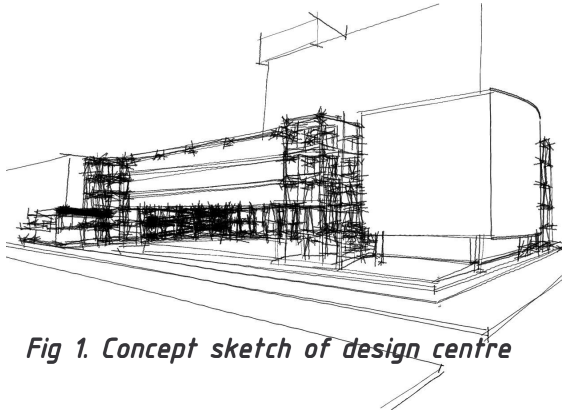


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## Introduction:



*Fig 1. Concept sketch of design centre*

### Aim:

The idea is not to simply create another industrial design school 50km from a well-established existing one. The design school shifts the focus from “industrial mass produced product development” as found in developed countries to product design indigenous to the South African context.

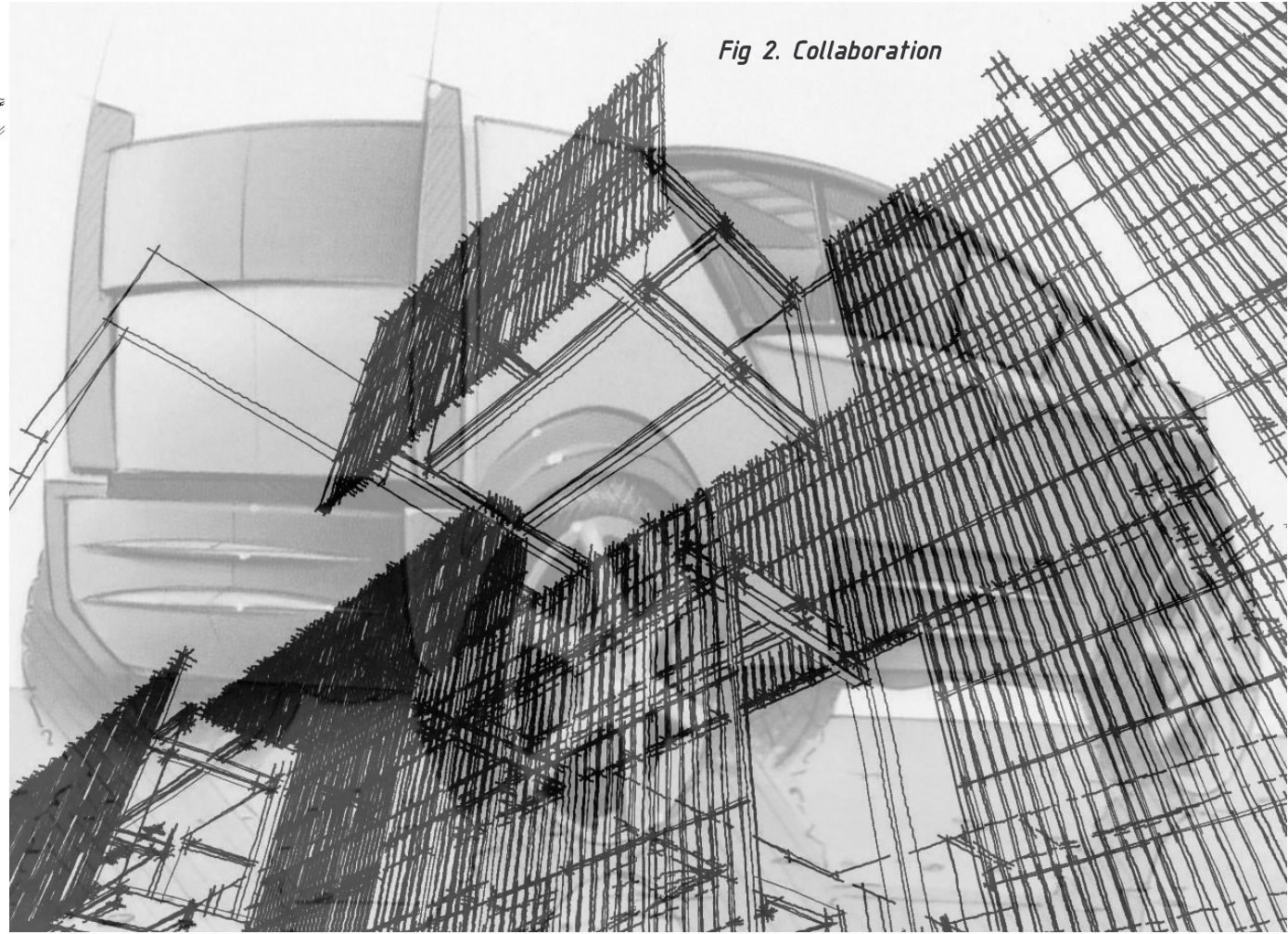
Pretoria is currently deprived of a designated institution of higher learning that is dedicated to the development of young talent in product development. The closest institution offering training in this type of design is the Wits Technikon in Johannesburg – school of industrial design. The other institution in the country is in

