AN URBAN CENTRE FOR TEMPORARY WORKERS

In Hatfield, Pretoria by **Andries Lourens van der Westhuizen**

Mentor: Rudolf van Rensburg
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SUBMITTED IN FULFILLMENT OF PART OF THE REQUIREMENTS FOR THE DEGREE MAGISTER IN ARCHITECTURE (PROFESSIONAL) IN THE FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY.

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DEPARTMENT OF ARCHITECTURE

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Aan
My Ouers

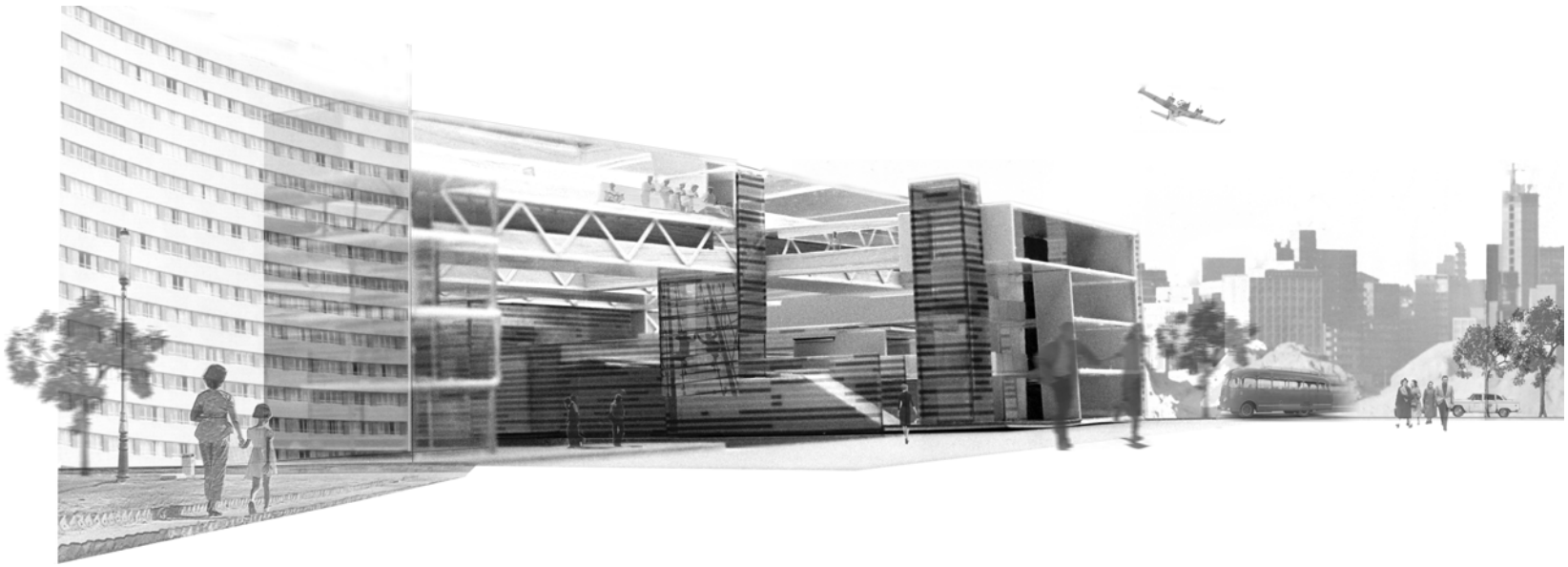
If I had not known that my life depends on my mind and my effort ... if I had not made it my highest moral purpose to exercise the best of my effort and the fullest capacity of my mind in order to expand my life...

Ayn Rand, *Atlas Shrugged*, 1957

Prologue

This thesis elaborates on the relationship between work and time and how it relates to quality architecture. Quality is a degree of excellence.

The project proposed is aimed at promoting quality in the built environment through workmanship.



Opsomming

Pretoria, in die Tswane Metropolitaanse area, is geleë in Gauteng, die provinsie waar die meeste handel in Suid-Afrika plaasvind. Hatfield, 'n voorstad in Pretoria, is die tuiste van baie studente aan 'n wye verskeidenheid akademiese inrigtings, insluite nde die Universiteit van Pretoria. Baie werkers pendel tussen Pretoria en Johannesburg op 'n daaglikse basis.

Die wêreld word vandag gekenmerk deur ewigdurende veranderinge, wat veral in Suid-Afrika tot onsekerheid lei, gepaardgaande met skommelinge in die ekonomie.

Die werkloosheidskoers van ongeveer 40% noodsaak dat baie Suid -Afrikaners tydelike, en selfs migrerende arbeiders word.

Hierdie onsekerheid word ook weerspieël in die boubedryf, waar geboue "tydelike" eienskappe toon, en waar vakmanskap in die beplanning en konstruksie daarvan ontbreek.

Die projek wat in hie rdie tesis bespreek word, is die gevolg van intensiewe beplanning rondom die voorgestelde Hatfield Gautrans Stasie, deur E.B Roccon (tesis vir MArch(Prof), 2003), wat geimplimenteer word om 'n effektiewe openbare vervoeraansluiting tussen Pretoria en Johannesburg te bewerkstellig.

'N STEDELIKE SENTRUM VIR TYDELIKE WERKERS

In Hatfield, Pretoria deur **Andries Lourens van der Westhuizen**

Mentor: Rudolf van Rensburg
Study leader: Finzi Saidi
Degree: MArch(Prof)

Summary

Pretoria, in the Tswane Metropolitan area, is in Gauteng, the province responsible for most trade in South Africa. Hatfield in Pretoria is home to many students of various institutions, including the University of Pretoria. Many workers live in Pretoria an d commutes daily between Pretoria and Johannesburg.

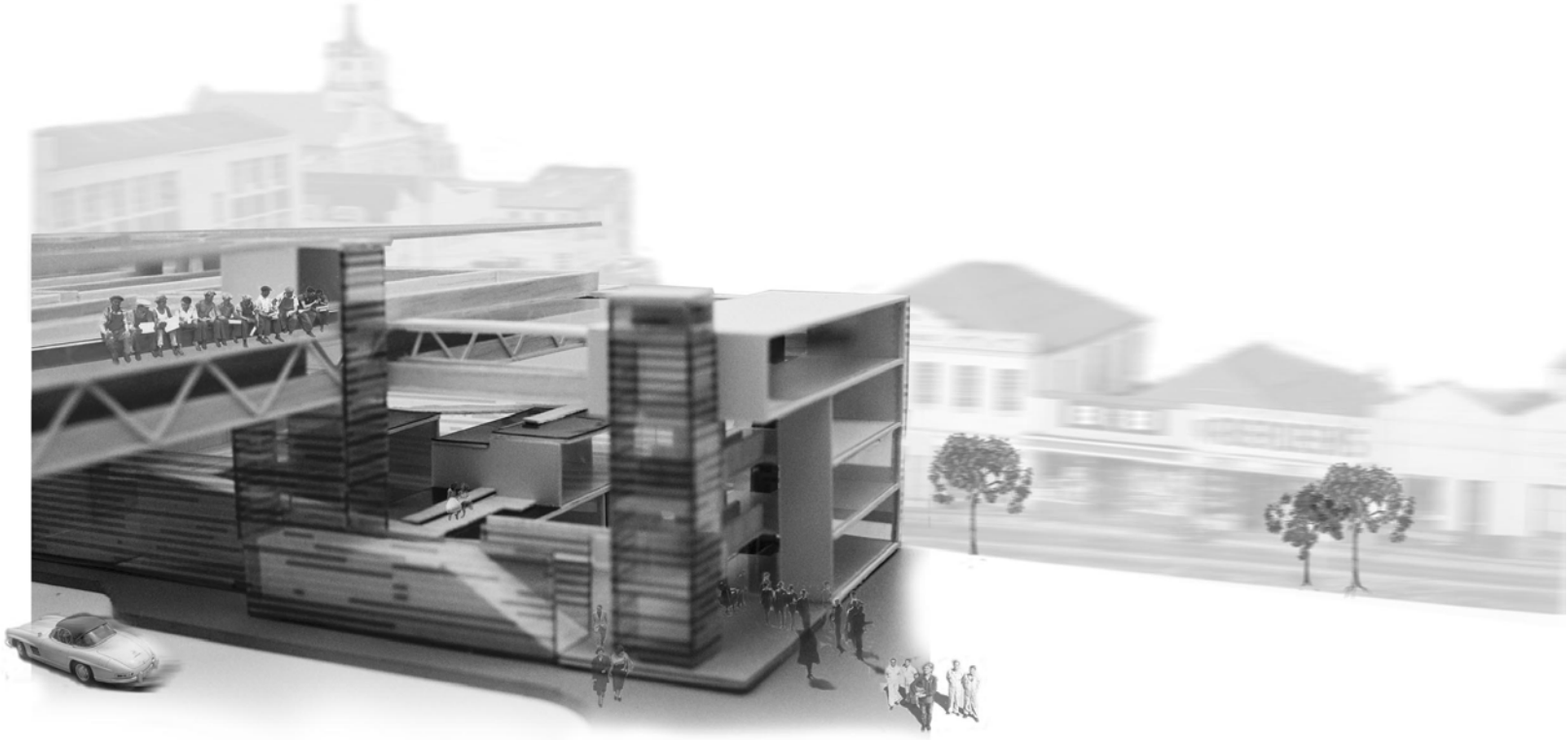
The world is characterized by ever - changing aspects today, and especially in South Africa uncertainty prevails. Fluctuations in the economy have resulted in a feeling of insecurity. An unemployment rate of approximately 40% has caused many South Africans to become temporary, and often migrant, workers.

This uncertainty also reflects in the built environment, where buildings have become "temporary", displaying a lack of workmanship in the planning and construction.

The project dis cussed in this thesis is a result of intensive planning on the site, in collaboration with the proposed Hatfield Gautrans Station by Bernard Roccon (thesis proposal for MArch(Prof) degree, 2003), implemented to provide an efficient public transport link be tween Pretoria and Johannesburg.

Die vernaamste funksies van hierdie prokek, d.w.s. die skep van ‘n stabiele sentrum, wat ook dien as ‘n toevlugsoord vir tydelike werkers, is die noodwendige resultaat van hierdie beplanningsproses.

Hierdie tesis mik veral na die herinstelling van ‘n vertr oue in die bouomgewing, en die skep van kwalitiet argitektuur deur werkverskaffing en vakmanskap.



The functions of the project, a stable centre acting as a datum point and haven for temporary workers, is a result of this planning process.

This thesis aims at re -establishing a trust in the built environment through quality architecture, by promoting wor k and workmanship.

List of Figures

All figures by Author, 2003, unless otherwise specified

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ABBREVIATIONS
HGSD: Hatfield Gautrain Station Development.
HUDF: Hatfield Urban Design Framework.
DOL: Department of Labour.
DOT: Department of Transport.

01

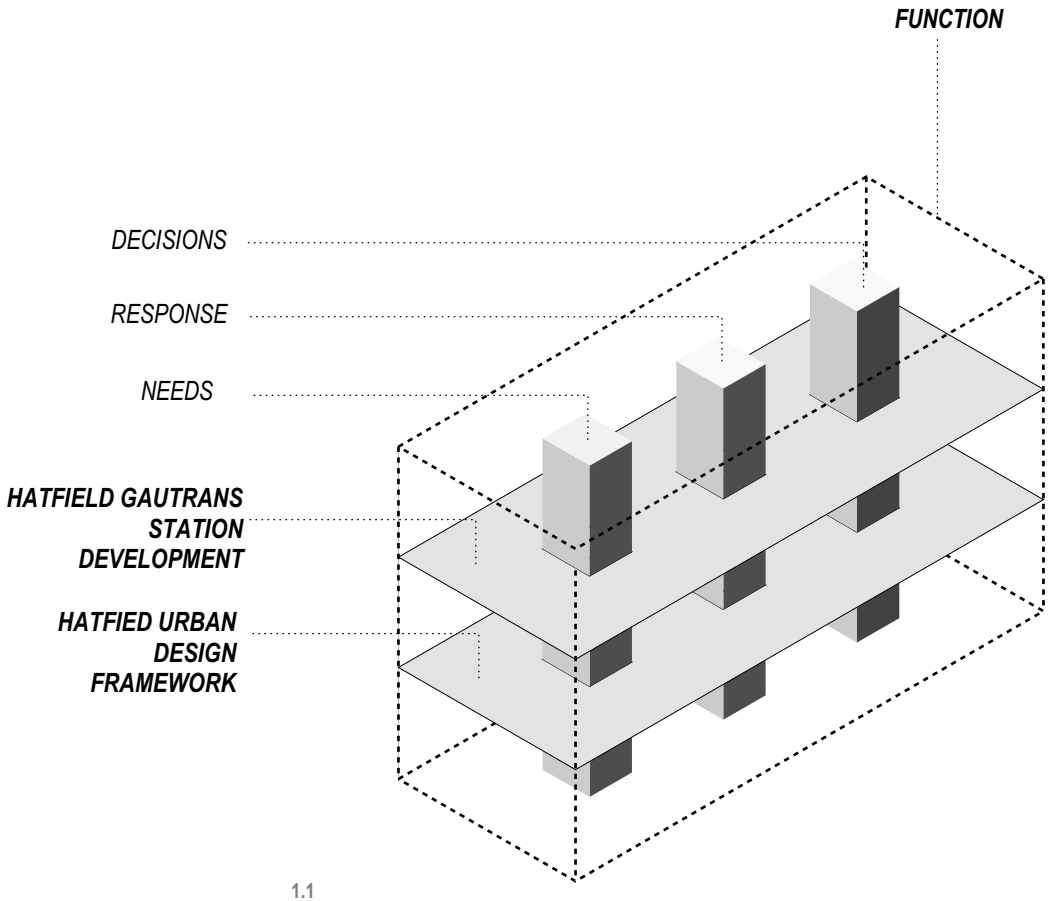
Project Overview

1.1__***INTRODUCTION***

The project can be defined as a response to the immediate socio -economical needs as delineated in the *Hatfield Urban Design Framework* (Van der Westhuizen & Roccon, 2003) , and that of the proposed Hatfield Gautrans Station Development (HGSD). (Roccon, EB, 2003, MArch (Prof)) . The project is therefore difficult to address through a conventional briefing document. This section will elaborate on the decisions that where taken to define the functions of the project.

