

# LACTIS



# LACTIS

AN AGRICULTURE AND TRAINING FACILITY ON  
THE IRENE DAIRY FARM

CHRISTOFFEL JACOBUS MENTZ IV

Submitted in partial fulfillment of the requirements for the degree MArch (Prof)  
Department of Architecture  
Faculty of Engineering, Built Environment and Information Technology  
University of Pretoria, South Africa  
Study leader: Nico Botes  
Studio Coordinator: Arthur Barker  
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TO  
DANELLE

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## FOR THE LOVE OF AGRICULTURE

I was named after my grandfather, a great man, who passed away during the course of this difficult year. Christoffel Jacobus Mentz, a family name in the Mentz family has been passed down for four generations, it is a name I carry with pride and I strive to live up to the name I carry. My grandfather was a farmer of profession and exceptionally hard working during his life till the age of 92, when my father and uncle asked him to please step down from the windmill. His love for nature and his surroundings made it easy to choose the topic for my dissertation, he cultured a love for nature and agriculture in all of his grand children. He had a light sense of humour and had the ability to always make his guests laugh and leave his farm with a smile. I live my life according to the example he set for all his children and grand children, to always work hard and to see the light side to life.

This is a tribute to the man who's name I have and who nurtured a love for agriculture.





## E K S E R P

In Afrika en spesifiek in Suid-Afrika, is landbou die sektor waaruit die meederheid landelike gemeenskappe hulle finansiële inkomste put, dit is ook die bron van voedsel vir beide landelike en stedelike gemeenskappe. Die grootste uitdaging in landbou ontwikkeling is die wyse waarop landboukundiges kennis bekom in volhoubare boerderymetodes. Daar bestaan 'n gebrek aan kennis onder boere oor die wyse waarop hulle volhoubare boerderypraktyke en omstandighede kan verbeter.

Landbou speel 'n kritieke rol in volhoubare ontwikkeling en in hongersnood en armoede verligting (Departement van Landbou, 2002:3).

'n Opleiding en didaktiese fasiliteite is die hoof konsep vir die ingryping op die Irene Suiwel Plaas. 'n Plek of ruimte waar aspirerende entrepreneurs en landboukundiges kennis kan opdoen in hulle veld. 'n Praktiese leersproses in landbou en die effektiewe en verantwoordelike gebruik van bestaande natuurlike hulpbronne op die terrein en die omliggende gebied sal deel vorm van die leerervaring.



## ABSTRACT

In Africa and specifically in South Africa, agriculture is the sector from which most rural communities derive their financial income, it is also the source of food for both rural and urban communities. The greatest challenge that Agricultural development faces is the means by which agriculturalists gain their knowledge in terms of the practice of sustainable agriculture. There lacks a structure between farmers about improving their practices and situations in terms sustainable agriculture.

Agriculture plays a crucial role in sustainable development and in hunger and poverty eradication (Department of Agriculture, 2002:3).

A learning and didactic facility for aspiring farmers and agriculturalists is the main concept for the intervention on the Irene Dairy Farm. A place and space where aspiring entrepreneurs and agriculturalists will gain knowledge in their field. A practical learning process of agriculture and the efficient and responsible use of available resources on site and the surrounding area will form part of this learning experience.



# PROJECT SUMMARY



Title:	'Lactis' - Latin <i>lactis</i> is of crucial importance for manufacturing dairy products, such as buttermilk and cheeses.
Building type:	The precinct is a Agricultural Education and Training Facility and is characterised as a School building.
Address:	391 Nellmapius drive Centurion 0046 South Africa
GPS coordinates:	25° 52' 34" S; 28° 12' 39" E
Research field:	Heritage and Cultural Landscape, Environmental Potential.
Client:	Department of Agriculture, The Irene Dairy Farm (van der Byl family).
Theoretical premise:	Adaptive re-use of significant heritage buildings.
Keywords:	Nellmapius, Irene, Dairy farming, productive landscape, Agricultural Education and Training, Agriculture development, heritage, Conventional agricultural buildings, pastoral landscape.



## INTRODUCTION

'Most people in sub-saharan Africa live in rural areas, and most Africans work in agriculture (57,3 percent), according to data from the UNFood and Agriculture Organization (faostat).' (Dercon and Gollin 2014:2)

Alois Hugo Nellmapius, bought the Northern and Western portions of the Doornkloof farm from Erasmus brothers, the sons of Daniel Elardus Erasmus. After he saw the productive potential of this part of Pretoria's landscape he bought several other farms along the Hennops River. In 1889 Nellmapius commissioned Willem de Zwaan to build a farmhouse and dairy which are still in use today (Allen 2007:198). Nellmapius named the farm after his daughter, who pronounced her name with three syllables, *Ireenee*.

This portion of the urban landscape of Pretoria was once defined as a productive landscape, with various productive activities taking place in the area (quarries, lime works, brick production). Agriculture forms part of the productive character of the area and will be the main focus of this dissertation.



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01

I R E N E

H I S T O R Y

019



1830

BOER VOORTEKKER DANIEL ELARDUS ERASMUS LEAVES CAPE TOWN ON THE GROOT TREK.



1844

DANIEL ERASMUS REGISTERS THE TITLE DEEDS FOR THE FARM DOORNKLOOF.



1855

THE VILLAGE ON THE NEIGHBOURING FARM ELANDSPOORT IS NAMED PRETORIA.



1889

A.H. NELLMAPIUS BUYS TWO THIRDS OF THE ERASMUS FARM, NAMED THE FARM AFTER HIS DAUGHTER.



1898

HACK'S & CO LTD. THE FIRST TRADING STORE OPENS NEAR THE TRAIN STATION.



1899

THE SECOND BOER WAR BREAKS OUT.



1902

THE IRENE TOWNSHIP IS ESTABLISHED BY J.A. VAN DER BYL.



1911

THE ESTABLISHMENT OF THE IRENE COUNTRY CLUB.



1954

THE ESTABLISHMENT OF THE NATIONAL DAIRY RESEARCH INSTITUTE ON THE IRENE FARM.



1974

IRENE ESTATE'S LIME WORKS HAD TO BE CLOSED DOWN.



1889

NELLMAPIUS COMMISSION  
WILLEM DE ZWAAN TO  
DESIGN HIS HOUSE AND  
STABLE.



1893

THE FIRST TRAIN ARRIVES  
AT THE NEWLY BUILT  
IRENE TRAIN STATION.



1896

J.A. VAN DER BYL  
BECOMES THE NEW  
OWNER OF IRENE  
FARM.



1903

IRENE FARM BECOMES  
HOME TO THE  
GOVERNMENT TREE  
NURSERY.



1908

J.C. SMUTS BUYS  
THE LAST THIRD OF THE  
FARM DOORNKLOOF  
STILL BELONGING TO THE  
ERASMUS FAMILY.



1998

CORNWALL HILL  
RESIDENTIAL ESTATE  
IS ESTABLISHED.



2003

THE FIRST RESTAURANT  
IS BUILT IN THE  
ORIGINAL BARN  
ON THE IRENE FARM,  
THE BARN.



2006

THE SOUTHDOWNS  
COUNTRY ESTATE  
IS ESTABLISHED.

# fig.1.1. HISTORIC TIME LINE OF IRENE ESTATE

# SHORT INTRODUCTION TO IRENE

The Irene area south of Pretoria is rich with history and decorated with numerous colourful characters who defined the story of this part of the city.

Mzilikazi, Daniel Erasmus, Hugo Nellmapius, Bertie van der Byl and Jan Smuts are but a few of the prolific residents in the short written history of Irene.

The first of these characters is the breakaway Zulu chief Mzilikazi, the founder of the Khumalo tribe. He devastated the area in the early nineteenth century after moving west from Mozambique due to conflict with the surrounding tribes in that area. "He slaughtered most of the Bakwena tribe at what is now Irene" (Allen, 2007:193).

Hereafter the first known white settlers in the area are the Voortrekkers.

Daniel Elardus Erasmus and his family established their home at the convergence of the two streams where the Irene Country Club is situated today.

He proclaimed the title deed of the Doornkloof farm in 1838. After Erasmus passed away in 1875 his 5 136 hectare farm was left to his three sons and was divided into three roughly equal portions between the streams that course through the farm (Allen, 2007:198).

The area was quiet until after the 1880/1881 war: (Helme, 1974:10) "the history of Doornkloof remains a closed book until the sparkling figure of Nellmapius bursts upon the scene at the end of the 1880s.

Alois Hugo Nellmapius was born on 5 May 1847 and immigrated to South Africa in the late 1880s (Helme, 1974:11), "presumably attracted by the glitter of diamonds at Kimberly and gold at Pilgrim's Rest". He became in his short life an "outstanding pioneer of industry and agriculture in the Transvaal". (Helme, 1974:11)

In the 1880s Nellmapius became obsessed with the idea of turning virgin Transvaal soil into productive agricultural land. (Helme, 1974:13)



After forming syndicates with business partners, he owned nearly one million hectares of land in the Pretoria area. Nellmapius came to own a number of farms along the Hennops River, in particular some 3 605 hectares of the original Doornkloof farm (Helme, 1974:14) from the Erasmus brothers, Stephanus and Daniel, who owned the western and northern portions of their late father's farm. Nellmapius named the farm after his young daughter, Irene, meaning 'peace' (Allen, 2007:192).

Nellmapius had "grandiose schemes for the development of his pet project - the model farm at Irene" (Kaye, 1978:86).

He began to experiment with different crops, but not limiting himself to agriculture, he also established a "stock farm and dairy, for which he imported seventy Friesland cows" (Kaye, 1978:87).

Everything was envisaged on a large and generous scale. There was nothing petty or over-cautious about him. (Kaye, 1978:87)

He employed only the most knowledgeable specialists for the operations on his farm. One of these specialists was a young Swiss veterinary surgeon, Dr Arnold Theiler, who became the stock manager and veterinary surgeon on Irene farm. He later became a state veterinary surgeon and established the Onderstepoort Veterinary Research Laboratory and Teaching Hospital just north of Pretoria.

Another of these specialists was his first horticulturist Richard Wills Adlam, the "curator of the Pietermaritzburg Botanical Gardens in 1889" (Helme, 1974:15). His successor was the German born J. Fuchs, or 'Hans' as he was known on the farm. He "was both horticulturist and farm manager until 1895 (Helme, 1974:16). Fuchs was responsible for the design and landscaping of the gardens. "He built two arched glass-houses [which], by their design, fit snugly and artistically under the canopy of great trees" (Kaye, 1978:86).

Theiler gives a detailed description of the farm in one of his letters home (Kaye, 1978:87):

'Imagine an undulating terrain', he writes, 'through the lowest part of which a river flows. Everything, as far as the eye can reach, is part of the farm ... All is grass and only grass, with trees only along the river. Yet there are also gardens, practically wild, in which peaches, oranges, pomegranates, figs, almonds etc. grow.'

The staff on the farm were categorised into farmers and artisans, of which the farmers were sub-categorised as stablehands and field workers.

The artisans included two joiners and carpenters, a blacksmith, a saddler, a painter, a butter-maker, a storekeeper, a butcher, and a coachman and driver (Helme, 1974:18).



Nellmapius decided to build his homestead west of where the Irene Country Club is today. The Erasmus brothers built a water-furrow that was fed by a dam upstream toward Rietvlei. The year after Nellmapius's arrival he extended the water-furrow, which he used to irrigate his orchards, gardens and vegetable gardens using gravity.

He commissioned one of the best 'contemporary' architects of the time, Willem de Zwaan, to design his home. The "large Hungarian-styled stable-barns had been built, as well as the double-storeyed building" (Helme, 1974:16), with dolomite blocks and red bricks of one metre thick, and served as a dairy and butchery on ground floor level and staff quarters on the first floor level. Theiler resided in this building during his time on the Irene Estate. He gives an elaborate description of the facilities on the farm during this time:

The commodious home for the owner surrounded by a veranda and newly planted garden. There were homes for two managers, tool-sheds, a dairy, two large stables with coach-house and workshop attached, chicken-runs, duck ponds, 'an enclosure for stork-like marsh birds', cattle kraals and also a pen for springboks. He was particularly impressed by the 'model stables arranged for each special animal', in which cows in calf and milk cows were kept separately (Kaye, 1978:87).

Fuchs was responsible for the landscaping and design of the gardens, with their "sweeping lawns, shady avenues and brightly coloured flower beds" (Kaye, 1978:86), and created a retreat for the Nellmapius family where they could escape from the troubles of the business world.

This was what the Irene Estate was famous for, and not as a grazing farm: "Irene was known to the public as an extensive flower, vegetable, and fruit garden, and for the perfection of its amenities, twenty thousand fruit trees and a hundred thousand forest-trees having been planted" (Wallace, 1896:25).

The forest trees consisted of imported timbers from America, Australia and North Africa. The trees that shaded the garden around the house were stinkwood, swamp mahogany, loquats, imbuia, jacaranda from South America, cypress from the Himalayas, and a camphor tree from Japan. Fuchs brought several saplings of forest trees and shrubs indigenous to Europe.

The abundance of fruit trees and shrubs were endless as Kaye (1978:87) explains: "Irrigation canals, bordered with hedges of quince, pear, apple, plum and peach, criss-crossed the lands." To imagine such a landscape where most of the trees bear fruit makes one think that Nellmapius created a Garden of Eden for himself and his family. The farm became an "investment and experimental" (Kaye, 1978:89) for Nellmapius.





The hill-tops have been planted with European trees - pine, oak, chestnut, etc., the lower slopes are clothed with vines, and in the valleys plantations of oranges and lemons alternate with American, Australian and African timber. There is hardly a crop from tea to turnips which I did not see in the course of a long morning's drive. (Kaye, 1978:90)

Nellmapius was of the opinion that the Highveld had incredibly fertile soil and that it was not being utilised to its full potential, as had been thought possible up until that time. He felt that the soil could yield a greater variety of products, such as wheat, rye, barley and oats, as well as maize, millet and sorghum, all of which were found to thrive in the Highveld soil.

The experimental farm became a refuge for Nellmapius, who in the early mornings could be found "tenderly inspecting his young orange trees and carefully going through the immense stables where horses, cows and even wild animals knew him intimately" (Kaye, 1978:90).

The livestock on the Irene Estate was as diverse as the workers on the farm. Nellmapius imported Friesland cows for the dairy production on the farm. He was also famous for preserving antelope species that were being decimated by hunters in the Lowveld. Among these species of antelope were eland, springbuck and zebra. Nellmapius experimented with taming the eland and zebra on his farm to work as coach animals. It was known that when travelling through the town of Pretoria from his Albert House residence he would commute on a cart pulled by four zebra. The eland proved to be more difficult to convince to serve any function other than being an alternative to cattle on the farm.

The grazing capability was perfect during the wet summer months but "incapable of supporting its ordinary stock of cattle during winter" (Wallace, 1896:25). The seventy Friesland cows which made up the dairy herd received artificial feeding to sustain their dairy production capabilities. He continues, however, that the farm as "an extensive flower, vegetable and fruit garden" (Wallace, 1896:25) was an "unqualified success".

Nellmapius advertised this service in his paper during 1893, which reads as follows:

Families and hotels can arrange for a regular supply of choice and forced vegetables in and out of season. Especially hothouse cucumbers, tomatoes, bleached celery, etc. can be had throughout the whole winter. Also fresh butter, sweet cream, evaporated fruit, finest fruit, vinegar salad oil, hams, bacon, lard and sausages (Helme, 1974:22).



Nellmapius “was not to see the full fruit of his life at Irene” (Helme, 1974:23). He caught a cold in the winter of 1893, which became much worse by the middle of July of that year. He had also developed a dangerous skin disease on his head, and by the 25th his condition was critical. On the night of the 27th of July his temperature suddenly rose, and at eight o'clock on the morning of July 28 he passed away.

“The short, spectacular Nellmapius era had ended” (Helme, 1974:25).

The Estate of Nellmapius was advertised in the press to be sold at an auction in Church Square. The press notice preceding the auction described the house as “substantially built, containing six rooms, bathrooms, kitchen, two pantries, two wine cellars, etc., etc., water laid throughout, surrounded by verandah” (Helme, 1974:35).

The Irene Estate was sold for a mere £21 500 and the buyer was J. A. van der Byl, acting as agent for Eckstein's and Lewis and Marks. Including stock and movables, auction fees and transfer fees, the final price came to about £26 000. Bought for £40 000 seven years previously by Nellmapius, who had spent another fortune developing it (Helme, 1974:35).

Johannes Albertus ‘Bertie’ van der Byl was born on the farm Elsenburg near Stellenbosch in 1856 (Helme, 1974:26). He received his education at Victoria College on the Island of Jersey, between France and the United Kingdom. “Intelligent, full of vitality, fun and common sense, Bertie rapidly made a name for himself as an efficient and popular farmer” (Helme, 1974:29).

The first two years at the Irene Estate were favourable for Bertie financially, and the greatest profit came from the Estate's building lime that was sold to the public. Interestingly enough, the second most profitable sector of the estate was the garden, which sold “strawberries, fruit, flowers and seedlings to the Johannesburg and Pretoria markets” (Helme, 1974:35).

In 1902, as soon as the war was over, Bertie established the Irene township to “assure the outlet for the milk produced by his dairy herd” (Helme, 1974:44).

The township was laid out with 337 one-acre erven, and the development started at the south-western corner close to the station.

In October 1903 the British Government started their tree nursery at Irene. The nursery rapidly became the most important of some half-dozen in the Transvaal, and lasted until the outbreak of the First World War in 1914 (Helme, 1974:44).



Bertie and his son were responsible for trees on the farm; the beautiful avenues of oaks along the river and around the homestead were planted with their own hands. Another of the species they planted was the Honey Locust Tree, “with its clusters of dark red thorns and honeyed pods, which are so much enjoyed by the farm pigs and cattle” (Helme, 1974:44).



fig.1.2. IRENE ESTATE 1937

028



0 1 km

fig.1.3. IRENE ESTATE 1971

029

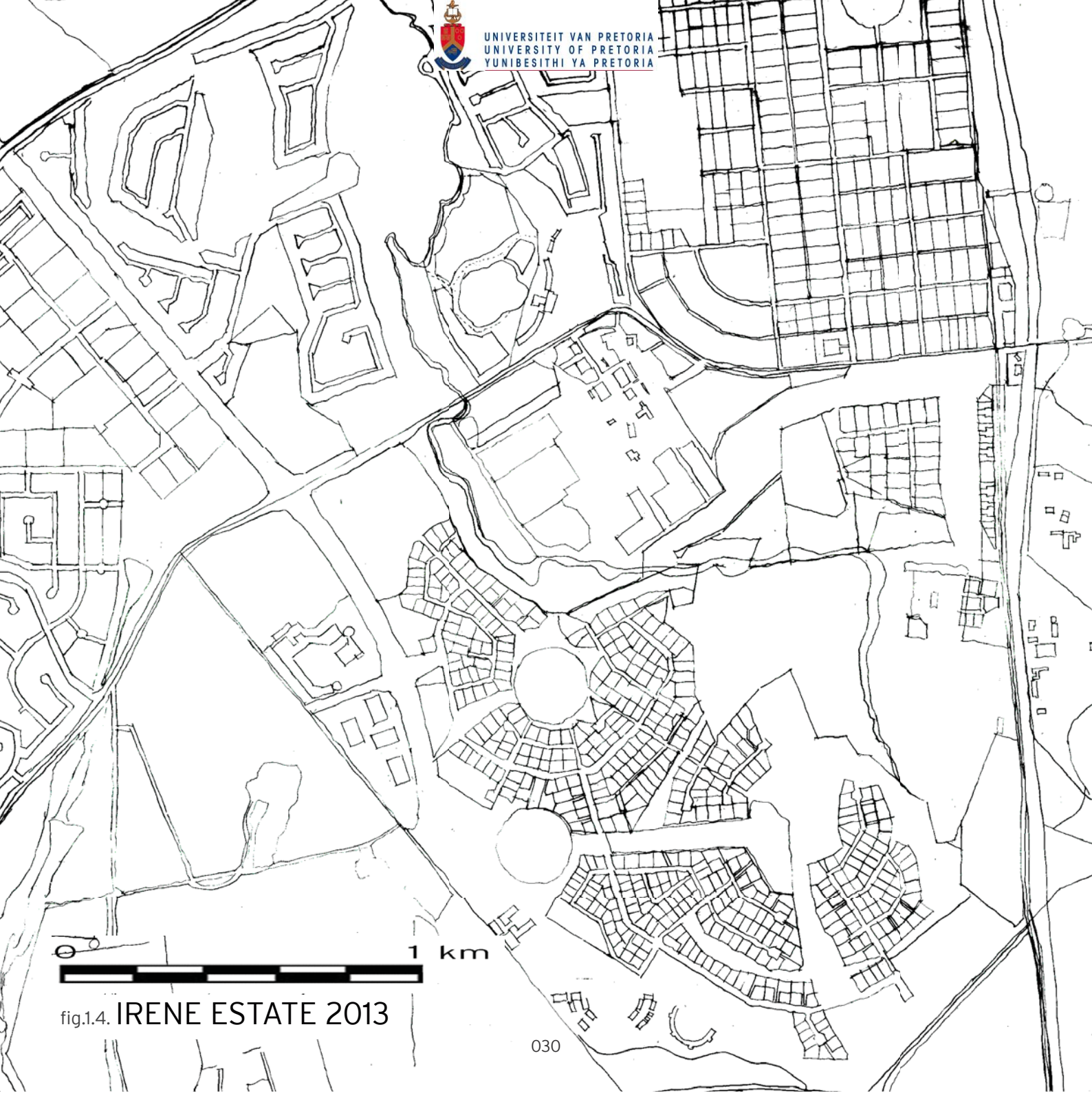


fig.1.4. IRENE ESTATE 2013

02

# THEORETICAL APPROACH

031

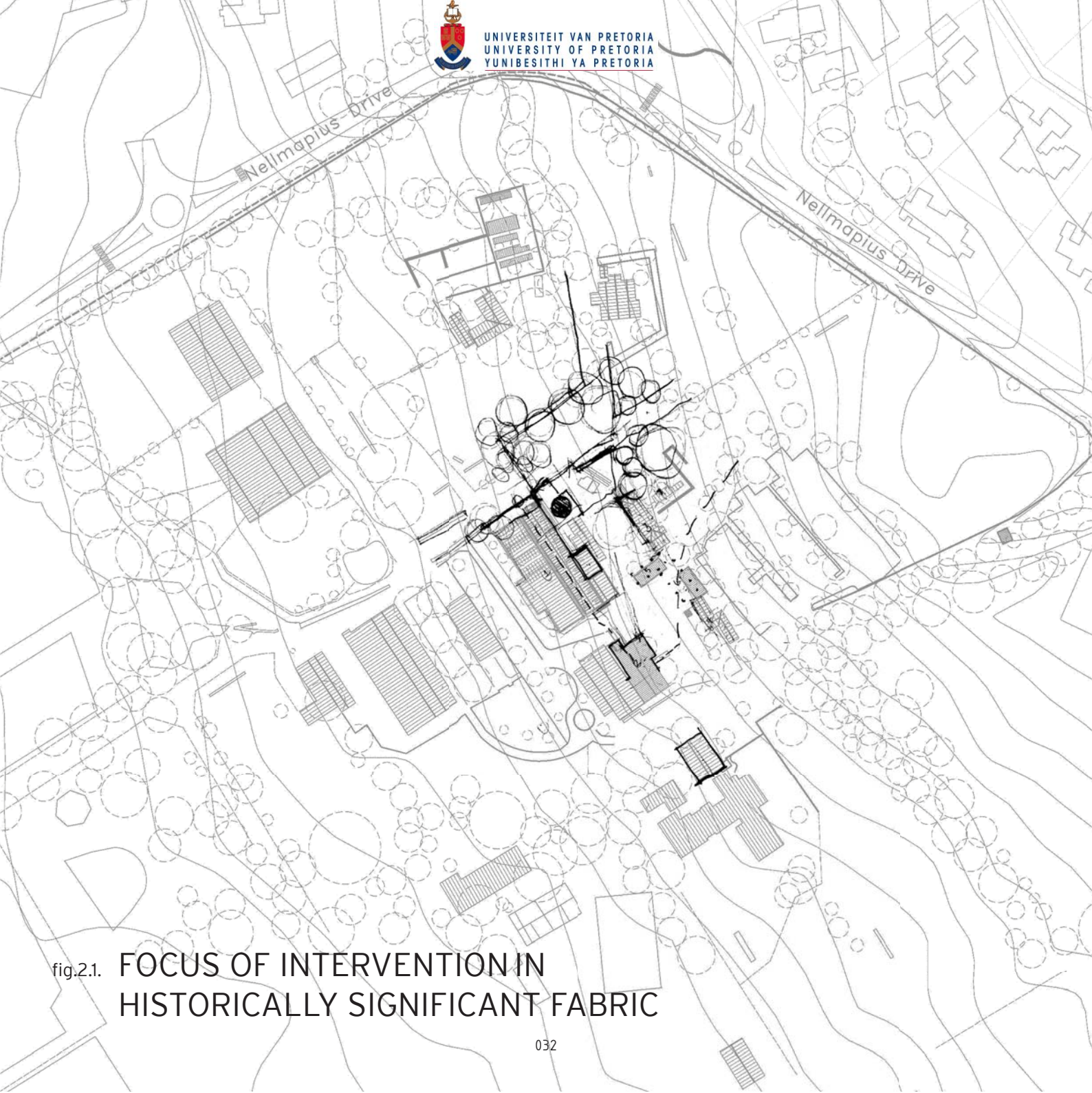


fig.2.1. FOCUS OF INTERVENTION IN  
HISTORICALLY SIGNIFICANT FABRIC



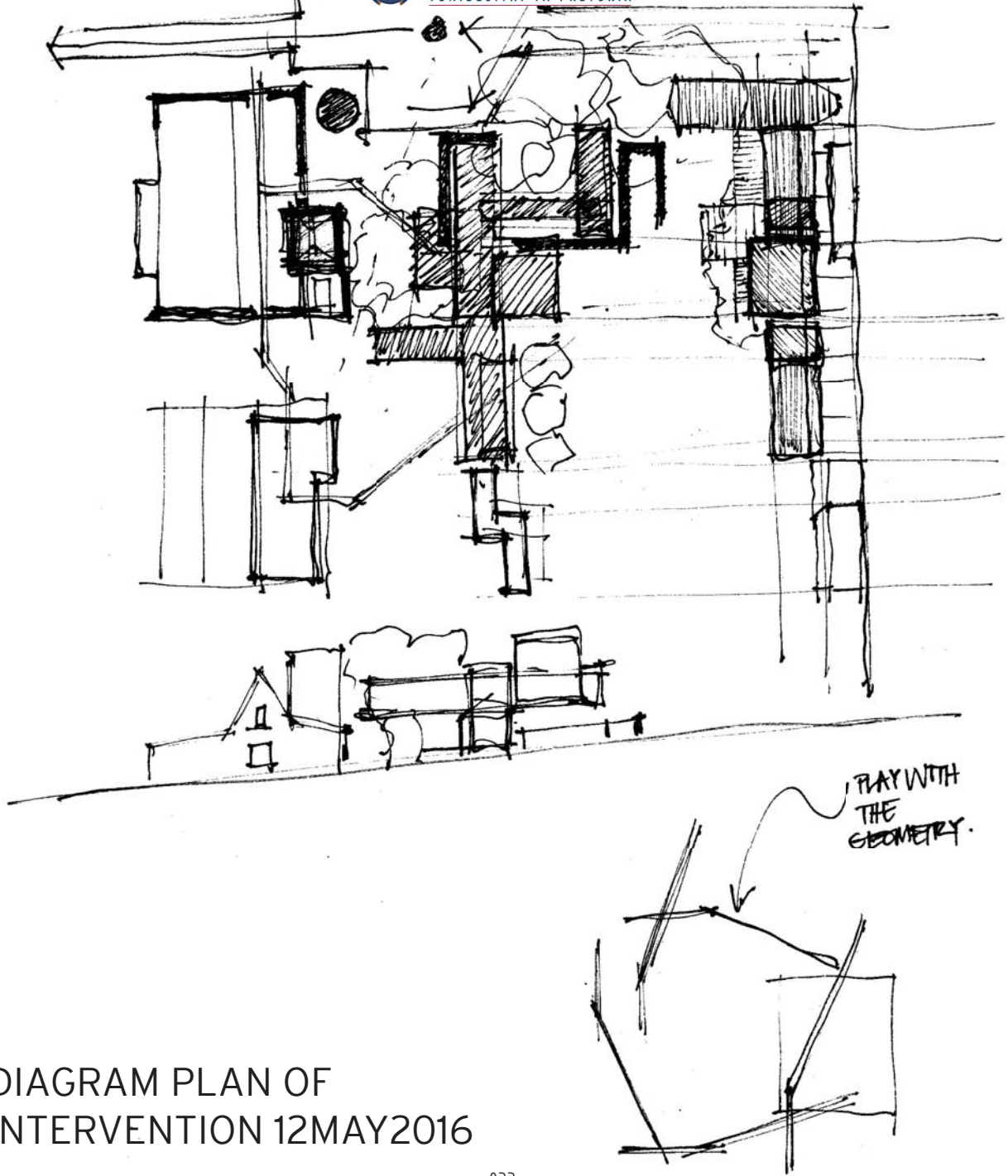


fig.2.2. DIAGRAM PLAN OF INTERVENTION 12MAY2016

# ISSUES IN SOUTH AFRICAN AGRICULTURE AND AGRICULTURAL EDUCATION

There are numerous problems facing South African agricultural development which have a severe effect on the environment and livelihoods of the citizens of the country.

South Africa is regarded as having the third largest biodiversity in the world. However, species extinction rates in this country are high due to unsuitable farming practices, deforestation, high population growth, and industrial development. (Department of Agriculture, 2002:8)

The Department of Agriculture developed a Policy on Agriculture in Sustainable Development, which aims to foster sustainable development in the agriculture sector by addressing the three main aspects of sustainable development: social, environmental, and economic. In Africa, and specifically in South Africa, agriculture is the sector from which most rural communities derive their financial income. It is also the primary source of food for both rural and urban communities.

Agriculture plays a crucial role in sustainable development and in hunger and poverty eradication. (Department of Agriculture, 2002:3)

The greatest challenge that agricultural development faces is the means by which agriculturalists gain their knowledge in terms of the practice of sustainable agriculture. According to research done by Mutizwa Mukute in 2010, the “approaches to, training and perception of sustainable agriculture in the region are currently rather negative, under-resourced and weak” (Mukute, 2010:4).

There lacks structure between farmers around improving their practices and situations in terms sustainable agriculture. Governments aren’t sufficiently supporting extension programs to develop sustainable agriculture to achieve a socially, ecologically and economically sustainable environment.

One of the key factors to create a sustainable agriculture development sector, according to (Rukuni, 1994) is:

Human capital in the form of professional, managerial and technical skills produced by investment in schools, agricultural colleges, faculties of agriculture and on-the-job-training and experience.

It is clear that education is the answer to the agricultural sector in terms of sustainable development. How farmers learn plays a major role in the development of a sustainable agricultural sector.

In his research document, Mukute (2010:5) explores the value of 'people centred-theory and practice'. Cultural historical activity theory (CHAT) can be applied as a bridging approach between the paradigms of learning and practice.

CHAT operates at two levels, allowing people to learn from more knowledgeable people, as well as from peers, in order to better understand and put that understanding into practice.

For his research, Mukute (2010:5,6) chose case studies of three sustainable agriculture sites, namely:

1. Zimbabwe: the Schools and College Programme (SCOPE). The SCOPE initiative was started in the mid-1990s with the support of the Ministry of Education. The initiative promoted "sustainable land use of school and college grounds and homesteads in the surrounding communities" and aimed to integrate these principles into the school curriculum. Their aim is to establish permaculture in the schools and surrounding communities;
2. Lesotho, MFS: a home grown sustainable agriculture practice called the 'Machobane Farming System' has been practised for the past fifty years. The practice involved using organic fertilizer which is locally produced, ensuring perennial vegetation cover, a cropping pattern adapted to the seasons of the year, which includes nitrogen fixing legumes, cash and food crops, natural pest control, relay cropping, and mass education;
3. Isidore, South Africa: South Africa started producing various organic products in the 1990s. The Isidore Organic Farm established a network of organic farmers in Durban, South Africa, to grow and market organic produce, to share knowledge, seed and tools, and to provide training to interested new organic farmers.

The agricultural site of Irene Dairy Farm is a suitable location for a model farm for sustainable agricultural practices by forming a base where aspiring agriculturalists can learn from more knowledgeable practitioners and develop their skills to practise agriculture in a more sustainable and holistic manner.

The best example similar to this strategy is Grootfontein Agricultural Development Institute in Middelburg, Eastern Cape. Their vision:



Is to be the world's largest centre of excellence in small-stock and in agricultural production in semi-arid to arid climates. To provide (i) world-class agricultural education and training by highly-skilled lecturers, (ii) innovative research led by expert researchers in partnership with producers and industry, and (iii) effective and relevant extension that build the capacity of farmers to innovate and engage in sustainable production toward household food security and widespread wealth creation within rural communities. (Department of Agriculture, 2010:2)

The means by which the facilities at the Irene Dairy Farm will be used to address this task are to remodel the buildings and facilities that have over time become under-utilised and whose functions were lost or which do not function optimally. The word remodelling is used as an umbrella term to encompass the various ways by which heritage significant buildings can be given a new life, while also being a witness to the rich history of the farm.

Synonymous terms referring to the type of architectural work traditionally called 'remodelling'. Terms such as 'architectural recycling'; 'environmental retrieval'; 'adaptive reuse'; 'retrofitting'; all of which are superficial and should be rejected because they do not represent any conceptual change with respect to previous stages of remodelling activity - reuse and improved technical performance have always figured among the remodeller's goals. (Machado, 1976:46)

Although Rodolfo Machado would argue that adaptive reuse is not a sufficient term to define the approach of remodelling, it can be seen that his theory is rather old-fashioned due to the age of the article, which was written in 1976. Since then the concepts of 'architectural recycling', 'adaptive reuse' and 'retrofitting' have become an integral part of the ways in which architects address heritage, and specifically culturally significant buildings.

The basic definition to "reuse and improve technical performance" (Machado, 1976:46) is fundamental to all of the above mentioned approaches.

The means by which the Irene Dairy Farm will be turned into a place of learning instead of just a commercial and tourist entity will be an adaptive reuse approach.

## ADAPTIVE REUSE

Historic buildings are witnesses to our past and give character to our built environment and currently serve, or could serve, practical functions. "In the pursuit of sustainable development, communities have much to gain from adaptively reusing buildings" (Department of the Environment and Heritage, 2004:2).



Avoiding demolition and reconstruction contributing to the sustainable development of adaptive reuse. "Recycling a valued heritage place makes adaptive reuse of historic buildings an essential component of sustainable development" (Department of the Environment and Heritage, 2004:2).

According to Australia's (Department of the Environment and Heritage, 2004:2):

Adaptive reuse is a process that changes a disused or ineffective item into a new item that can be used for a different purpose. Sometimes, nothing changes but the item's use.

Adapting a historic building should have minimal impact on the heritage significance of the building and its setting. The success of built heritage adaptive reuse projects are the projects that "respect and retain" (Department of the Environment and Heritage, 2004:3) the heritage of the historic building in a sympathetic manner by adding a contemporary layer that gives value to the future of the building.

There exist policies to manage change and development to heritage places. Some standards to these policies are (Department of the Environment and Heritage, 2004:3):

- discouraging 'facadism' - gutting the building and retaining its facade.
- requiring new work to be recognisable as contemporary, rather than a poor imitation of the original historic style of the building.
- seeking new use for the building that is compatible with its original use.

The benefits of adaptively reusing historic buildings has a major positive impact on sustainable development, and these benefits include:

#### ENVIRONMENTAL:

The environmental benefits when a historic building involves adaptive reuse are significant, "as these buildings offer so much to the landscape, identity and amenity of the communities they belong to" (Department of the Environment and Heritage, 2004:3). Another environmental benefit is the retention of the original building's 'embodied energy', which is defined as the energy consumed by all the processes associated with the production of the building.

## SOCIAL:

To keep and reuse historic buildings has long-term benefits for the people who consider these buildings to have value. When executed in an acceptable manner, the cultural significance of a building can be restored and maintained and the building's continued survival can be ensured. Counteracting the neglect and disrepair of a building, when adaptive reuse is applied in a sympathetic way, the historically significant building can continue to be used and appreciated by current and future generations.

## ECONOMIC:

The financial benefits of reusing and adapting historic buildings are obvious due to the savings that are a product of avoiding demolition of the old building and the construction of a completely new building. The Australian (Department of the Environment and Heritage, 2004:5) describes this tendency:

While there is no definitive research on the market appeal of reused heritage buildings, they have anecdotally been popular because of their originality and historic authenticity.

## PROMOTING INNOVATION:

Adapting and reusing historic buildings presents a great challenge for architects to create innovative solutions when using historic buildings for a new application. The popularity of adapting historic buildings has a positive effect in architecture, as more and more examples are being produced. This is a testimony to how adaptive reuse can be applied to protect and retain the cultural significance of the historic built fabric.



fig.2.3. PORT ELIZABETH OPERA HOUSE (Sue Hoppe, 2007:wikimedia.org); (the matrixcc, 2015)

The best practice guidelines were set out by the the Australia ICOMOS Charter for places of Cultural Significance. The Charter was first adopted in 1979 at the historic south Australian mining town of Burra. Their vision for conservation and the reason for conserving historic buildings is described as (Australia ICOMOS, 2000:1):

Places of cultural significance enrich people's lives, often providing a deep and inspirational sense of connection to the community and landscape, to the past and to lived experiences.

The Charter advocates a cautious approach to change (Australia ICOMOS, 2000:1):

Do as much as necessary to care for the place and to make it usable, but otherwise change it as little as possible so that its cultural significance is retained.

In the Burra Charter cultural significance is described as (Australia ICOMOS, 2000:12):

A concept which helps in estimating the value of places. The places that are likely to be of significance are those which help [form] an understanding of the past or enrich the present, and which will be of value to future generations.

They continue to elaborate on the meaning of cultural significance, which is the (Australia ICOMOS, 2000:12) "aesthetic, historic, scientific or social value for past, present or future generations".

Included in the aesthetic value of a place are the aspects of sensory experience, "the smells and sounds associated with the place and its use" (Australia ICOMOS, 2000:12).

Considering the activities and location associated with the Irene Dairy Farm, the sensory experiences of the farm and its function are a major contribution to the significance of the site. The ruination of these sensory experiences will be the failure of the intervention, so the approach will have to consider this. The approach will be applied in a sensitive manner: to intervene but not to interfere. Anything that is suggested on the site and on the functions will take this approach to heart and be applied in a sympathetic manner.

The following diagram depicts the process by which any architect or designer should apply the Burra Charter when working with culturally significant buildings.

Sequence of investigations, decisions and actions

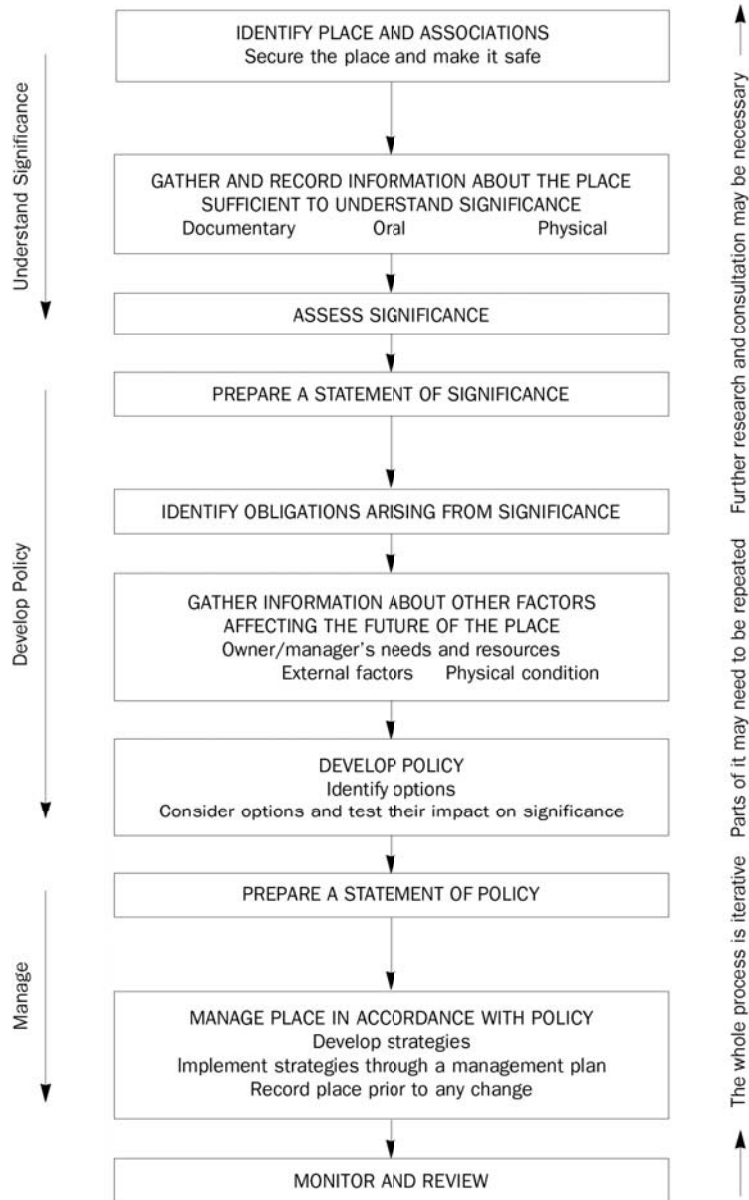


fig.2.4. BURRA CHARTER PROCESS (Australia ICOMOS, 2000:10)



03

P R E C E D E N T  
S T U D I E S

041



fig.3.1. PERGOLA SPACE (nm&associates, 2007)



fig.3.2. PERGOLA SPACE VIEWED FROM OUTSIDE (nm&associates, 2007)

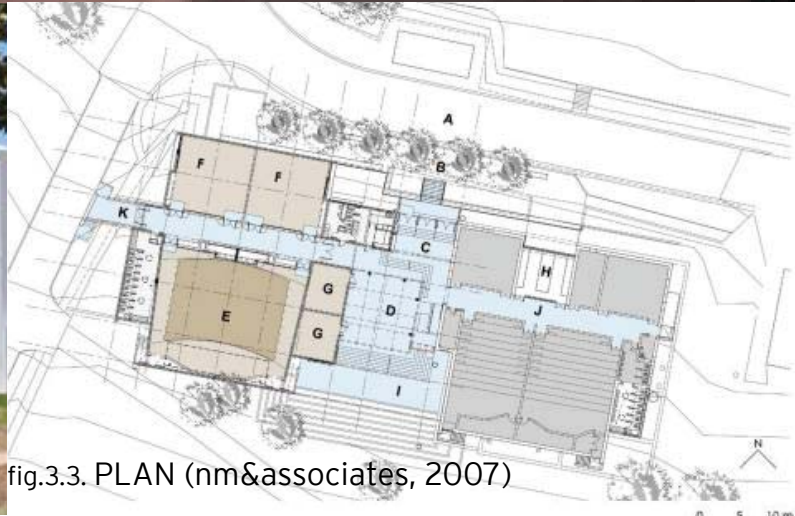


fig.3.3. PLAN (nm&associates, 2007)

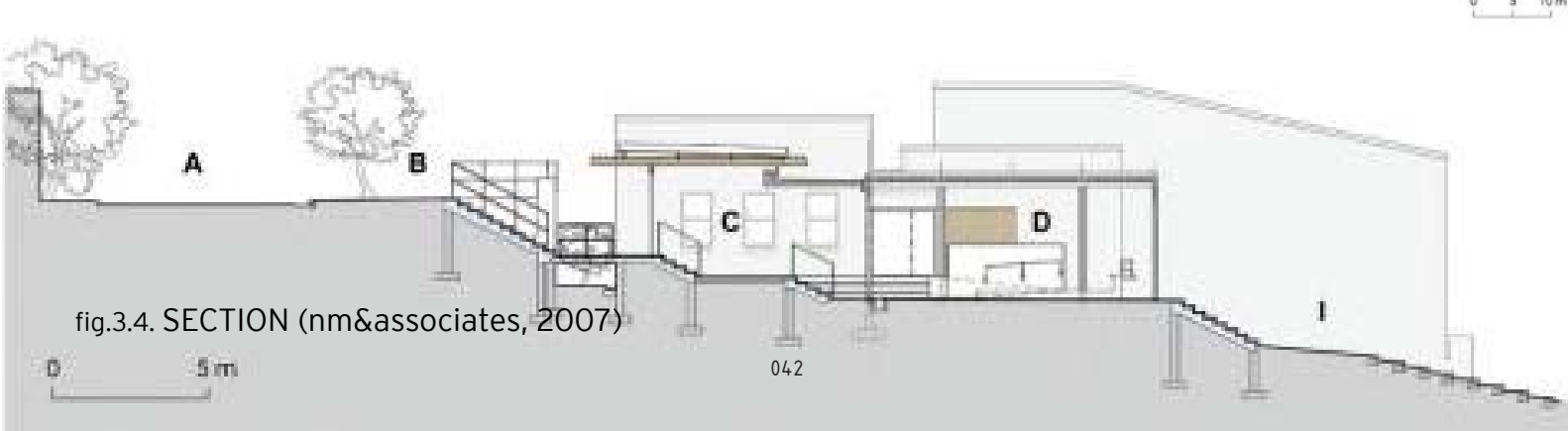


fig.3.4. SECTION (nm&associates, 2007)



# EXTENSION TO LECTURE FACILITIES AT ELSENBURG AGRICULTURAL COLLEGE.

by NM&Associates, planners and designers.  
2005-2007

The context in remodelling, according to Rodolfo Machado, is defined by the existing building where the architect or designer imagines to intervene. In his essay for Progressive Architecture journal, "Old buildings as palimpsest. Towards a theory of remodelling", (Machado, 1976:49) explains the context that the existing building allows for the architect:

In remodelling, the past is represented by the old object itself. But this object is also the most immediate context of the work of remodelling; the past pervades the building and the building itself becomes the primary level of the context of intervention.

This project is the result of the "government's recognition of the importance of investing in agricultural training and education." (NM&Associates, 2007) The buildings were designed and formed with a few key considerations that informed the process of the design. The conceptual ideas were the following:

- THE CAMPUS AVENUE: this avenue plays a key role in establishing a vibrant pedestrian atmosphere and could inform the future development of the campus.
- THE ELSENBURG FARM LANDSCAPE: the landscape which defines the primary context of the building holds the key to the structure and spatial opportunities. This informs the organisation and how the buildings are situated in the landscape. The buildings are simply a series of white walls set into the slope of the site that frames the views of the vineyards.
- THE LECTURE BUILDING AS A SERIES OF LINKED SPACES: in response to the topography and the existing lecture facility, the building is an extension of these structures and parallel to the Campus Avenue. This avenue links all the new spaces with the existing structures and is designed in such a way that it provides for other activities, and not just movement spaces.
- THE TEACHING SPACES AND THE SPILL-OUT SPACES: the lecture spaces were designed to be clearly identified as such, with open green courtyards that allow these spaces to spill out into the Campus Avenue.

The extension of the lecture facilities has provided ample space for teaching on a formal and informal basis. The simple approach to the design process is what made the extension of the lecturing facilities such a great success.



fig.3.5. PHOTOGRAPH OF THE GARKAU FARM AS IT STANDS TODAY. (Funambulic, 2011)



fig.3.6. COW SHED ON THE GARKAU FARM ESTATE. (Gossel and Leuthäuser, 2005:178)

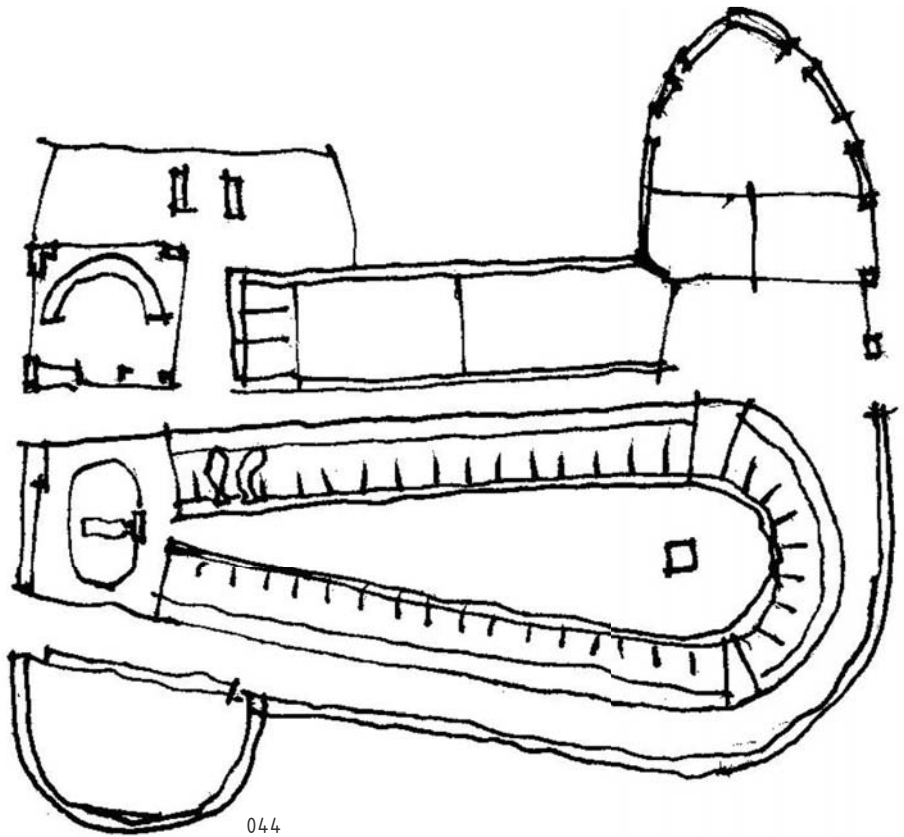


fig.3.7. PLAN SKETCH after (Gossel & Leuthäuser, 2005:178)

044

# COW SHED ON THE GARKAU FARM ESTATE NEAR LUBECK, GERMANY.

by Hugo Häring.  
1922-1928.

The design of the Garkau Cow shed is probably one of the best examples of Hugo Häring's functional architecture buildings. He was one of the few architects in the 1920s and 1930s who promoted 'organic architecture' (Aschenbrenner, 1999).

The idea was to create an architecture that did not follow a preconceived style, but rather developed according to the needs of use, context, and construction, which would allow the building to gain its own appearance and identity (Botha, 2013:65).

Häring believed that architecture should spontaneously emerge from its surroundings, almost naturally. Unlike the Art Nouveau movement, Häring designed the building for the function and the environment it was situated in: the form follows function ideal, rather than the function following the form.

In this case the building was designed to serve the function of feeding the cows and how they would require to use the space.

The heart of the "organ-like" stall is the pear-shaped byre for one bull and forty one cows (Gossel & Leuthäuser, 2005:178).

The building is made up of concrete, steel, brick and wood. These materials work in seamless harmony in the manner that Häring used them in the construction of the cow shed. In a brief description by Gossel & Leuthäuser (2005:178), one gets to understand the construction poetics:

The supports for the steel construction lie inside the building. Parts of the horizontal frame appear as bright strips in the brickwork. Originally left neutral, the vertical weather boards on the hay lofts and silo were painted a bright green colour in the late 1930s.

The Garkau Farm Estate is a testimony to a time when design considered the requirements of animals before the human requirements, designed from the functional requirements of the interior spaces which determine the form of the exterior of the building.



fig.3.8. SITE MAP (gadi.agric.za, 2015)



fig.3.9. AERIAL PHOTOGRAPH (gadi.agric.za, 2015)



fig.3.10. AUCTION AND HANDLING PENS (Mentz CJ, 2016)

046

# GROOTFONTEIN AGRICULTURAL DEVELOPMENT INSTITUTE, MIDDELBURG, EASTERN CAPE, SOUTH AFRICA. established in 1911-

When the Union of South Africa was established in 1910, the Grootfontein farm together with some military buildings and other equipment was purchased from the British Government by the last Minister of Agriculture of the Cape colony, Mr FS Malan. On 7 February 1911 it was converted into an agricultural school and experiment station. (gadi.agric.za, 2015)

Today the agricultural school strives to be a world leader in training and research in small-stock and agricultural production in arid and semi-arid regions. They focus on agricultural education and training highly-skilled lecturers, executing innovative research in partnership with industry and producers, and aim to develop effective extension programmes that expand the capacity of farmers to innovate and engage in sustainable production practices for household food security and wealth creation in rural communities (gadi.agric.za, 2015).

The facilities at the Grootfontein Agricultural Development Institute provide for all the education and training to take place in specific buildings. The programme consists of various classes, and most of these classes are in separate buildings:

- **ENGINEERING BUILDING:** short courses are held here in building craft (masonry and carpentry), mechanics (petrol and diesel engines, as well as farming equipment), and metallurgy (gas and arc welding).
- **FARM SECTION:** this department is responsible for the general maintenance of the 12 000 hectare grounds.
- **AUCTION AND HANDLING PENS:** auctions are held here annually for small-stock animals. The building also functions as a lecture space when it is not used as an auction space.
- **SHEARING SHED:** this is one of the most important classes at Grootfontein. The students learn about classing wool, as well as shearing the sheep themselves. clinical examinations on animals and sample collection take place in this building.
- **“BLIKKESDORP”:** named so after the sheet metal construction of the complex. This is where feeding experiments take place on the institute grounds.



fig.3.11. Wool sorting (Mentz CJ, 2016)



fig.3.12. Farm management (Mentz CJ, 2016)



fig.3.13. Abattoir (Mentz CJ, 2016)





- **ABATTOIR:** this building is a fully equipped abattoir that can handle sheep, goats, cattle and pigs. The courses presented in this building are in grading carcasses and the assimilation thereof. The production of various meat products take place in this abattoir, which is also responsible for the meat of the hostel on campus.
- **WOOL RESEARCH:** this building serves as lecture rooms, as well as education in wool characteristics.
- **PASTURE RESEARCH:** the function of the research is to create an environment where all farmers can learn about the sustainable economic farming industry and to teach them about the latest technological developments in the industry. This building also houses a herbarium, with the regional vegetation being cultivated.
- **SOIL CONSERVATION:** this building houses the Agricultural Economics Department and Agricultural Management. They present short courses in Agricultural Management for farmers and give economic advice and perform feasibility studies for farmers.
- The lecture hall, 'Bergsig Hostel', and Recreational Hall are the other buildings that make up the facilities on the grounds.

This Agricultural Development Institute serves as an informative precedent for the programmatic intentions on the Irene Dairy Farm. The institute will become a place where all farmers of the region can go for sound advice on technology and economic advancements in the field of agriculture. The success of the Grootfontein Agricultural Development Institute is of relevance to the research and courses that take place in the Institute, all of which is informed by their sponsors that make up the industry.



fig.3.14. CHARLES SMITH Wines (Olson Kundig, 2012)

# CHARLES SMITH WINES, WALLA WALLA, WASHINGTON.

by Olson Kundig, Tom Kundig.  
2012.

Charles Smith Wines is located in downtown Walla Walla in the former Johnson Auto Electric building, constructed in 1917. Winemaker Charles Smith with his “rock ‘n’ roll” style, approached the Olson Kundig team and requested that they design an office space and tasting room. Inspired by his “in-your-face” attitude, the team had to design a raw space, keeping the original aesthetic of the building in mind, to create a flexible interior that can transform and be used as office space or a tasting room, as well as retail space and an entertainment venue.

The facade and the shell of the original building had undergone minor structural changes but was left raw to stay true to the original aesthetic of the building. Staying true to the automotive history of the building, the team replaced the doors with two custom, highly flexible doors which can be mechanically operated to open the interior space to the street’s outdoor seating and act as an awning when opened.

The interior and furniture was designed to be completely flexible and inserted into the space as movable objects. The furniture can be moved and adjusted to serve various functions, depending on the requirements of the events. The design of the space was informed by the drive-through concept to allow vehicles such as delivery vehicles and taco trucks to move through the space, as need be.

The success of this intervention is in the simple approach to the design process and the minimal changes that were done to the original building. Staying true to the history of the site and the building, the design was informed by the rich history and therefore suits the building in a sympathetic manner.

The simple mechanical operations of the interior and the doors eliminates the need for any energy inputs and requires the users to interact with the design elements to suit their requirements. The general aesthetic of the Olson Kundig firm is rather simple and has a great appeal due to the rustic and raw feel. The application of construction materials in a different way to the norm gives a great example for the future of tectonics in architecture.

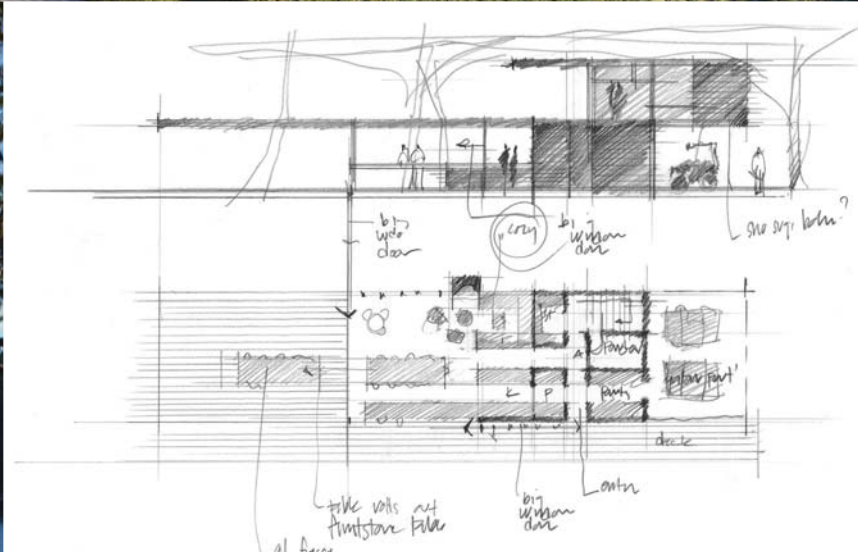


fig.3.15. POLE PASS RETREAT (Olson Kundig,2015)

# POLE PASS RETREAT, SAN JUAN ISLANDS, WASHINGTON.

by Olson Kundig, Tom Kundig.  
2015.

The site for this waterfront family retreat is a dense forest shoreline located in the San Juan archipelago which separates Washington State from Canada. The temperate Pacific northwest climate makes this house perfect for family gatherings in the summer. Nestled in the forest while framing views over the meadows and harbour that make up the surrounding area of the site.

The horizontal proportions of the building allows it to blend with the surroundings. The timber cladding is treated with a traditional Japanese method called 'shou-sugi-ban'. This treatment protects the timber and discourage insects from damaging the timber. The colour effect from this treatment gives the timber a dark, almost silver colour and changes over time.

The architects made the space as flexible as possible to allow various potential functions throughout the course of the year. The building's pavilion window walls are all openable to accommodate for the warmer summer months and allow large groups of people to "dissolve" (Olson Kundig, 2015) the threshold between the building interior and the site. These walls are opened using a 'walk-along-hand wheel' (Olson Kundig, 2015), a mechanical apparatus designed by the architects. This mechanical hand-cranked wheel allow the large glass facades to move effortlessly. The interior and exterior spaces become one- various components in the interior extends to the deck such as the kitchen counter.

The organization of the spaces were done in such a way that the bottom floor accommodates the public functions such as the kitchen and the deck, which has the same area as the building footprint. The top floor is for the private functions in the building, and houses all the bedrooms as well as the green roof which is seen as a small "meadow" (Olson Kundig, 2015), that serves a private escape in the building. The exterior envelope of steel and timber cladding is juxtaposed with a soft interior palette of pine with wood rafters exposed throughout the space.



fig.4.1. SITE



# 04 SITE

055

# SITE: CONTEXT FOR THE ARCHITECTURE

The greatest challenge that agricultural development faces is the means by which agriculturalists gain their knowledge, in terms of the practice of sustainable agriculture. According to research done by Mutizwa Mukute in 2010, the “approaches to, training and perception of sustainable agriculture in the region are currently rather negative, under-resourced and weak” (Mukute, 2010:4).

Between the city of Pretoria and the agricultural land of the Highveld (Delmas) one finds the remnants of what was once the model farm in the Transvaal. The Irene Farm was the brainchild of business tycoon Hugo Alois Nellmapius. Of Hungarian decent, this visionary businessman felt that the Highveld soil could yield much greater numbers than the practice of the day, and he employed numerous professionals on the farm to ensure that all aspects of the farming industry would perform to their greatest potential.

Over time the farm has been reduced in size due to the expanding city fabric, and what remains today is a mere fraction of the approximate 27 000 hectares that was once the Irene Farm. The current owners maintain the herd of dairy cows, but this is merely for the nostalgic atmosphere the cows add to the farm and not for any financial gain. Their fortunes came from the land that the farm occupied that was sold off and today house various occupants, from industry, to commercial and residential functions.

## BUILT FABRIC

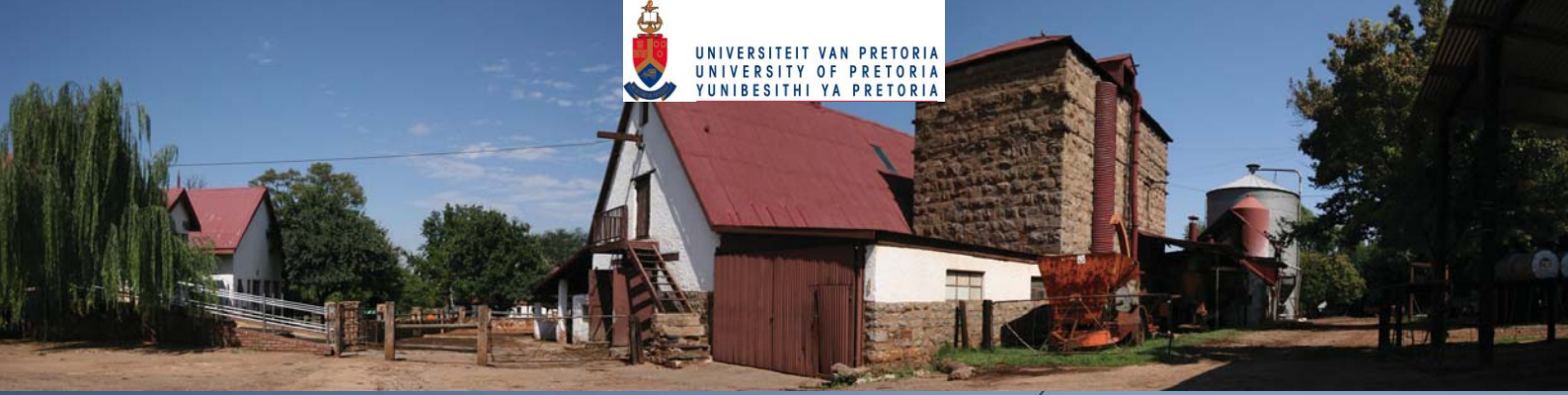
There are numerous buildings on the farm, which vary in size and function, some of which were in existence from the beginning of the farm and serve the same function to this day. Next to these historical buildings are various additions to the site that were added purely for their functional requirements and not do necessarily consider the sensitivity of the heritage of the adjacent buildings of the spaces.

## HERITAGE SPACES AND BUILDINGS

Considering the significant heritage of the site and the spaces that define the Irene dairy farm, there are a few of the buildings that contribute to the significance of the place. The first and most important building to consider is the main stable, that is still in use today as it was designed in 1889. Nellmapius based the barn structure on a Hungarian model, as this was the country he moved from to the Transvaal. It was designed to house the seventy Friesland dairy cows on the farm. Today this building forms an integral part of the workings of the farm. The dairy herd are fed before being milked in the adjacent milking parlour building.