Cape Town. With the introduction of a facility of this nature, new talent may emerge thereby encouraging further development in design.

The development of a design school in Pretoria forms part of the Council for

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Scientific and Industrial Research’s (CSIR) development strategy to put in place fourteen design schools in South Africa that focus on product design and development.



*Fig 2. Collaboration*

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**Definition of objective:**

***Industrial Design: The conception and planning of products for multiple reproduction – is a creative and inventive process concerned with the synthesis of such instrumental factors as engineering, technology, materials and aesthetics into machine producible solutions that balance all user needs and desires within technical and social constraints.***

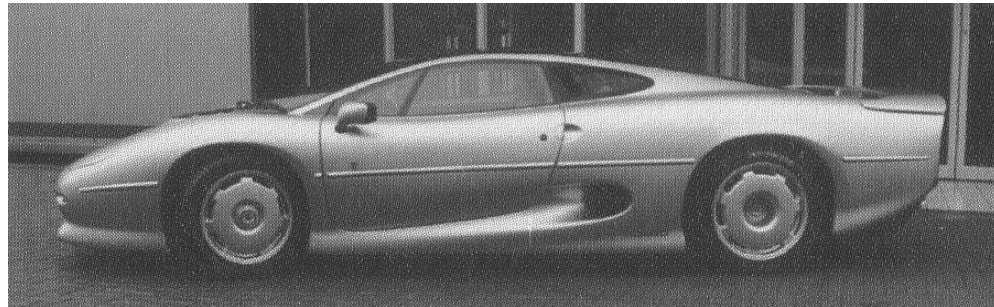
Fiell, 2000. p6.

It is important to understand the current trends and philosophies that are inherent in product development and industrial design respectively; and how these ideas relate to architecture. Ideas that are prominent in product and car design are of great value in the design and development of new buildings.

There are certain similarities that car and industrial designers share, paying great attention to specific details in order to make their designs more competitive and acceptable for the end user. Some of these issues need identification and analysis in order to understand how architects can benefit in terms of finer design elements.

Designers share design principles because of the scale of their design discipline. Whether designing a car, a chair or a hi-fi, the designer has a challenge to satisfy the end-user's

senses. Sensory perfection is what one may refer to as the design challenge. Each design is an attempt to improve and beat previous designs and products; designers are constantly battling against competition and have to keep corporate branding in mind as the designs evolve.



***Fig 3. Jaguar XJ220 designed by South African Keith Helfet***

Product development and industrial design share many design ideas. Some of the elements of design that exist in product development are in close association with those found in the realm of car design. Many of these design issues relate to the human user, relating to the five senses. Products on both ends of the scale must be acceptable to touch, sight, smell and in some instances even taste and sound. Designers are constantly challenging the past and lessons that are learned from it.

This paper allows an in depth investigation into designers and their products and how the products move in

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and through the development processes required. The theories and philosophies along with methods are documented to generate an understanding of the intricacies of design outside of architecture. The information and theories researched are compared to current architectural trends and later incorporated into a design to facilitate the development of product designers.

An extract from Perini, 1998 pg63:  
*With the Design*

*Machine, BERTONE do not claim they have invented a means of making any type of design project materialise at the wave of a magic wand. The Design Machine is neither a company or a workshop; it is, instead, a system of companies, studios, workshops and technical and human resources, organised to provide everything it takes to design and develop from prototype to production.*

Above is an image of a Jaguar XJ220 designed by South African born industrial designer Keith Helfet. This is an example of what design training can achieve.