1.2__***VISION***

The vision for the project is to establish a vibrant urban development while reacting to the needs of the local community and neighbouring projects. The development therefore forms a prototype of how urban developments could take place to count er unsustainable developments, such as urban sprawl and other practices, currently undermining the integrity of the built environment in South Africa.



1.3__*CONTEXT*

In a broader context, the development will take place in Pretoria, within Gauteng, one of nine provinces in South Africa. Many workers staying in Pretoria commute to Johannesburg daily, resulting in the need for a reliable public transport sys tem between the two cities. The proposed Gautrans Rapid Rail Link, to be initiated by Blue IQ, an affiliation of the Gauteng Provincial Government, will address the commuter needs for many years to come. Construction of the rail link is planned to start in 2007.

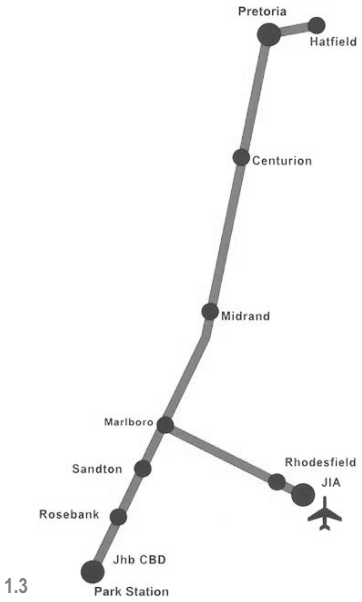
This project proposal will be undertaken with the assumption that the rail line will be built, responding to the HGSD, as proposed by Bernard Roccon, (thesis proposal, MArch(Prof) 2003).

On a smaller scale, the development will take place in Hatfiel d, a suburb in Pretoria, home to mostly students and young professionals. Recent proliferation of commercial enterprises, such as motor show rooms, has started to diminish the residential character of this area. Some important spatial linkages to other fun ctions, for instance the Hatfield Plaza Retail development, do exist, and will form part of the master plan for the development.

1.4__*LOCATION*

The project is located on erf 717, in Hatfield, between Schoeman street to the north and School street to the south. As a result of the adjacent HGSD, two road servitudes penetrate the site in the form of a shuttle road as well as a service r oad, also used for feeding the bus terminal.

1.2



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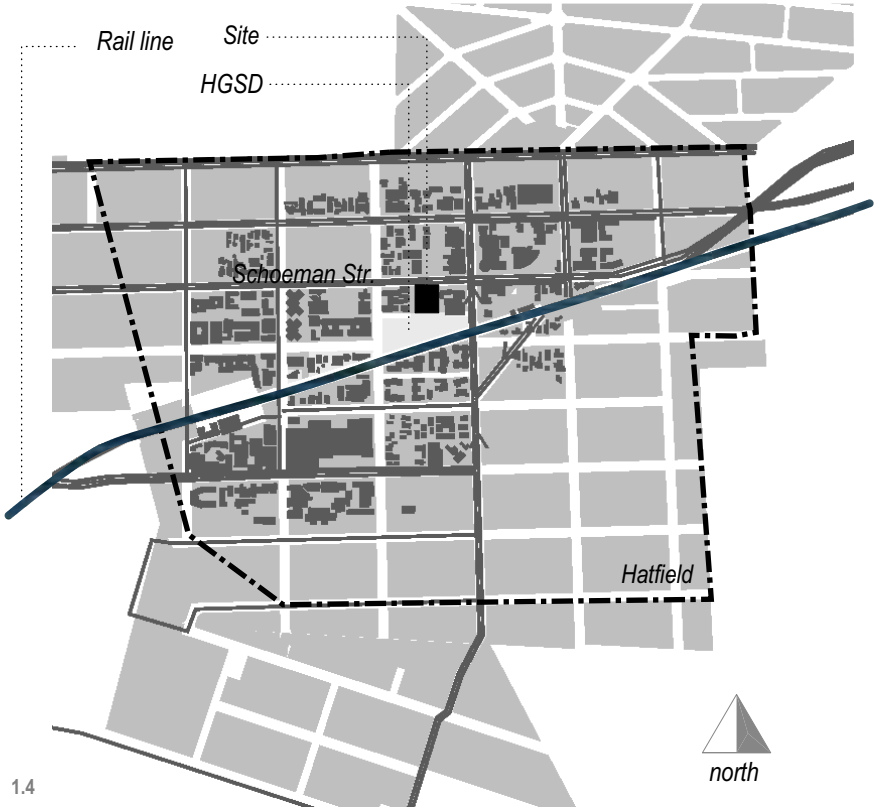
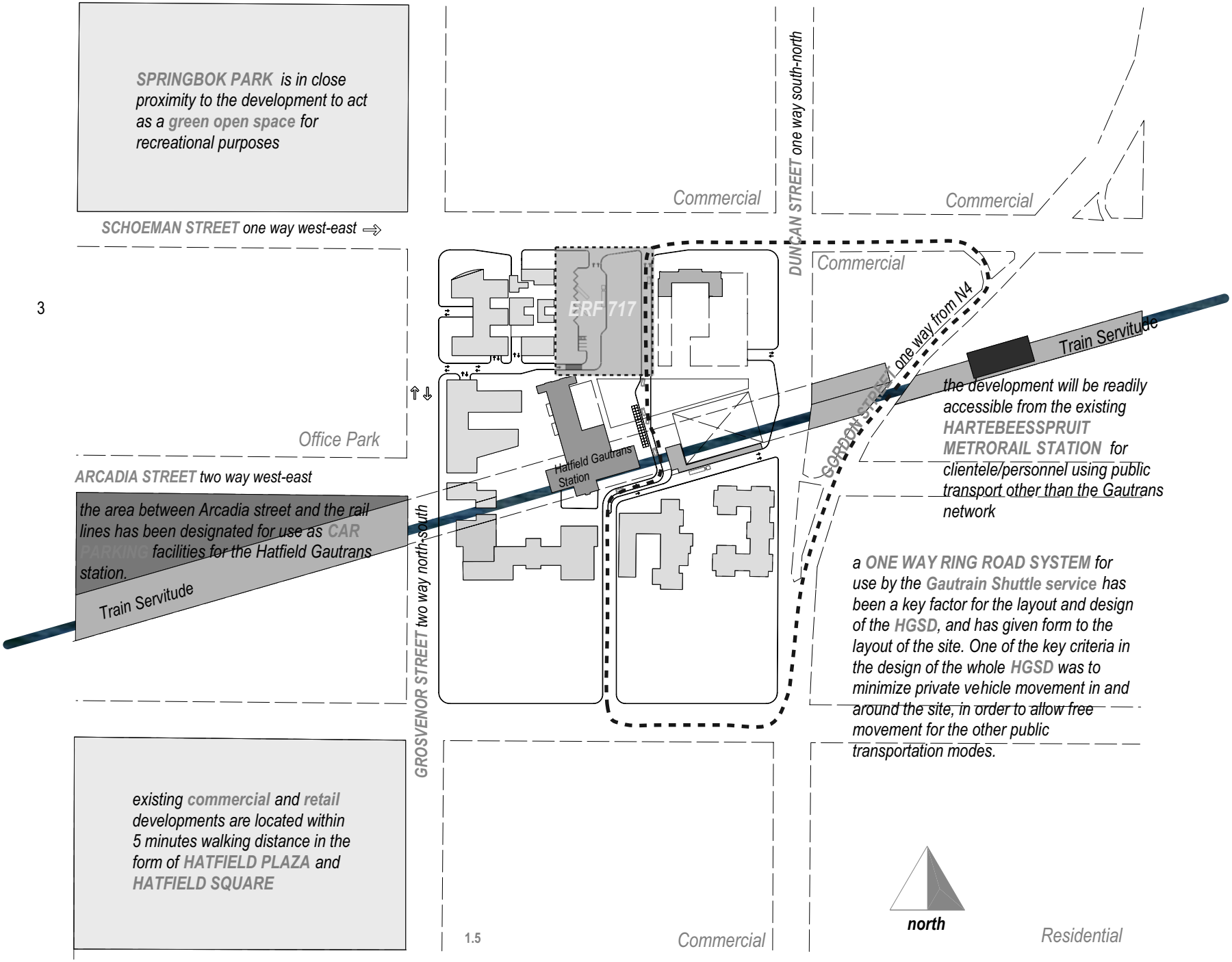
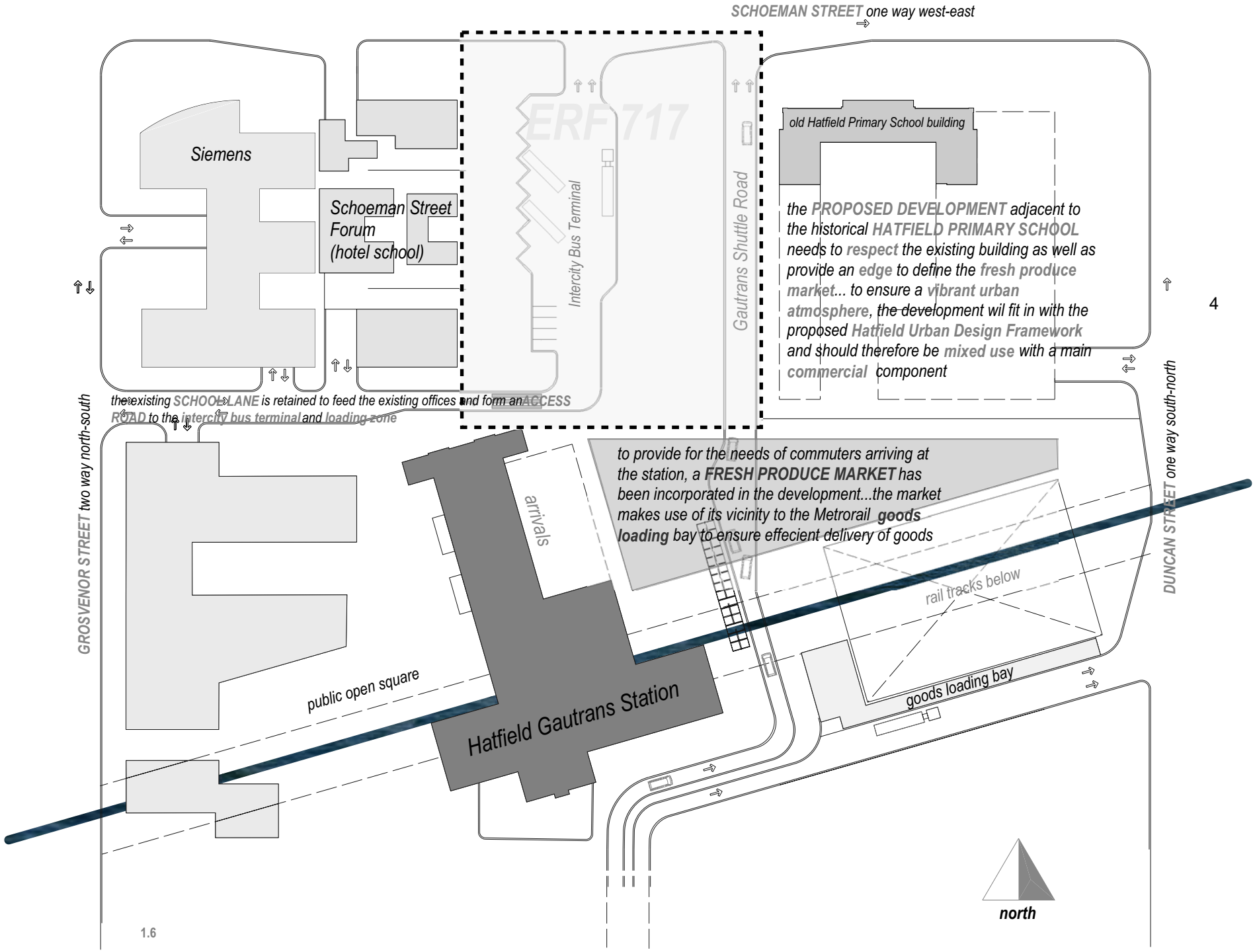


1.4

1.1 Diagram of programme generators.
1.2 Map of South Africa indicating Gauteng and Pretoria.
1.3 Gautrain Rapid Rail Link route and stations.
1.4 Hatfield, Pretoria.
Following pages:
1.5 Context plan for proposed development.
1.6 Hatfield Gautrain Station Development Master Plan.