056





057

fig.4.2. MAIN STABLE: SITE

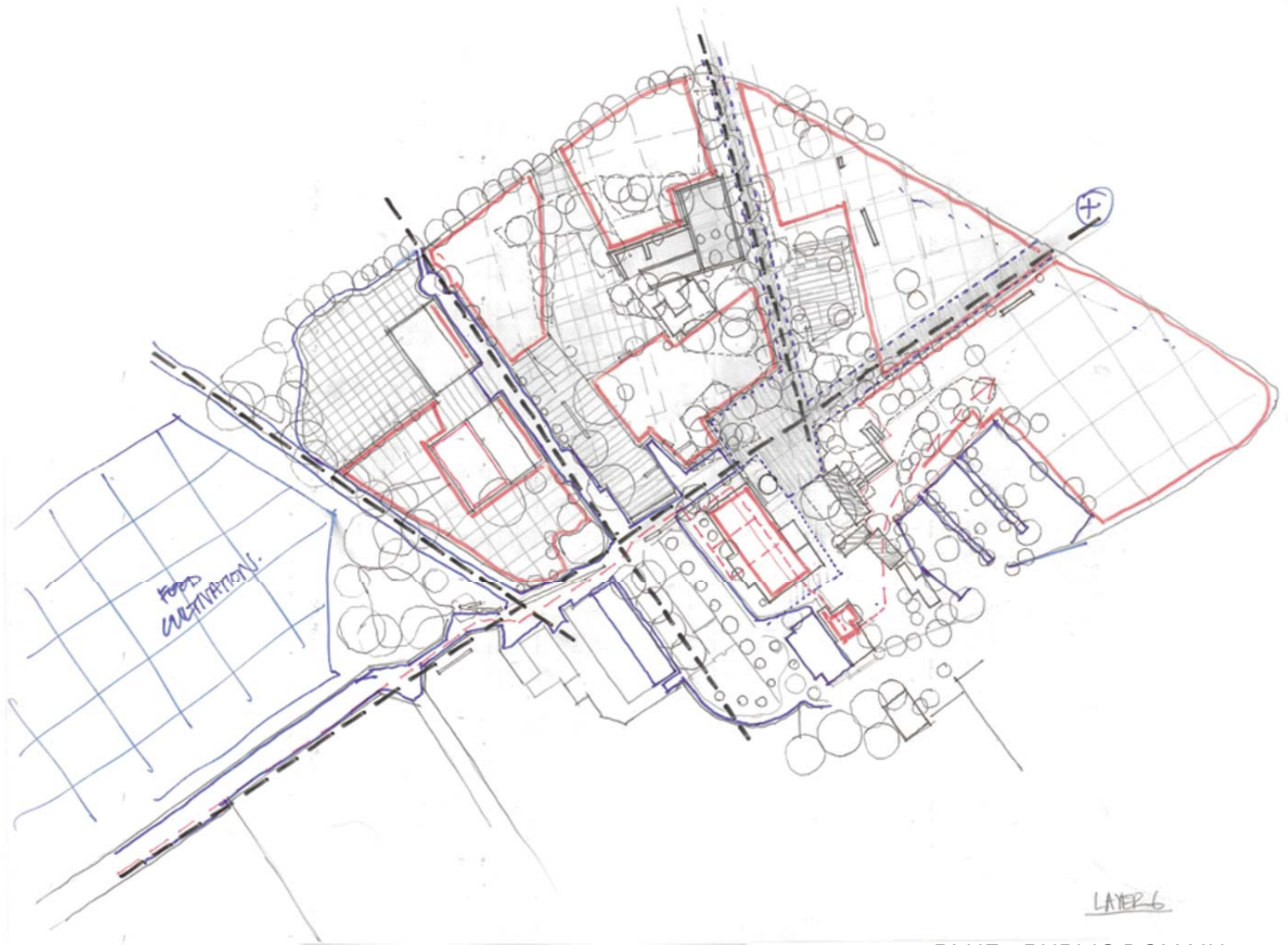


fig.4.3. EXISTING BUILT FABRIC

058



fig.4.4. EXISTING BUILDINGS+HISTORIC AXES



BLUE - PUBLIC DOMAIN  
RED - COW DOMAIN  
BLACK - EXISTING FABRIC

fig.4.5. EXISTING BUILDINGS+FUNCTIONS



fig.4.6. HERITAGE - BUILDINGS

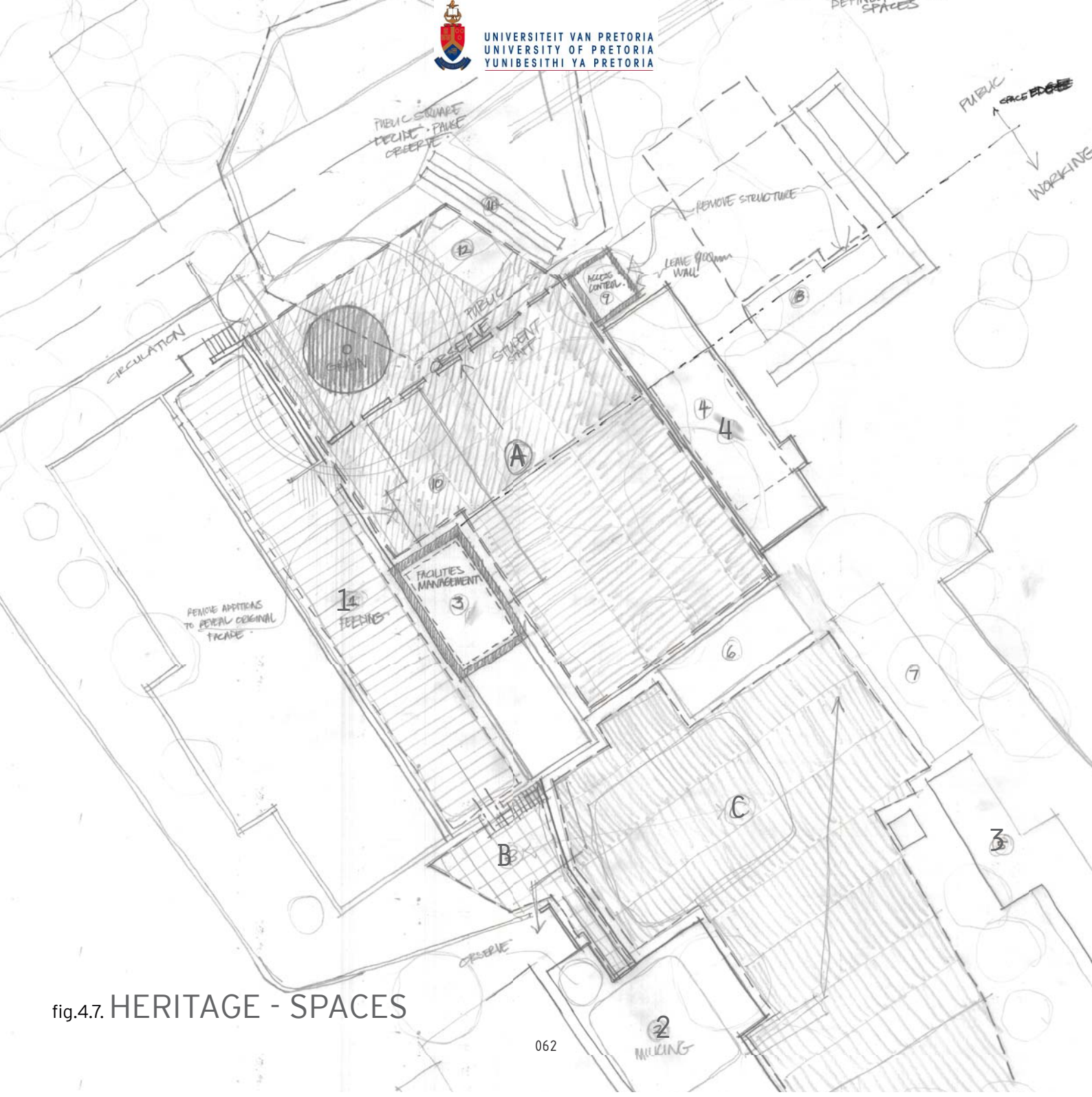


fig.4.7. HERITAGE - SPACES

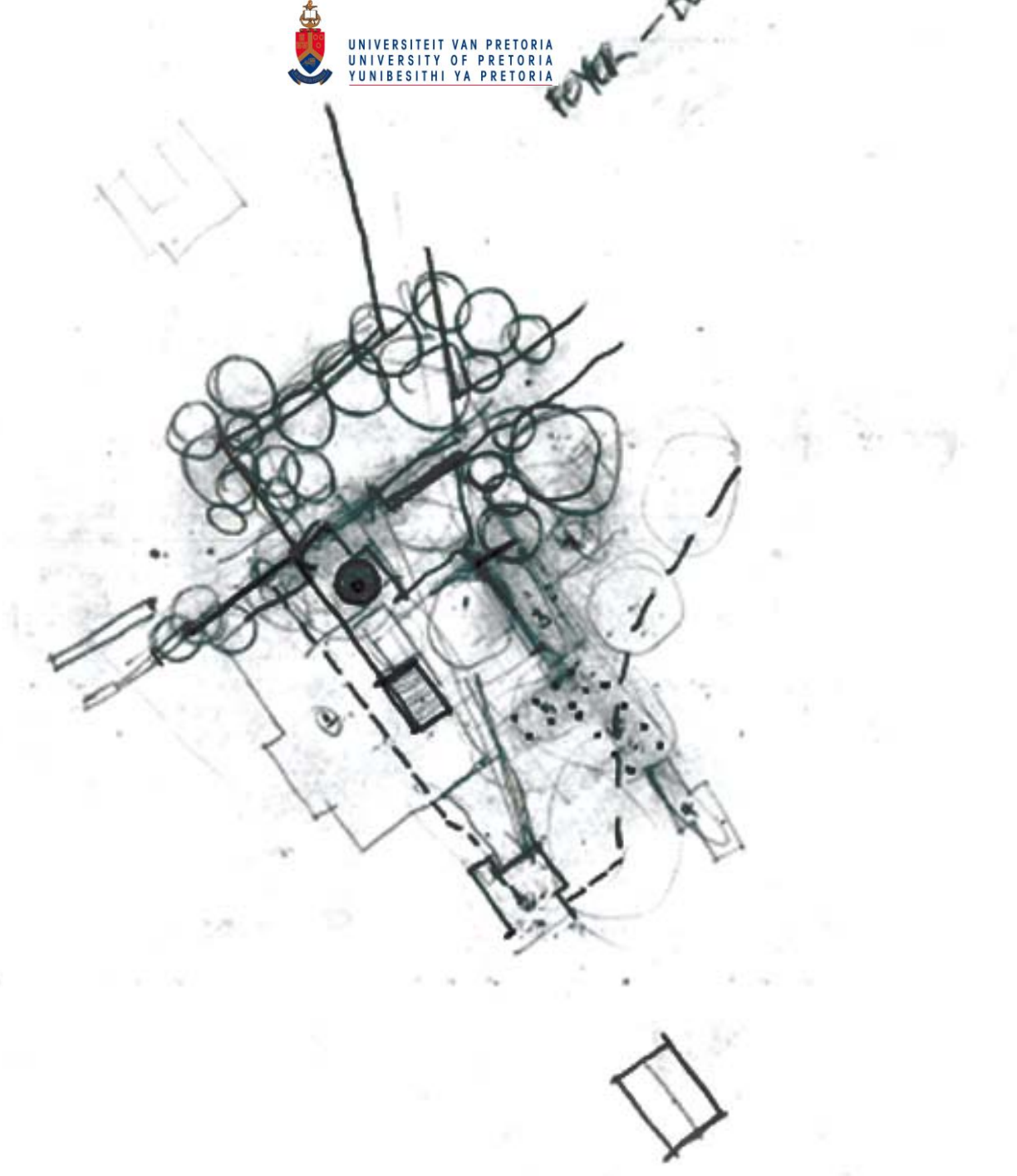


fig.4.8. FOCUS AREA - SIGNIFICANT HERITAGE

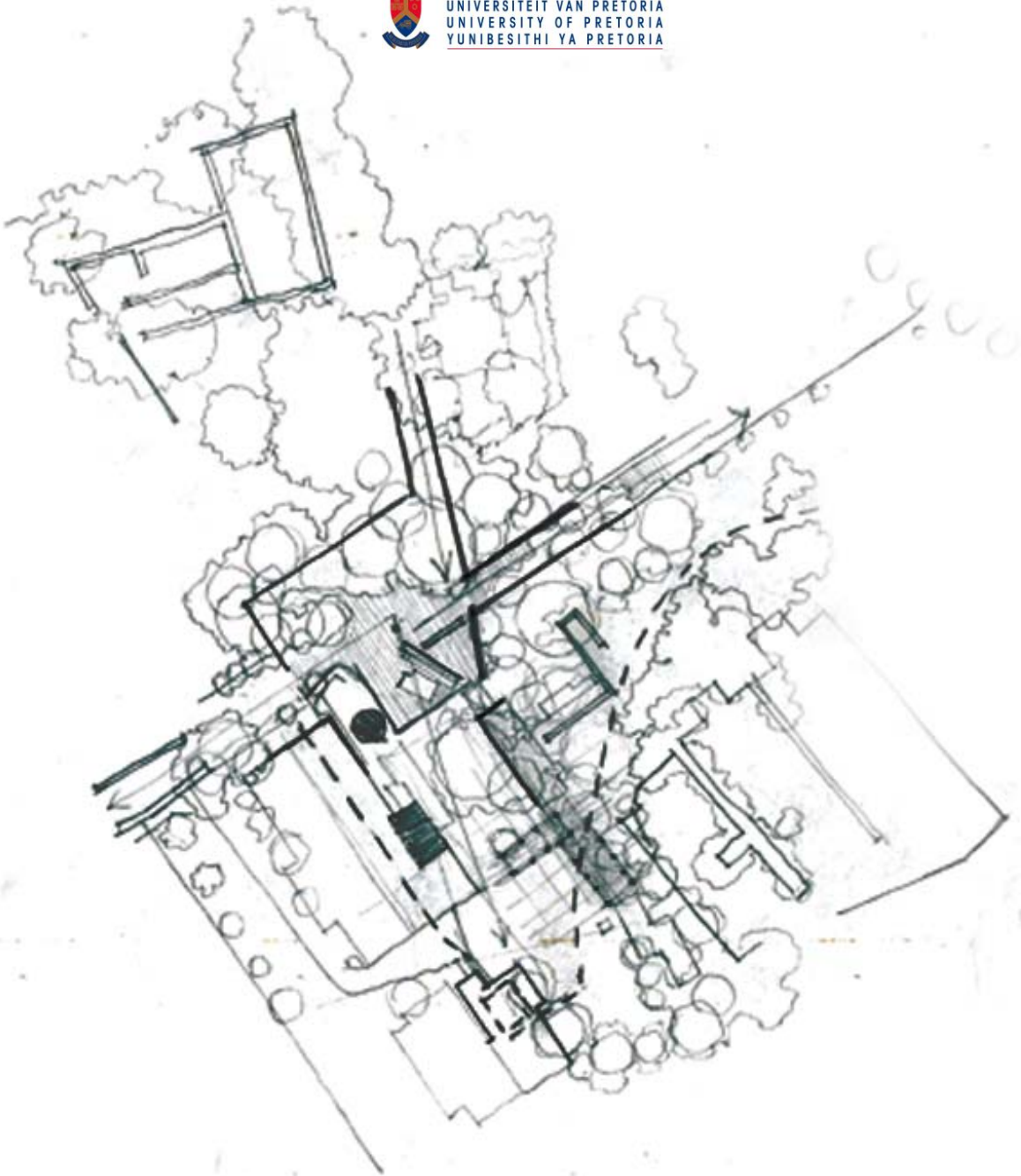


fig.4.9. FOCUS AREA - HERITAGE: BUILDINGS AND TREES



05

# PROGRAMME

065

# PROGRAMMATIC RESPONSE FOR THE SITE

## THE INTENSION FOR THE SITE IS TO ESTABLISH AN AGRICULTURAL EDUCATION AND TRAINING FACILITY

The Irene Dairy Farm is an ideal location for an Agricultural Education and Training Facility within the city limits of Pretoria, situated halfway between the urban context of the city centre and the agricultural land on the outskirts of the city.

Historically, the farm has been a model farm in the Transvaal and the vision of the first owner could be revived through the establishment of an education and training facility. This intention will be accentuated through the suggested architecture on the farm, where the architecture will aid in the process of practical learning in the field of agriculture.

### PRACTICAL TRAINING

To fit into the context of the site and the existing programmes on the site, the proposed intervention will house a dairy research facility to develop on the dairy production of the farm. The research facility will have laboratories that contribute to increased production on the dairy farm. Along with the dairy research, pasture research will be introduced to determine the best grazing for optimal dairy production on the farm, as well as establishing best practice for interested parties in the field of dairy production around the city.

The existing maintenance facilities will be upgraded and updated to suit the requirements of a twenty first century farm. These facilities will form part of the engineering department of the education and training facility. This section will consist of a mechanics faculty, for maintenance of the farm implements as well as maintenance of diesel and petrol engines, a metallurgy division, for learning the required skills of welding, specifically arc and gas welding, and a building craft section, for masonry building and carpentry skills training.

### THEORETICAL TRAINING

The theoretical side of the education and training facility will be housed in the lecture hall, which could also accommodate practical learning by allowing enough space for animals to form part of the lectures taking place, giving a hands-on approach in terms of the species that defines the practice on the site. The theoretical component will form part of the learning experience and not be the main focus of the facility.



# SUGGESTED PROGRAMME

## PRACTICAL TRAINING

### ENGINEERING DEPARTMENT

Mechanics:	maintenance of farming implements and engines.
Metallurgy:	learning welding skills with arc and gas welding.
Building Craft:	masonry building and carpentry training.

## THEORETICAL TRAINING

Dairy Research:	research in dairy production and optimising production.
Laboratories:	samples collected from dairy research will be investigated in detail to establish optimal production on the farm.
Pasture research:	research into the grazing varieties that can contribute to optimising dairy production.
Feeding experiments:	experimenting on the outcomes of pasture research.
Species classification:	determining suitable dairy cows for the dairy herd that will contribute to optimal dairy production.

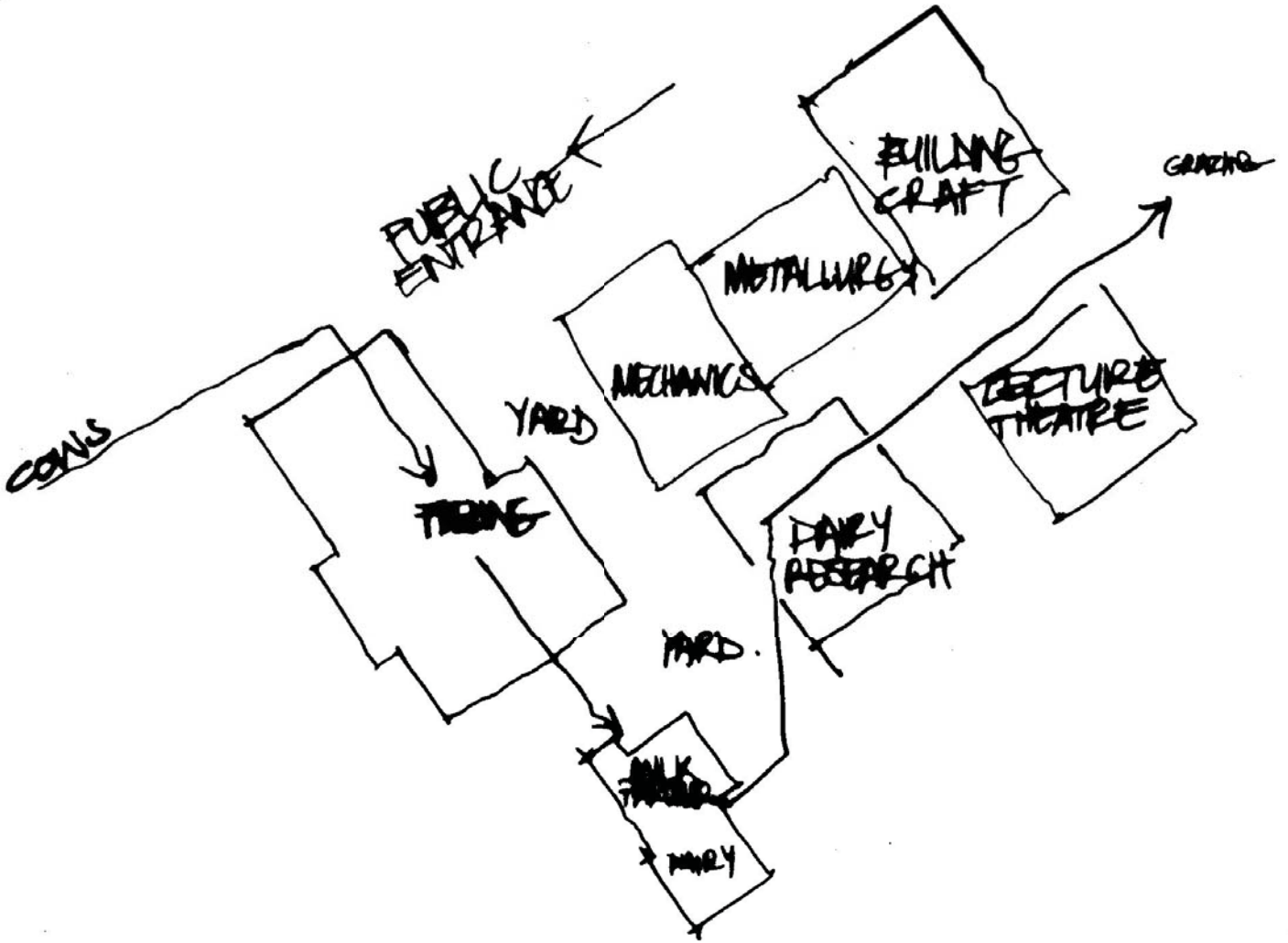


fig.5.1. DIAGRAM OF SUGGESTED PROGRAMMES ON SITE



fig.5.2. NEW PROGRAMME LIMITATION



fig.5.3. URBAN VISION

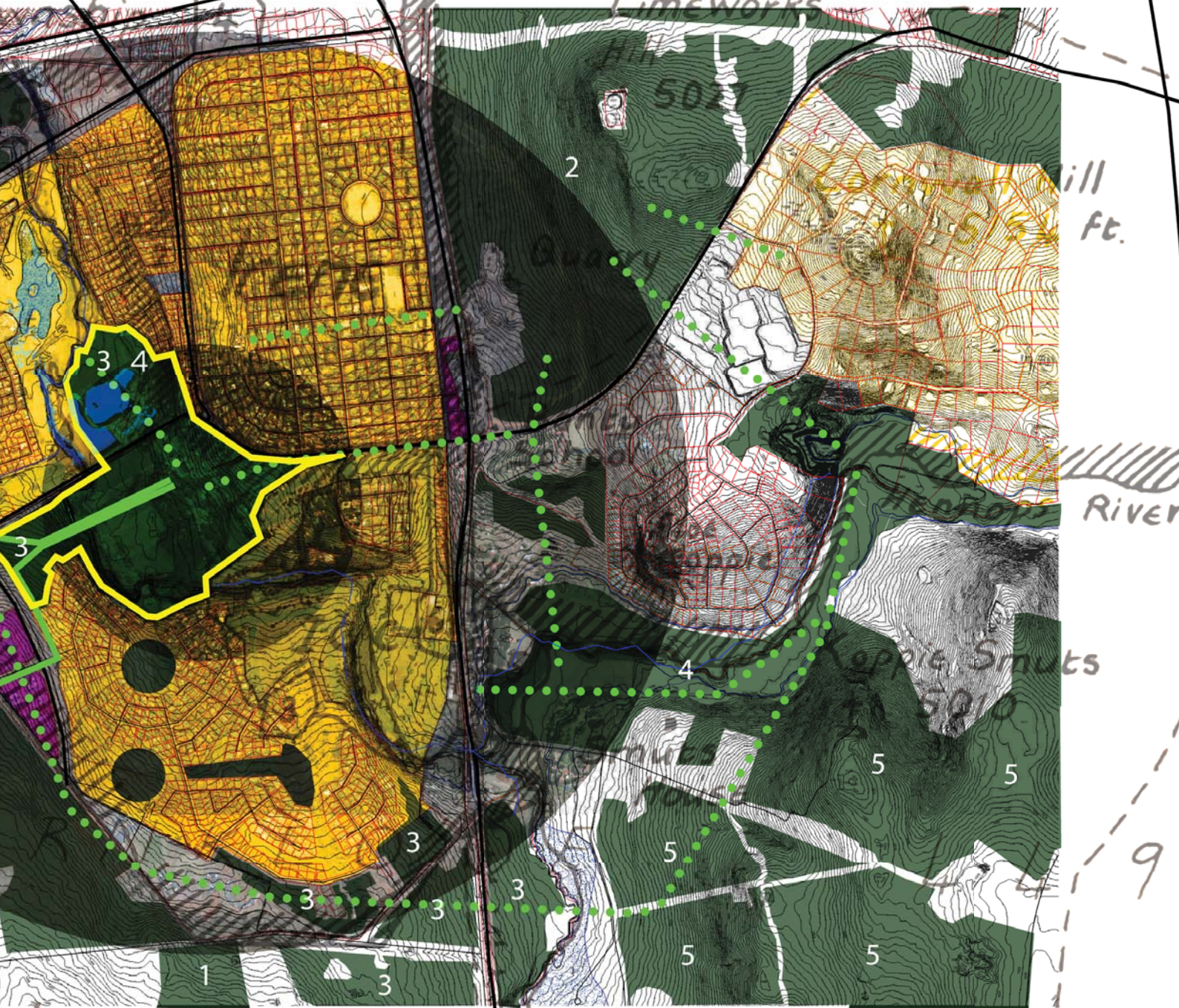
- 1 GRAZING
- 2 PARK: RECREATION
- 3 FOOD CULTIVATION
- 4 FLOODPLAINS+WETLANDS
- 5 PARK: REHABILITATE

070

Doringkloof



Lime works



Hill ft.

River

Opie Smuts

ch Institute

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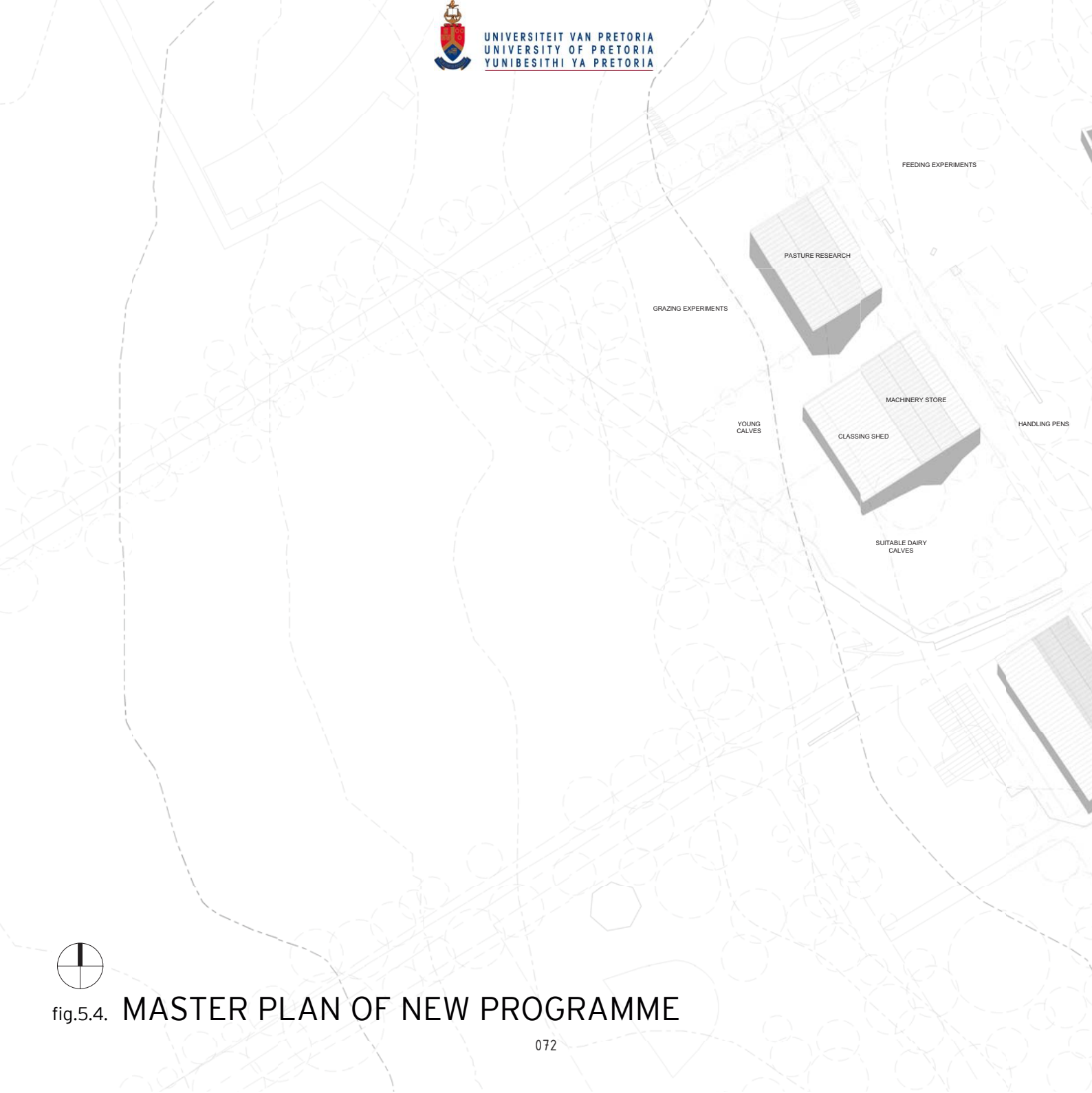
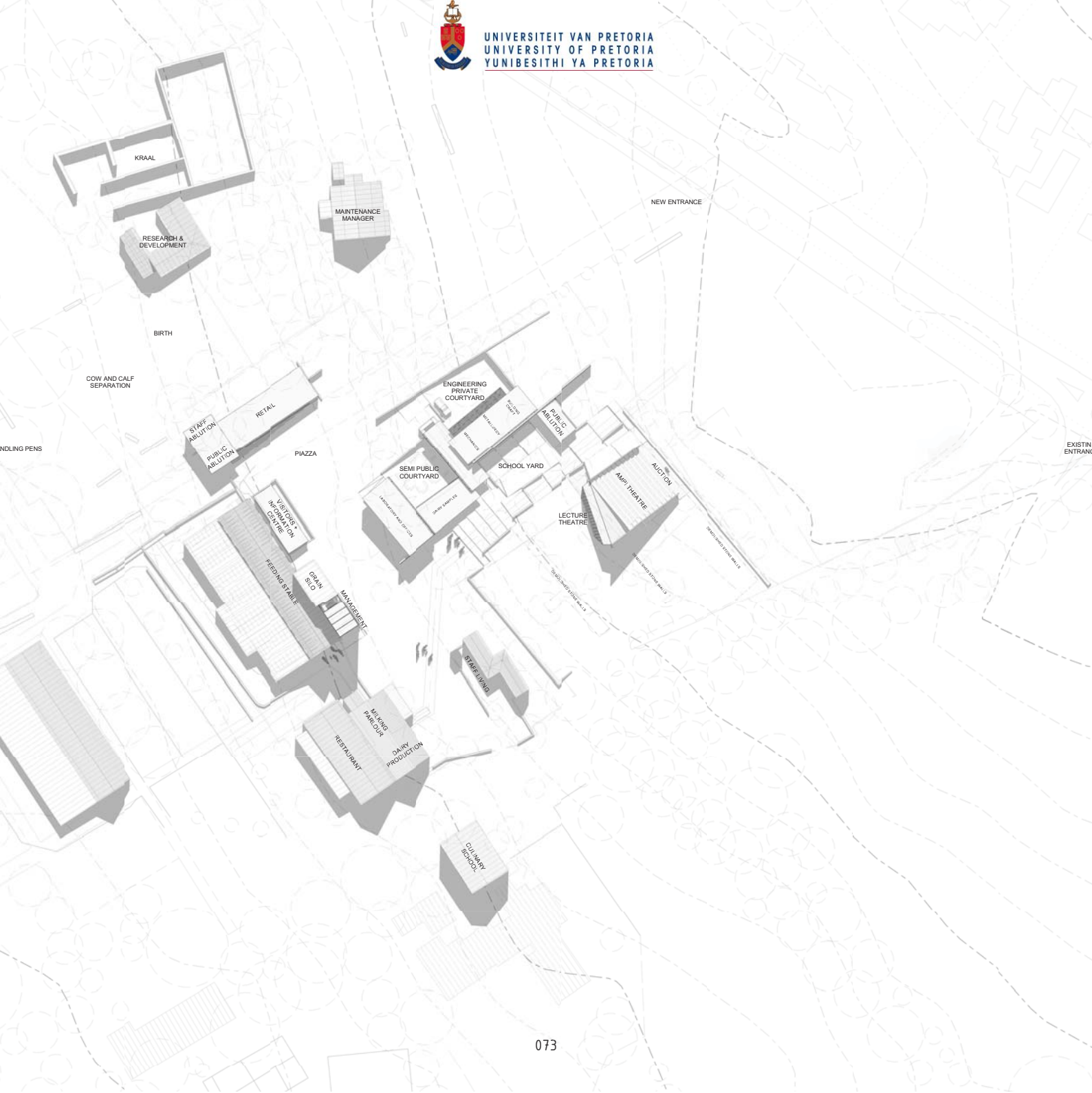


fig.5.4. MASTER PLAN OF NEW PROGRAMME





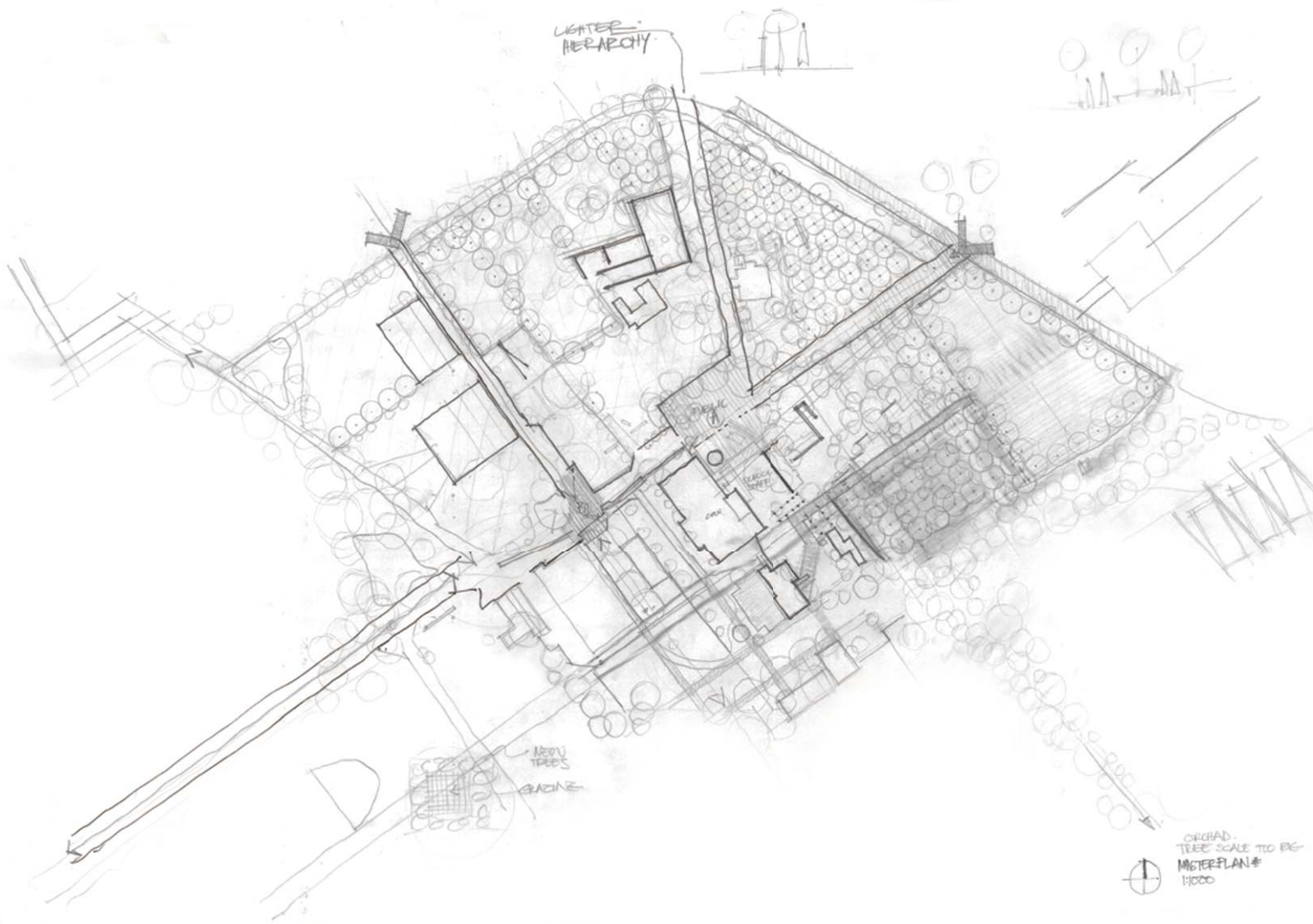


fig.5.5. MASTER PLAN  
New fruit trees

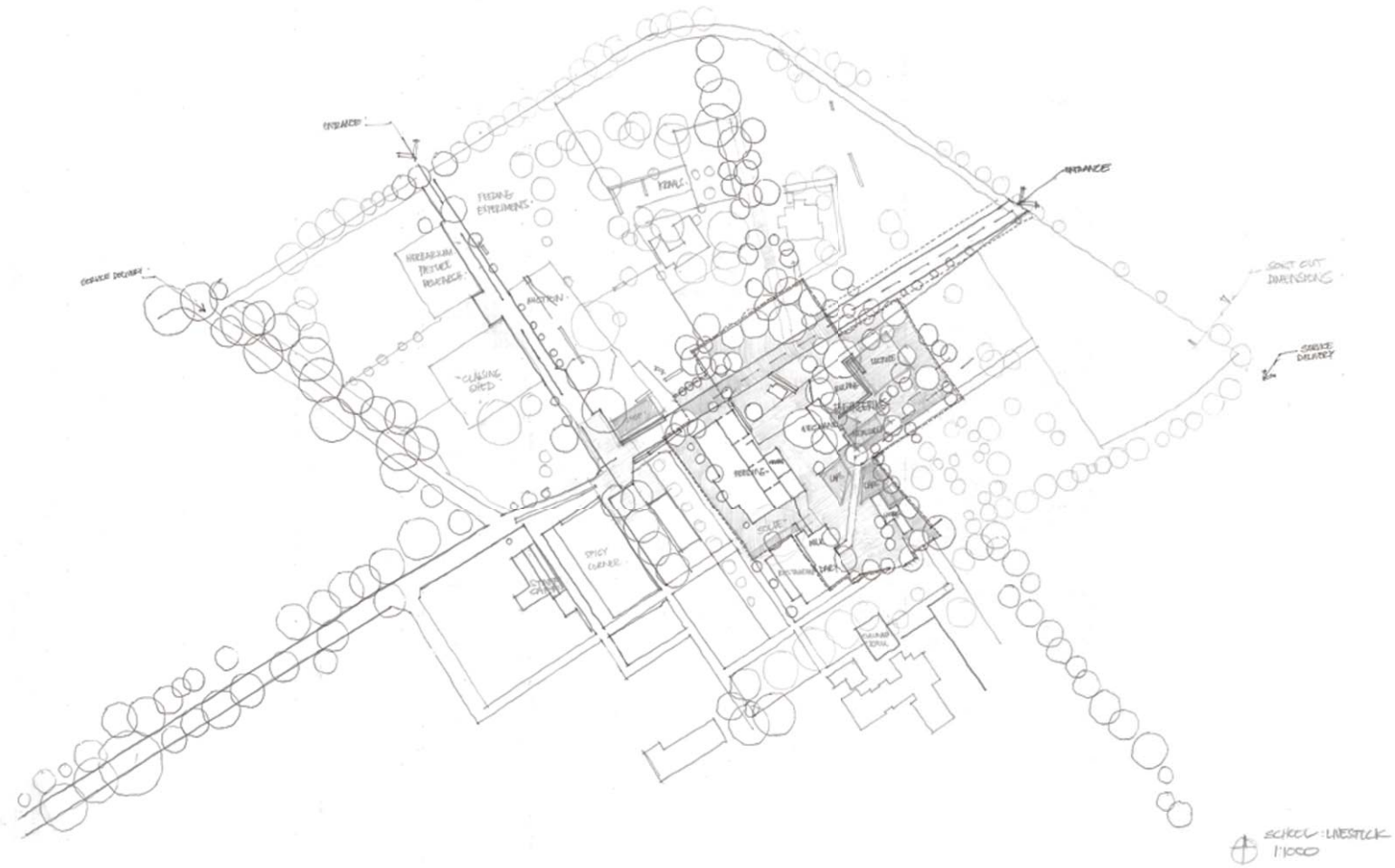


fig.5.6. MASTER PLAN OF SCHOOL PROGRAMME



fig.5.7. DEMOLISHED STRUCTURES

076

06

DESIGN

DEVELOPMENT

077

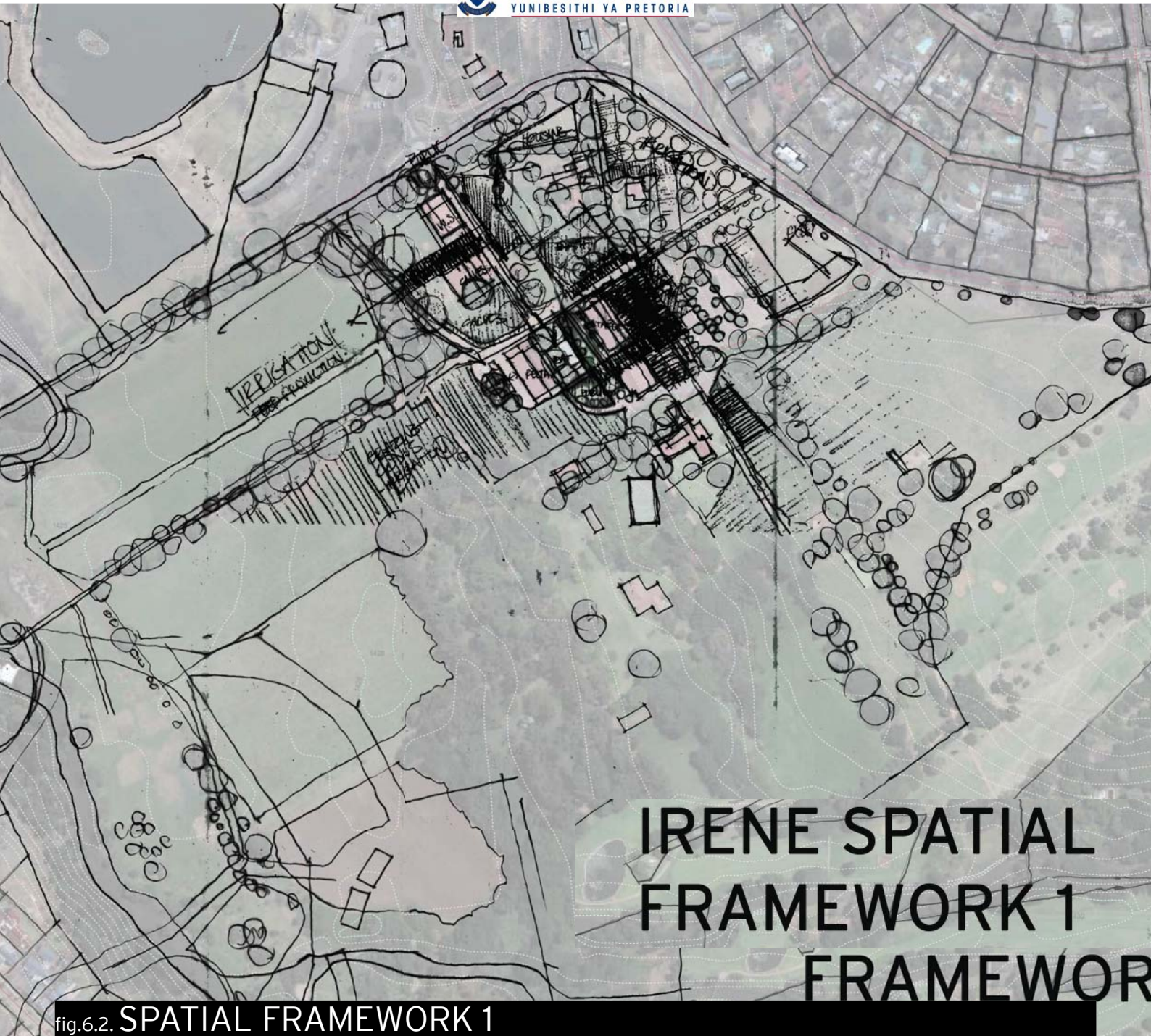


## DESIGN DEVELOPMENT

The following chapter depicts the development of the design from the inception of the concept for the Agricultural Education and Training Facility. Included is the development of the Masterplan for the school and the informants which were discovered through the mapping and research exercises.

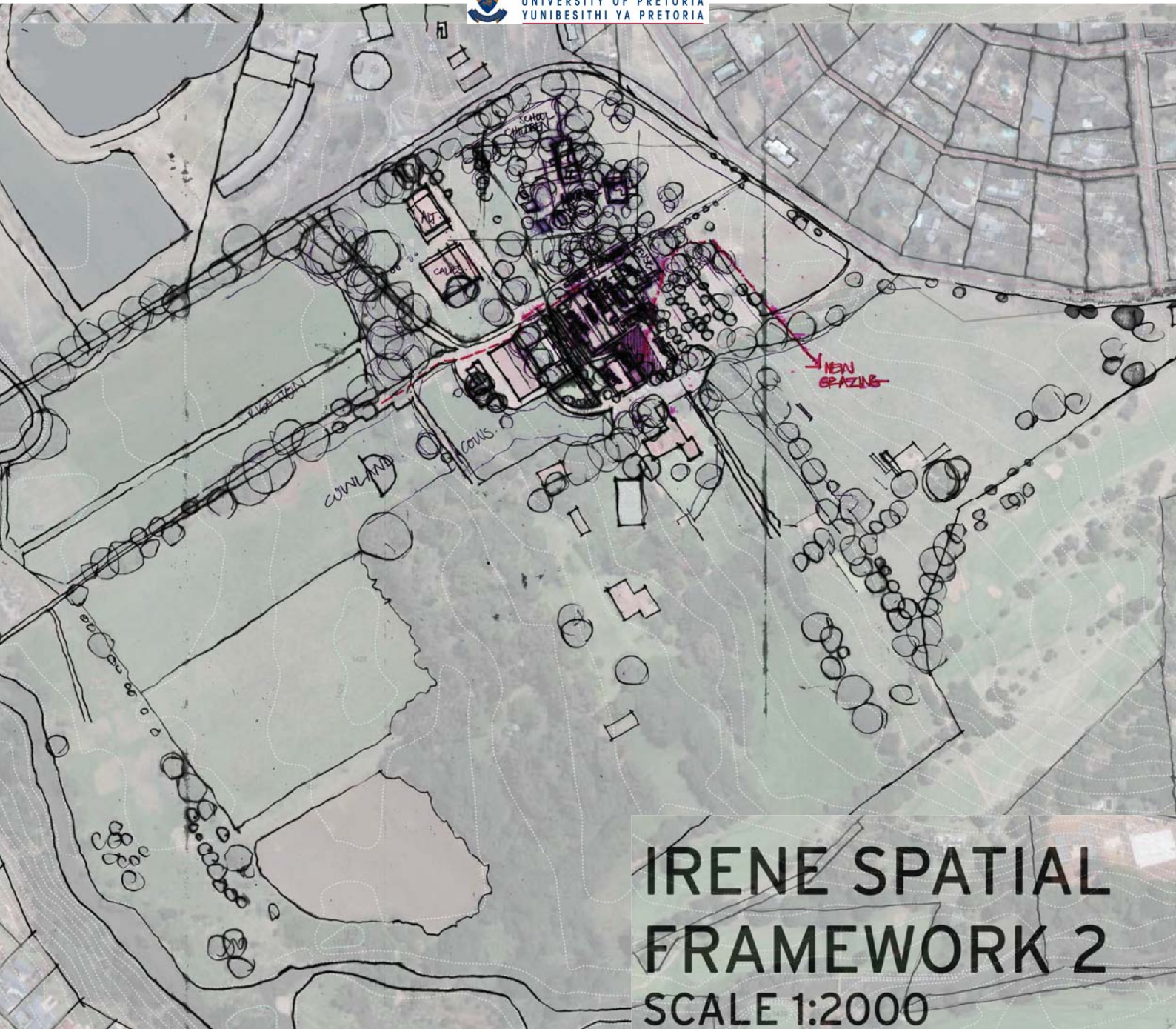
The images have legends that elaborate on the content of the specific image and what effect it had on the development of the overall design.

All the images are that of the author, whether it is hand drawn or aided with digital means.



# IRENE SPATIAL FRAMEWORK 1 FRAMEWORK

fig.6.2. SPATIAL FRAMEWORK 1



**IRENE SPATIAL  
FRAMEWORK 2**  
SCALE 1:2000

fig.6.3. SPATIAL FRAMEWORK 2



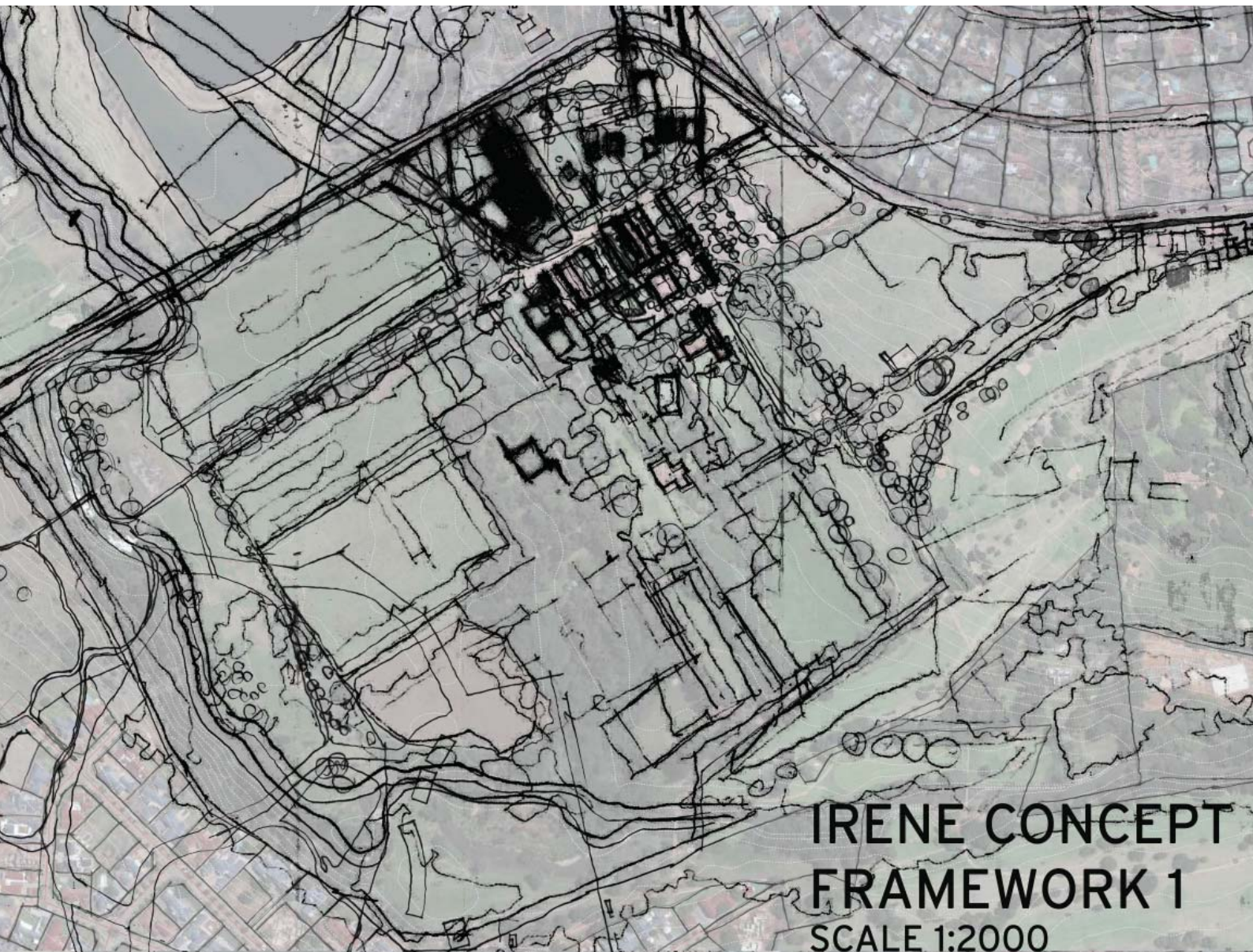


fig.6.4. CONCEPTUAL FRAMEWORK 1

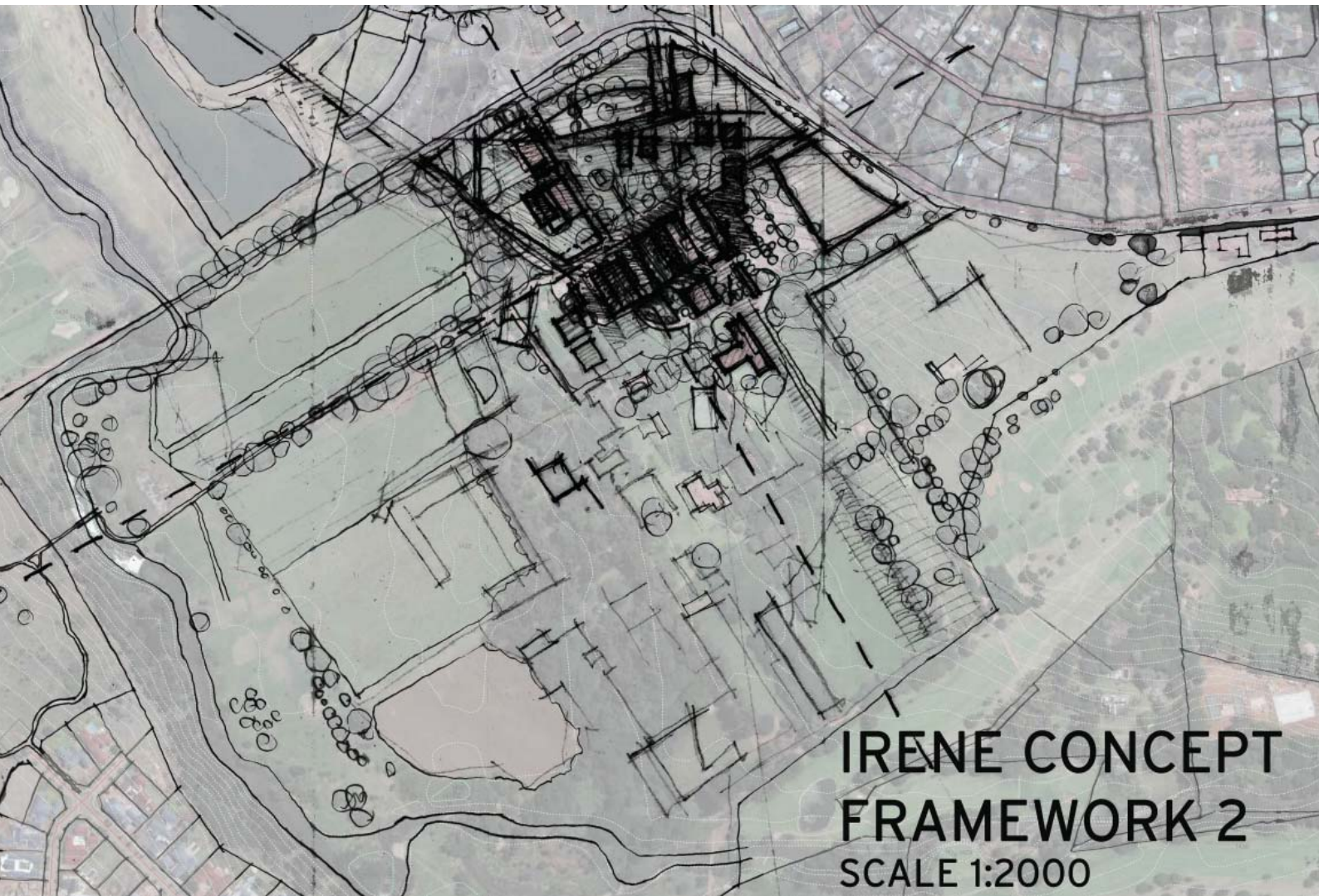


fig.6.5. CONCEPTUAL FRAMEWORK 2

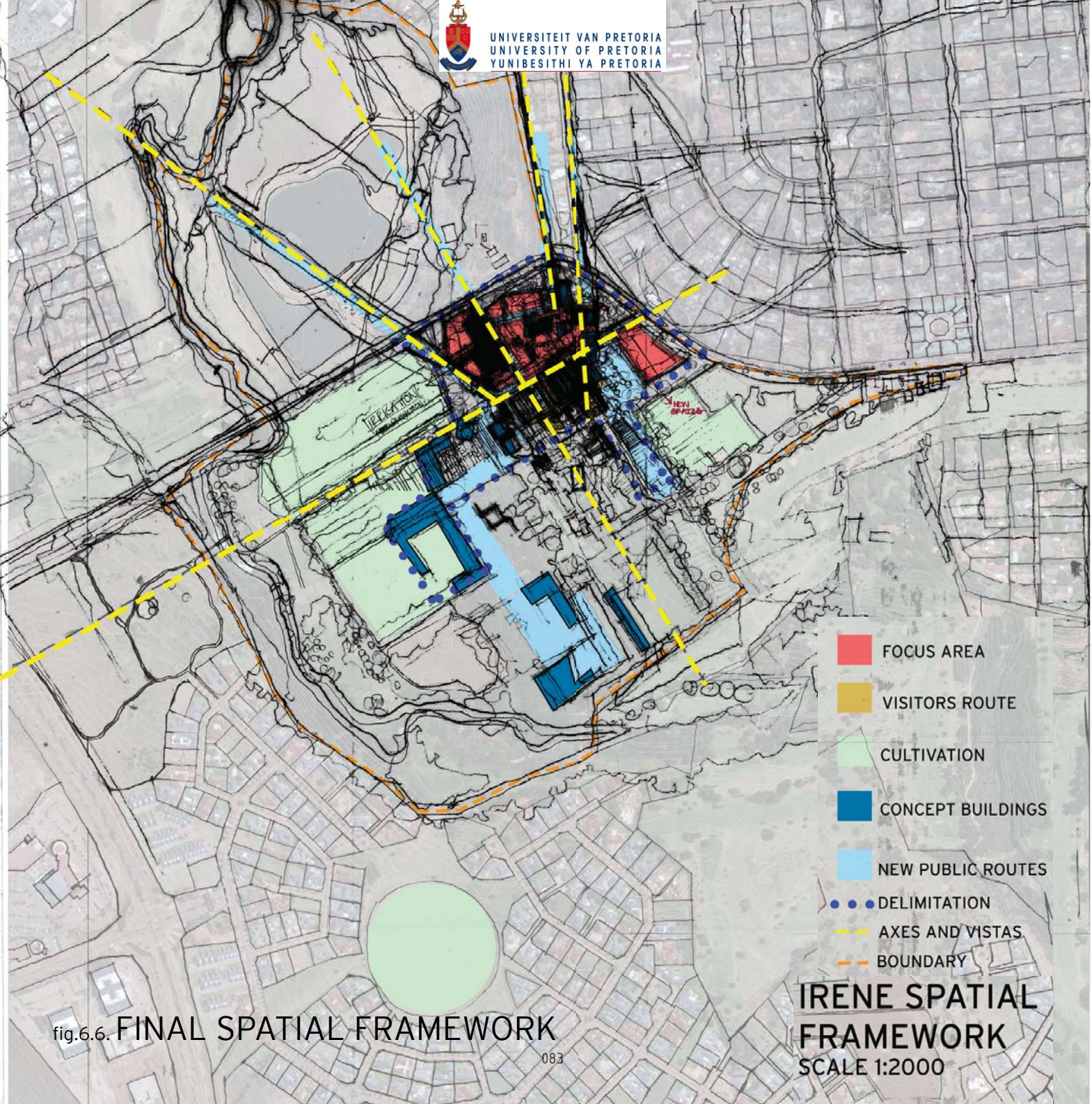


fig.6.6. FINAL SPATIAL FRAMEWORK

083



fig.6.7. PERSPECTIVES 1

The initial architectural response for the context was the product of purely intuitive reaction to what the context allowed.



084



fig.6.8. PERSPECTIVES 2

Placing new buildings next to the existing architecture without being too sympathetic to the sensitivity of the significant historic fabric.

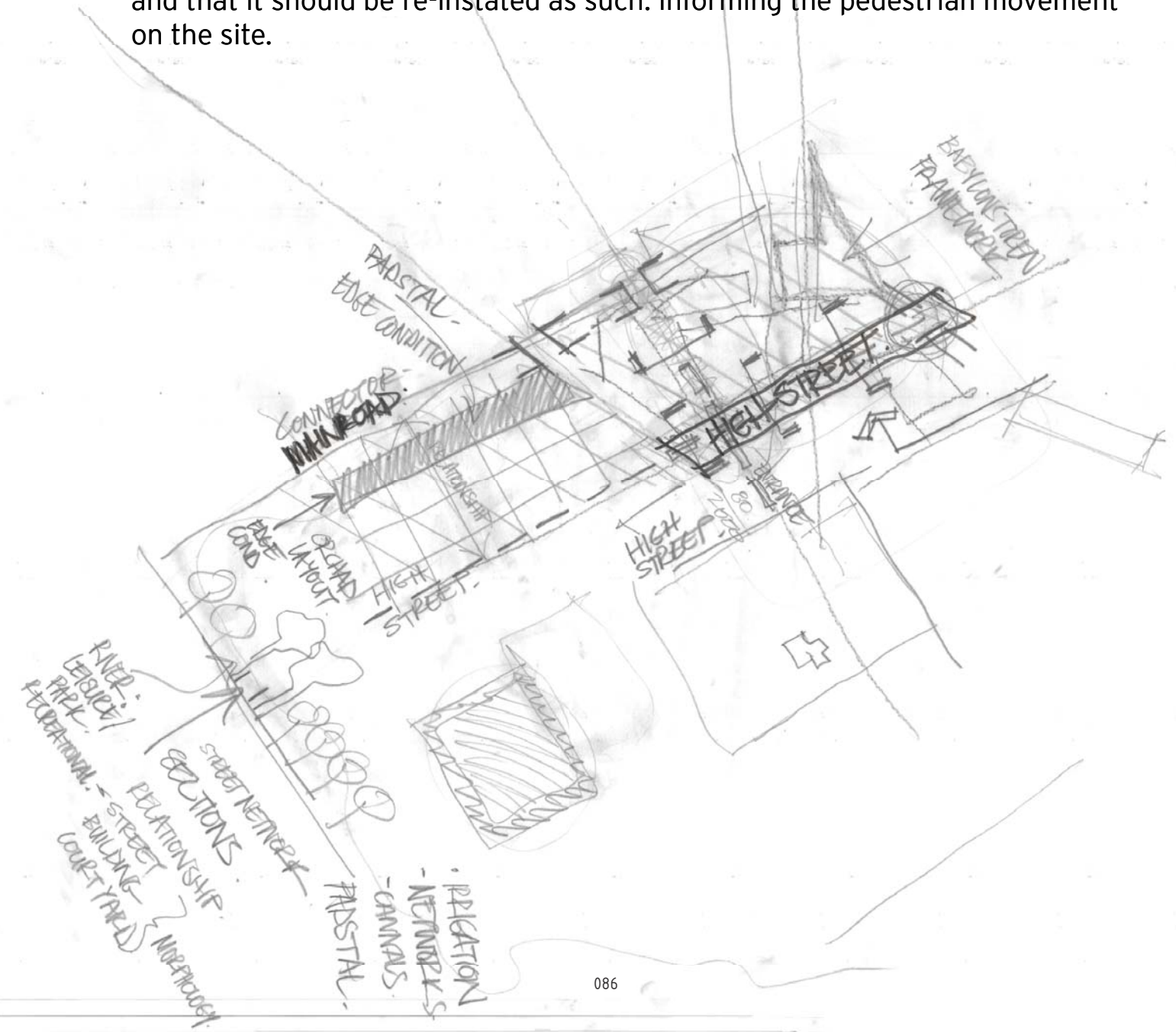


fig.6.9.

# HISTORIC MAPPING



Through the historic mapping exercise the most important informant that was discovered was that the original entrance of the farm was not in use any more and that it should be re-instated as such. Informing the pedestrian movement on the site.



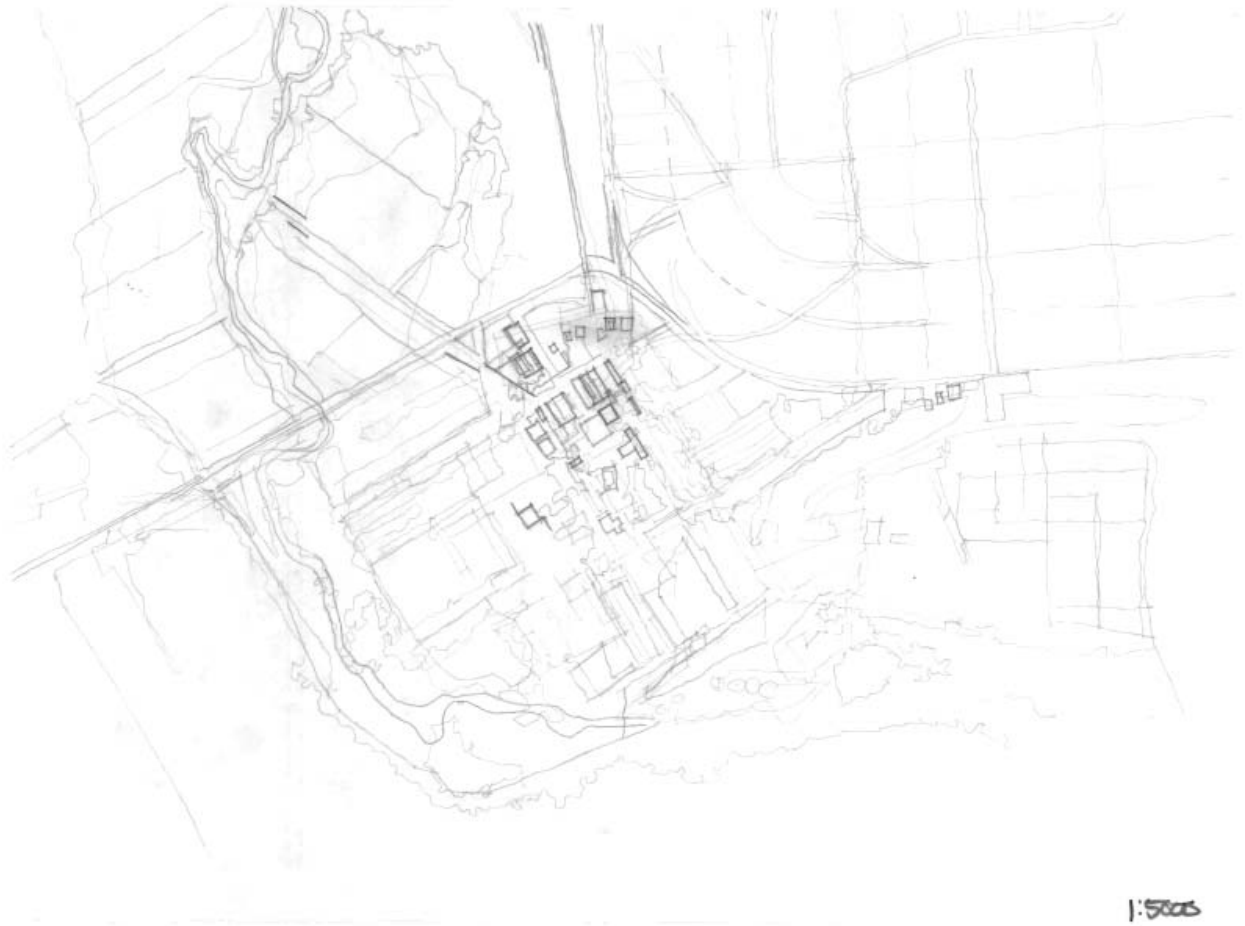


fig.6.10. **BUILT FABRIC ON THE SITE**

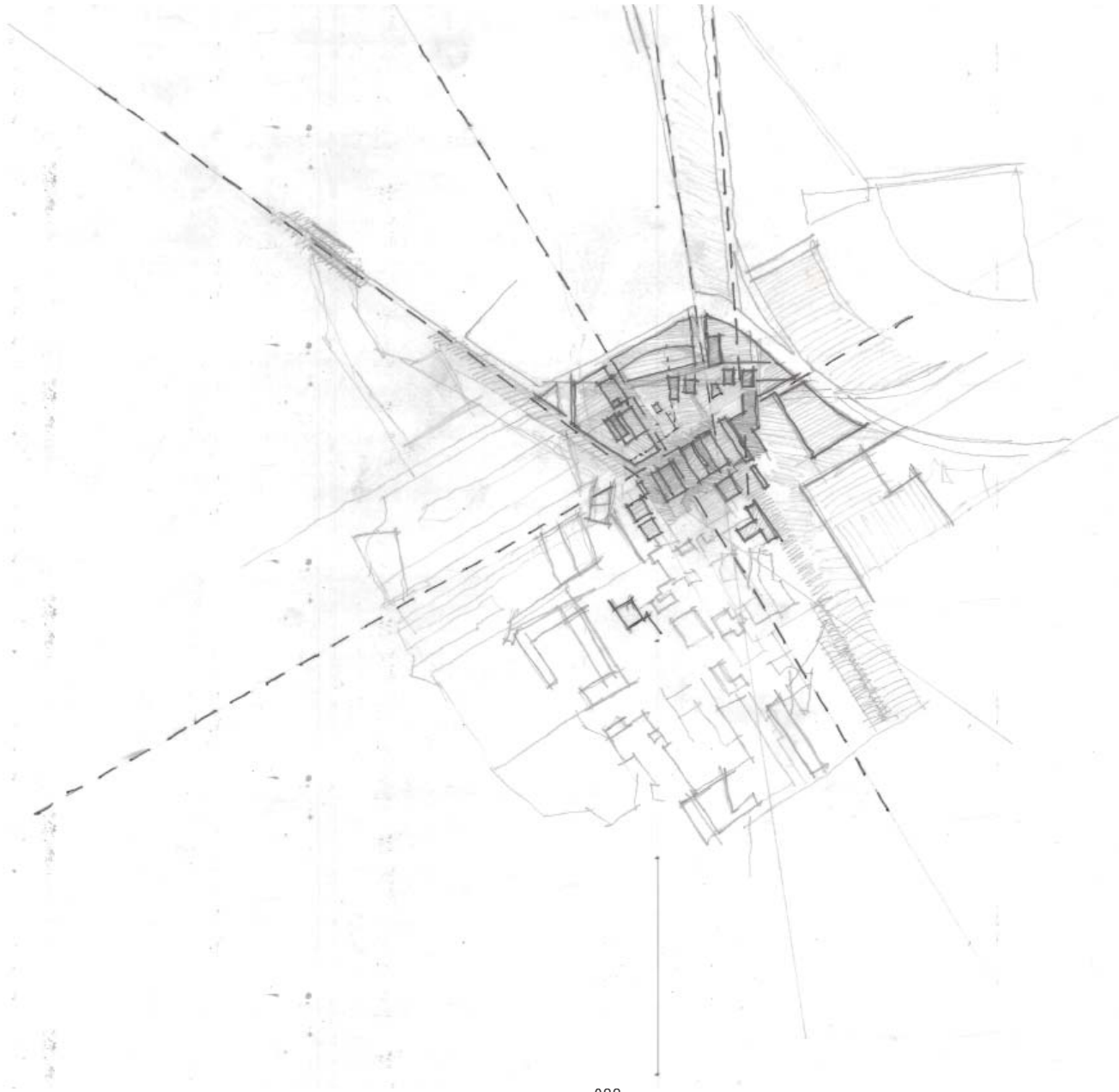
The image above shows the built fabric on the site, all of which are closely knit together in the northern top corner. The importance of the irrigated croplands dictated that the architecture could not develop on the productive land.

087



fig.6.11. **HISTORIC AXES**

This shows the historic axes on the site within the context of the built fabric. The remnants of these historic axes are still visible today, integrated in the suburban development that happened over the past century.





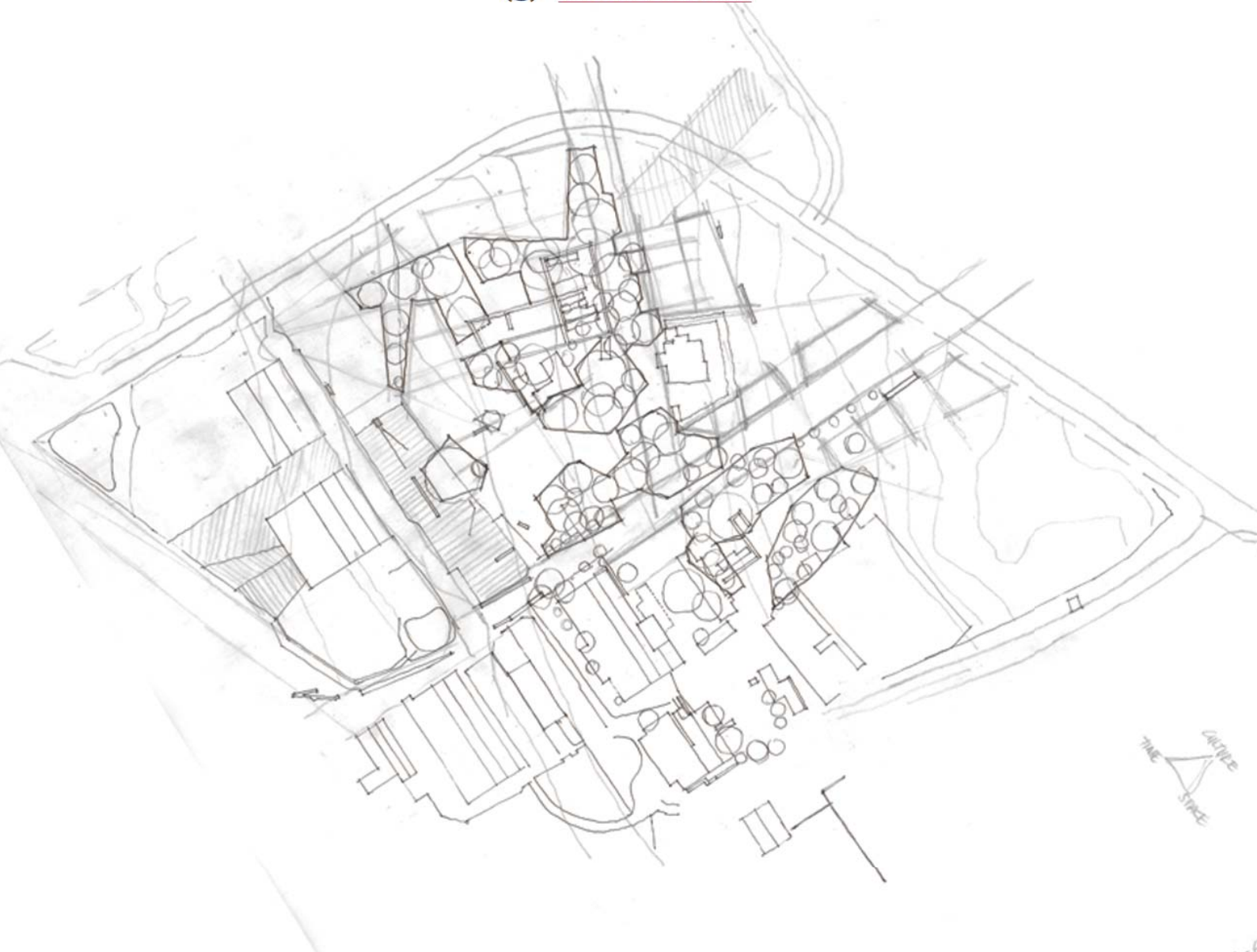


fig.6.12. **FIRST PROGRAMME ON SITE**

The first programmatic response to the framework and the historic mapping of the Irene Dairy Farm. One of the very first limitations set out was to retain the existing trees on the terrain, the result of the first owner's vision for the farm. All these trees would be kept inside courtyards that would be formed by the architecture around these trees.

fig.6.13. TREE CANOPIES

This image shows the outlines of the canopies of these trees and the courtyards that would be formed around these trees.