**Clients:**

The design school is supported by the CSIR and government. These two bodies in collaboration offer funds to establish schools and institutions for the development of design education.

A design school or design centre for Pretoria is of great importance; the CSIR's "DesignNation" initiative explains this concept well. The CSIR's idea is to upgrade facilities for the education of industrial and product design from where designers can be educated and trained at design schools distributed throughout the country. Fourteen schools are planned for the next 20 years and thus a design school or centre designed for Pretoria is viable and required in the "DesignNation" framework.

Government currently sponsors the Wits Technikon's industrial design school with machinery and tuition. This is important in understanding the government's input in the field of product and industrial design.

Sponsorship for the design school is ongoing in terms of operating after the construction phases.

Starting at school level the CSIR is promoting the understanding and education of people in terms of industrial design. This means that children are educated in design and CAD software to make them aware of the fact that they can have a career in product design in this country. When these children emerge from schools into tertiary education, they are prepared for training in industrial and product design.

Input into schools from the government affords people the opportunity to demand locally manufactured and designed goods because of their knowledge in design taught at school level. This is good for the economy because new markets and companies may emerge in the near future and uplift the current situation of few industrial and product design firms and companies. Government is putting in effort to speed up this process and the CSIR is

proposing that this process may take at least twenty years to have an effect on the local markets. Thus, an input of funding for proposed design schools is part of the proposal from the government and the CSIR.

An extract from the "DesignNation" website concerning Government participation in design education:

*"DesignNation is geared to synchronize with national strategies such as the Advanced Manufacturing Technology Strategy and the Research and Development strategy. It is imperative that these efforts culminate in the legislation of a 'design policy' for South Africa that will pave the way for increased competitiveness in the global market. The DesignNation 'system of design' will dovetail with the national 'system of innovation' to ensure an integrated approach to product development, and the creation of a modern knowledge economy."*

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**Site:**

The site for the proposed design school is located on the southern edge of the Pretoria CBD, directly south of the City Hall, on the corner of Minnaar and Bosman Streets. On the two remaining corners are the fire brigade and the historic ambulance building on the southwestern and northwestern corners respectively.

The site is within walking distance of the Pretoria station and main traffic and pedestrian routes.

Currently the site is owned by Spoornet and is used for undercover parking for the employees of Spoornet. An existing Spoornet building is found on the north-eastern corner of the site.

**Urban design:**

This site falls within the Paul Kruger Street development strategy and therefore has predetermined environmental impacts. Most of the design parameters that are understood from this development framework include constraints in terms of street spaces, façade relationships and proportions relevant to the Museum Park precinct and all the uses related to these factors.

The Museum Park precinct and the City Hall precinct actively informs the design and functions directly related to the site and its spaces.

The site falls within the City Hall precinct, which is discussed along with the Museum Park in the context study.

*Fig 5 Location map of Pretoria, South Africa*

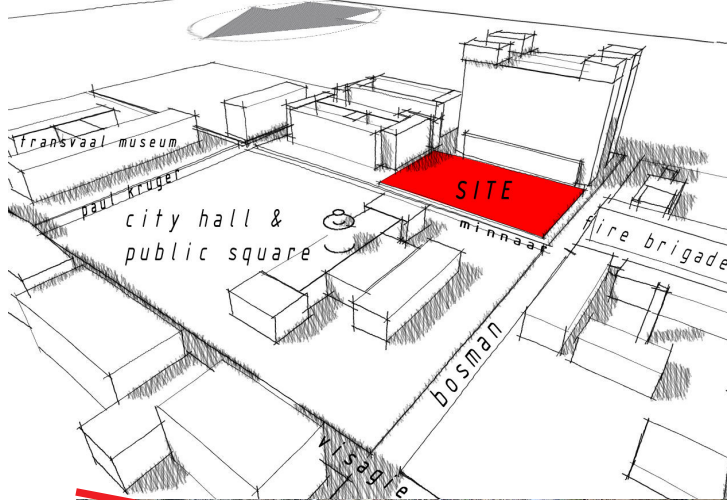


*Fig 4. Location map of the African continent*



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Fig 6. Aerial sketch of City Hall Precinct



