICKET OVAL
ERF 17/26408
ASTRO HOCKEY FIELD
FREE STATE STADIUM
ERF 2/26408
ATHLETICS TRACK
ST ANDREWS STREET
ERF 2924
ERF 1/2290
ERF 26780
ERF 79/654
ERF 3251
ERF 3251
ERF 4823
ERF 7595
PROPOSED PUBLIC VIEWING DECK
SELBORNE AVENUE
SPRUIT
ERF 24798
150ø MUNICIPAL SEWER LINE
150ø MUNICIPAL SEWER LINE
PROPOSED BUS STOP
SPRUIT
PROPOSED MARKET STALLS
ATT HORAK STREET
PROPOSED EXTENSION TO PEDESTRIAN ROUTE
PROPOSED ABLUTION BLOCK
SPRUIT
ERF 6/24797
ERF 24797
ERF 15/26408
ERF 13/26408
BETOGER AVENUE
ERF 6/26408
ST GEORGES STREET
PROPOSED SITE
ERF 14/26408
40 580m2
MUNICIPAL SWIMMING POOL FACILITIES
PARK WEST POLICE STATION
ERF 3256
PRESIDENT BOSHOF STREET
ERF 3228
PARK ROAD
ERF 1363
ERF 1364
ERF 1/1365
ERF 2/1365
ERF 1365
ERF 1373
ERF 1374
ERF 1375
ERF 1/1379
ERF 1/1378
ERF 1379
ERF 1376
ERF 1377
ERF 2/1378
ELLA STREET
ERF 1380
ERF 1385
ERF 1386
ERF 1387
ERF 1395
ERF 1393
ERF 22095
ERF 27863
ERF 1396
ERF 1397
ERF 22041
ERF 1391
ERF 22017
ENTRANCE TO CENTRAL UNIVERSITY OF TECHNOLOGY
ERF 26643
ERF 1435
ERF 1436
ERF 1437
KING EDWARD ROAD
ERF 26484
ERF 29575
ERF 1400
ERF 1399
ERF 24930
ERF 26478
ERF 24932
ERF 1402
ERF 18980
ERF 1450
ERF 1451
ERF 1452
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ERF 1/24932
ERF 1456
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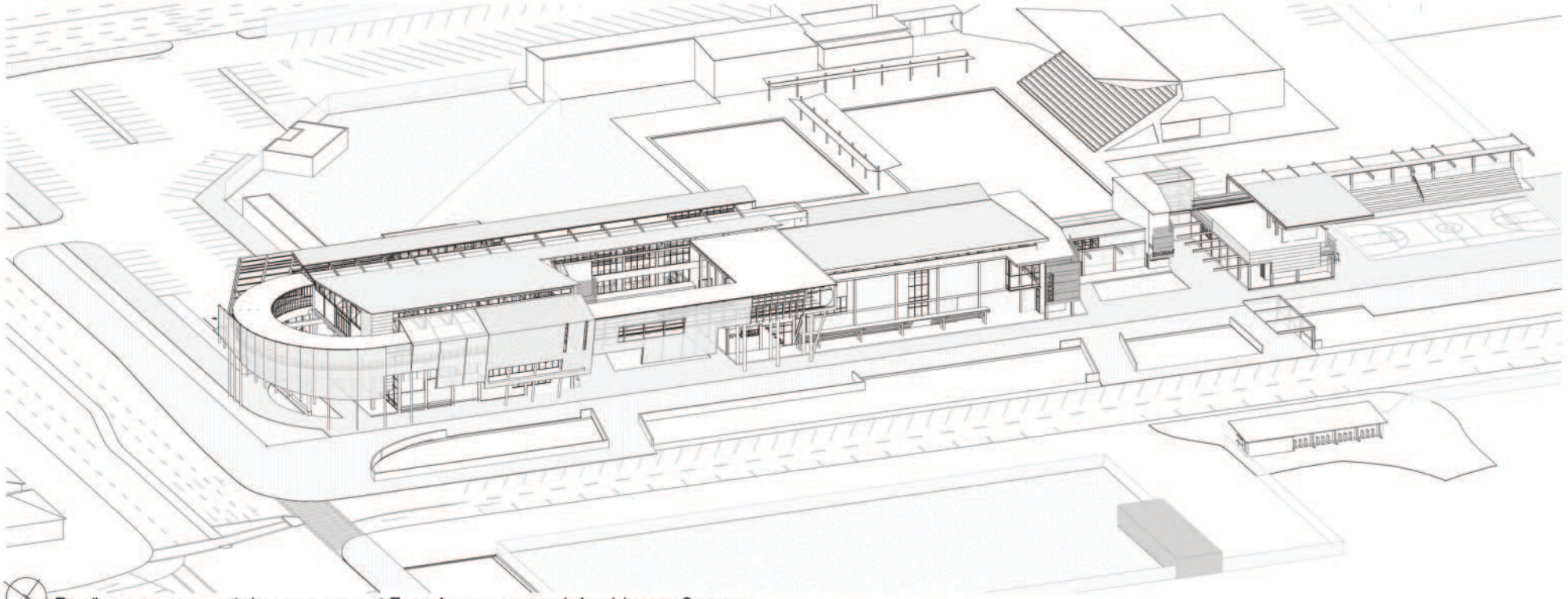
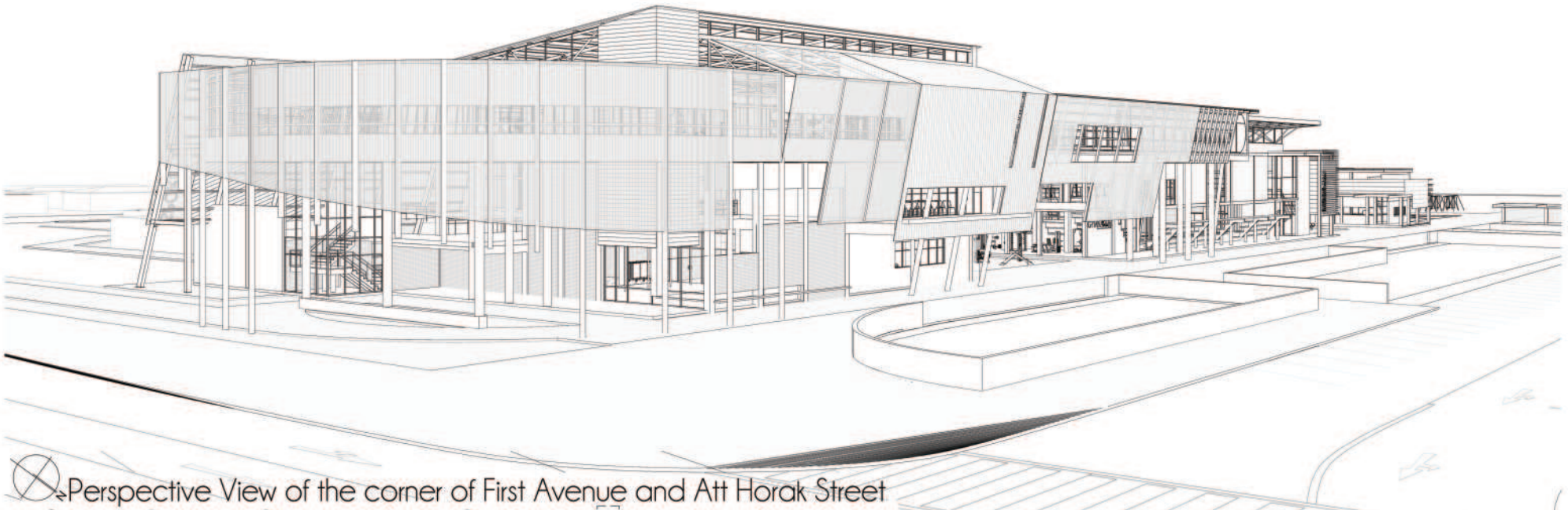
ERF 1463
N

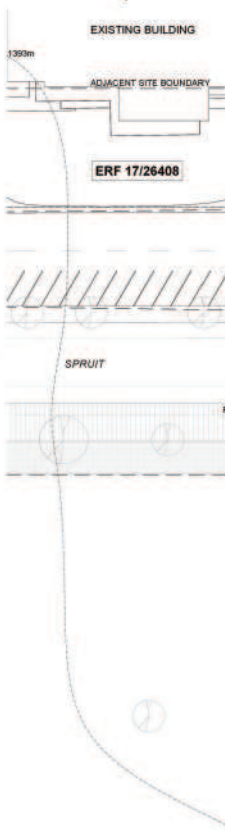
Area Plan



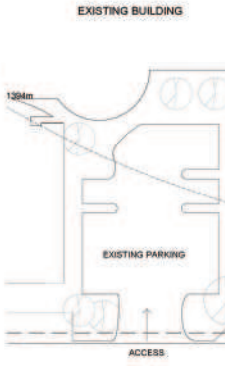
Bird's eye view of the corner of First Avenue and Att Horak Street



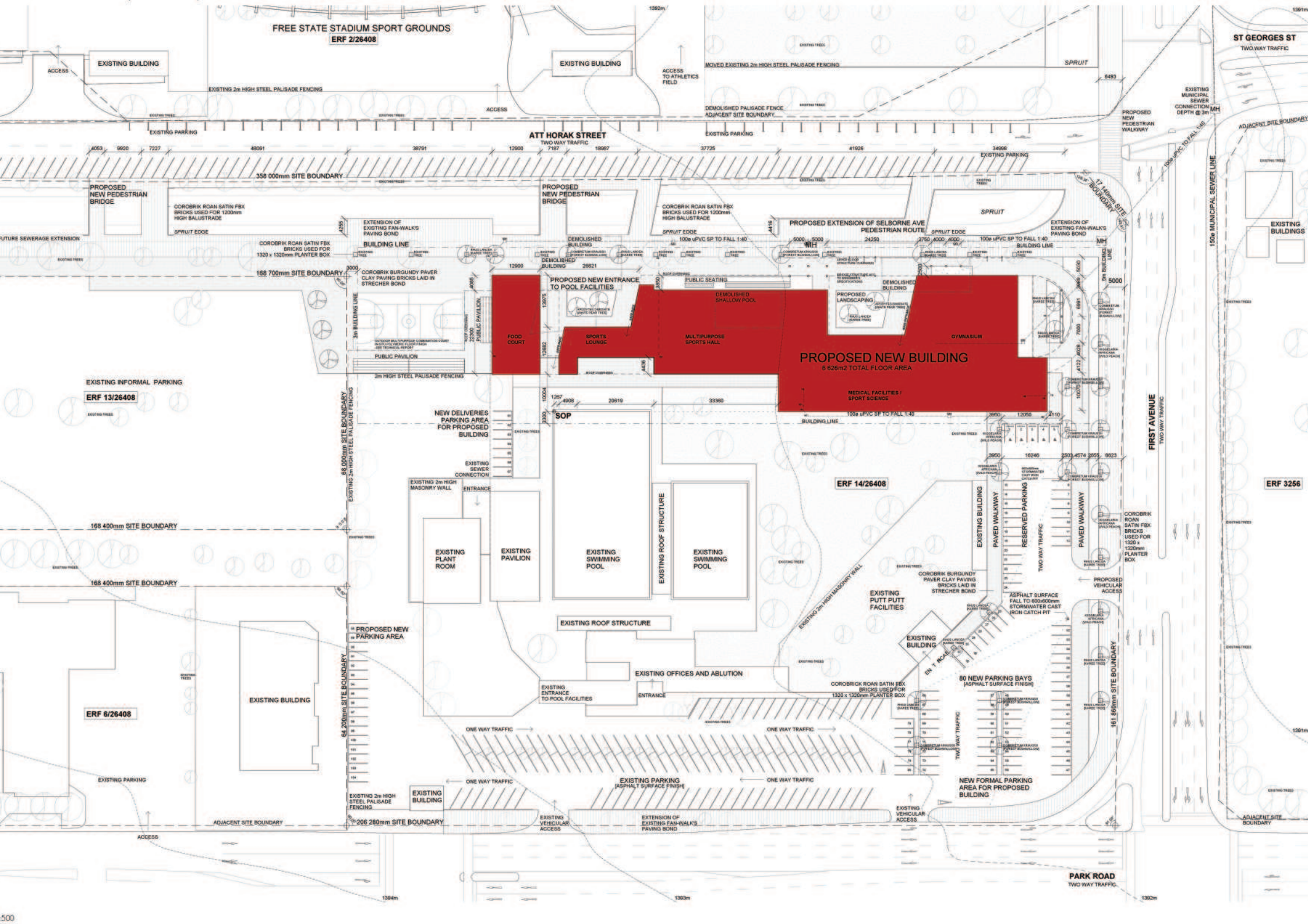
Perspective View of the corner of First Avenue and Att Horak Street