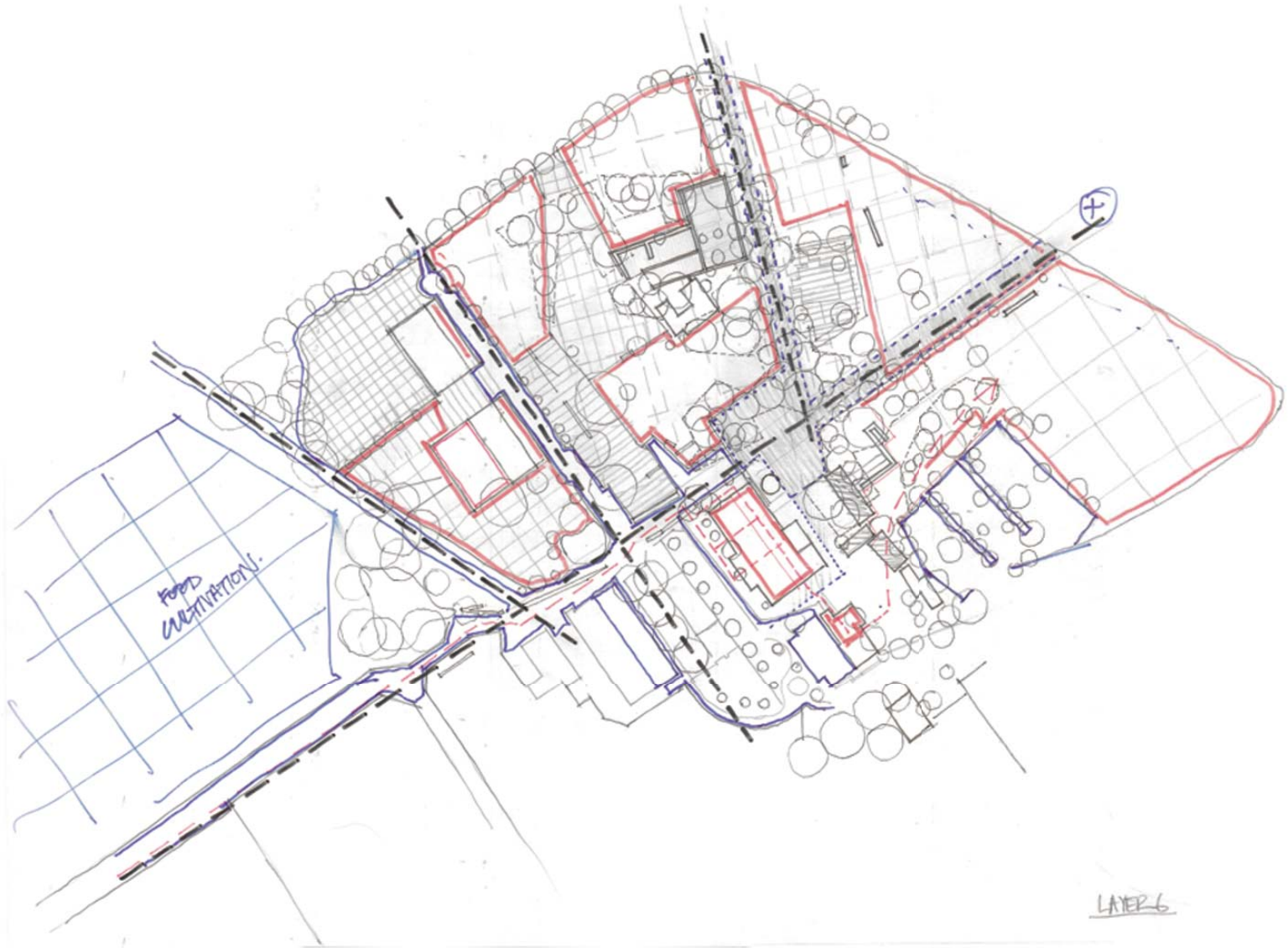


fig.6.14. ZONING

This image shows the zoning for the various users of the Agricultural school.  
Red: cows district; blue: visitors; hatch: cultivated land and feeding experiments.



## fig.6.15. FOCUS AREA

These two images are both of the focus area for the dissertation. Showing the built fabric and the elements that define the spaces in the focus area. Historically this is also the most important space on the farm, the farmyard, or as it is known in Afrikaans: "die plaaswerf". The significance of the main stable on the farm informed the choice for the focus area.

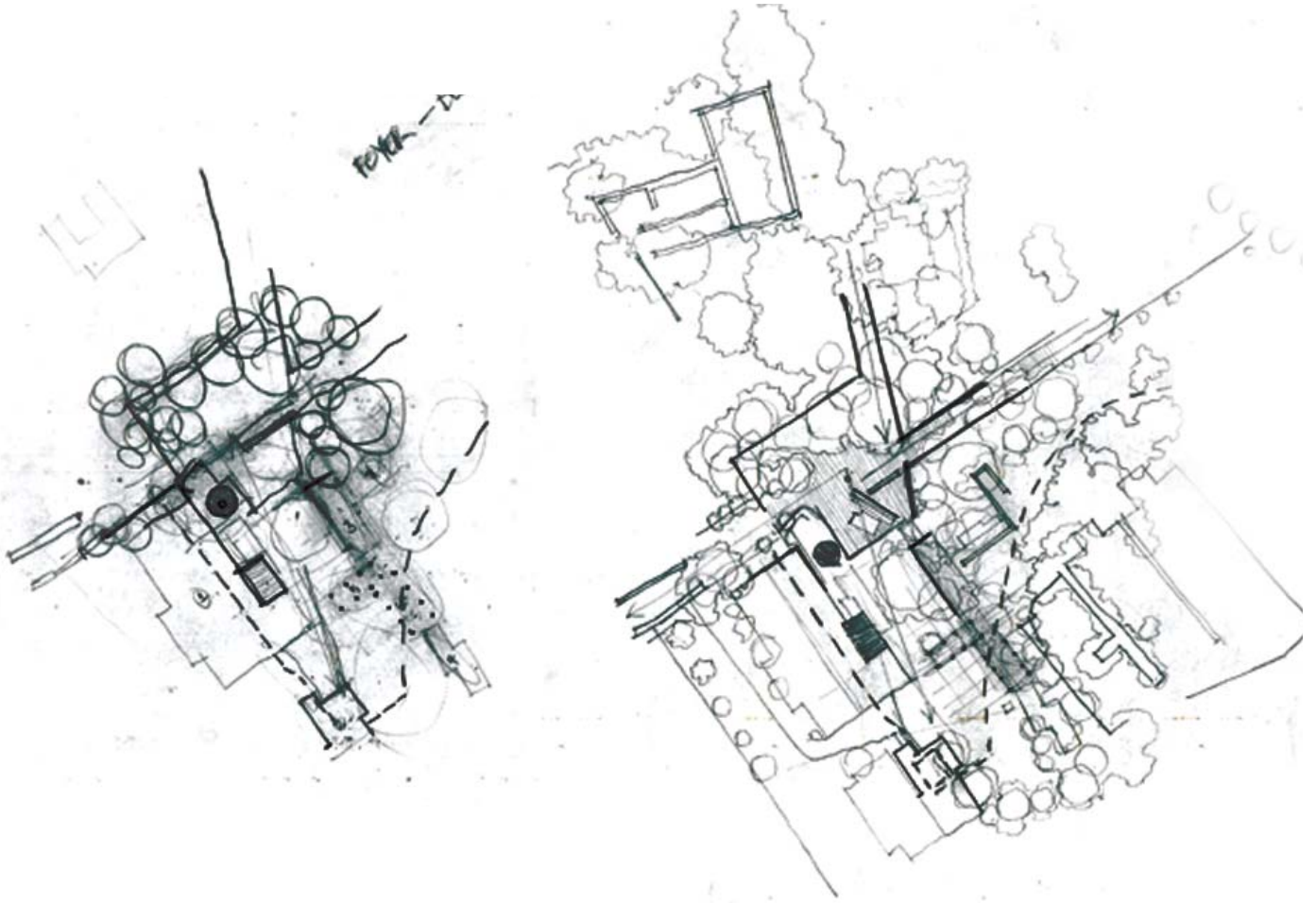




fig.6.16. **ZONING ELABORATION**

These images elaborate on the zoning of the new agricultural training facility.

Green: cows district

Red: visitors

Blue: students and staff

Black: built fabric



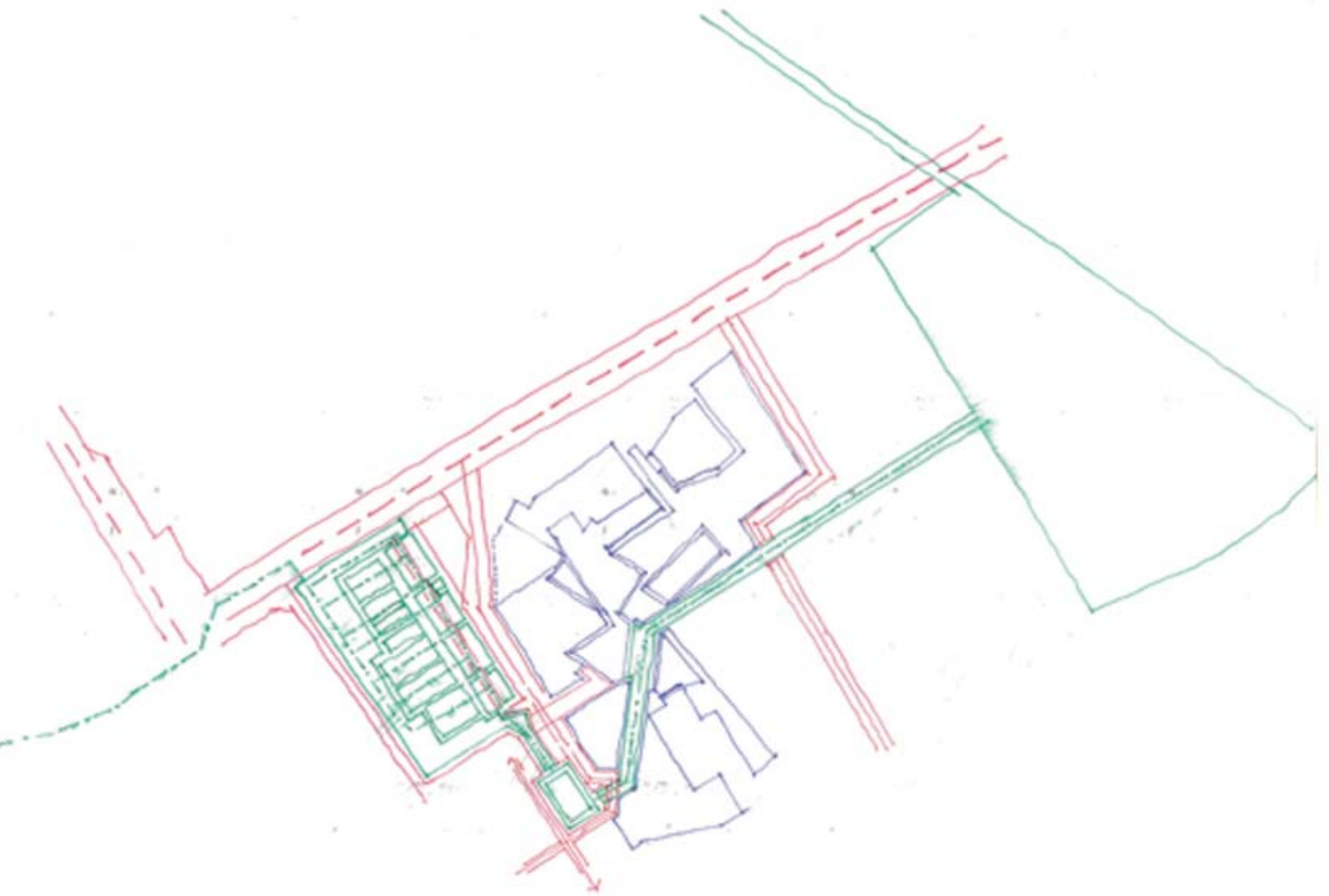
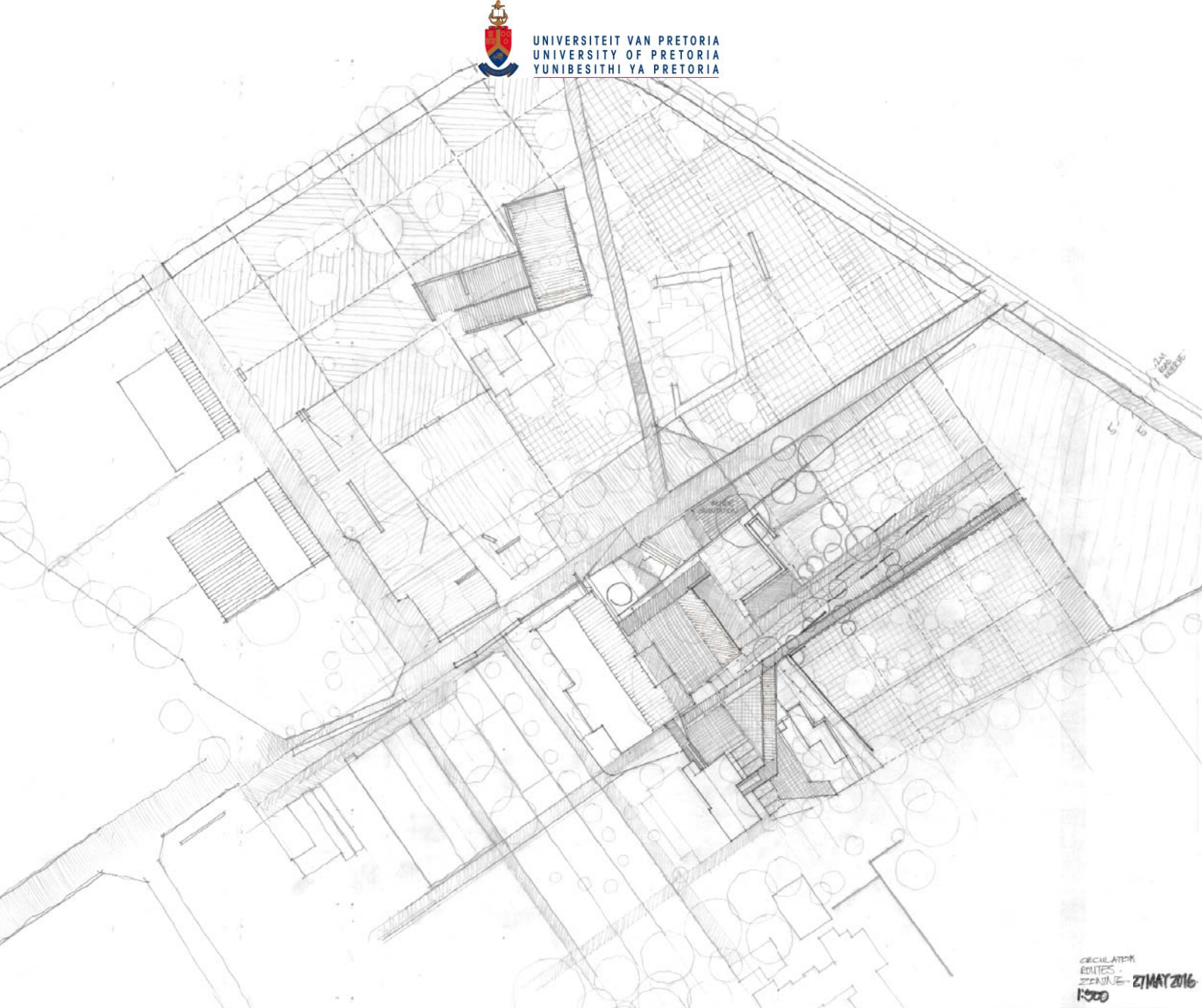


fig.6.17. ZONING LEGEND

Red: visitors  
Blue: students and staff  
Green: cows district

VISITORS  
STUDENTS+STAFF  
COWSDISTRICT



SCALE: 1:500  
DATE: 27 MAY 2016

fig.6.18. **MASTER PLAN OF THE AGRICULTURAL EDUCATION AND TRAINING FACILITY.**

Where new fruit bearing trees will be planted to further define the space of the focus area.



fig.6.19. COMBINATION OF MASTER PLANS

This image is a combination of all the exploration that was done on a master plan scale. Which is clearly visible from this image is the emphasis that is placed around the main stable, the focus area of this dissertation.





# SKETCH PLANS

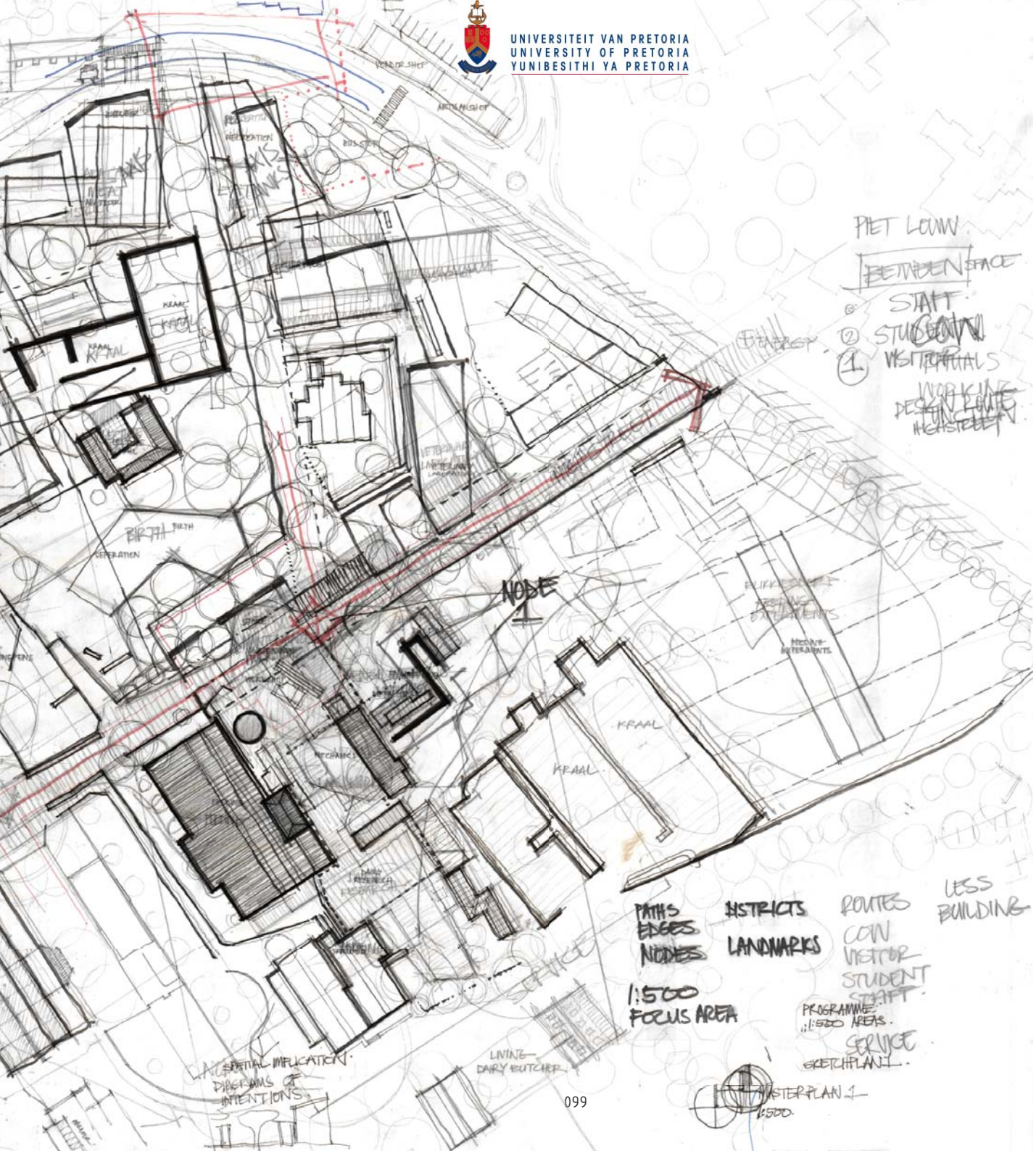
097



fig.6.20. SKETCH PLAN 1

This image is the result of combining all the layers of the first sketch plan for the Agricultural Education and training facility. Programming most of the terrain around the top corner of the current farm, which proved to be excessive. The forms that was suggested in this first sketch plan also did not relate to any of the existing structures and had an almost alien relationship with the terrain.





PIET LOUW  
BETWEENFACE  
STAFF  
STUDENT  
VISITORS  
WORKING  
DESIGN ROUTE  
HIGH STREET

LESS BUILDING  
ROUTES  
CON  
VISITOR  
STUDENT  
STAFF  
PROGRAMME  
AREAS  
SERVICE  
SKETCHPLAN



099

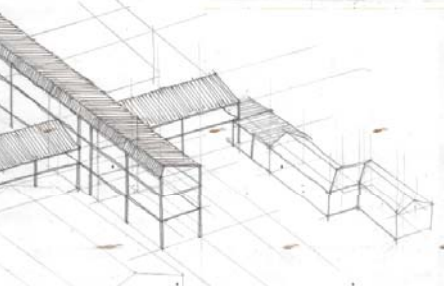
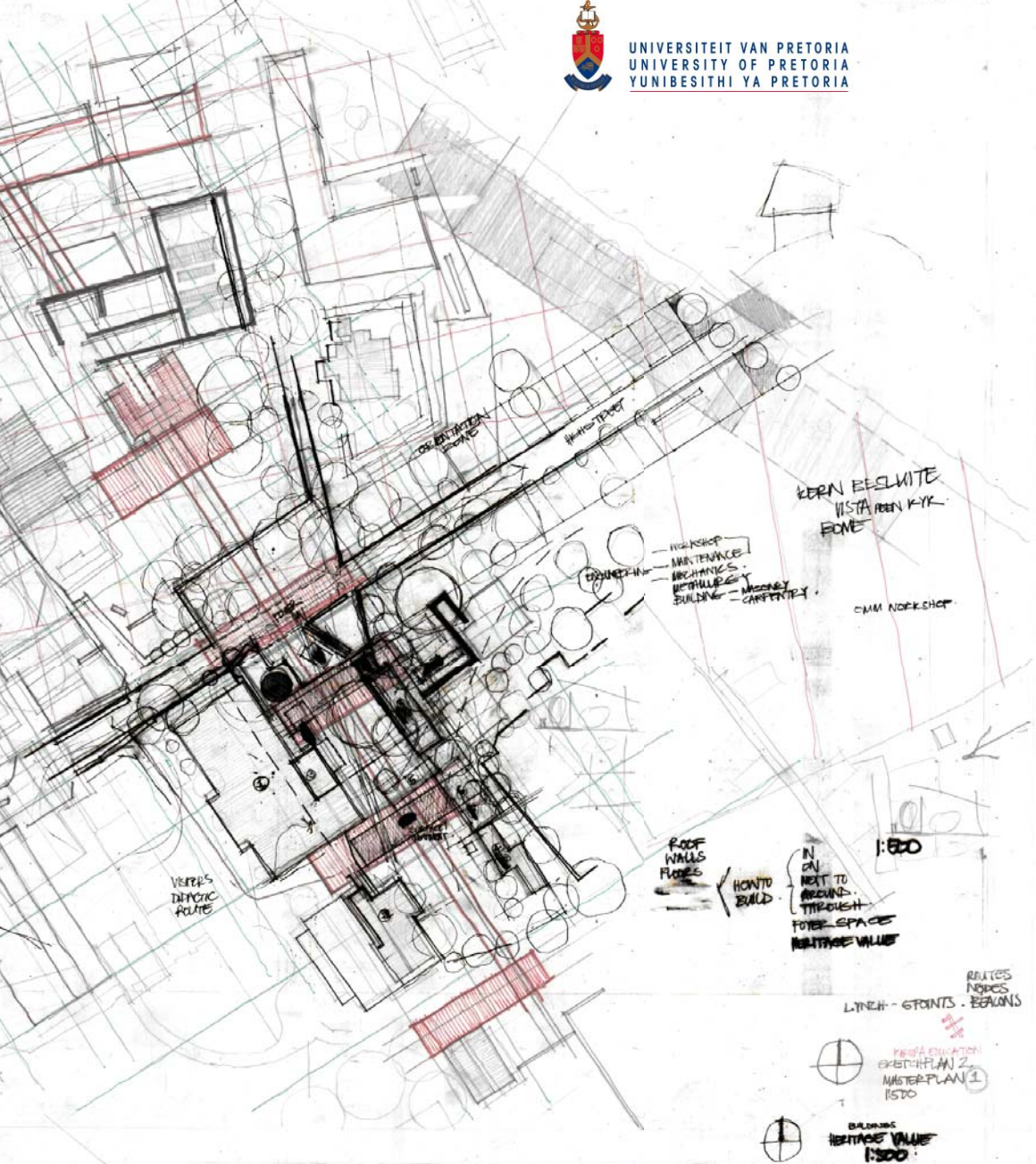


fig.6.21. **SKETCH PLAN 2**

The second sketch plan utilised a more controlled nature of architecture. This was informed by the stereotypical layout of a conventional school building, where a long corridor connects all the functions around it, in this case, the classrooms.

The problem with this option was that the architecture overwhelmed the main space in the focus area, the farm yard and as a result the intention of fitting into the existing fabric with a delicate hand was not achieved.





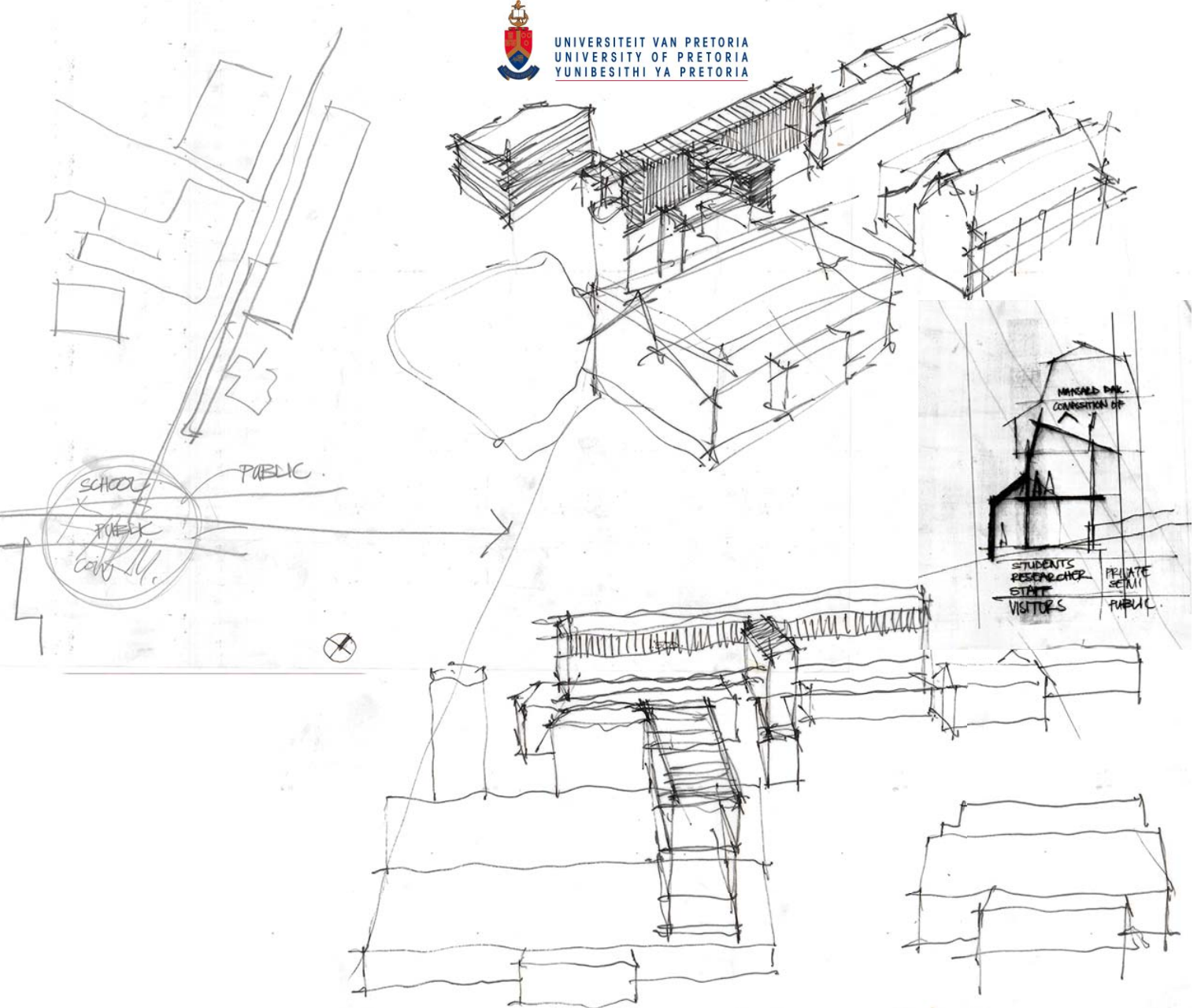


fig.6.22. **RECONSIDERATION**

After reconsidering the intention of the new architecture suggested for the farm, the third sketch plan had a more subtle approach to where it would manifest in the focus area. As a result, the architecture was informed by the footprints of the existing buildings on the terrain, morphing and manipulating these existing structures to create more controlled forms in and around the farmyard.

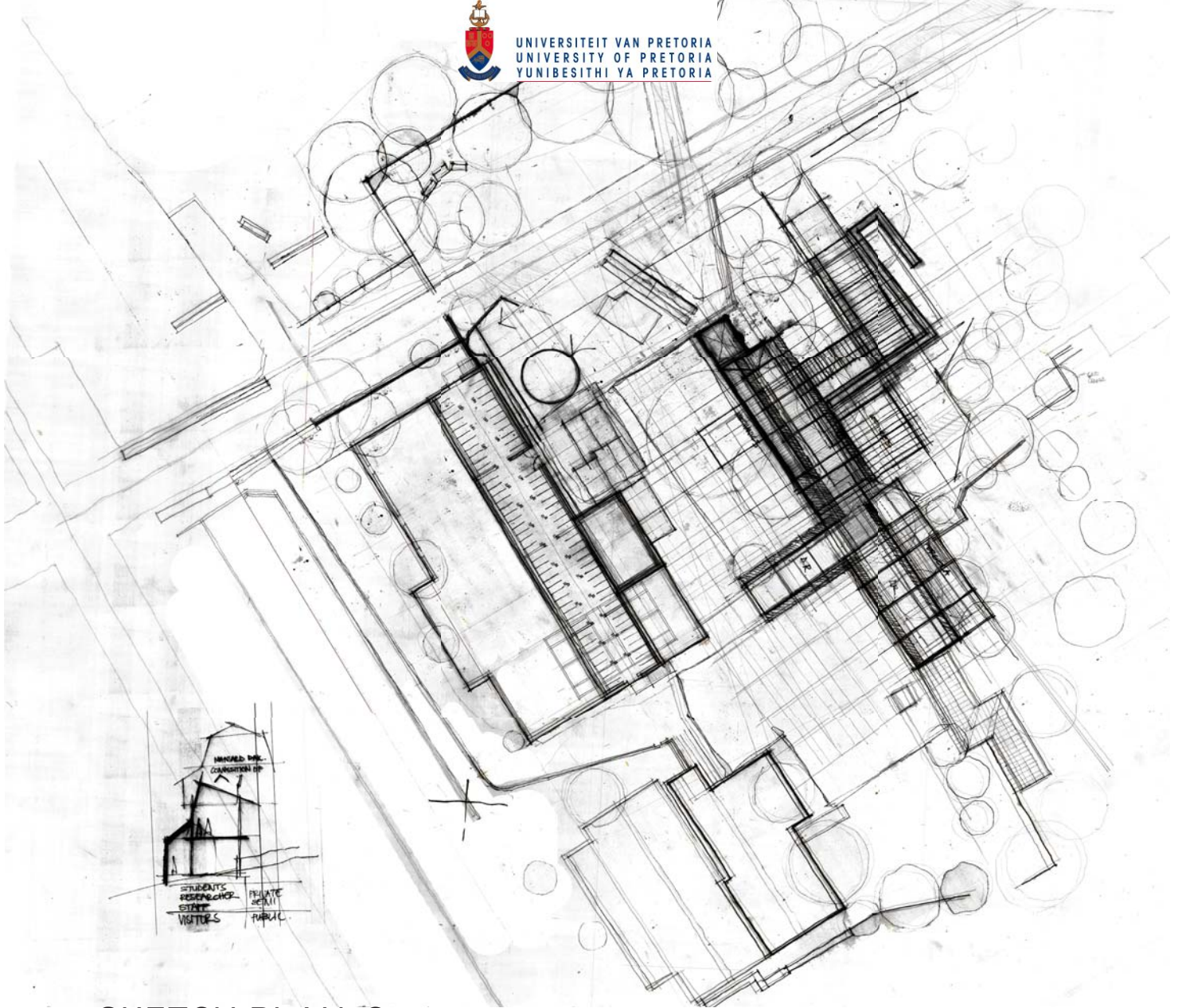


fig.6.23. SKETCH PLAN 3

The critique of the third sketch plan was that it was too reserved as clearly new architecture on the context of the farm. By simply morphing the existing buildings on the farm made no statement about the possibilities on the farm.

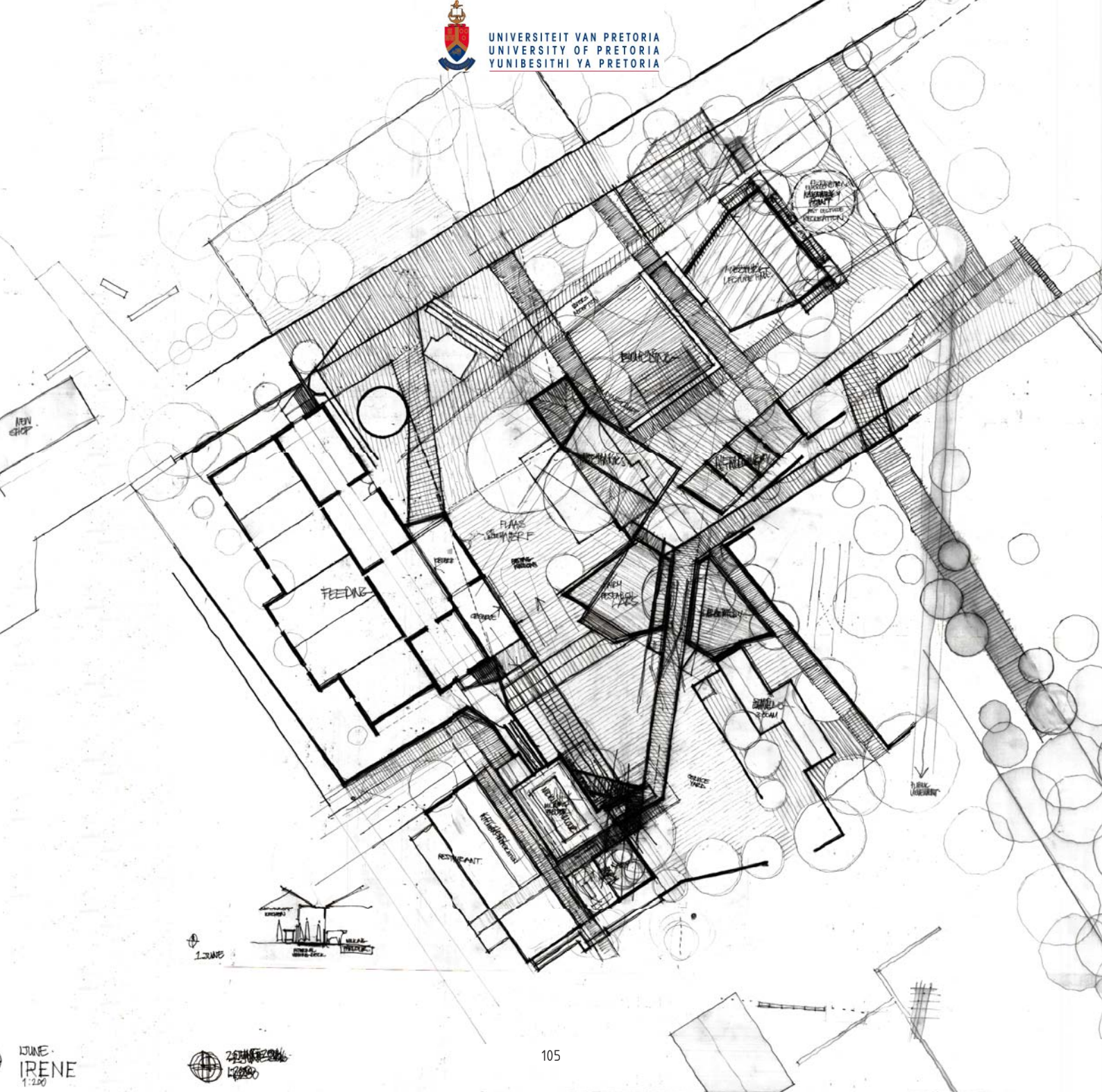
The intention is to create a new face of agriculture on the Irene Dairy Farm which the previous version evidently did not achieve.

fig.6.24. **MANIPULATING GEOMETRY**

The response was then a much more radical approach, informed by manipulating the geometry of the existing structures, intentionally striving to be different from the existing fabric.

The result was architecture that had no uniformity in its form or definition of space and again had a rather alien characteristic which clearly did not suit the context of the Irene Dairy farm. A comment made by a critique was that it looks as if five different architects designed the buildings on the plan.





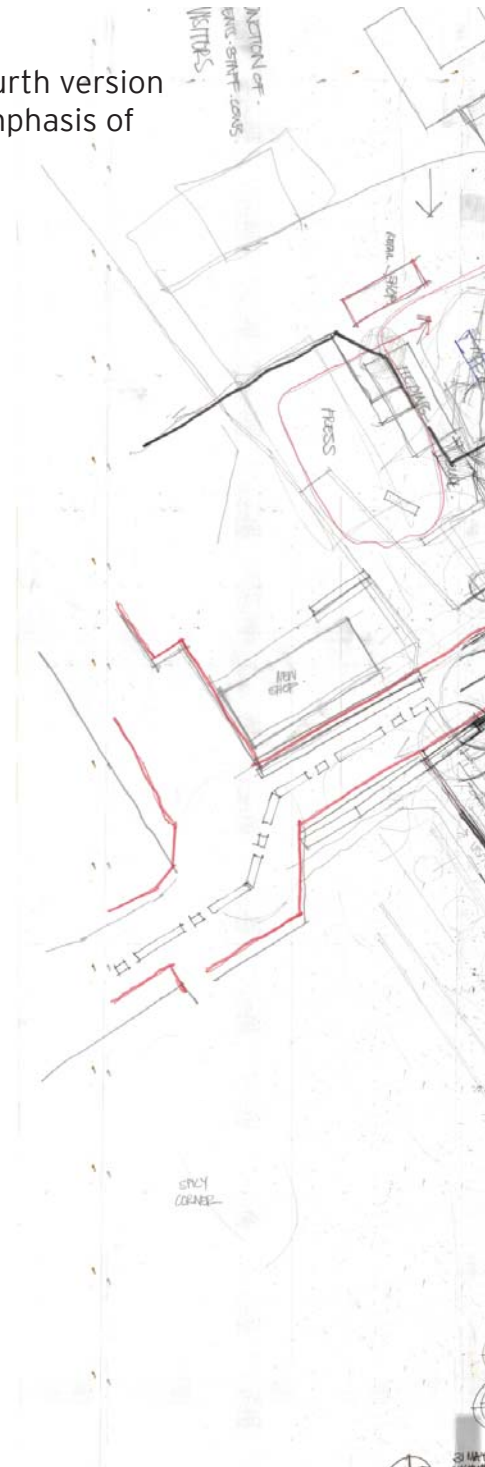
IRENE  
1:200

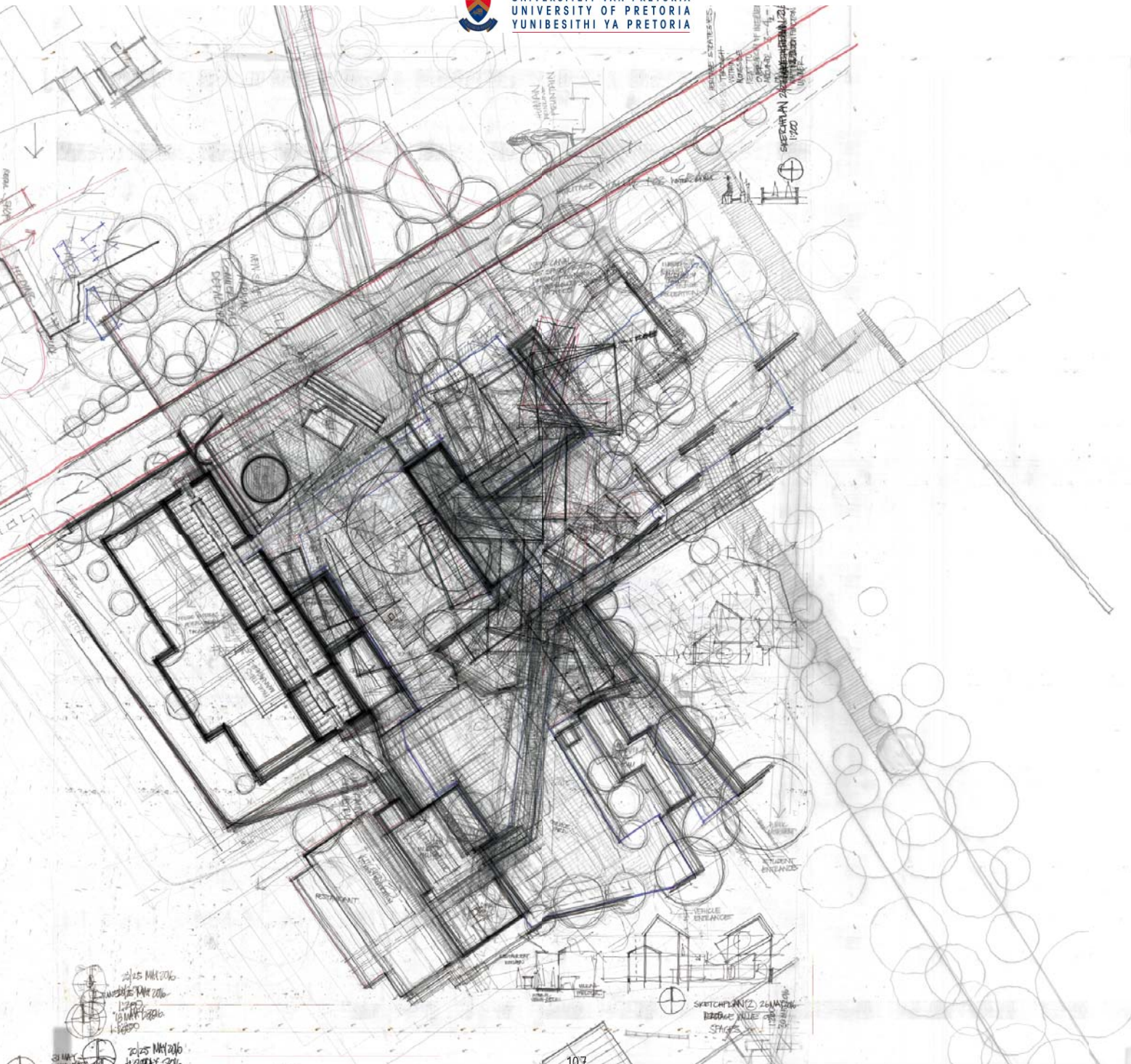




# fig.6.25. SKETCH PLAN 4

This image is the combination of all the planning done for the fourth version of the sketch plan. The product of these images is the evident emphasis of the architecture being formed around the focus area.







# fig.6.26. SKETCH PLAN 4, JUNE EXAM AXONOMETRIC

The product that was presented in the June exam was developed from the fourth sketch plan. The image below shows the axonometric of the architecture formed around the focus area. It is clear that the alien nature of this suggested architecture would not suit the existing architecture on the farm.



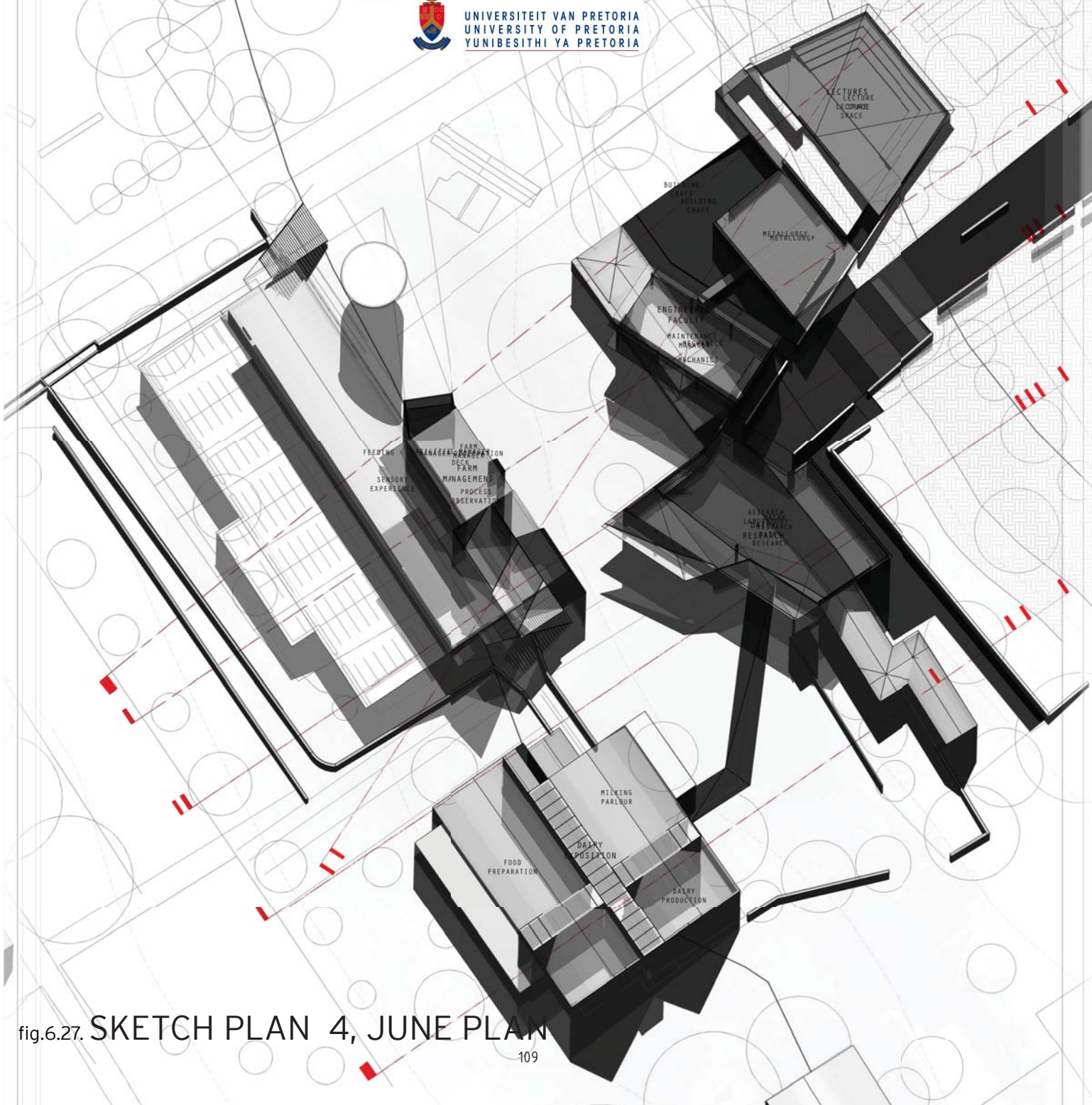


fig.6.27. SKETCH PLAN 4, JUNE PLAN

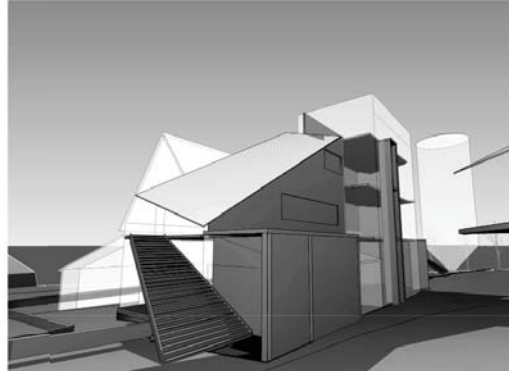
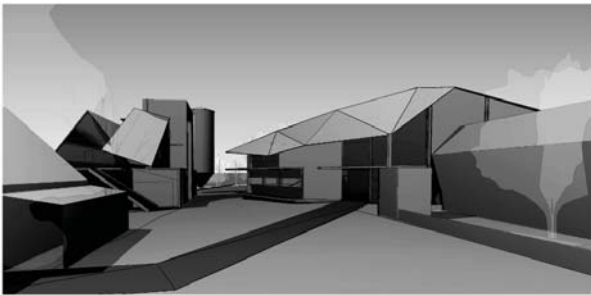


fig.6.28. **PERSPECTIVES 3**

These images show the suggested architecture of the fourth sketch plan in context. The form of the architecture is clearly in conflict with the existing architecture and had to be reconsidered to achieve the intention of sympathetic architecture for the Agricultural Education and Training Facility.

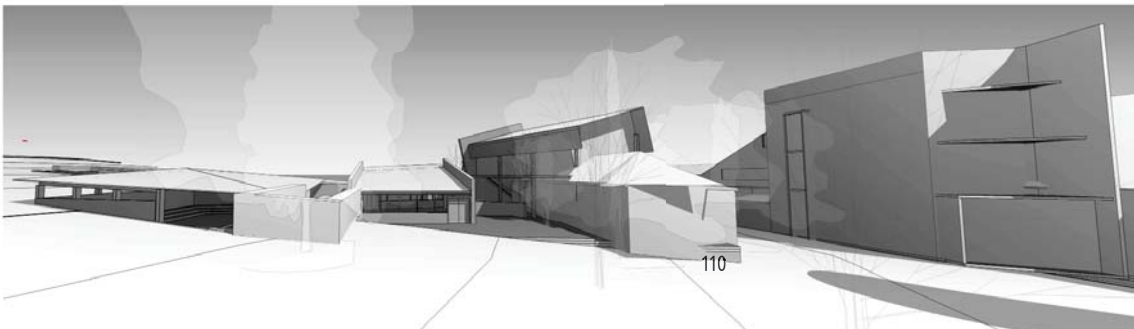
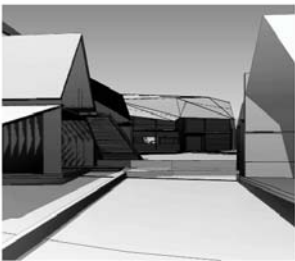
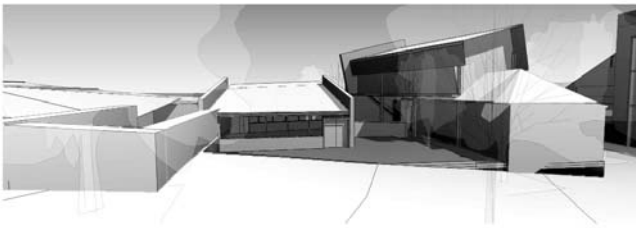
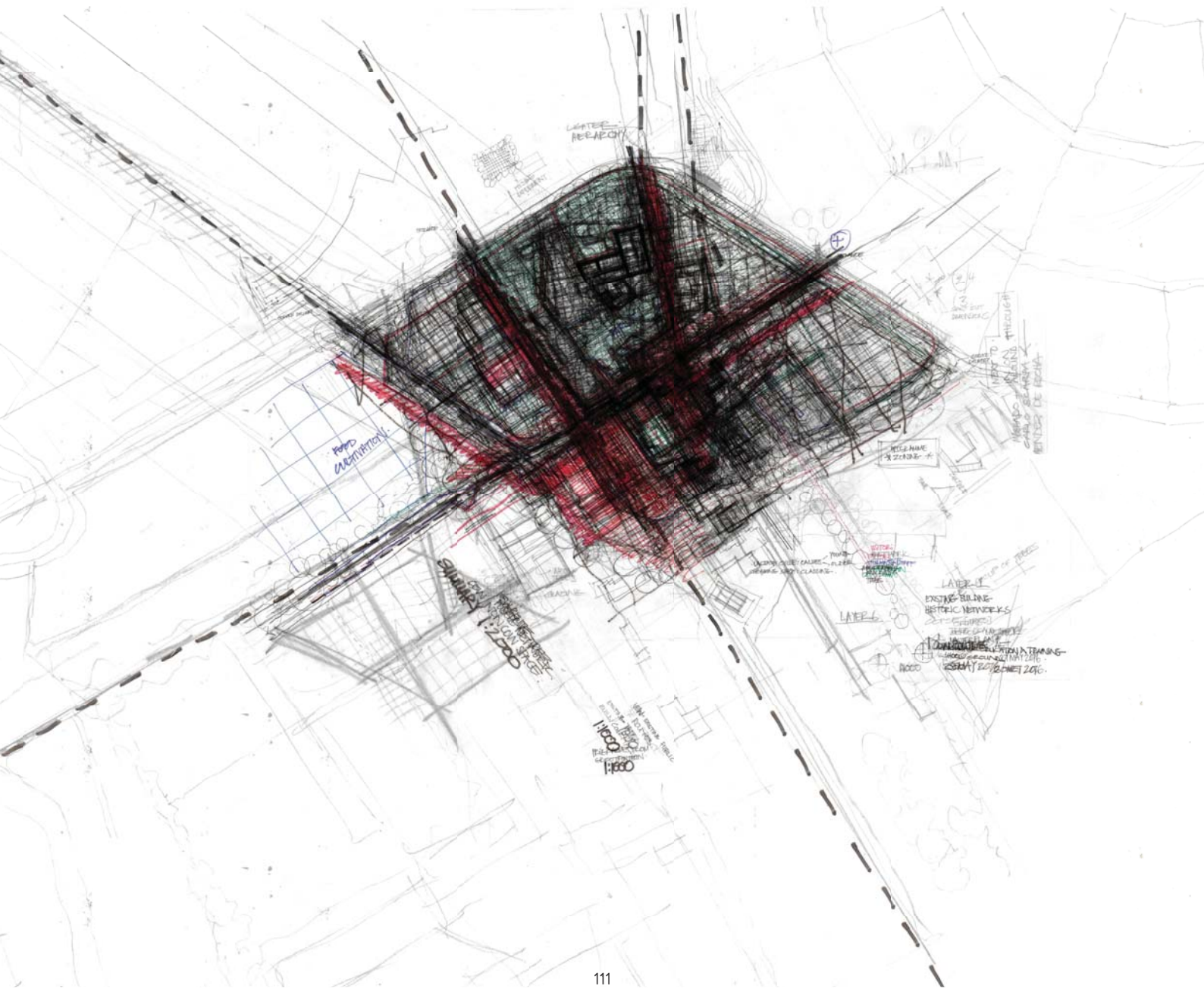
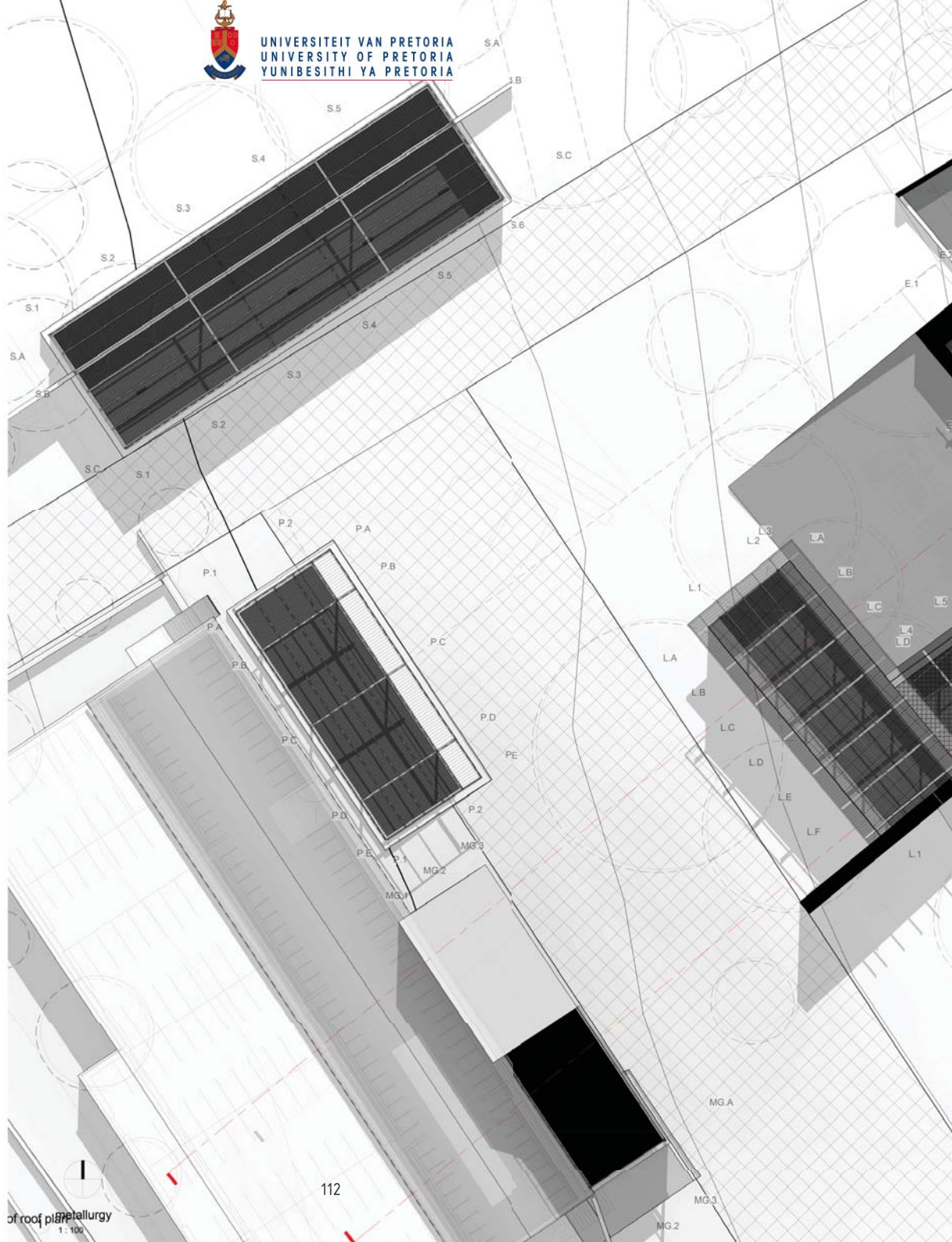




fig.6.29. **COMBINED MASTER PLAN**

The combined master plan for the Agricultural Education and Training facility.







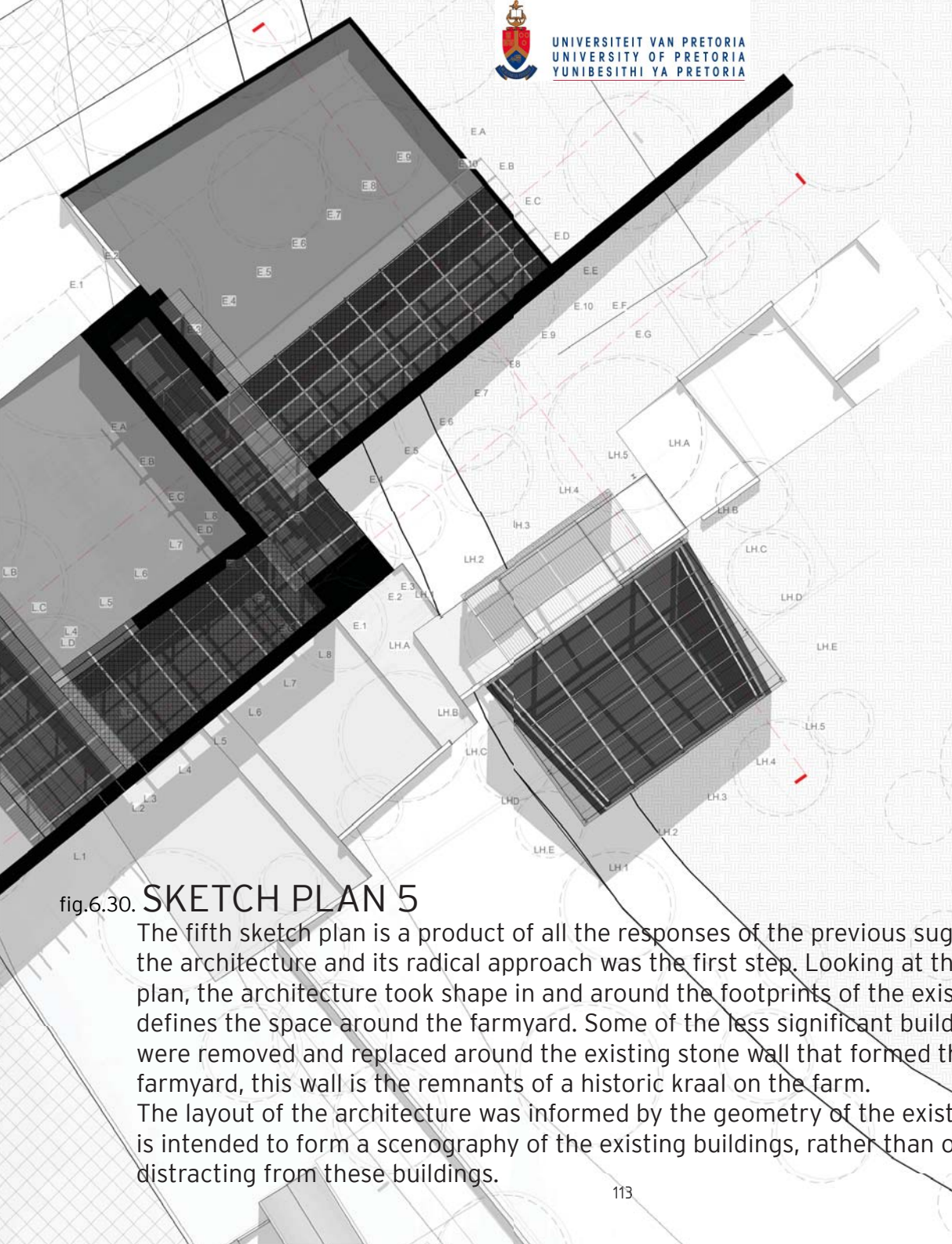


fig.6.30. **SKETCH PLAN 5**

The fifth sketch plan is a product of all the responses of the previous suggestions. To tame the architecture and its radical approach was the first step. Looking at the second sketch plan, the architecture took shape in and around the footprints of the existing structures that defines the space around the farmyard. Some of the less significant buildings and structures were removed and replaced around the existing stone wall that formed the edge of the farmyard, this wall is the remnants of a historic kraal on the farm. The layout of the architecture was informed by the geometry of the existing architecture and is intended to form a scenography of the existing buildings, rather than overwhelming and distracting from these buildings.

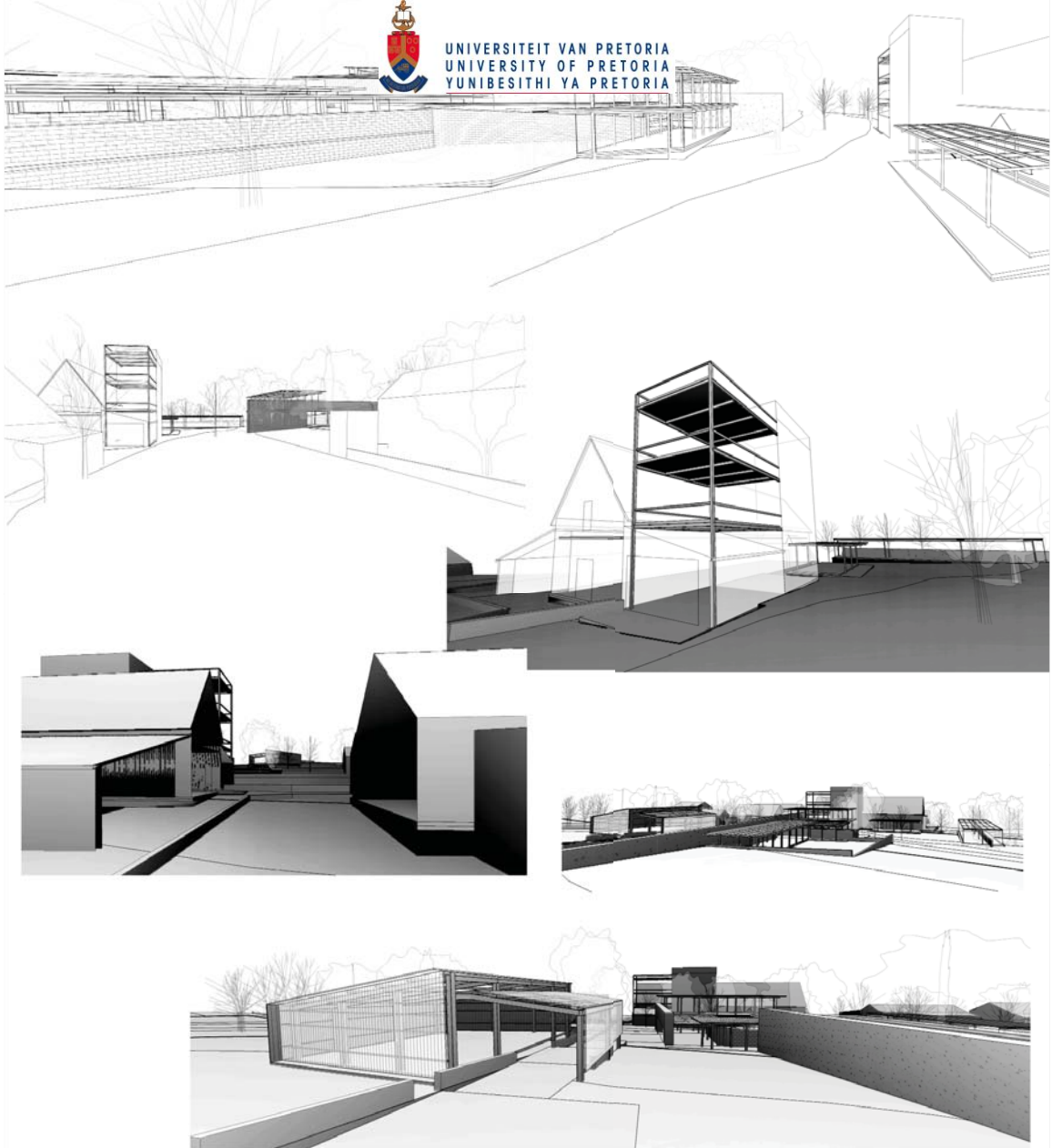
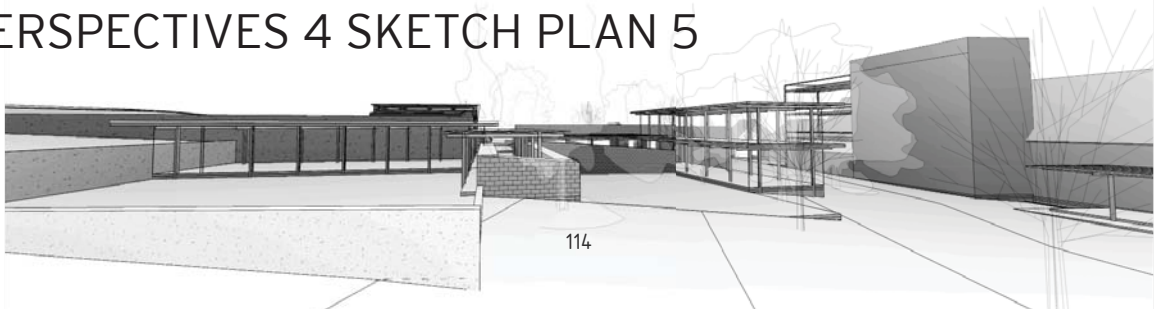


fig.6.31. PERSPECTIVES 4 SKETCH PLAN 5



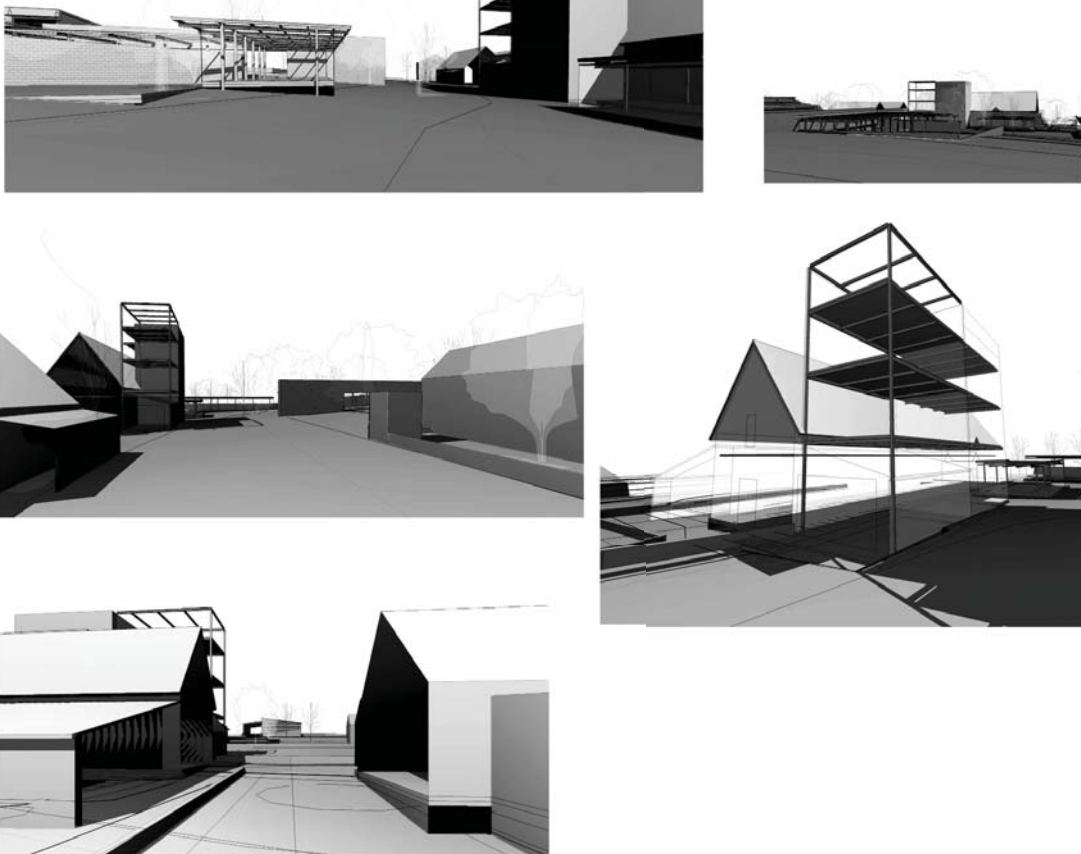


fig.6.32. **PERSPECTIVES 5**  
**SKETCH PLAN 5**

The fifth sketch plan buildings in the context of the focus area. The new architecture had a greater sympathy towards the existing architecture, although some of the buildings are not achieving the intention of being clearly new, striving to be the new face of agriculture.