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Fig 7. Aerial photo of site context

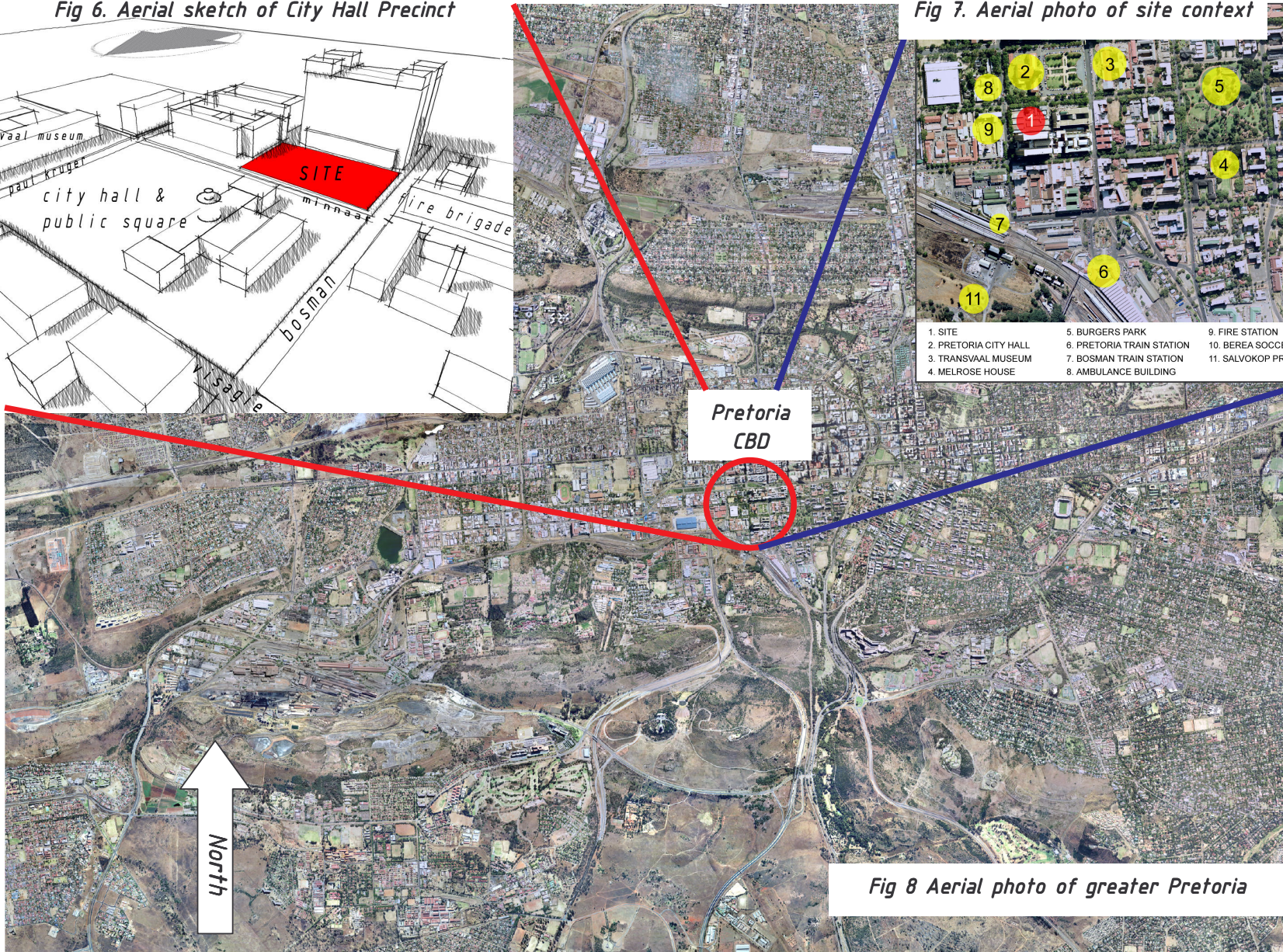
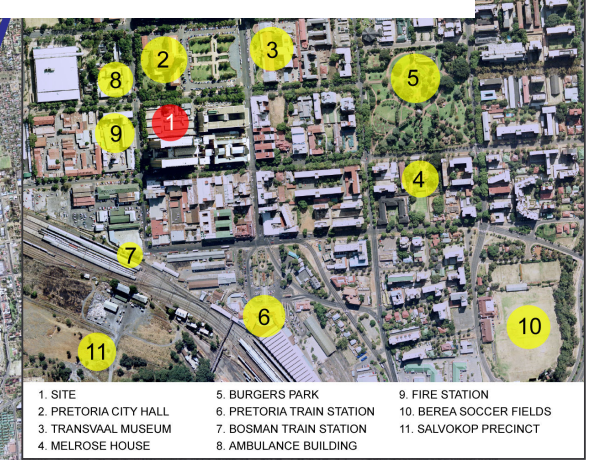