Project Overview




SCHOEMAN STREET one way west-east
Siemens
Schoeman Street Forum (hotel school)
ERF 717
Intercity Bus Terminal
Gautrans Shuttle Road
old Hatfield Primary School building
the PROPOSED DEVELOPMENT adjacent to the historical HATFIELD PRIMARY SCHOOL needs to respect the existing building as well as provide an edge to define the fresh produce market... to ensure a vibrant urban atmosphere, the development wil fit in with the proposed Hatfield Urban Design Framework and should therefore be mixed use with a main commercial component
4
the existing SCHOOL LANE is retained to feed the existing offices and form an ACCESS ROAD to the intercity bus terminal and loading zone
GROSVENOR STREET two way north-south
DUNCAN STREET one way south-north
to provide for the needs of commuters arriving at the station, a FRESH PRODUCE MARKET has been incorporated in the development...the market makes use of its vicinity to the Metrorail goods loading bay to ensure effecient delivery of goods
arrivals
rail tracks below
public open square
Hatfield Gautrans Station
goods loading bay
north
1.6

1.5__*SOCIO-ECONOMICAL NEEDS*

The project aims at ensuring a vibrant urban atmosphere in the modal transfer area. The following socio-economical needs of both the HGSD and the local community are addressed.

The HGSD's needs are:

__24-hour activity to ensur e active and passive security.
__An intercity bus terminal.
__A temporary storage, and loading facility forming part of the service road to service the development.
__Overnight accommodation for commuters and temporary workers.
__Police presence.

Local Community's needs:

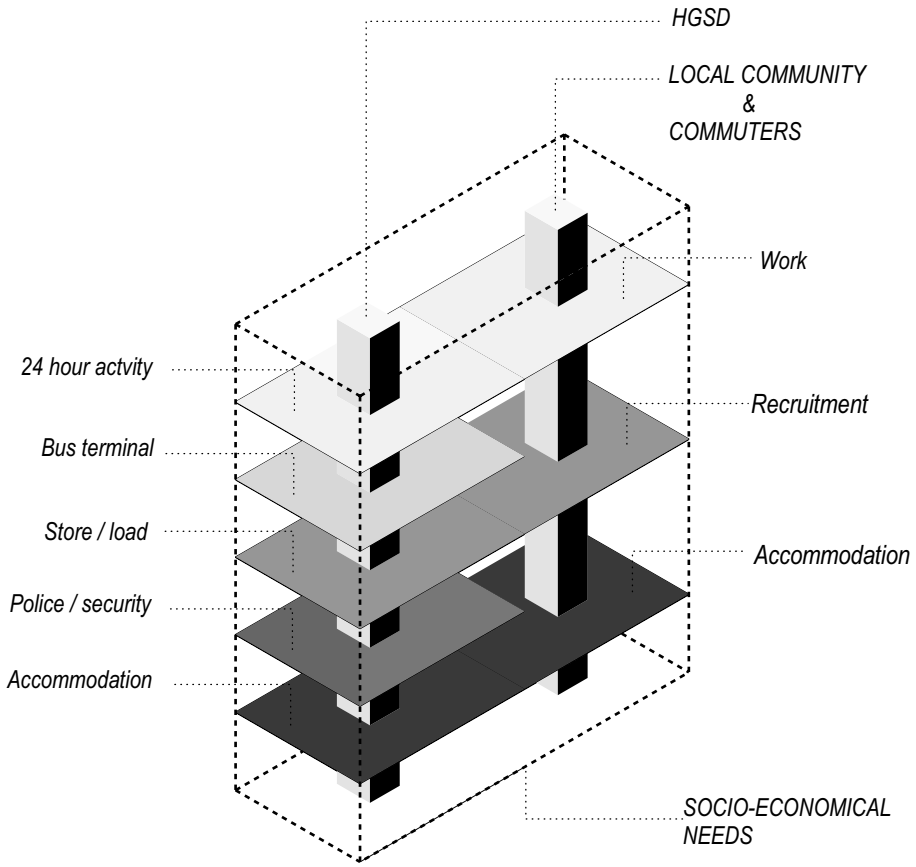
__According to the Hatfield Urban Design Framework (HUDF, 2003), a large part of the local community consists of students of various nearby institutions, including the University of Pretoria. Their needs in terms of a recruitment agency, a s well as certain on -site jobs with flexible shifts, will be catered for.
__Hostel type accommodation for students.
__The creation of jobs and the promotion of work in a commuter and institutional zone.

1.6__*FUNCTION*

To react to the aforementioned needs, a rather unique programme has been adopted. The following functions will form part of the accommodation schedule to be implemented:

__An Intercity Bus Terminal providing a coach service to nearby cities a nd towns, not covered by the Metro -rail and Gautrans networks. Public ablutions, ticketing and concessions are included.
__A warehouse facility allowing secure and dry temporary storage and loading of goods. This includes offices and ablution facilities fo r workers.
__A *Job Centre,* functionally linked to the warehouse facility acting, as a recruitment agency, while providing on -site jobs. The type of jobs available, warehouse and office work, will revolve around a 24-hour shift schedule.
__A Satellite polic e station, overlooking the HGSD, will provide active security.
__Office developments overlooking the Bus Terminal included to allow "eyes" on the street during office hours.
__A large part of the development will include overnight accommodation. This aspect of the project will also provide passive security through 24-hour activity.

Because of logistical reasons, the Project Profile (Chapter 02), mainly deals with the *Job Centre* part of the complex.



1.7

1.7__*URBAN DESIGN*

The following main guidelines are to be used to ensure a safe, secure and vibrant urban development:

__Avoidance of blank walls facing the street. Keeping the design as visually permeable as possible to ensure passive surveillance.
__Keeping building heights restricted to 15m. Occupants will be able to maintain contact with ground level, ensuring "eyes on the street".
__Clear sight lines are to be maintained at all times to enhance visual security.
__Ensure a gradual transition between pub lic and private space.
__Security in terms of access to spaces should rather be implied than forced.
__The most vibrant, and therefore safest, space will be one with 24-hour activity.
__Mixed use functions allow for variety in terms of movement, at all times.

1.8__*SITE*

The site historically formed part of the old Hatfield Primary School, a heritage building protected by the Simon van der Stel Foundation through a clause. The only remains left of the school has been incorporated into the design of the adjacent Barloworld Delta Motor Showrooms.

Currently the site, and its infrastructure, in the form of motor showrooms, is owned by Saab Motor Company South Africa. The only vegetation found on the site is ground creepers framing the main showroom window to the north.

The new development will require the current building to be demolished. The structure, aluminum and glass, can be reconstructed elsewhere.

The current character of the site is harsh, defined by brick paving blocks and motorcars.

1.8

1.9

1.10

1.7 Diagram of response to socio -economical needs.
1.8 – 1.10 Existing development on site.

1.9 ***BIOPHYSICAL***

Pretoria's climate is extremely predictable, and the implications of such a climate should be reflected in the design of the development.

The average daily temperatures for January are 16 C_{min} and 28.1 C_{max} with a lowest and highest temp erature of 8 C and 37.0 C respectively. This implies hot summers, with mild evenings. Rainfall during the summer months is mostly limited to afternoon thundershowers. General prevailing wind direction is from east and northwest directions in summer, with the highest average prevailing velocities (7.3 m per second in December) from a southeasterly direction. This implies relevantly low natural air movement, which increases surface temperature.

The average daily temperatures for July are 7 C_{min} and 19.5 C_{max} with a lowest and highest temperature of 3.6 C and 25.9 C respectively. This implies mild winter days, with cold evenings. The mean monthly precipitation for July is 3mm with a minimum of 0mm, which implies clear weather during winter. This aspect o f Pretoria's weather is rather predictable, and ensures sunny days during winter.

Low wind velocities imply the possibility of an increase in surface temperature on exposed surfaces, which could be utilized in a building's thermal performance.

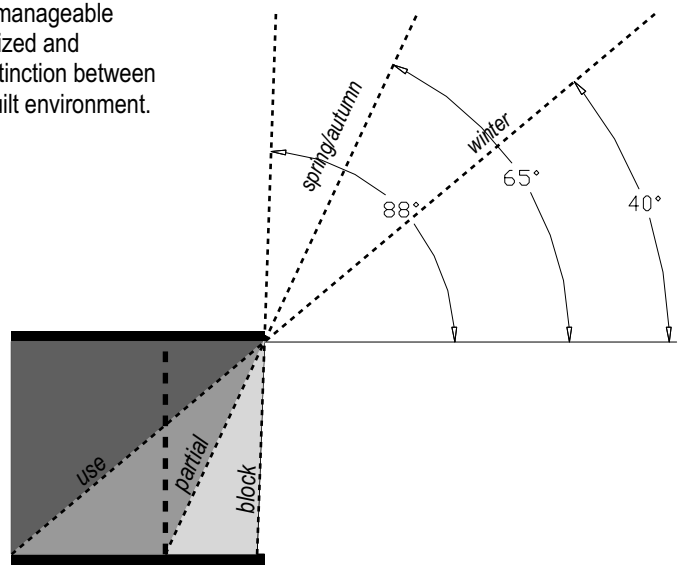
The mean annual precipitation in this region is 494 mm per year (min), 686 mm per year (average) and 1 069 mm per year (max). Most of this rain occurs during summer months, requiring harvesting and storage of rain for use during winter months. Hail does occur four days per year on average, enough to be considered a threat to building materials and vegetation.

The weather information portrays an extremely predictable and manageable climate, which could be utilized and optimized to narrow the distinction between inside and outside in the built environment.

The building should promote external circulation, and the opening of spaces to the outside. A further aspect is the full usage of the climatic c onditions to optimize the thermal performance of the building to minimize the use of mechanical systems.

Management of the effect of the sun will be the most significant factor. The information given in terms of solar angles at 12:00 can be interpreted in the following way:

__88° to 65°: block the sun
__65° to 40°: use the sun



1.12

1.11

Solar times	Date	06.00	08.00	10.00	12.00	14.00	16.00	18.00
Clock times		06.18	08.18	10.18	12.18	14.18	16.18	18.18
Azimuth	21/12	112E	101E	91E	0	91W	101W	112W
Altitude	21/12	10	35	63	88	63	35	10
Azimuth	21/3 & 9	90E	76E	53E	0	53W	76W	90W
Altitude	21/3 & 9	0	26	51	65	51	26	0
Azimuth	21/6	-	55E	34E	0	34W	55W	-
Altitude	21/6	-	14	32	40	32	14	-

1.11 Solar angles for Pretoria
1.12 Guideline for solar angle usage

02

Project Profile

2.1__*INTRODUCTION*

This section deals with the *Job Centre* component of the development only.

The need for this project has been identified by the Department of Labour (DOL) to help promote employment and alleviate unemployment in Gauteng. The *Job Centre* concept will be an initiative by the DOL, implemented as a prototype in this project, with the vision to have it reproduced elsewhere. It will be a prototype not only because of the way in which work is created, but also in its promotion.

The project will be one of two integrated projects to be developed on erf 717, Hatfield, Schoeman Street. The projects, an inter-city bus terminal, and the *Job Centre*, will be implemented in an integrated way to maximize synergy with the adjacent HGSD.

For practical reasons, the project will be expected to respond to the decisions taken, and the subsequent servitudes set up, by the HGSD.

2.2__*SITE MANAGEMENT STRATEGY*

To synergise with the HGSD, the site has been divided in two portions to accommodate a one-way service route with access from School lane, terminating with an exit into Schoeman Street.

The two main activities on the site will be a collaborative project between the DOL and the Department of Transport (DOT), also jointly responsible for the acquisition of the property, and implementing the service lane (fig. 2.1).

A further intervention affecting the property is the implementation of a two-lane one-way road servitude on the eastern border of the site in a north-south direction.

The area to the west of the bus service lane will accommodate an Inter-city Bus Terminal to operate in conjunction with the Gautrain Station.

This area will also allow for the envisaged satellite police station.

The *Job Centre* will be located to the east of the service road, and the DOL will obtain ownership to the property.

2.3__*CLIENT PROFILE*

The Department of Labour

The Job Centre will be an initiative by the DOL with the vision of establishing job opportunities in the community. One of the aims in the project will be to ensure maximum work creation even in the construction process.

The Job Centre (Pty Ltd)

The *Job Centre*, a company initiated by the DOL, will be responsible for the implementation of the project.

2.4__*USER PROFILE*

The target market for the project will be:

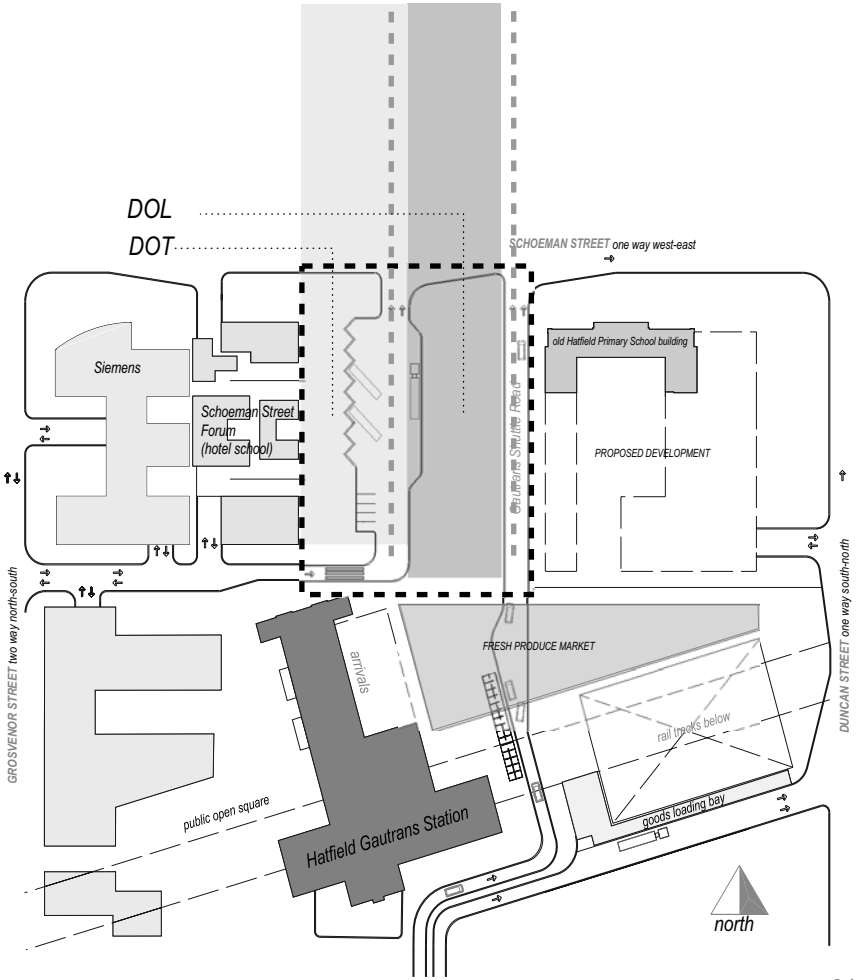
A The local community, especially the local student population, Hatfield being an institutional node in the city.