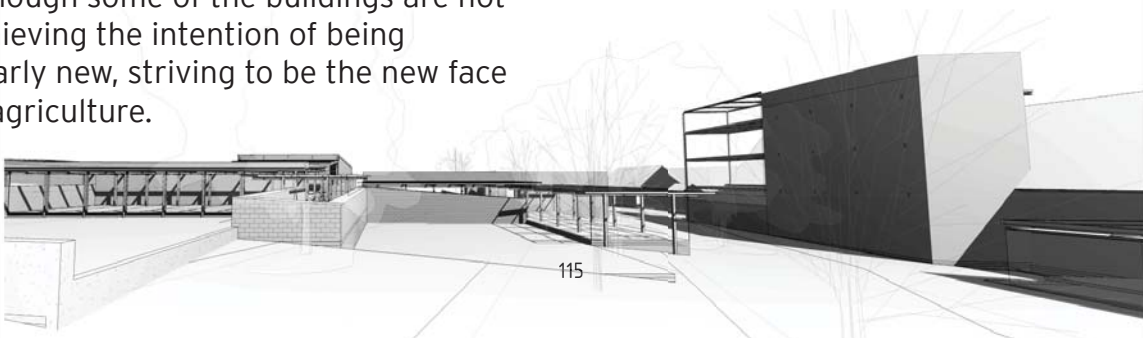
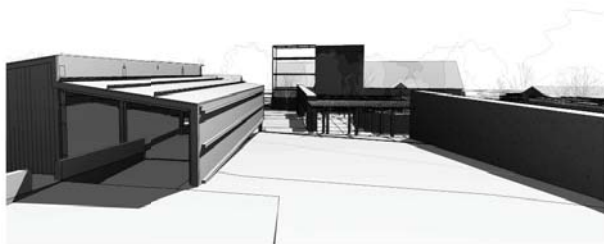
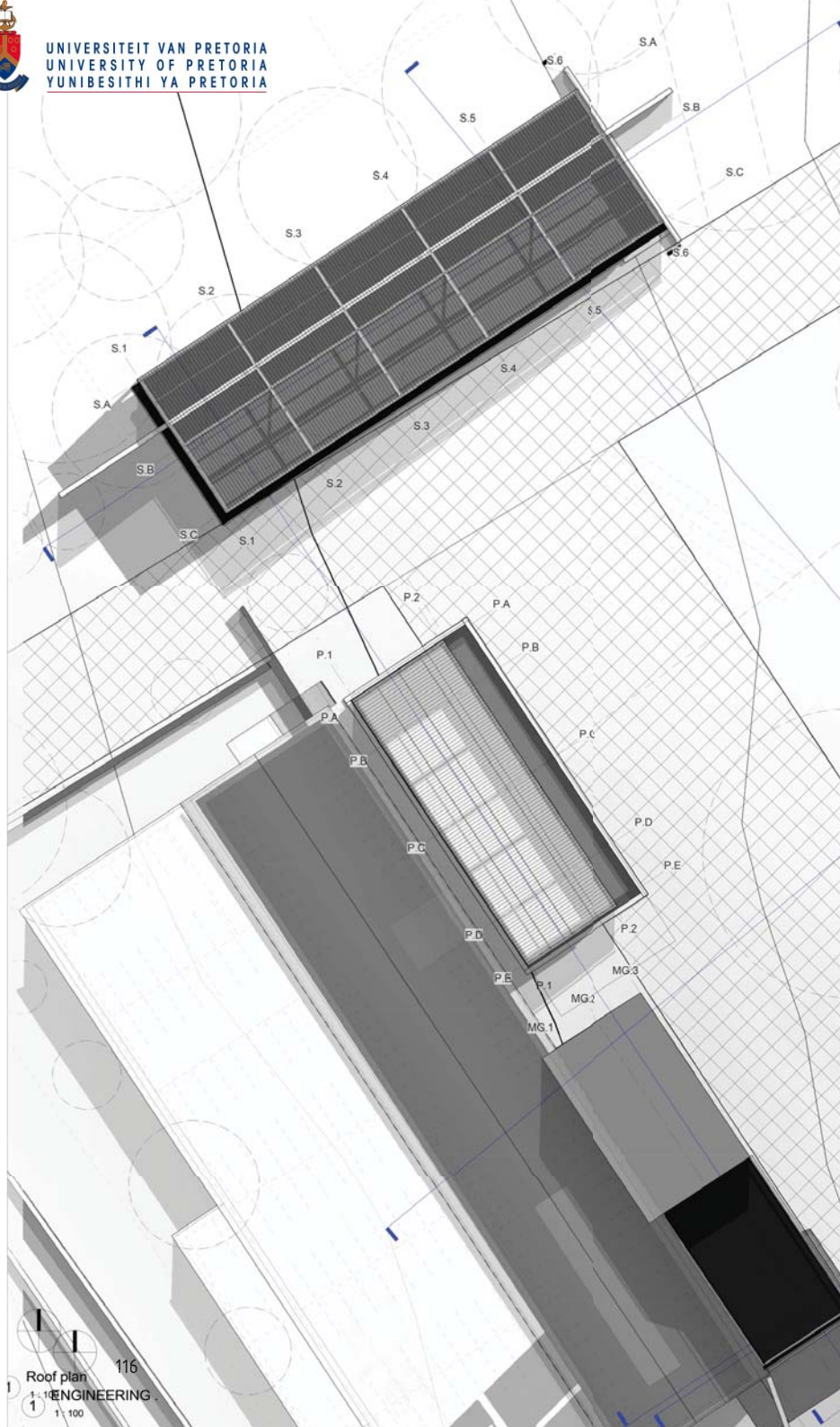
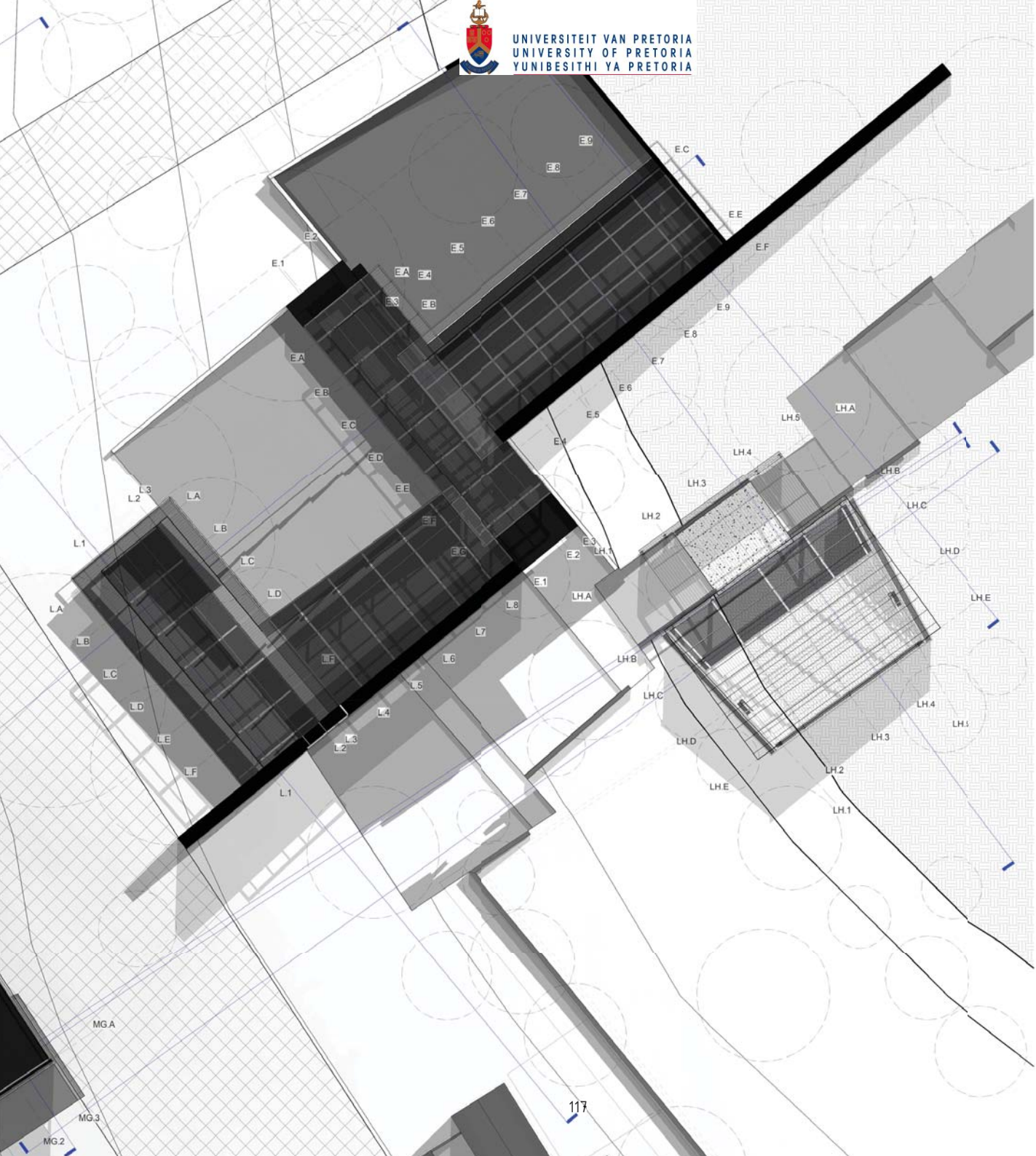


fig.6.33. SKETCH PLAN 5  
The final layout of sketch plan 5





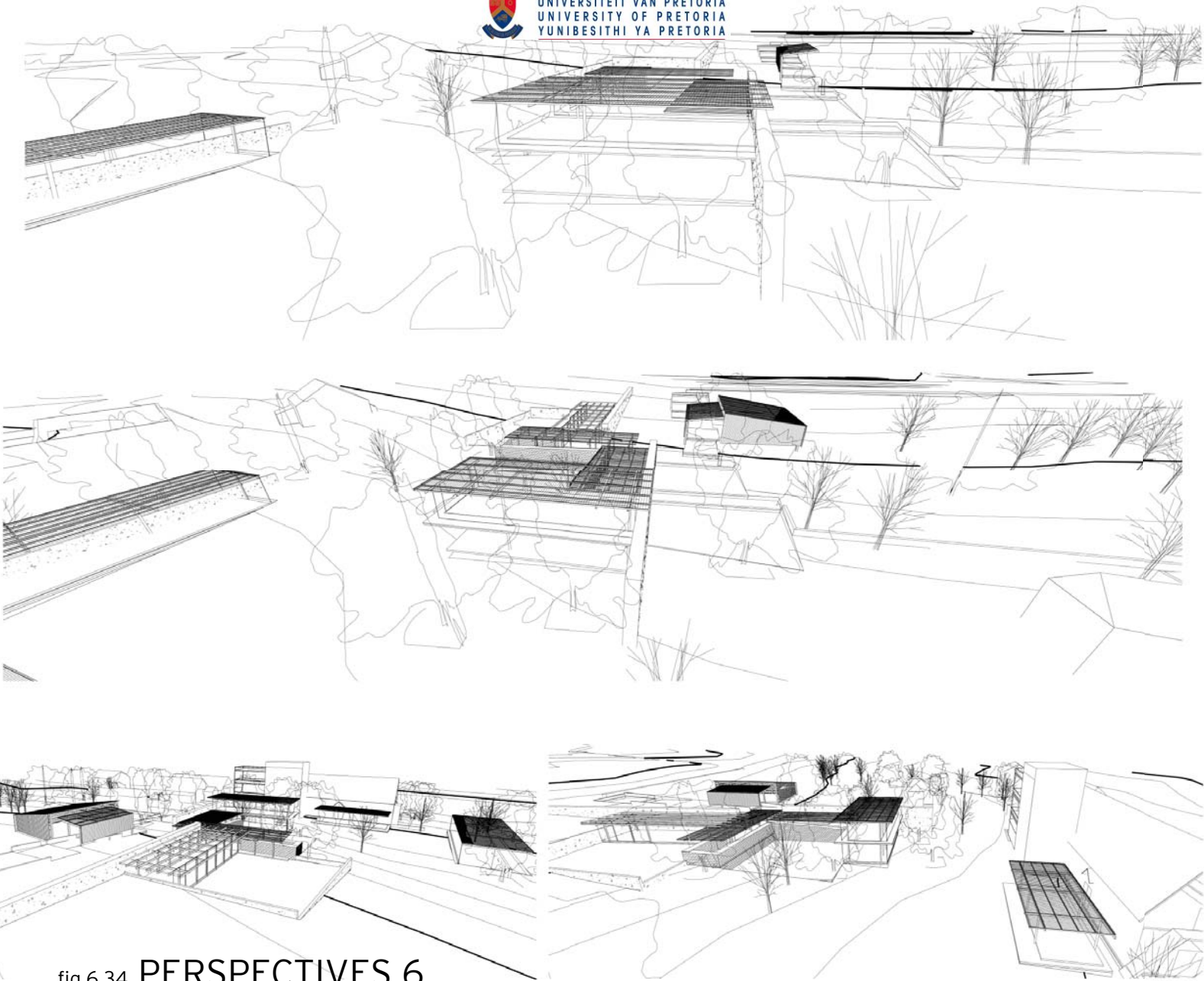


fig.6.34. **PERSPECTIVES 6**

These perspective drawings depicts the new architecture in the context of the focus area. The relationship of the new architecture to the existing buildings has a much more sympathetic character and start achieving the initial intentions for the agricultural education and training facility.

fig.6.35. PERSPECTIVES 7

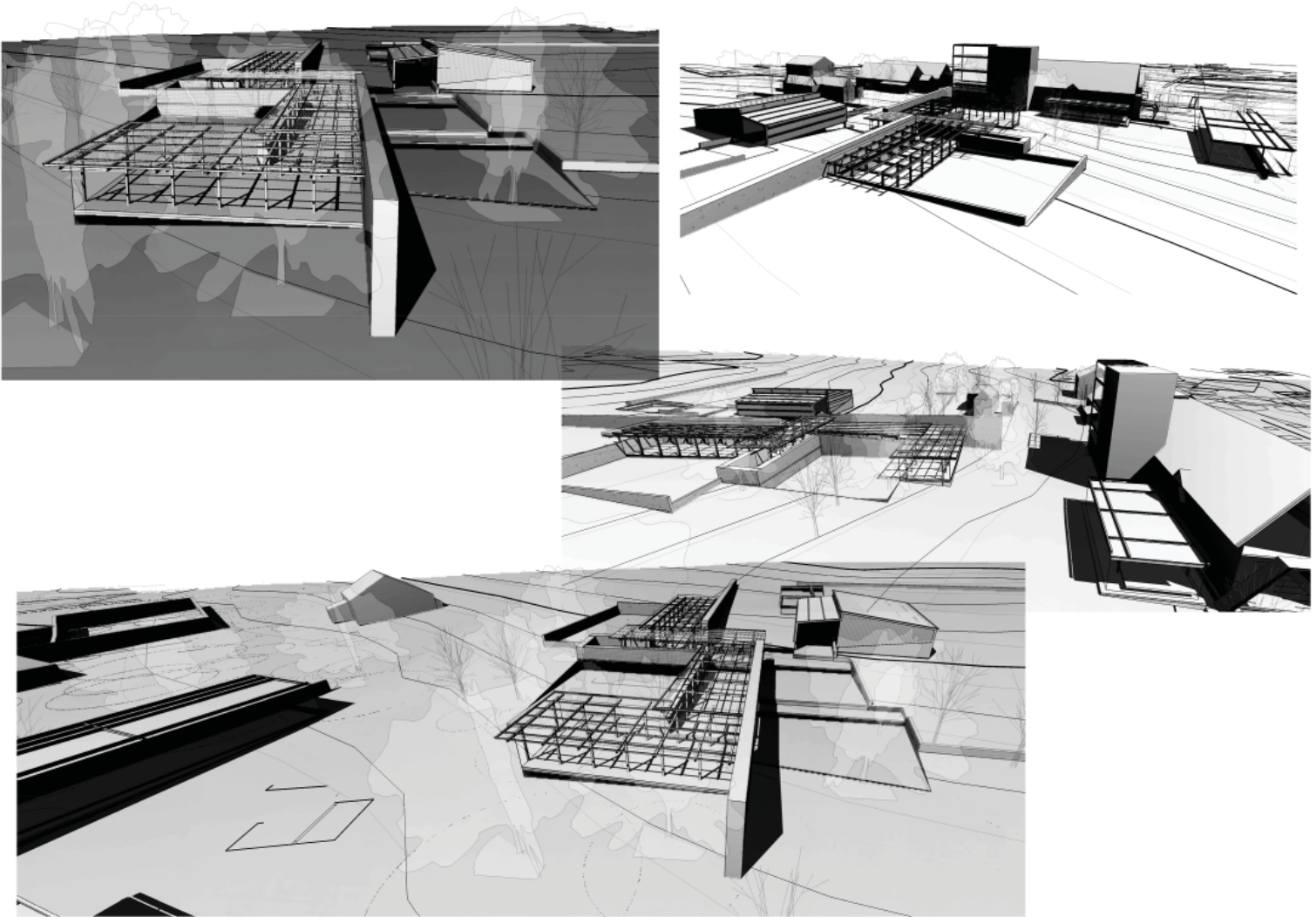


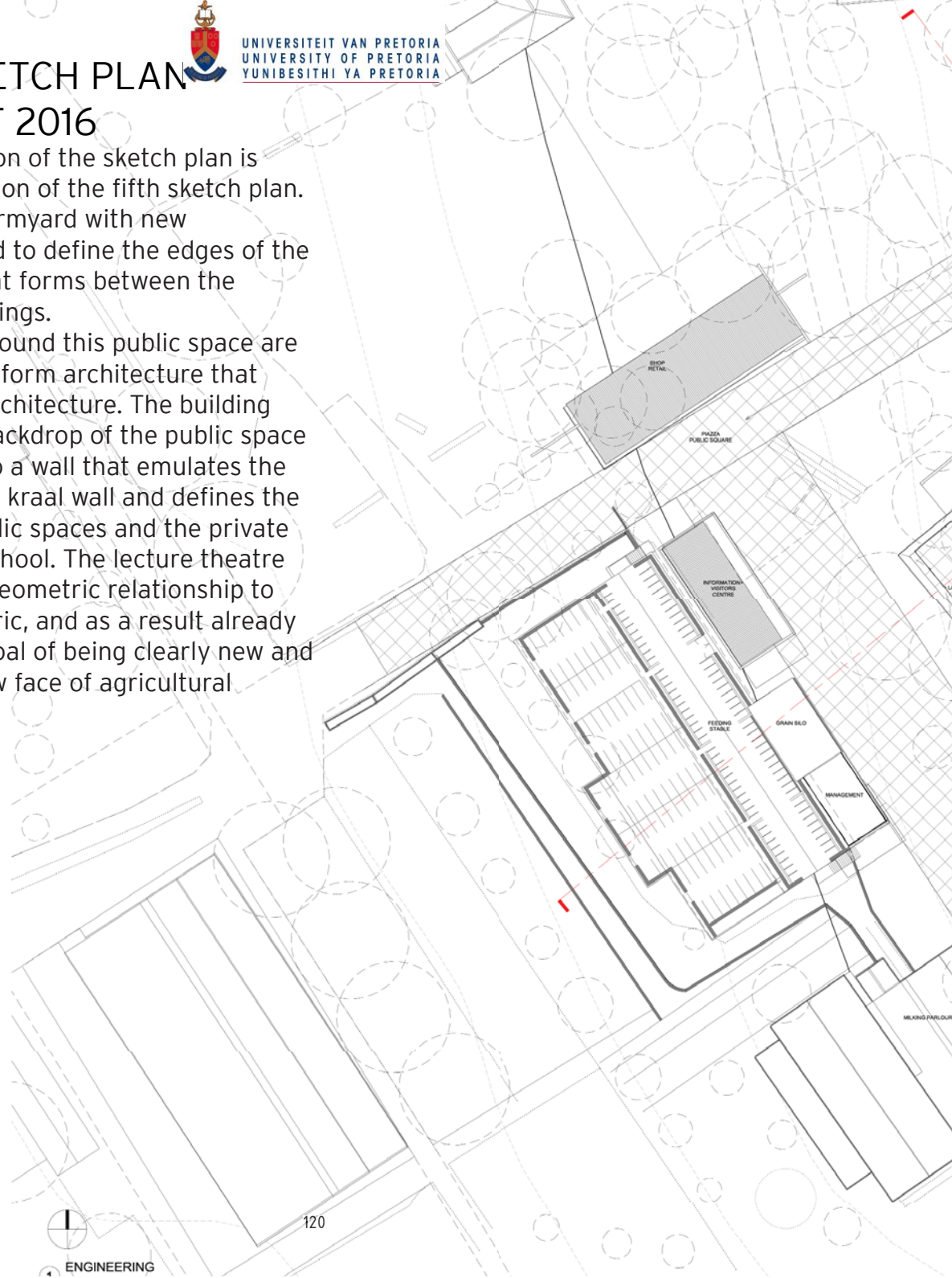
fig.6.36. FINAL SKETCH PLAN



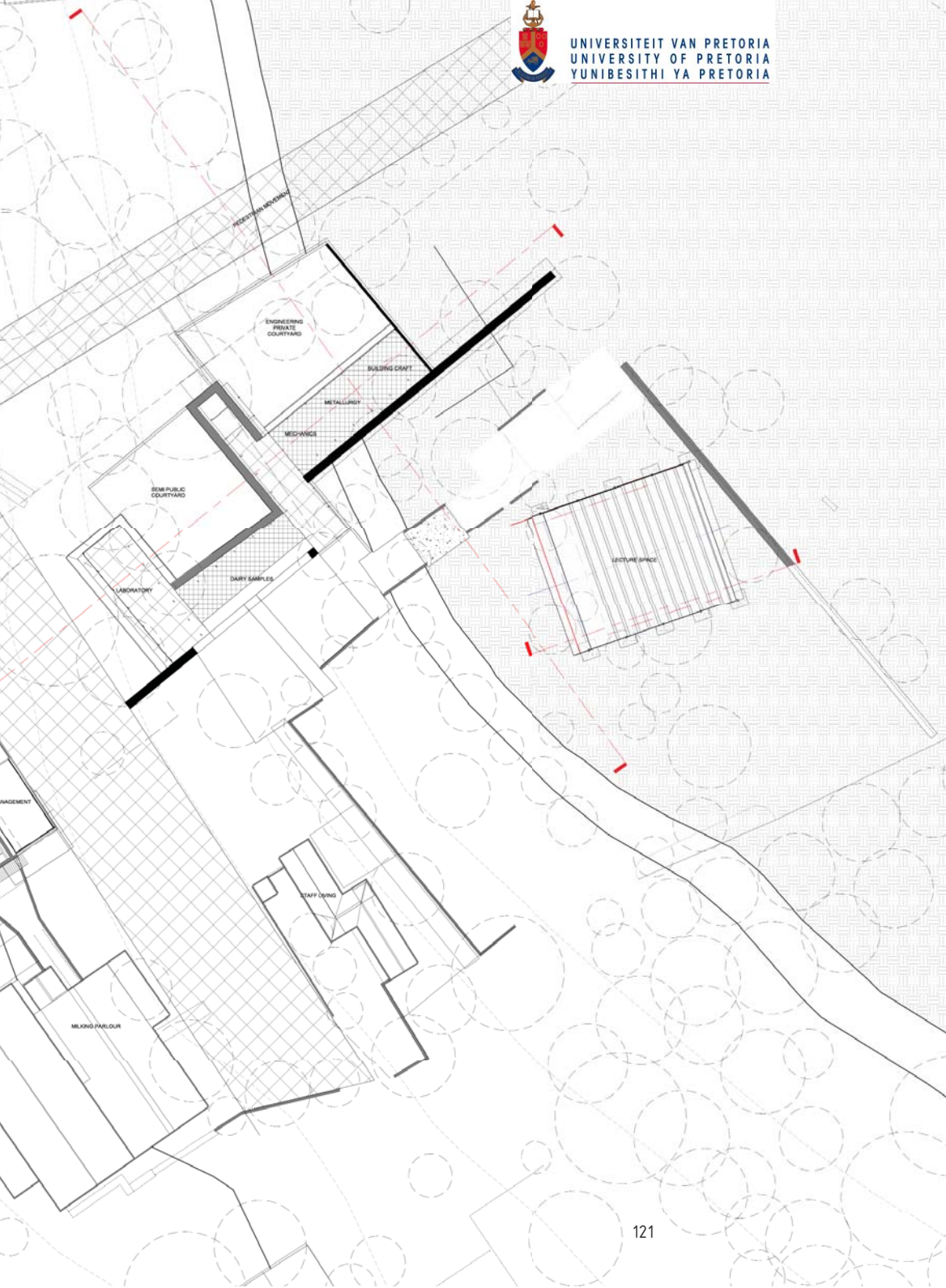
31 AUGUST 2016

The latest version of the sketch plan is simply an iteration of the fifth sketch plan. To define the farmyard with new architecture and to define the edges of the public space that forms between the significant buildings.

The pavilions around this public space are merely there to form architecture that relates to the architecture. The building that form the backdrop of the public space is placed next to a wall that emulates the remnants of the kraal wall and defines the edge of the public spaces and the private spaces of the school. The lecture theatre changed in its geometric relationship to the existing fabric, and as a result already achieving the goal of being clearly new and defining the new face of agricultural education.







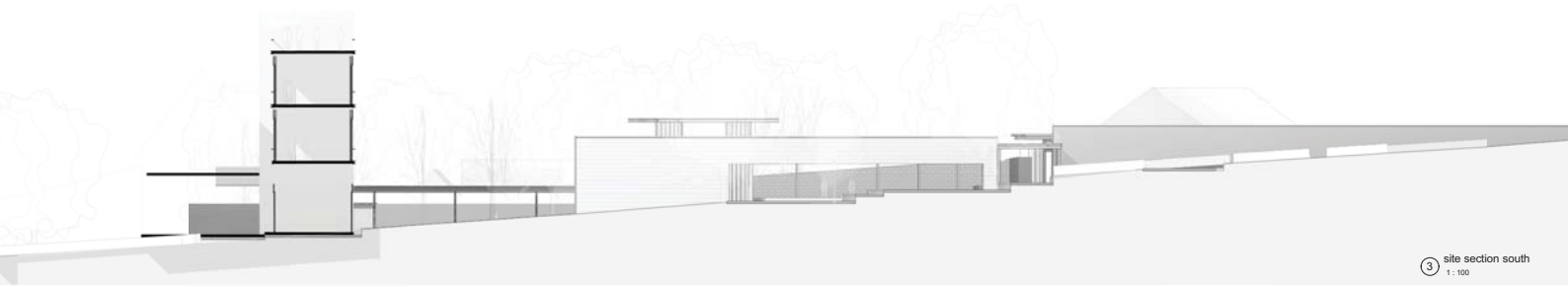
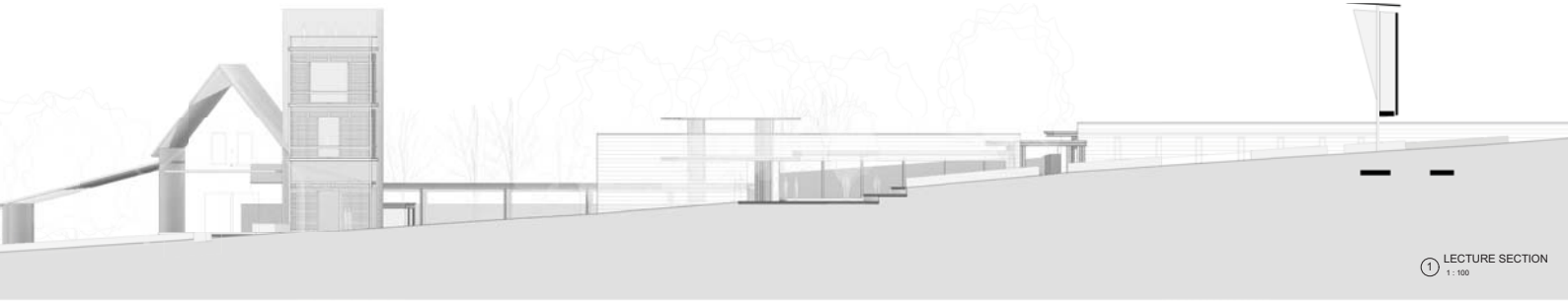
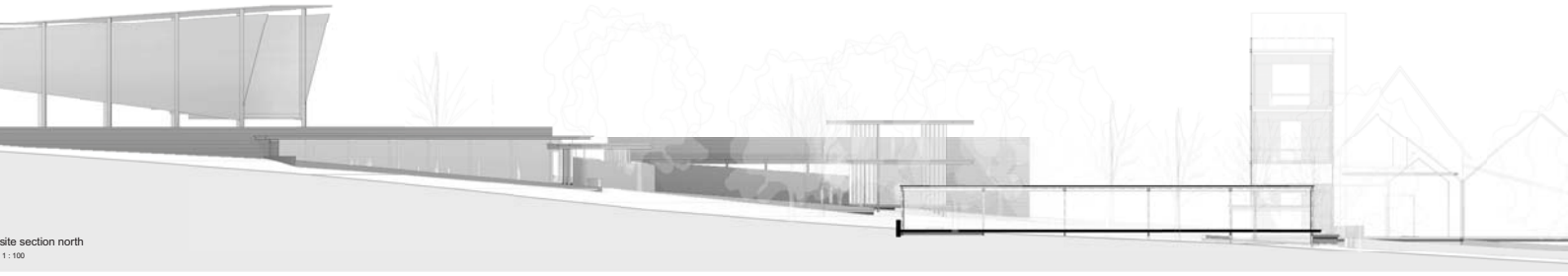


fig.6.37. LONGITUDINAL-SECTION 31 AUGUST 2016

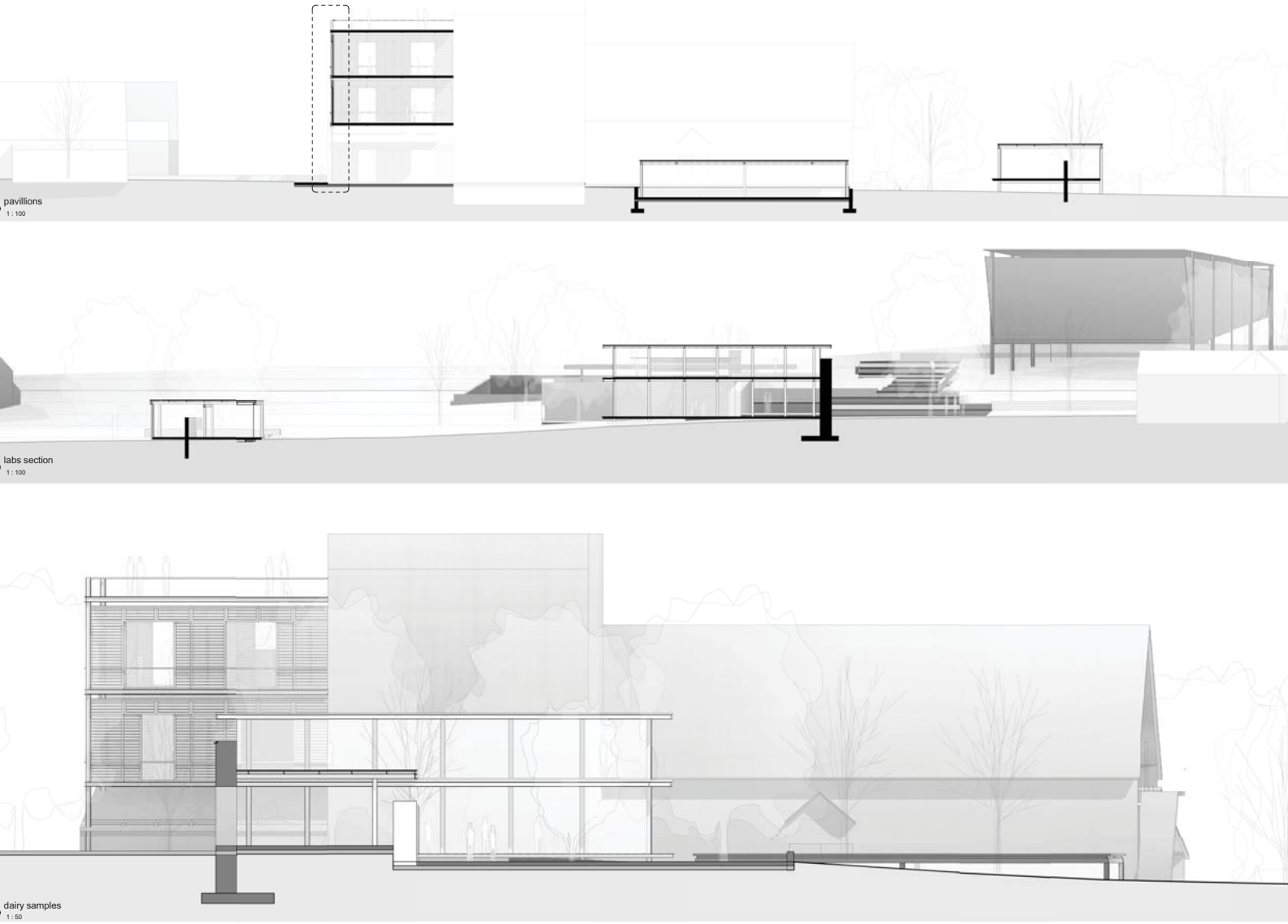


fig.6.38. CROSS-SECTION 31 AUGUST 2016

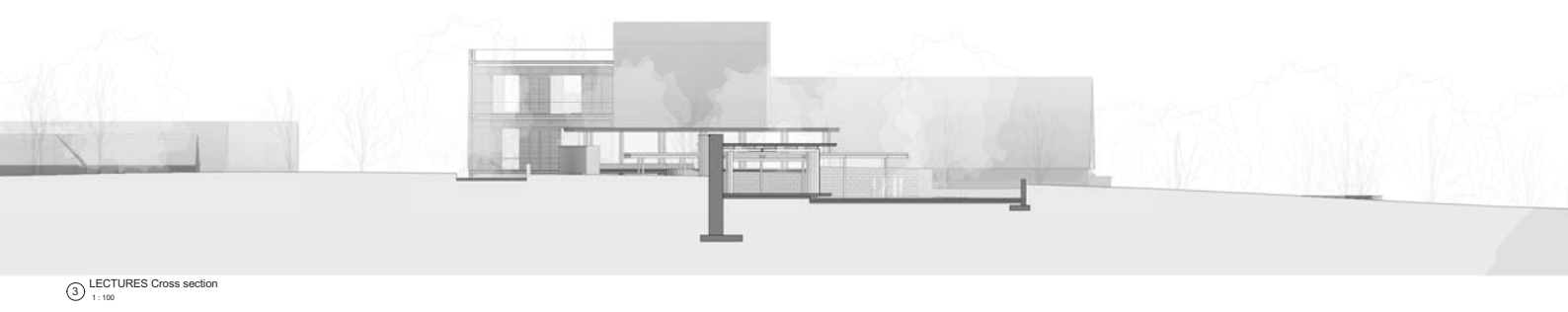
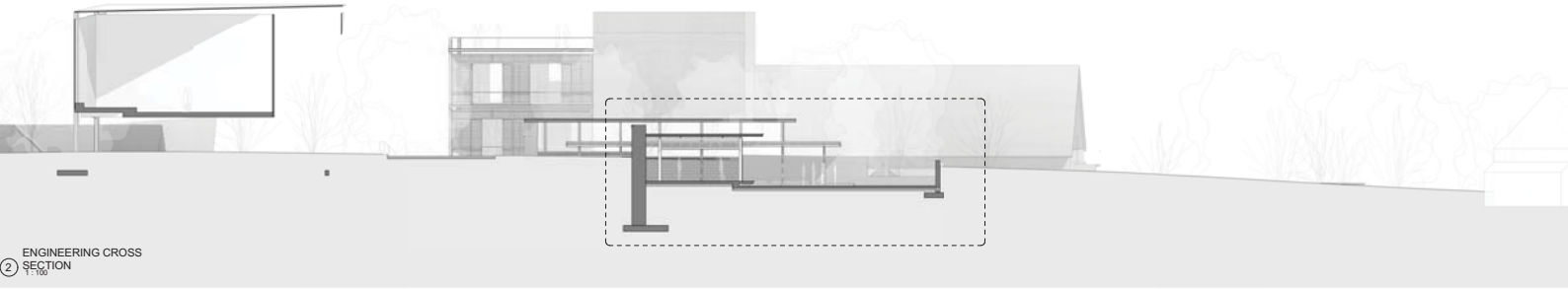
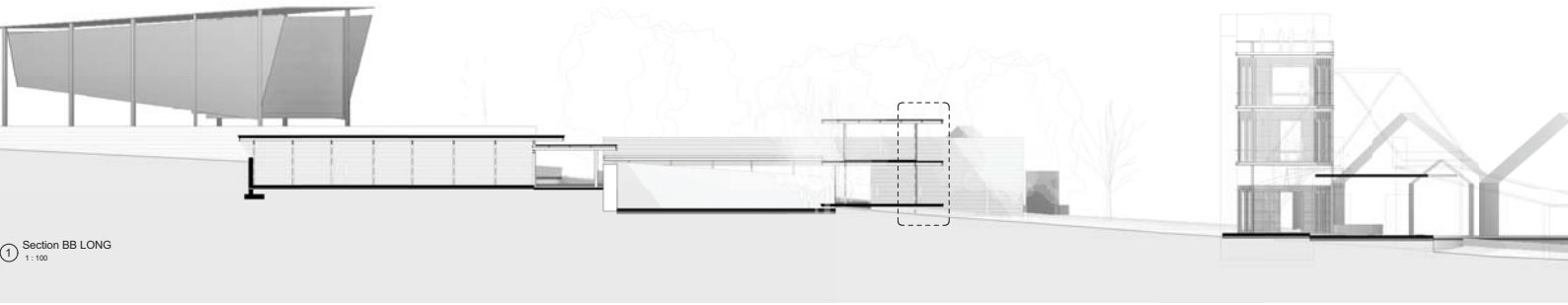


fig.6.39. SECTION: ENGINEERING DEPARTMENT 31 AUGUST 2016





07

# TECHNOLOGY

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The drawing has always played a central role in architecture. It is the graphic language that architects use to express an idea and, consequently, it is intimately linked to the history of architecture, having been its principal mode of translating ideas into reality. The drawing is the architect's essential means of expression and communication, the tool most often used to convey his or her intentions to clients, builders, and the general public. While, like any other means of representation, it has a limited ability to reflect the real world, it is the mechanism that allows for the best reading of the relationships between a project's formal, functional, and technical aspects.

Depending on the standpoint from which it is analysed, the architectural drawing has great importance as a document. It is considered a work of art in and of itself and, in this respect, each document can be analysed in terms of composition, colour, or intent. With regard to its creator, the drawing has enormous biographical interest, reflecting his or her ideas and architectural reasoning, and even his or her moods. Finally, the drawing is also of documentary interest vis-à-vis the architecture. (Bahamón, 2005:8)

This introduction to *Sketch-Plan-Build, World Class Architects Show How It's Done* is a suitable description of what we as architects do, how we communicate with our audience of the public. Through the process of iteration of the ideas and drawings for this design, the discovery of one's own intentions are interesting to note, how such ideas reveal themselves. How the tectonic intention is deeply imbedded in the early stages of the design without being intentional. The approach to any design project is deeply rooted in the technology that will be used in the final product. The process is not product-driven, rather technology-driven, and also by the systems that dictate the product and the form of the product.



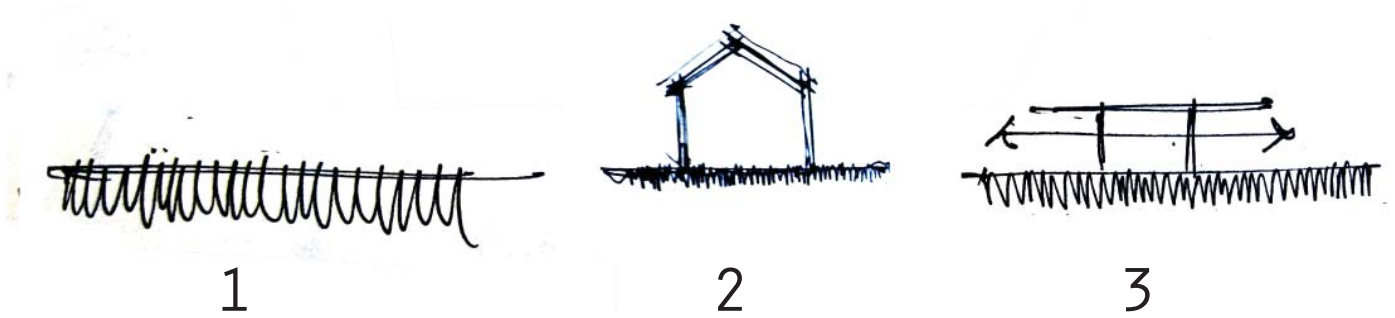


fig.7.1. DIAGRAM OF THE CONCEPT INTENTION FOR THE NEW AGRICULTURE ARCHITECTURE ON IRENE DAIRY FARM.

1. CONVENTIONAL AGRICULTURE: The norm is that agriculture takes place on the landscape that is available.
2. CONVENTIONAL AGRICULTURAL ARCHITECTURE: Portal frame structures are used to create maximum sheltered space with minimum structure. "Portal frames are very efficient in material use and are therefore competitive in price. However, they do have large labour content and need to be accurately made." (SAISC, 1994:12.1)
3. SIMPLE AGRICULTURAL ARCHITECTURE: To create continuous and unobstructed space for the learning process of agriculture within a sheltered space. This is the intention of the architectural vision on the site.



The issue in question is the fact that in southern Africa, agriculture is the sector from which most rural communities derive their livelihoods and financial income. It is also the source of food for both rural and suburban communities. "Most people in sub-saharan Africa live in rural areas, and most Africans work in agriculture (57.3 percent), according to data from the UNFood and Agriculture Organization (faostat)" (Dercon & Gollin 2014:2).

According to the Agricultural Household census (2011), undertaken by the Department of Agriculture, the majority of households involved in agriculture are managed by men and women between 45-54 years old, and consist of 10.8 of men and 10.5 percent of women (Statistics South Africa, 2013:3).

The smallest age bracket is between the ages of 15-29 years old and is made up of 5.7 percent of men and 3.9 percent of women. The research also indicates that there were in general more males (52.1 percent) than female (47.8 percent) agricultural household heads (Statistics South Africa, 2013:3). These numbers bear witness to the scale of the issue, which can be accounted to the fact that the youth in South Africa contribute to the stigma that agriculture is not a viable career choice in the twenty first century; rather that it is an activity that grandparents practice in the rural communities in southern Africa. The intention of this learning facility is to turn agriculture into an attractive career choice for the youth of our country, where they can contribute to the economic strength of the country and the sustenance of our society.

The location for this learning and didactic facility is the Irene Dairy Farm in the suburb of Centurion in Pretoria. The site is situated between the city fabric of Pretoria and the productive landscape around the city, specifically the Delmas agriculture landscape. This gives the opportunity to bridge this difference in the activities in the city and the suburban areas, specifically.



The greatest challenge that agriculturalists face is the means by which agriculturalists learn. “How farmers learn” is a topic of discussion all around the world, and this issue is also echoed in South Africa. According to Mutizwa Mukute in his paper “Improving Farmer Learning in and for Sustainable Agriculture in Southern Africa of 2010”, “approaches to, training and perceptions of sustainable agriculture in the region are currently rather negative, under-resourced and weak” (Mukute, 2010:2).

The intention of the technology that will be used on the site is that it should be as simple as possible so that the students can apply this technology in the future after graduating from the institute [Refer to page 047, *Pole Pass Retreat* by Olson Kundig]. Blurring the thresholds between the internal and external spaces, with flexible facades and sliding doors will achieve this. The architecture will form the edges and the boundaries of the public spaces and the farmyard and schoolyard. These boundaries will be articulated by water channels and yard walls to define the public and private spaces on the site, and will determine the public movement on the site in general. This relates to the practice of conventional agriculture that takes part on the landscape that is available for agricultural activities.

The basic principles of uniformity for profile sizes of steel members for columns and beam structures will form the basis of the simple construction approach that will be employed. To keep the construction as simple as possible determines that the members should be easily handled and easily constructed.

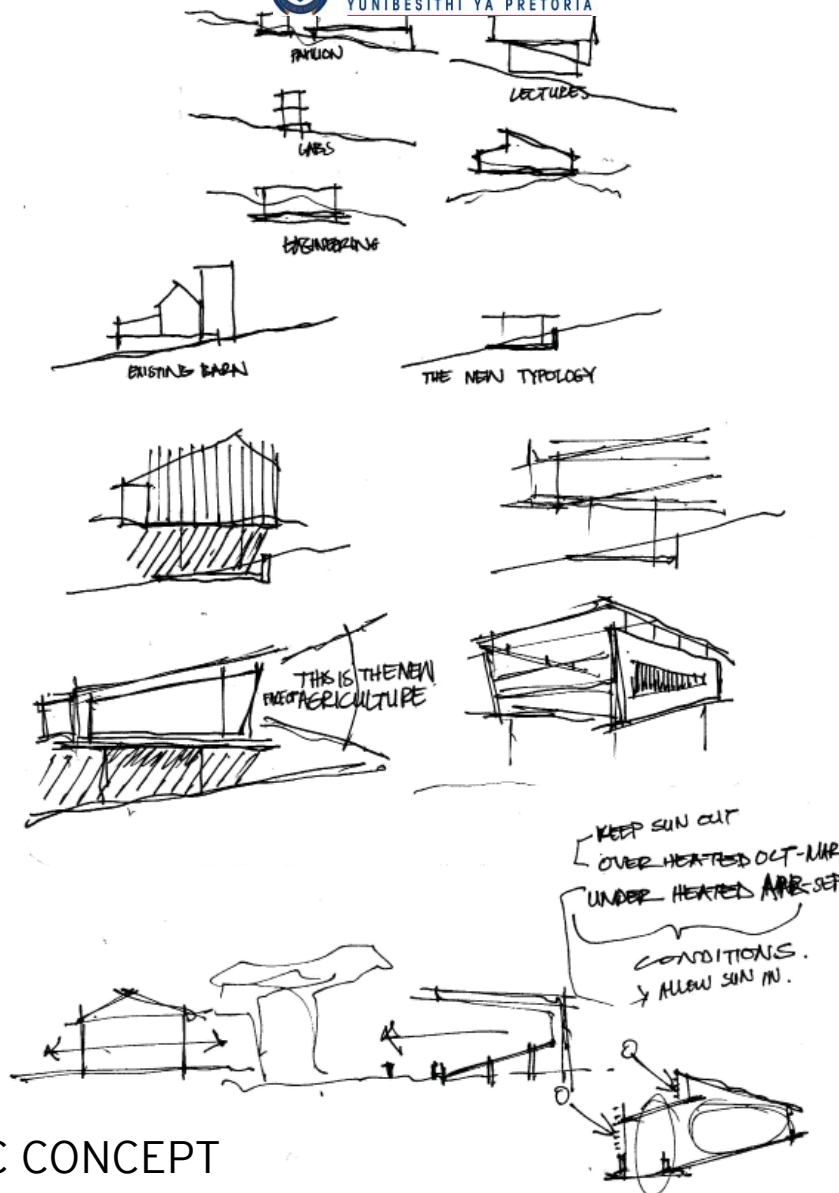


fig.7.2. TECTONIC CONCEPT

### EXISTING TYPOLOGY VERSUS NEW TYPOLOGY

The existing typology has a strong stereotomic base from where the light tectonic elements are placed on this heavy base. The intention of the new typology is to simply extend the horizontal surface with the stereotomic elements and then place the light weight tectonic elements on top of the extension of the landscape.

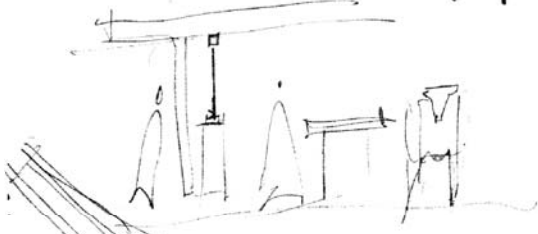
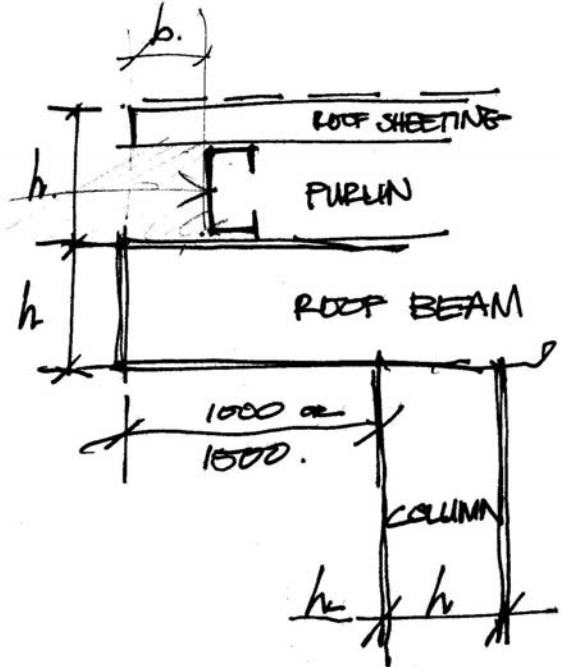
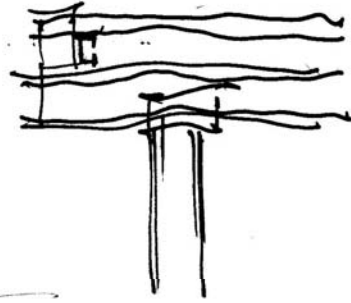
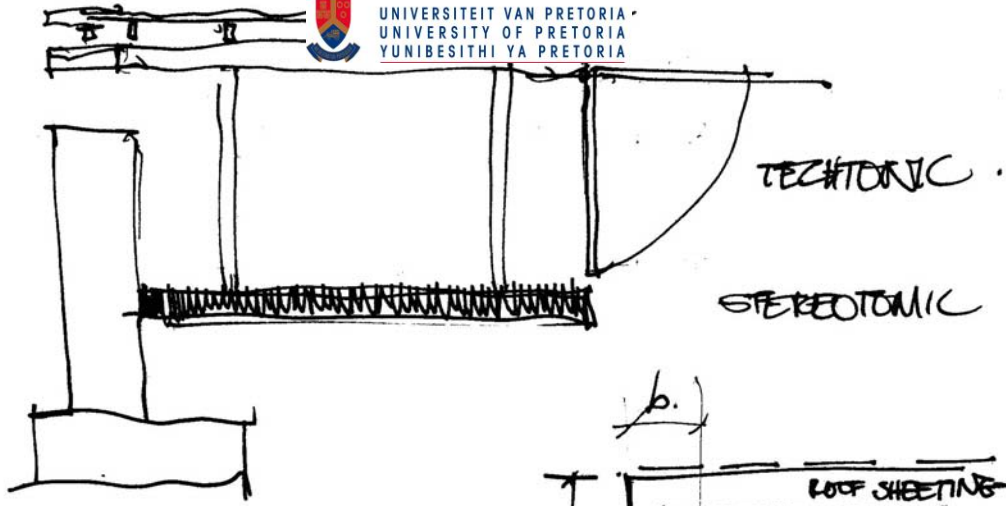


fig.7.3. APPROACH OF THE TECHNOLOGY

STEREOTOMIC

Elements as an extension of the landscape

TECTONIC

Elements gives verticality to the architecture.  
Human spaces and cow spaces have a close relationship with one another,  
blurring the thresholds between  
man and nature.

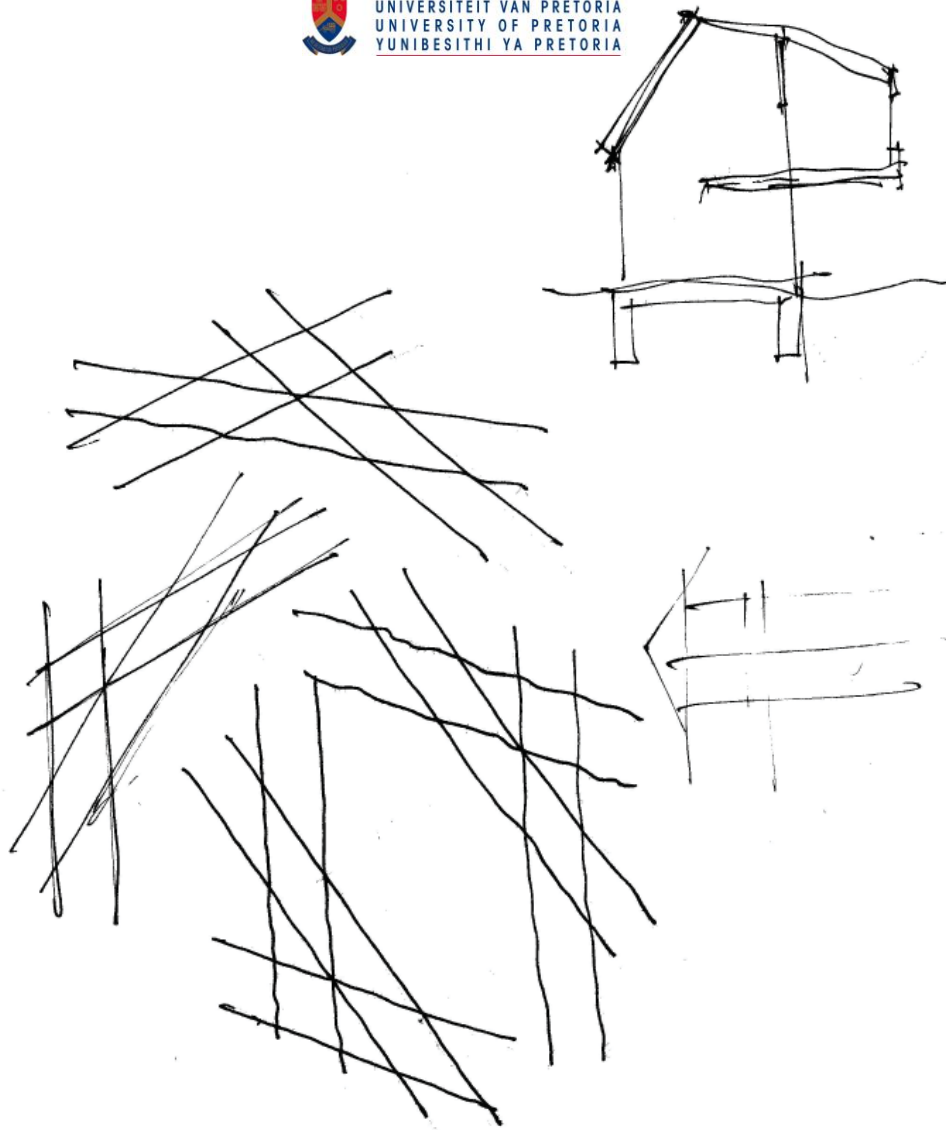


fig.7.4. **TECTONIC INTENTION: LIGHTWEIGHT ENVELOPE**

The initial intention for the technology that will form the architecture on the site is informed by the composition and the geometry of the haunch support between an I-profile column and beam. Juxtaposing the distilled geometry of these elements creates an applicable composition for a plan and section application for the new architecture on the site.

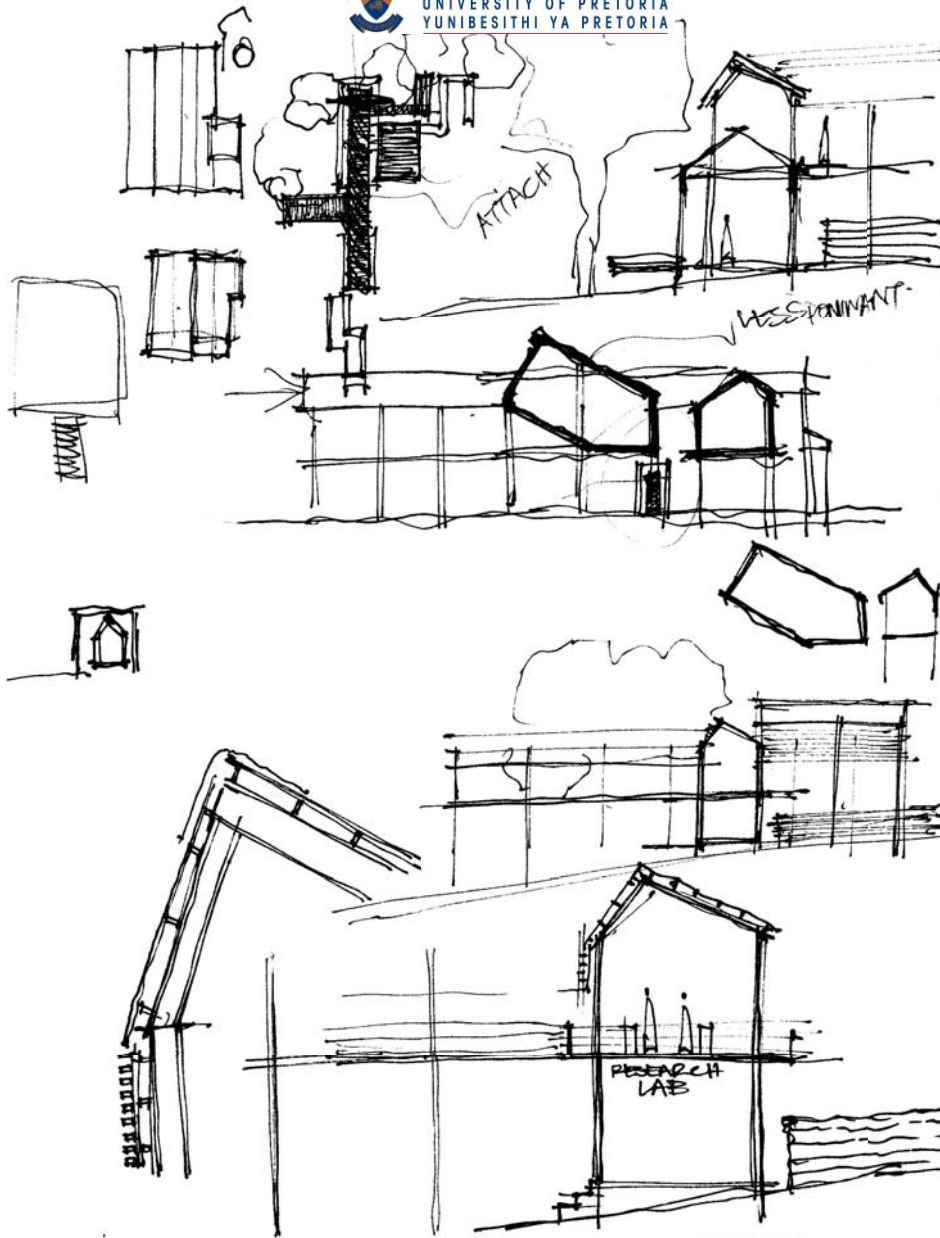


fig.7.5. **THE NEW TYPOLOGY**

This image depicts some of the initial ideas for the envelope of the new structures, being as light as possible and is informed by the existing practice on the site, where the infill is done in a tectonic fashion while the stereotomic elements extend the horizontal landscape of the terrain.

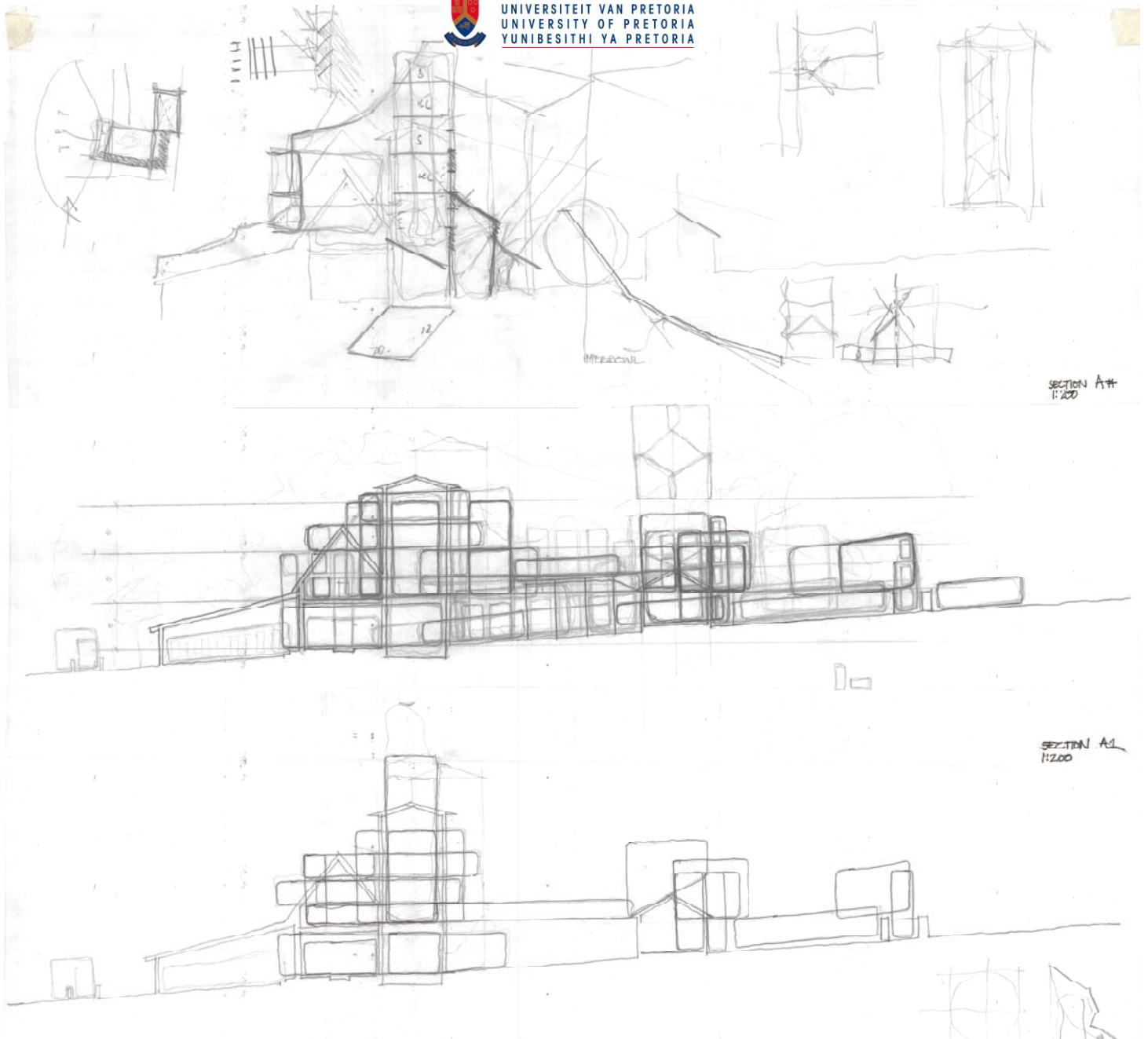


fig.7.6. **MAIN STABLE FORMS**

The Main Stable was reduced to the essence of its form and the composition of these forms. These forms became the kit-of-parts for the shape of the new typology.



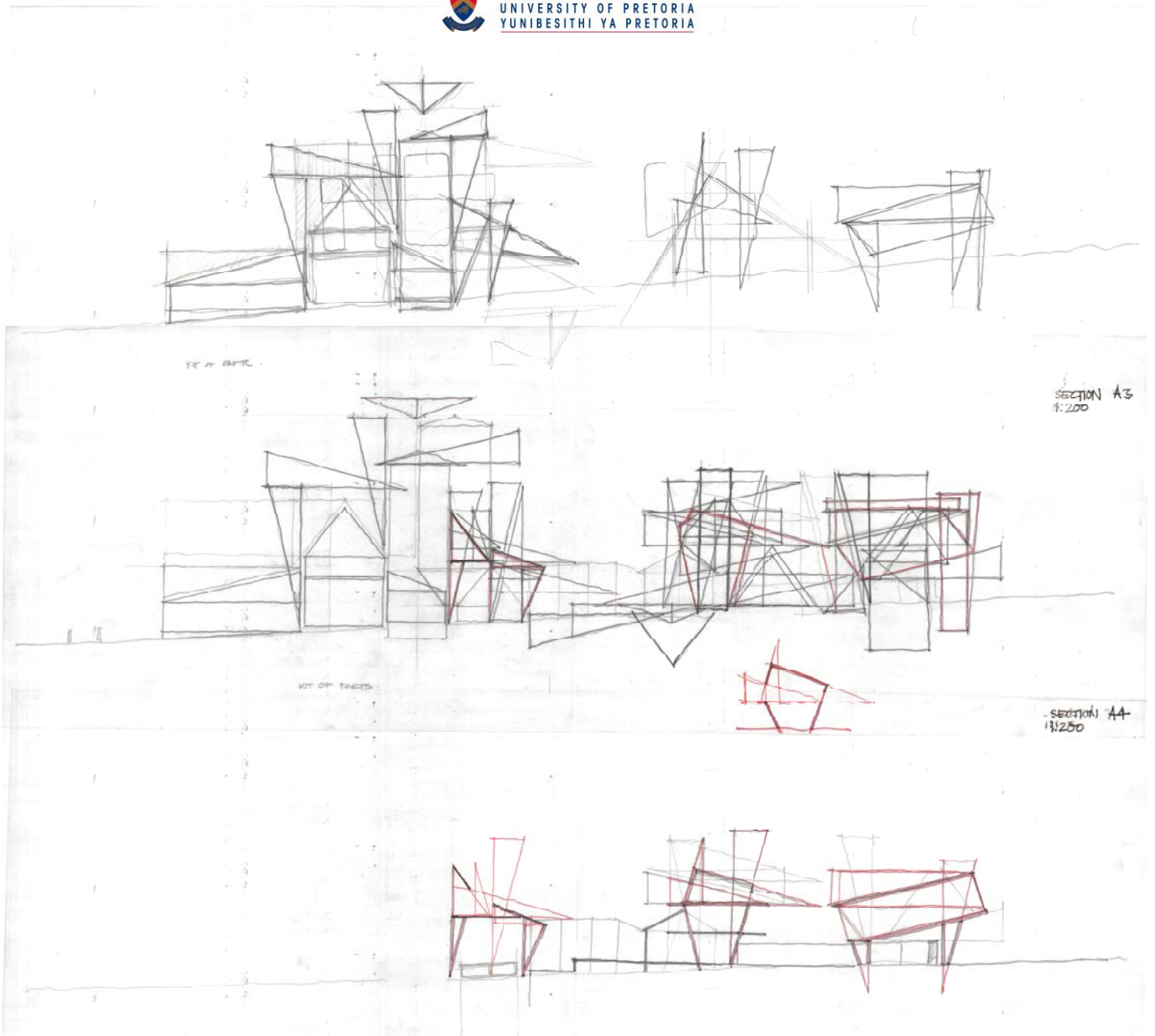


fig.7.7. **KIT OF PARTS**

By manipulating this kit of parts that make up the form of the Main Stable the new typology grew and revealed various options for the intervention.

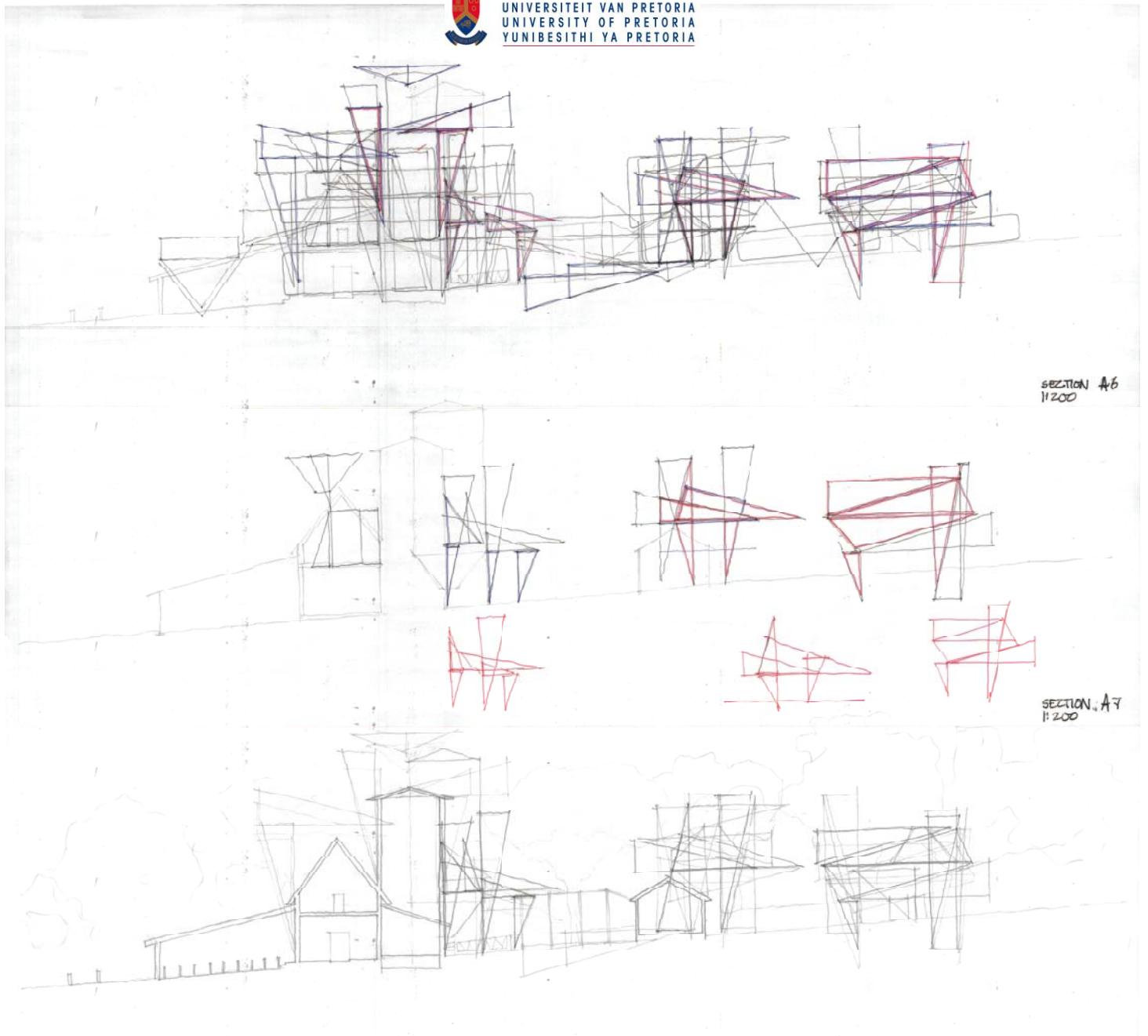


fig.7.8. **DEVELOPMENT OF THE NEW TYPOLOGY**  
The various options for the new typology became clearly distinguishable as contemporary and not simply a re-interpretation of the existing historic fabric.