Fig 8 Aerial photo of greater Pretoria

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**Choice for site:**

Having looked at the location of the site and understanding the precinct wherein it belongs lends the site to creating an environment for tertiary type of learning:

- Well established human urban room
- Security provided on the street level
- Pedestrian-friendly
- Safe clean environment
- On the outskirts of the high-energy city CBD
- Within close proximity to housing
- Walking distance to transportation nodes, business infrastructure and retail

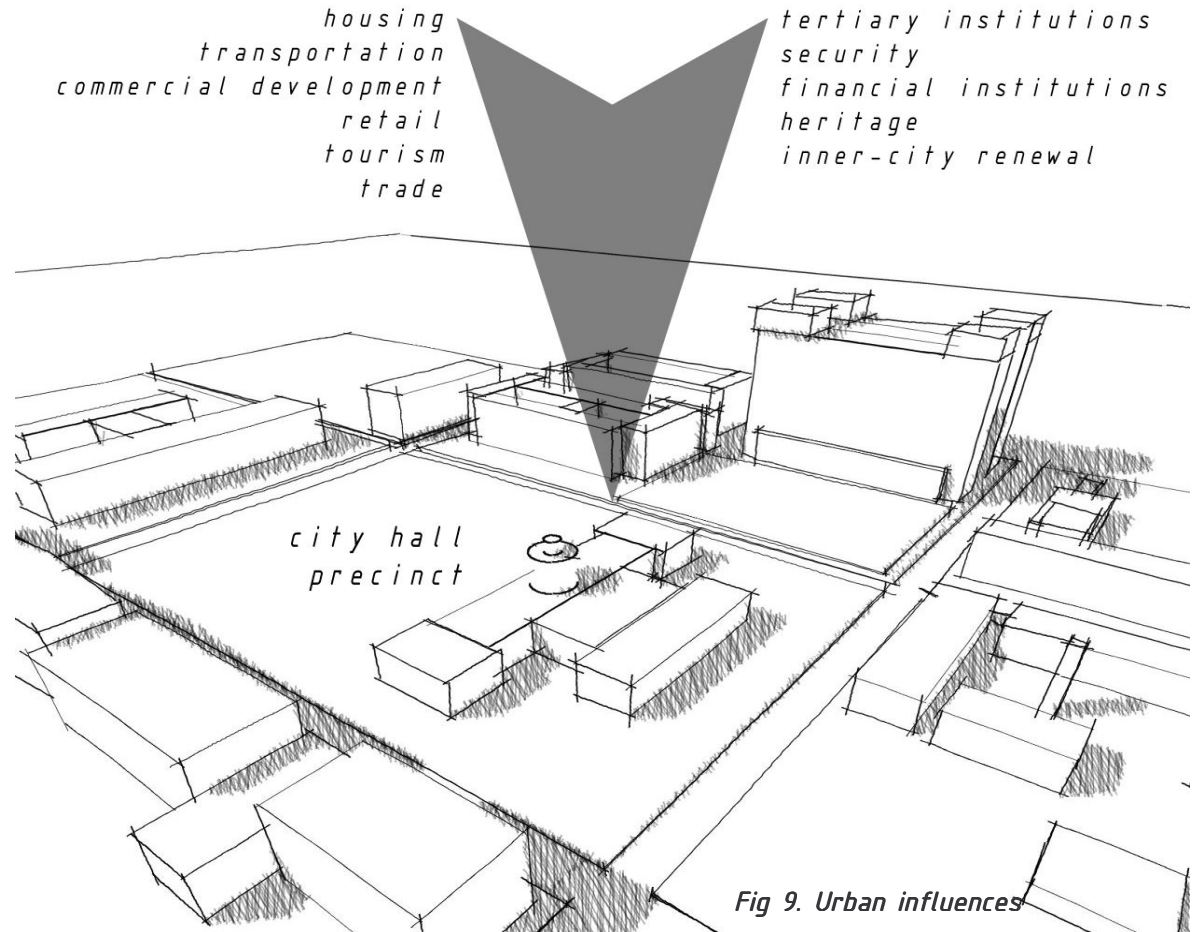
One of the main determining factors for choosing this site is security; to create an urban campus environment without the need to enclose the building with security barriers. The precinct is currently patrolled by security guards on foot and this ensures that homeless people and street crime is eradicated from this precinct.