B Commuters using the Gautrain / Metrorail / Public Transport.

One of the requirements of students and certain commuters using public transport is the ability to have easy access to temporary employment opportunities.

These employment opportunities need to allow flexible time schedules.

A reliable job market database will be provided at the *Job Centre.*



2.1

2.5__*FINANCIAL PROFILE*

The DOL will fund the eventual capital and property. The *Job Centre* (Pty Ltd) will be responsible for the construction, operation and maintenance, of the development. The *Job Centre* , which also provides a recruitment company service, will be a business that trades with personnel as a commodity.

After 20 years the property will be handed back to the DOL.

2.6__*VISION*

The vision for the *Job Centre* is to be a prototype in providing a service as a recruitment agency, and the creation of employment, by making use of its location in a public transportation and institutional node.

2.7__*AIMS*

The project will aim to:

__Be as visible as possible in its location to promote its facilities.
__Be a prototype of how such a building should function internally, and externally with its environment; to provide maximum employment opportunities, both during the construction and its eventual function.
__Be a prototype of how a facility that promotes work should be constructed.

2.8__*GOALS*

The goals will be to:

__Comply with the DOL's policy to promote and enhance work opportunities in South Africa.
__Coincide with the Human Ri ghts legislation, stipulating that all South Africans have the right to work and earn a living.
__Create, and facilitate as many work opportunities as is possible.

Students / Local Community

Students and other temporary workers will be catered for by:

__Providing a service allowing a generation of income during studies, while gaining useful experience in the work field.
__Access to job seeking facilities.
__Functioning as a reliable recruitment company with an up -to-date recruitment database aimed at temporary workers.
__Addressing the need for hostel type accommodation.

Commuters

Commuters using public transport will be provided with a quick and effective facility to do job hunting. Overnight accommodation will also be available.

2.1 Site management strategy.
2.2 Diagram of *Job Centre* functions.

2.9__***FUNCTION***

The main functions of the *Job Centre* will be to act as a recruitment agency, providing some on-site employment opportunities. The centre will act as a link between the employer and employee when dealing with temporary personnel, to eliminate unnecessary legal and monetary obligations towards the employee. The centre will act as a safe and secure body through which the employees could file complaints and give feedback regarding their work and employers.

Certain on-site jobs, either office or warehouse work, will form the other function of the centre.

In these instances, a company will contract the *Job Centre* to have defined work done.

The centre will also function as a haven for workers/commuters by way of an overnight accommodation component.

A Take Away/Cafeteria function will also be introduced. Its location next to public transport facilities will imply a regular influx of clientele, also catering for the needs of employees.

2.10__***RECRUITMENT PROCESS***

External employers will advertise vacancies at the *Job Centre*, who in turn will provide job-hunting facilities for recruits to have access to these jobs.

The agency will recruit the personnel most suitable for the work by means of a contract. Contracts will thus be between the *Job Centre* and recruits on one hand, and the *Job Centre* and employer on the other. Payment will be to the *Job Centre*, who in turn will compensate the personnel. Making use of this system, employers will be alleviated of obligations towards employees. The *Job Centre*'s revenue out of this system, and the services provided, will comprise a percentage of the salary the recruit earns.

2.11__***ON-SITE EMPLOYMENT***

The on-site employment opportunities available include both manual labour (warehouse located) and office work. The opportunities consist of shift jobs, revolving around a 24 hour schedule.

Warehouse work:

__**Loading and off-loading of goods.**
__**Transport of goods to applicable destinations, such as the fresh produce market.**
__**A cleaning team that offers a service to the adjacent developments.**
__**Picking and packing of goods for temporary storage in the warehouse.**
__**Collecting and sorting of waste for recycling.**

Office Work:

__**Data capture work.**
__**Call centre work doing telemarketing and market research.**
__**Administration work (filing, sorting and printing).**

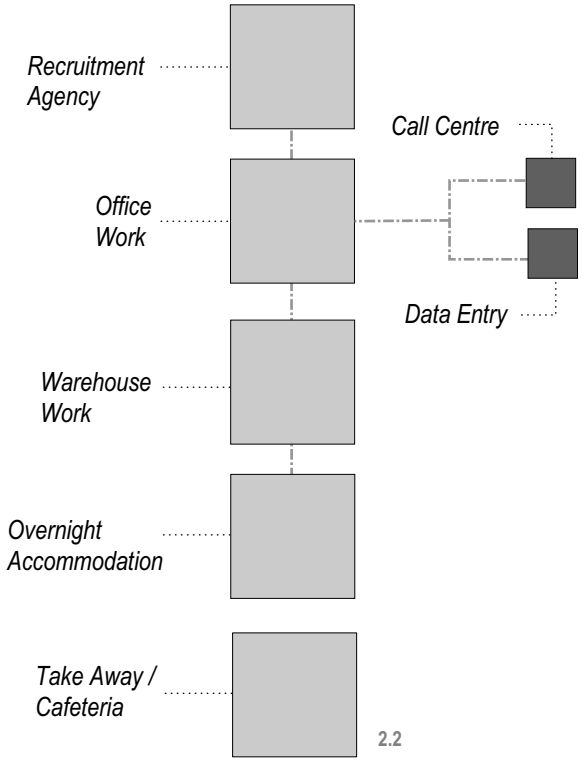
2.12__***SERVICE PROVISION***

Warehouse Component

__**Contract picking and packing of goods for external contractors making use of the proximity of the rail line to transport goods to and from the warehouse.**
__**The loading / off-loading of goods as well as the transport of those goods to their various destinations within the HGSD.**
__**Temporary storage of goods.**
__**The recycling and removal of waste from adjacent developments.**

Office Component

__**To supply a data capturing service towards private companies. A company can contract the *Job Centre* to have a certain amount of data captured within a certain time. The centre will provide the facilities as well as the personnel and training.**
__**To host a call centre through which private companies can do market research or telemarketing on a contract basis. A company can contract the *Job Centre* to have a certain amount of people contacted within a certain time, with the associated data capture involved.**



2.2

Personnel Services

The services rendered by the *Job Centre* towards personnel (recruits) will be:

__**The provision of assistance in legal and monetary matters.**
__**Assistance and training in the set up and layout of a well-maintained Curriculum Vitae.**
__**The assessment of skills with eventual career counseling.**
__**The provision of a reliable job market data base. A form of networking will be established between the *Job Centre* and various local tertiary institutions such as the University of Pretoria and Damelin College. In this way there can be feedback regarding the need and availability of jobs. This aspect will form an integral part of the Knowledge Management System (KMS), making up a valuable part of the intangible assets.**

2.13__*CONSTRUCTION*

Materials

The following aspects determined the choice of materials:

__**Flexible character and the relative ease through which it can be altered to show craftsmanship and detail.**
__**Traditional and extensive usage in the region, currently and in the past.**
__**The low embodied energy needed in the manufacture in most cases.**

In-situ concrete. Tshwane boasts beautiful examples of in -situ concrete, a skill and tendency which seems to have decreased in popularity over the last decade. Concrete will be used for its sculptural qualities, as well as the many different low -maintenance finishes which could be derived when some time is spent either during the preparation of the formwork, or afterwards.

Face bricks · In most new developments taking place in Hatfield, plaster-and-paint seems to have been preferential to face brick construction. Face bricks from a local manufacturer will be used extensively in the project. The challenge for the architect will be to use these building blocks not only as structural elements, but also in other components of the building.

Timber cladding and decking. Timber cladding and decking will be used due to the fact that it is a renewable source, as well as the finishes and textures which can be obtained. The timber used, will be the only material used, needing regular maintenance in the form of varnish and treatment.

Steel. Selected steel contractors will be responsible for the custom manufacturing of some lightweight components, making use of standard profiles. Preferab ly steel with a certain amount of chrome will be used to eliminate the need for paint.

Natural stone. Slate and sand stone tiling will be used in conjunction with thermal massing in the building.

Polycarbonate sheeting. Polycarbonate sheeting will be used instead of glass due to its thermal performance when used in the right applications.

Contractors. The contractors chosen for the project will be required to work in close contact with the construction team in order to facilitate skills transfer and quality control. The architect will be required to do extensive quality control; his respons ibility does not end at working drawing stage.

2.14__*SUSTAINABILITY*

Social: The project will be required to be socially sustainable in the following ways:

__**By facilitating the creation of jobs.**
__**By providing a service to the local community and adjacent developments.**
__**By providing an educational com ponent in assisting and training recruits with skills.**

Economical: The building will be economically sustainable in the following ways:

__**By making use of the site's location to the fullest extent to generate income for the centre.**
__**By promoting the cen tre through its appearance and functionality.**

Environmental: The building will be expected to be environmentally sustainable in the following ways:

__**The building will be required to benefit through improved thermal performance due to the shuttle road.**
__**Passive environmental control should form a basis for the design of the building to reduce the impact that energy sources have on the environment.**
__**Vegetation should form part of the design to enhance the ecological conditions on the site, which has been reduced to nil as a result of the existing motor dealership. Historically the site formed part of the lawn sports facilities of Hatfield Primary School. As much as possible part of this character needs to be recovered.**

2.3 Old Hatfield Primary School building.
2.4 – 2.5 Motorcar showrooms in the vicinity.
2.6 Diagram of accommodation schedule layout.
2.7 Diagrammatic office layout.

2.15__***ARCHITECTURE***

The architecture of the development should respond to the immediate built environment in various ways. Firstly, it should combat the “temporary” architecture which dominate the area through motorcar showrooms. These aluminium and glass boxes do project a very glamorous image. The construction and function is however of a temporary nature and against the principles of the HUDF, which calls for inhabitable spaces for humans, not motorcars. The building should portray a more stable, inhabita ble and long -term image to attain a more permanent atmosphere in the area.

Instead of showcasing motorcars, the buildings should showcase and celebrate work.

The development should not compete with the HGSD in terms of importance, but rather complement it . On the northern façade, the building should respect the historical fabric in the form of the old Hatfield Primary School. The development should also respond to the two roads passing through it in an aggressive, yet acceptable way.
The architecture shou ld act as a prototype of how such a project could be implemented.

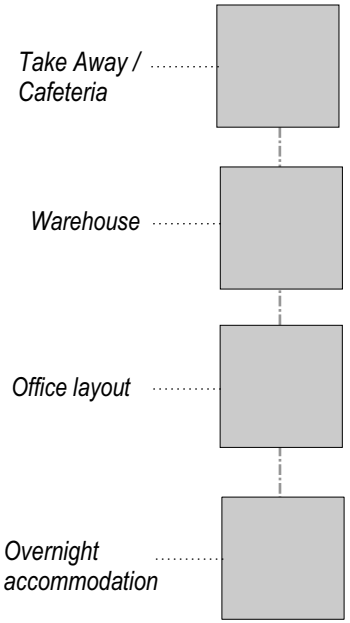
2.16__**ACCOMMODATION SCHEDULE**

The accommodation schedule comprise four functional layouts within the development:

__Office layout
__Warehouse layout
__Take Away / Cafeteria layout
__Overnight accommodation layout

The four functions are integrated into one p roject, but will be designed to be adaptable so that each layout can function separately to plan for possible future changes.

The sizes and functions portrayed in the accommodation schedule were derived from the requirements of the Job Centre, and is a re sult of the optimization of building area on a limited site.