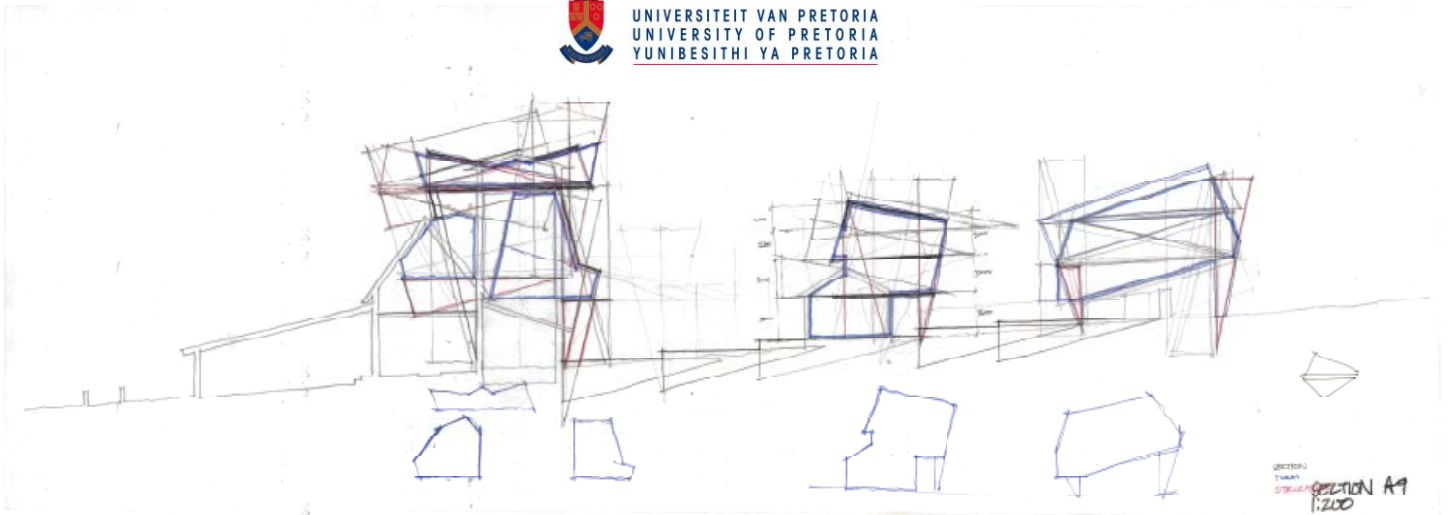


fig.7.9. SECTION OF THE NEW TYPOLOGY

This section depicts the form of the new architecture on the Irene Dairy Farm.

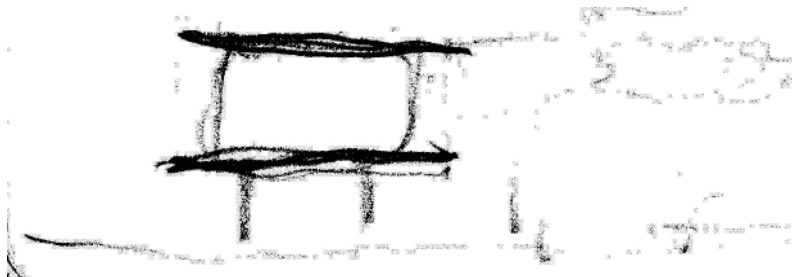
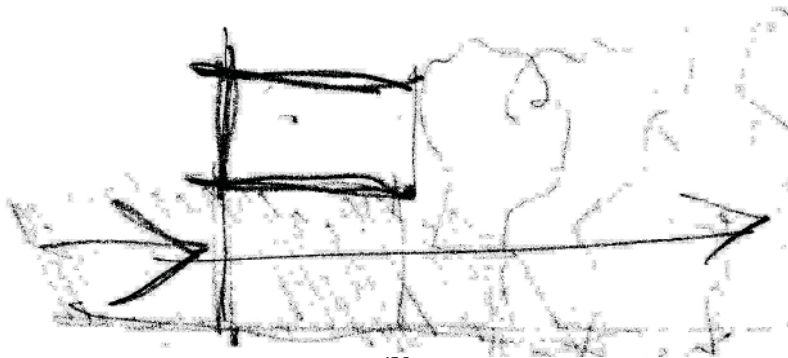


fig.7.10. EXTENSION OF THE LANDSCAPE

By extending the landscape on which agriculture takes place. The architecture will be inserted in such a manner that it does not obstruct the activities related to agriculture.



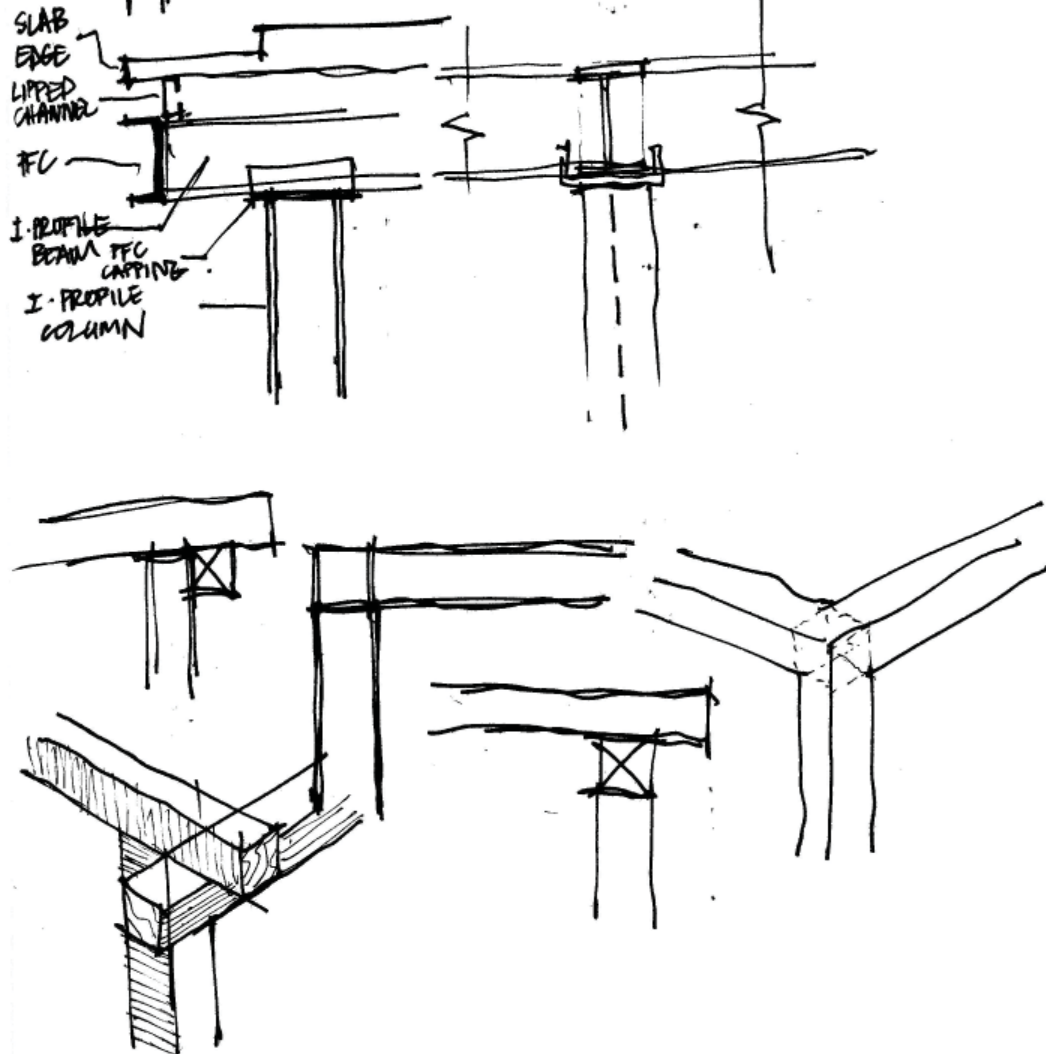


fig.7.11. STRUCTURAL INTENTION: UNIFORMITY.  
Standardised connections and details.

# STRUCTURAL STEELWORK AS A CHOICE FOR TECTONIC APPLICATION

The choice for the tectonic elements suggested in the design of this dissertation is that of structural steelwork. According to the Southern African Structural Steelwork Detailing Manual “The term structural steel is used to describe the steel members whose function it is to support the loads or resist the forces that act on a structure.” (SAISC, 1994:2.1)

The fact that structural steelwork is described as a versatile material makes it an logical choice as material for the new architecture on site. This relates to the attitude that has been practiced on the Irene Dairy Farm, where all additions on the site has been done with structural steelwork, for its easy application and the relatively lightweight of the material.

Historically this varied slightly with the addition of a heavy stereotomic plinth, usually done with rock that was sourced on site, with light structures fulfilling the tectonic requirements, done with timber members, also sourced from the site. Although this was in a time when the farm produced lumber in large quantities and with no environmental consciousness towards the sustainability of timber as a building material in the region. Replacing the timber used as a tectonic elements with steel will give the new typology its unique aesthetic which will be protected with sustainable timber cladding material, or with light steel mesh.

The last aspect of the steelwork as material and structural choice is the “desirability of using standardised steelwork connections and details.” (SAISC, 1994:ix). This in turn ties in with the tectonic concept to keep uniformity in the structural system which reduces the construction period of the new buildings and keeping the construction as simple as possible to relate to the practical learning experience of the intended programme. The students of the learning facility should be able to apply this new knowledge of technology in the future in their own farming endeavours.

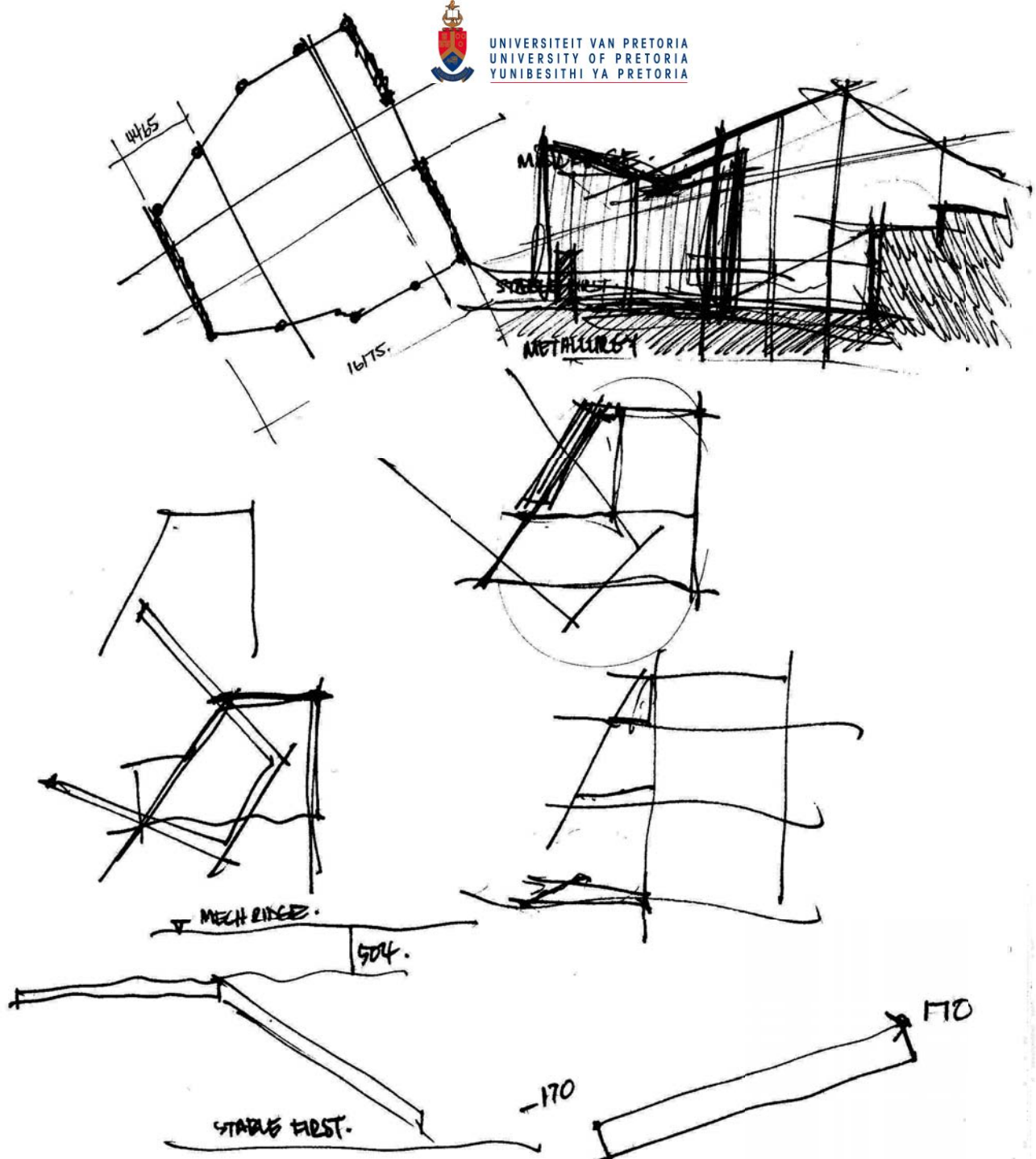


fig.7.12. INITIAL FORM OF LECTURE SPACE



DIAGRAMS OF  
LECTURE HALL.

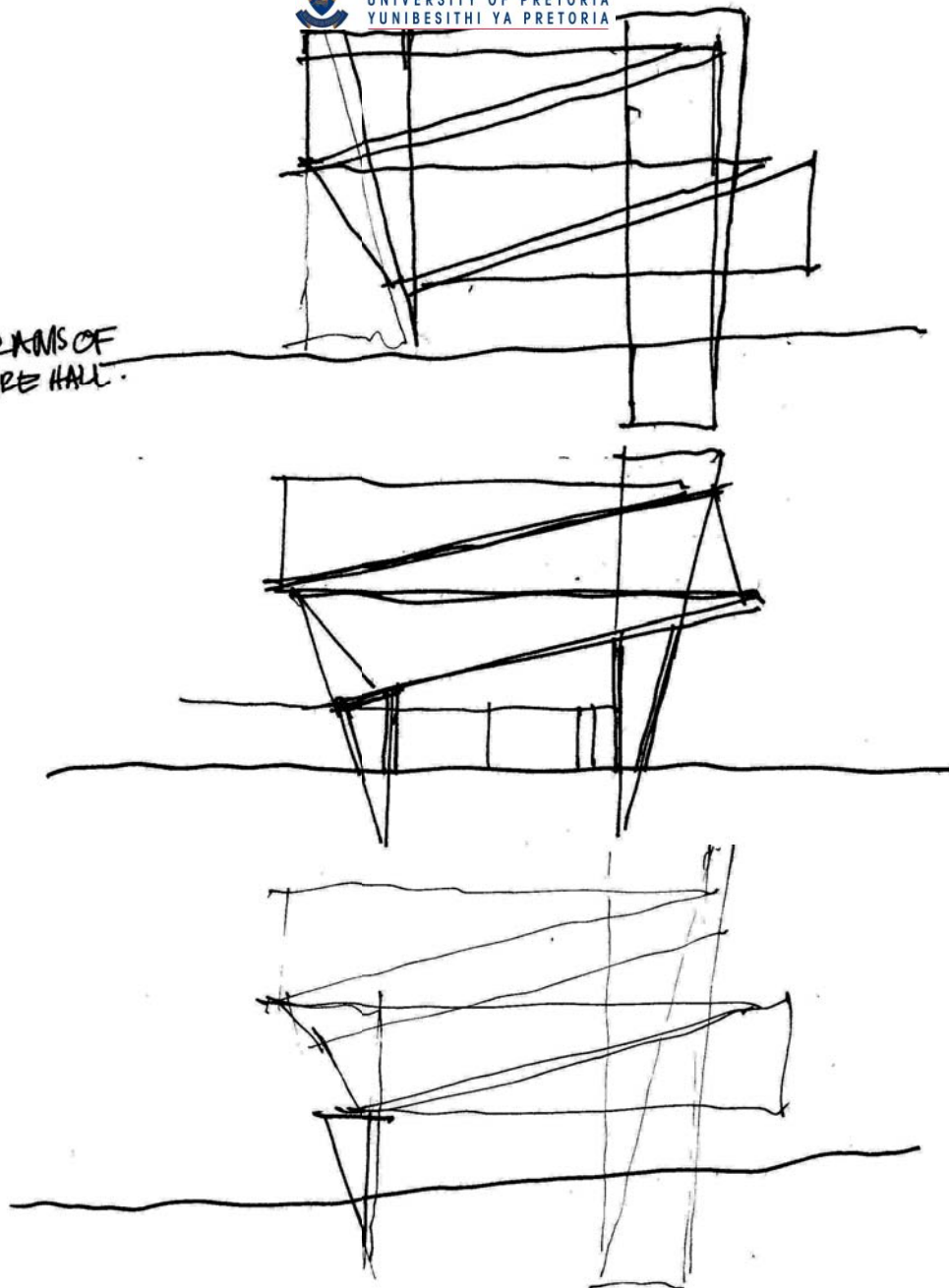


fig.7.13. DEVELOPMENT OF THE LECTURE SPACE.  
Creating a clearly new language on site



6 ROWS OF 22 SEATS.

22 SEATS/ROW.  
4 ROWS IN EACH BLOCK.  
→ 88 SEATS PER BLOCK  
3 BLOCKS = 264 SEATS.

DIAGRAMS OF FUNCTIONAL REQUIREMENTS

↳  $\frac{264m^2}{min. SEATING}$

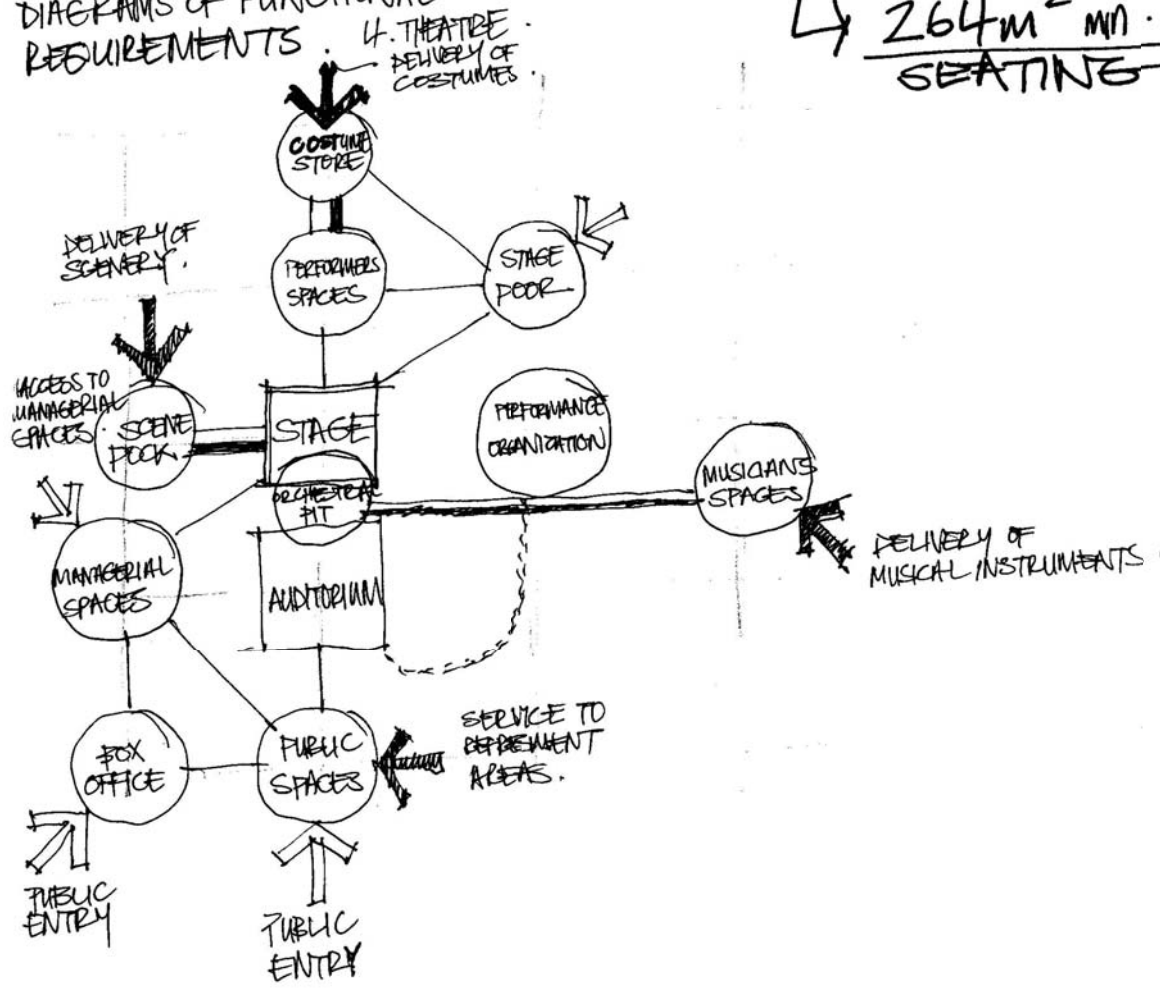


fig.7.14. DIAGRAMMATIC LAYOUT OF AUDITORIUM SPACES from the Metric Handbook (Adler, 1999:20,13).



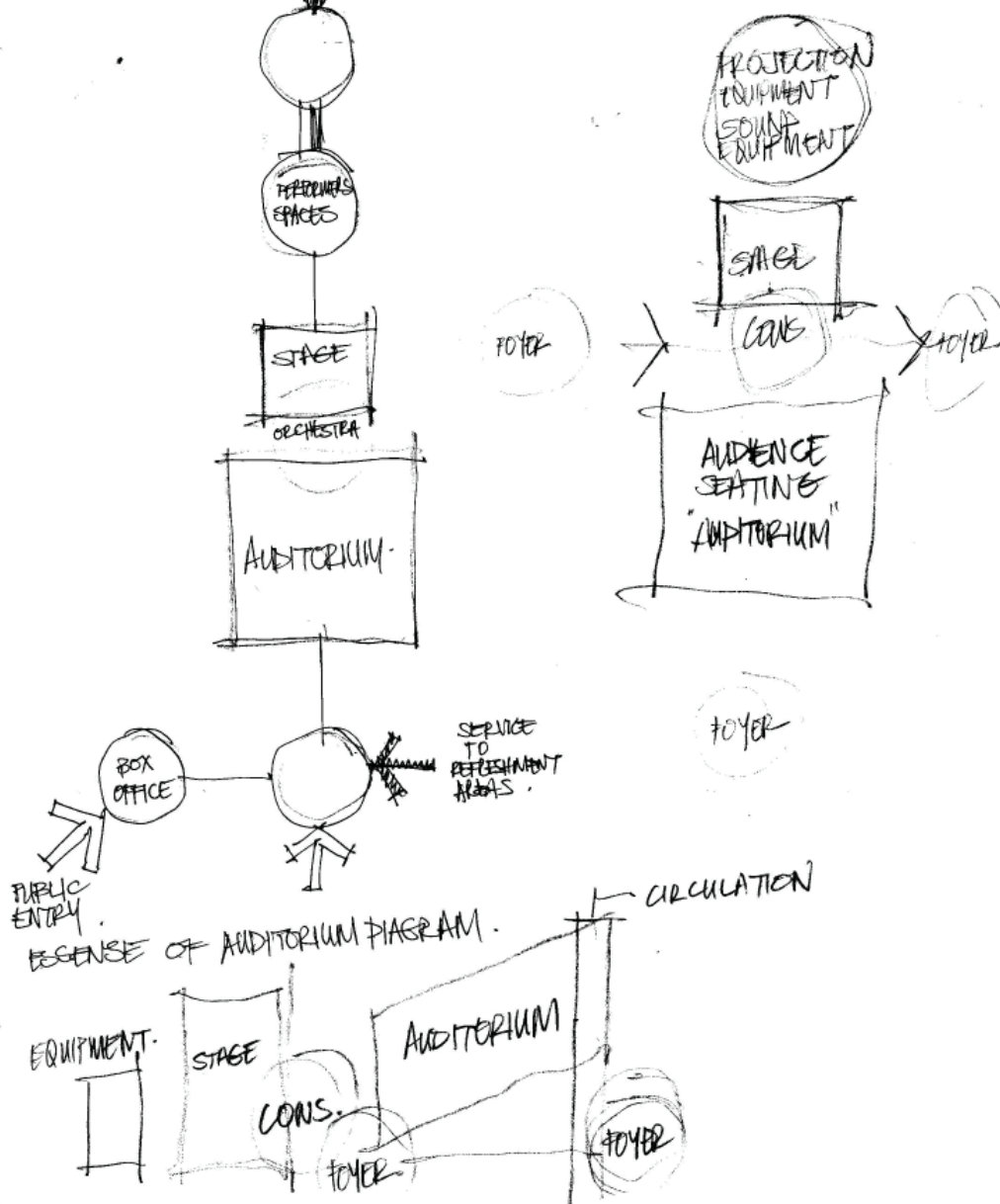


fig.7.15. REDUCING THE DIAGRAMMATIC LAYOUT OF AUDITORIUM SPACE from the Metric Handbook (Adler, 1999:20,13).

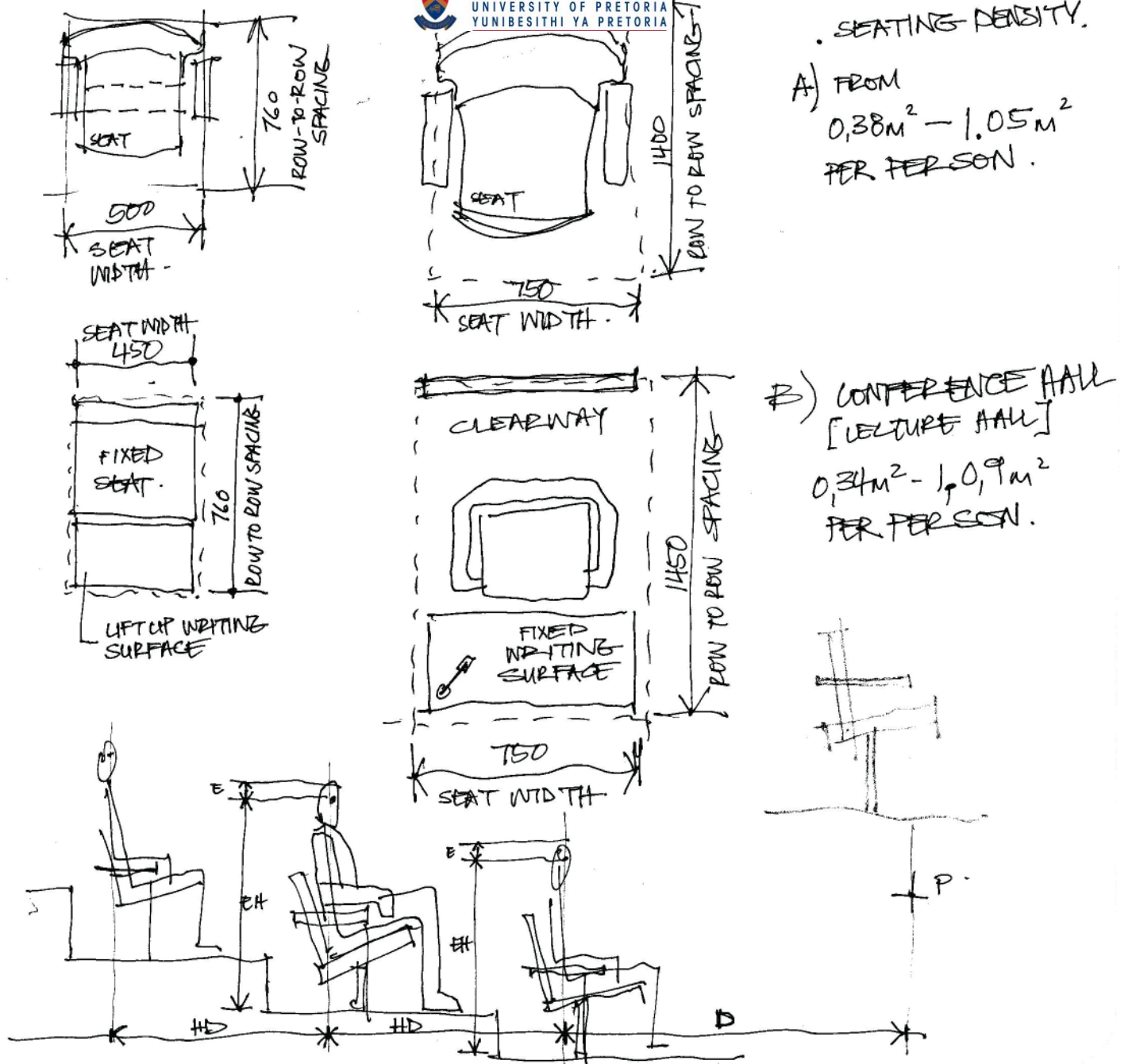


fig.7.16. SEATING DENSITIES AND GRAPHIC OF VERTICAL SIGHT LINES from the Metric Handbook (Adler, 1999:20,7).

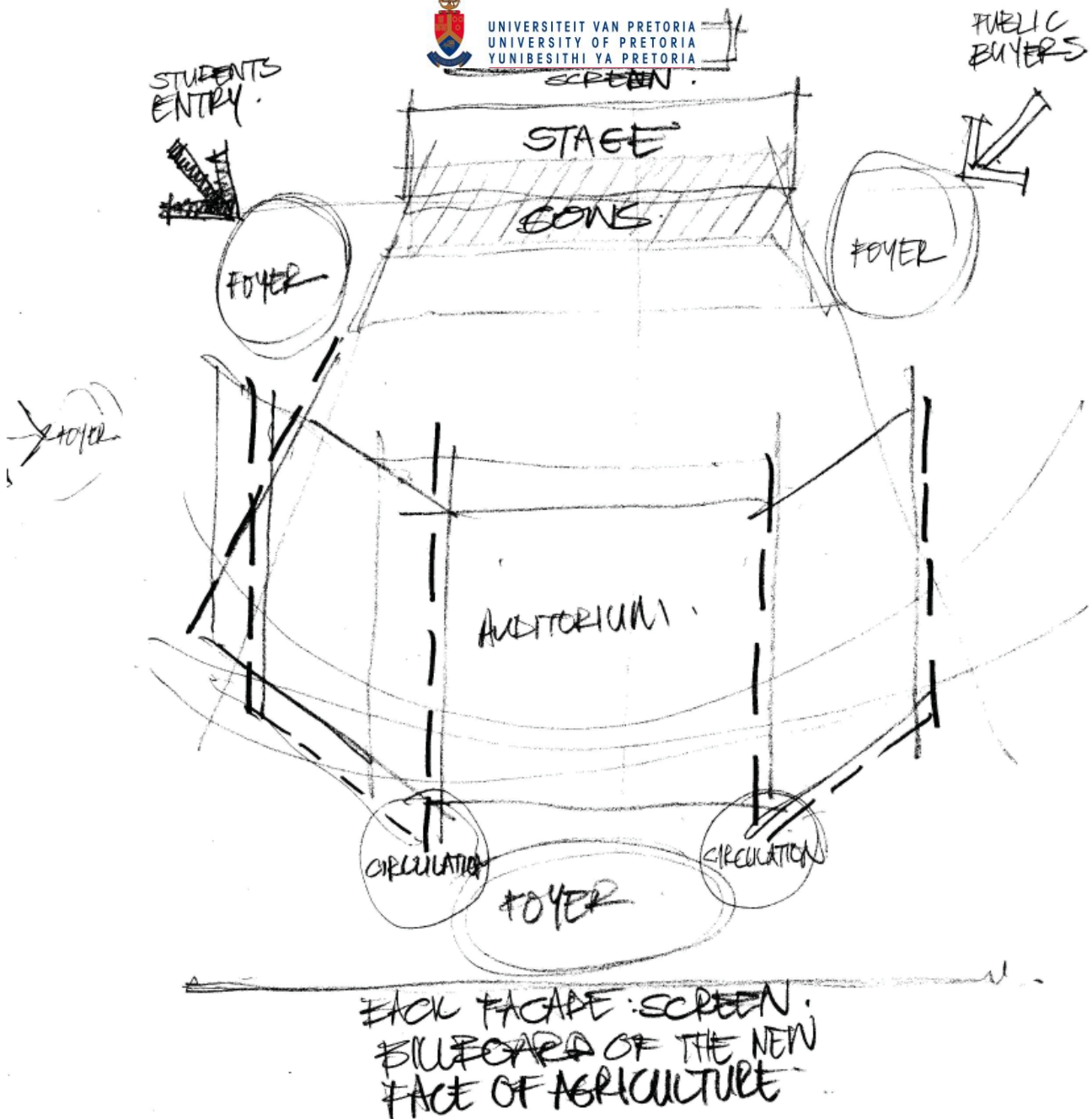
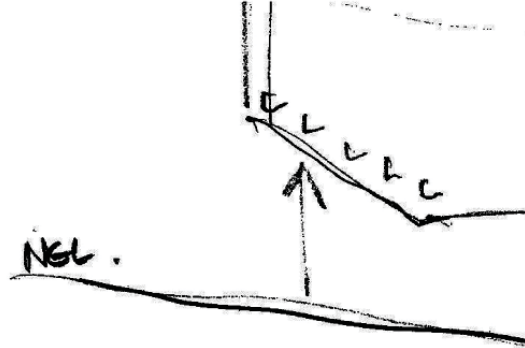


fig.7.17. APPLYING SPATIAL REQUIREMENTS OF AN AUDITORIUM ON THE IRENE DAIRY FARM.

This was determined by the functional requirements of the learning facility.



IF VECTURE  
PAVED AF  
→ MIN. OF

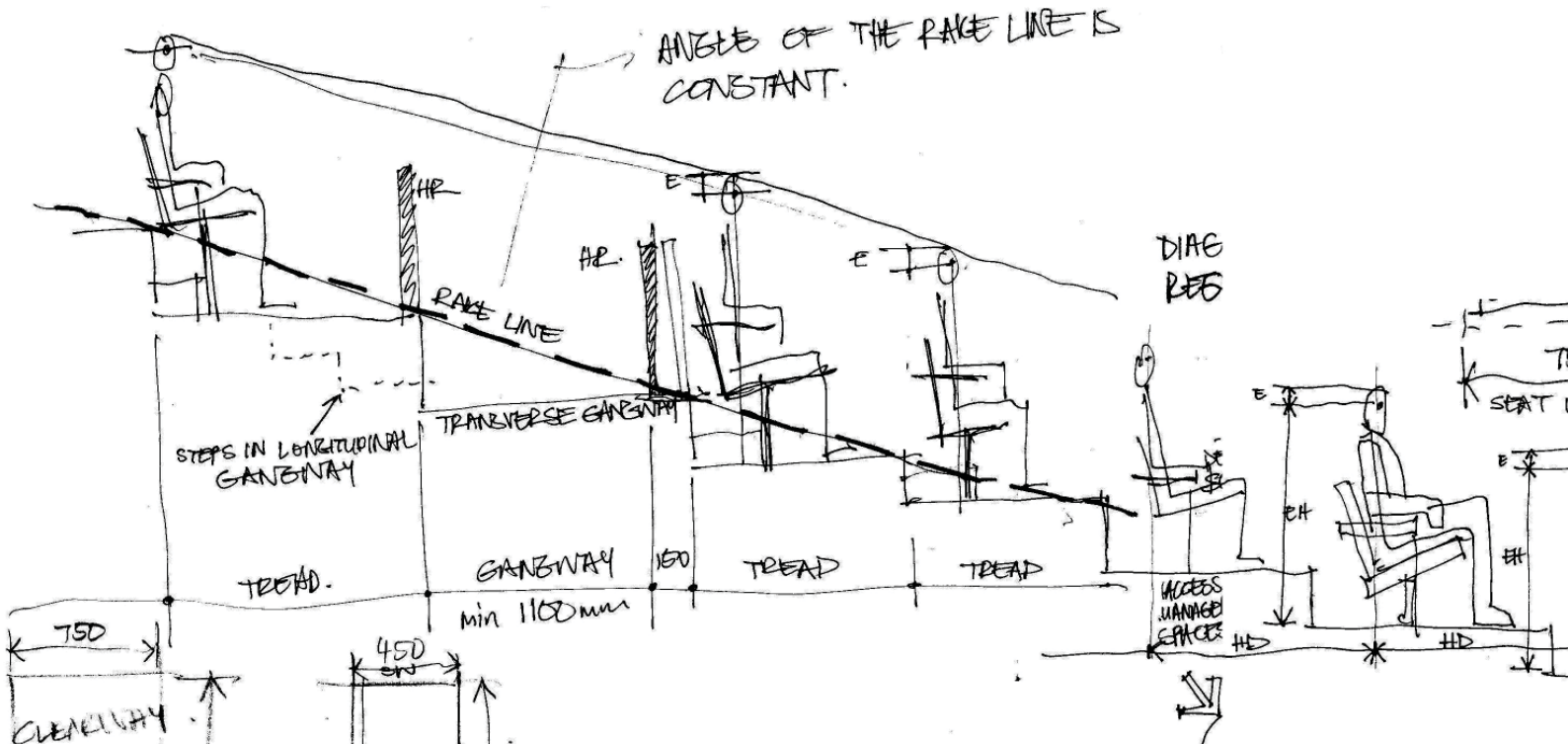
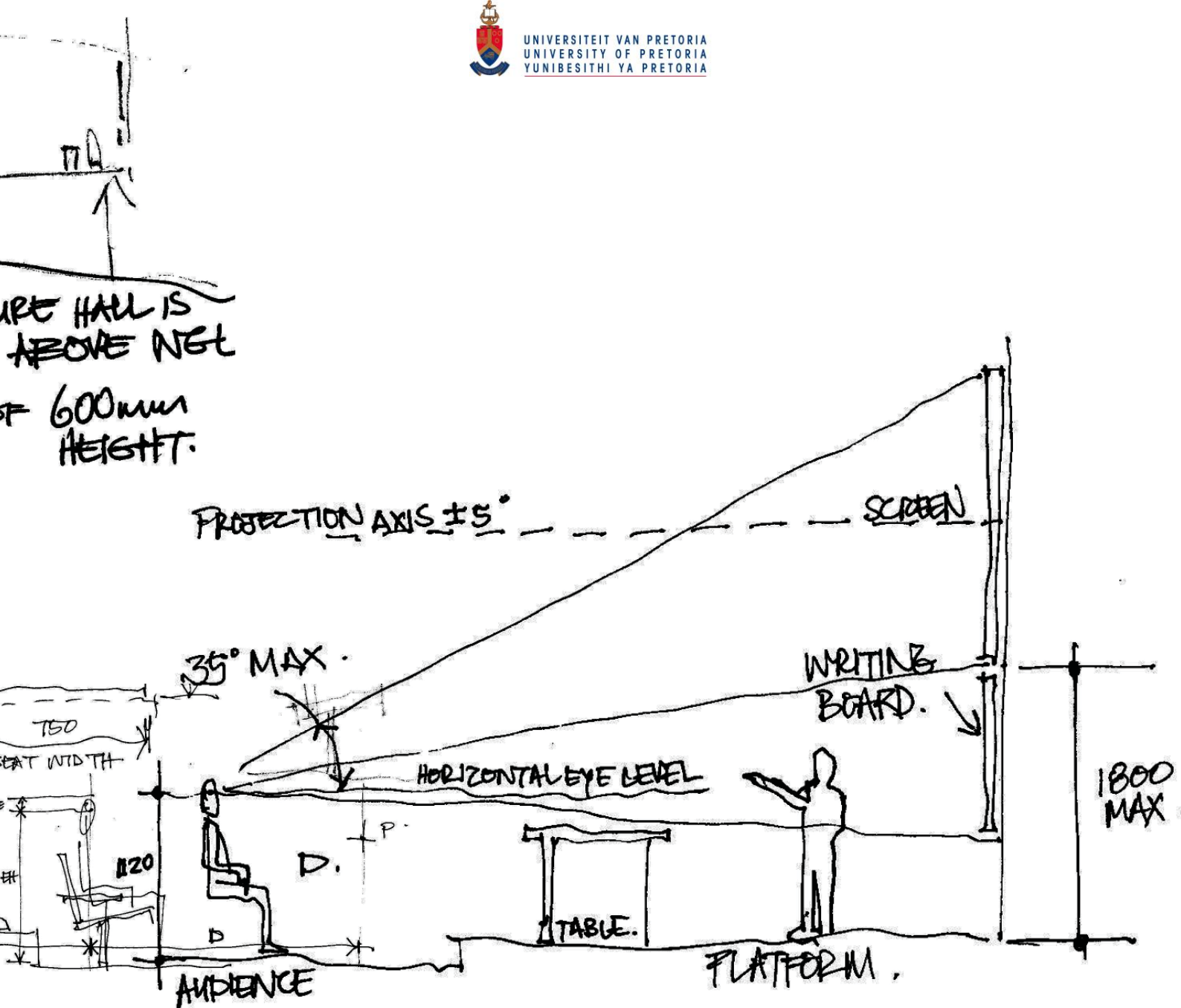


fig.7.18. LECTURE THEATRE

This combined diagram depicts the basic requirements for a theatre intended for lectures, informed by the Metric Handbook, by David Adler.



The left portion showing the "sight lines at a transverse gangway" (Adler, 1999:20,8), the next portion of the diagram showing the "vertical sight lines" (Adler, 1999:20,7), and the last portion depicting a "section through a lecture theatre" (Adler, 1999:20,28).

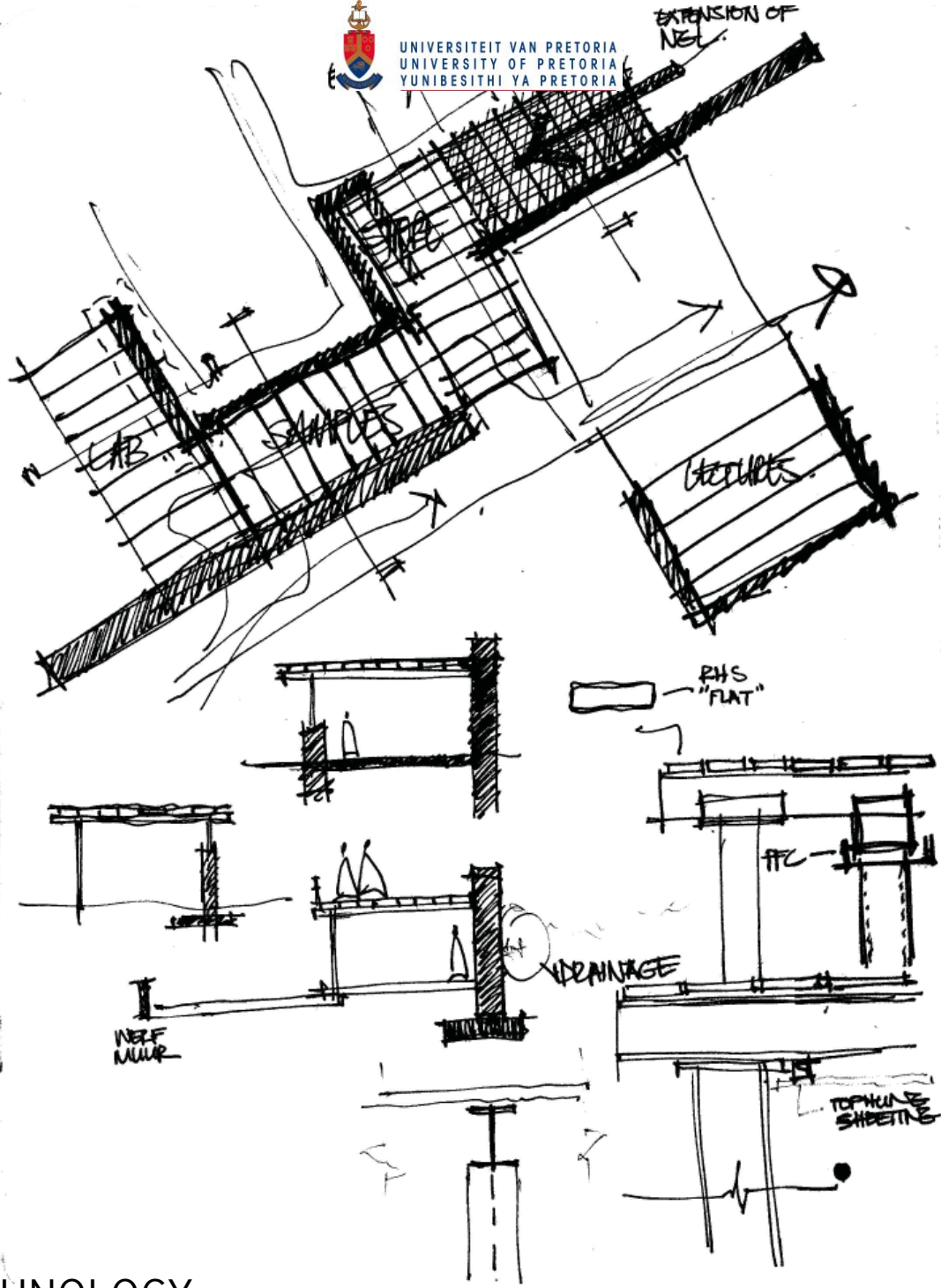


fig.7.19. TECHNOLOGY.

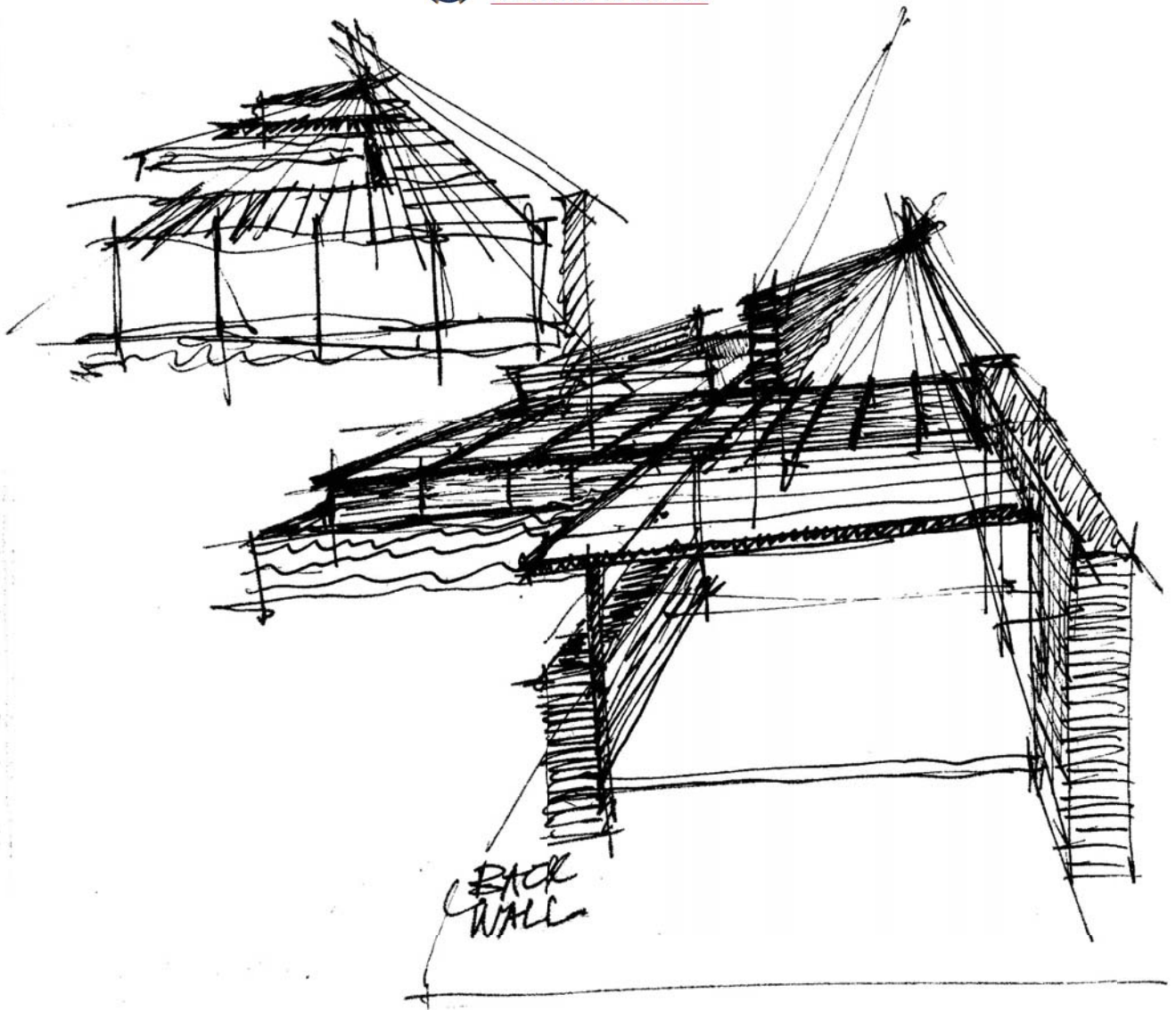


fig.7.20. TECHNOLOGY DIAGRAM.

The technology that will be used in the construction of the new architecture on the Irene Dairy Farm, separating the horizontal and vertical elements and emphasizing the horizontal proportions of the architecture.







08

FINAL  
CHAPTER

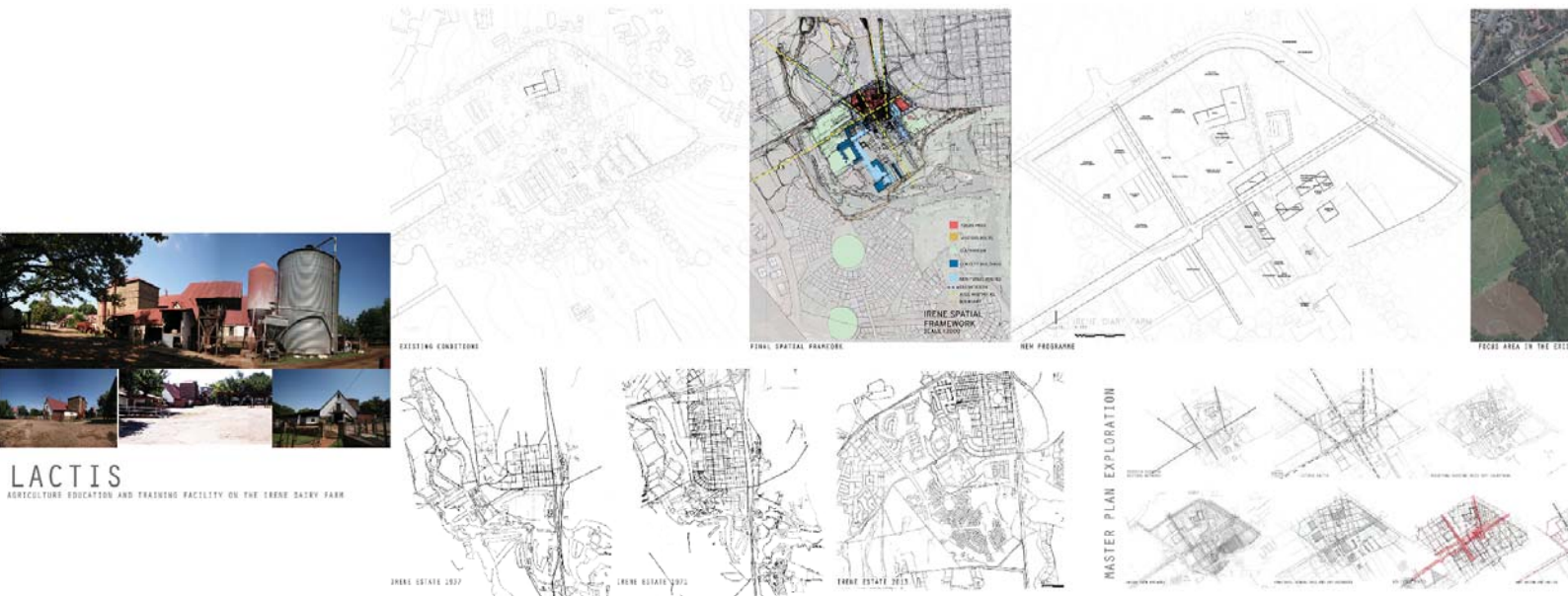
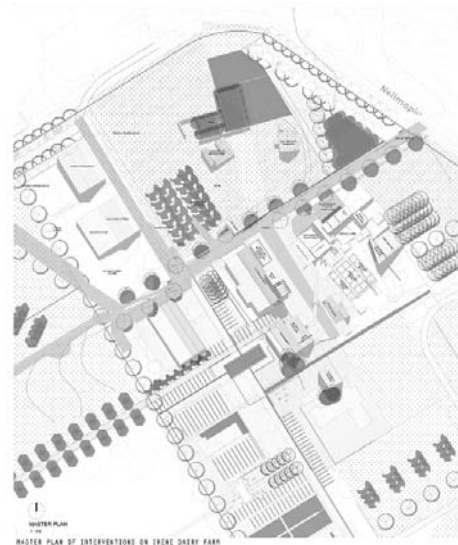


fig.8.1. INTRODUCTION TO IRENE DAIRY FARM



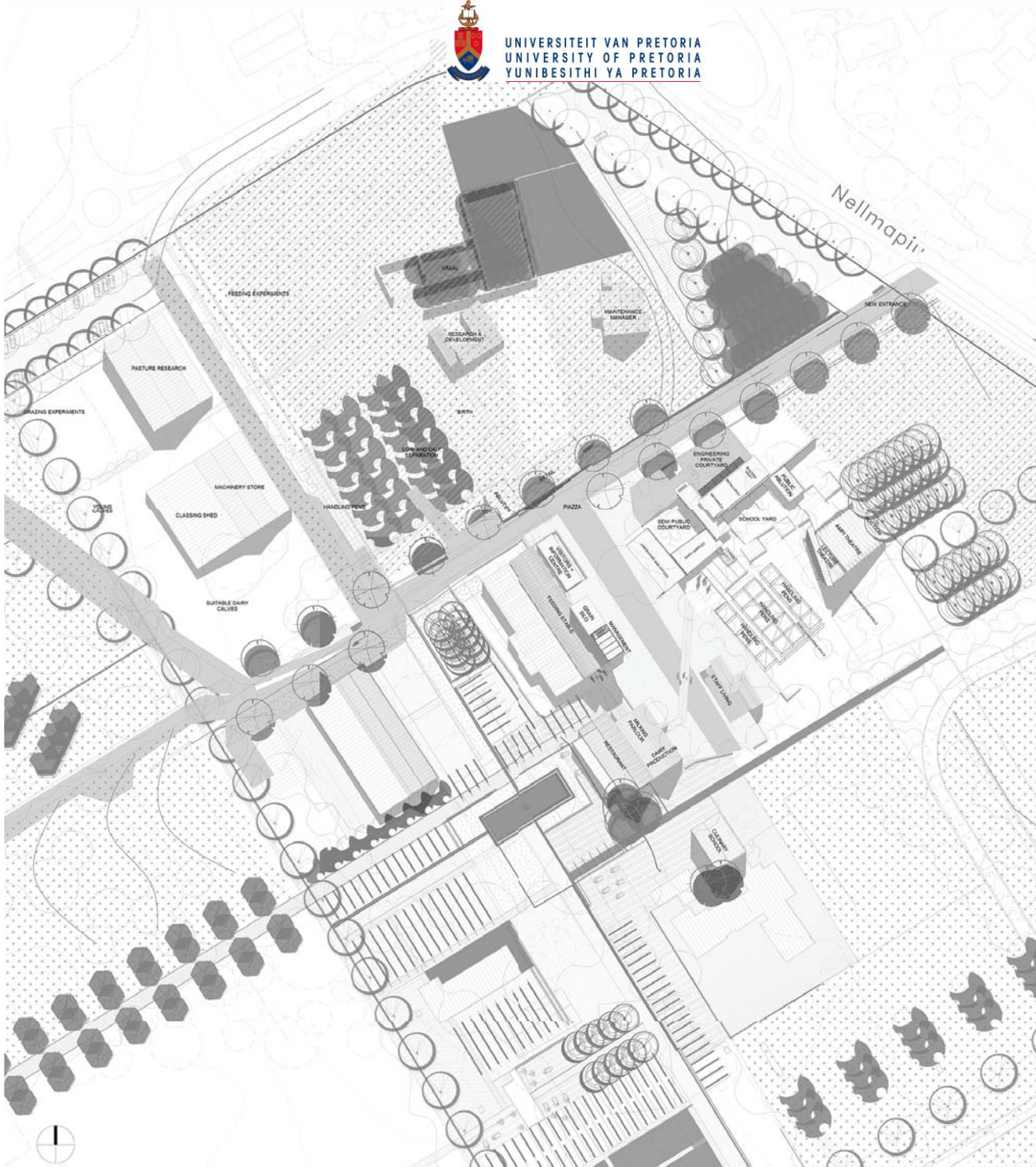


fig.8.2. MASTER PLAN OF INTERVENTIONS ON IRENE DAIRY FARM



THE CONCEPTUAL INTENTION FOR A NEW AGRICULTURAL ARCHITECTURE ON THE IRENE DAIRY FARM.

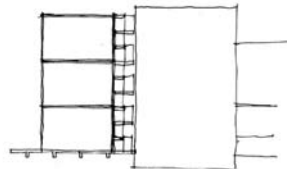
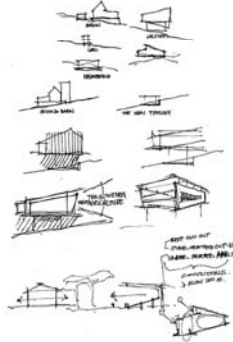


TECTONIC CONCEPT

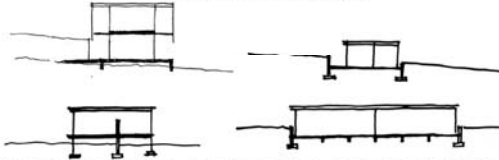
EXISTING TYPOLOGY VS NEW TYPOLOGY

THE EXISTING TYPOLOGY HAS A HEAVY STEREOTOMIC BASE. THE LIGHT TECTONIC ELEMENTS ARE PLACED ON THIS HEAVY BASE.

THE INTENTION OF THE NEW TYPOLOGY IS TO SIMPLY EXTEND THE HORIZONTAL SURFACE WITH STEREOTOMIC ELEMENTS AND THEN PLACE LIGHT-WEIGHT TECTONIC ELEMENTS ON TOP OF THIS EXTENSION OF THE LANDSCAPE.



PLACING LIGHT TECTONIC ELEMENTS NEXT TO EXISTING STEREOTOMIC STRUCTURES



EXTENDING THE LANDSCAPE WITH HORIZONTAL STEREOTOMIC ELEMENTS. PLACING THESE ELEMENTS: INTO OR ON TOP OF THE LANDSCAPE.

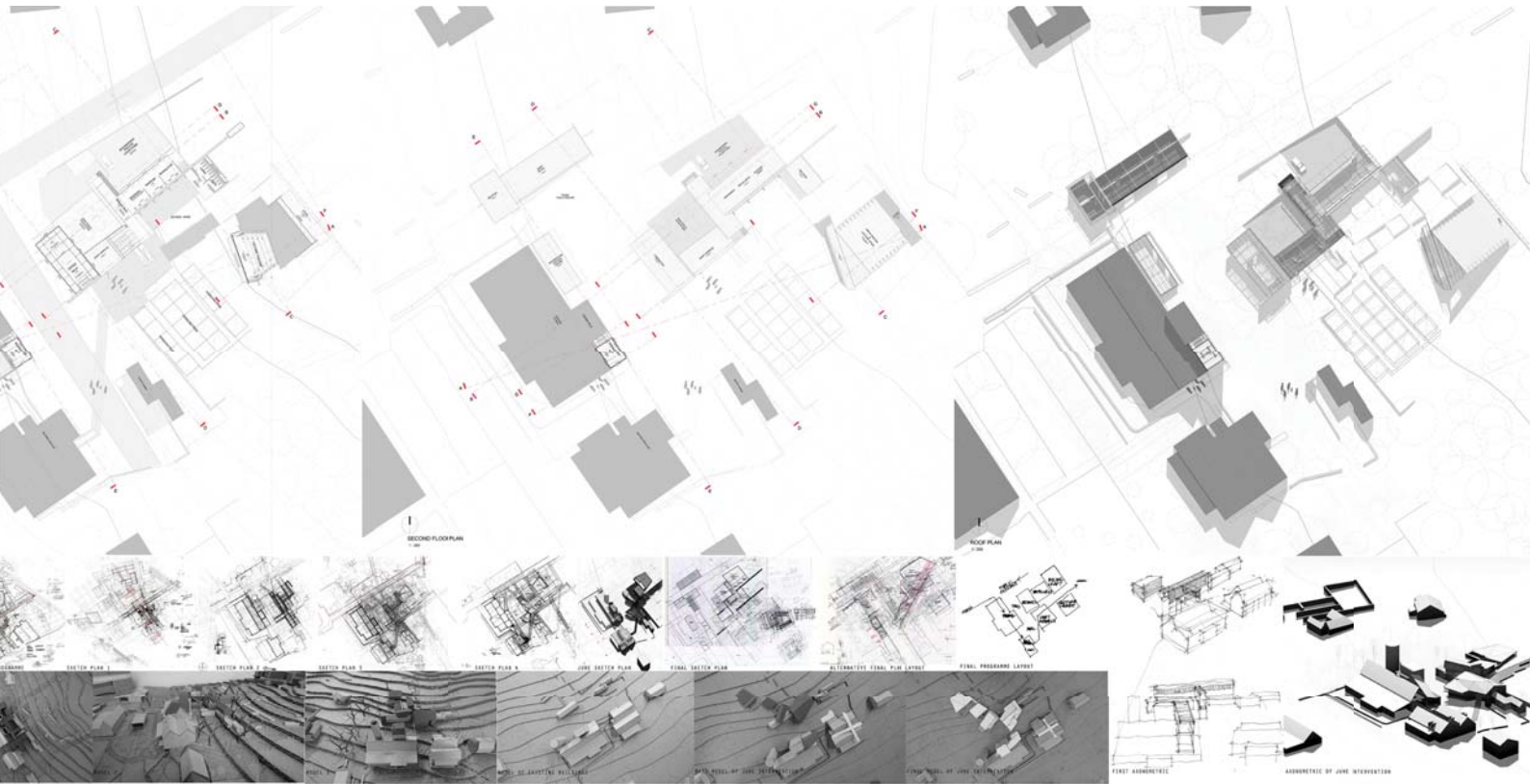


THE FINAL APPROACH IS THE COMBINATION OF PLACING STEREOTOMIC ELEMENTS INTO THE LANDSCAPE AND LIGHT TECTONIC ELEMENTS ABOVE THE LANDSCAPE.