The site belongs to the City Hall precinct and offers a large open square where people can visit and relax. It makes sense to create an urban campus kind of environment here because there are many benefits:

Learners will occupy the site and precinct at different times of the day, therefore making the urban space more

active with their presence. This precinct offers a safe environment in terms of noise and vehicular traffic within the city. Housing options are readily available within walking distance to the site as well as commercial facilities and retail stores. The site offers a heritage component because of the link with the greater Museum Park precinct.

Public transportation facilities are available within walking distance which eliminates the need to have personal transportation. This falls within the Inner-city Spatial Development Framework for Pretoria as the framework asks to eliminate personal transportation as far as possible within the near future.



*Fig 9. Urban influences*

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Creating an urban campus within this precinct may lead to an upliftment of the use of surrounding buildings into uses adapted for other kinds of tertiary learning. This may create a movement back into the city for education facilities and housing (refer to Figure 9).

#### **Architectural objectives:**

To design a building that functions well in the circumstances that are required for product development needs the understanding of product design. This understanding goes further than the traditional history of such typical school buildings that are currently being used.

A study of the trends and philosophies in product design is undertaken in "Design Approach" to fully understand the functional requirements for such a school of design. The architectural requirement for the building relates to the direct functions undertaken within the school. The building reacts to environmental elements such as landscape, streetscape, urban spaces and rooms, building typologies in the immediate area and elements that are in direct influence of the design school.

### **Design theory and development study**

#### **Product development school:**

Currently there are two industrial schools in South Africa: Wits Technikon and the Cape Technikon. Both were visited in order to complete this investigation.

The two schools have a strong "western" influence and are training students who, with little further studies required, can continue practicing in Europe, America and in the East. Both schools have sophisticated machine shops and these are geared to produce prototypes of outstanding quality. The Wits Technikon has more advanced modern-day machines aimed at rapid prototyping and this helps to keep the school up to date with the latest trends and technologies. This machinery helps train students in how to design products that can be manufactured by specific machines and products that can be mass-produced in factories.

#### **Learning in an industrial/product design school:**

The following information was gathered from visits to the Cape Technikon School of product design and the Wits school of industrial design:

The first year in the design school focuses on the development of presentations and presentation materials. Students are introduced to graphic materials and how to apply different presentation techniques. Design and art history is also introduced at first year level with design history being the most important. Later in the first year students are taught technical drawings and documentation of prototyping as well as how to work with drawing instruments and the technical specifications of assemblies. Prototyping is introduced and students start experiencing the challenge of designing objects and products.

The second year continues with design and art history and the focus shifts towards design and eventually becomes the main theoretical component of the course. Students are introduced to computer modelling programmes and rendering packages. Visual techniques are explored and the students are taught different modelling and prototyping materials that can be machined along with material properties and their uses. The students are trained to design and build their prototypes and how to make these simple enough for manufacture.

In the third year, the students learn more advanced computer design packages and rendering programmes, at this point design-history is still the main theory component. Prototypes and models become more important and

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presentations are of a professional standard while business orientated lectures are now introduced into the programme to allow students to become focussed on the entrepreneurial side of product design. Students are introduced to real-world problems by interaction with real clients who have association with the institutions.

The fourth and final year in industrial/product design is more entrepreneurial in format. Students are given the freedom to interact with businesses and they are encouraged to design objects as if in a private business situation. Students are given the option of designing objects from the first meeting with the client up to technical documentation and theoretical discourse.