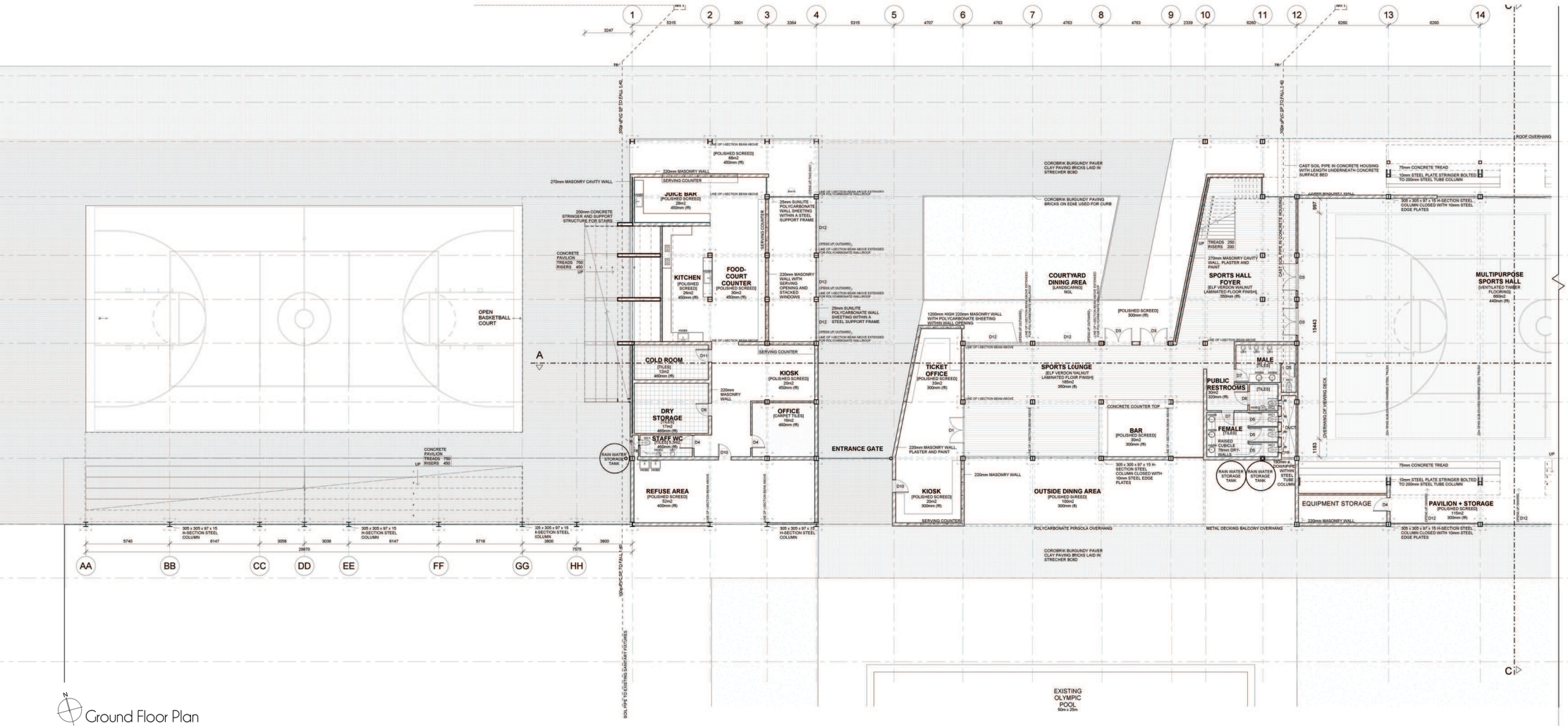




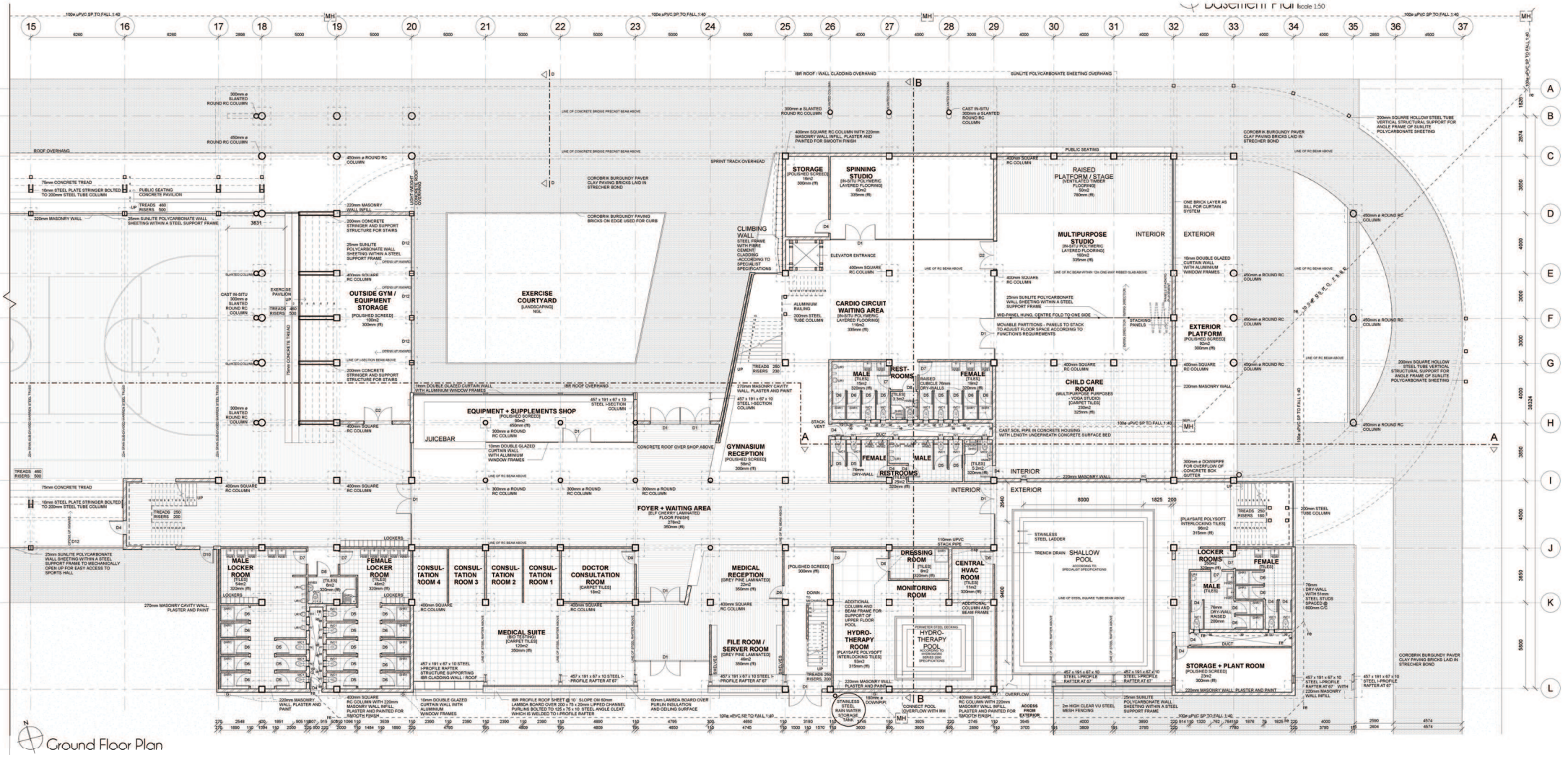


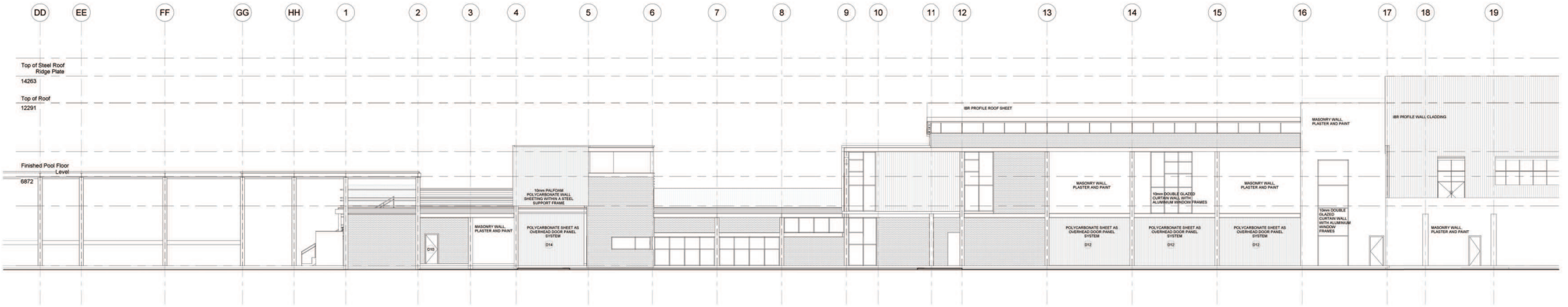



FREE STATE STADIUM SPORT GROUNDS
ERF 2/26408
EXISTING BUILDING
ACCESS
EXISTING 2m HIGH STEEL PALISADE FENCING
EXISTING PARKING
ATT HORAK STREET
TWO WAY TRAFFIC
ACCESS TO ATHLETICS FIELD
MOVED EXISTING 2m HIGH STEEL PALISADE FENCING
SPRUIT
DEMOLISHED PALISADE FENCE ADJACENT SITE BOUNDARY
ST GEORGES ST
TWO WAY TRAFFIC
EXISTING MUNICIPAL SEWER CONNECTION DEPTH @ 3m
MH
PROPOSED NEW PEDESTRIAN WALKWAY
ADJACENT SITE BOUNDARY
358 000mm SITE BOUNDARY
PROPOSED NEW PEDESTRIAN BRIDGE
COROBRIK ROAN SATIN FBX BRICKS USED FOR 1200mm HIGH BALUSTRADE
SPRUIT EDGE
FUTURE SEWERAGE EXTENSION
EXTENSION OF EXISTING PAN-WALK'S PAVING BOND
BUILDING LINE
COROBRIK ROAN SATIN FBX BRICKS USED FOR 1320 x 1320mm PLANTER BOX
168 700mm SITE BOUNDARY
COROBRIK BURGUNDY PAVER CLAY PAVING BRICKS LAID IN STRECHER BOND
DEMOLISHED BUILDING
PROPOSED NEW ENTRANCE TO POOL FACILITIES
PUBLIC SEATING
DEMOLISHED SHALLOW POOL
PROPOSED LANDSCAPING
PROPOSED EXTENSION OF SELBORNE AVE PEDESTRIAN ROUTE
100ø uPVC SP TO FALL 1:40
17 140mm SITE BOUNDARY
150ø MUNICIPAL SEWER LINE
EXISTING BUILDINGS
3m BUILDING LINE
PUBLIC PAVILION
FOOD COURT
SPORTS LOUNGE
MULTIPURPOSE SPORTS HALL
GYMNASIUM
PROPOSED NEW BUILDING
6 626m2 TOTAL FLOOR AREA
MEDICAL FACILITIES / SPORT SCIENCE
2m HIGH STEEL PALISADE FENCING
EXISTING INFORMAL PARKING
ERF 13/26408
68 000mm SITE BOUNDARY
EXISTING 2m HIGH STEEL PALISADE FENCING
NEW DELIVERIES PARKING AREA FOR PROPOSED BUILDING
SOP
EXISTING SEWER CONNECTION
ERF 14/26408
ERF 3256
EXISTING 2m HIGH MASONRY WALL
ENTRANCE
EXISTING PLANT ROOM
EXISTING PAVILION
EXISTING SWIMMING POOL
EXISTING ROOF STRUCTURE
EXISTING SWIMMING POOL
EXISTING BUILDING
PAVED WALKWAY
RESERVED PARKING
TWO WAY TRAFFIC
PAVED WALKWAY
COROBRIK ROAN SATIN FBX BRICKS USED FOR 1320 x 1320mm PLANTER BOX
168 400mm SITE BOUNDARY
168 400mm SITE BOUNDARY
COROBRIK BURGUNDY PAVER CLAY PAVING BRICKS LAID IN STRECHER BOND
PROPOSED VEHICULAR ACCESS
EXISTING PUTT PUTT FACILITIES
ASPHALT SURFACE FALL TO 600x600mm STORMWATER CAST IRON CATCH PIT
EXISTING 2m HIGH MASONRY WALL
EXISTING ROOF STRUCTURE
PROPOSED NEW PARKING AREA
EXISTING BUILDING
EXISTING OFFICES AND ABLUTION
EXISTING ENTRANCE TO POOL FACILITIES
ENTRANCE
COROBRICK ROAN SATIN FBX BRICKS USED FOR 1320 x 1320mm PLANTER BOX
80 NEW PARKING BAYS (ASPHALT SURFACE FINISH)
ERF 6/26408
EXISTING BUILDING
ONE WAY TRAFFIC
ONE WAY TRAFFIC
TWO WAY TRAFFIC
161 860mm SITE BOUNDARY
EXISTING PARKING
EXISTING PARKING (ASPHALT SURFACE FINISH)
ONE WAY TRAFFIC
NEW FORMAL PARKING AREA FOR PROPOSED BUILDING
EXISTING 2m HIGH STEEL PALISADE FENCING
EXISTING BUILDING
64 200mm SITE BOUNDARY
EXISTING VEHICULAR ACCESS
EXTENSION OF EXISTING PAN-WALK'S PAVING BOND
EXISTING VEHICULAR ACCESS
ADJACENT SITE BOUNDARY
ACCESS
ADJACENT SITE BOUNDARY
FIRST AVENUE
TWO WAY TRAFFIC
PARK ROAD
TWO WAY TRAFFIC
1392m
1391m
1384m
1393m
1392m
1391m

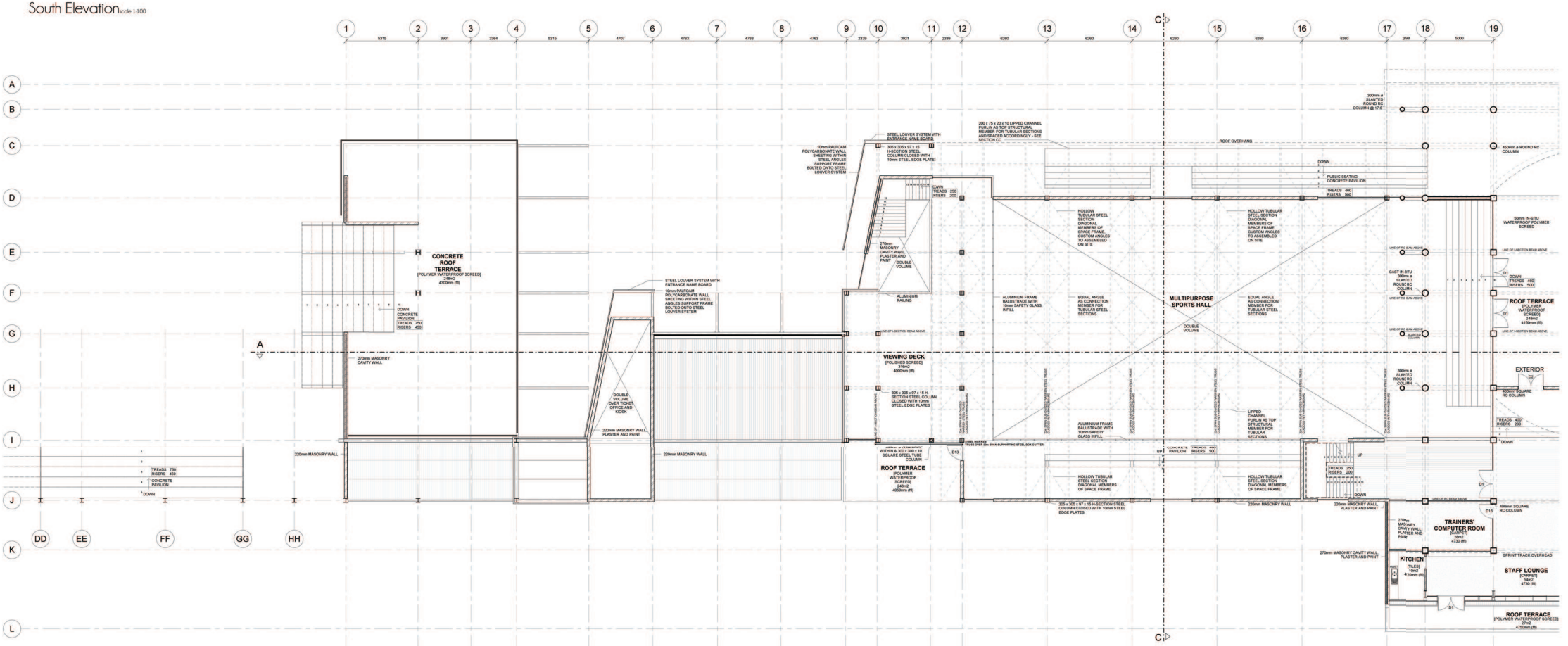


Ground Floor Plan

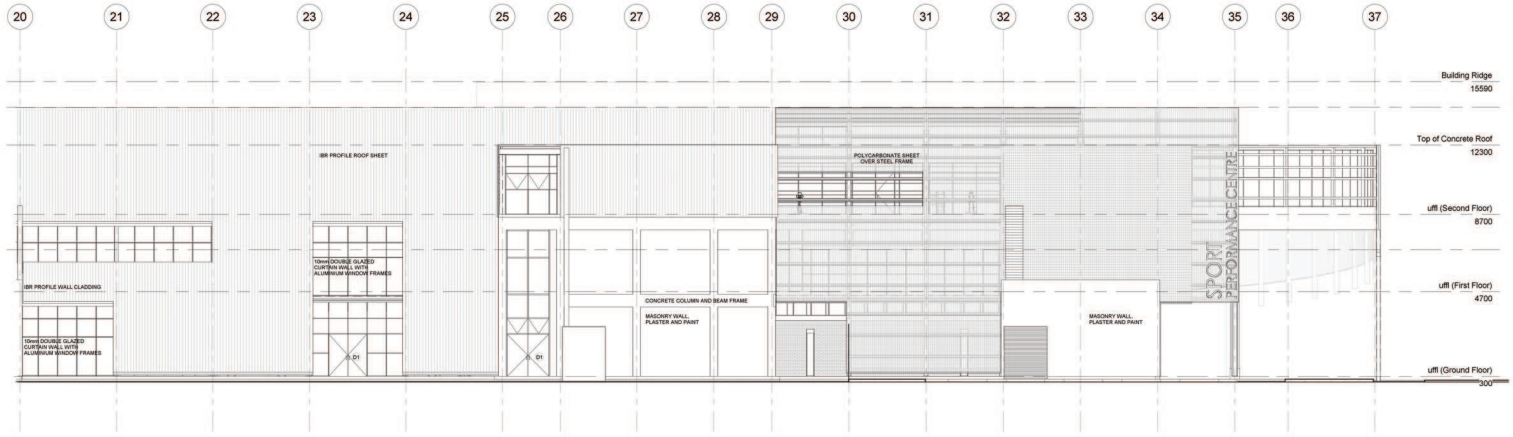

Basement Plan
Ground Floor Plan
EXERCISE COURTYARD
OUTSIDE GYM / EQUIPMENT STORAGE
EQUIPMENT + SUPPLEMENTS SHOP
JUICEBAR
GYMNASIUM RECEPTION
FOYER + WAITING AREA
STORAGE
SPINNING STUDIO
CLIMBING WALL
CARDIO CIRCUIT WAITING AREA
MALE RESTROOMS
FEMALE RESTROOMS
MULTIPURPOSE STUDIO
RAISED PLATFORM / STAGE
EXTERIOR PLATFORM
CHILD CARE ROOM
MALE LOCKER ROOM
FEMALE LOCKER ROOM
CONSULTATION ROOM 4
CONSULTATION ROOM 3
CONSULTATION ROOM 2
CONSULTATION ROOM 1
DOCTOR CONSULTATION ROOM
MEDICAL SUITE
MEDICAL RECEPTION
FILE ROOM / SERVER ROOM
DRESSING ROOM
MONITORING ROOM
CENTRAL HVAC ROOM
HYDRO-THERAPY ROOM
HYDRO-THERAPY POOL
SHALLOW POOL
LOCKER ROOMS
STORAGE + PLANT ROOM
INTERIOR
EXTERIOR