fig.8.3. DESIGN APPROACH

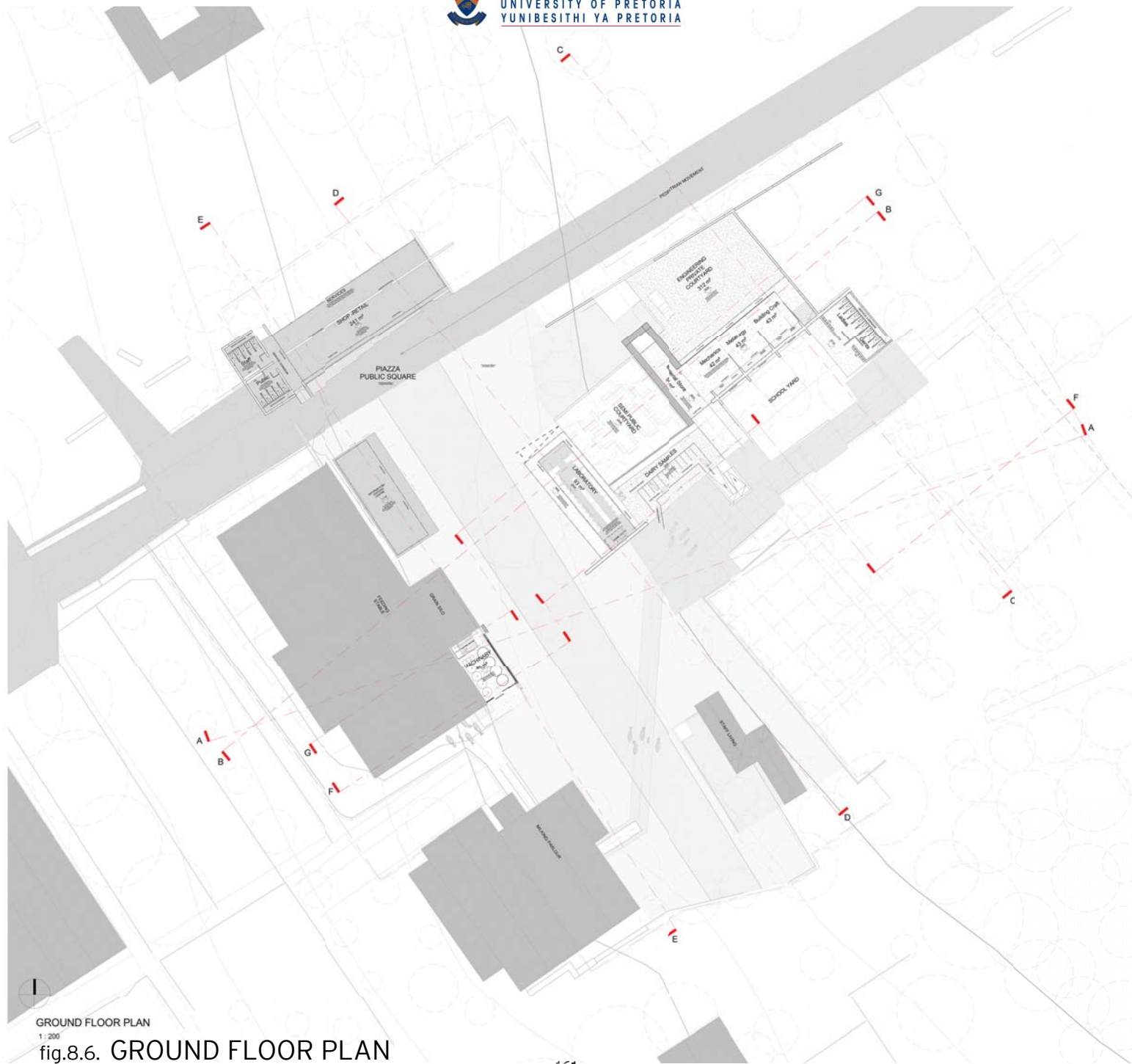


fig.8.4. PLANS AND DESIGN DEVELOPMENT OF THE AGRICULTURE EDUCATION AND TRAINING FACILITY









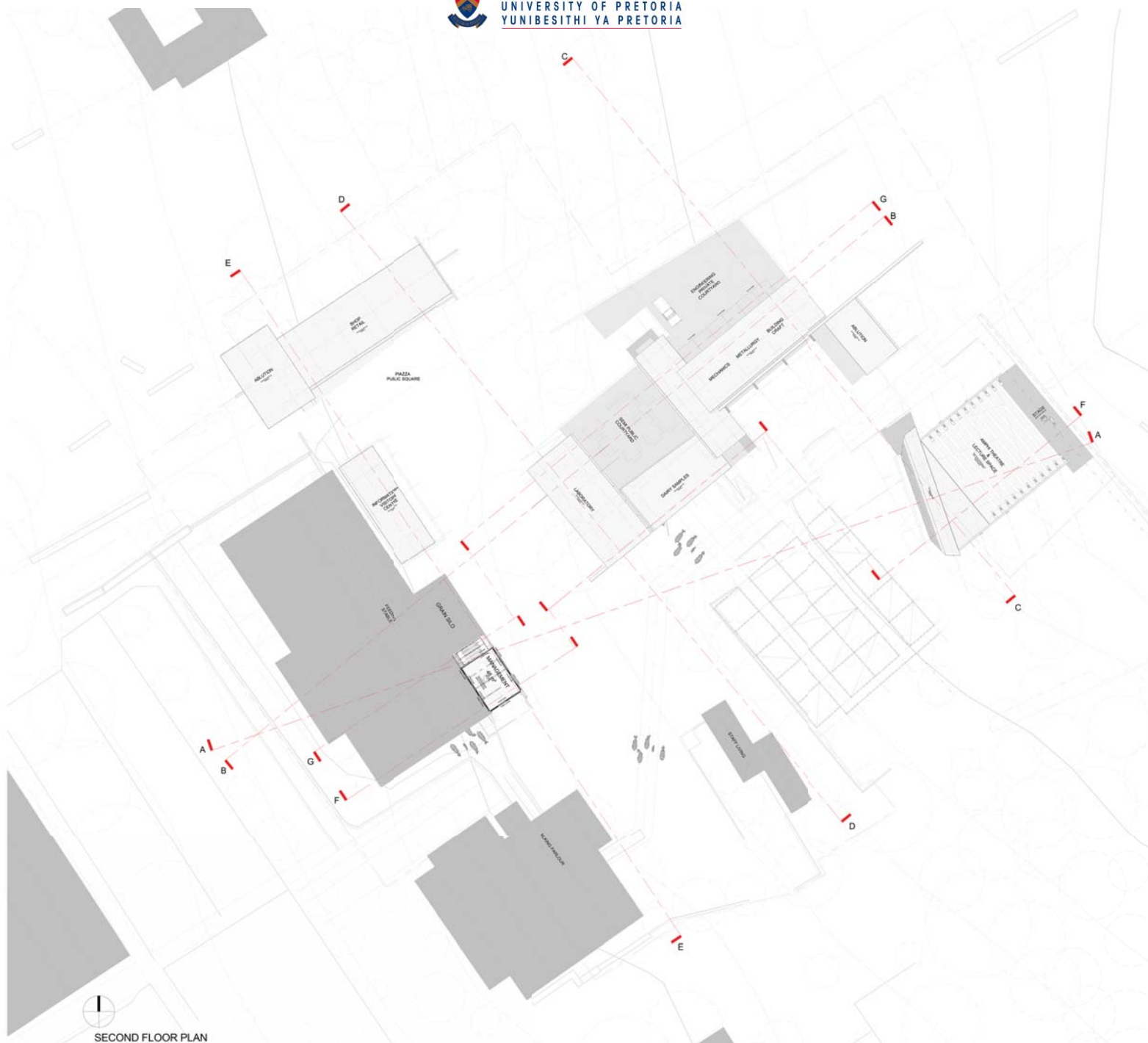
GROUND FLOOR PLAN

1:200

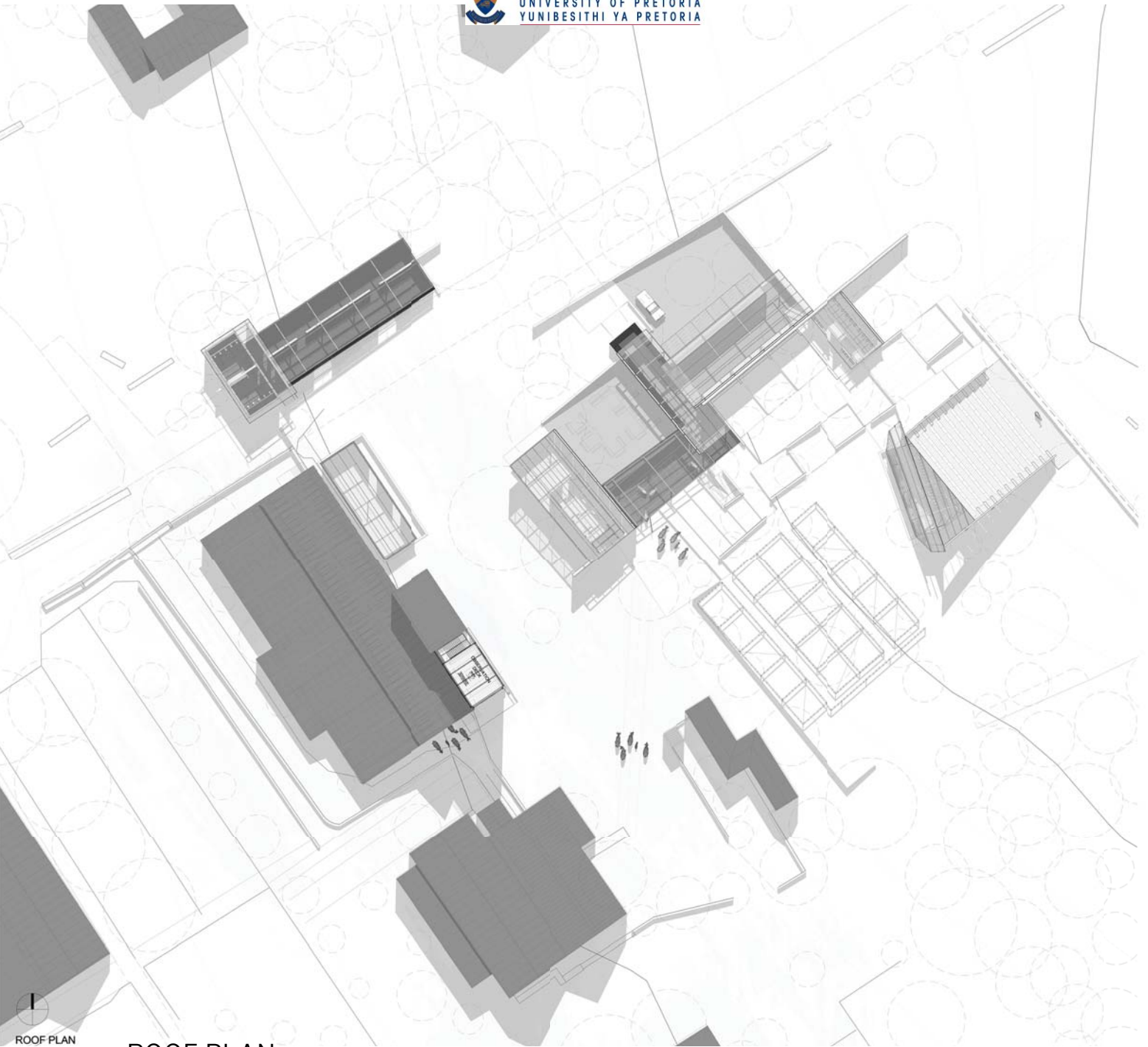
fig.8.6. GROUND FLOOR PLAN



FIRST FLOOR PLAN  
fig.8.7. FIRST FLOOR PLAN



SECOND FLOOR PLAN  
fig.8.8. SECOND FLOOR PLAN



ROOF PLAN  
fig.8.9. ROOF PLAN

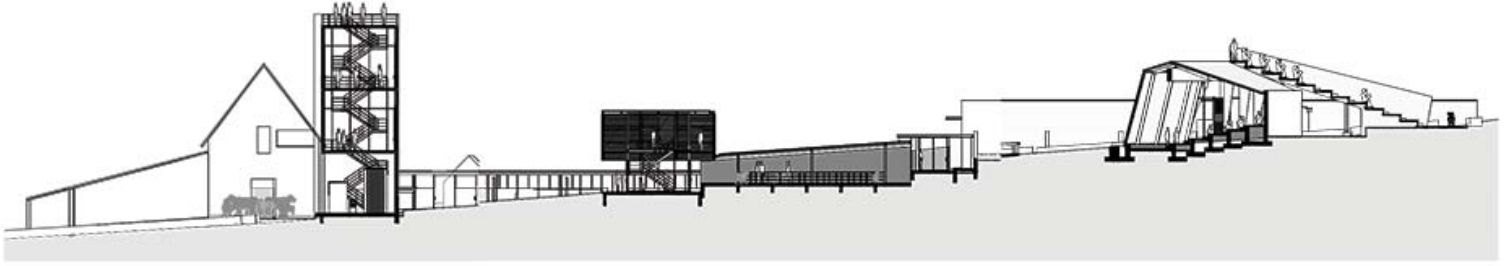


fig.8.10. FINAL SECTIONS

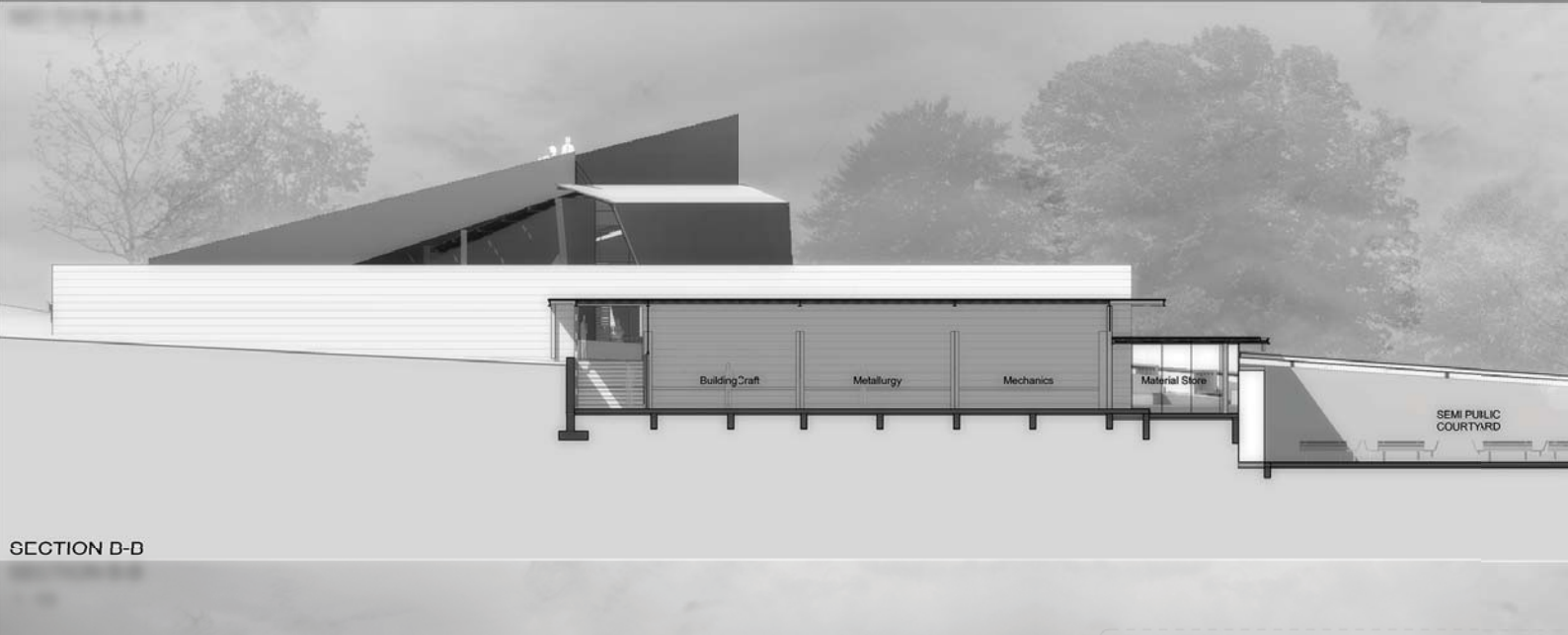


fig.8.11. SECTION A & B





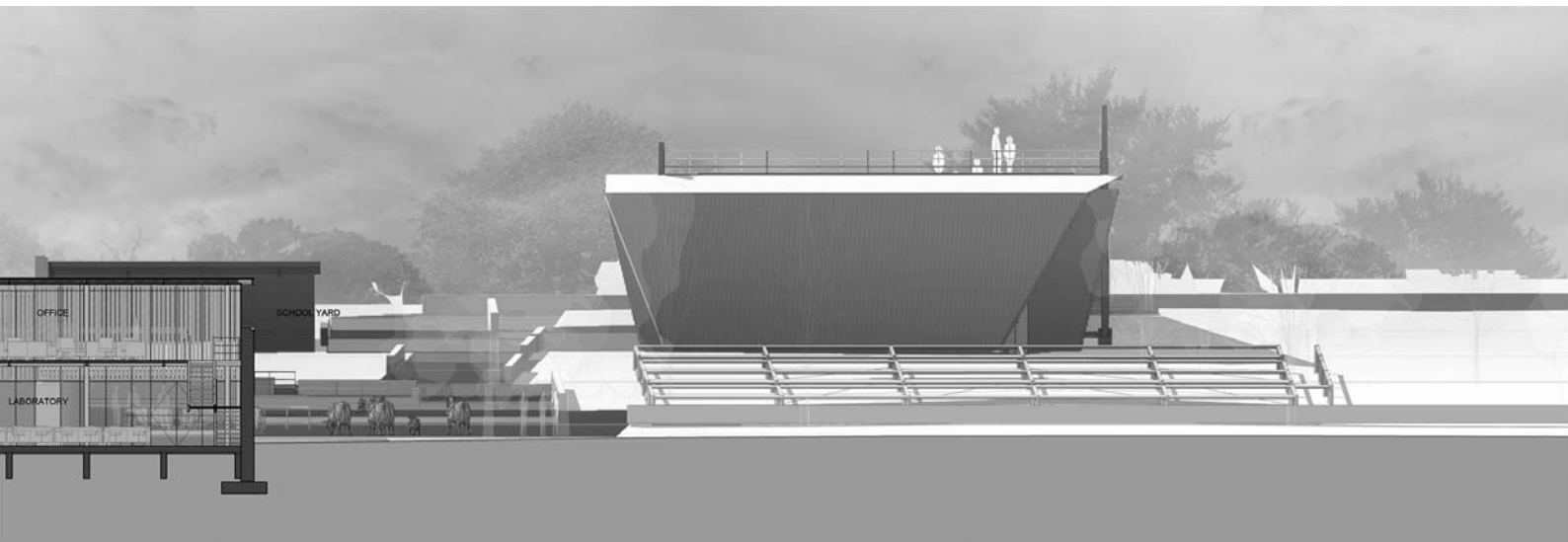
SECTION C-C



SECTION D-D

fig.8.12. SECTION C & D







SECTION E-E

fig.8.13. SECTION E



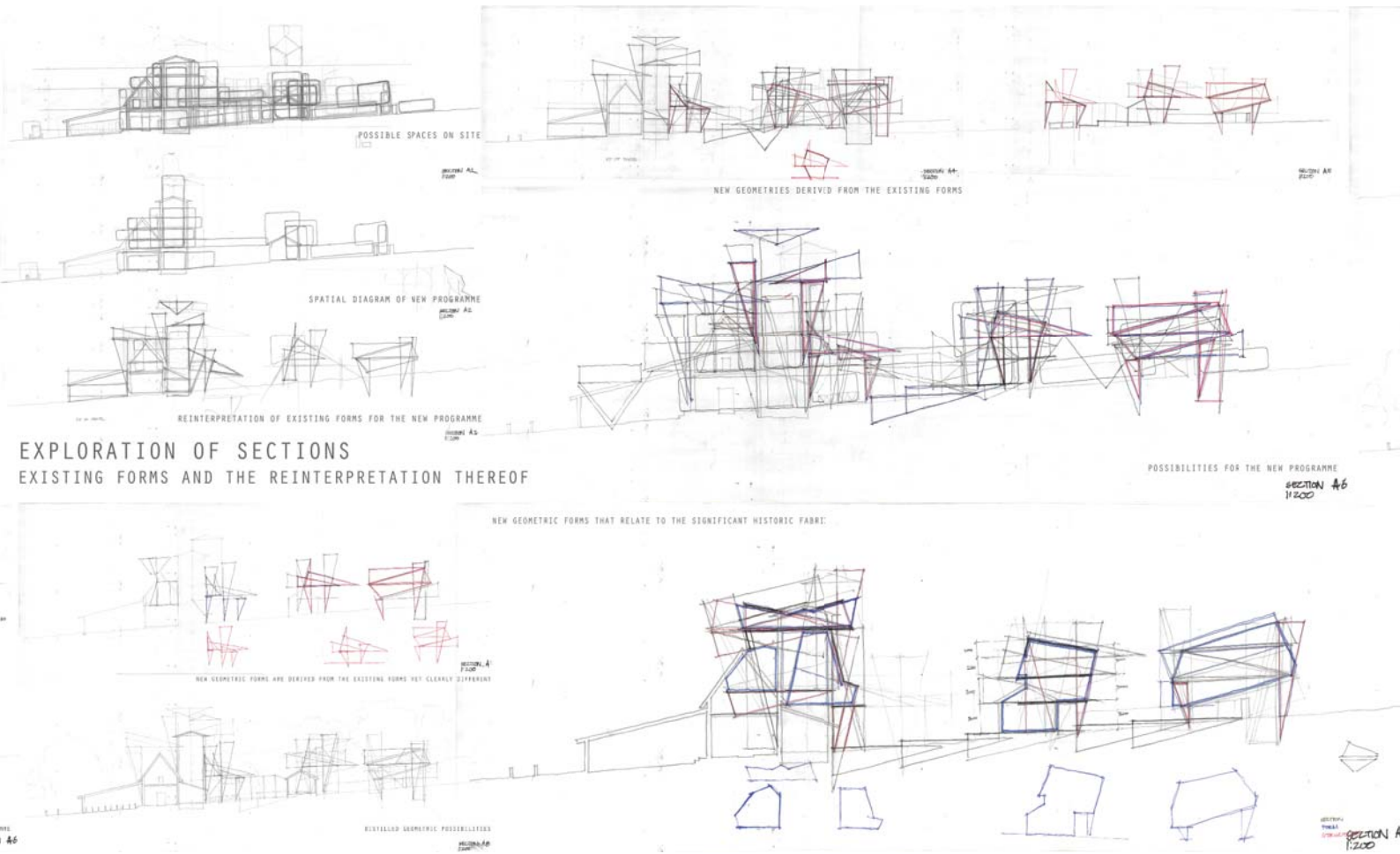
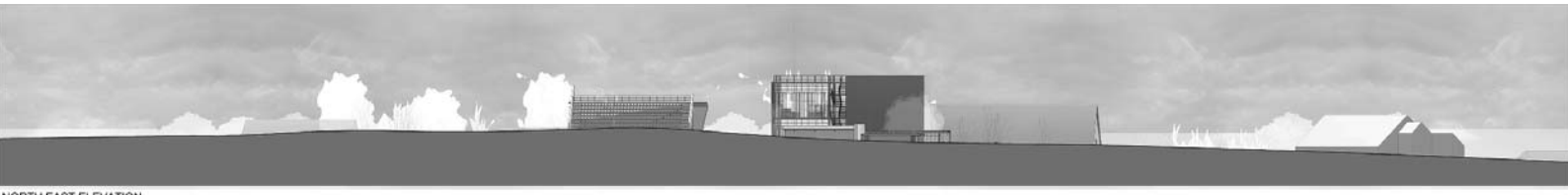


fig.8.14. SECTION DEVELOPMENT



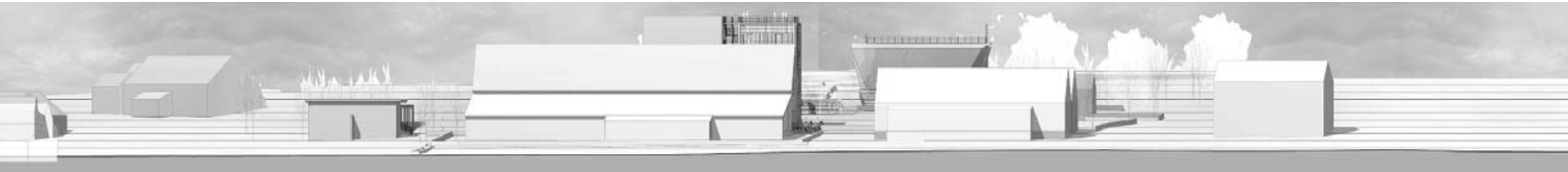
NORTH EAST ELEVATION

1 : 200



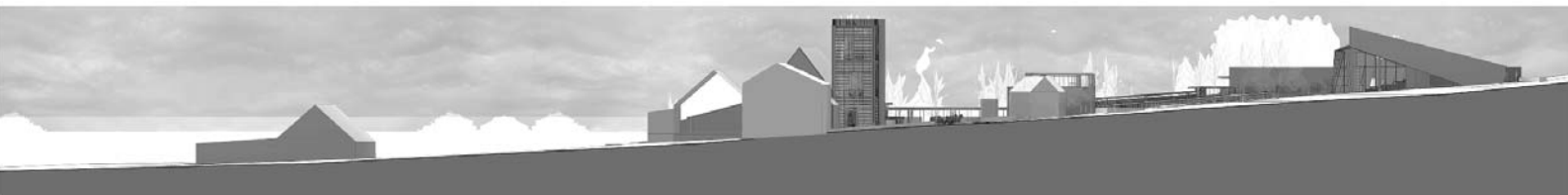
NORTH WEST ELEVATION

1 : 200



SOUTH WEST ELEVATION

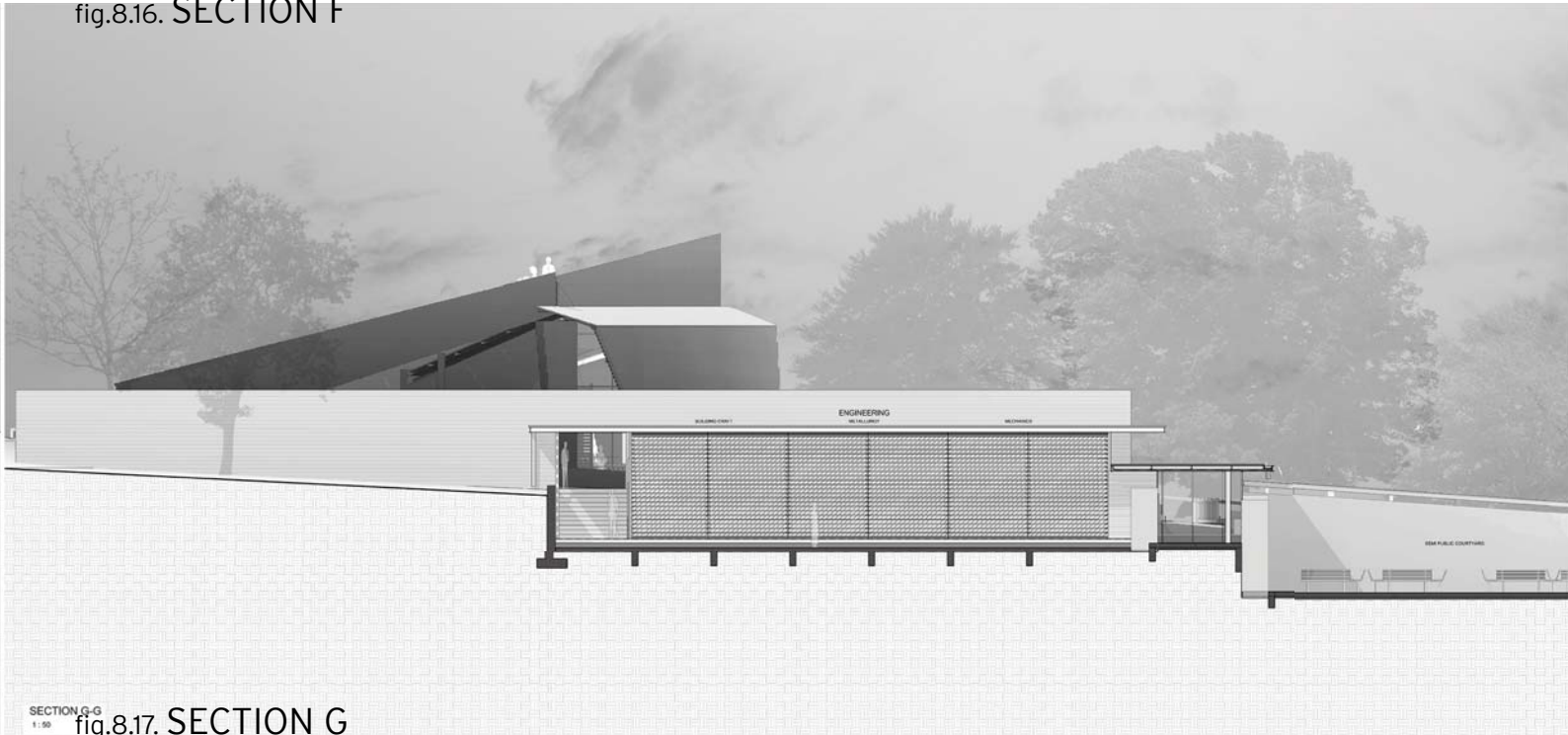
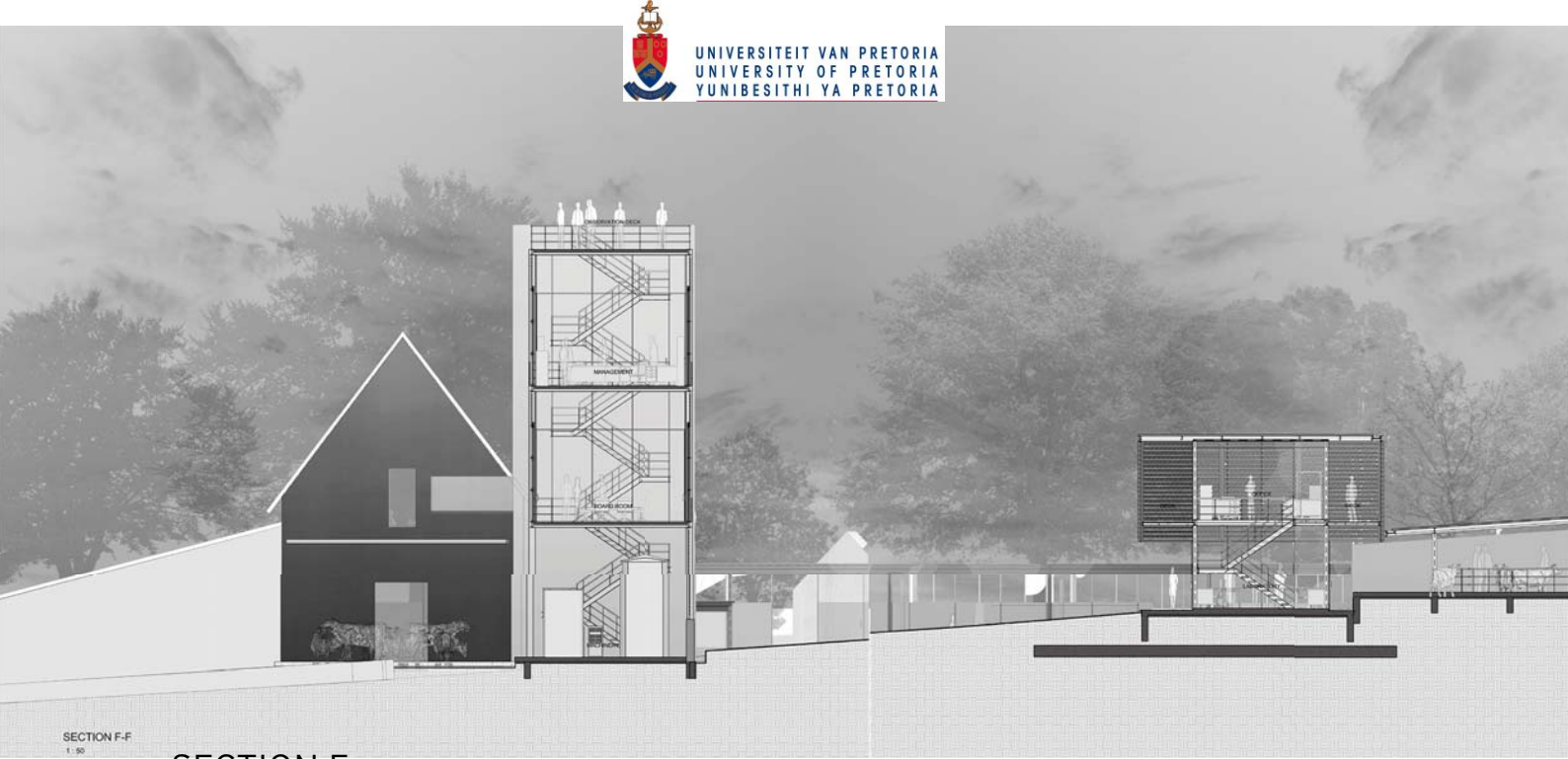
1 : 200

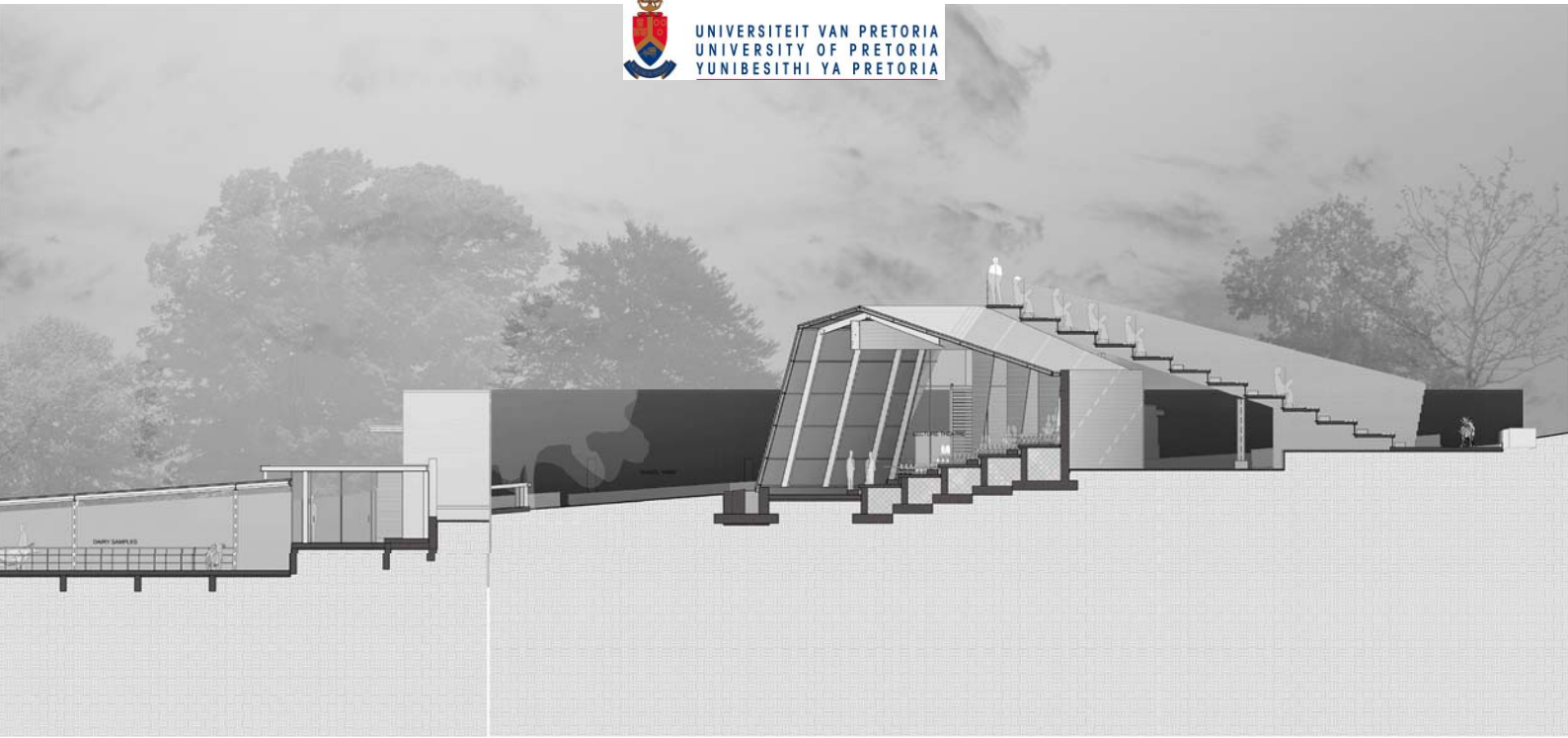


SOUTH EAST ELEVATION

1 : 200

fig.8.15. ELEVATIONS





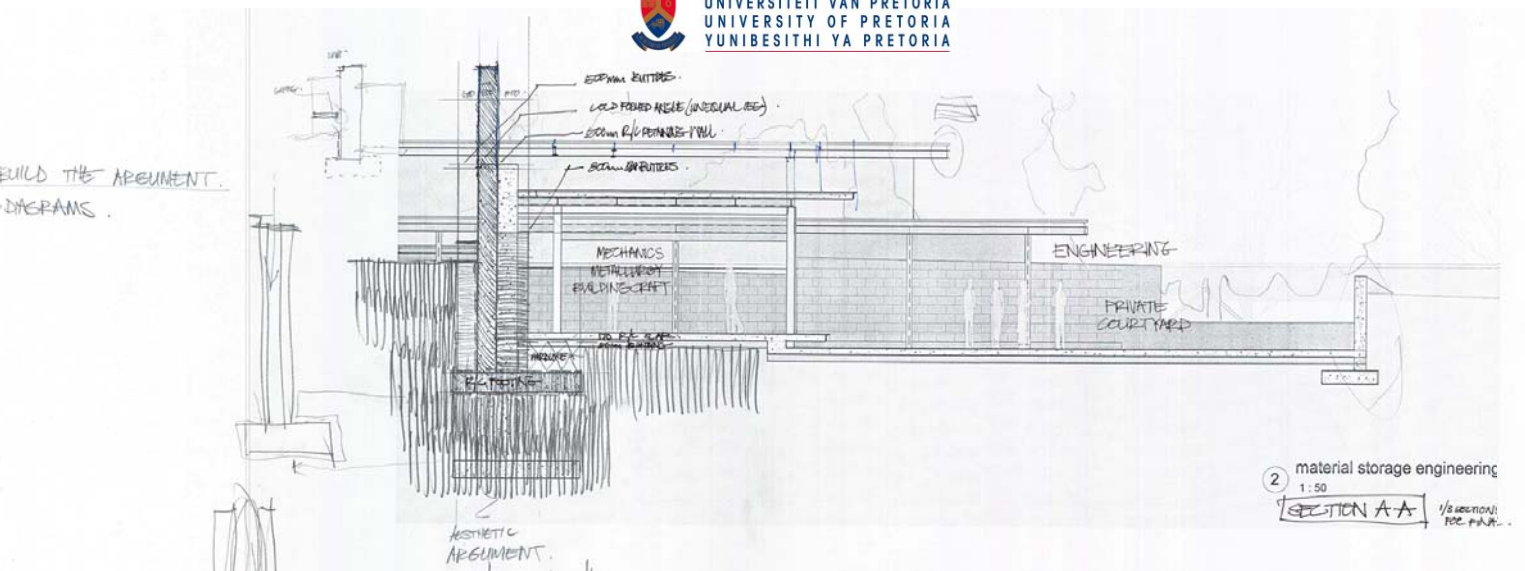


fig.8.18. ENGINEERING DEPARTMENT DEVELOPMENT

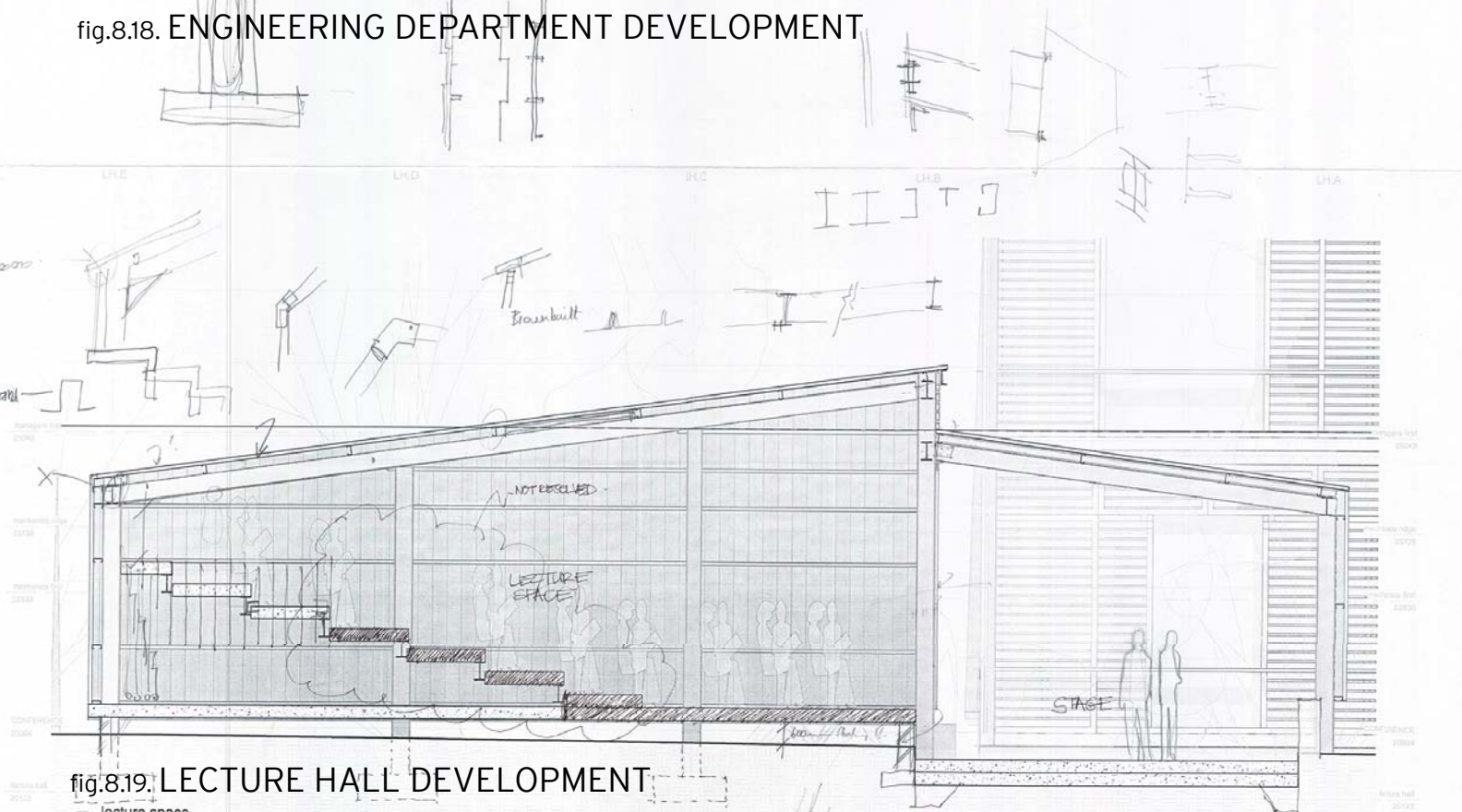


fig.8.19. LECTURE HALL DEVELOPMENT



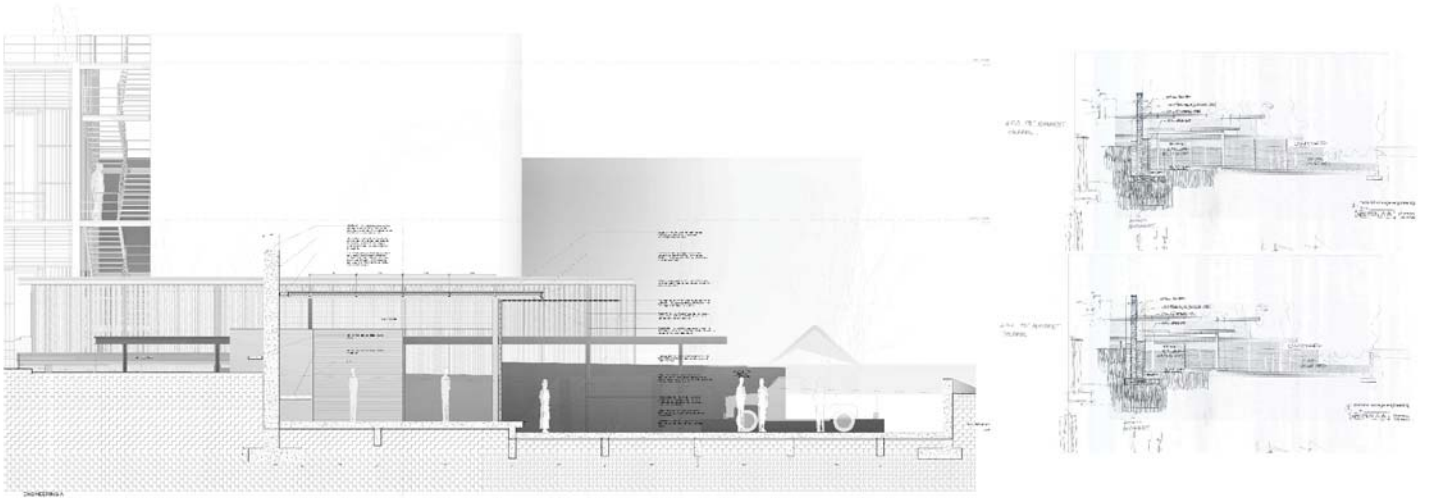


fig.8.20. ENGINEERING DEPARTMENT PROGRESS

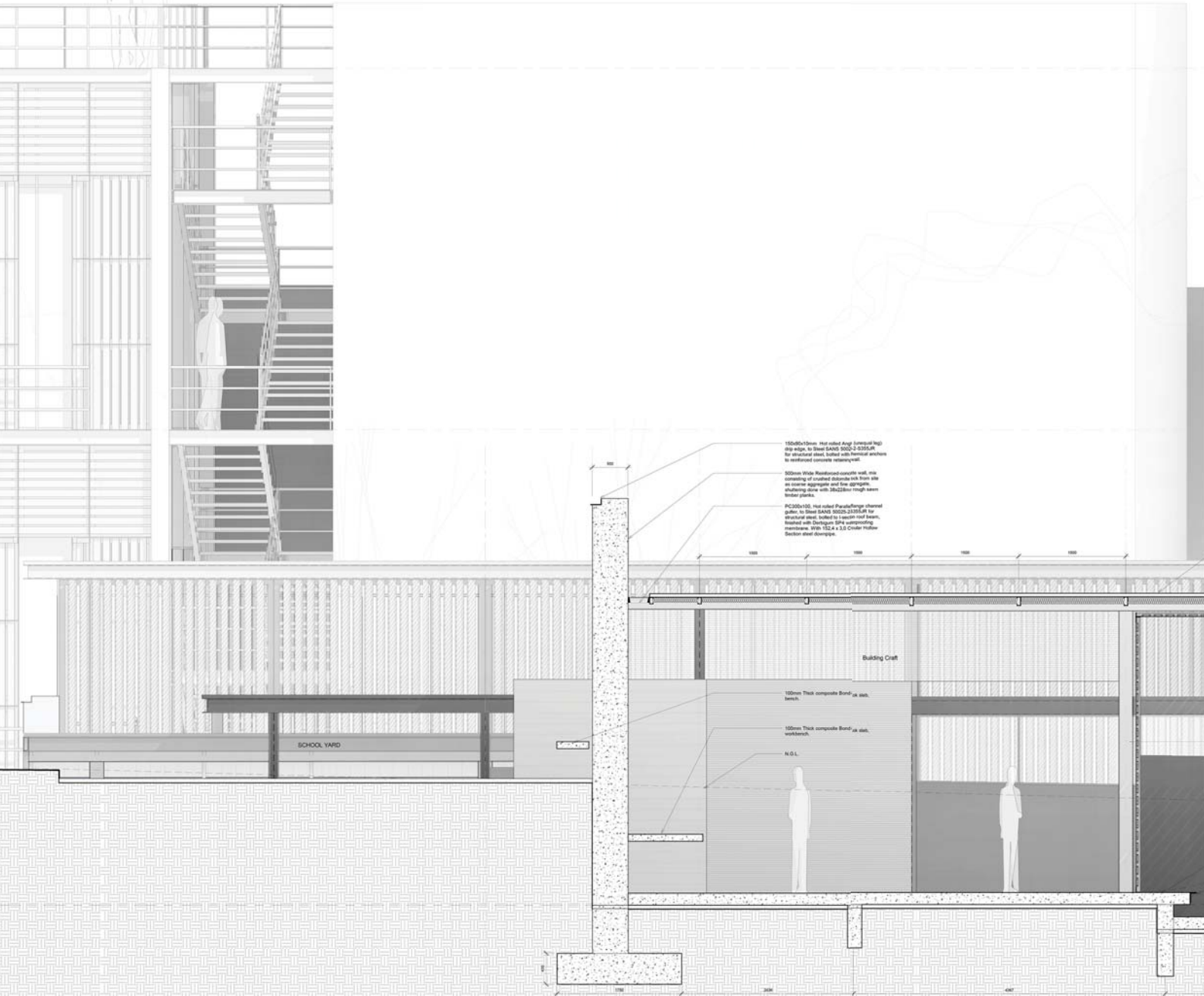
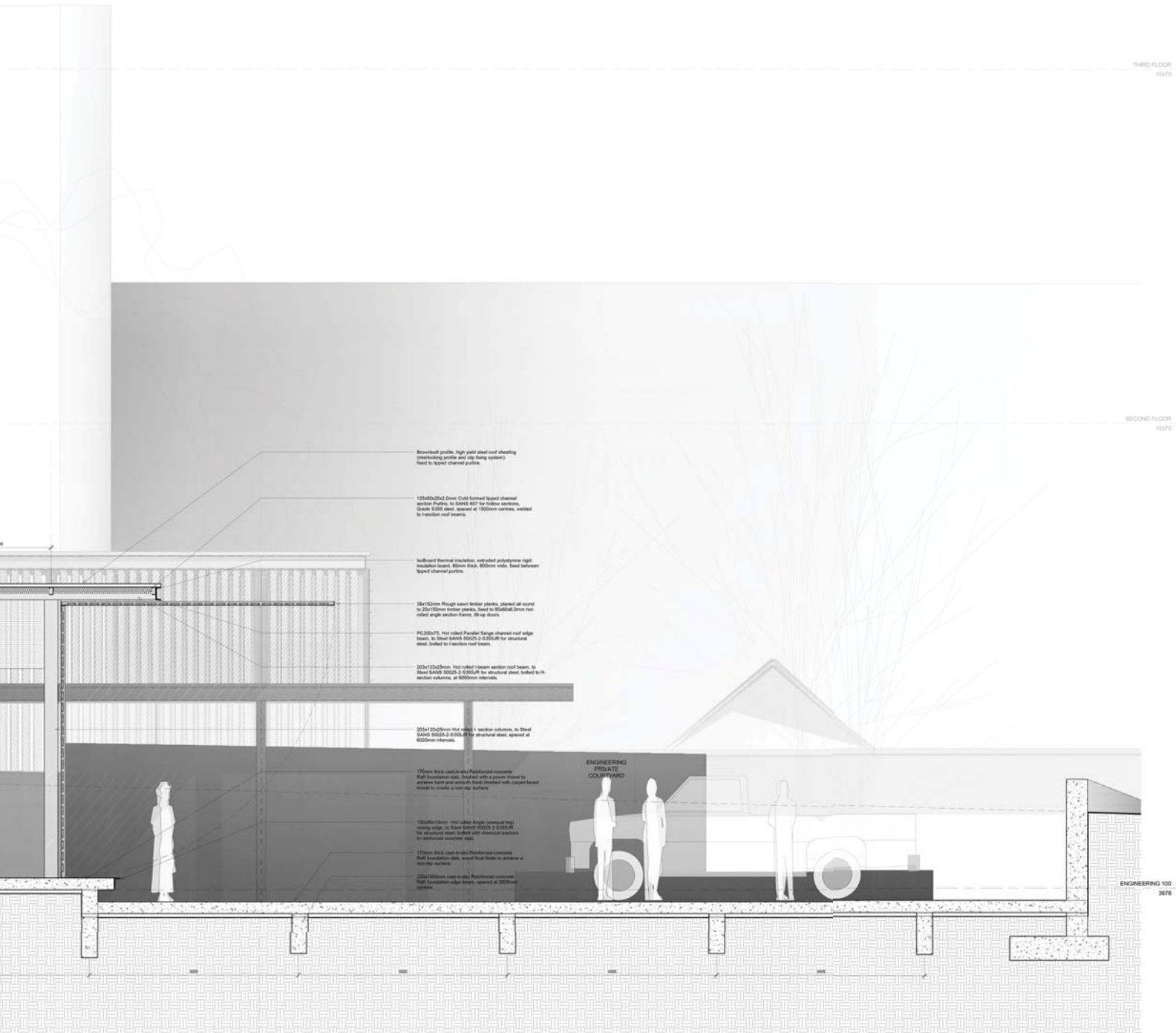
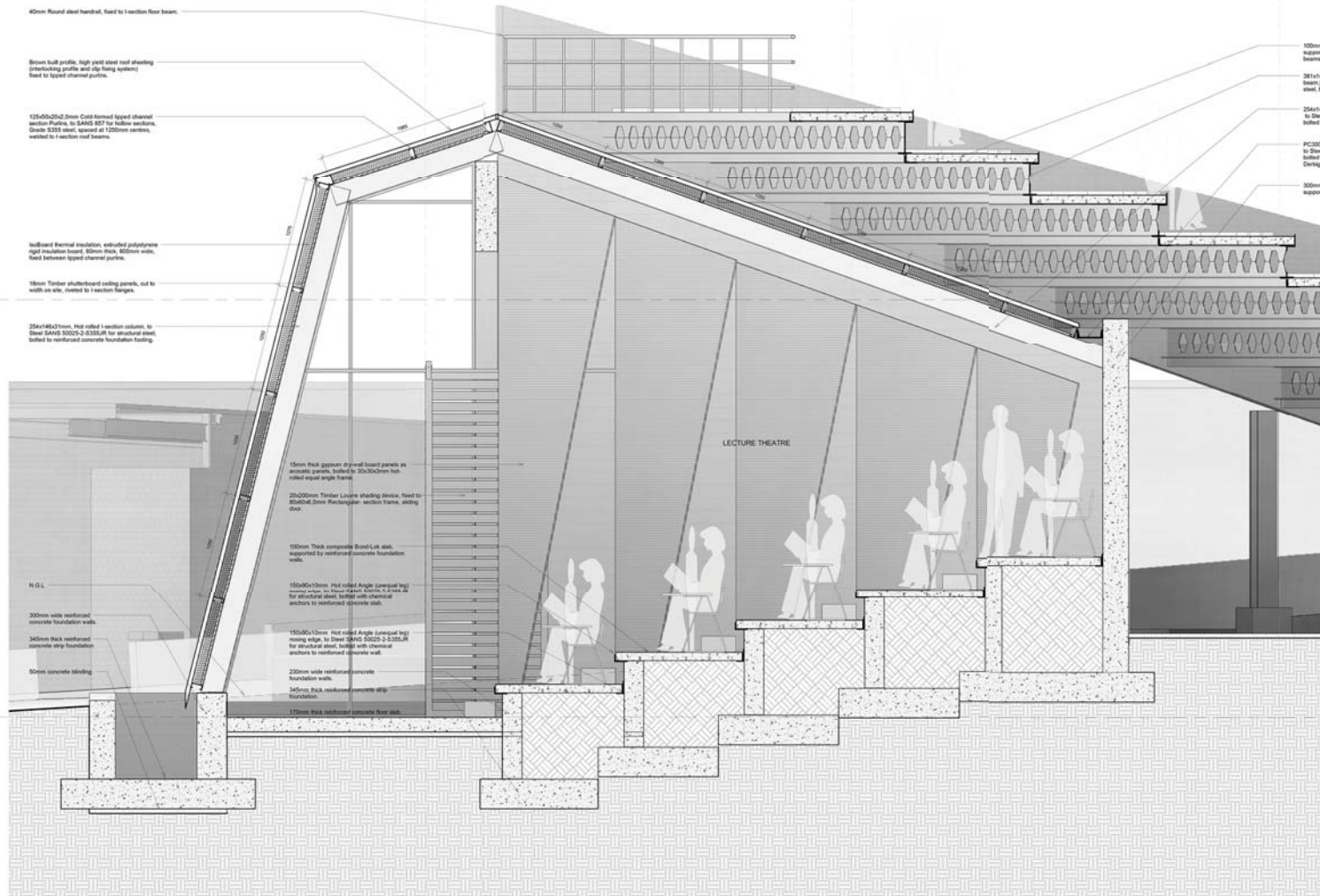


fig.8.21. ENGINEERING\_SECTION A

ENGINEERING A  
1 : 20





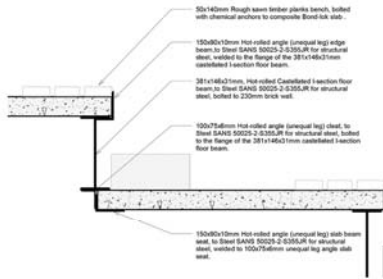
LECTURE THEATRE A

1 : 20

fig.8.22. LECTURE THEATRE\_SECTION A

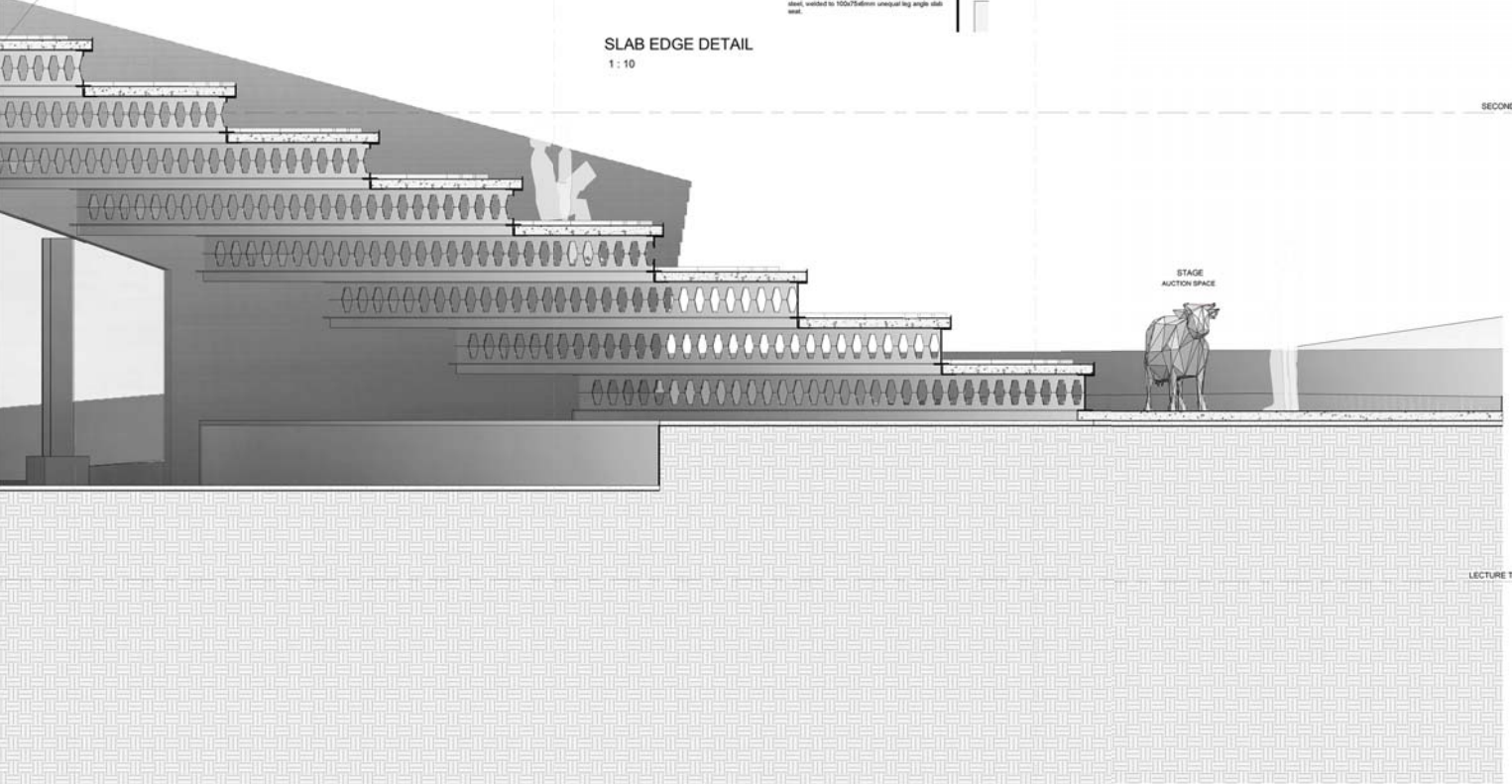


- 100mm Thick composite Bond-Lok slab, supported by Cast-in-place I-section floor beams.
- 281x146x21mm, Hot rolled Cast-in-place I-section floor beams to Steel SANS 50025-2-535LR for structural steel, bolted to 230mm brick wall.
- 254x146x21mm, Hot rolled I-section roof beams to Steel SANS 50025-2-535LR for structural steel, bolted to reinforced concrete retaining wall.
- PC200x100, Hot rolled Parallel flange channel puffer, to Steel SANS 50025-2-535LR for structural steel, bolted to I-section roof beam, finished with Deltaplan SP4 waterproofing membrane.
- 300mm Reinforced concrete retaining wall supported by reinforced concrete foundation strip.



SLAB EDGE DETAIL

1 : 10



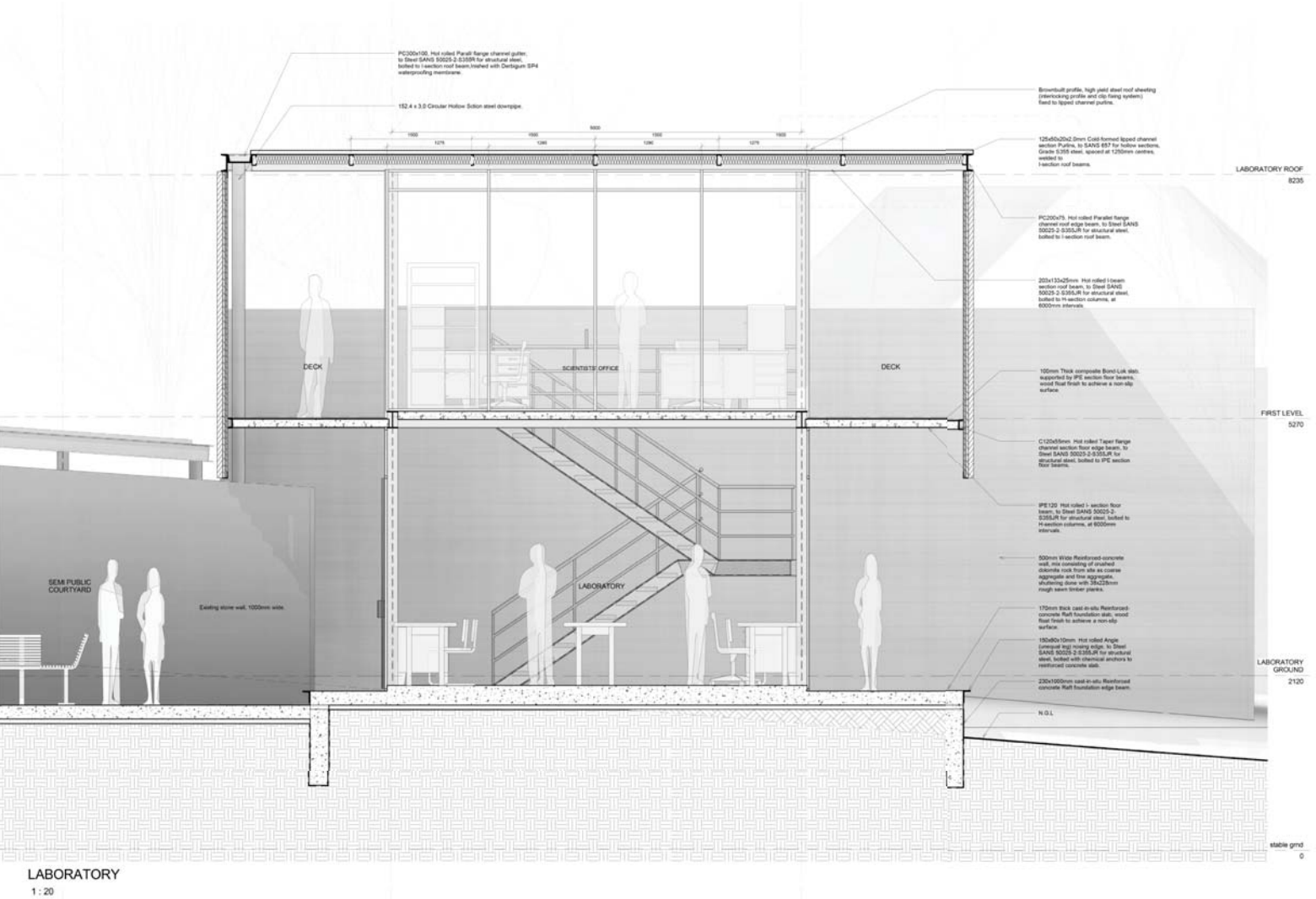


fig.8.23. LABORATORY\_SECTION

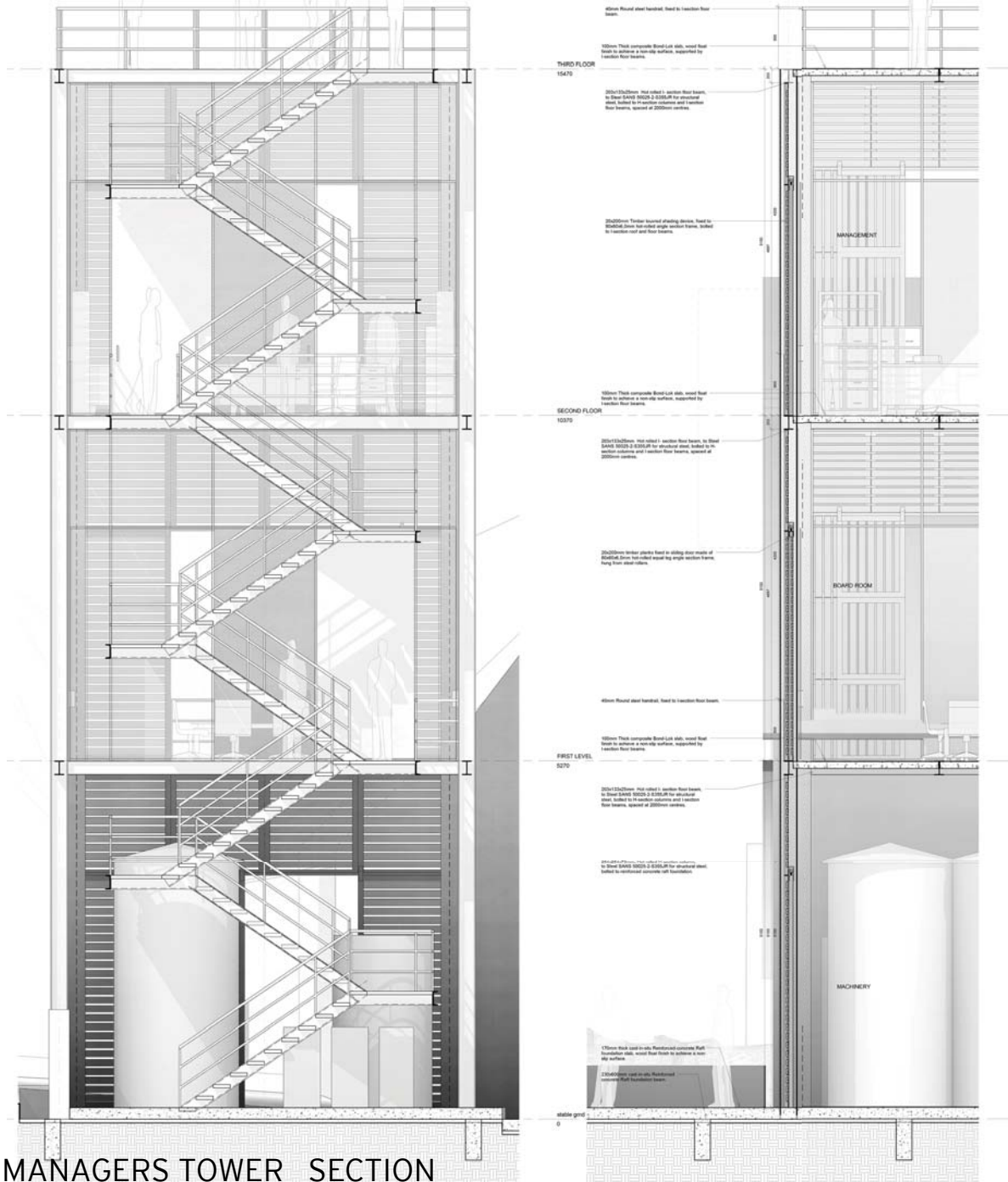


fig.8.24. MANAGERS TOWER\_SECTION

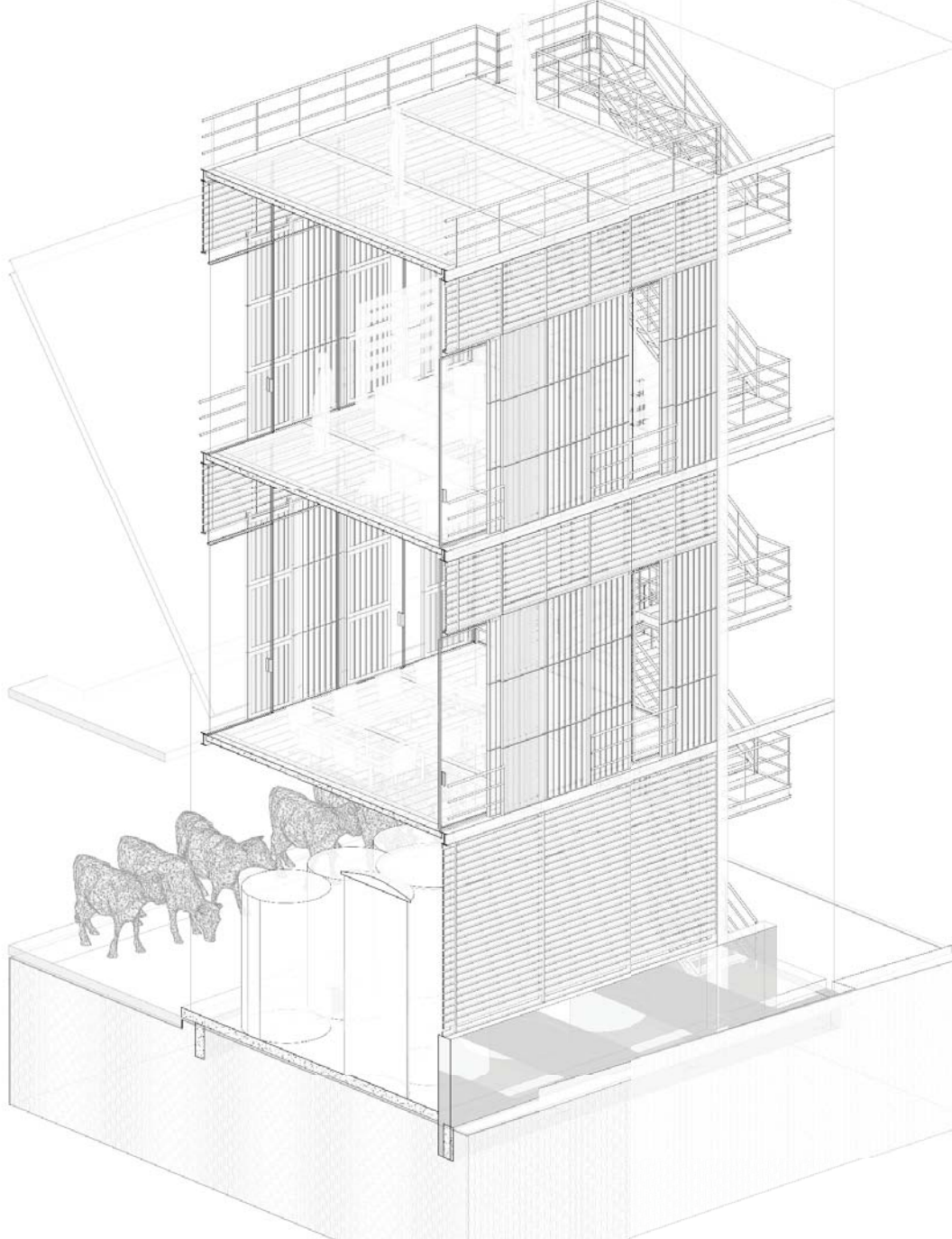


fig.8.25. MANAGERS TOWER AXONOMETRIC SECTION



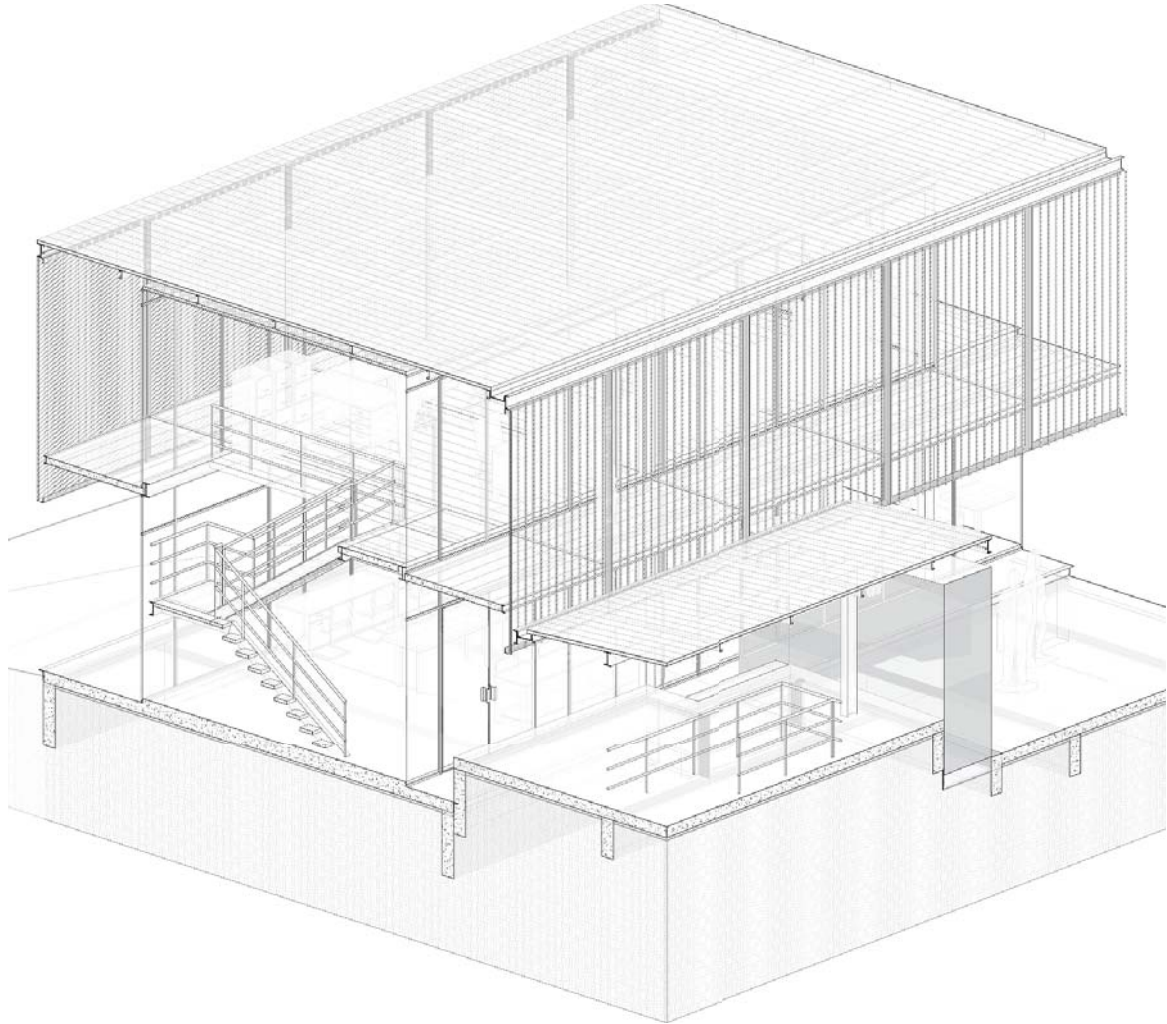


fig.8.26. LABORATORY AND OFFICE AXONOMETRIC SECTION

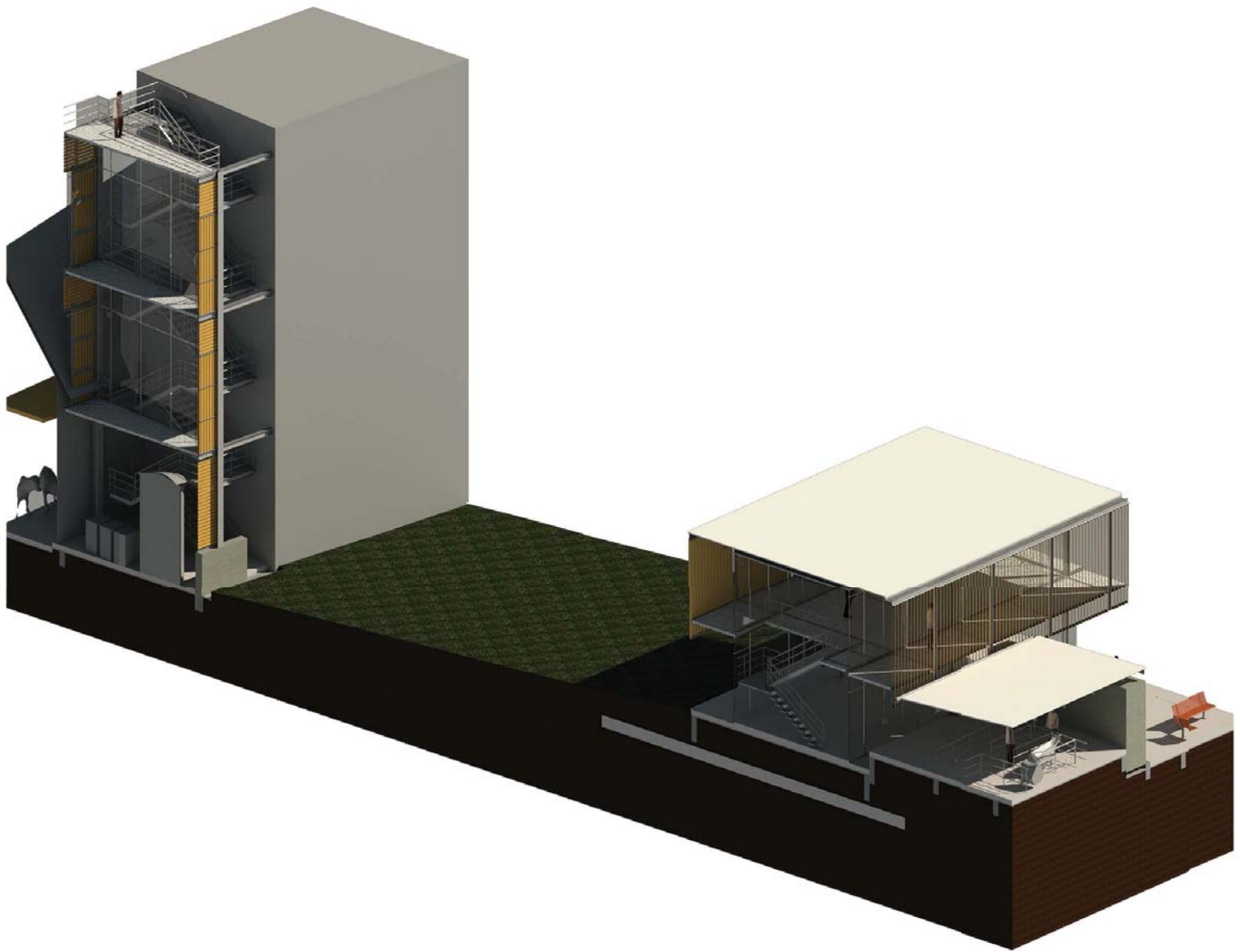


fig.8.27. AXONOMETRIC SECTION OF LABORATORY AND MANAGEMENT OFFICE

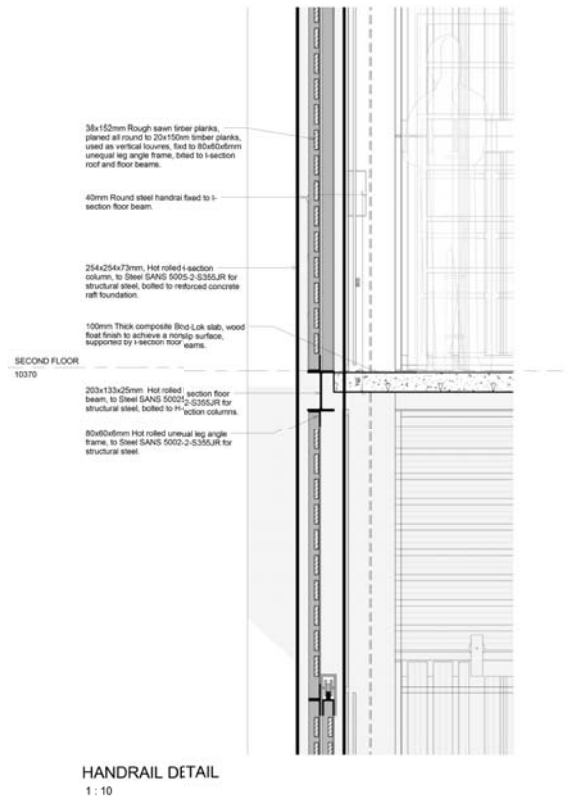
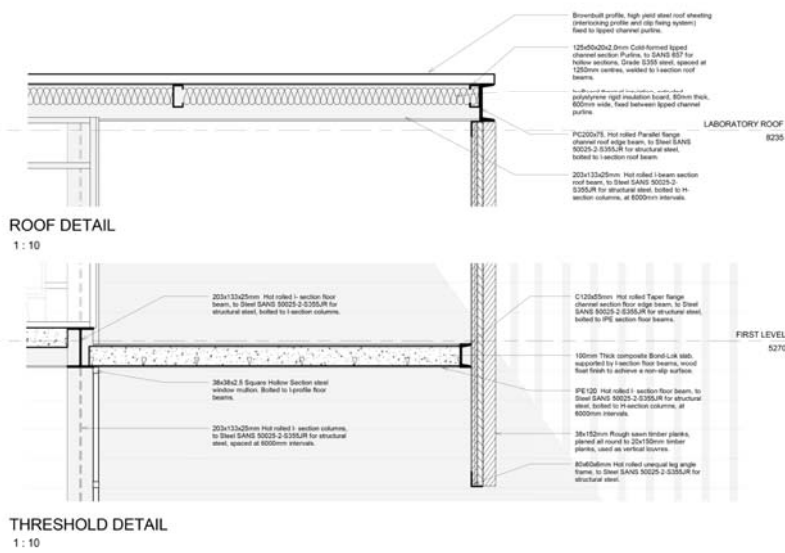