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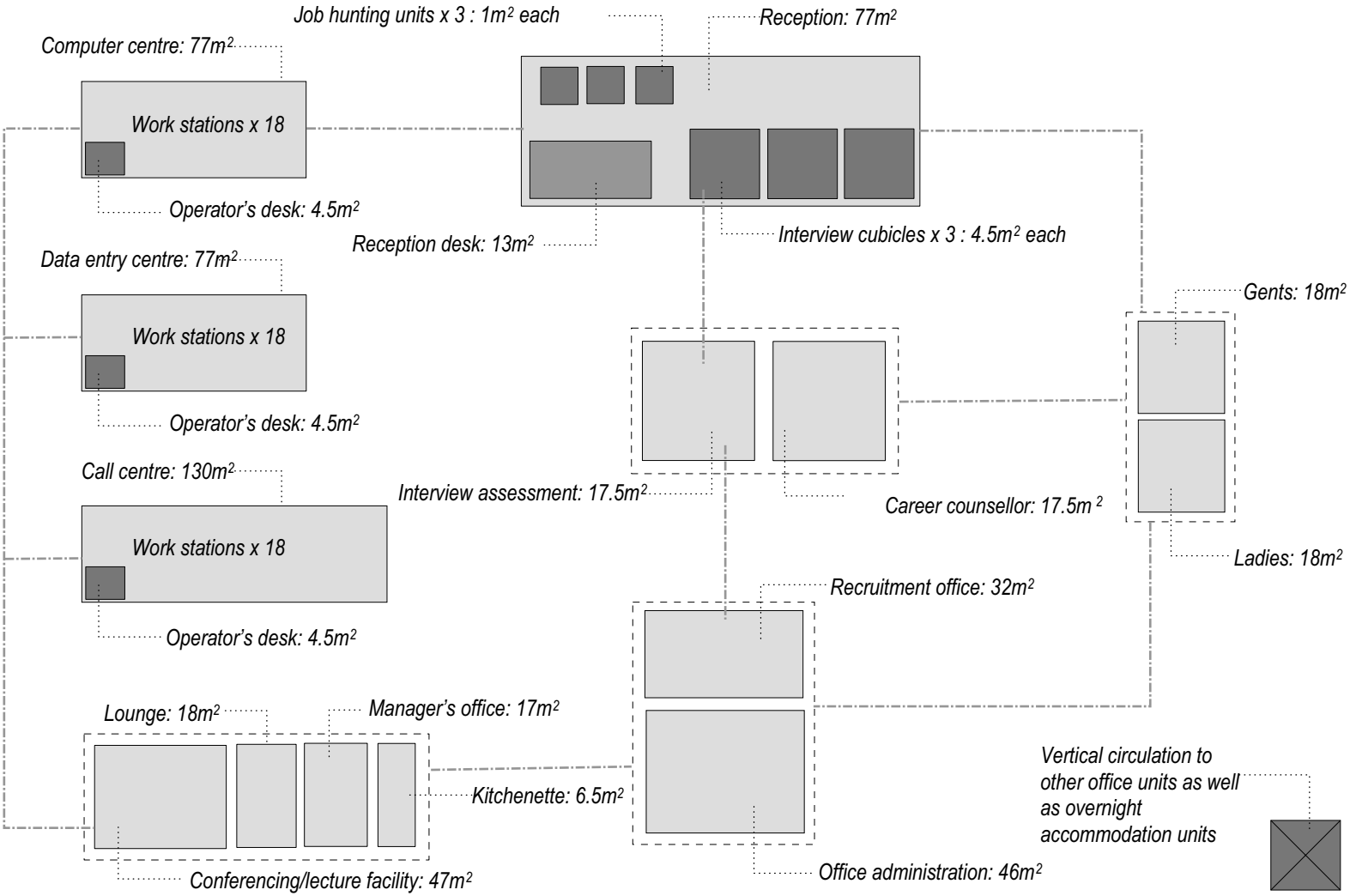

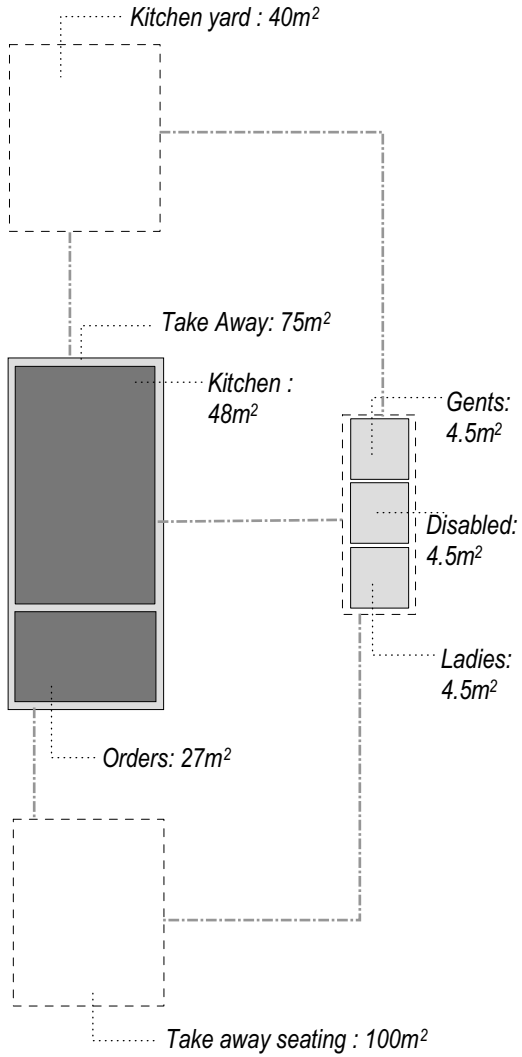

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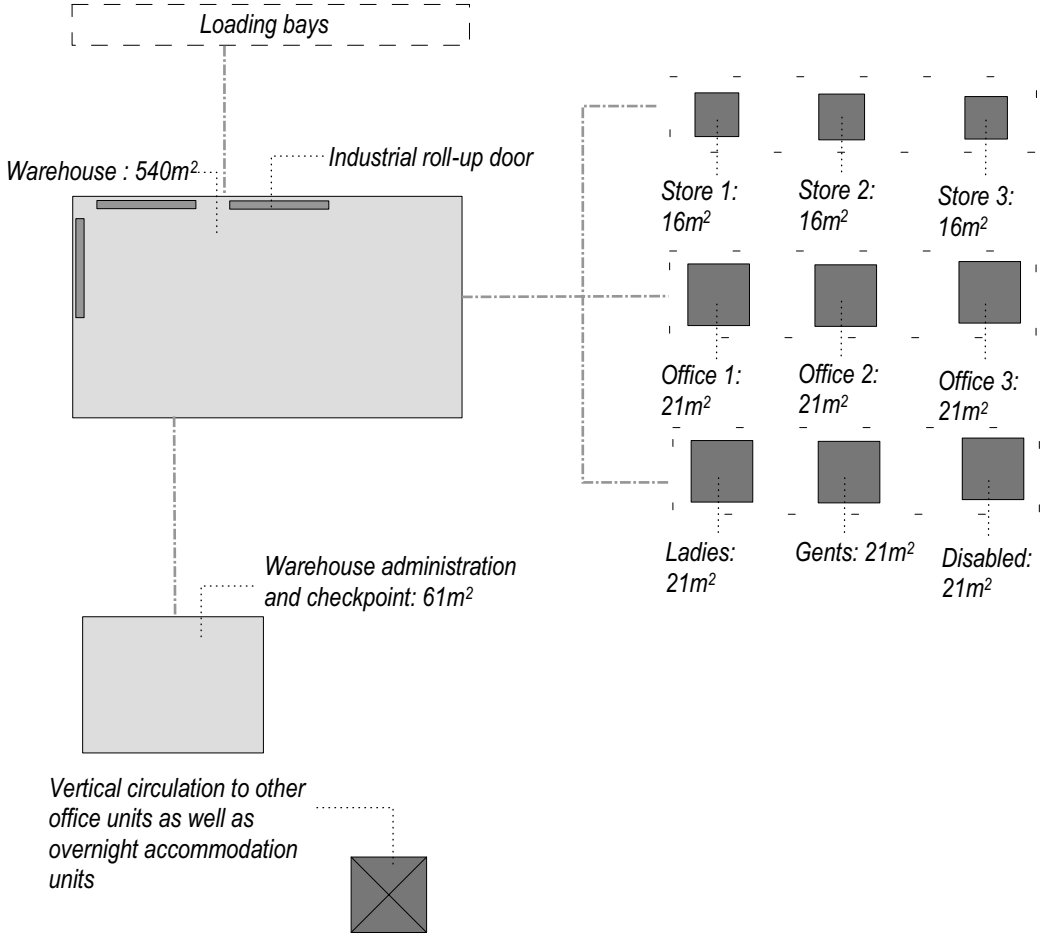

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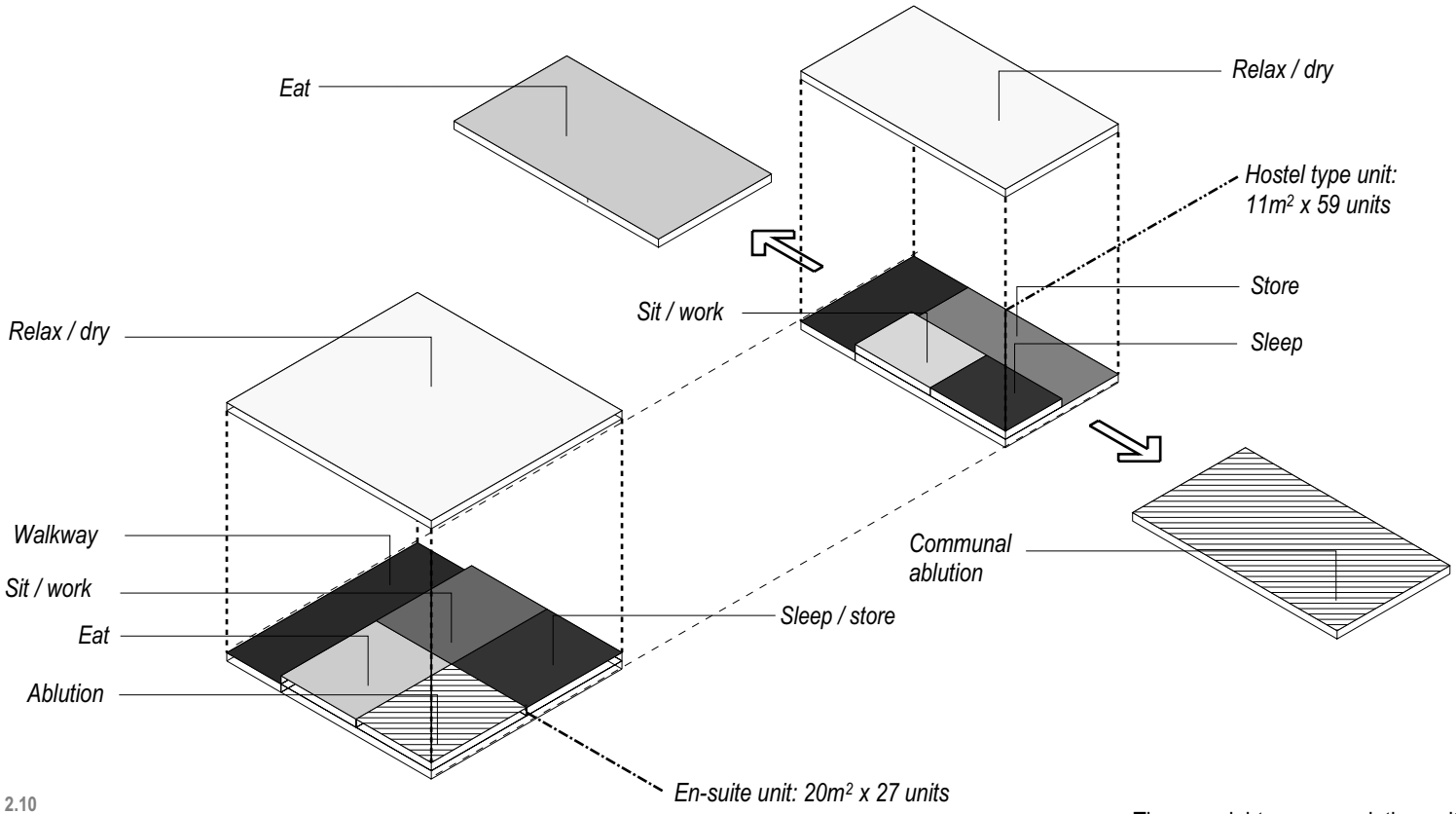


2.10

The overnight accommodation units will cater for both en -suite units, and hostel type accommodation with communal ablution facilities. In order to fulfill other needs such as relaxation space and a place for drying clothes, each unit will also have an exte rnal space allocated for this purpose.

Other functions include laundry and storage rooms. The front desk reception will collaborate with the main reception at the *Job Centre* . Rates and services delivered for the units will range from self -cater (own bedding etc.) to hotel -type service, depending on the needs of the customers. Beds will vary between double, single and bunk beds.

FUNCTION	SPACE DESCRIPTION	AREA	ACCOMMODATION
WAREHOUSE	Warehouse	540	Loading bays, industrial roll-up doors, 7.5 m clear ceiling height for forklift maneuvering.
	Warehouse offices	63	Overlooking the warehouse for security and communication. Workstations and communication points.
	Warehouse ablutions	63	Ladies, Gents and Disabled. Including washing and showering facilities.
	Warehouse storage	48	Separate storage spaces for equipment to be used in the maintenance of the centre.
	Warehouse Administration and Checkpoint	61	Spatially linked with warehouse through industrial roll-up doors for easy circulation, while maintaining link with office part of Job Centre. Workstations and communication points, including printing facilities.
JOB CENTRE	Reception	77	Reception desk, interview cubicles x 3, job hunting units x 3.
	Interview Assessment	17.5	Work station. Spatially linked with interview cubicles for effective communication.
	Career Counsellor	17.5	Work station. Functionally linked with assessment office as a next logical step in recruitment process.
	Recruitment Office	32	Work stations x 3. Telecommunication points.
	Job Centre Administration	46	Centrally located for access. Printing facilities.
	Conferencing facility	47	Multimedia facilities. Accommodates 18 participants.
	Lounge	18	Spatially linked to conferencing facility. Comfortable seating for visitors.
	Manager's Office	17	Work station and telecommunication.
	Kitchenette	6.5	Washbasin, refrigerator and storage. Spatially linked to conferencing and lounge.
	Job Centre Ablutions	36	Ladies and Gents. Including washing and showering facilities.
	Computer Centre	77	Workstations x 18. Communication points and service duct. Operator's desk. Electronic card-operated sliding doors. HVAC system.
	Data Entry	77	Workstations x 18. Communication points and service duct. Operator's desk. Electronic card-operated sliding doors. HVAC system.
	Call Centre	130	Workstations x 30. Communication points and service duct. Operator's desk. Electronic card-operated sliding doors. HVAC system. Acoustically treated.
TAKE AWAYS	Take Aways	75	Kitchen, Order area. Sinks, stoves, ovens, preparation area desks. External service entrance.
	Kitchen Yard	40	Spatially linked with kitchen and service entrance.
	Take Away seating	100	External seating with visual link to surrounding developments.
	Take Away ablutions	13.5	Ladies, Gents and Disabled.
OVERNIGHT ACCOMMODATION	Overnight Services	50	Washing and drying facilities
	Overnight Service storage	25	Storage for equipment
	Overnight Ablutions	108	Ladies, Gents and Disabled. Including washing and showering facilities.
	En-suite Units	540	Units x 27. Includes bedding (single, double or bunk), kitchenette, lounge, and ablution facilities (WC, HWB and SHW) + storage.
	Hostel Units	695	Units x 59. Includes bedding (single or bunk), seating and desk + storage.
LANDSCAPING		300	Courtyards, roof ponds, etc
CIRCULATION		664	Twenty percent of building area.
TOTAL		**3984**	

Average rate per square meter: R 2 258

TOTAL BUILDING COST: R 8, 995, 795

03

Feasibility and Risk

3.1__***INTRODUCTION***

In a prototype development such as this scheme, certain risks need to be catered for to increase its financial feasibility due to the lack of a suitable precedent to depend on. In this case the different functions need to be as flexible a nd adaptable as possible, while still being able to function as one integrated whole.