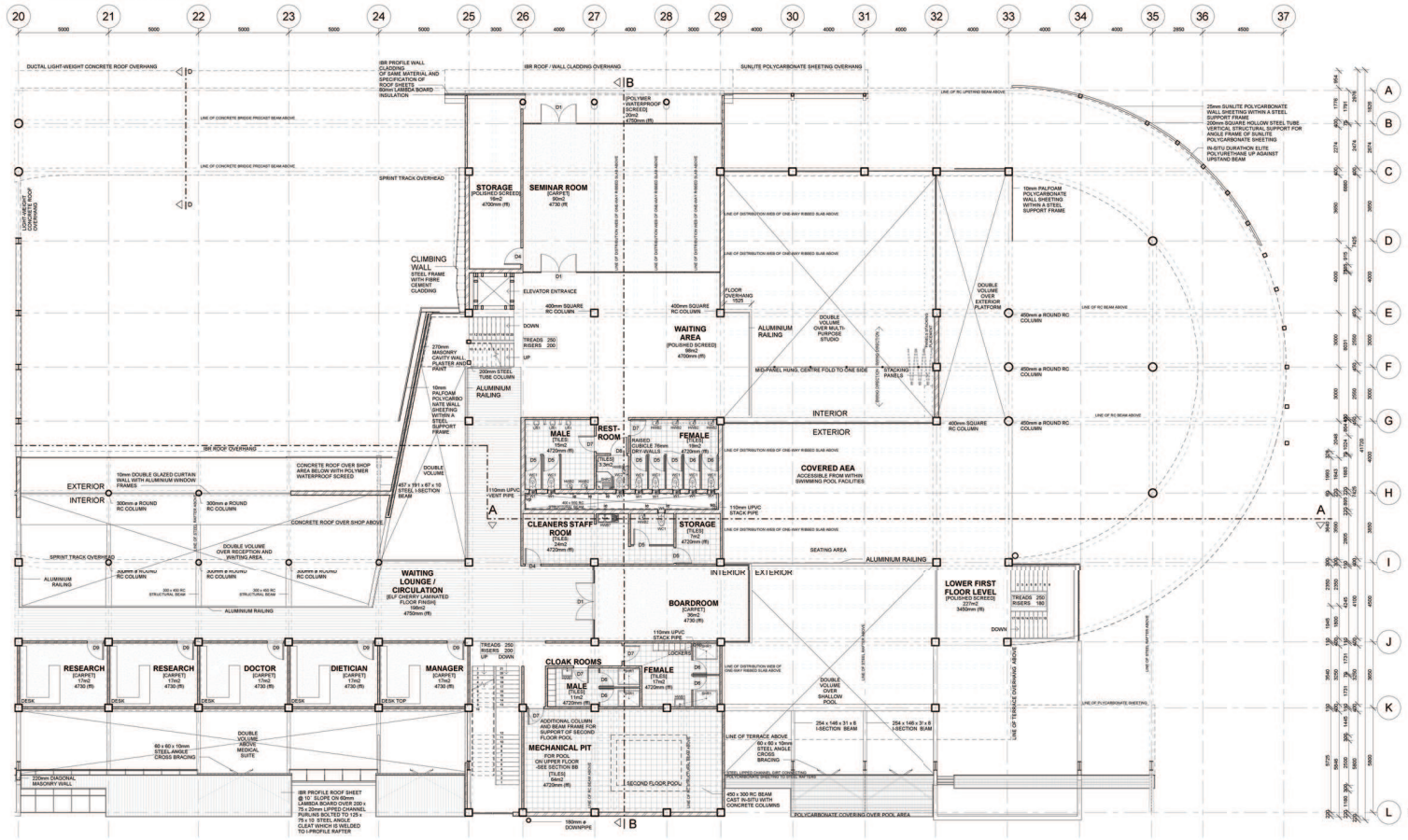
South Elevation scale 1:100



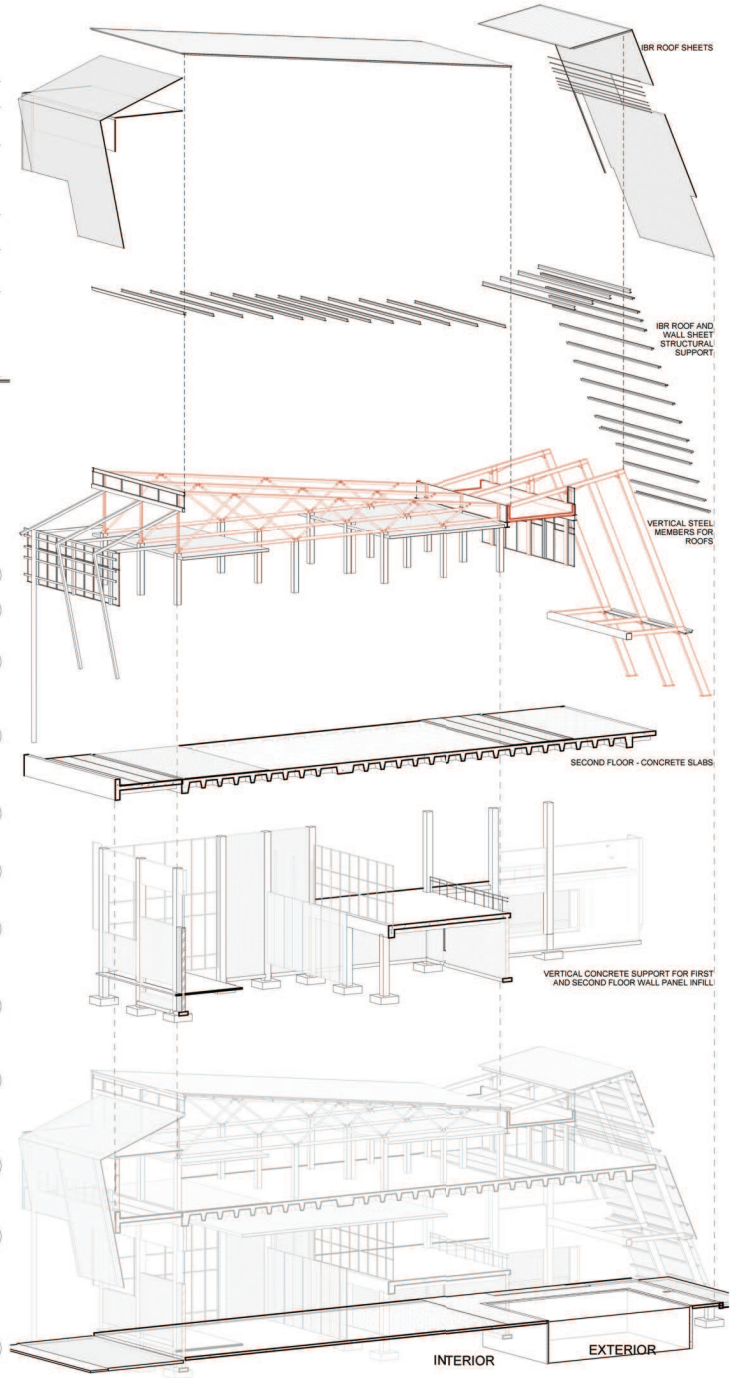
First Floor Plan scale 1:100



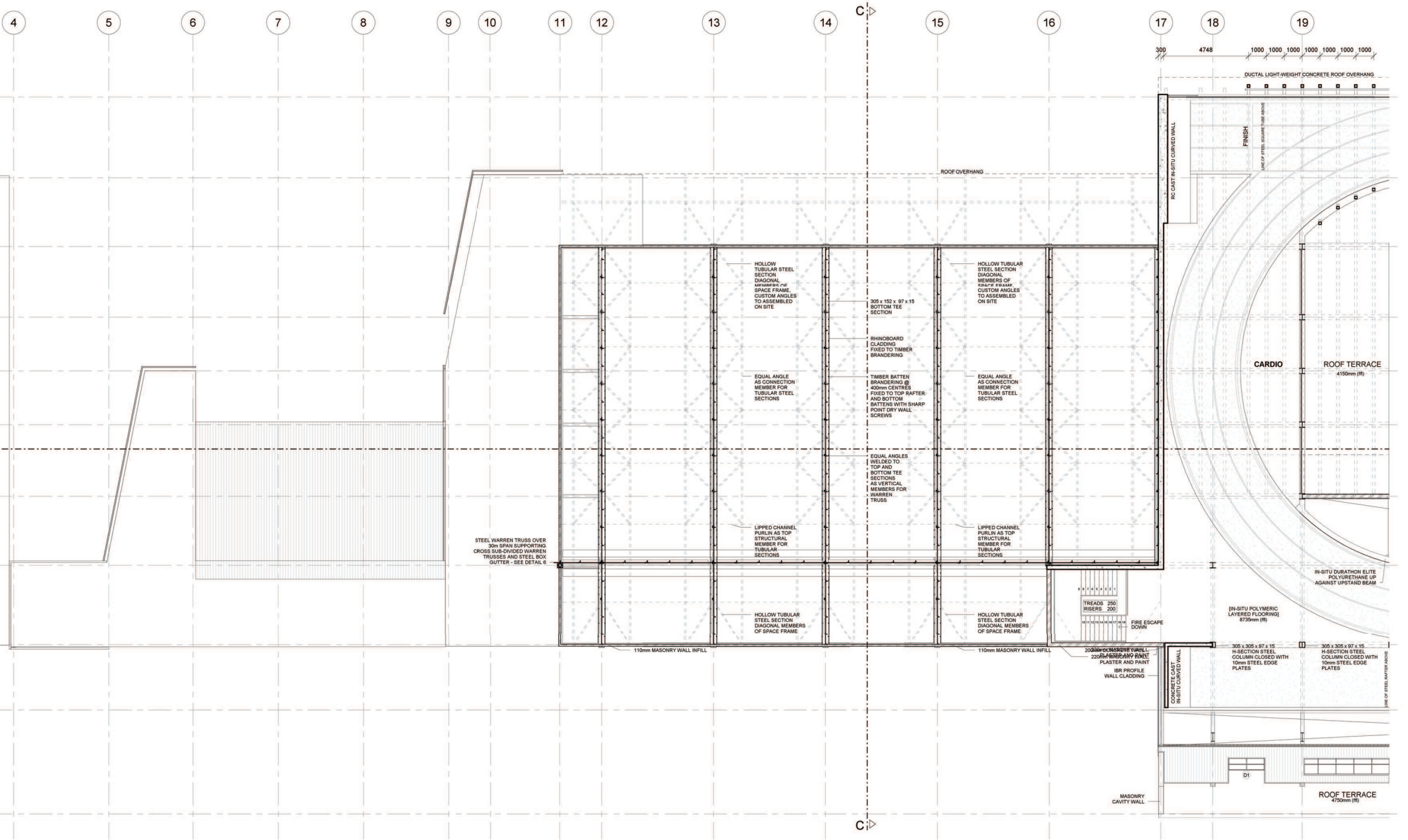
South Elevation scale 1:100



First Floor Plan scale 1:100



Exploded Section - Concrete and Steel Structure Systems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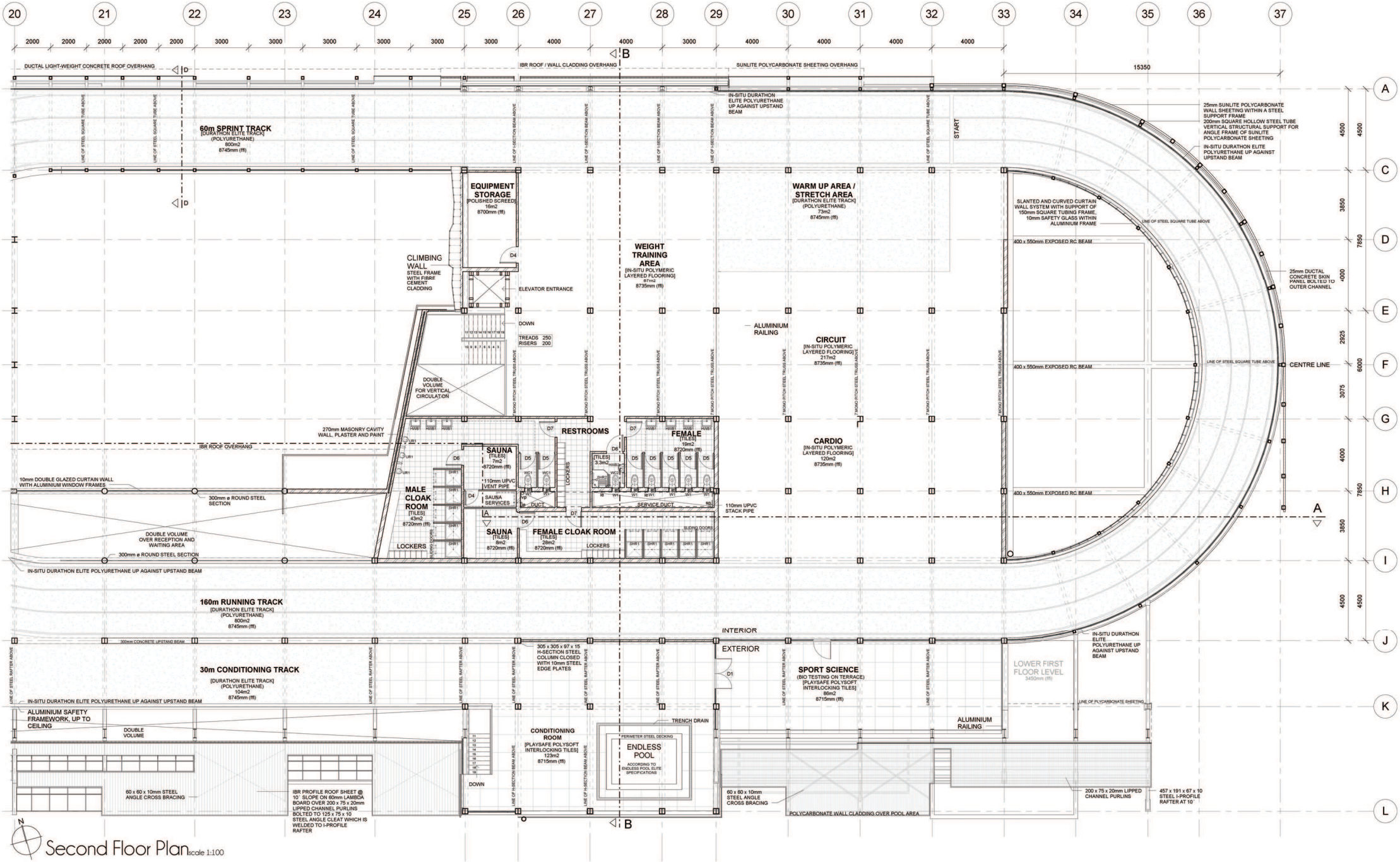
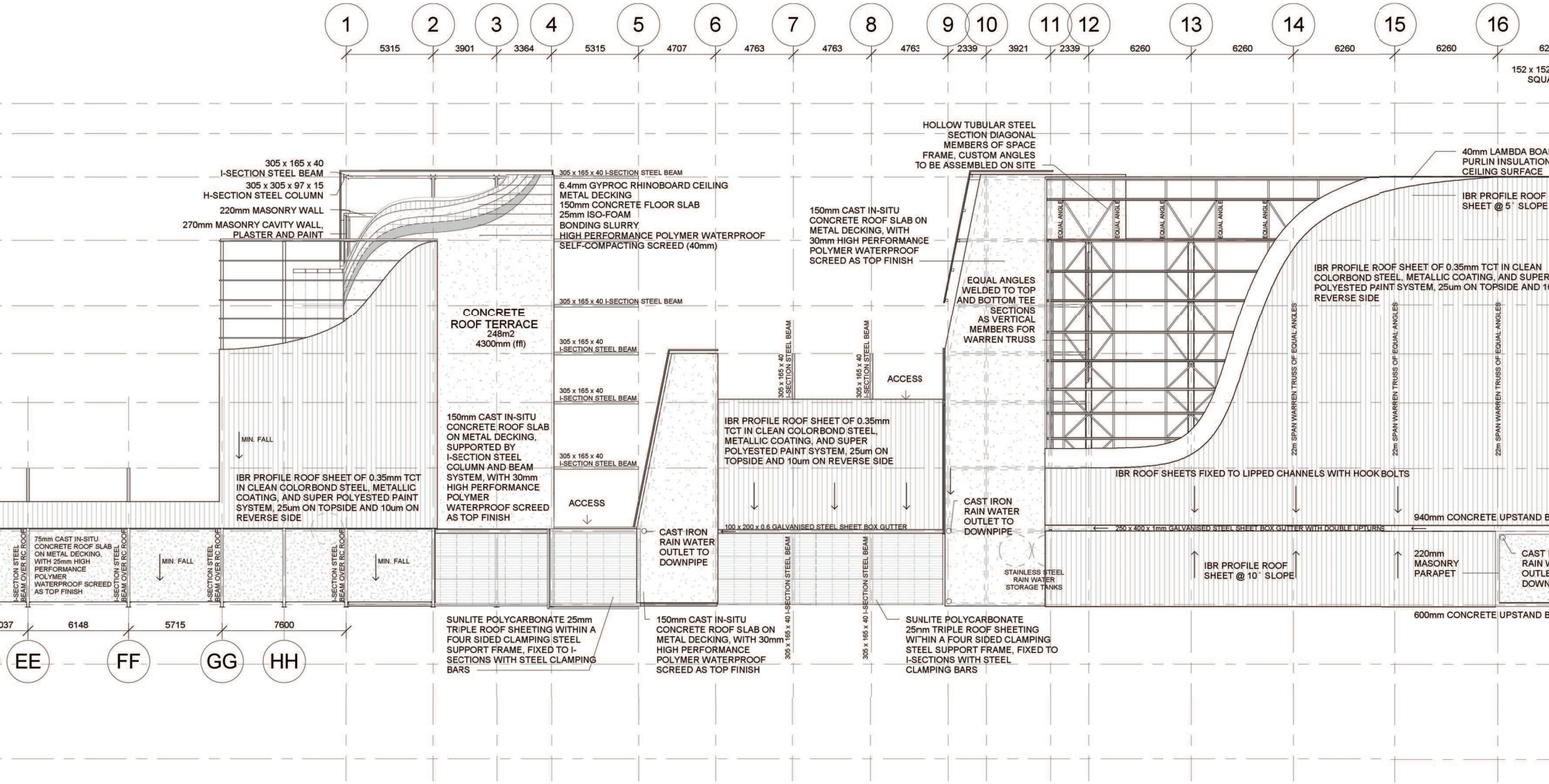
C
300
4748
1000 1000 1000 1000 1000 1000 1000
DUCTAL LIGHT-WEIGHT CONCRETE ROOF OVERHANG
ROOF OVERHANG
RC CAST IN-SITU CURVED WALL
FINISH
LINE OF STEEL SQUARE TUBE ABOVE
CARDIO
ROOF TERRACE
4150mm (ffl)
HOLLOW TUBULAR STEEL SECTION DIAGONAL MEMBERS OF SPACE FRAME CUSTOM ANGLES TO ASSEMBLED ON SITE
305 x 152 x 97 x 15 BOTTOM TEE SECTION
RHINOBOARD CLADDING FIXED TO TIMBER BRANDERING
EQUAL ANGLE AS CONNECTION MEMBER FOR TUBULAR STEEL SECTIONS
TIMBER BATTEN BRANDERING @ 400mm CENTRES FIXED TO TOP RAFTER AND BOTTOM BATTENS WITH SHARP POINT DRY WALL SCREWS
EQUAL ANGLES WELDED TO TOP AND BOTTOM TEE SECTIONS AS VERTICAL MEMBERS FOR WARREN TRUSS
LIPPED CHANNEL PURLIN AS TOP STRUCTURAL MEMBER FOR TUBULAR SECTIONS
STEEL WARREN TRUSS OVER 30m SPAN SUPPORTING CROSS SUB-DIVIDED WARREN TRUSSES AND STEEL BOX GUTTER - SEE DETAIL 6
HOLLOW TUBULAR STEEL SECTION DIAGONAL MEMBERS OF SPACE FRAME
110mm MASONRY WALL INFILL
TREADS 250
RISERS 200
FIRE ESCAPE DOWN
IN-SITU DURATHON ELITE POLYURETHANE UP AGAINST UPSTAND BEAM
[IN-SITU POLYMERIC LAYERED FLOORING]
8735mm (ffl)
PLASTER AND PAINT
IBR PROFILE WALL CLADDING
CONCRETE CAST IN-SITU CURVED WALL
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN CLOSED WITH 10mm STEEL EDGE PLATES
LINE OF STEEL RAFTER ABOVE
D1
MASONRY CAVITY WALL
ROOF TERRACE
4750mm (ffl)