fig.8.28. DETAIL SECTIONS

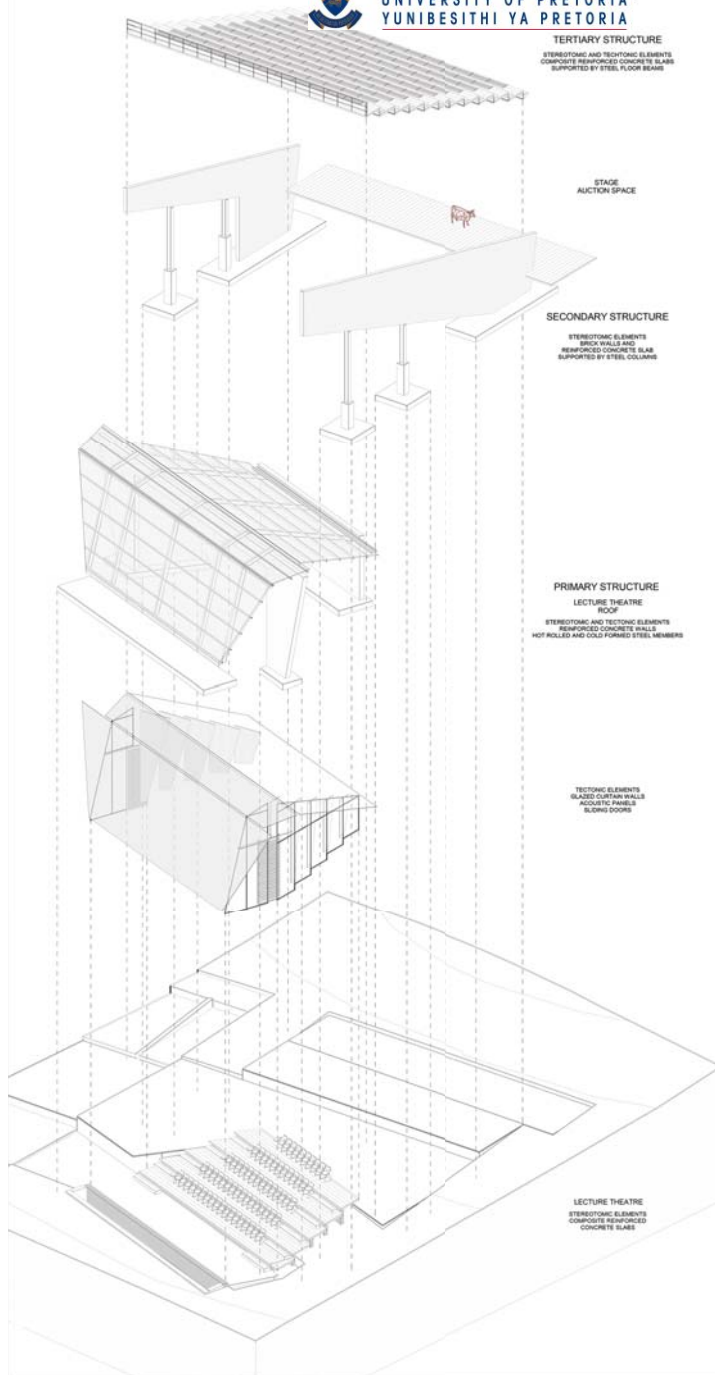
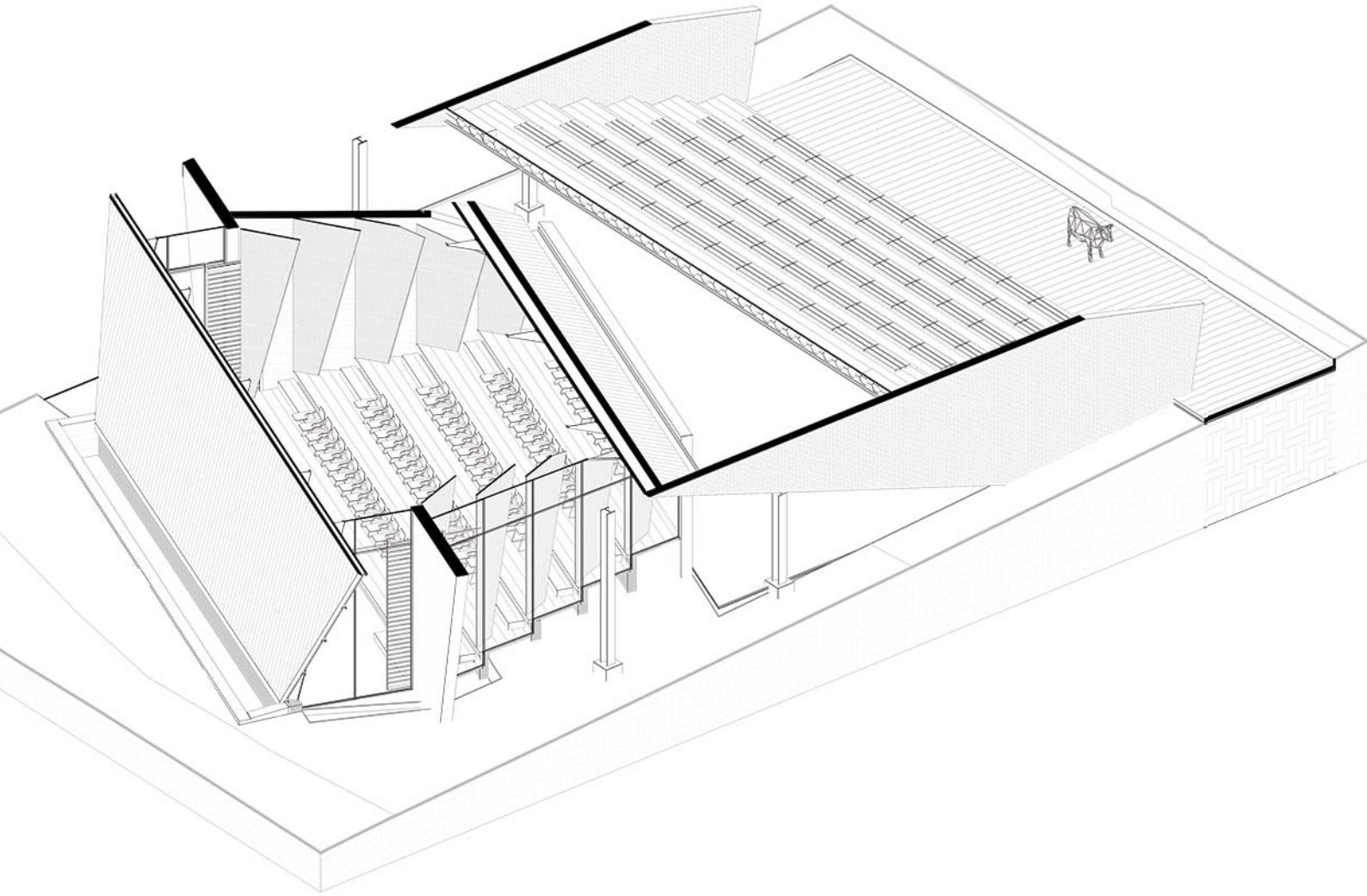


fig.8.29. LECTURE THEATRE STRUCTURE



ISOMETRIC PLAN  
LECTURE THEATRE - THEORETICAL CLASSES  
AMPHITHEATRE - AUCTIONS, FUNCTIONS

fig.8.30. LECTURE THEATRE ISOMETRIC PLAN

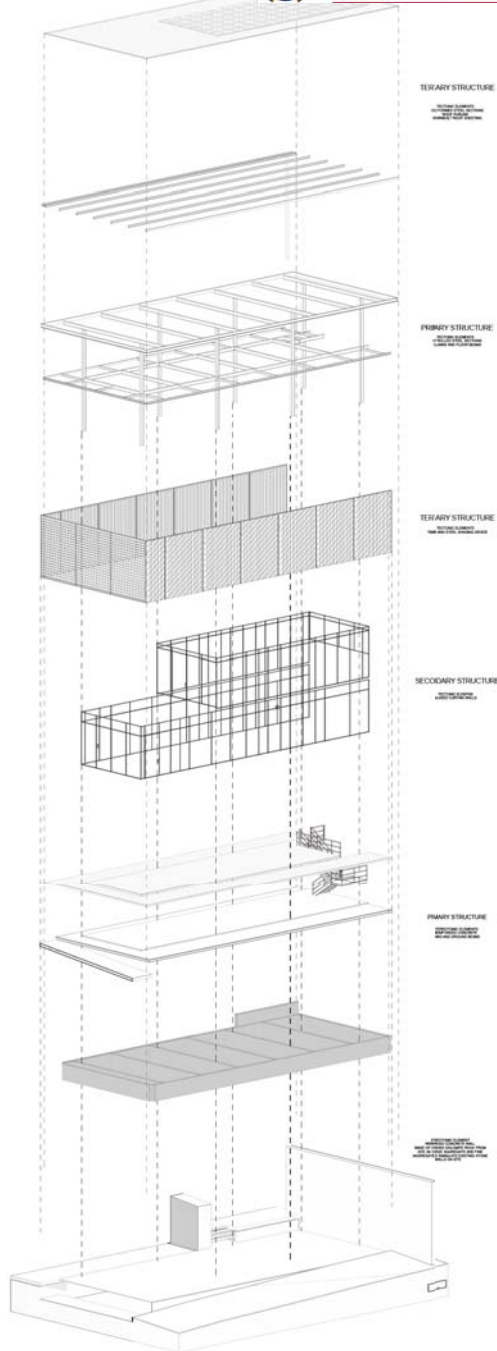


fig.8.31. LABORATORY STRUCTURE

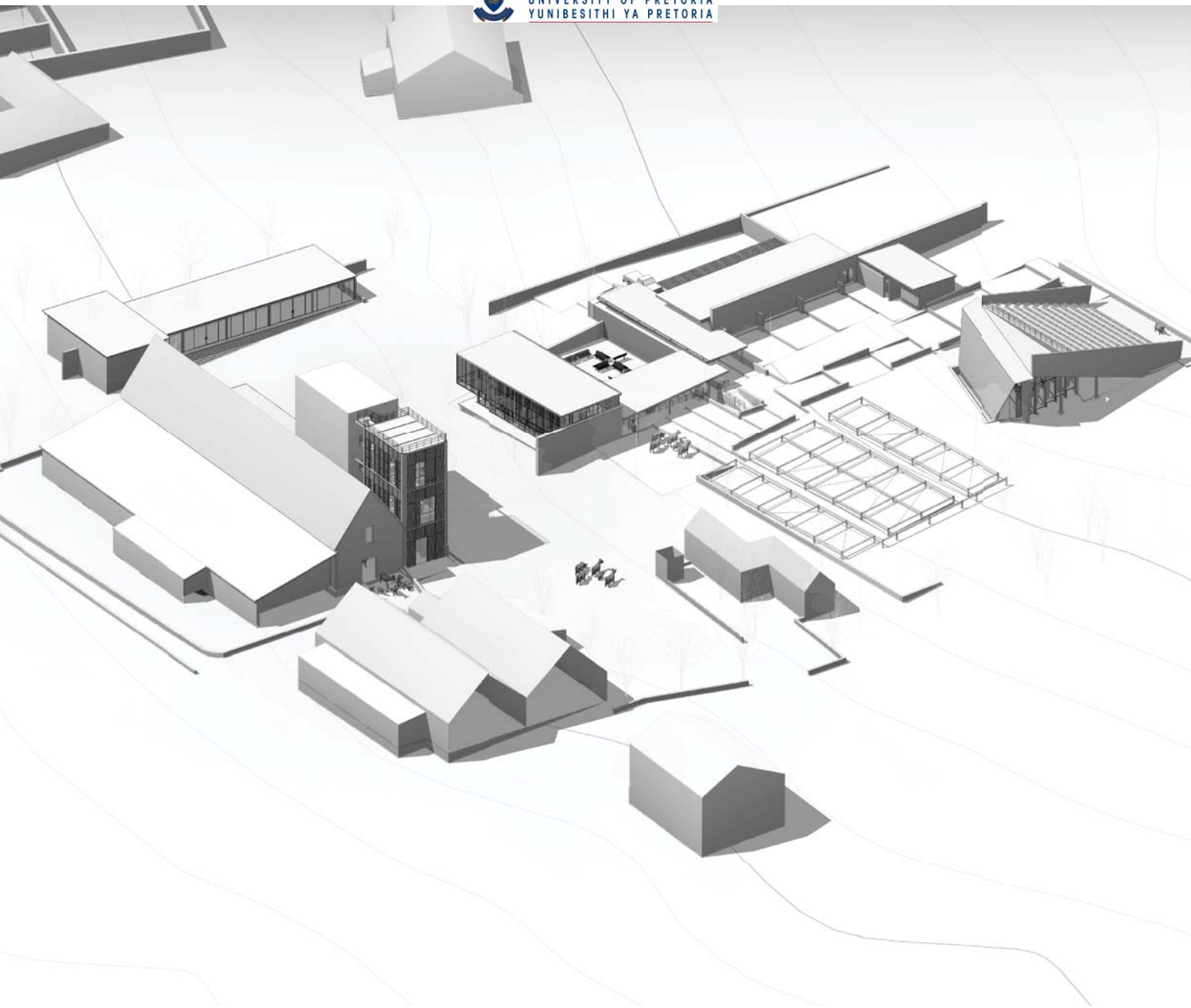


fig.8.32. FINAL AXONOMETRIC VIEW

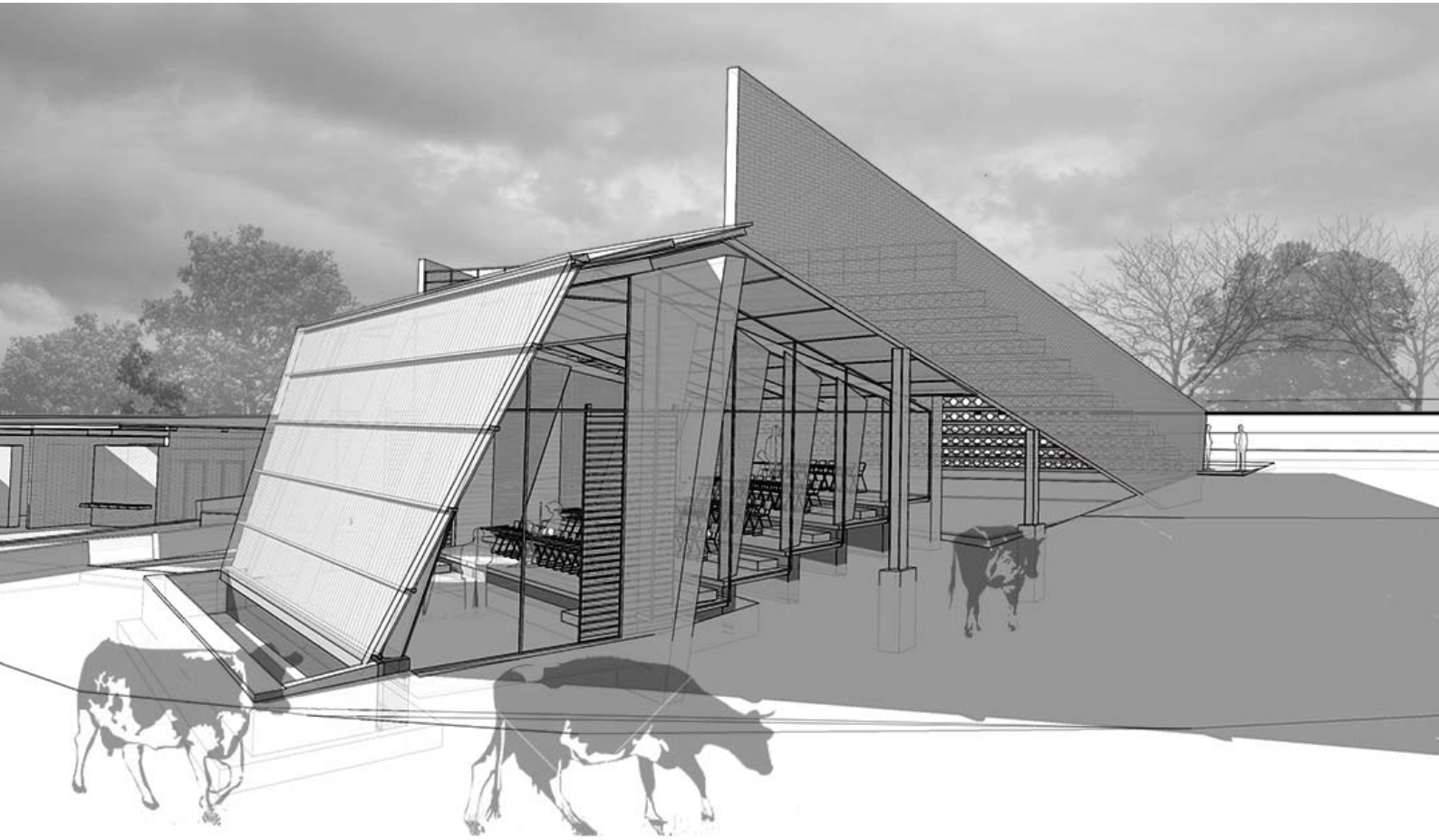


fig.8.33. LECTURE THEATRE PERSPECTIVE



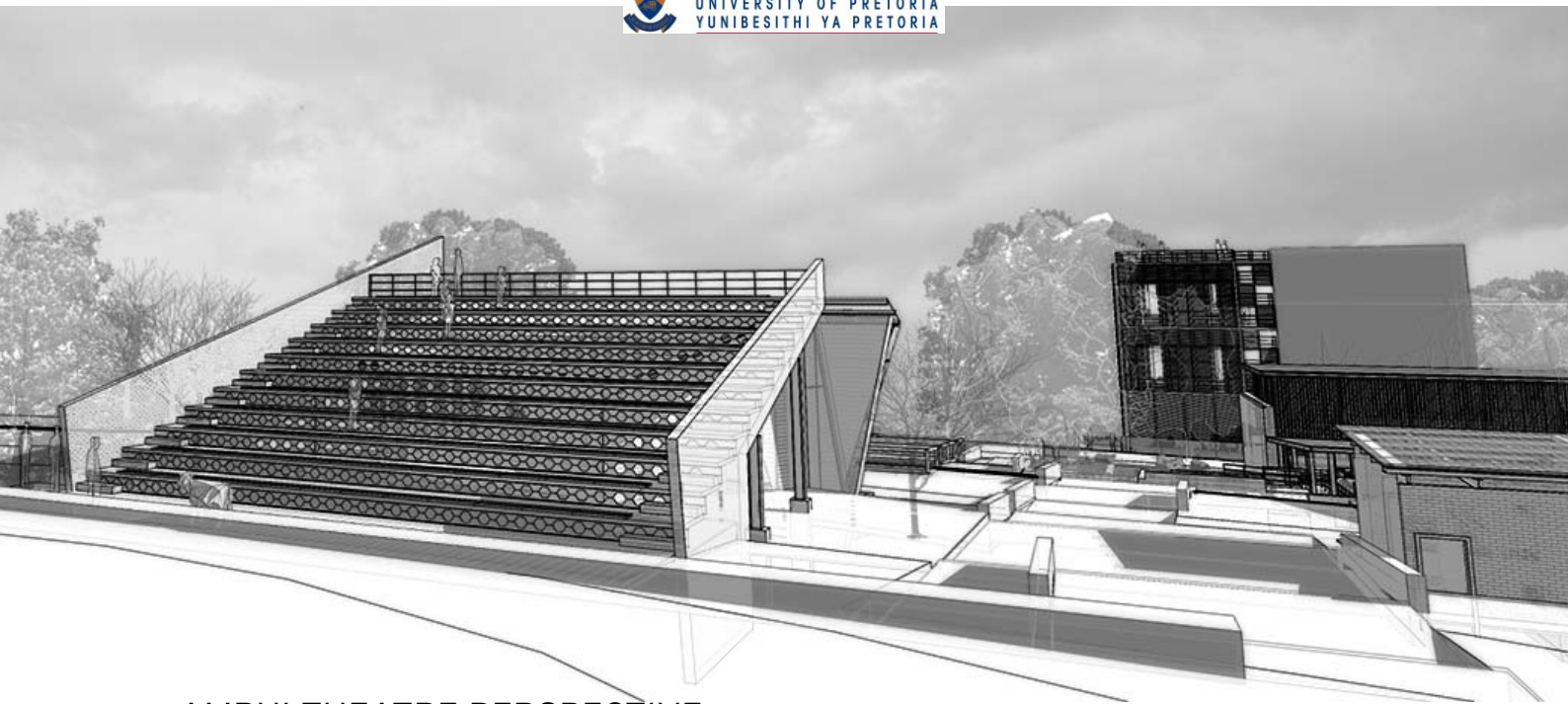


fig.8.34. AMPHI THEATRE PERSPECTIVE

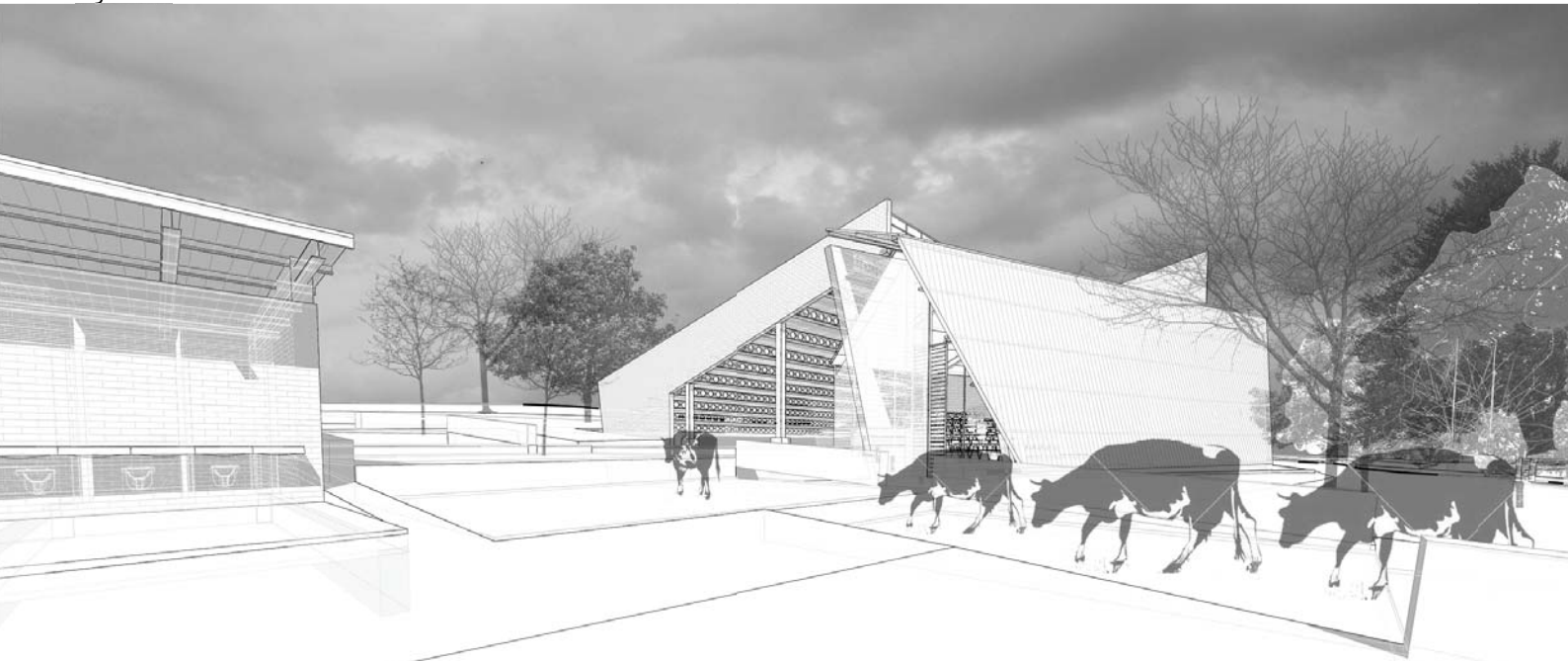
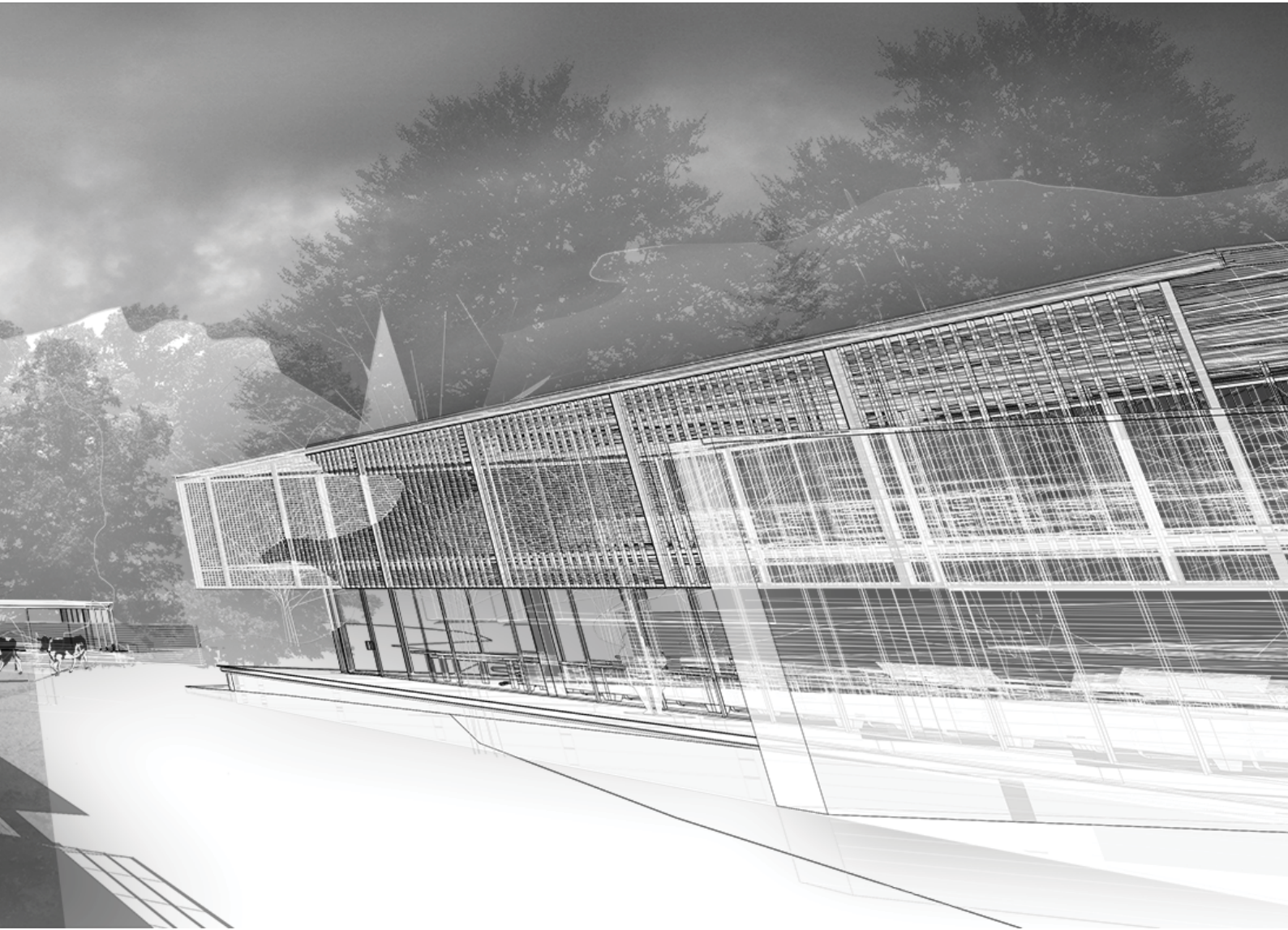


fig.8.35. LECTURE THEATRE ENTRANCE



fig.8.36. MANAGERS OFFICE



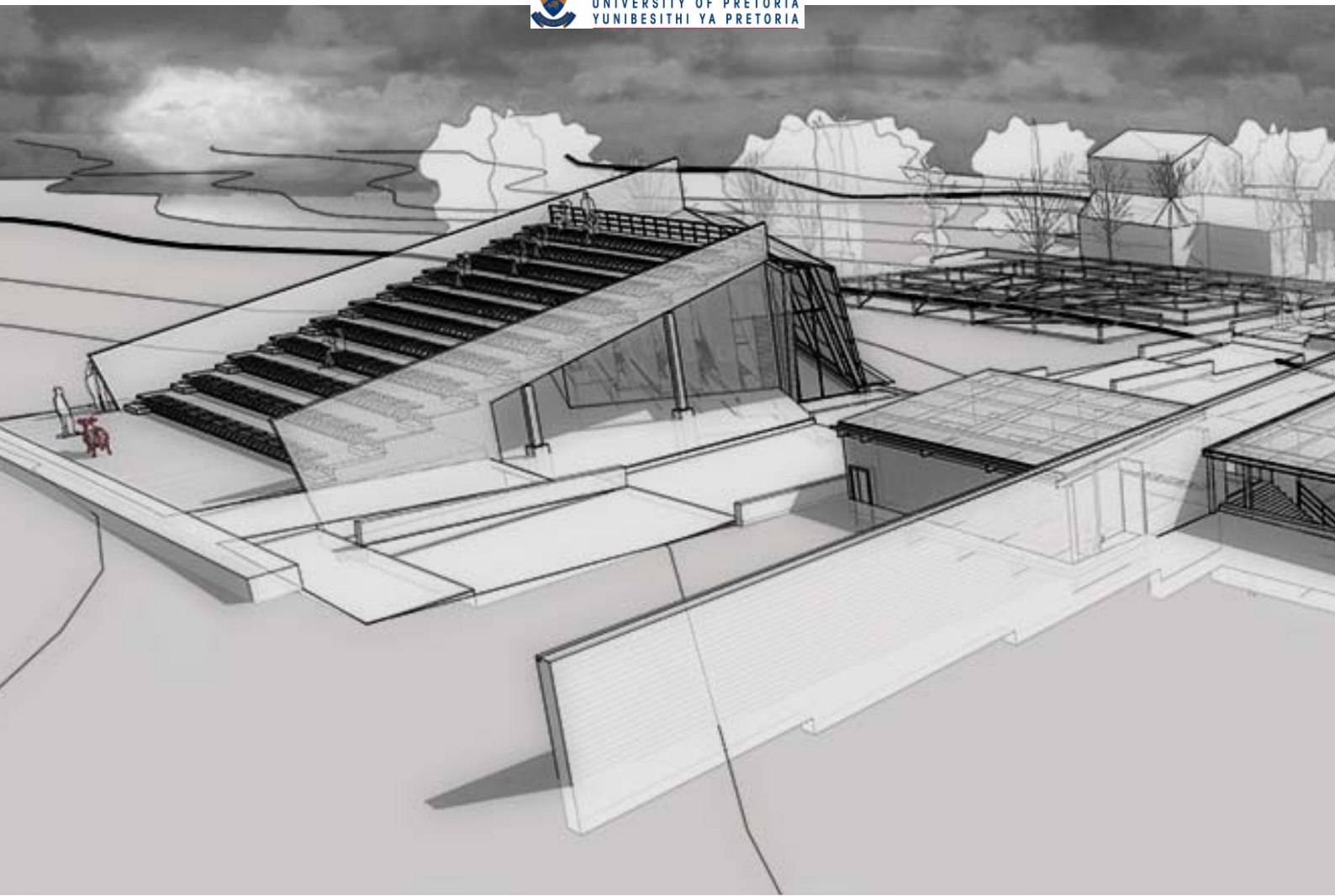
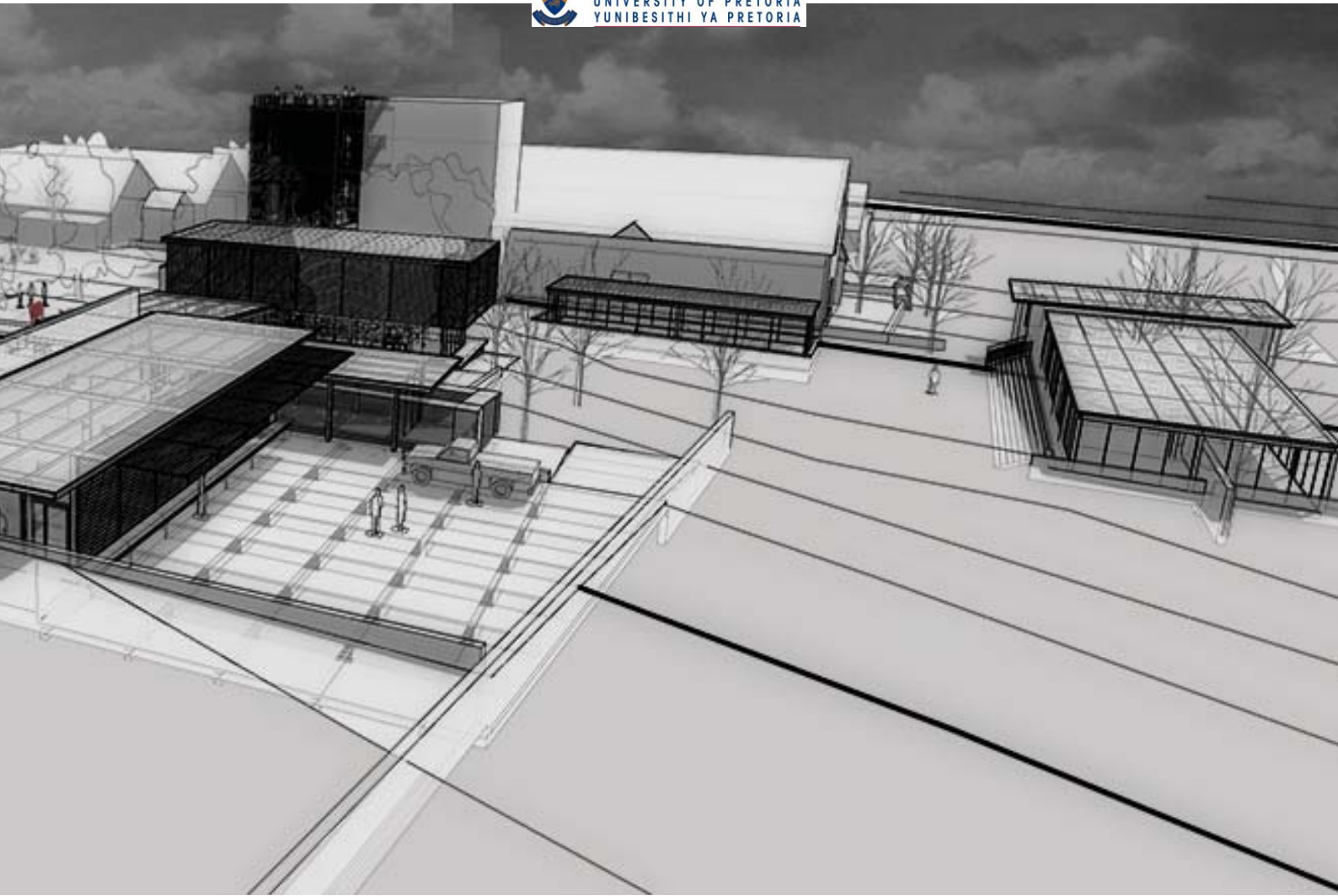


fig.8.37. AGRICULTURE EDUCATION AND TRAINING PRECINCT



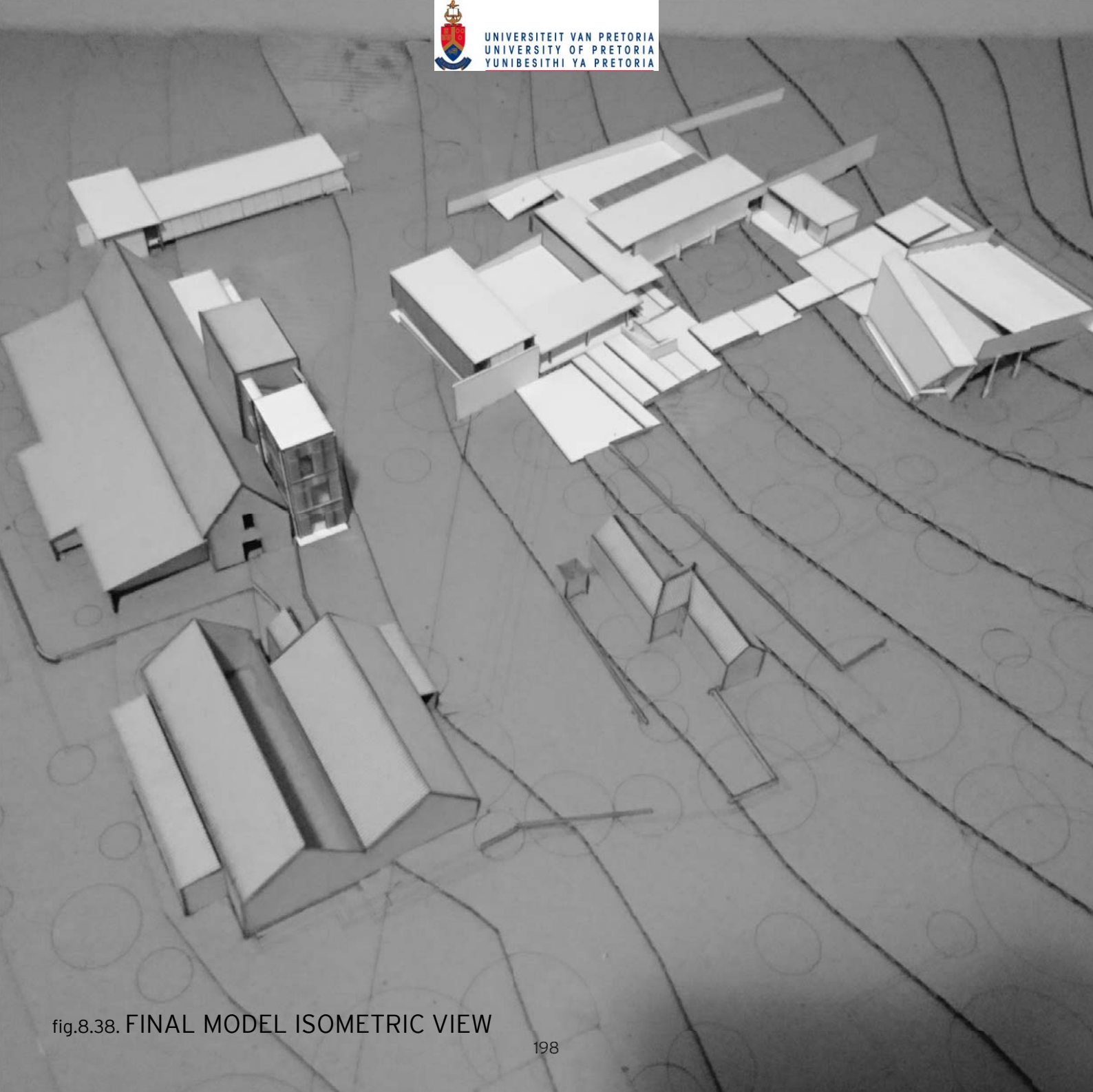


fig.8.38. FINAL MODEL ISOMETRIC VIEW

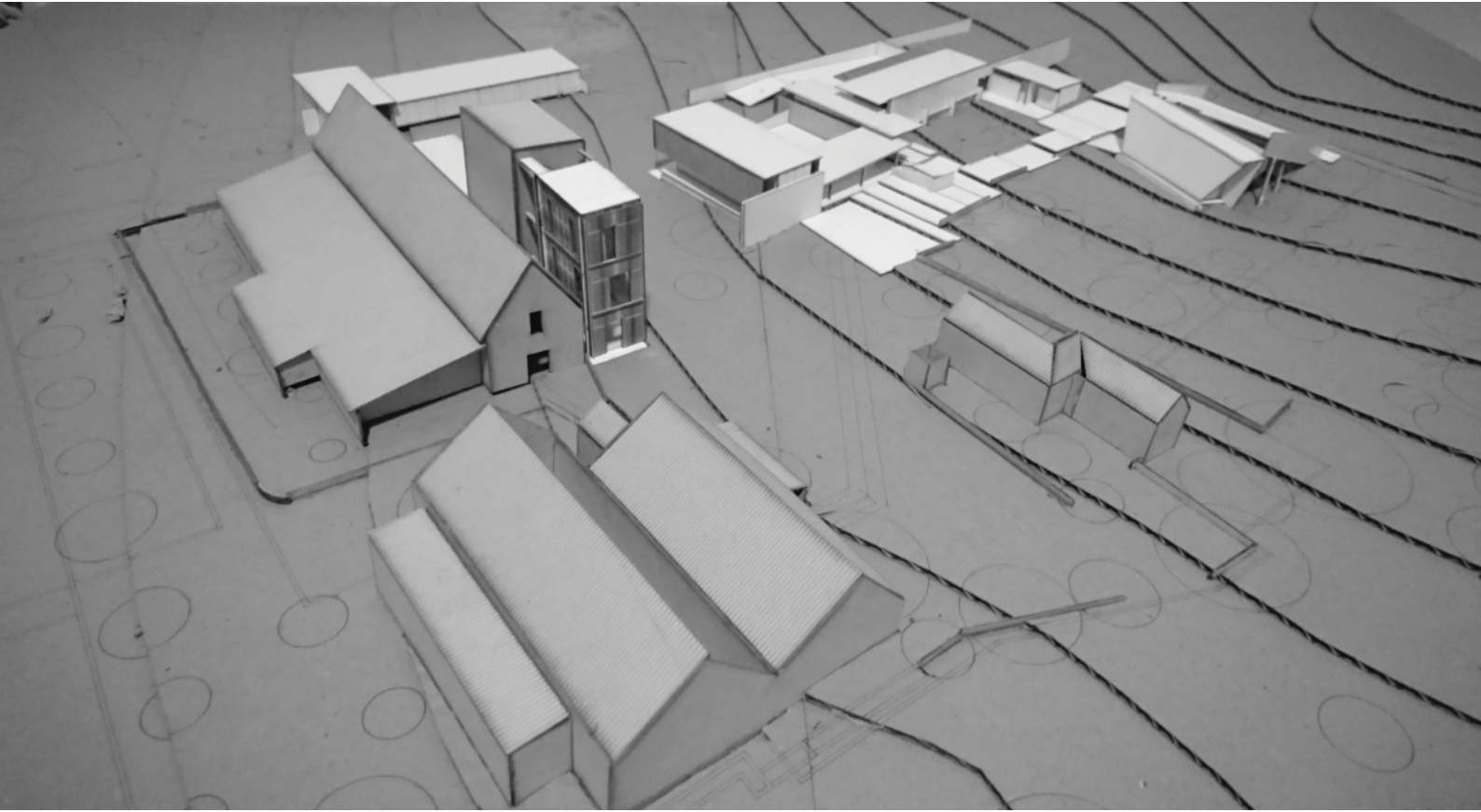


fig.8.39. FINAL MODEL PERSPECTIVE VIEW

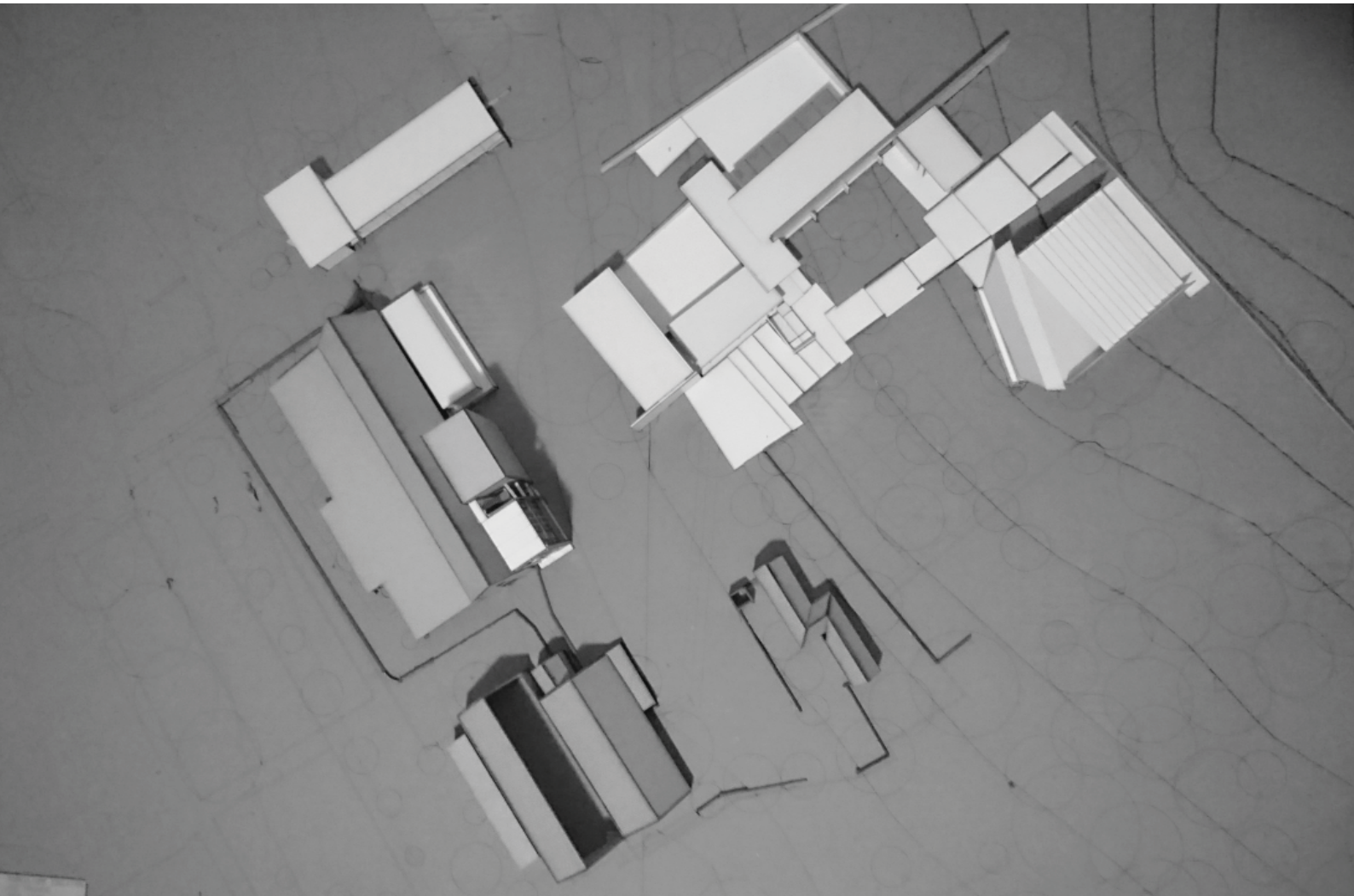


fig.8.40. FINAL MODEL PLAN VIEW



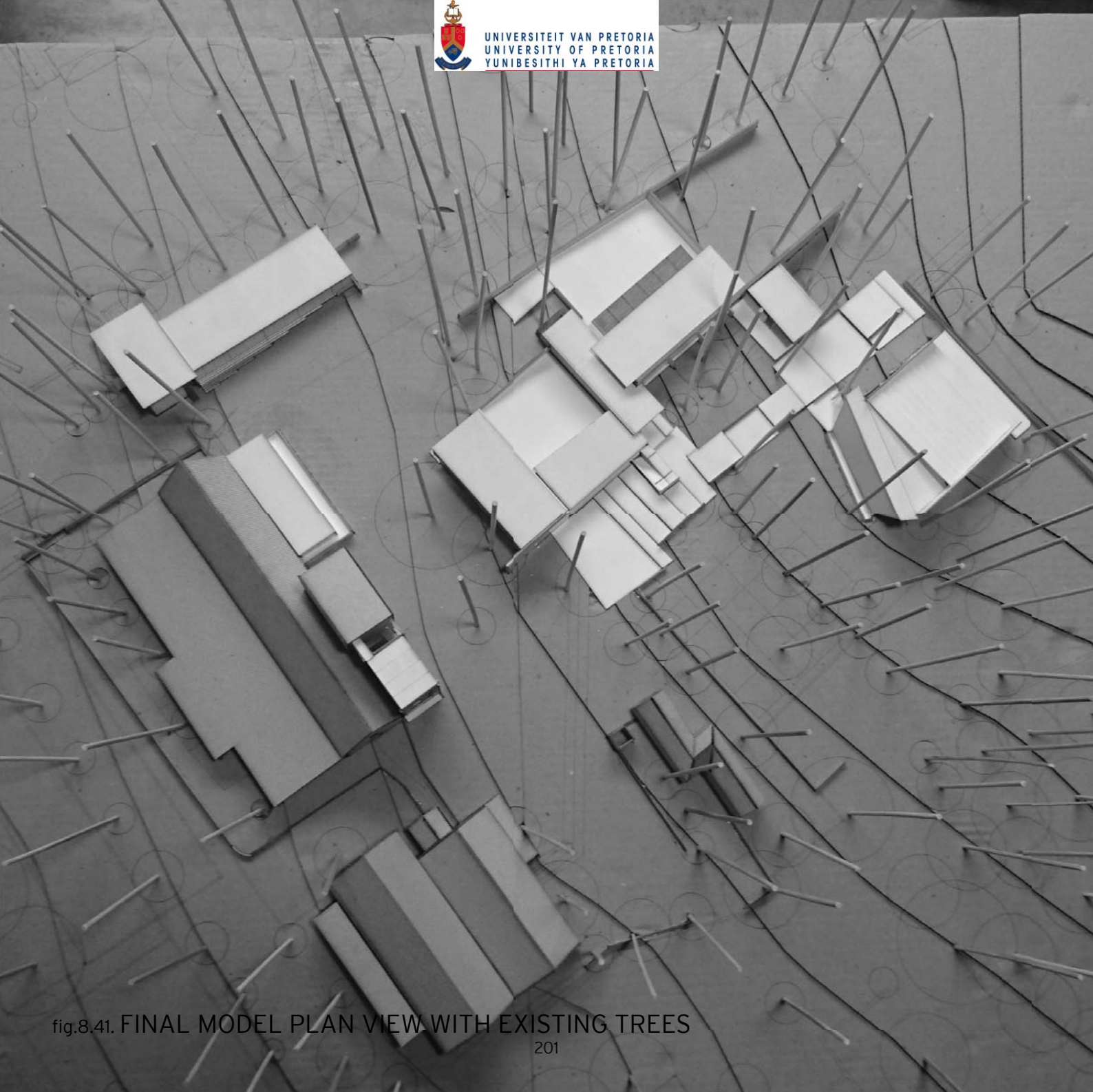


fig.8.41. FINAL MODEL PLAN VIEW WITH EXISTING TREES  
201

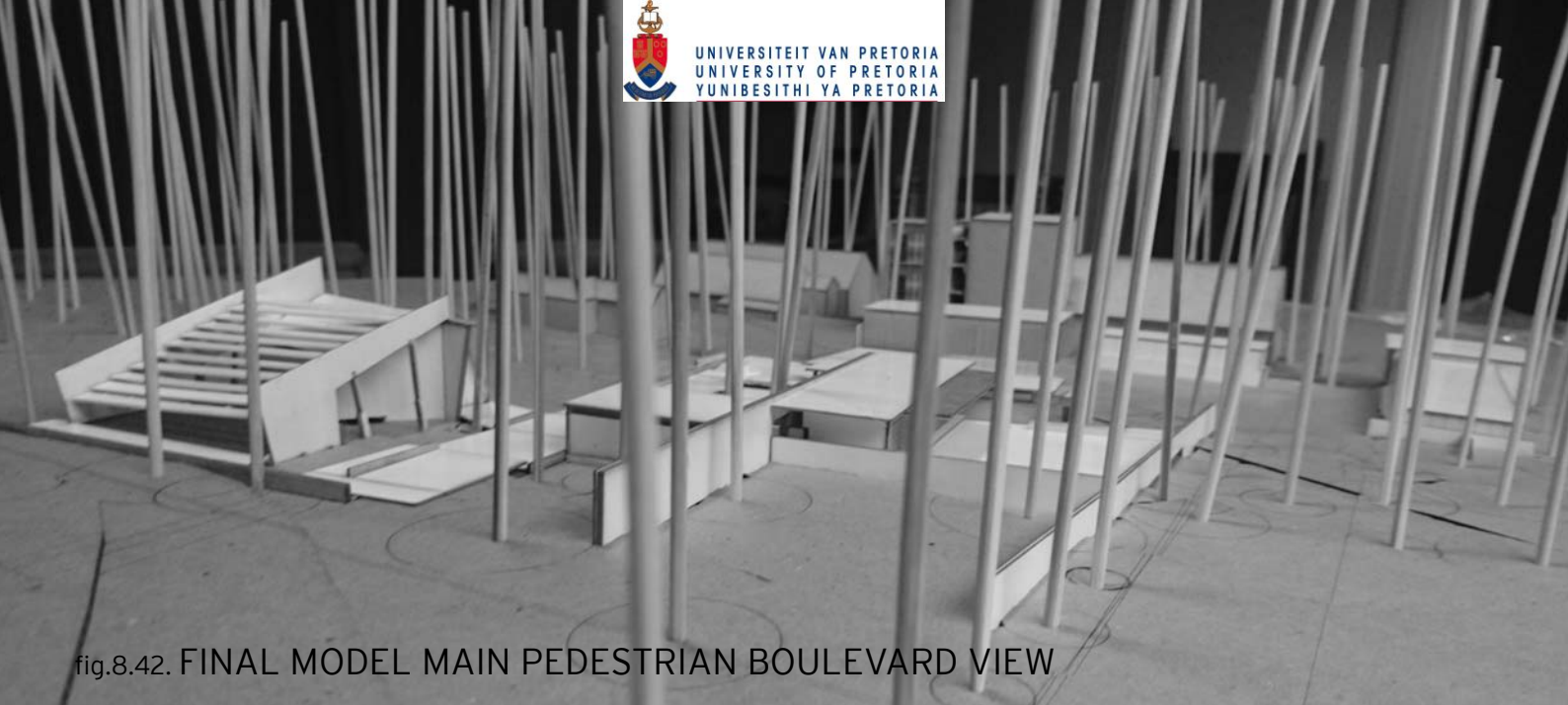


fig.8.42. FINAL MODEL MAIN PEDESTRIAN BOULEVARD VIEW



fig.8.43. FINAL MODEL AMPHI THEATRE

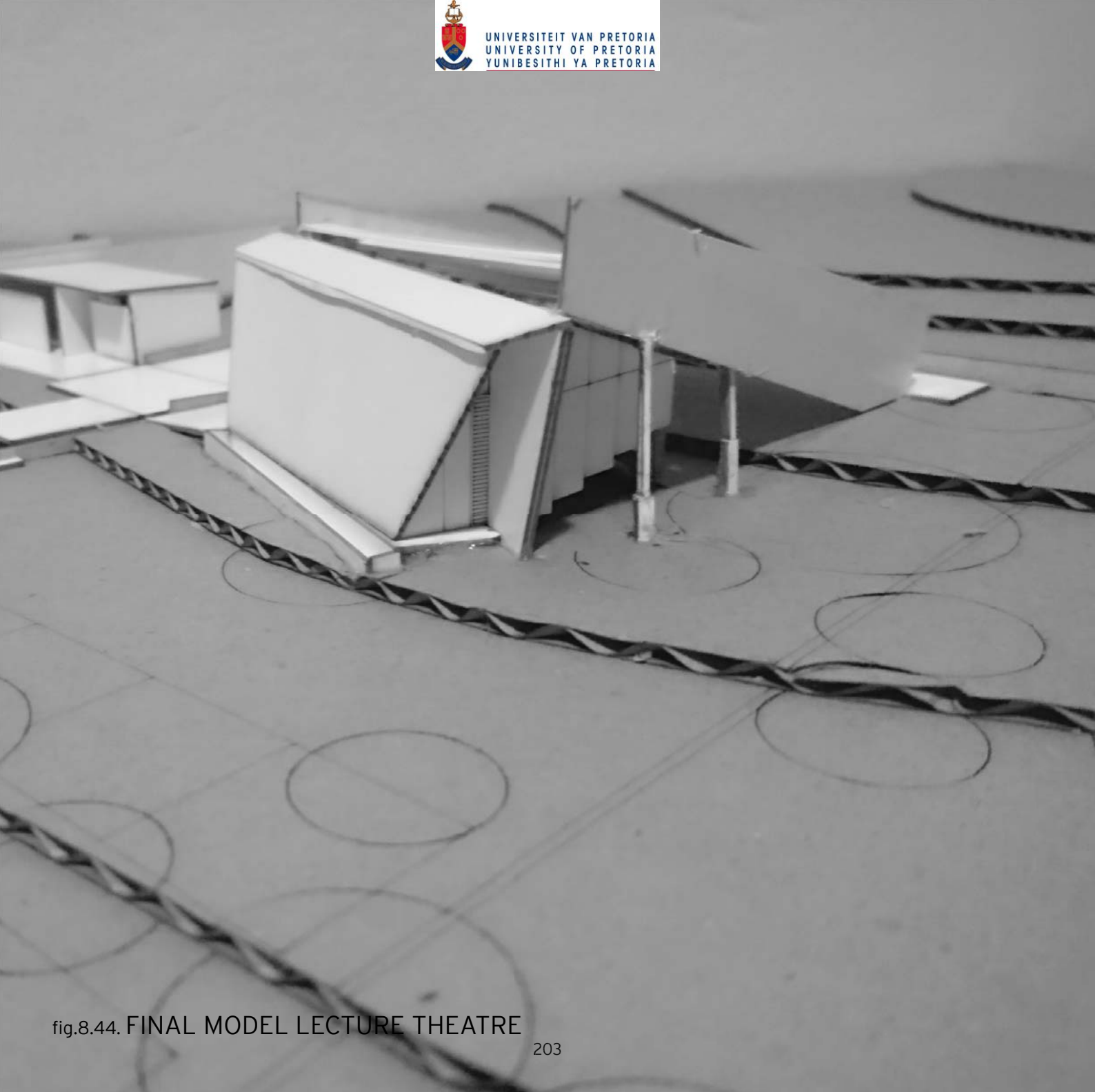


fig.8.44. FINAL MODEL LECTURE THEATRE



fig.8.45. FINAL MODEL MANAGERS TOWER



fig.8.46. FINAL STRIP MODEL OF LABORATORY AND OFFICE DECK

## CONCLUSION

The clear conclusion for the Lactis intervention on the Irene Dairy Farm is control, over the architecture that was suggested for the Agriculture Education and Training facility. The proposed programme is perfectly suited for the current education milieu in South Africa, where funding for the masses in terms of education is crucial and not readily available. With the funding from an established estate, the Irene Dairy Farm, agricultural education will address a need for affordable education in a sector that will soon become in high demand in the southern African region.

Through the course of the year the design has developed to become better suited for the farm and the specific space where the architecture was proposed. It was in turn determined and almost dictated by the existing conditions and buildings that surround the new buildings. The proposed scheme for the June examination had an alien aesthetic to the existing architecture and would not have functioned as intended. The intent was that the new design should intervene but not interfere with the existing conditions, in terms of aesthetics as well as function.

If the question is raised that would this be possible? Definitely, with suitable funding from the land owners and government, this programme will surely make a difference in the gap between secondary and tertiary education as a high-tech college.





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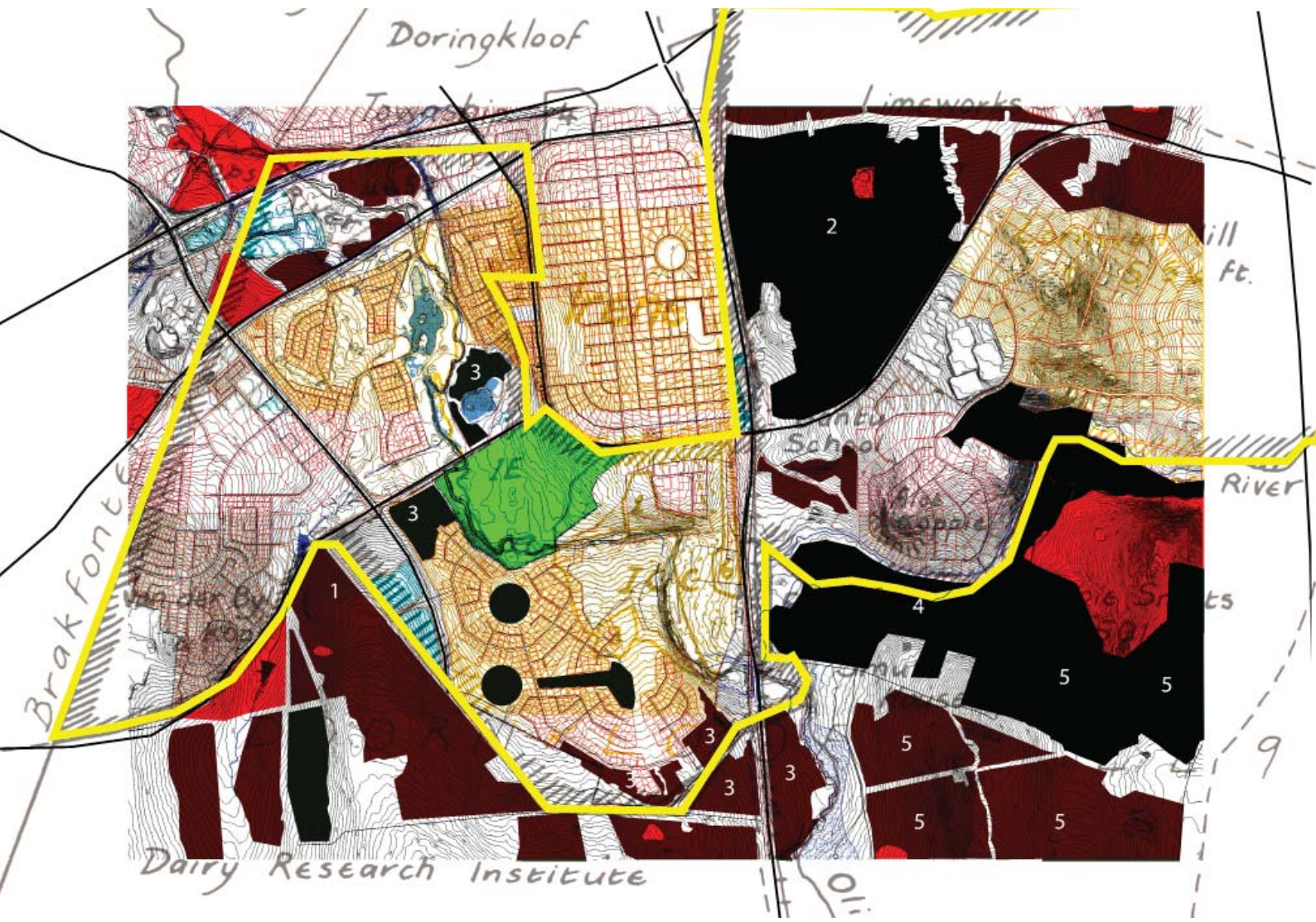
## APPENDIX 1

# IRENE

# URBAN FRAMEWORK

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<p>1830</p> <p>BOER VOORTEKKER DANIEL ELARDUS ERASMUS LEAVES CAPE TOWN ON THE GROOT TREK.</p>	<p>1844</p> <p>DANIEL ERASMUS REGISTERS THE TITLE DEADS FOR THE FARM DOORNKLOOF.</p>	<p>1855</p> <p>THE VILLAGE ON THE NEIGHBOURING FARM ELANDSPDOORT IS NAMED PRETORIA.</p>	<p>1889</p> <p>A.H. NELLMAPIUS BUYS TWO THIRDS OF THE ERASMUS FARM, NAMED THE FARM AFTER HIS DAUGHTER.</p>	<p>1889</p> <p>NELLMAPIUS COMMISSION WILLEM DE ZWAAN TO DESIGN HIS HOUSE AND STABLE.</p>	<p>1893</p> <p>THE FIRST TRAIN ARRIVES AT THE NEWLY BUILT IRENE TRAIN STATION.</p>	<p>1896</p> <p>J.A. VAN DER BYL BECOMES THE NEW OWNER OF IRENE FARM.</p>
<p>1898</p> <p>HACK'S &amp; CO LTD. THE FIRST TRADING STORE OPENS NEAR THE TRAIN STATION.</p>	<p>1899</p> <p>THE SECOND BOER WAR BREAKS OUT.</p>	<p>1902</p> <p>THE IRENE TOWNSHIP IS ESTABLISHED BY J.A. VAN DER BYL.</p>	<p>1903</p> <p>IRENE FARM BECOMES HOME TO THE GOVERNMENT TREE NURSERY.</p>	<p>1908</p> <p>J.C. SMUTS BUYS THE LAST THIRD OF THE FARM DOORNKLOOF STILL BELONGING TO THE ERASMUS FAMILY.</p>		
<p>1911</p> <p>THE ESTABLISHMENT OF THE IRENE COUNTRY CLUB.</p>	<p>1937</p> <p>THE MARIE VAN RIEBEECK NATURE RESERVE IS PROCLAIMED, TODAY KNOWN AS THE RIETVLEI NATURE RESERVE.</p>	<p>1954</p> <p>THE ESTABLISHMENT OF THE NATIONAL DAIRY RESEARCH INSTITUTE ON THE IRENE FARM.</p>	<p>1974</p> <p>IRENE ESTATE'S LINE WORKS HAD TO BE CLOSED DOWN.</p>	<p>1998</p> <p>CORNWALL HILL RESIDENTIAL ESTATE IS ESTABLISHED.</p>	<p>2003</p> <p>THE FIRST RESTAURANT IS BUILT IN THE ORIGINAL BARN ON THE IRENE FARM, THE BARN.</p>	<p>2006</p> <p>THE SOUTHDOWN'S COUNTRY ESTATE IS ESTABLISHED.</p>

# IRENE TIME LINE

(After Swanepoel, M. 2012:15,16,18,20)



IRENE 1937  
(Helme, N. 1976)



# IRENE 1971

(Helme, N. 1976)



**IRENE 2013**  
(City of Tswane, Pretoria Aerial photos. 2013)



Landscape Urbanism: "urban infrastructure sows the seeds of future possibility, staging the ground for both uncertainty and promise" - James Corner (Hess, 2014: 2)

The Approach: Landscape Urbanism

Landscape as Urbanism (Hess, 2014: 2)

The Vision

The resurrection of land

The Method

- Continuous productive urban landscapes (C-PUL)
- Slow food model
- Regenerative landscape architecture

Case Studies

Themes

The application

-Ecological and urban processes over time  
Change in landscape fabric & Urban sprawl (Hess, 2014: 2)

Deterioration of ecological processes (namely disturbed forests, bogs, hydrological systems and urban processes: urbanisation, fragmentation, isolated land parcels, social and economic segregation)

Rehabilitation of greenlands  
Water purification, public parks, pedestrian oriented movement, scenic integration through trade.