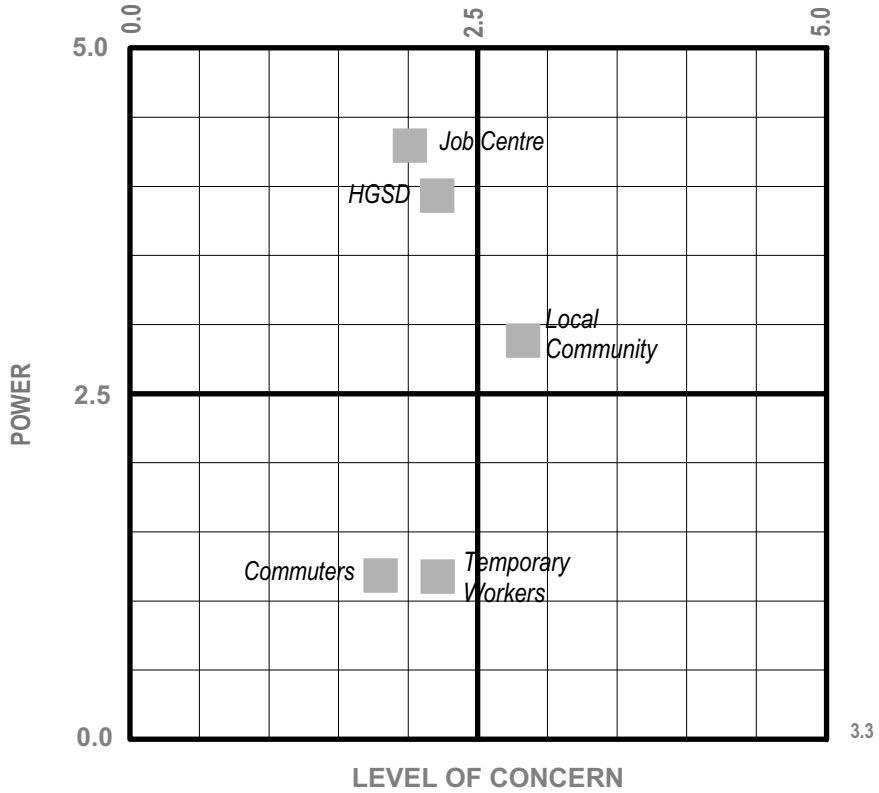
The approach was to allow for future adaptability by allowing the different functions to be independent of each other in terms of circulation. This will enhance the project's feasibility, even in the case of postponement or cancellation of the HGSD.

This aspect is insured by the placing of the circulation infrastructure on the outside, linking the different functions. In a study of the floor plans it becomes evident that all the different functions can operate separately, without the normal security problems associated with changing the programme of a development. This aspect also links with the project profile which stated that the building should promote work in progress. All movement by occupants is therefore visible by passers-by.

3.1

3.2 ***STAKEHOLDERS***

Target user group:
_Temporary Workers.
_Commuters.
_Local student population.
Programme collaborators:
_Gautrain Rapid Rail Link: HGSD.
Financing Capital:
_Department of Labour: Job Centre.



3.3

3.1 Commuter stakeholder.
3.2 Stakeholder Weighting Table.
3.3 Key Stakeholders Matrix.

STAKEHOLDERS	POWER			LEVEL OF CONCERN			
	Influence on others	Direct labour control	Y-Axis	Technical	Social	Environmental	X-Axis
Weighting	**0.65**	**0.35**		**0.2**	**0.2**	**0.4**	
Temporary Workers	2	0	**1.3**	0	5	3	**2.2**
Commuters	2	0	**1.3**	3	4	1	**1.8**
Local Community	4	1	**2.95**	3	5	3	**2.8**
HGSD	5	2	**3.95**	5	2	2	**2.2**
Department of Labour: Job Centre	5	3	**4.3**	5	1	2	**2**

3.2

RISK DESCRIPTION	CONSEQUENCE	LIKELIHOOD	RISK FACTOR	RISK RESULT	MITIGATION
STAKEHOLDER RISKS					
Temporary Workers	4 Major	4 Moderate	16	HIGH	Management and promotion of faciltites need to be efficient to ensure centre usage by workers. Backup plan: Robust layout, centre can be subdivided in different functions.
Commuters	4 Major	4 Moderate	16	HIGH	Influx of commuters will depend on the success of the HGSD. Ensure close collaboration with this development.
Local Community	2 Minor	3 Unlikely	6	LOW	A high need for such a development exist within the local student population, enhancing the feasibility of the project, therefore lowering the risk. Ensure usage through promotion of facilties.
HGSD	4 Major	4 Moderate	16	HIGH	The project depends to a large degree on the success of this development. Financial mitigation need to be planned for to ensure feasibility of the centre in separation of this development.
Department of Labour: Job Centre	3 Moderate	3 Unlikely	9	MEDIUM	The initial capital depends on the client. As a government initiative, the risk minimises. Risk of capital loss need to be catered for by proper financial and project management.
INTERNAL RISKS					
Structural Failure	5 Catastrophic	3 Unlikely	15	HIGH	Large spans of overhead structures poses a problem. Risk minimised by overdesigning the structural steel members.
HGSD Failure	4 Major	3 Unlikely	12	MEDIUM	Development is dependant on the HGSD. Design centre to be able to function independently
Ventilation System Failure	3 Moderate	3 Unlikely	9	MEDIUM	Backup generator supplied, and openings to aid natural ventialtion.
Management	3 Moderate	3 Unlikely	9	MEDIUM	The different functions need to be managed to ensure the success of the centre as a whole.
Loss of potential	4 Major	4 Moderate	16	HIGH	Failure of interest in the centre and its functions can fail the project. Design for felxibility in terms of function: **Robust**
Stakeholder Group Conflict	3 Moderate	2 Rare	6	LOW	The interaction of the HGSD and the Job Centre is of cardinal importance in the development. Proper project management and communication will mimise this risk

RISK DESCRIPTION	*CONSEQUENCE*	*LIKELIHOOD*	*RISK FACTOR*	*RISK RESULT*	*MITIGATION*
UNPREDICTABLE EXTERNAL RISKS					
Failure of completion	3 Moderate	4 Moderate	12	MEDIUM	Controlled management of the design and building phases within the program of works.
PREDICTABLE BUT UNCERTAIN RISKS					
Market Risks	3 Moderate	4 Moderate	12	MEDIUM	Monitor economics during planning phase, ensure partnership with the HGSD.
Inflation / Taxation	4 Major	5 Likely	20	HIGH	Proper project management, ensure proper promotion of facilities to generate income as soon as possible
LEGAL RISKS					
Health & Safety Legislation	3 Moderate	4 Moderate	12	MEDIUM	Plan for possible safety issues especially in Warehosue function.
Contractual	4 Major	3 Unlikely	12	MEDIUM	Proper project management with the employers recruiting the temporary workers.
Performance	4 Major	5 Likely	20	HIGH	The qualtiy of workmanship will determine success of the project: high risk due to structural challenges.
Size of project	4 Major	4 Moderate	16	HIGH	Ensure the construction time and implementation are well managed within the scope of the HGSD.

20

3.4

04

Precedent Studies

4.1__The Menil Collection.

HOUSTON, USA. **Piano & Fitzgerald**
1981-1986

The Menil Collection by Renzo Piano was chosen as a precedent for the way in which the building is "crafted", not only during the construction, but also in the conceptual "making" of th e building. Another convincing aspect is the multifunctional use of building components.

The Menil is a study centre for an established private art collection, housing different galleries for a rotating selection of these works. One of the client's, Domini que de Menil, foremost requirements were that all art work on display be seen in natural light, and that this light be handled in such a way that visitors are alert to its constant changes with time, season and weather.

The characteristic "piece" which responds to this request is the light -diffusing "leaves", integrated with the space frame truss system. It is so arranged that natural light permeates everywhere in the ground floor galleries. The upper part of each ferro -cement leaf also serves structurally as the lower chord of the ductile iron truss that supports the roof of ultra -violet light -excluding glass, and the return air-duct threaded through it. (Buchanan 1993:143) The rest of the leaf curls down to hide most of this, to block direct sunlight, and to scatter the light reflected off the upper part of the neighbouring leaf. The material and manufacturing of the leaf and truss, both of which are immaculately crafted castings, are updated versions of older technologies. The castings for these units were crafted in Piano's building workshop, and the time and workmanship is evident in the end product.

Besides controlling the amount of light and diffusing it, the leaves are shaped to help achieve stable temperatures within the galleries. Their horizontal tops reflect heat back through the glass, and also hold a protective layer of hot air under it, while minimizing the downward radiation of heat.

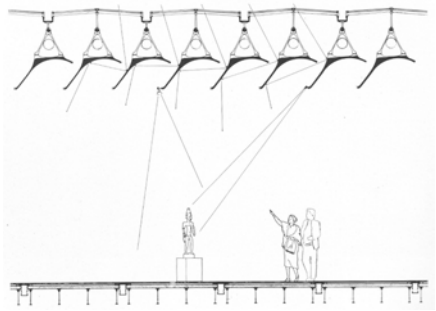
The leaves therefore do not only play a structural role, but also helps in temperature regulation, reducing the redundancy associated with these "pieces".

Another aspect to be mentioned is the way in which the building rests within the already established built environment. Piano used the same grey clapboarding in the design of the building as can be found in nearly all the bun galows surrounding the building.

To emphasize entry on an implied rather than an aggressive way, planting flanks the route to the main entrance, set back into the building. Recessing the entrance also reinforces the cross -axis, placed off -center (symmetry denotes monumentality), defined by the entrance and the lobbies to which it leads

Clean, clear and "neat" planes and lines give an overall quality finish to the building. The building is portrayed as a complete, crafted building, qualities expected from an art gallery.

4.1



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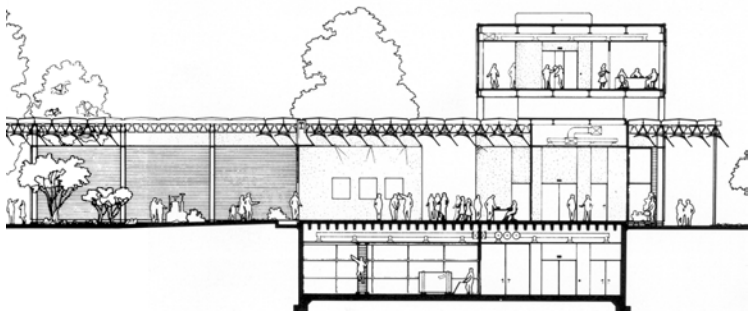

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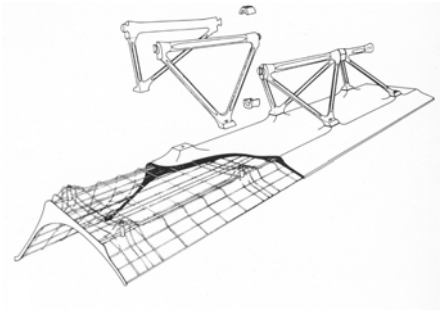

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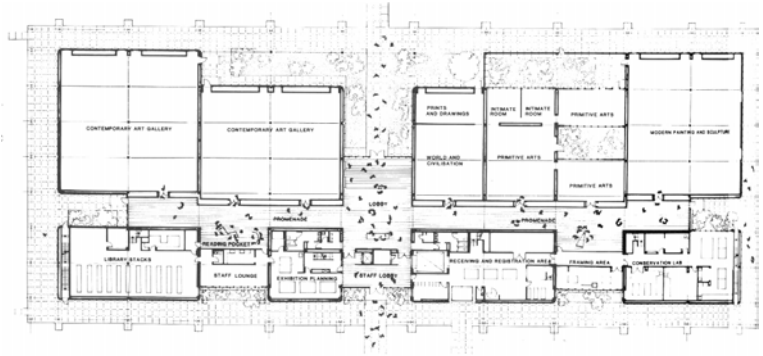
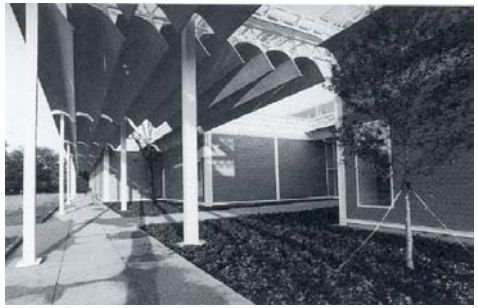


4.5

4.1 South -eastern corner of the museum, looking along the southern colonnade. Note the grey clapboarding also used in adjacent bungalows.
4.2 Part section through a gallery showing the design of the leaves, which block out direct sun, and reflect and diffuse the light they admit. The leaves also trap an insulating layer of warm air above them. Their lower edge also supports the artificial lighting.