Second Floor Plan scale 1:100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5315
3901
3364
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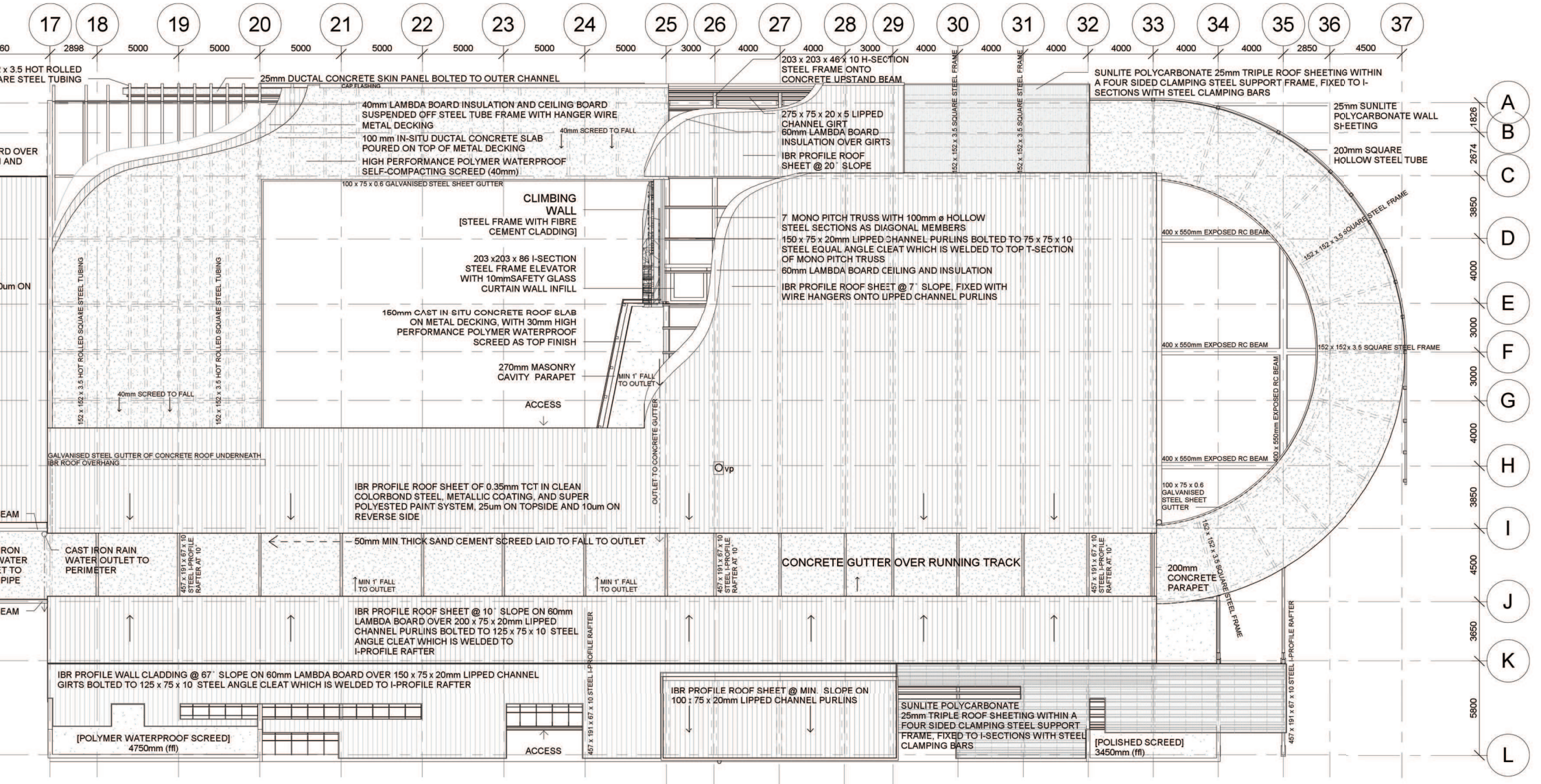
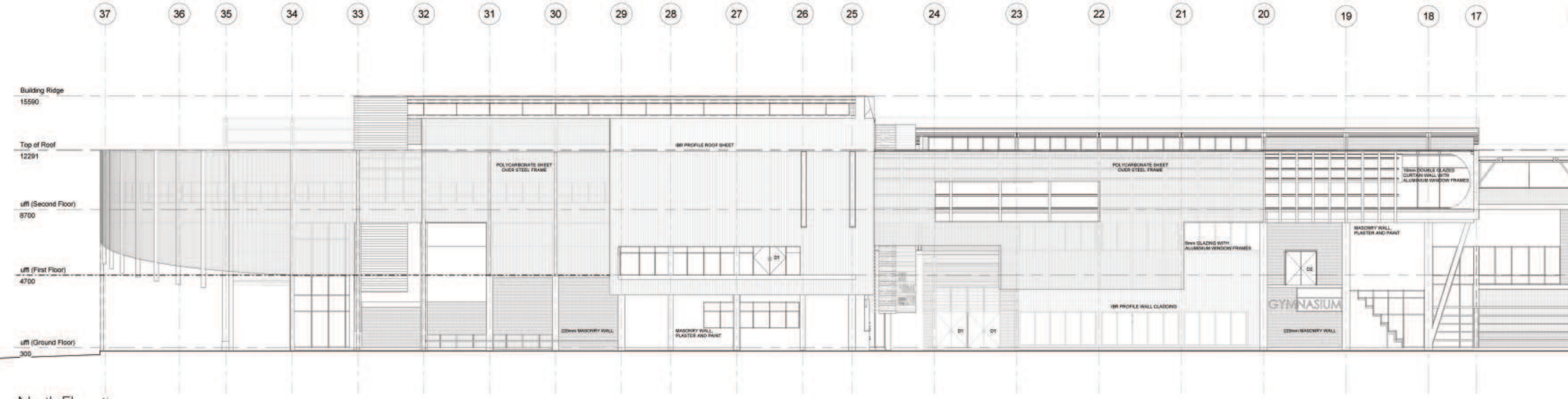
4707
4763
4763
4763
2339
3921
2339
6260
6260
6260
6260
305 x 165 x 40 I-SECTION STEEL BEAM
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN
220mm MASONRY WALL
270mm MASONRY CAVITY WALL, PLASTER AND PAINT
6.4mm GYPROC RHINOBOARD CEILING
METAL DECKING
150mm CONCRETE FLOOR SLAB
25mm ISO-FOAM
BONDING SLURRY
HIGH PERFORMANCE POLYMER WATERPROOF
SELF-COMPACTING SCREED (40mm)
CONCRETE ROOF TERRACE
248m2
4300mm (ffl)
MIN. FALL
IBR PROFILE ROOF SHEET OF 0.35mm TCT IN CLEAN COLORBOND STEEL, METALLIC COATING, AND SUPER POLYESTED PAINT SYSTEM, 25um ON TOPSIDE AND 10um ON REVERSE SIDE
150mm CAST IN-SITU CONCRETE ROOF SLAB ON METAL DECKING, SUPPORTED BY I-SECTION STEEL COLUMN AND BEAM SYSTEM, WITH 30mm HIGH PERFORMANCE POLYMER WATERPROOF SCREED AS TOP FINISH
ACCESS
CAST IRON RAIN WATER OUTLET TO DOWNPIPE
SUNLITE POLYCARBONATE 25mm TRIPLE ROOF SHEETING WITHIN A FOUR SIDED CLAMPING STEEL SUPPORT FRAME, FIXED TO I-SECTIONS WITH STEEL CLAMPING BARS
150mm CAST IN-SITU CONCRETE ROOF SLAB ON METAL DECKING, WITH 30mm HIGH PERFORMANCE POLYMER WATERPROOF SCREED AS TOP FINISH
HOLLOW TUBULAR STEEL SECTION DIAGONAL MEMBERS OF SPACE FRAME, CUSTOM ANGLES TO BE ASSEMBLED ON SITE
150mm CAST IN-SITU CONCRETE ROOF SLAB ON METAL DECKING, WITH 30mm HIGH PERFORMANCE POLYMER WATERPROOF SCREED AS TOP FINISH
EQUAL ANGLES WELDED TO TOP AND BOTTOM TEE SECTIONS AS VERTICAL MEMBERS FOR WARREN TRUSS
IBR PROFILE ROOF SHEET OF 0.35mm TCT IN CLEAN COLORBOND STEEL, METALLIC COATING, AND SUPER POLYESTED PAINT SYSTEM, 25um ON TOPSIDE AND 10um ON REVERSE SIDE
100 x 200 x 0.6 GALVANISED STEEL SHEET BOX GUTTER
CAST IRON RAIN WATER OUTLET TO DOWNPIPE
STAINLESS STEEL RAIN WATER STORAGE TANKS
SUNLITE POLYCARBONATE 25mm TRIPLE ROOF SHEETING WITHIN A FOUR SIDED CLAMPING STEEL SUPPORT FRAME, FIXED TO I-SECTIONS WITH STEEL CLAMPING BARS
IBR ROOF SHEETS FIXED TO LIPPED CHANNELS WITH HOOK BOLTS
250 x 400 x 1mm GALVANISED STEEL SHEET BOX GUTTER WITH DOUBLE UPTURNS
940mm CONCRETE UPSTAND
600mm CONCRETE UPSTAND
IBR PROFILE ROOF SHEET @ 10° SLOPE
220mm MASONRY PARAPET
IBR PROFILE ROOF SHEET @ 5° SLOPE
40mm LAMBDA BOA
PURLIN INSULATION
CEILING SURFACE
IBR PROFILE ROOF SHEET OF 0.35mm TCT IN CLEAN COLORBOND STEEL, METALLIC COATING, AND SUPER
POLYESTED PAINT SYSTEM, 25um ON TOPSIDE AND 10
REVERSE SIDE
22m SPAN WARREN TRUSS OF EQUAL ANGLES
22m SPAN WARREN TRUSS OF EQUAL ANGLES
22m SPAN WARREN TRUSS OF EQUAL ANGLES
EQUAL ANGLE
75mm CAST IN-SITU CONCRETE ROOF SLAB ON METAL DECKING, WITH 25mm HIGH PERFORMANCE POLYMER WATERPROOF SCREED AS TOP FINISH
I-SECTION STEEL BEAM OVER RC ROOF
6148
5715
7600
EE
FF
GG
HH

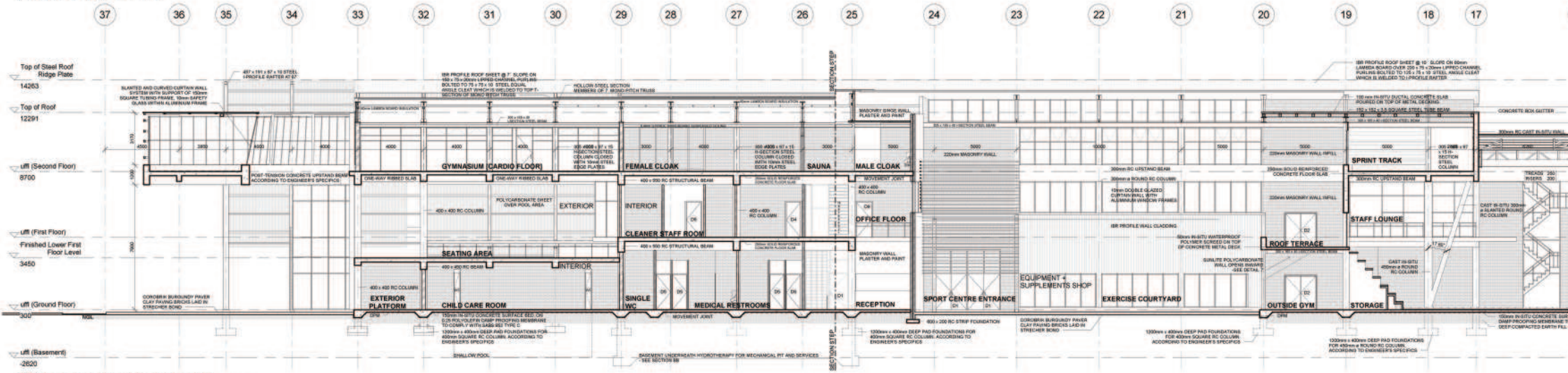
N

Roof Plan

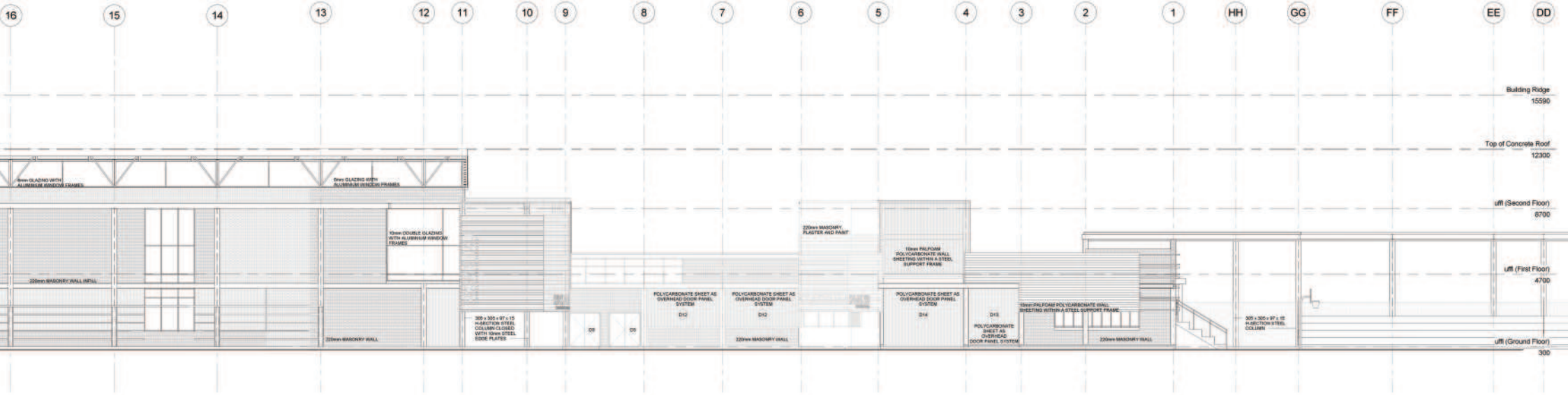

17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37
2898 5000 5000 5000 5000 5000 5000 5000 3000 4000 4000 3000 4000 4000 4000 4000 4000 4000 2850 4500
A B C D E F G H I J K L
1826 2674 3850 4000 3000 3000 4000 3850 4500 3650 5800
25mm DUCTAL CONCRETE SKIN PANEL BOLTED TO OUTER CHANNEL
CAP FLASHING
40mm LAMBDA BOARD INSULATION AND CEILING BOARD SUSPENDED OFF STEEL TUBE FRAME WITH HANGER WIRE
METAL DECKING
100 mm IN-SITU DUCTAL CONCRETE SLAB POURED ON TOP OF METAL DECKING
40mm SCREED TO FALL
HIGH PERFORMANCE POLYMER WATERPROOF SELF-COMPACTING SCREED (40mm)
100 x 75 x 0.6 GALVANISED STEEL SHEET GUTTER
CLIMBING WALL
[STEEL FRAME WITH FIBRE CEMENT CLADDING]
203 x203 x 86 I-SECTION STEEL FRAME ELEVATOR WITH 10mmSAFETY GLASS CURTAIN WALL INFILL
150mm CAST IN SITU CONCRETE ROOF SLAB ON METAL DECKING, WITH 30mm HIGH PERFORMANCE POLYMER WATERPROOF SCREED AS TOP FINISH
270mm MASONRY CAVITY PARAPET
MIN 1° FALL TO OUTLET
ACCESS
152 x 152 x 3.5 HOT ROLLED SQUARE STEEL TUBING
40mm SCREED TO FALL
GALVANISED STEEL GUTTER OF CONCRETE ROOF UNDERNEATH IBR ROOF OVERHANG
IBR PROFILE ROOF SHEET OF 0.35mm TCT IN CLEAN COLORBOND STEEL, METALLIC COATING, AND SUPER POLYESTED PAINT SYSTEM, 25um ON TOPSIDE AND 10um ON REVERSE SIDE
OUTLET TO CONCRETE GUTTER
CAST IRON RAIN WATER OUTLET TO PERIMETER
457 x 191 x 67 x 10 STEEL I-PROFILE RAFTER AT 10°
50mm MIN THICK SAND CEMENT SCREED LAID TO FALL TO OUTLET
MIN 1° FALL TO OUTLET
CONCRETE GUTTER OVER RUNNING TRACK
IBR PROFILE ROOF SHEET @ 10° SLOPE ON 60mm LAMBDA BOARD OVER 200 x 75 x 20mm LIPPED CHANNEL PURLINS BOLTED TO 125 x 75 x 10° STEEL ANGLE CLEAT WHICH IS WELDED TO I-PROFILE RAFTER
457 x 191 x 67 x 10 STEEL I-PROFILE RAFTER
IBR PROFILE WALL CLADDING @ 67° SLOPE ON 60mm LAMBDA BOARD OVER 150 x 75 x 20mm LIPPED CHANNEL GIRTS BOLTED TO 125 x 75 x 10° STEEL ANGLE CLEAT WHICH IS WELDED TO I-PROFILE RAFTER
[POLYMER WATERPROOF SCREED] 4750mm (ffl)
ACCESS
IBR PROFILE ROOF SHEET @ MIN. SLOPE ON 100 x 75 x 20mm LIPPED CHANNEL PURLINS
SUNLITE POLYCARBONATE 25mm TRIPLE ROOF SHEETING WITHIN A FOUR SIDED CLAMPING STEEL SUPPORT FRAME, FIXED TO I-SECTIONS WITH STEEL CLAMPING BARS
[POLISHED SCREED] 3450mm (ffl)
203 x 203 x 46 x 10 H-SECTION STEEL FRAME ONTO CONCRETE UPSTAND BEAM
275 x 75 x 20 x 5 LIPPED CHANNEL GIRT
60mm LAMBDA BOARD INSULATION OVER GIRTS
IBR PROFILE ROOF SHEET @ 20° SLOPE
152 x 152 x 3.5 SQUARE STEEL FRAME
7° MONO PITCH TRUSS WITH 100mm ø HOLLOW STEEL SECTIONS AS DIAGONAL MEMBERS
150 x 75 x 20mm LIPPED CHANNEL PURLINS BOLTED TO 75 x 75 x 10 STEEL EQUAL ANGLE CLEAT WHICH IS WELDED TO TOP T-SECTION OF MONO PITCH TRUSS
60mm LAMBDA BOARD CEILING AND INSULATION
IBR PROFILE ROOF SHEET @ 7° SLOPE, FIXED WITH WIRE HANGERS ONTO LIPPED CHANNEL PURLINS
400 x 550mm EXPOSED RC BEAM
25mm SUNLITE POLYCARBONATE WALL SHEETING
200mm SQUARE HOLLOW STEEL TUBE
100 x 75 x 0.6 GALVANISED STEEL SHEET GUTTER
200mm CONCRETE PARAPET