Quilba, Brazil

-Bracing of horizontal surfaces  
Ground plane as field of action  
Flange of soles  
Surface continues - Roads & grounds become one.

Open and unused landscape areas are being reappropriated and given new programmatic activities. The landscape is central to the shaping of urban relationship leading to improved integration through green corridors, pedestrian movement and the flow of programme from site to site.

Agricultural Land, Grazing land, Food cultivation, Green corridors, Linking of open land reserves



Flange street (food) farm, Brooklyn, NYC

-Operation of working method  
Utopian + Operative strategy

Agrarian Vision: implementation of productive landscapes "It requires the participation of landowners, investors, residents and representatives of civil society, which identifies particular urban areas for transformation as part of a wider metropolitan strategy"

Material exercises include public furniture, agrarian typologies, pedestrian movement, Public parks, etc. all linked to agricultural activity



Babylonstoren, Western Cape

-Imagery (Hess, 2014: 2)  
Collective imagination - stimulated by awareness of the material world  
Approach to reintroduce imagination into the 21st Century which have disappeared amongst rationalisation and development practices

Historic narrative and agricultural genius loci is reconstituted.  
"A modernist created a 21st century Broad acres city"  
"Materiality, representation and imagination are not separate worlds."

The physical acts as a model of landscape urbanism movement encompassing the tangible and intangible aspects of an integrated productive landscape project



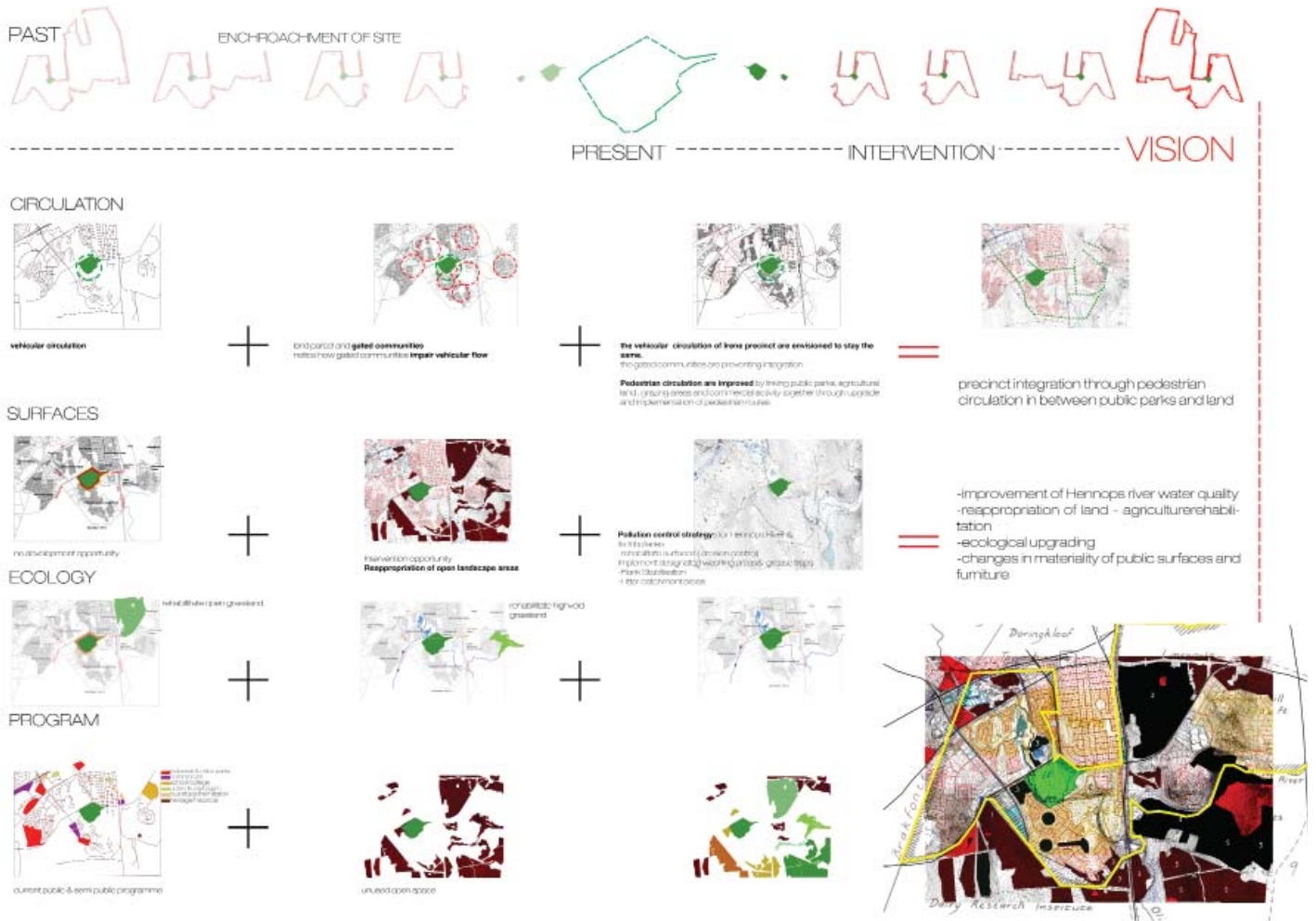
Crossways farm, Kogale, Chris Nauder Architects

# LANDSCAPE URBANISM

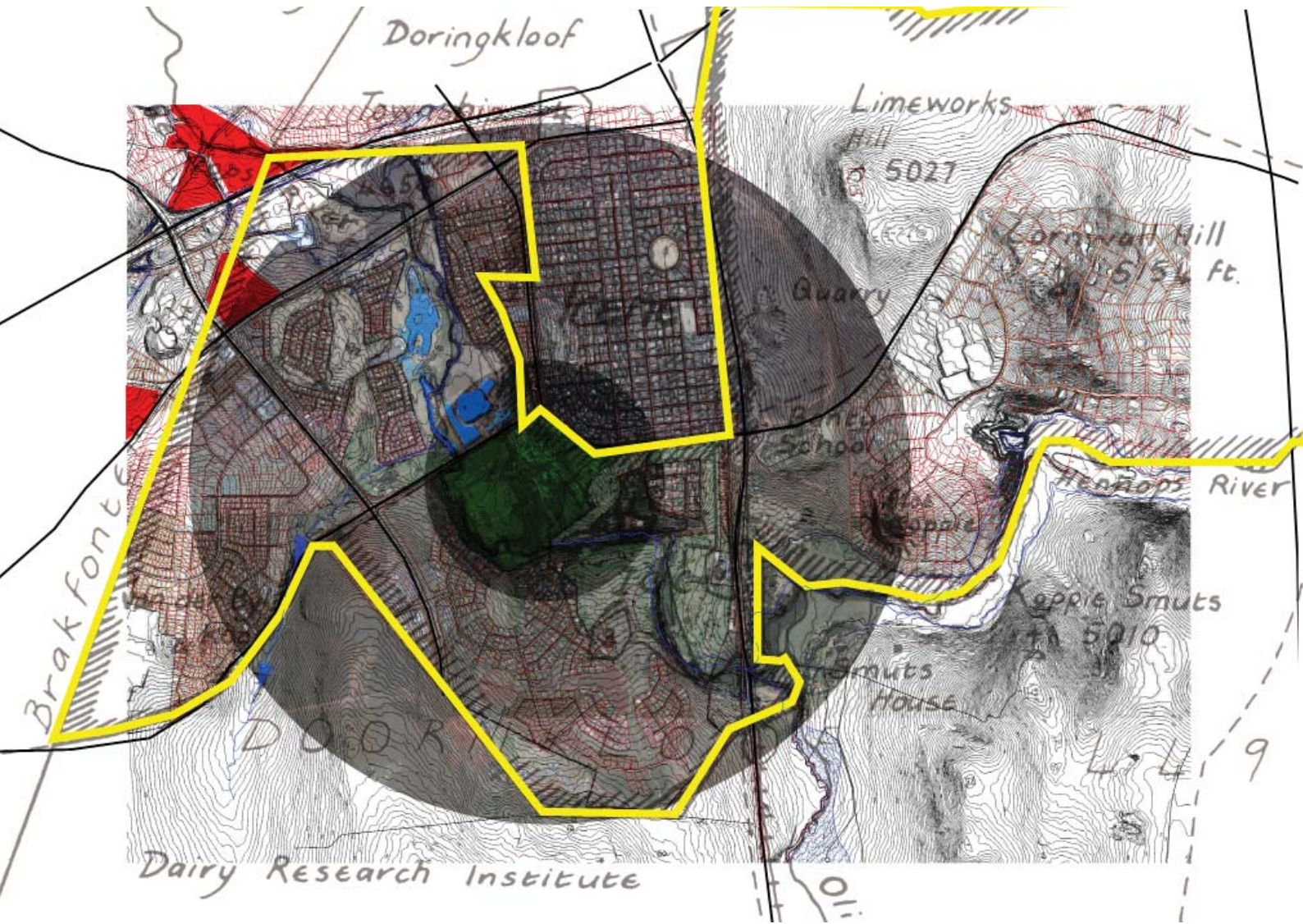




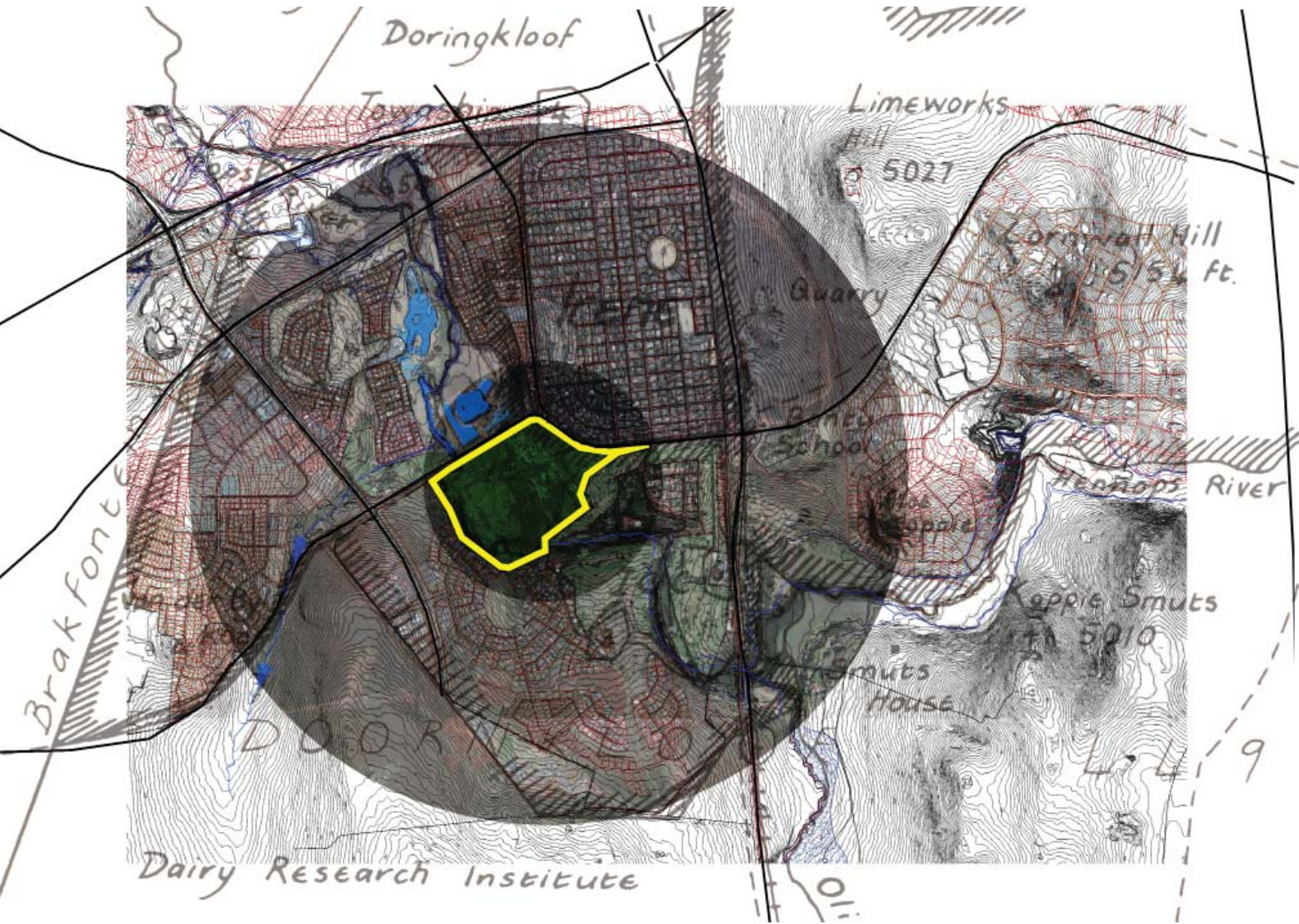
# IMAGINARY LANDSCAPE



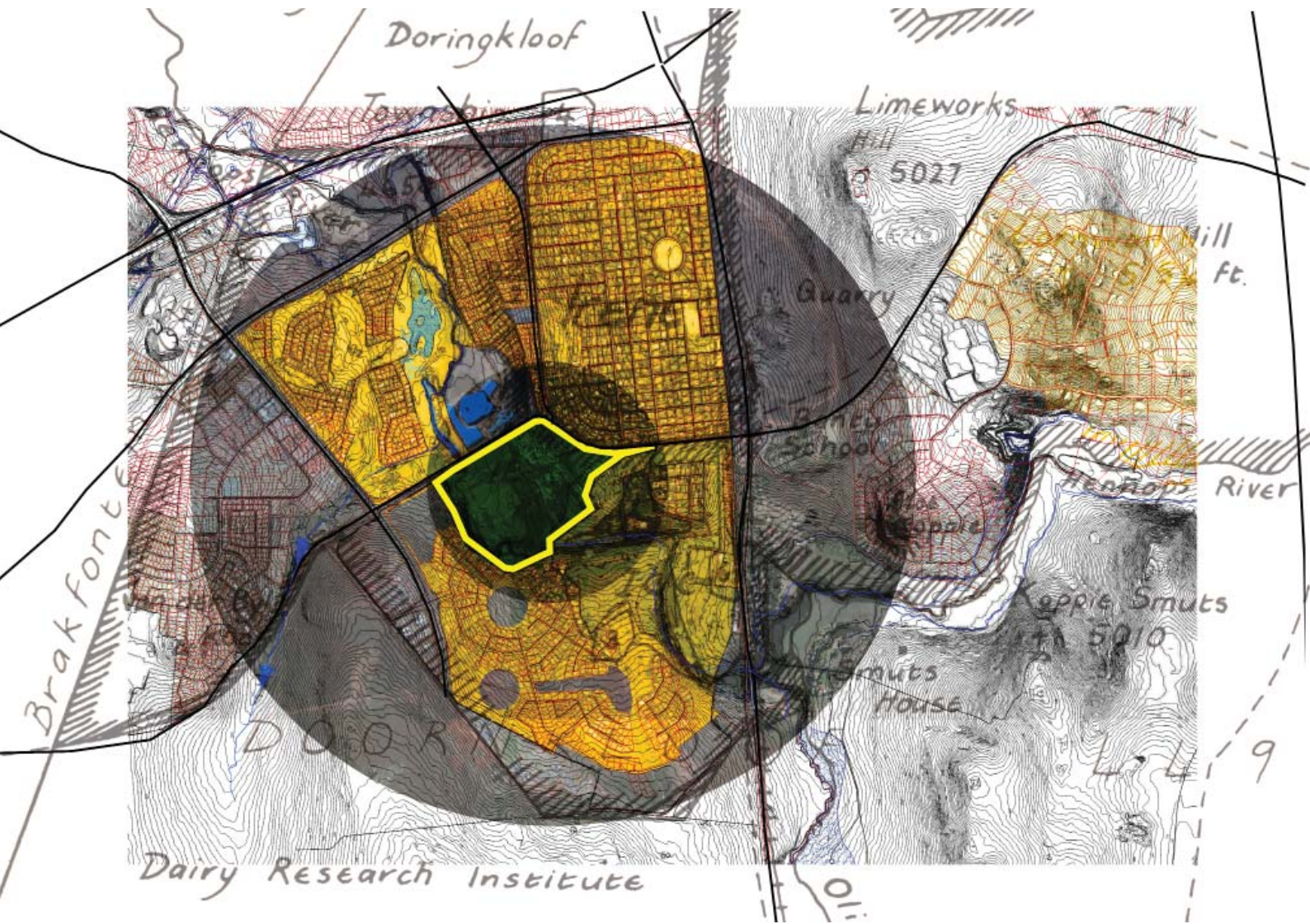
# IRENE VISION



## ORIGINAL FARM BOUNDARY

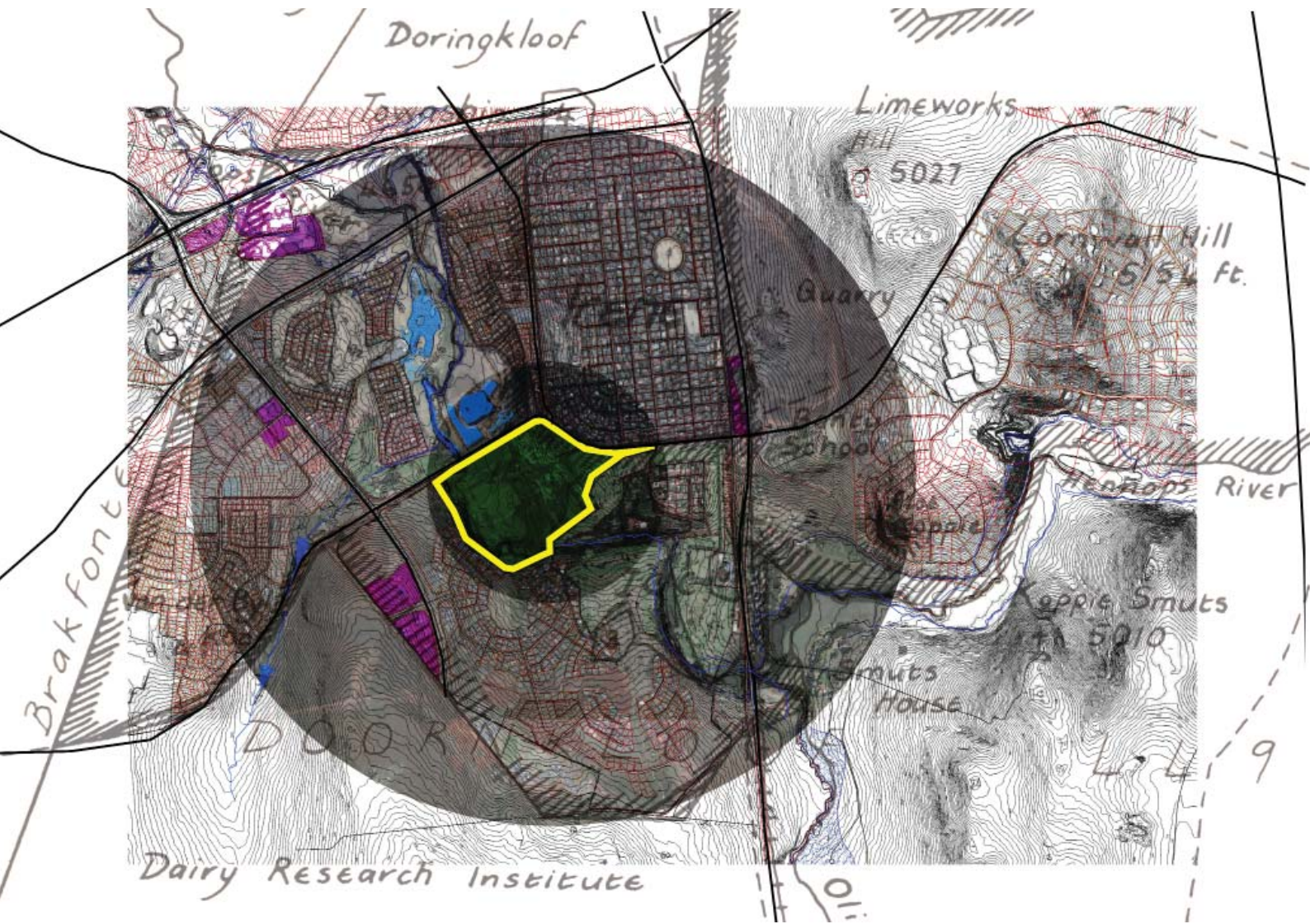


## CURRENT IRENE FARM BOUNDARY



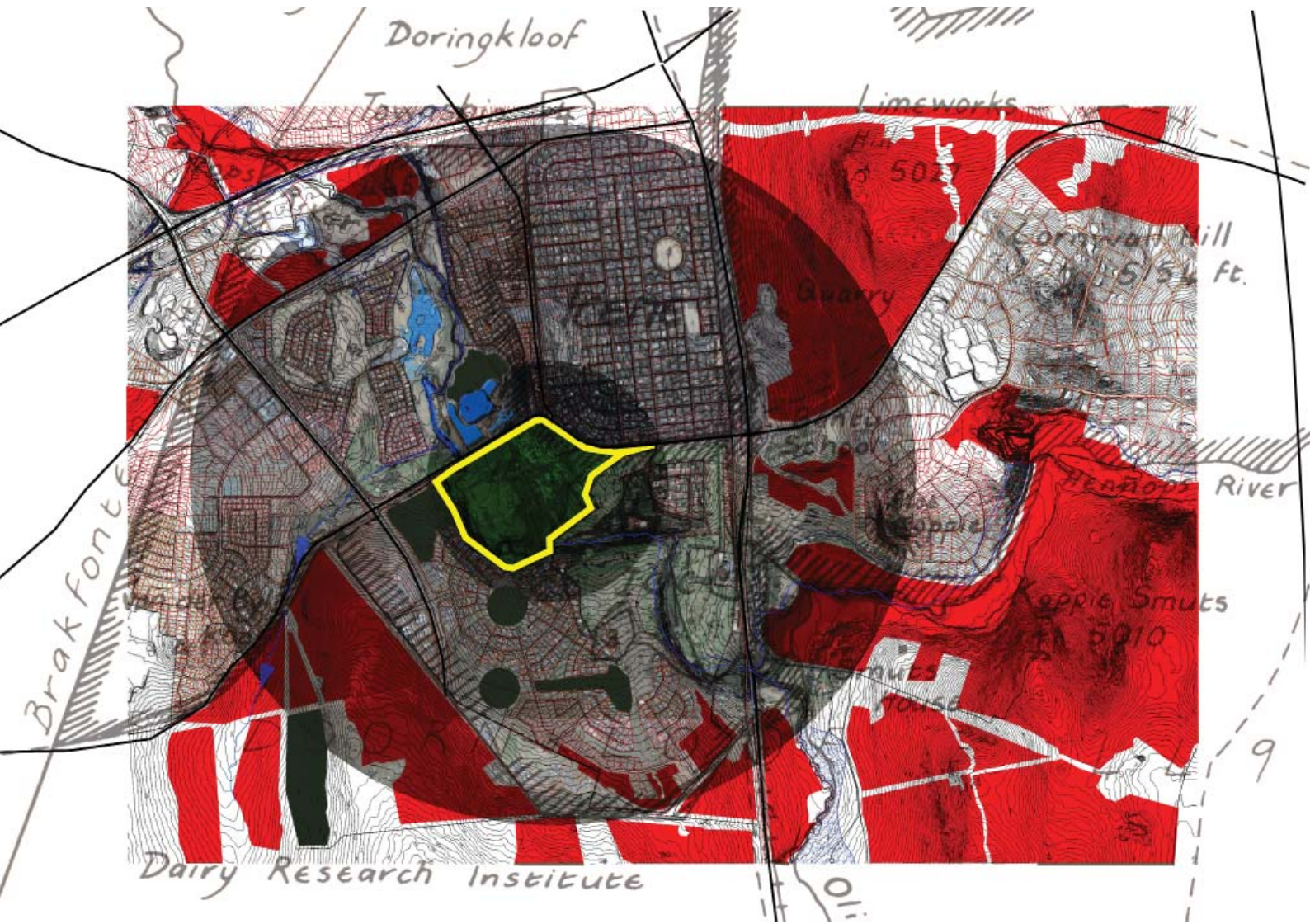
## GATED COMMUNITIES

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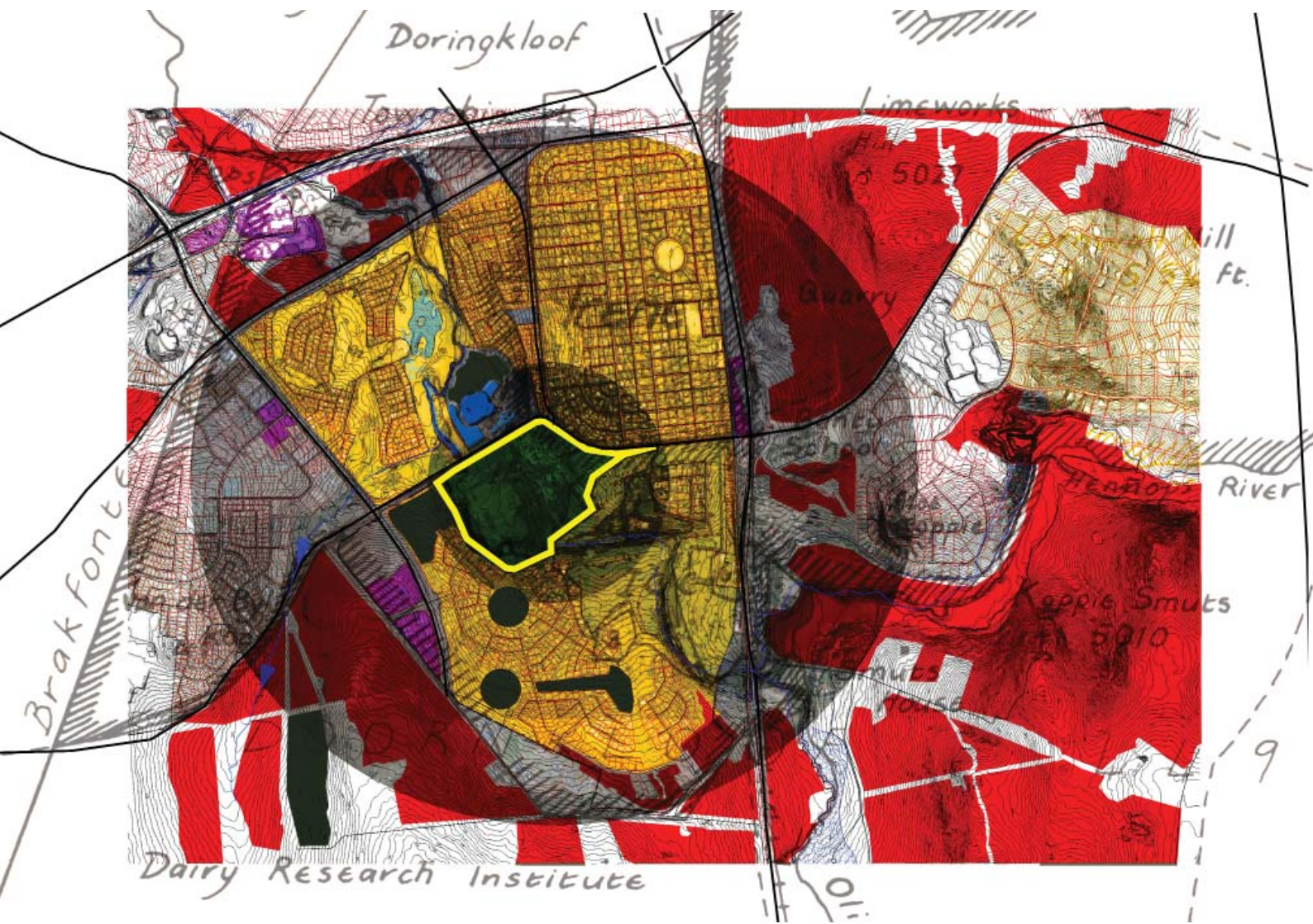
## COMMERCIAL ACTIVITIES

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## HORIZONTAL SURFACES

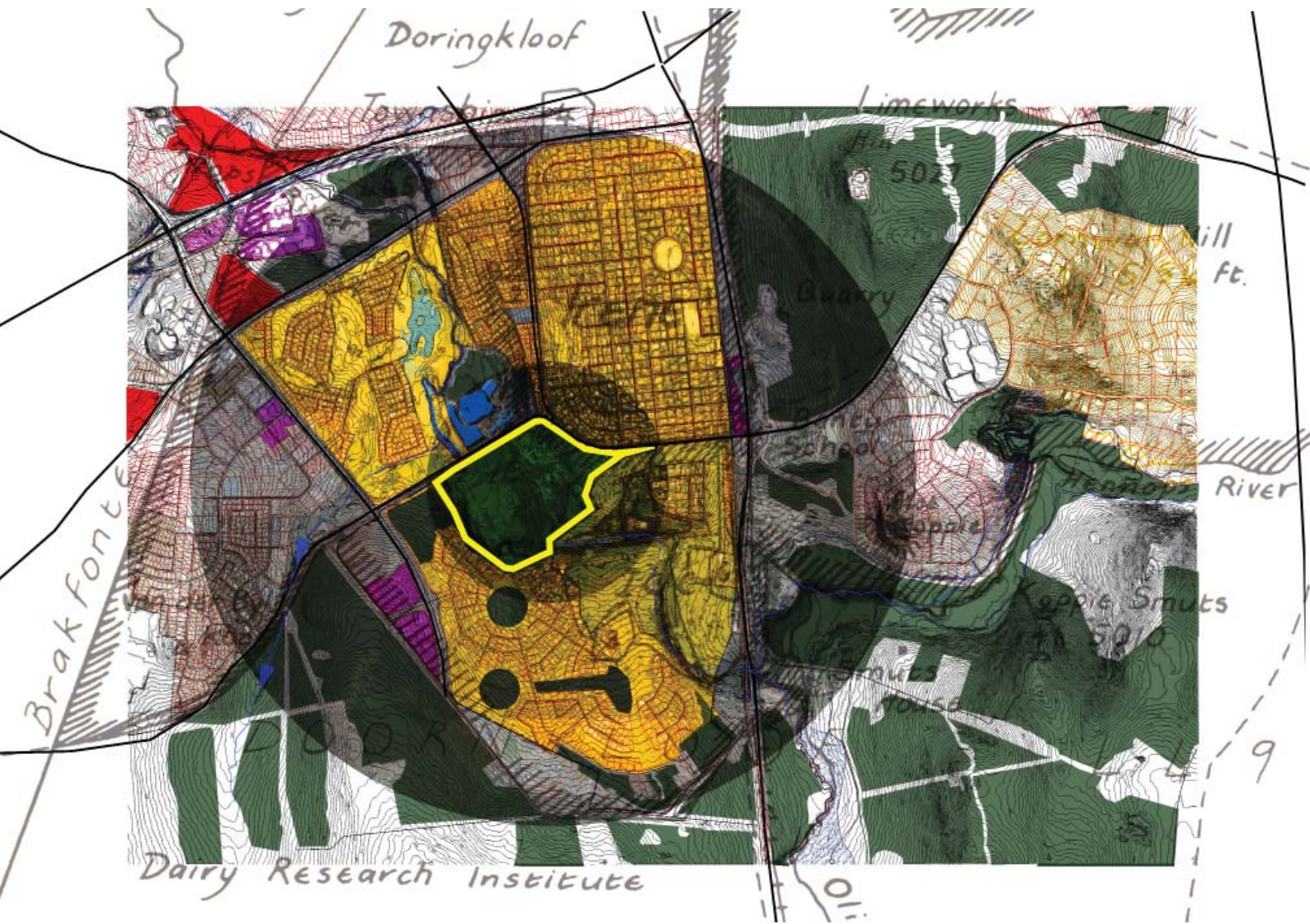
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## UNUSED OPEN SITES

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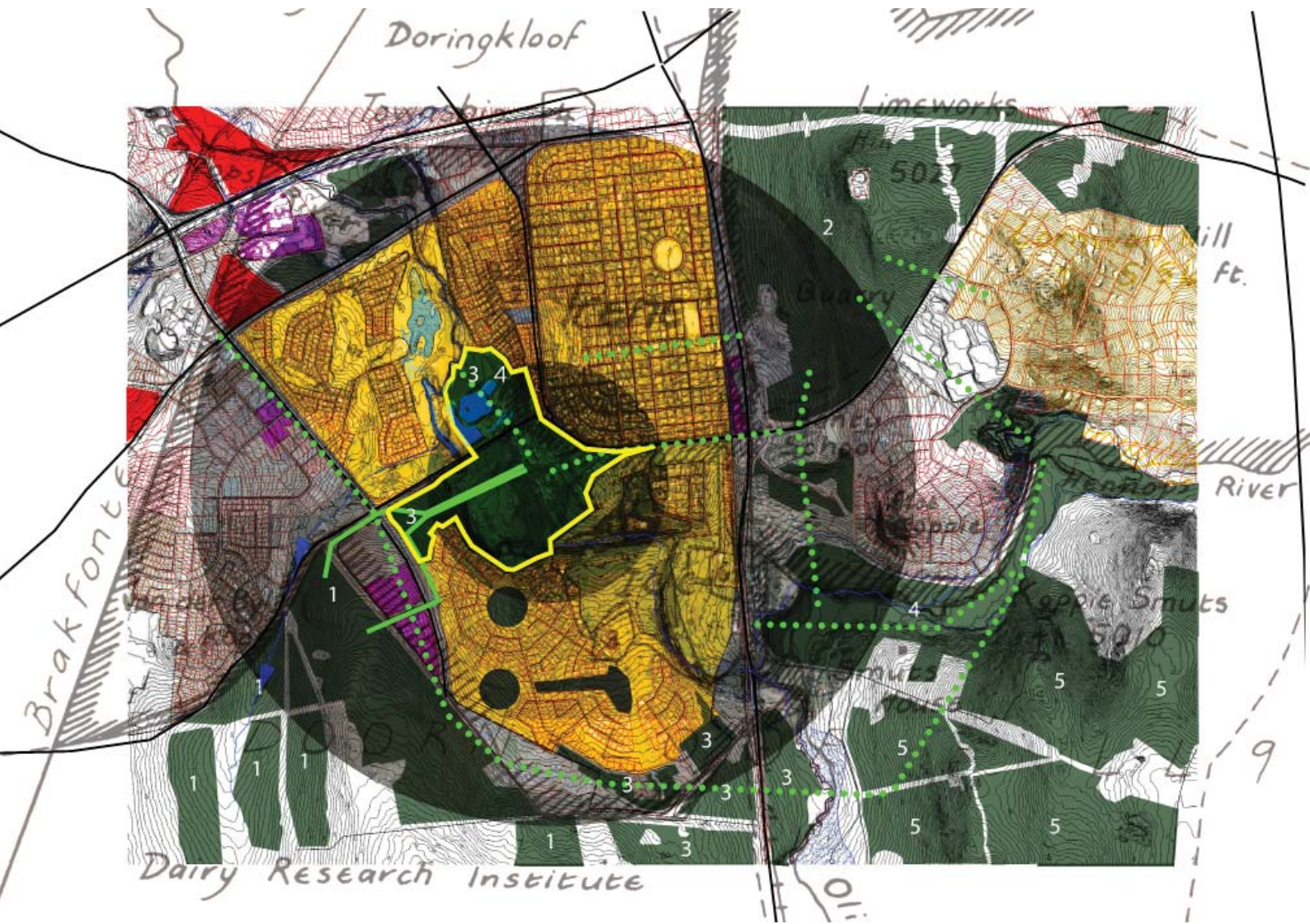
## PROGRAMME OPEN SITES

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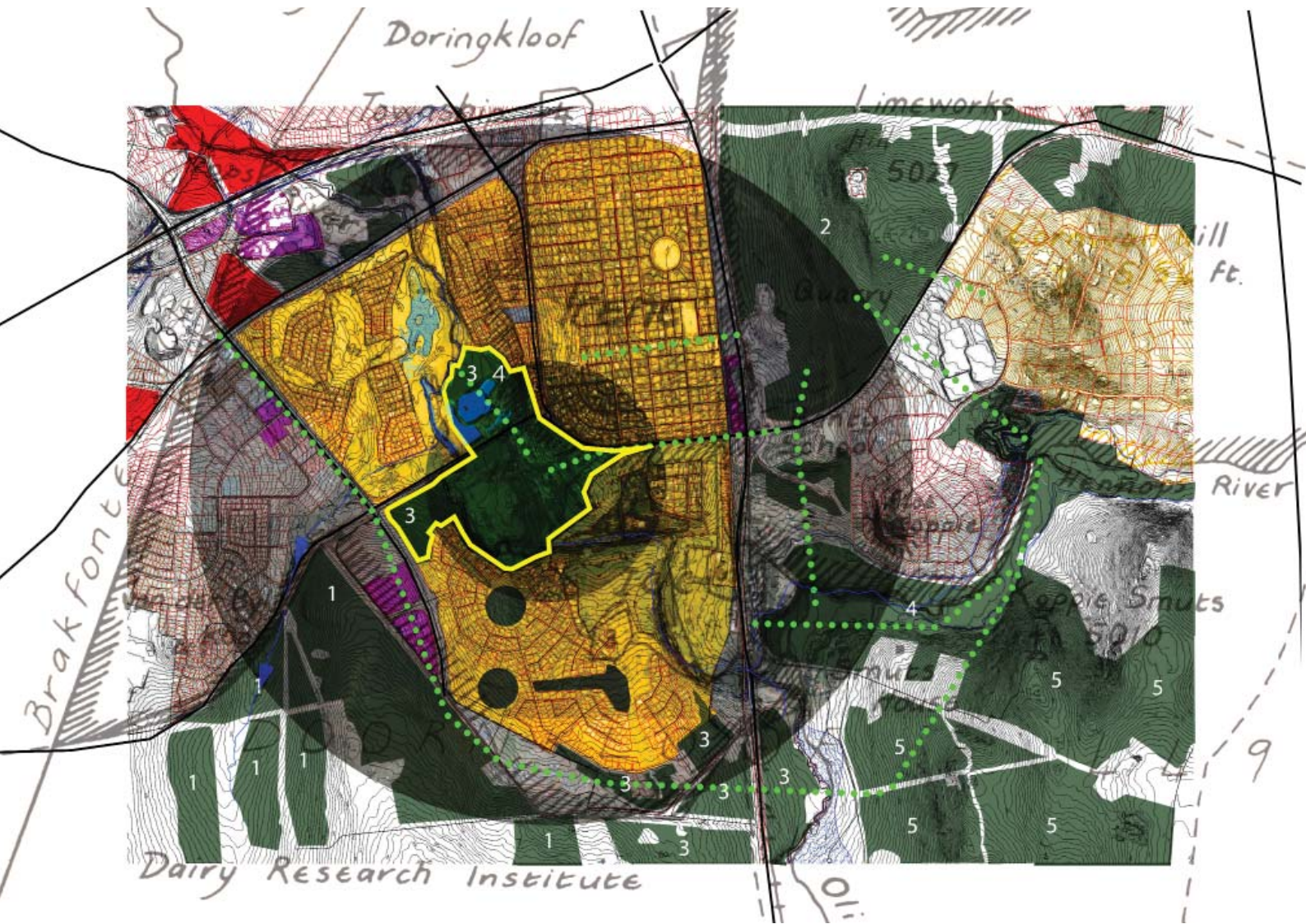


## NEW SITE BOUNDARY

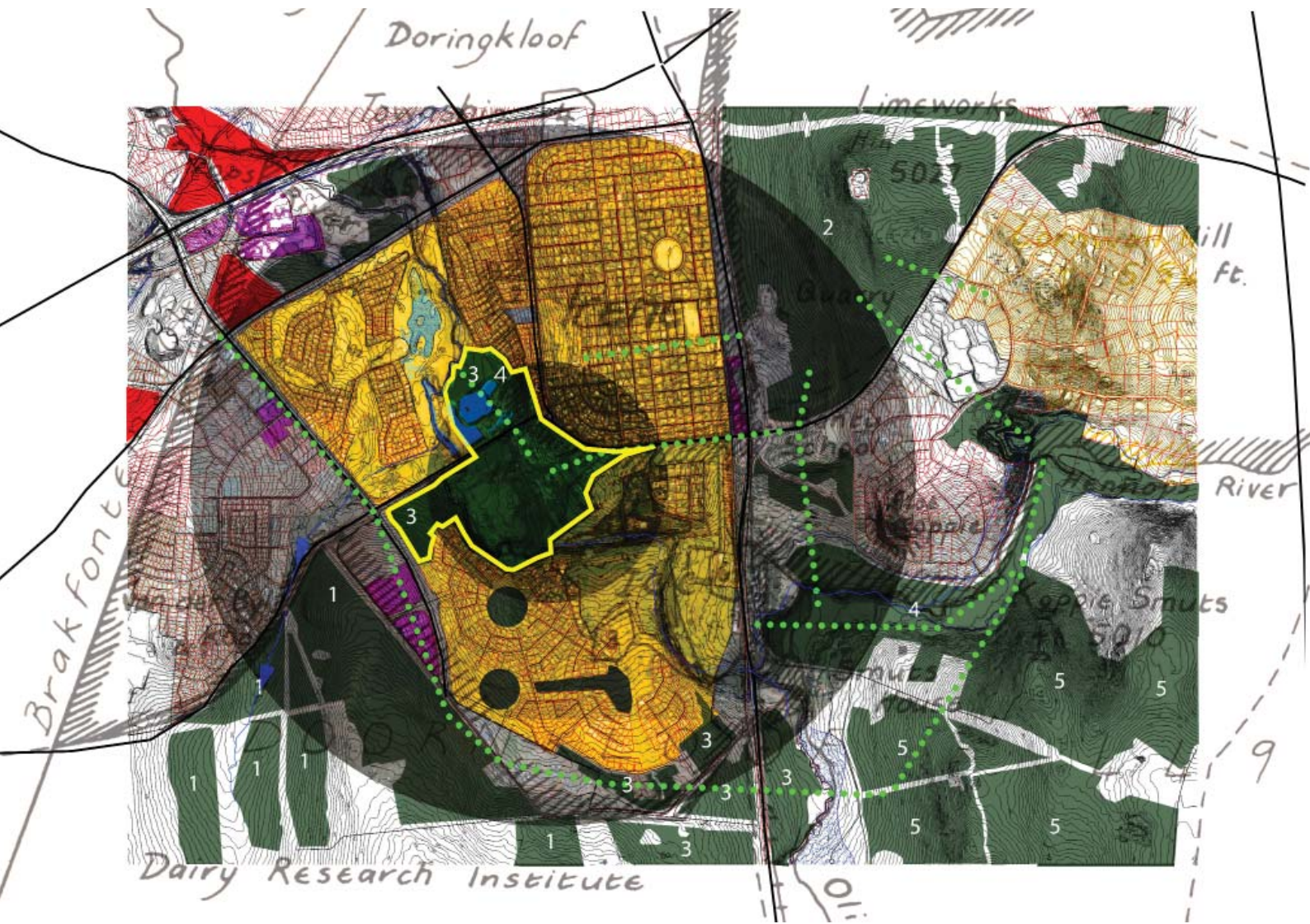
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## NEW PROGRAMMES

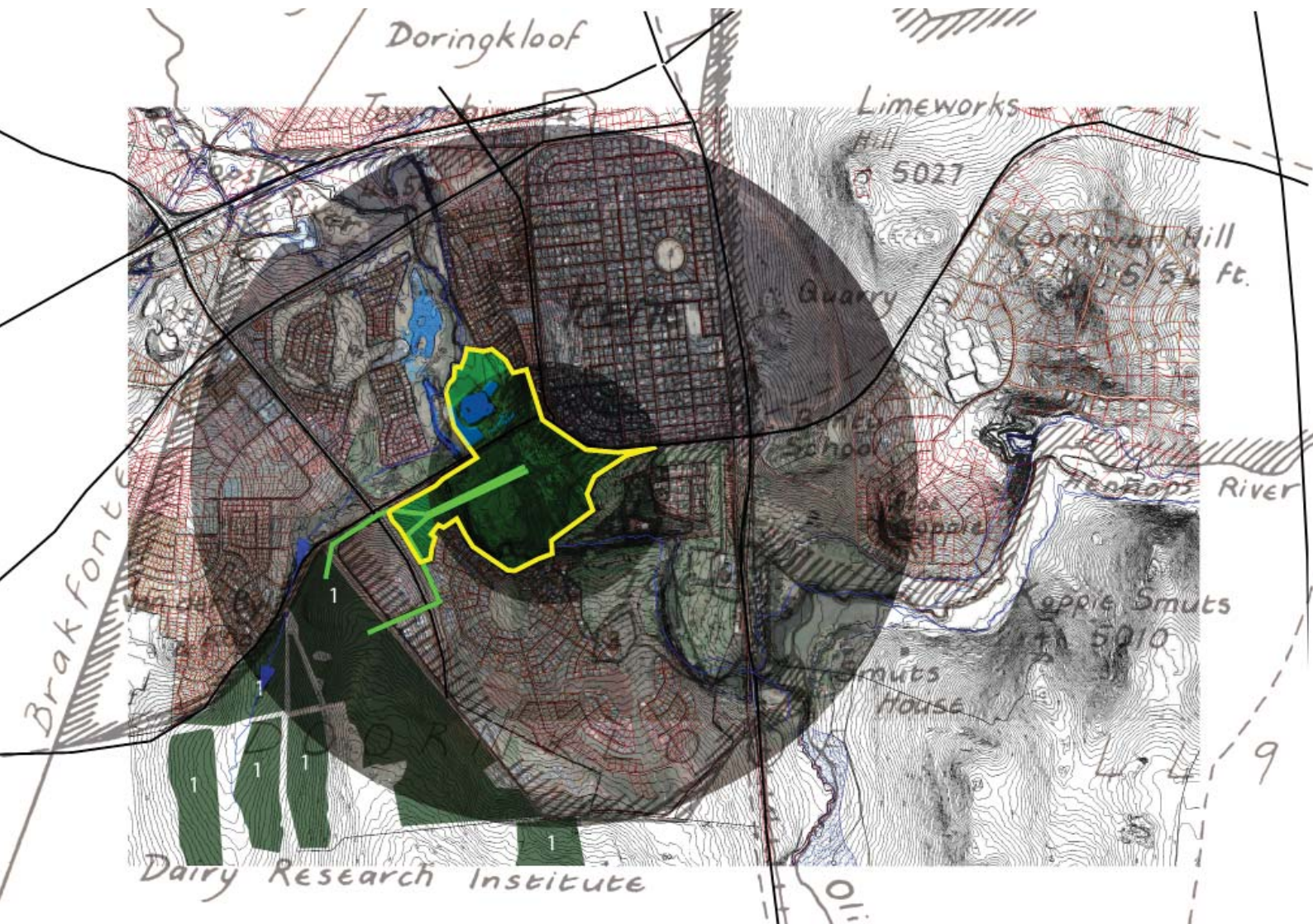


## NEW COW ROUTES

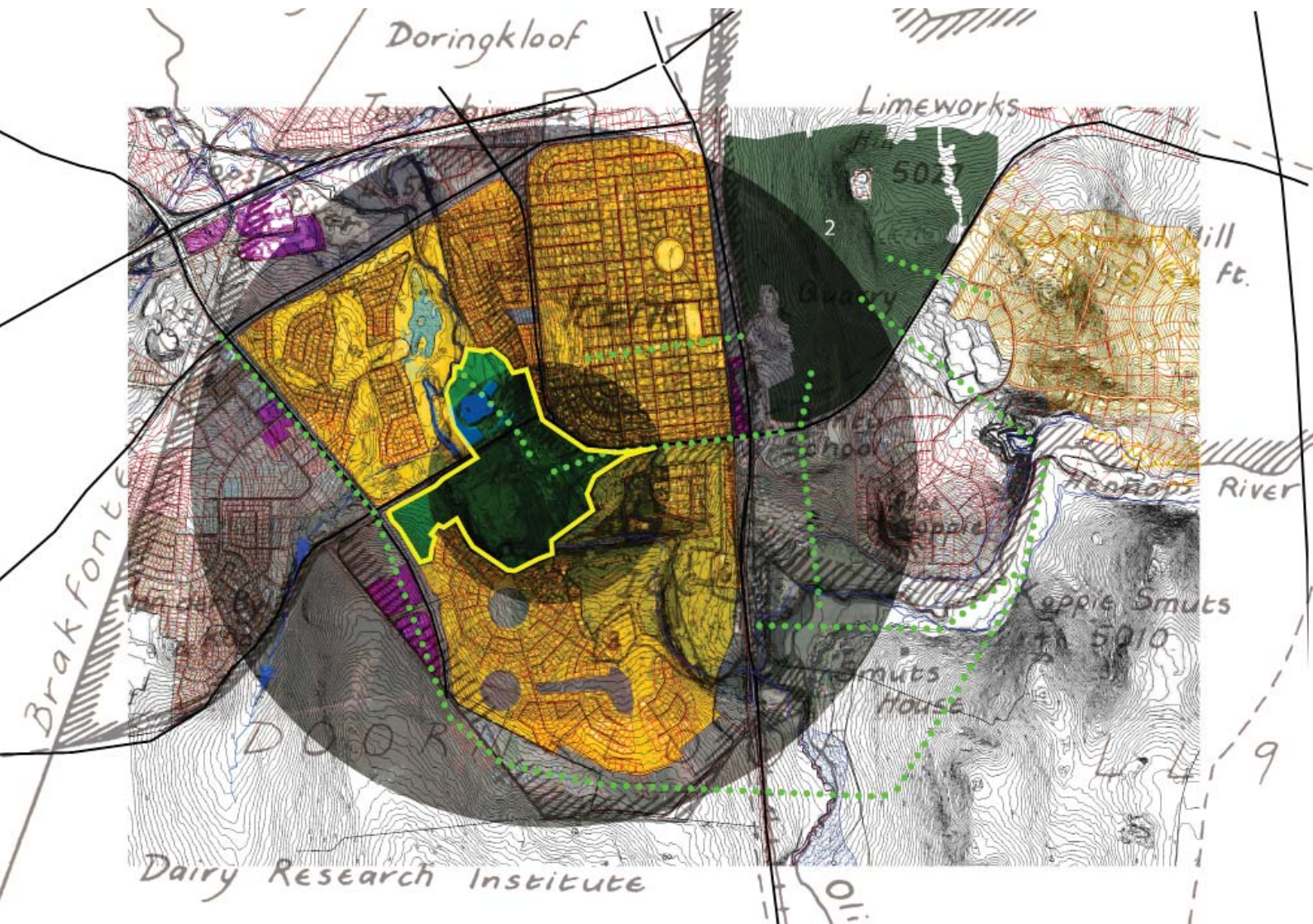


# NEW PEDESTRIAN ROUTES

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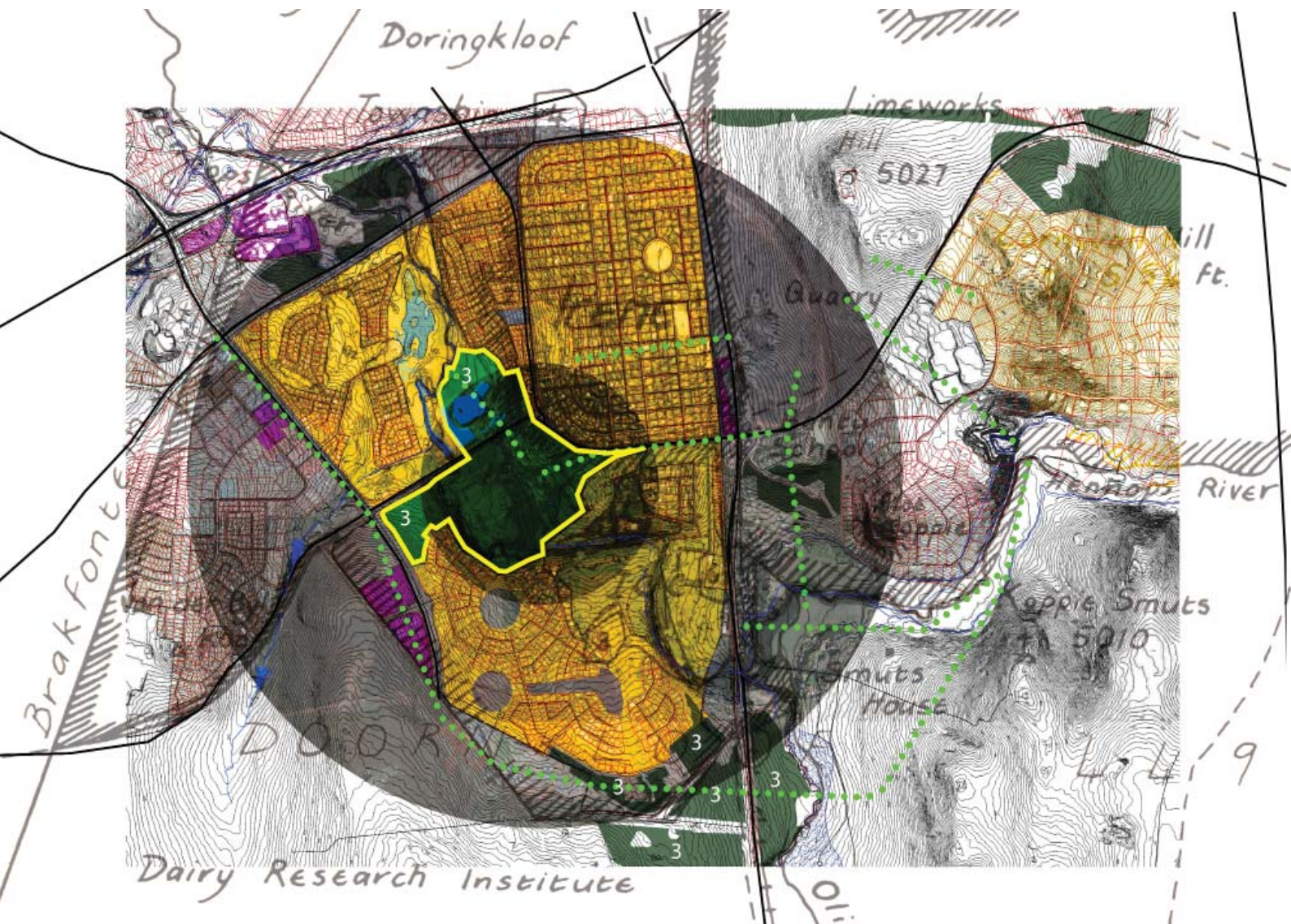


## NEW GRAZING



## RECREATIONAL PARKS

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## FOOD CULTIVATION

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Precedent: Crossways farm, Kouga

Category: Food cultivation, urban agriculture, community upliftment, slow food



Precedent: Eagle Street Rooftop farm, Brooklyn NYC

Category: Food cultivation, urban agriculture, community upliftment, slow food



APPROACH

Landscape  
Urbanism -

Economical & urban  
processes over time

Staging of horizontal  
surfaces

Operation of working  
method

Imaginary

INTENT

Expansion of productive landscape

Didactic Role

Community involvement

Reintroduction of historic landscape

Accentuation of agricultural genus loci

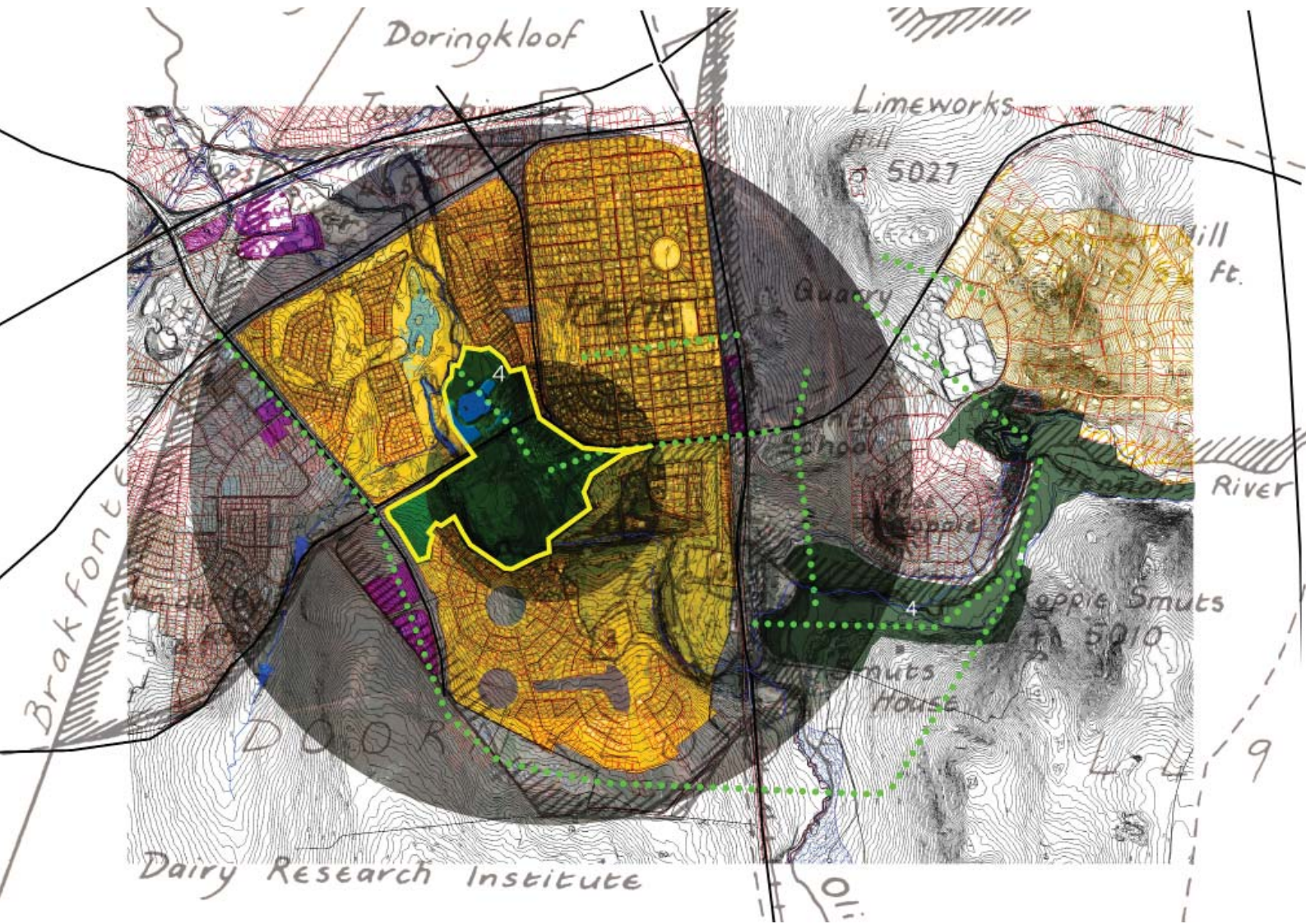
PROGRAMME

- Food cultivation
- Community involvement
- Economic upliftment
- Market spaces
- Restaurants

Precedent: Babylonstoren, Western Cape

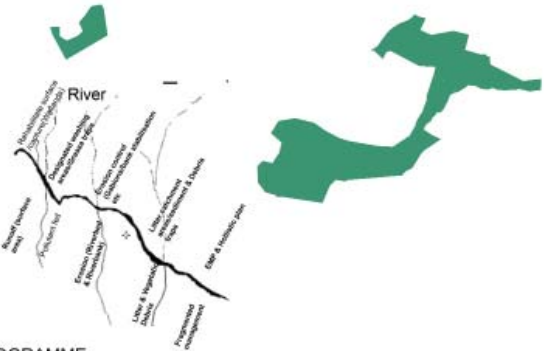


## Food cultivation & additional grazing



## FLOOD PLAINS+WETLANDS

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**APPROACH**

Landscape Urbanism -  
Economical & urban processes over time

**INTENT**

Water quality improvement  
Flood control  
Storm water management

The parks adjacent to the Hennops River would multipurposely act as floodplains and public parks.

A system would be put in place that can be adaptable to change over time. The type of landscape can be altered and reprogrammed with the development of the surrounds if necessary as long as it can act as a floodplain.

**PROGRAMME**

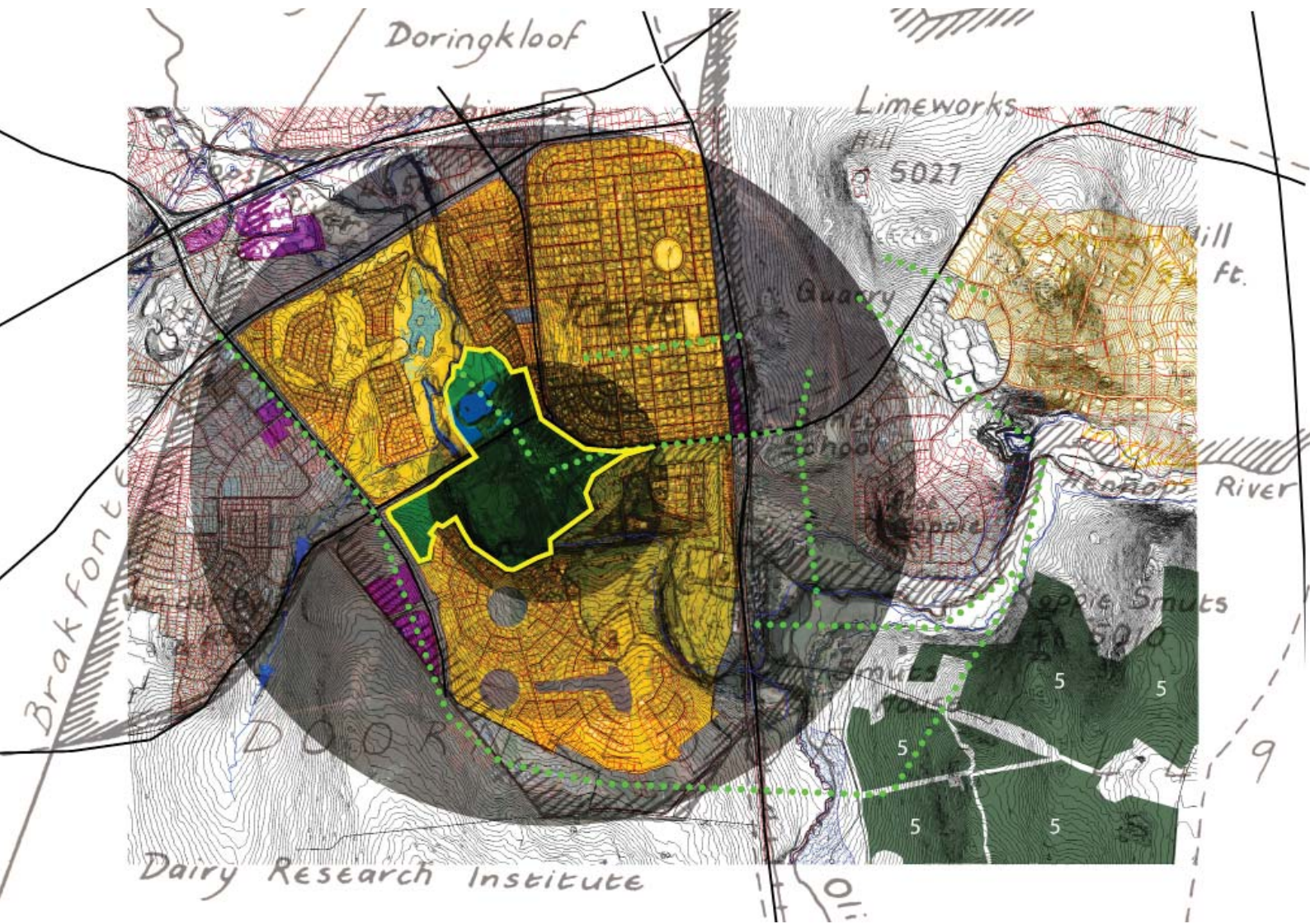
- Floodplain
- Public Park
- Storm water management
- Litter catchment basins
- Subsurface wetlands
- Erosion Control through surface rehabilitation
- embankment upgrade through Gabions



Regulation of the use of flood plain areas through legislation and other non-structural measures;  
- Prevention and relief measures for low frequency floods;  
- improvement in the urban drainage water quality.  
There should be a strong interaction between urban master plans, urban drainage and flood control master plans and other city plans related to water supply and sanitation and solid waste management. Land use is closely related to urban drainage. Therefore, urban drainage master plans should be essential components of urban master plans.

Precedent: Curitiba - Brazil  
Category: Storm water management

# Public parks as floodplains & Water quality improvement (Hennops River & Tributaries)



## REHABILITATION PARKS

# ECOSYSTEMS VISION\_Hennops River

A study was done by a Researcher at UJ. Data was collected over a 2 year period (January 2002- December 2003) to determine the average water quality of the Hennops river over the past 2 years.

The information was compared to two other studies which were done by Hoffmann (1994) and Sheperd et al (2000) respectively.

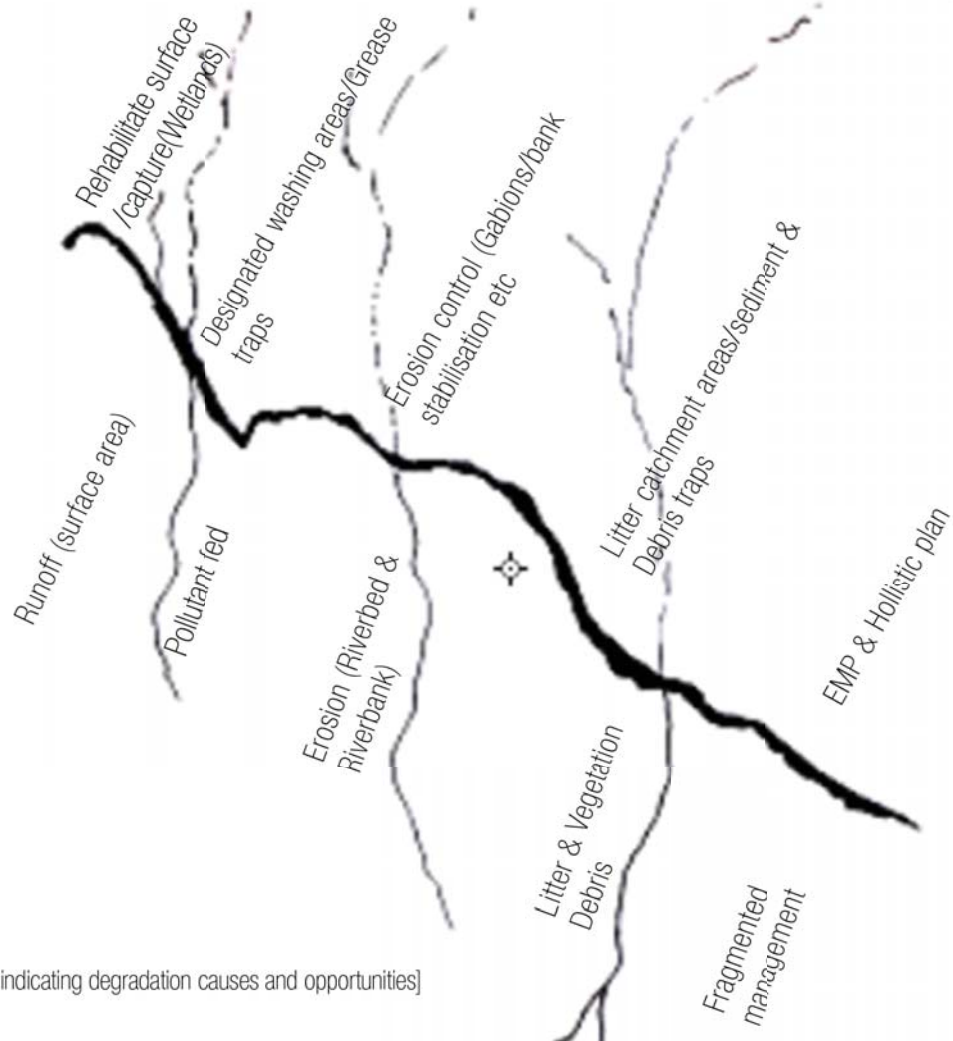
This was done to ascertain how the Hennops River and its tributaries deteriorated

The present status can be compared to its previous conditions.

The conclusion drawn from the information available is to determine what type of pollution it is and also how the pollutant enters the water. **This will establish how the architect and if the architect can implement anything to try prevent the further decay of the Hennops River as well as gradually rehabilitate it.**

# DESIGN PROPOSAL\_Hennops River

The conclusion and aim of the gathering of this information is to try ascertain how the polluted state of the Hennops River can be countered by way of a landscape and/or architectural intervention.



[image: diagram of the Hennops River indicating degradation causes and opportunities]

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