4.3 Exploded and cutaway perspective of the piece shows how the ductile elements of the truss and the ferro-cement leaf come together.
4.4 Cross section through entrance lobby.
4.5 Ground-floor plan: note recessed entrance and cross-axis.
4.6 Recess of the entrance.



4.6

4.2_Altemira School. SANTIAGO, CHILE. **Mathias Klotz.**
1999-2000.

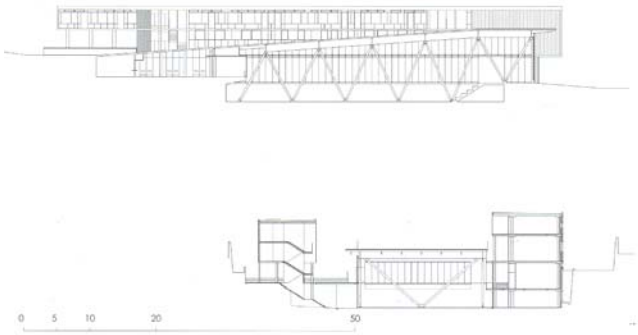
Since the programme of the project discussed in this thesis is extremely complex, consisting of a multitude of different spaces of varied volume, a school building were chosen to best exemp lify how such spaces can be organized.

The Altermira School by Mathias Klotz was chosen as a precedent for both the multi -functional use of space; and the elements that define these spaces. The choice of structure, and the way in which it is integrated in the project, also played a deciding role.

The project is a response to a competition scheme of 10 000m ^{2} for 1 400 students in Santiago, and is located on a rectangular site of 60 meters by 200 meters with a 20% slope on its long side. The layout comprises four buildings, located around a central playground with an open view to the city. The mayor areas are a gym and a cafeteria. It is situated in the centre of the site looking to the street, used for common public activities. The roof of these spaces is an inclined surface that also functions as the playground area. This volume is constructed of a kneecapped steel structure. The perimeter buildings are projected to define this multi -functional space, and house the classrooms. This structure is made up of con crete columns and floors, without exposed beams, to ensure maximum flexibility.

This project illustrates an exercise in structures and surfaces, subject to a general proposal of clearness and simplicity (Futagawa 2002:96) . The spatial approach taken by Klotz is simple: build the borders, liberate the centre.

4.7

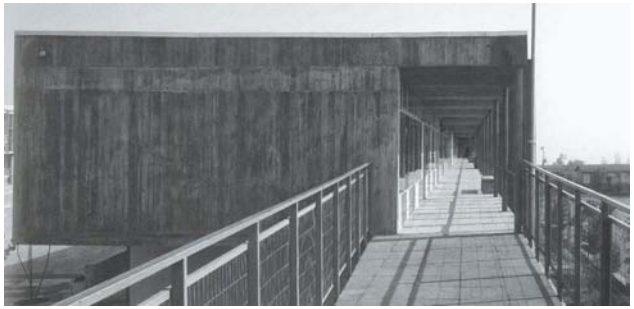


4.7 Cross and longitudinal sections through building indicating gym steel structure and the concrete structure of the buildings framing the gym.
4.8 View of main entrance from street.

4.8

4.9

4.11



4.12

4.9 Interior view of gym. The steel structure carries a concrete roof doubling as a playground.
4.10 East façade of gym. Note the clean, clear lines.
4.11 View down concrete roof playground. Note the classrooms framing the space.
4.12 Entrance to a walkway leading to classrooms. Note the quality of off-shutter concrete.
4.13 View towards classrooms and roofscape.

4.10

4.13

05

Urban Design Concept

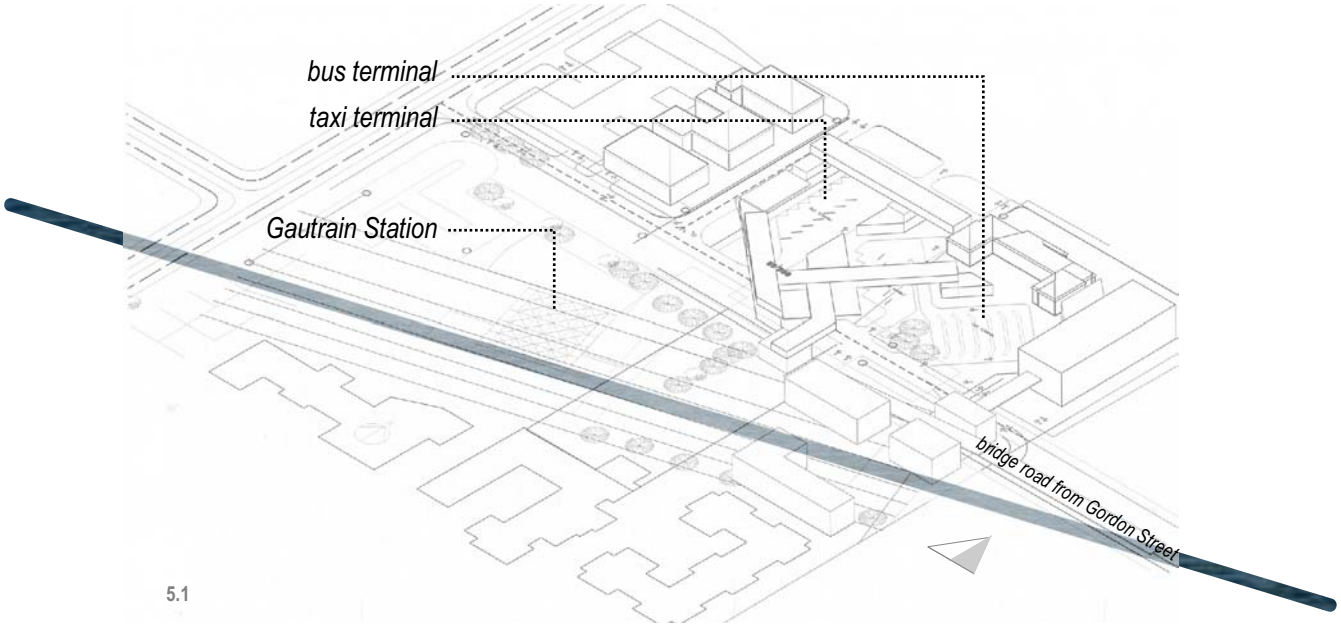
5.1__***INTRODUCTION***

The final design solution for the site discussed in this thesis came, as result of extensive planning as to what would work in collaboration with the HGSD. Much time was spent on the planning, and testing, of different functions for a mod al transfer facility to complement the station. The initial concept for the area surrounding the station was a modal transfer facility, able to process private vehicles, shuttle buses and coaches. A decision was made to pedestrianise the area as much as possible; to ensure a safe, vibrant urban development. Private vehicles were "banned" from the site, assigned to a proximate parkade in Arcadia Street. Access is now only given to Gautrain shuttle buses, service vehicles and coaches for the intercity bus ter minal. The roads were also laid out to have minimal impact on pedestrian movement channels, limiting the times roads have to be traversed by foot to reach a destination.

The result of these decisions was that I managed to plan myself out of a job.

The decision was then made to focus on one site, designing a building responding to the context by ensuring a vibrant urban development. Ironically, the concept of a *Job Centre* f ulfilled all the needs of such a development, and a client was chosen.

The resulting Urban Design Concept is based on trial and error during this planning stage, and is a suggestion on how sustainable urban developments could be implemented.



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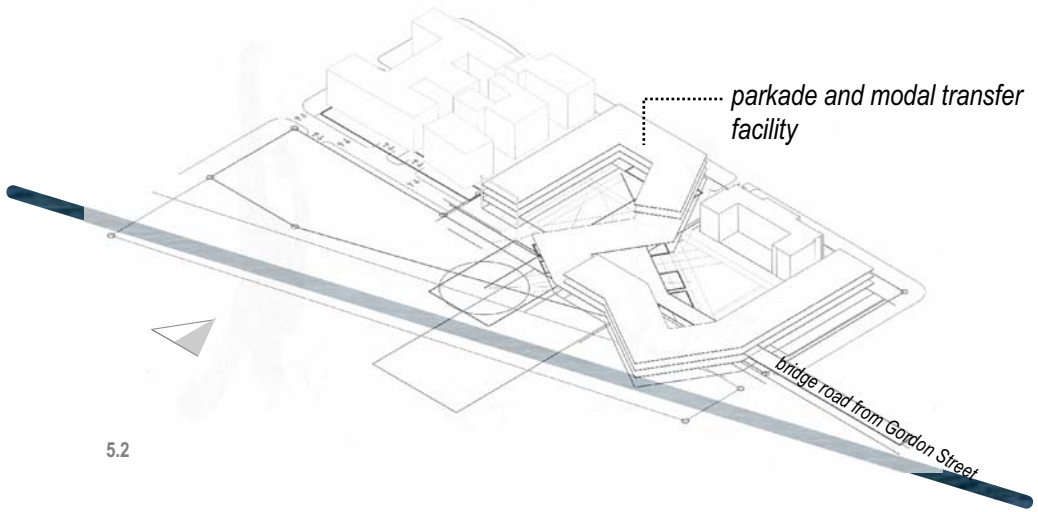


5.2

5.2__*CONCEPT*

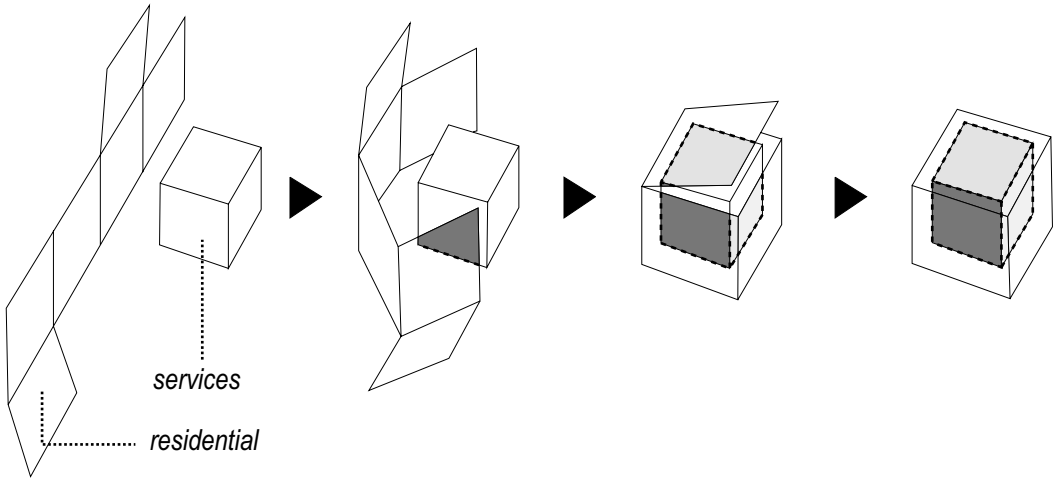
As an urban design concept, the main principle applied in the project is to envelope the ancillary functions of a settlement, such as place of work and transport, with the residential function.

Another aspect is to keep these residential units to a maximum elevation of 15m to ensure connection and a relationship with ground level, eliminating the disconnected feeling experienced by inhabitants of high-rise apartment blocks.

In effect, every vertical storey in an apartment block now becomes a ho rizontal residential strip, with the ability to traverse other buildings, as well as road servitudes.

In an urban context, this will ensure a higher building density, without the "dead" spaces which occur after hours such as in the Pretoria CBD. Twenty -four hour activity and p assive security through "eyes on the street" therefore ensures a vibrant urban atmosphere, while combating urban sprawl.

5.1 Modal Transfer planning concept 1.
5.2 Modal Transfer planning concept 2.
5.3 Urban design concept: enveloping the ancillary functions with the residential component.