North Elevation scale 1:100



3D Longitudinal Section AA scale 1:100


16
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7
6
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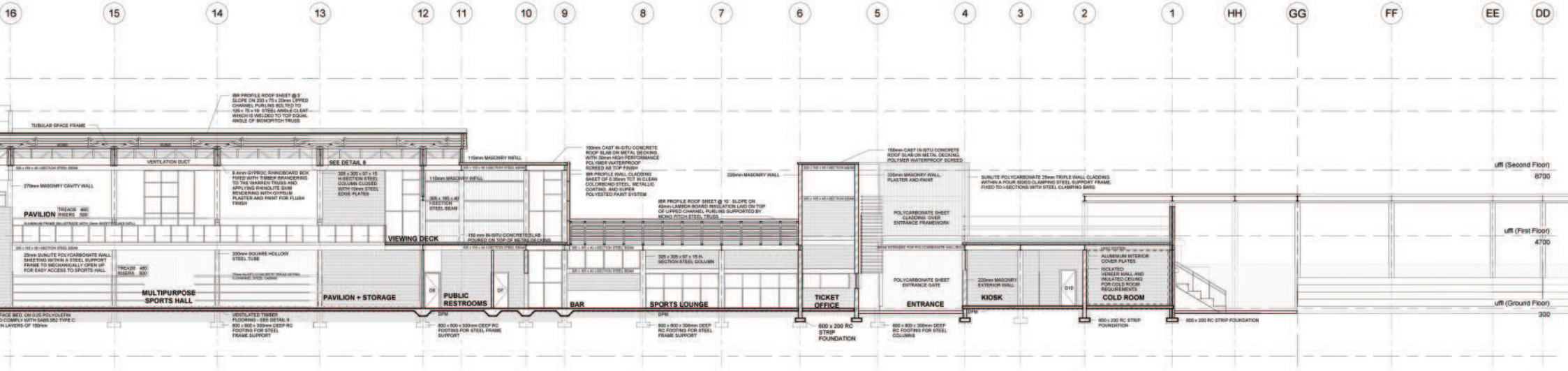
4
3
2
1
HH
GG
FF
EE
DD
Building Ridge
15590
Top of Concrete Roof
12300
ufl (Second Floor)
8700
ufl (First Floor)
4700
ufl (Ground Floor)
300
9mm GLAZING WITH ALUMINIUM WINDOW FRAMES
6mm GLAZING WITH ALUMINIUM WINDOW FRAMES
10mm DOUBLE GLAZING WITH ALUMINIUM WINDOW FRAMES
220mm MASONRY WALL INFILL
220mm MASONRY WALL
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN CLOSED WITH 10mm STEEL EDGE PLATES
D9
D8
POLYCARBONATE SHEET AS OVERHEAD DOOR PANEL SYSTEM
D12
POLYCARBONATE SHEET AS OVERHEAD DOOR PANEL SYSTEM
D12
220mm MASONRY WALL
220mm MASONRY, PLASTER AND PAINT
10mm PALFOAM POLYCARBONATE WALL SHEETING WITHIN A STEEL SUPPORT FRAME
POLYCARBONATE SHEET AS OVERHEAD DOOR PANEL SYSTEM
D14
D13
POLYCARBONATE SHEET AS OVERHEAD DOOR PANEL SYSTEM
10mm PALFOAM POLYCARBONATE WALL SHEETING WITH IN A STEEL SUPPORT FRAME
220mm MASONRY WALL
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN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HH
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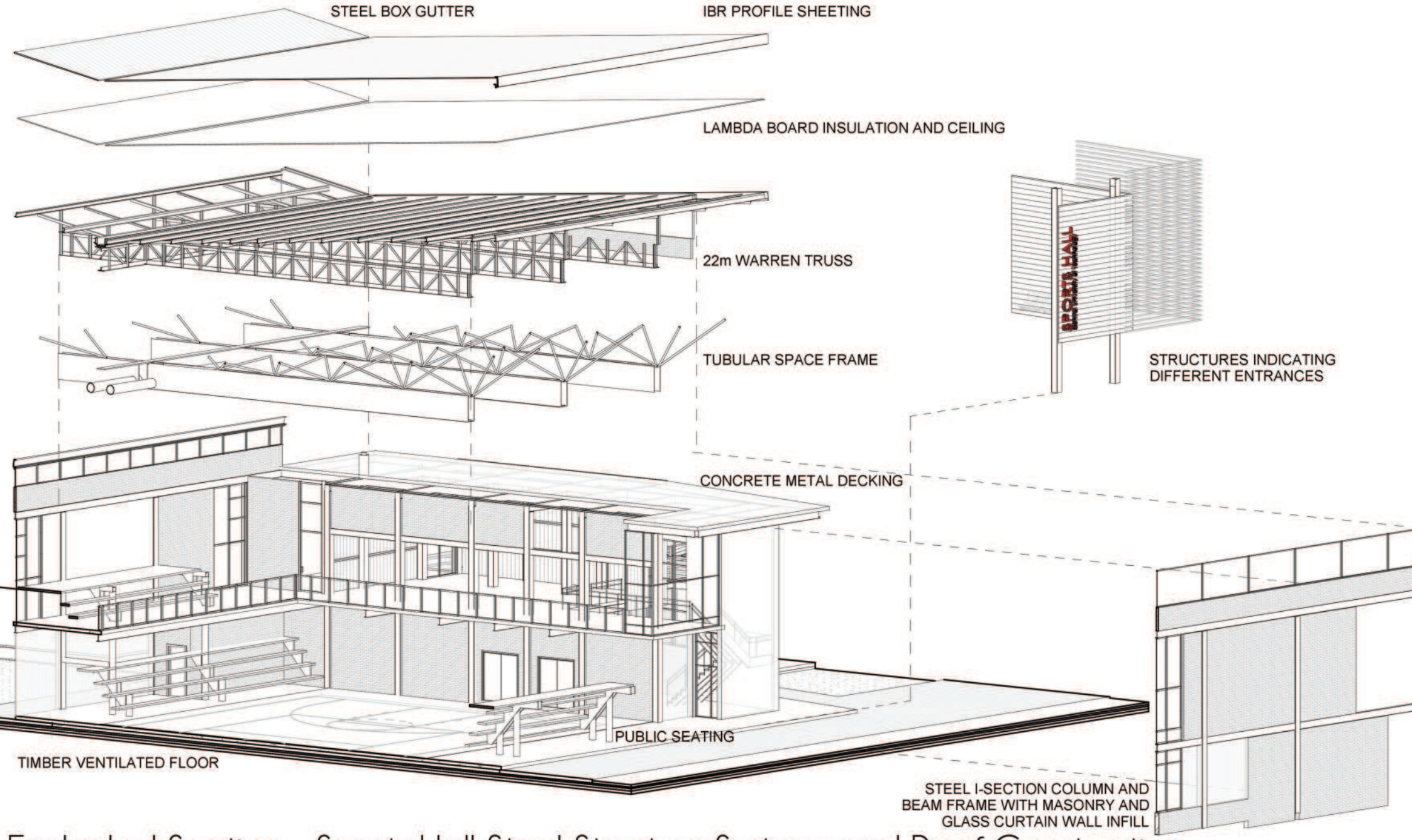
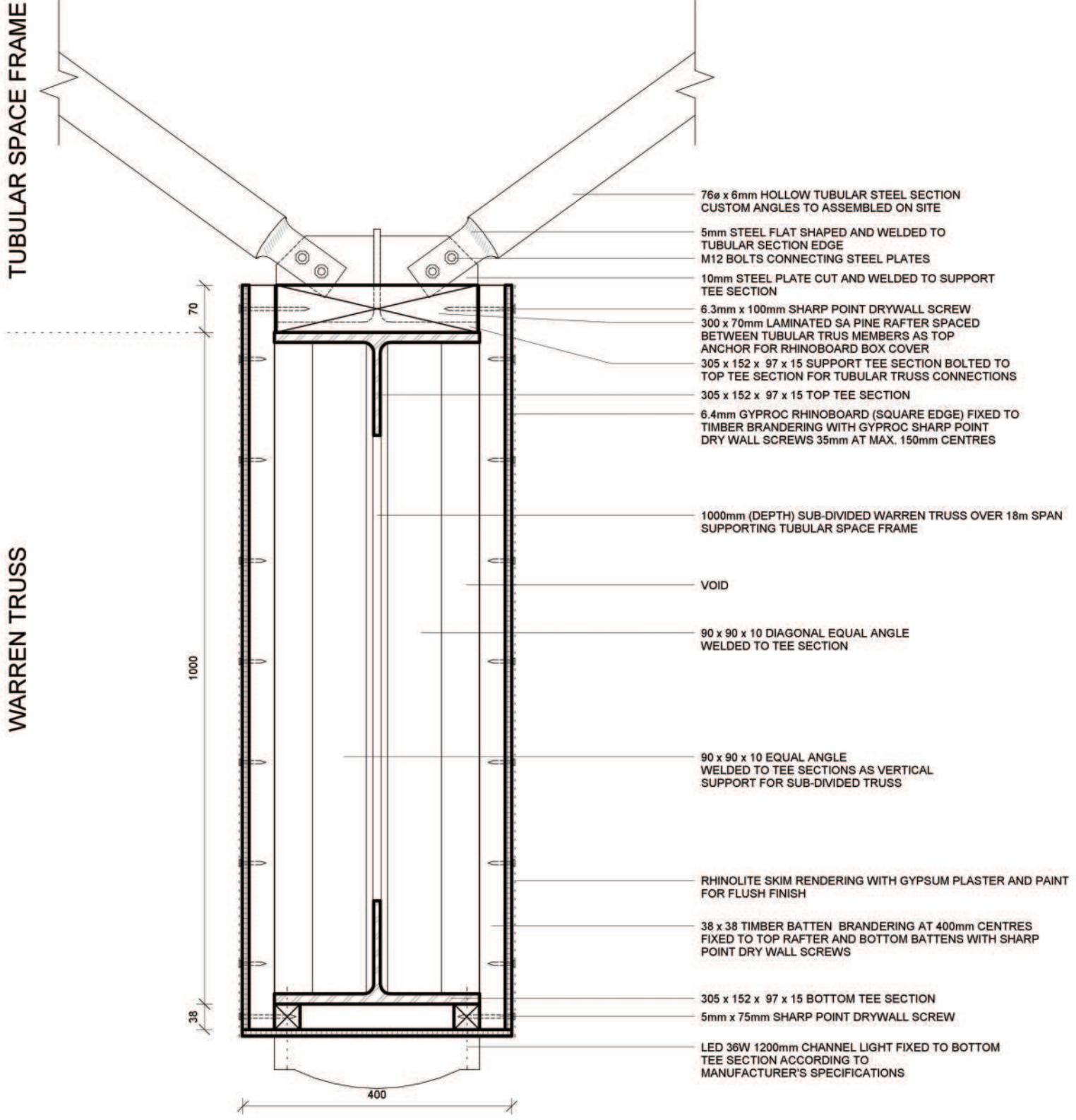
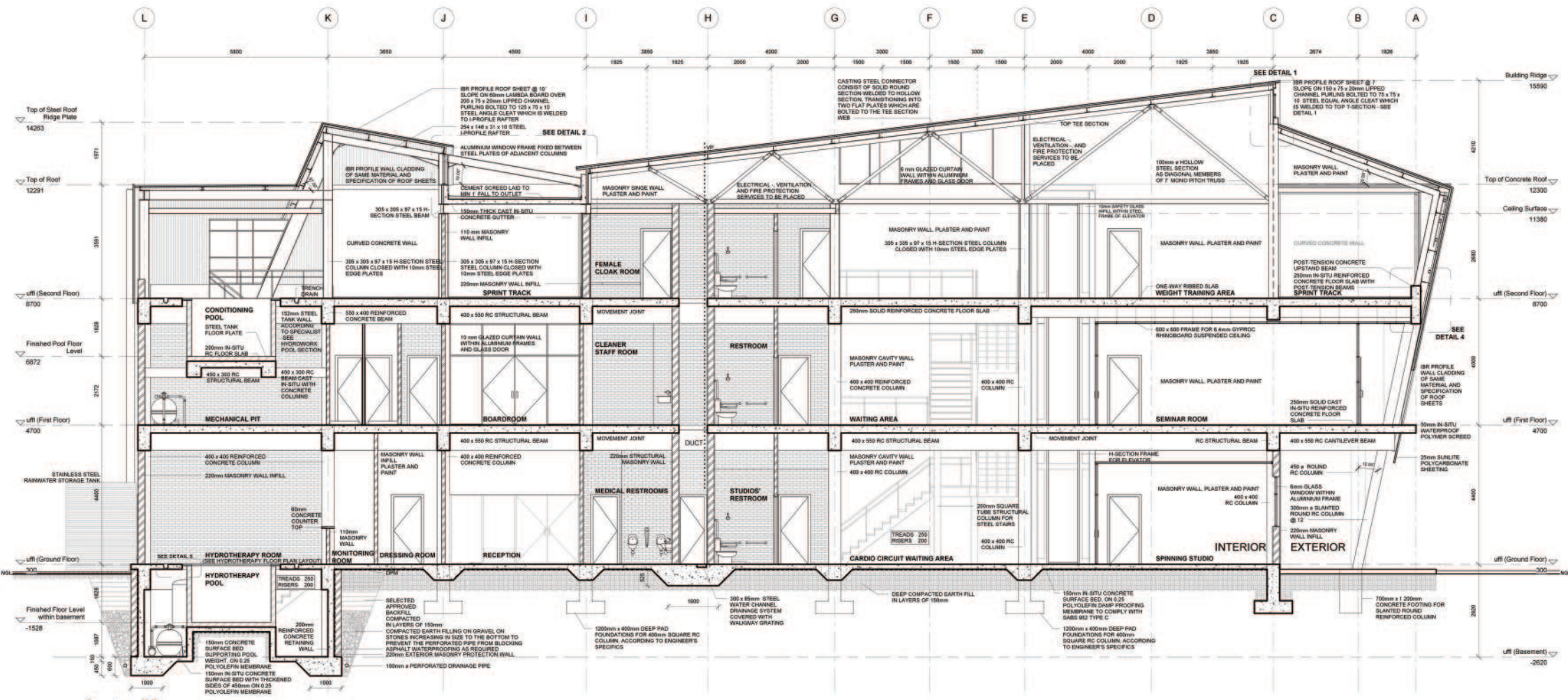
FF
EE
DD
ufl (Second Floor)
8700
ufl (First Floor)
4700
ufl (Ground Floor)
300
TUBULAR SPACE FRAME
VENTILATION DUCT
SEE DETAIL 8
270mm MASONRY CAVITY WALL
PAVILION
TREADS 460
RISERS 500
25mm SUNLITE POLYCARBONATE WALL SHEETING WITHIN A STEEL SUPPORT FRAME TO MECHANICALLY OPEN UP FOR EASY ACCESS TO SPORTS HALL
TREADS 460
RISERS 300
MULTIPURPOSE SPORTS HALL
300mm SQUARE HOLLOW STEEL TUBE
VENTILATED TIMBER FLOORING - SEE DETAIL 9
600 x 600 x 300mm DEEP RC FOOTING FOR STEEL FRAME SUPPORT
PAVILION + STORAGE
VIEWING DECK
110mm MASONRY INFILL
305 x 165 x 40 I-SECTION STEEL BEAM
150 mm IN-SITU CONCRETE SLAB POURED ON TOP OF METAL DECKING
D6
D7
PUBLIC RESTROOMS
DPM
600 x 600 x 300mm DEEP RC FOOTING FOR STEEL FRAME SUPPORT
150mm CAST IN-SITU CONCRETE ROOF SLAB ON METAL DECKING WITH 30mm HIGH-PERFORMANCE POLYMER WATERPROOF SCREED AS TOP FINISH
BR PROFILE WALL CLADDING SHEET OF 0.35mm TCT BI-CLEAN COLORBOND STEEL, METALLIC COATING, AND SUPER POLYESTER PAINT SYSTEM
BR PROFILE ROOF SHEET @ 10° SLOPE ON 40mm LAMINDA BOARD INSULATION LAID ON TOP OF LIPPED CHANNEL PURLINS SUPPORTED BY MONO PITCH STEEL TRUSS
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN
BAR
SPORTS LOUNGE
DPM
600 x 600 x 300mm DEEP RC FOOTING FOR STEEL FRAME SUPPORT
209mm MASONRY WALL
150mm CAST IN-SITU CONCRETE ROOF SLAB ON METAL DECKING, POLYMER WATERPROOF SCREED
TICKET OFFICE
600 x 200 RC STRIP FOUNDATION
209mm MASONRY WALL, PLASTER AND PAINT
POLYCARBONATE SHEET CLADDING OVER ENTRANCE FRAMEWORK
POLYCARBONATE SHEET ENTRANCE GATE
ENTRANCE
600 x 600 x 300mm DEEP RC FOOTING FOR STEEL COLUMNS
SUNLITE POLYCARBONATE 25mm TRIPLE WALL CLADDING WITHIN A FOUR SIDED CLAMPING STEEL SUPPORT FRAME, FIXED TO I-SECTIONS WITH STEEL CLAMPING BARS
220mm MASONRY EXTERIOR WALL
D10
KIOSK
DPM
UPVC 10*30
ALUMINIUM INTERIOR COVER PLATES
ISOLATED VENEER WALL AND INULATED CEILING FOR COLD ROOM REQUIREMENTS
COLD ROOM
600 x 200 RC STRIP FOUNDATION
600 x 300 RC STRIP FOUNDATION



Exploded Section - Sports Hall Steel Structure Systems and Roof Construction


TUBULAR SPACE FRAME
WARREN TRUSS
70
1000
38
400
76ø x 6mm HOLLOW TUBULAR STEEL SECTION
CUSTOM ANGLES TO ASSEMBLED ON SITE
5mm STEEL FLAT SHAPED AND WELDED TO
TUBULAR SECTION EDGE
M12 BOLTS CONNECTING STEEL PLATES
10mm STEEL PLATE CUT AND WELDED TO SUPPORT
TEE SECTION
6.3mm x 100mm SHARP POINT DRYWALL SCREW
300 x 70mm LAMINATED SA PINE RAFTER SPACED
BETWEEN TUBULAR TRUS MEMBERS AS TOP
ANCHOR FOR RHINOBOARD BOX COVER
305 x 152 x 97 x 15 SUPPORT TEE SECTION BOLTED TO
TOP TEE SECTION FOR TUBULAR TRUSS CONNECTIONS
305 x 152 x 97 x 15 TOP TEE SECTION
6.4mm GYPROC RHINOBOARD (SQUARE EDGE) FIXED TO
TIMBER BRANDERING WITH GYPROC SHARP POINT
DRY WALL SCREWS 35mm AT MAX. 150mm CENTRES
1000mm (DEPTH) SUB-DIVIDED WARREN TRUSS OVER 18m SPAN
SUPPORTING TUBULAR SPACE FRAME
VOID
90 x 90 x 10 DIAGONAL EQUAL ANGLE
WELDED TO TEE SECTION
90 x 90 x 10 EQUAL ANGLE
WELDED TO TEE SECTIONS AS VERTICAL
SUPPORT FOR SUB-DIVIDED TRUSS
RHINOLITE SKIM RENDERING WITH GYPSUM PLASTER AND PAINT
FOR FLUSH FINISH
38 x 38 TIMBER BATTEN BRANDERING AT 400mm CENTRES
FIXED TO TOP RAFTER AND BOTTOM BATTENS WITH SHARP
POINT DRY WALL SCREWS
305 x 152 x 97 x 15 BOTTOM TEE SECTION
5mm x 75mm SHARP POINT DRYWALL SCREW
LED 36W 1200mm CHANNEL LIGHT FIXED TO BOTTOM
TEE SECTION ACCORDING TO
MANUFACTURER'S SPECIFICATIONS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B
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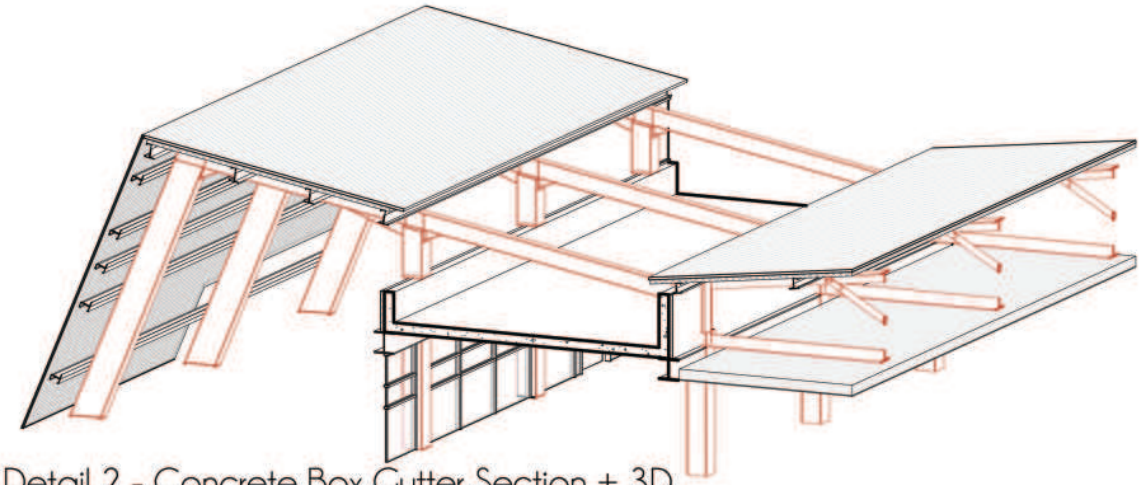
5800
3650
4500
3850
4000
3000
3000
4000
3850
2674
1826
1925
1925
2000
2000
1500
1500
1500
1500
2000
2000
1925
1925
SEE DETAIL 1
SEE DETAIL 2
IBR PROFILE ROOF SHEET @ 10° SLOPE ON 60mm LAMBDA BOARD OVER 200 x 75 x 20mm LIPPED CHANNEL PURLINS BOLTED TO 125 x 75 x 10 STEEL ANGLE CLEAT WHICH IS WELDED TO I-PROFILE RAFTER
254 x 146 x 31 x 10 STEEL I-PROFILE RAFTER
ALUMINIUM WINDOW FRAME FIXED BETWEEN STEEL PLATES OF ADJACENT COLUMNS
CASTING STEEL CONNECTOR CONSIST OF SOLID ROUND SECTION WELDED TO HOLLOW SECTION, TRANSITIONING INTO TWO FLAT PLATES WHICH ARE BOLTED TO THE TEE SECTION WEB
IBR PROFILE ROOF SHEET @ 7° SLOPE ON 150 x 75 x 20mm LIPPED CHANNEL PURLINS BOLTED TO 75 x 75 x 10 STEEL EQUAL ANGLE CLEAT WHICH IS WELDED TO TOP T-SECTION - SEE DETAIL 1
TOP TEE SECTION
ELECTRICAL -, VENTILATION - AND FIRE PROTECTION SERVICES TO BE PLACED
100mm ø HOLLOW STEEL SECTION AS DIAGONAL MEMBERS OF 7° MONO PITCH TRUSS
MASONRY WALL PLASTER AND PAINT
Top of Steel Roof Ridge Plate
14263
Top of Roof
12291
Building Ridge
15590
Top of Concrete Roof
12300
Ceiling Surface
11380
1671
3391
4215
IBR PROFILE WALL CLADDING OF SAME MATERIAL AND SPECIFICATION OF ROOF SHEETS
CEMENT SCREED LAID TO MIN 1° FALL TO OUTLET
305 x 305 x 97 x 15 H-SECTION STEEL BEAM
150mm THICK CAST IN-SITU CONCRETE GUTTER
110 mm MASONRY WALL INFILL
CURVED CONCRETE WALL
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN CLOSED WITH 10mm STEEL EDGE PLATES
220mm MASONRY WALL INFILL
SPRINT TRACK
MASONRY SINGE WALL PLASTER AND PAINT
ELECTRICAL -, VENTILATION - AND FIRE PROTECTION SERVICES TO BE PLACED
6 mm GLAZED CURTAIN WALL WITHIN ALUMINIUM FRAMES AND GLASS DOOR
FEMALE CLOAK ROOM
MASONRY WALL PLASTER AND PAINT
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN CLOSED WITH 10mm STEEL EDGE PLATES
10mm SAFETY GLASS INFILL WITHIN STEEL FRAME OF ELEVATOR
MASONRY WALL PLASTER AND PAINT
ONE-WAY RIBBED SLAB
WEIGHT TRAINING AREA
CURVED CONCRETE WALL
POST-TENSION CONCRETE UPSTAND BEAM
250mm IN-SITU REINFORCED CONCRETE FLOOR SLAB WITH POST-TENSION BEAMS
SPRINT TRACK
uffl (Second Floor)
8700
uffl (Second Floor)
8700
2680
TRENCH DRAIN
CONDITIONING POOL
STEEL TANK FLOOR PLATE
200mm IN-SITU RC FLOOR SLAB
450 x 300 RC STRUCTURAL BEAM
152mm STEEL TANK WALL ACCORDING TO SPECIALIST (SEE HYDROWORK POOL SECTION
450 x 300 RC BEAM CAST IN-SITU WITH CONCRETE COLUMNS
550 x 400 REINFORCED CONCRETE BEAM
400 x 550 RC STRUCTURAL BEAM
10 mm GLAZED CURTAIN WALL WITHIN ALUMINIUM FRAMES AND GLASS DOOR
MOVEMENT JOINT
CLEANER STAFF ROOM
RESTROOM
290mm SOLID REINFORCED CONCRETE FLOOR SLAB
600 x 600 FRAME FOR 6.4mm GYPROC RHINOBOARD SUSPENDED CEILING
SEE DETAIL 4
Finished Pool Floor Level
6872
1628
2172
MASONRY CAVITY WALL PLASTER AND PAINT
400 x 400 REINFORCED CONCRETE COLUMN
400 x 400 RC COLUMN
MASONRY WALL PLASTER AND PAINT
IBR PROFILE WALL CLADDING OF SAME MATERIAL AND SPECIFICATION OF ROOF SHEETS
uffl (First Floor)
4700
MECHANICAL PIT
BOARDROOM
WAITING AREA
SEMINAR ROOM
250mm SOLID CAST IN-SITU REINFORCED CONCRETE FLOOR SLAB
50mm IN-SITU WATERPROOF POLYMER SCREED
uffl (First Floor)
4700
400 x 400 REINFORCED CONCRETE COLUMN
220mm MASONRY WALL INFILL
400 x 550 RC STRUCTURAL BEAM
400 x 400 REINFORCED CONCRETE COLUMN
MOVEMENT JOINT
220mm STRUCTURAL MASONRY WALL
DUCT
400 x 550 RC STRUCTURAL BEAM
MASONRY CAVITY WALL PLASTER AND PAINT
400 x 400 RC COLUMN
MOVEMENT JOINT
RC STRUCTURAL BEAM
400 x 550 RC CANTILEVER BEAM
H-SECTION FRAME FOR ELEVATOR
25mm SUNLITE POLYCARBONATE SHEETING
STAINLESS STEEL RAINWATER STORAGE TANK
4400
MASONRY WALL INFILL PLASTER AND PAINT
60mm CONCRETE COUNTER TOP
110mm MASONRY WALL
MEDICAL RESTROOMS
STUDIOS' RESTROOM
200mm SQUARE TUBE STRUCTURAL COLUMN FOR STEEL STAIRS
TREADS 250 RISERS 200
MASONRY WALL PLASTER AND PAINT
400 x 400 RC COLUMN
450 ø ROUND RC COLUMN
6mm GLASS WINDOW WITHIN ALUMINIUM FRAME
300mm ø SLANTED ROUND RC COLUMN @ 12°
220mm MASONRY WALL INFILL
4400
uffl (Ground Floor)
300
SEE DETAIL 5
HYDROTHERAPY ROOM
(SEE HYDROTHERAPY FLOOR PLAN LAYOUT)
MONITORING ROOM
DRESSING ROOM
RECEPTION
CARDIO CIRCUIT WAITING AREA
SPINNING STUDIO
INTERIOR
EXTERIOR
uffl (Ground Floor)
300
NGL
DPM
HYDROTHERAPY POOL
TREADS 250 RISERS 200
Finished Floor Level within basement
-1528
1628
1097
150
450
600
200mm REINFORCED CONCRETE RETAINING WALL
150mm CONCRETE SURFACE BED SUPPORTING POOL WEIGHT, ON 0.25 POLYOLEFIN MEMBRANE
150mm IN-SITU CONCRETE SURFACE BED WITH THICKENED SIDES OF 450mm ON 0.25 POLYOLEFIN MEMBRANE
1000
1000
SELECTED APPROVED BACKFILL COMPACTED IN LAYERS OF 150mm COMPACTED EARTH FILLING ON GRAVEL ON STONES INCREASING IN SIZE TO THE BOTTOM TO PREVENT THE PERFORATED PIPE FROM BLOCKING ASPHALT WATERPROOFING AS REQUIRED
220mm EXTERIOR MASONRY PROTECTION WALL
100mm ø PERFORATED DRAINAGE PIPE
1200mm x 400mm DEEP PAD FOUNDATIONS FOR 400mm SQUARE RC COLUMN, ACCORDING TO ENGINEER'S SPECIFICS
1600
300 x 85mm STEEL WATER CHANNEL DRAINAGE SYSTEM COVERED WITH WALKWAY GRATING
DEEP COMPACTED EARTH FILL IN LAYERS OF 150mm
150mm IN-SITU CONCRETE SURFACE BED, ON 0.25 POLYOLEFIN DAMP PROOFING MEMBRANE TO COMPLY WITH SABS 952 TYPE C
1200mm x 400mm DEEP PAD FOUNDATIONS FOR 400mm SQUARE RC COLUMN, ACCORDING TO ENGINEER'S SPECIFICS
700mm x 1 200mm CONCRETE FOOTING FOR SLANTED ROUND REINFORCED COLUMN
2920
uffl (Basement)
-2620