Currently South African students are trained in this way. The focus is on training professionals who are able to produce rapid-prototypes and products of first-world standards. Students are given the tools to enter a global profession; this caters for the design of everyday products in order to make daily living easier and more comfortable.

**Design aim: not merely another design school.**

To design a school of product design that is only 50km away from an existing industrial design school does not make

much sense, especially as the market for industrial and product designers in South Africa is relatively small. There is a need to focus on the local product and craft markets. The problem is that local crafts people need to be trained to improve the quality of their products.

The Technikon of Cape Town is currently looking at starting a workshop during Technikon breaks to aid the local people with their crafts. Cape Town is a hive of tourist activity and craft markets are popular in and around the city.

The objective is to provide a school that not only offers training in industrial design but also helps in the development of fine art such as crafts and traditional artefacts manufactured by local people and bought by the public and tourists. The school will offer artists the opportunity to come in and better the quality of their products by introducing them to new materials and techniques of manufacture. At the same time, offering them the choice of further studies in industrial and product design. When an individual comes into an environment of further training, the person should be informed of other possibilities beyond their current situation through the institution itself. People who make use of this design facility will be exposed to “western” approaches in the design and manufacture of objects and artefacts.

A design institution offering this level of impact upon local designers influences

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people through other disciplines in design has to respond to the arts and crafts markets that exist in South Africa. The challenge would then be to design a facility that offers short courses in fundamental product improvement as well as an industrial design school that will allow students to further specialise in fields, for example: car, furniture and product design.

Why industrial design training and awareness?

**South Africa:**

The country is relatively new to the field of product and industrial design (this being most notable by the number of institutions offering courses for these practices today.) Currently few professional practices exist in the country and most of them are aimed at producing goods for the medium to high-income group.

Goods that are produced in South Africa are competing with products imported from all over the world and in a few cases are of inferior standard. Many of the products in homes are made in the East while the designs are designed in the United States, Europe or the East. Labour is relatively cost effective in the East and production time is short. People in the west have used this to their advantage and in so doing generate vast quantities of products in the shortest possible time whilst saving on costs.



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South Africa has the capability to produce objects of mass production in limited time, as in the case of vehicle assembly plants scattered over the country. Presently mother-companies such as Toyota and Nissan are using South African assembly plants to generate vehicles for export to South America and into Africa itself.

One of the biggest problems that South Africa has is that of exportation of raw materials. It is understood through interviews conducted at the Cape Technikon, that South Africa mines and exports raw materials and later buys back the material in fabricated forms and profiles at an enormous cost. This is normal practice, although we do manufacture a few products for our own use; unfortunately, South Africa does not have the monopoly in this practice. This is one reason why South Africa is not producing all of its own products and goods.

Another problem is the poor quality of South African products. It is bad enough that we are not producing the goods, but the few that are built are poorly executed, is quite another. This does not imply that all the goods are bad, merely that the more affordable goods are not of a suitable standard. South African designers are often criticised for the high prices of their products, this is because the quality of affordable products is relatively low.

Well-known designers of products in South Africa are producing top quality goods at a high price. Designer furniture in this country is carefully designed and built to last while the cheaper mass-produced equivalent is poorly assembled and is made of low-grade materials.

It is also important to note that a general trend found amongst some of the manufacturers is to become strongly competitive and to avoid partnerships in the product and industrial design sector. Ziggy Strohbach of the Cape Technikon (product design lecturer) explains that companies are 'killing' each other due to the independence of manufacture; people do not want to collaborate and share companies. He also points out that if the companies make alliances and partnerships to create larger firms it would lead to better products due to; less machinery costs, better design and idea sharing and stronger partnerships between manufacturer, suppliers and clients. In this way, companies can grow and become stronger instead of splitting up because of individual greed. Products at an affordable rate will improve the quality and design of goods and larger firms will compete for better manufactured and designed products in general.

It was noted through discussions that each person wants to execute his own design and run his own manufacturing processes, if this is the case, it will lead

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to poor quality products due to the limited capital of small companies.

A training facility to teach people to design good quality products is essential. People currently producing objects locally must be informed on some level of the importance of designing and manufacturing products to a high standard while keeping the objects affordable – this is possible through the collaboration of ideas through larger companies.