Section BB



Detail 2 - Concrete Box Gutter Section + 3D

CONCRETE GUTTER OVER RUNNING TRACK

J

I

60mm LAMBDA BOARD OVER PURLIN INSULATION AND CEILING SURFACE

IBR ROOF SHEETS FIXED TO LIPPED CHANNELS WITH HOOK BOLTS

CAP FLASHING, SAME AS ROOF SHEET OF 0.35mm TCT IN CLEAN COLORBOND STEEL, METALLIC COATING, AND SUPER POLYESTED PAINT SYSTEM FIXED BETWEEN ROOF SHEET AND LAMBDA BOARD

200 x 75 x 20 x 2.5 COLD FORMED LIPPED Z-CHANNEL BOLTED TO CLEAT WITH 4 x M16 BOLTS

CANT STRIP

BASE FLASHING

254 x 146 x 31 x 10 STEEL I-PROFILE RAFTER

PROTECT EXPOSED STRUCTURE AGAINST WATER DRIP AND CONSTANT MOISTURE
TYPE OF PROTECTION SYSTEM: DUPLEX PAINT
PREPARATORY TREATMENT: HOT-DIP, GALVANIZED (85 µm) CHEMICAL TREATMENT
PRIMARY COAT: EPOXY (60 µm)
FINISHING LAYER: POLYURETHANE(60 µm)

254 x 146 x 31 x 10 STEEL I-PROFILE HAUNCH

140 x 16 END PLATE BOLTED TO COLUMN WITH M20 BOLTS

HAUNCHED BEAM

IBR PROFILE WALL CLADDING OF SAME MATERIAL AND SPECIFICATION OF ROOF SHEETS

305 x 305 x 97 x 15 H-SECTION STEEL COLUMN CLOSED WITH 10mm STEEL EDGE PLATES

6mm GLASS WINDOW WITHIN ALUMINIUM WINDOW FRAME

ALUMINIUM WINDOW FRAME FIXED BETWEEN STEEL PLATES OF ADJACENT COLUMNS

60 150

EXTERIOR

IBR PROFILE ROOF SHEET OF 0.35mm TCT IN CLEAN COLORBOND STEEL, METALLIC COATING, AND SUPER POLYESTED PAINT SYSTEM, 25um ON TOPSIDE AND 10um ON REVERSE SIDE

150 60

200 x 75 x 20 x 3 LIPPED CHANNELS AS FRAME FOR FLASHING

BASE FLASHING LAP

CAP FLASHING

BASE FLASHING FOLDED OVER RAFTER

CANT STRIP

DPC LAYER OVER CONCRETE

60mm LAMBDA BOARD OVER PURLIN INSULATION AND CEILING SURFACE

150 x 75 x 20 x 5 LIPPED CHANNEL PURLIN BOLTED TO CLEAT WITH 4 x M16 BOLTS AS TOP STRUCTURAL MEMBER FOR TUBULAR SECTIONS AND SPACED ACCORDINGLY - SEE SECTION BB

305 x 152 x 97 x 15 TOP TEE SECTION

140 x 16 END PLATE BOLTED TO VERTICAL CONCRETE MEMBER OF GUTTER WITH M20 BOLTS

MASONRY SINGLE WALL PLASTER AND PAINT

TWO 100 x 100 x 10 EQUAL ANGLES WELDED TO WEB OF H-SECTION, AS VERTICAL EDGE SUPPORT FOR 7 MONO PITCH TRUSS AND KEEPS CONCRETE GUTTER IN POSITION

305 x 152 x 97 x 15 BOTTOM TEE SECTION

6.4mm GYPROC RHINOBOARD SUSPENDED CEILING

220mm MASONRY WALL INFILL

TWO 100 x 100 x 10 EQUAL ANGLES WELDED TOGETHER AND ONTO H-SECTION BEAM, AS VERTICAL EDGE SUPPORT FOR CONCRETE GUTTER

COUNTER FLASHING

600mm CONCRETE UPSTAND BEAM

ONE LAYER TORCHON DERBIGUM SP4 WATERPROOFING MEMBRANE, WITH END LAPS SEALED TO PRIMER SURFACE TO FALLS AND CROSSFALLS BY 'TORCH-FUSION' FINISHED WITH TWO COATS BITUMINOUS ALUMINUM PAINT. WATERPROOFING TO BE INSTALLED BY AN APPROVED DERBIGUM CONTRACTOR

50mm MIN THICK SAND CEMENT SCREED LAID TO MIN 1° FALL TO OUTLET

1° FALL

CONTINUOUS CLEAT WITH FLASHING DRIP

CUSTOM CONCRETE SPOUT FOR OVERFLOW, OUTLET OVER COURTYARD

940mm CONCRETE UPSTAND BEAM

GUTTER WITH FALL TO OUTLET

450

60mm LAMBDA BOARD INSULATION

150

SLIP JOINT

150mm THICK CAST IN-SITU CONCRETE GUTTER

305 x 305 x 97 x 15 H-SECTION STEEL BEAM

BOLTED ANGLE CLEATS TO WEB OF STEEL BEAMS

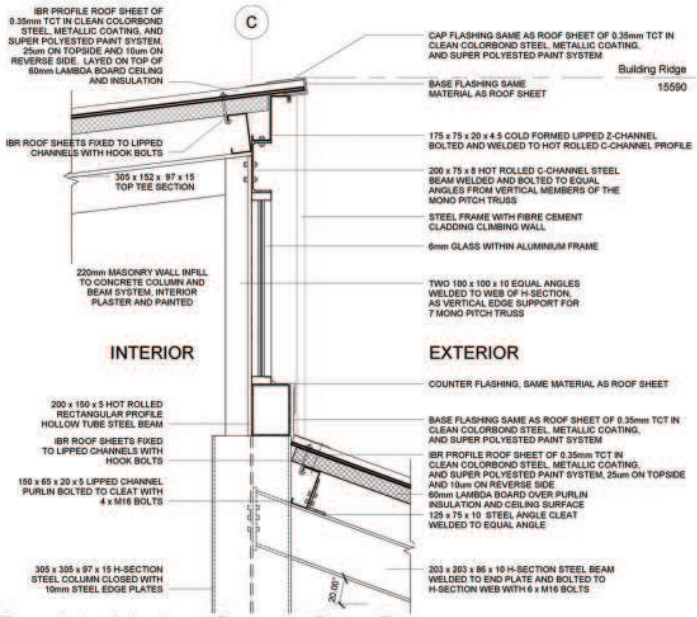
305 x 305 x 97 x 15 H-SECTION STEEL COLUMN CLOSED WITH 10mm STEEL EDGE PLATES

110 mm MASONRY WALL INFILL

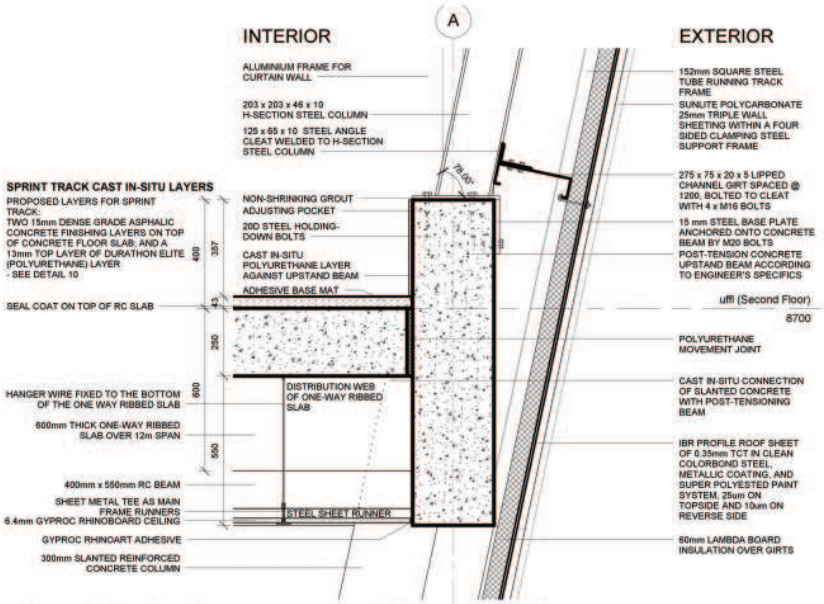
305 x 305 x 97 x 15 H-SECTION STEEL BEAM

305 x 305 x 97 x 15 H-SECTION STEEL COLUMN CLOSED WITH 10mm STEEL EDGE PLATES

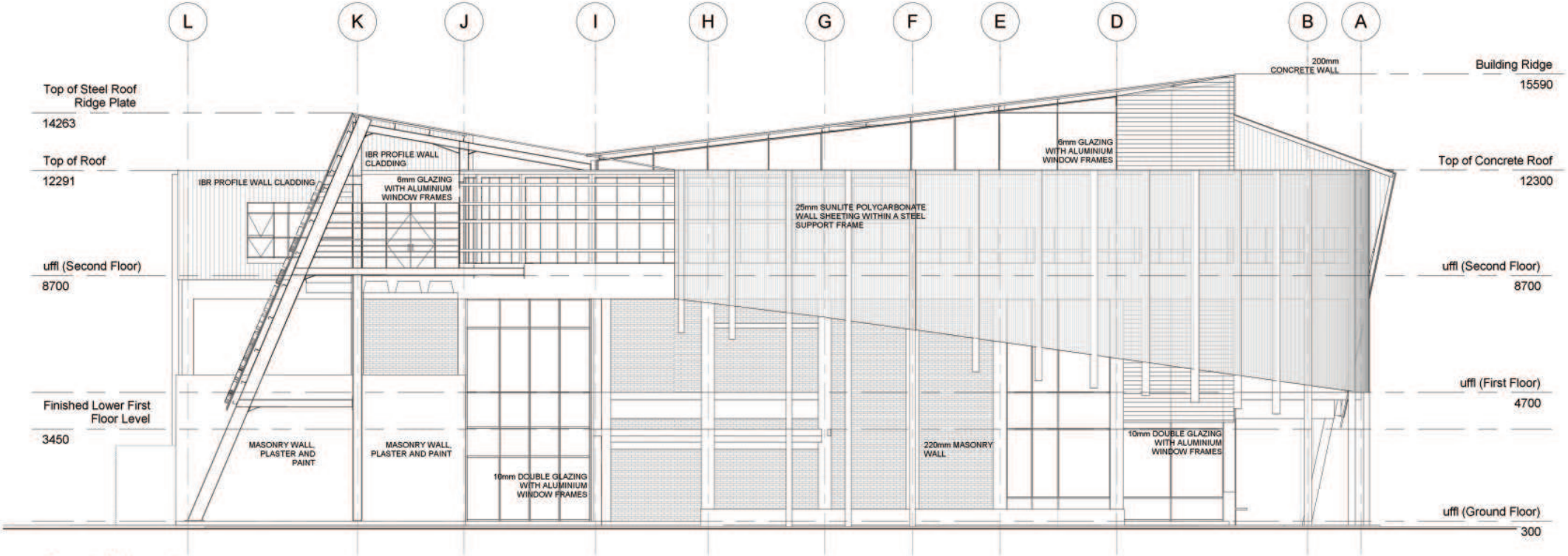
INTERIOR



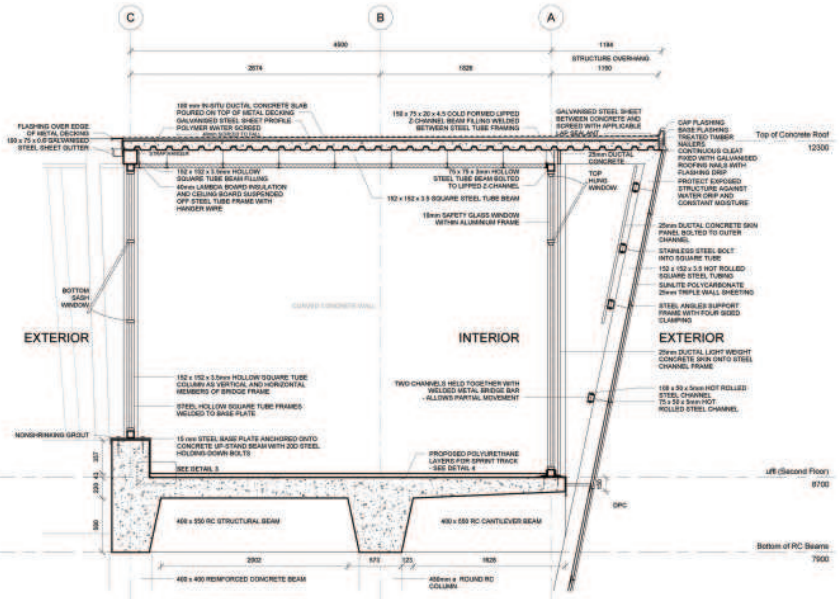
Detail 1 - Northern Facade Roof Connection



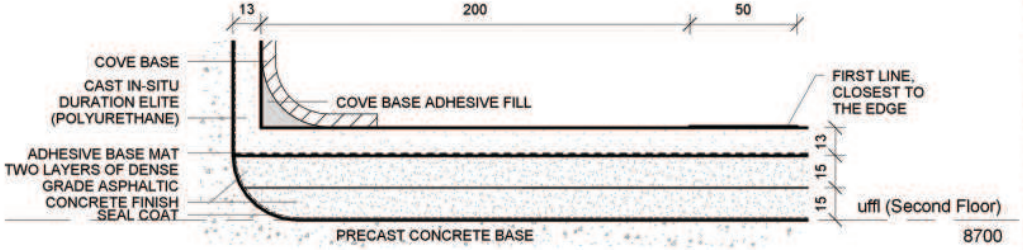
Detail 4 - Steel connection with Concrete Beam



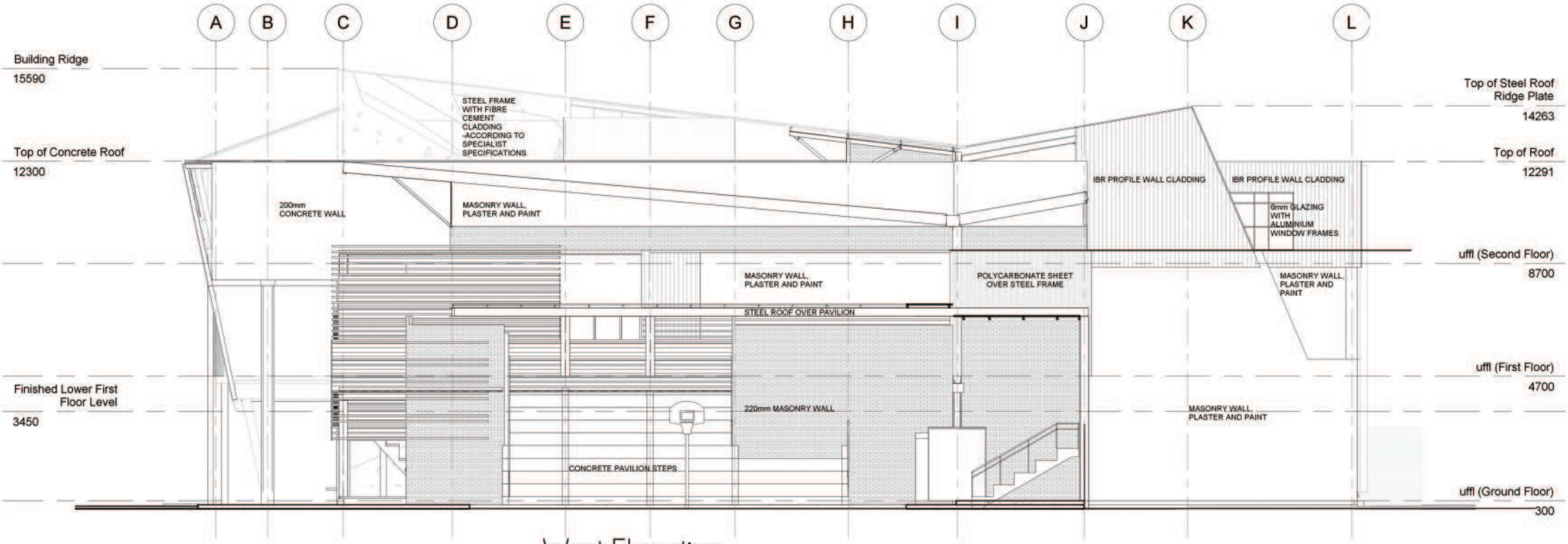
East Elevation



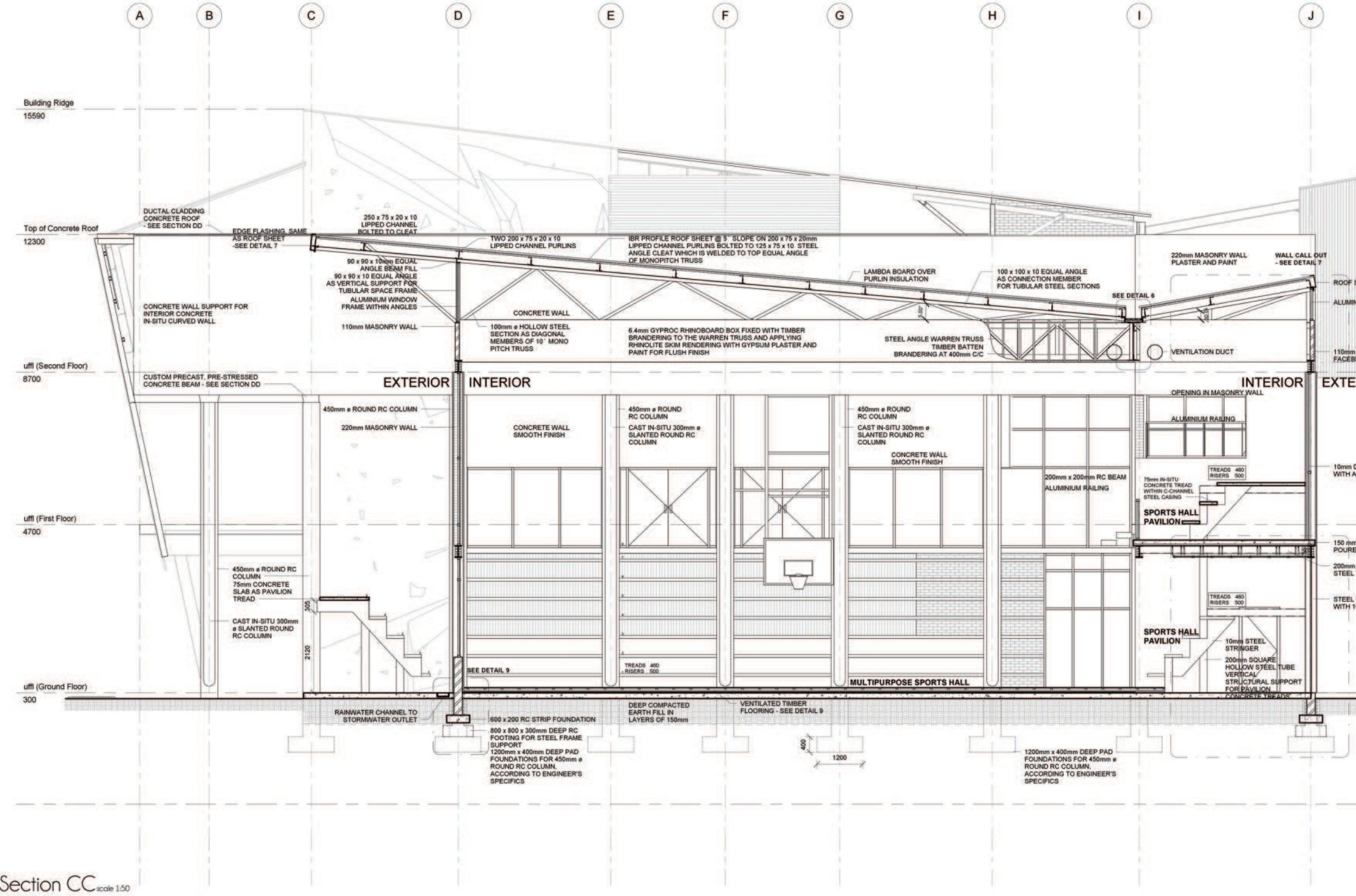
Section DD - Detail of 25m Bridge structure



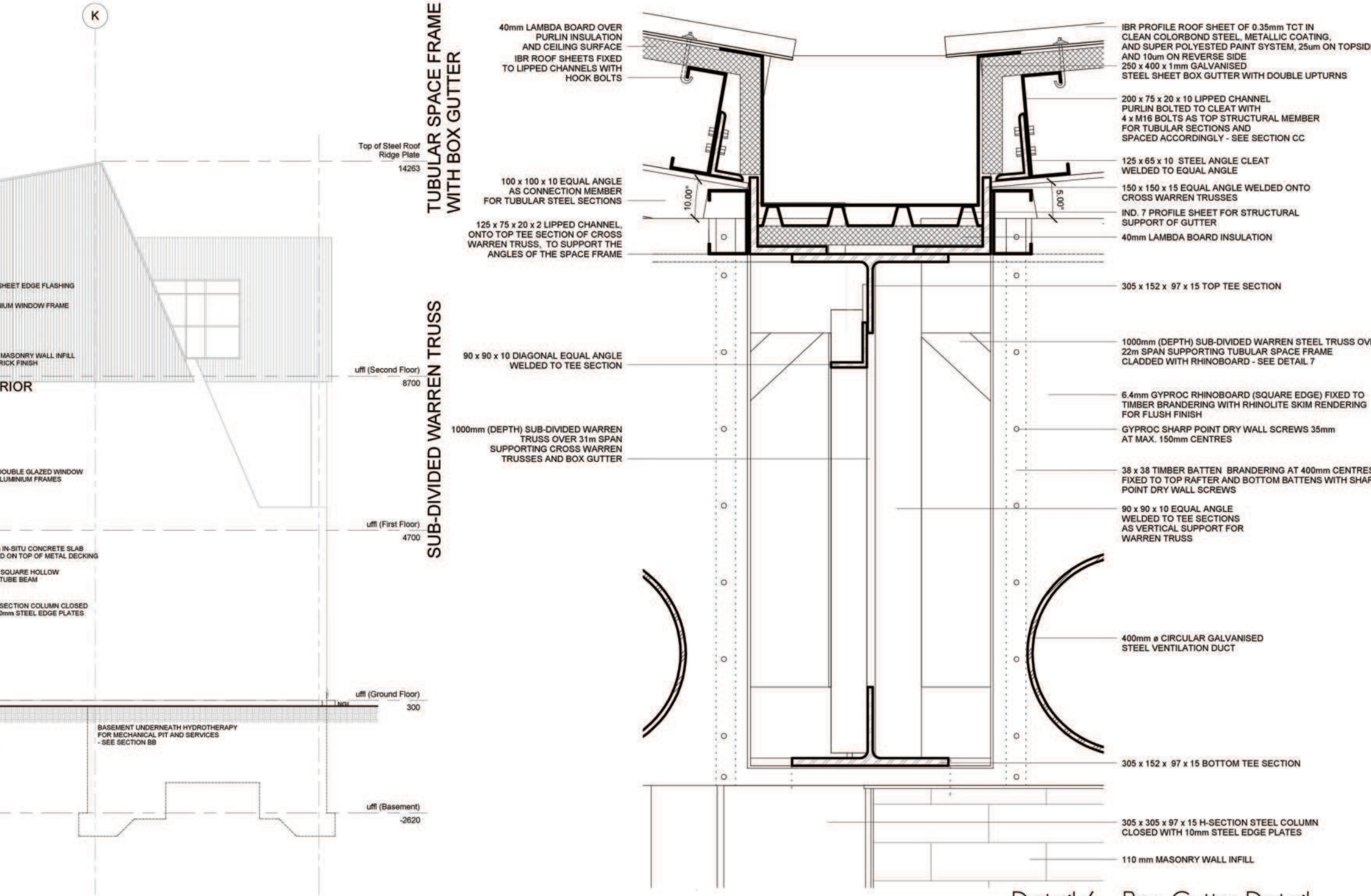
Detail 3 - Surface Layers of Sprint Track



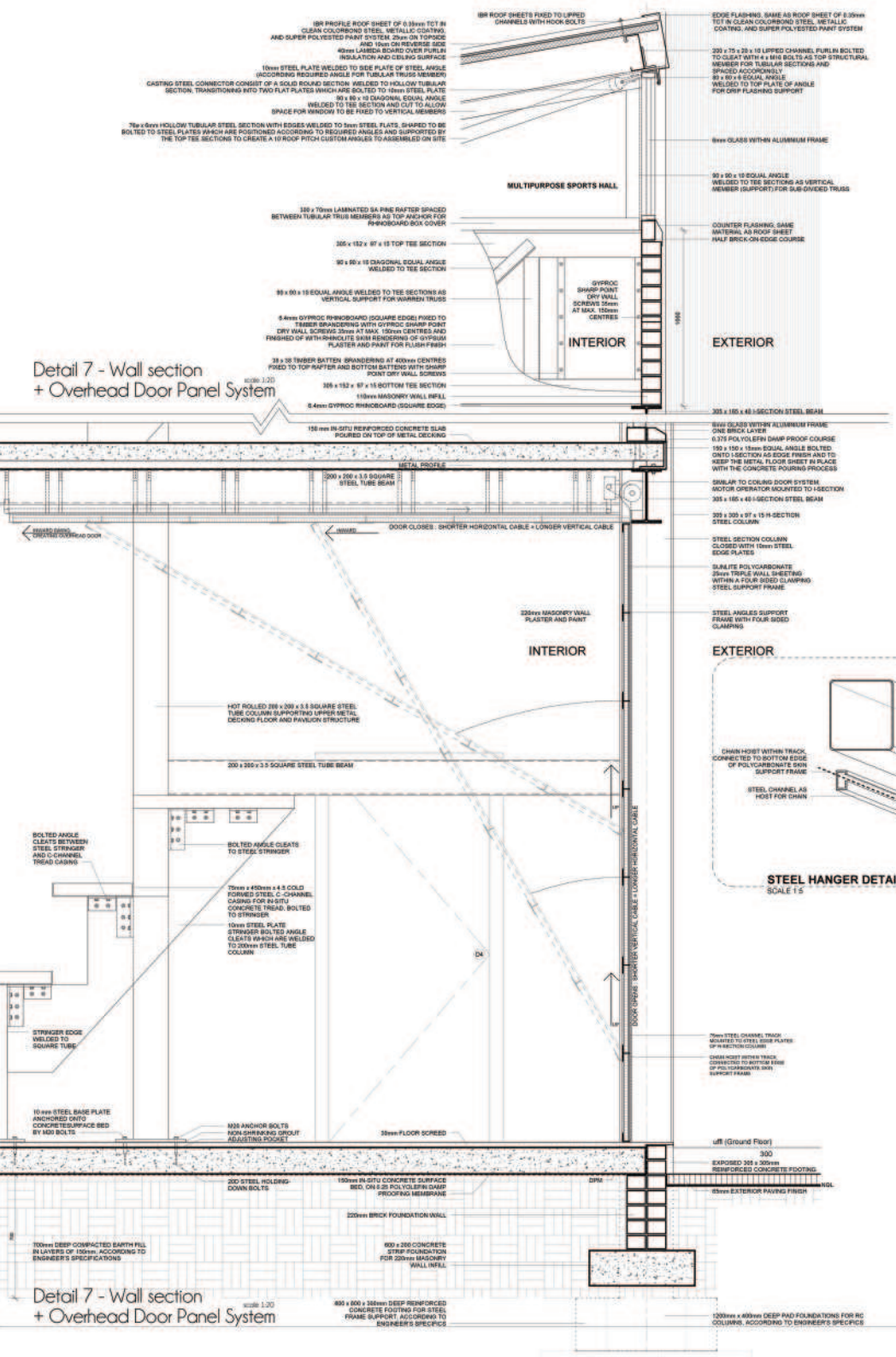
West Elevation



Section CC scale 1:50



Detail 6 - Box Gutter Detail

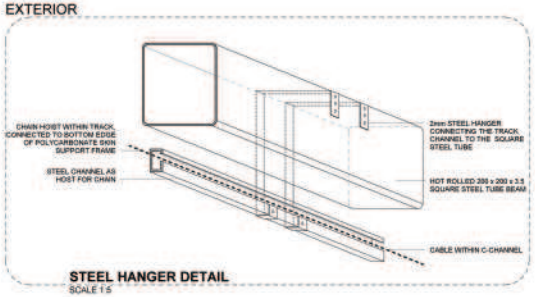


Detail 7 - Wall section
+ Overhead Door Panel System

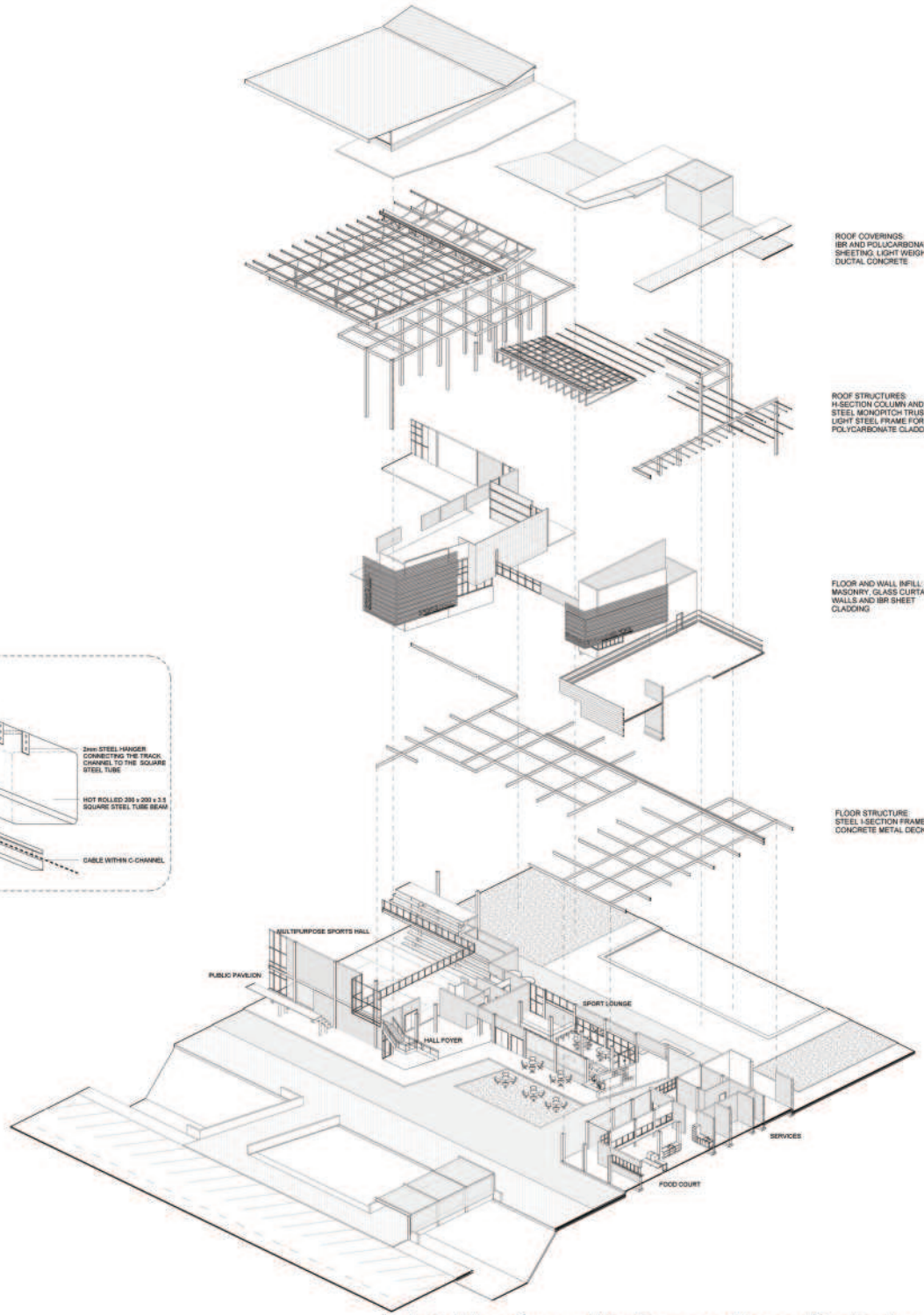
scale 1:20

Detail 7 - Wall section
+ Overhead Door Panel System

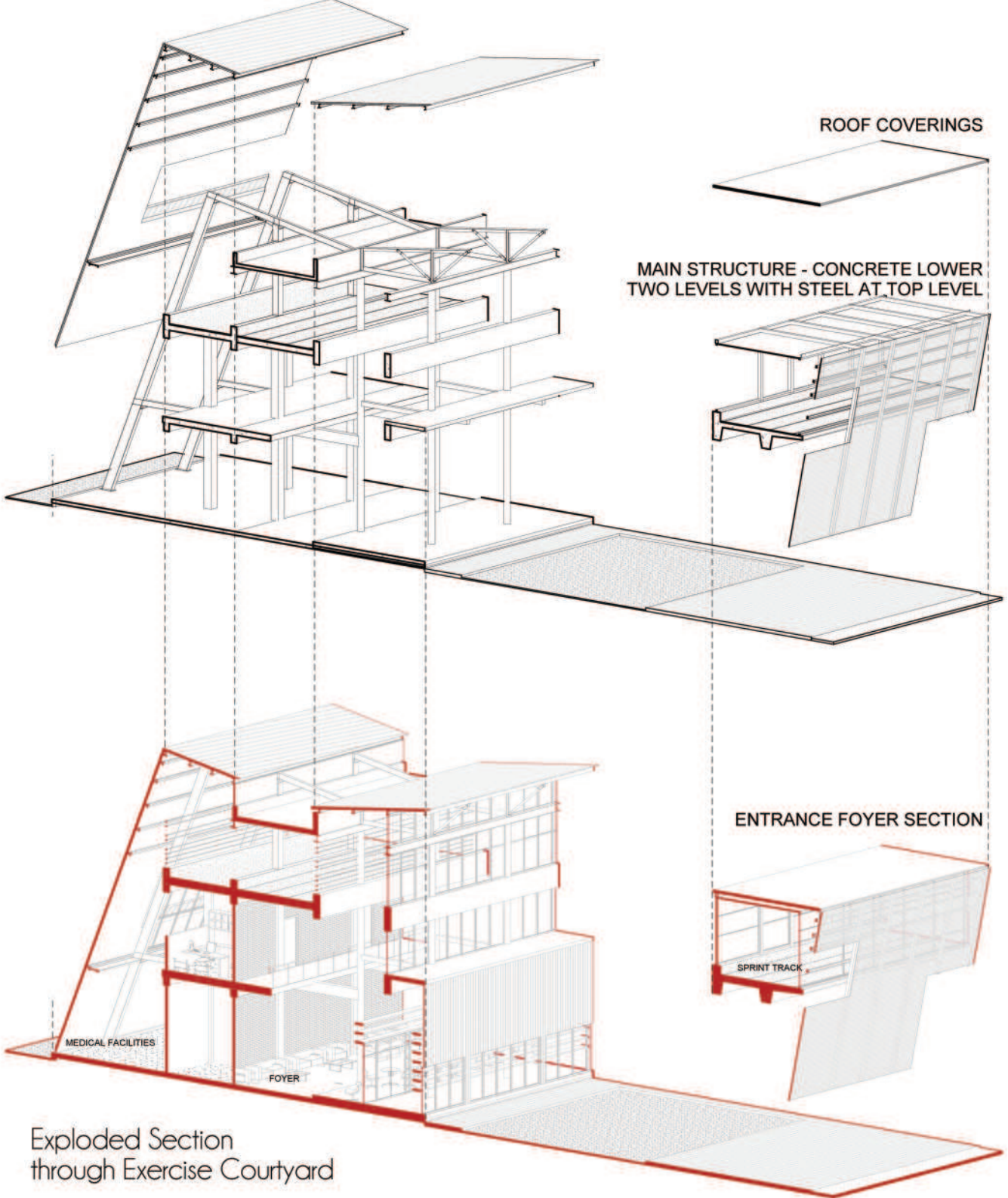
scale 1:20



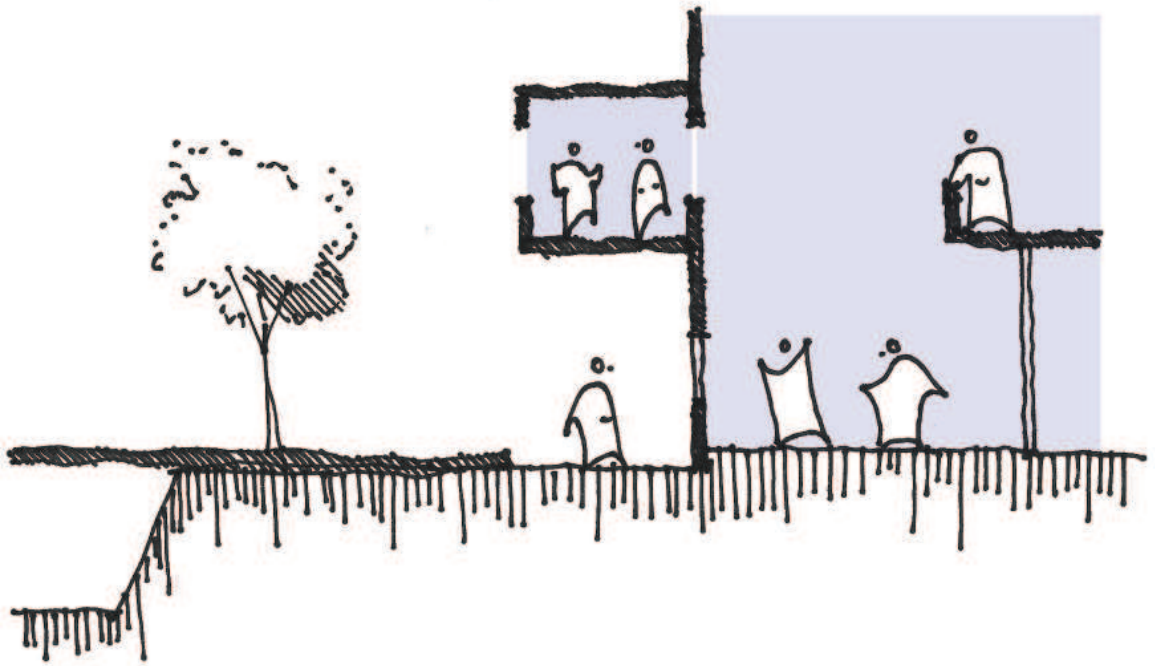
STEEL HANGER DETAIL
SCALE 1:5

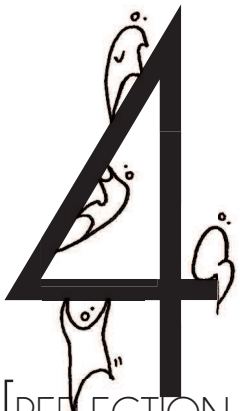


Exploded View - Proposed New Entrance to Municipal Pool Facilities



Exploded Section
through Exercise Courtyard

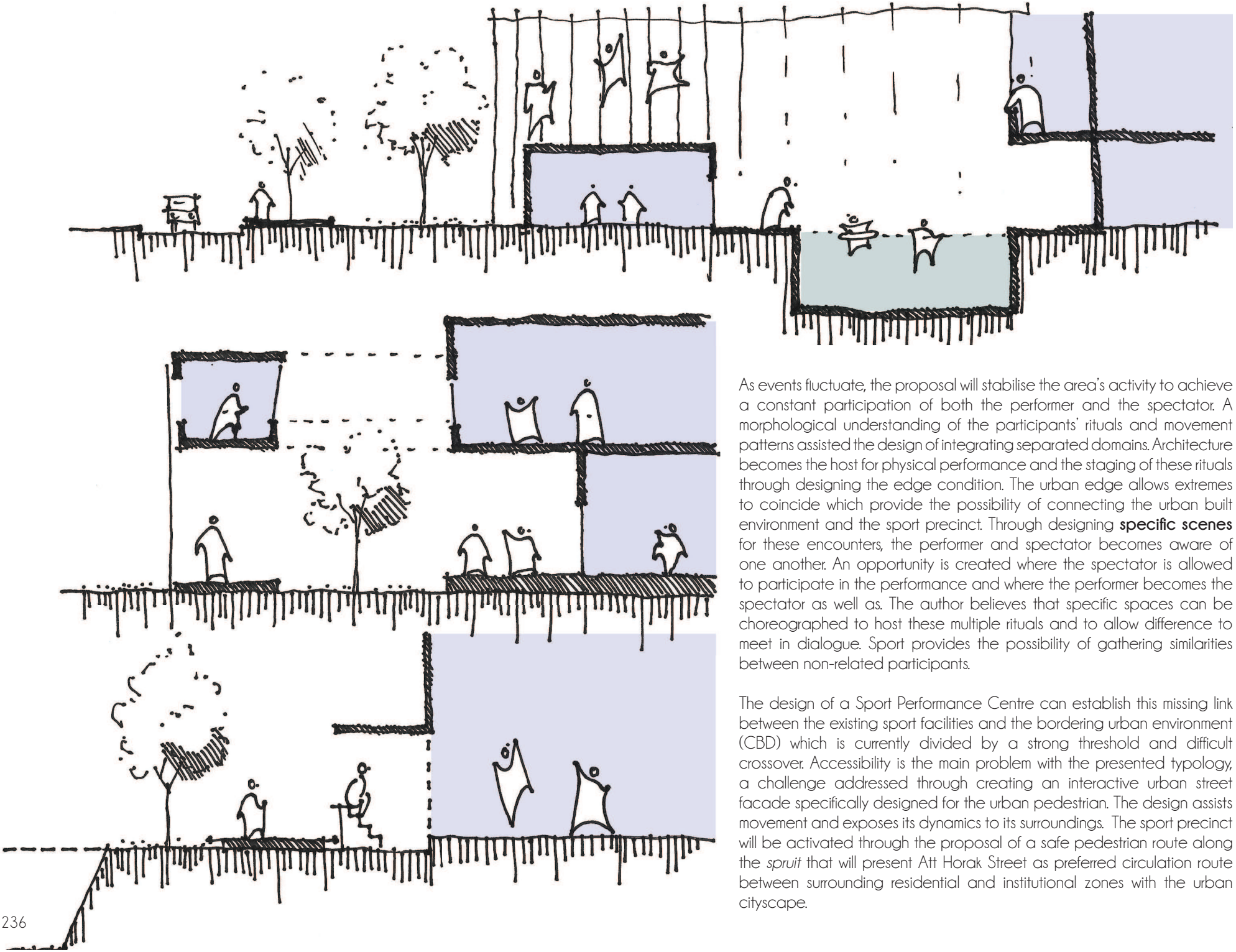




[REFLECTION + EVALUATION]

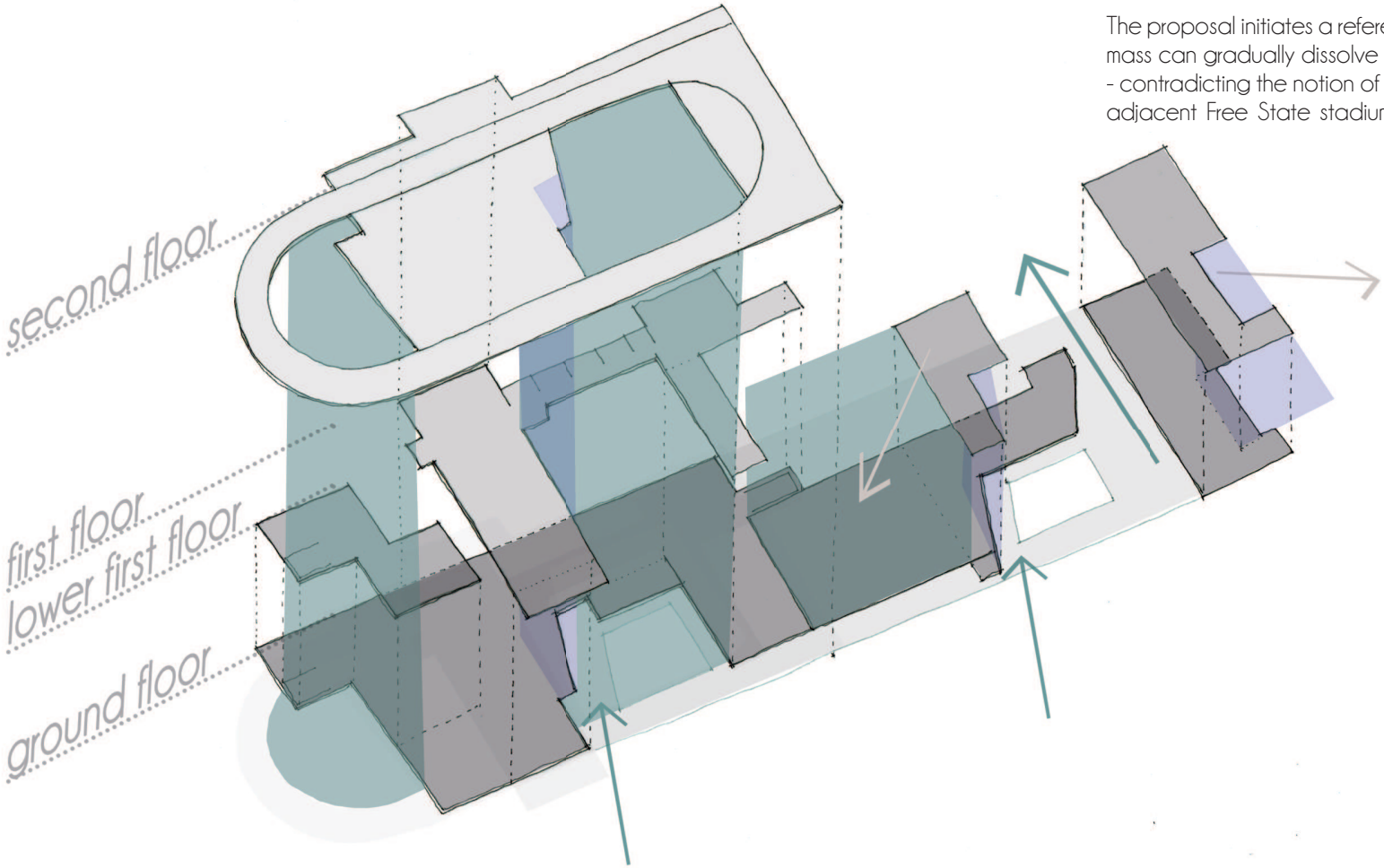
The proposal initiates an integration of two separated urban zones. Because of its urban importance, the Sport Precinct of Bloemfontein needs an intervention, not only to provide a building to incorporate all participants as equals and active role players of the area, but to connect all the facilities through a route of possibilities.

The design aims to achieve a continuous flow of urban vibrancy into the inanimate sport precinct. With the extension of the existing fan-walk into the precinct, this flow will be guided to actually reach the sport facilities as it was intended to do. The building, as urban representative on the boundary line of the CBD, welcomes the pedestrian. With the route continuing along the *spruit*, the building accompanies the pedestrian's movement and presents multiple events to the participant. Specific pause spaces are designed to allow the pedestrian to divert from the route and step into a state of contemplation. He/she is given the opportunity to become part of the events presented to him/her. Thus a choice of participation will gather a variety of participants to engage in the same activity. Multiple sports, social and cultural activities present the possibility of activating the area and adjusting to the extreme fluctuating patterns within the precinct.

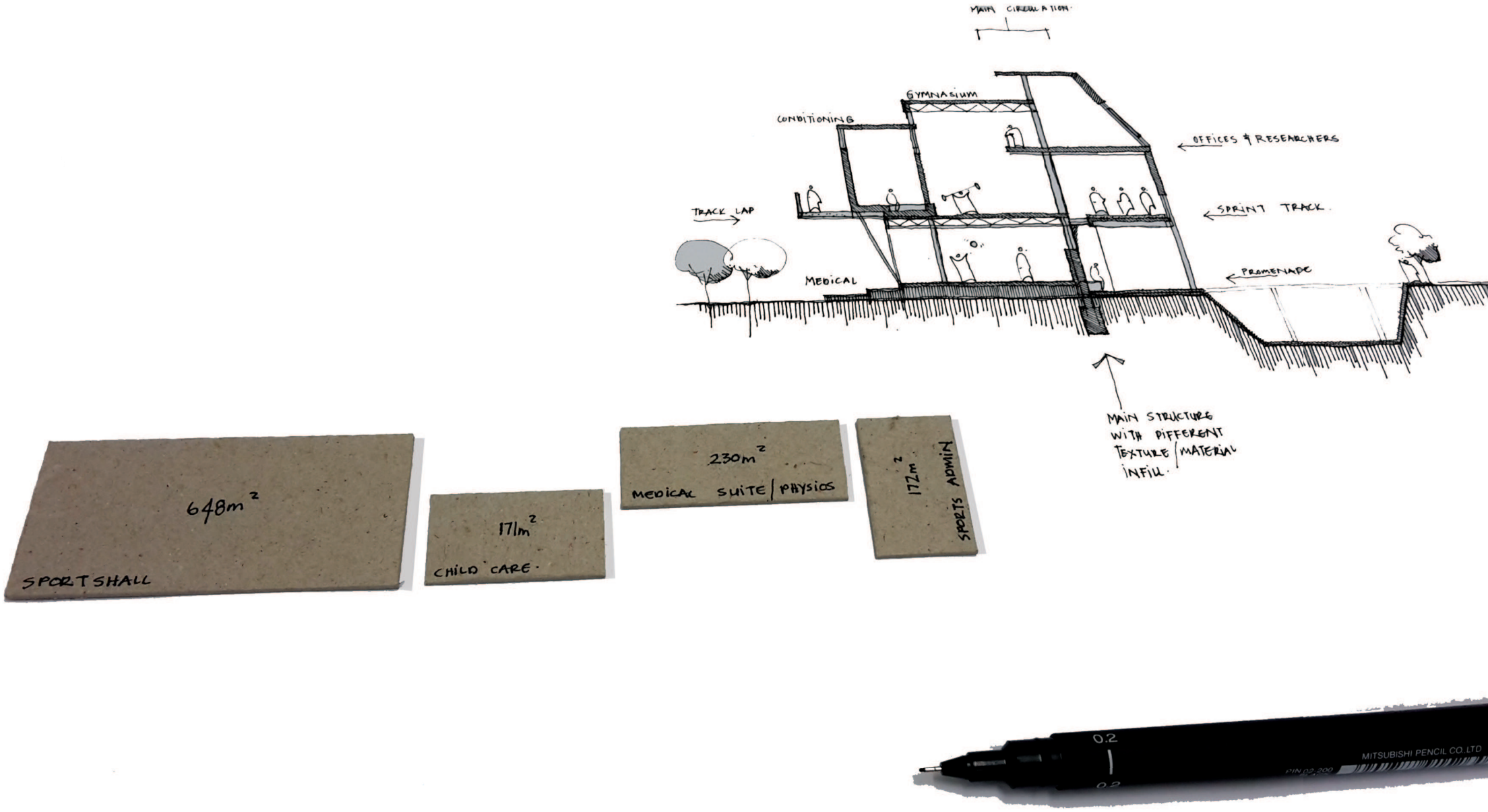


As events fluctuate, the proposal will stabilise the area's activity to achieve a constant participation of both the performer and the spectator. A morphological understanding of the participants' rituals and movement patterns assisted the design of integrating separated domains. Architecture becomes the host for physical performance and the staging of these rituals through designing the edge condition. The urban edge allows extremes to coincide which provide the possibility of connecting the urban built environment and the sport precinct. Through designing **specific scenes** for these encounters, the performer and spectator becomes aware of one another. An opportunity is created where the spectator is allowed to participate in the performance and where the performer becomes the spectator as well as. The author believes that specific spaces can be choreographed to host these multiple rituals and to allow difference to meet in dialogue. Sport provides the possibility of gathering similarities between non-related participants.

The design of a Sport Performance Centre can establish this missing link between the existing sport facilities and the bordering urban environment (CBD) which is currently divided by a strong threshold and difficult crossover. Accessibility is the main problem with the presented typology, a challenge addressed through creating an interactive urban street facade specifically designed for the urban pedestrian. The design assists movement and exposes its dynamics to its surroundings. The sport precinct will be activated through the proposal of a safe pedestrian route along the *spruit* that will present Att Horak Street as preferred circulation route between surrounding residential and institutional zones with the urban cityscape.



The proposal initiates a reference point for the sport precinct, where urban mass can gradually dissolve to a more relatable scale within the precinct - contradicting the notion of sports architecture such as the overpowering adjacent Free State stadium. The volume is then also cut and layered to accommodate for the extensive building programme and to maintain visual connections between all participants while exposing the activities on the exterior. With the future development plans of the urban corridor and the accepted proposal of a new sports academy, the building stands as catalyst for change. The proposal should maintain a sense of activity and happenings which initiated the design of event upon event to create a continuous flow of movement - integrating the participation of the traditionally separated participants.


MAIN CIRCULATION
GYMNASIUM
CONDITIONING
OFFICES & RESEARCHERS
TRACK LAP
SPRINT TRACK
PROMENADE
MEDICAL
MAIN STRUCTURE WITH DIFFERENT TEXTURE / MATERIAL INFILL
648m²
SPORTSHALL
171m²
CHILD CARE
230m²
MEDICAL SUITE / PHYSIOS
172m²
SPORTS ADMIN
0.2
MITSUBISHI PENCIL CO.LTD

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