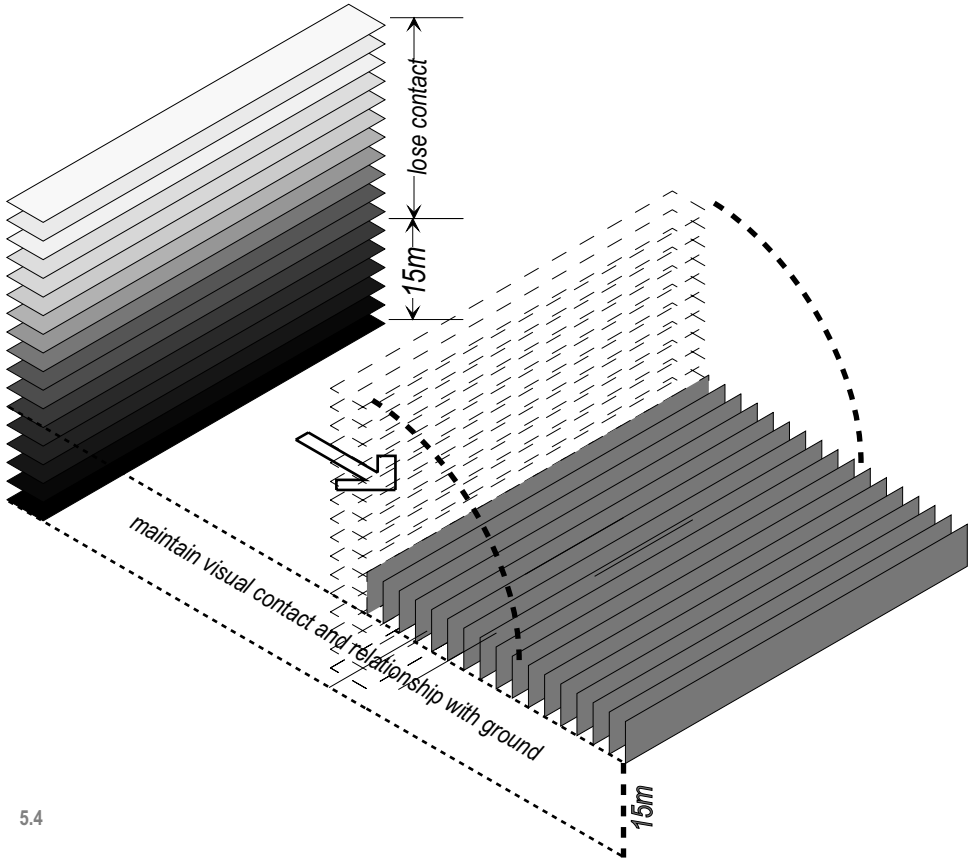


5.3

On an environmental response level, the concept offers a meditation on the conceptual boundaries between interior and exterior space. In a way interior space is to a large extent a 19th-century "invention". With the exception of the Pantheon and the great Gothic cathedrals, architecture once largely served to define exterior, civic space. It is only with the rise of post-Enlightenment notions of the individual, an increasing focus on personal privacy, and the progressive retreat from the public domain, that the architectural conceptualization of interior space becomes viable. A close connection exists between space and social territory. With the contemporary world so privatized, interior space threatens to consume all space. The problem now is that almost all social space has become interior space (shopping malls), and we are not aware of it. In South Africa, and especially Pretoria with its predictable climate, exterior space should be utilized as much as possible. This concept allows an opportunity to do just that.

Figure 5.4 illustrates how the concept could be applied to an urban context such as Hatfield.

Figure 5.5 illustrates a proposed implementation of this concept on the project in discussion. An aspect, which should be mentioned, is that the "warehouse" function can be replaced by a "community centre" function to be used by the community forming a layer above the other functions.



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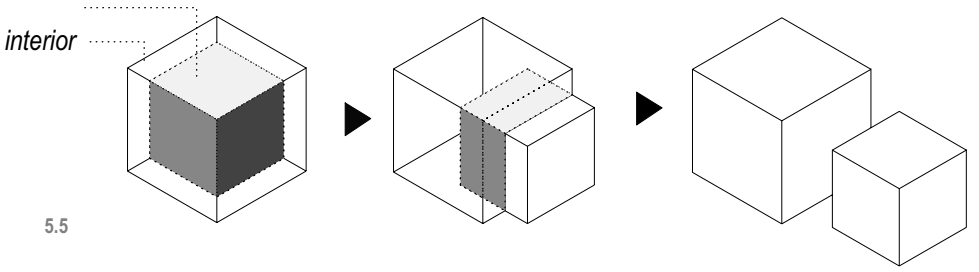
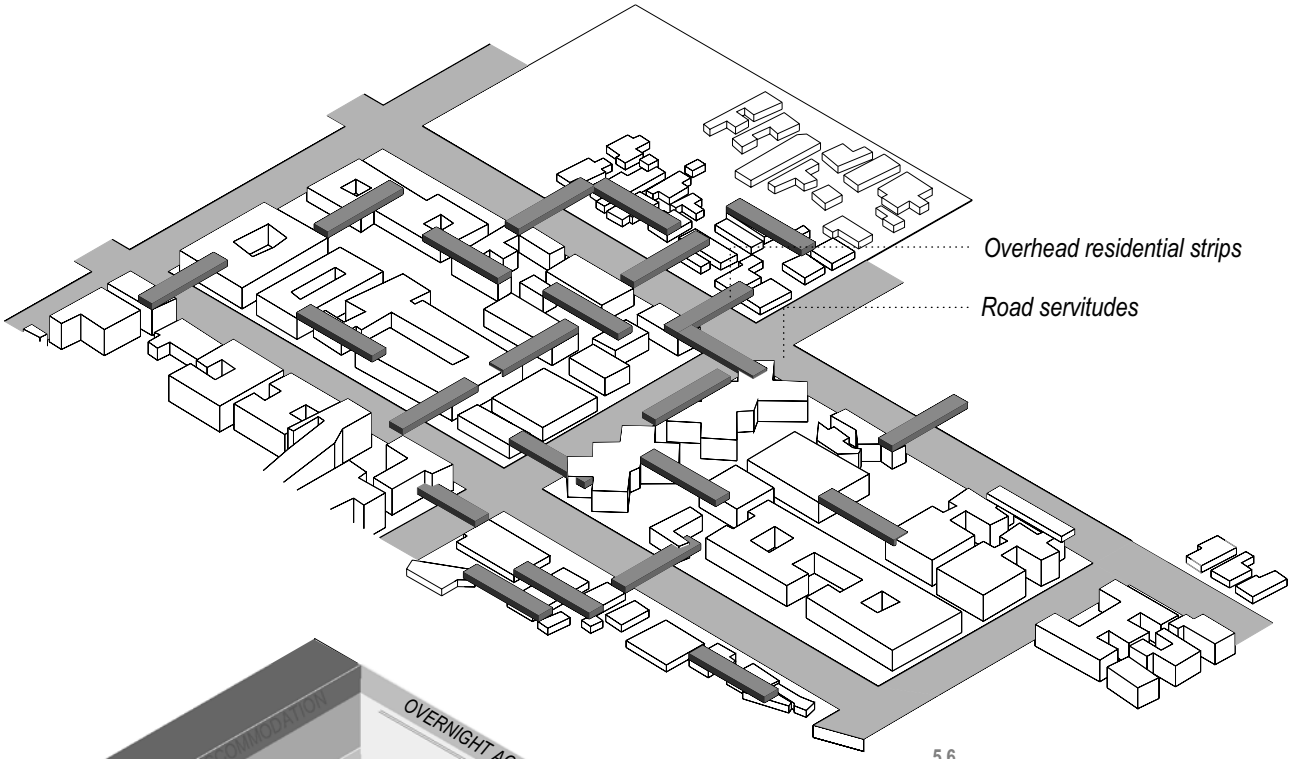


5.5

5.4 Rotating the vertical to form a horizontal residential plane.
5.5 Moving interior social space to the exterior.
5.6 Urban design concept applied to an urban context.
5.7 Urban design concept diagrammatically applied to the project.



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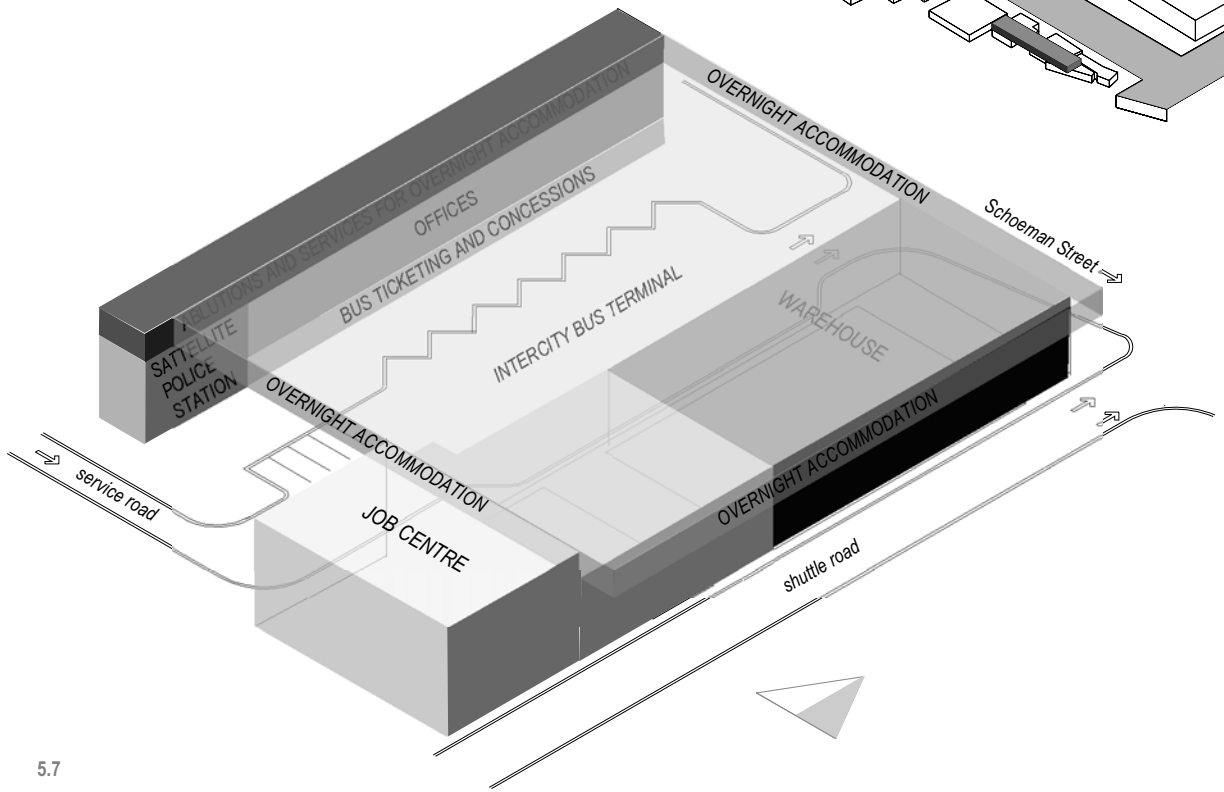
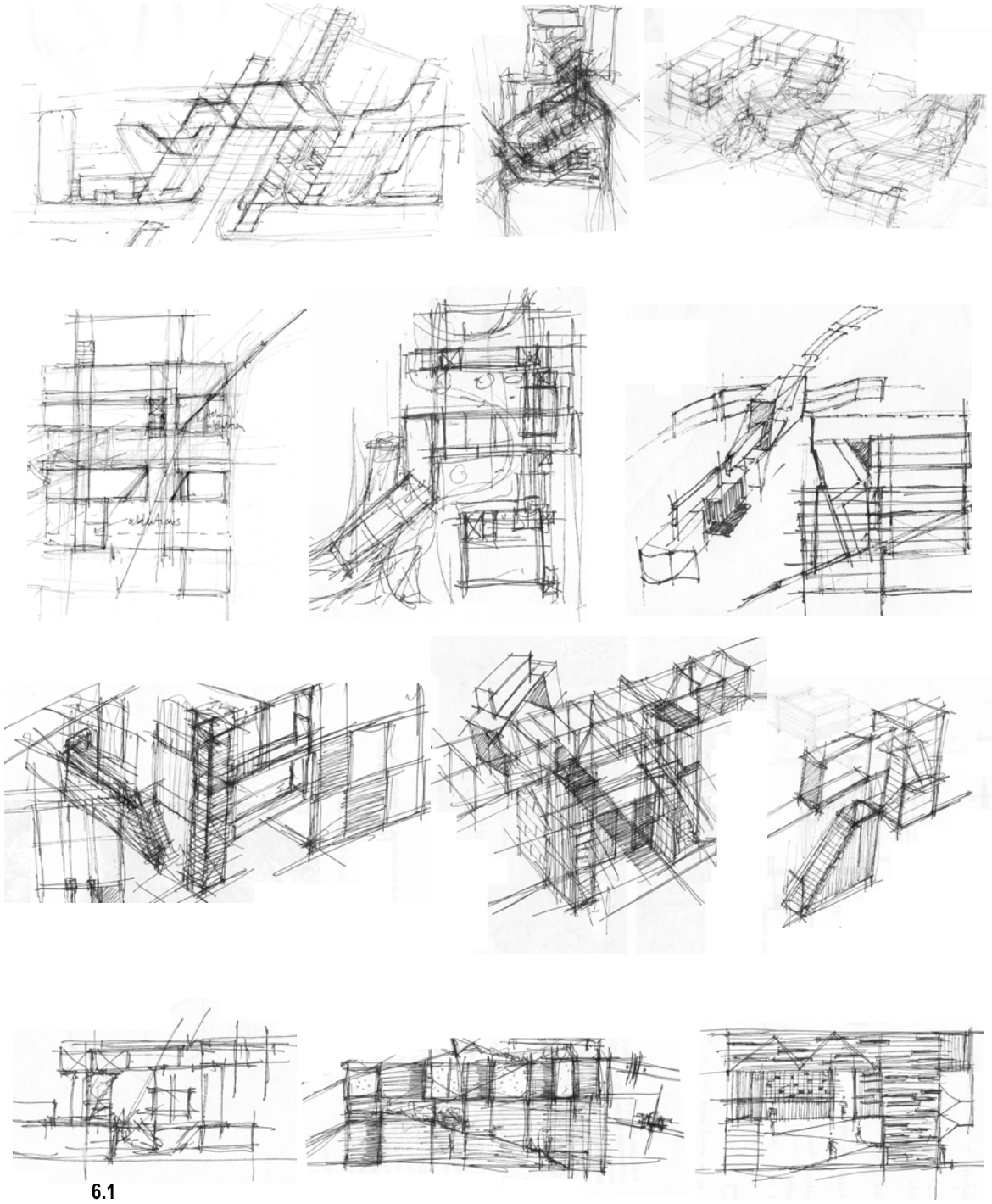


5.7

06

Design Development



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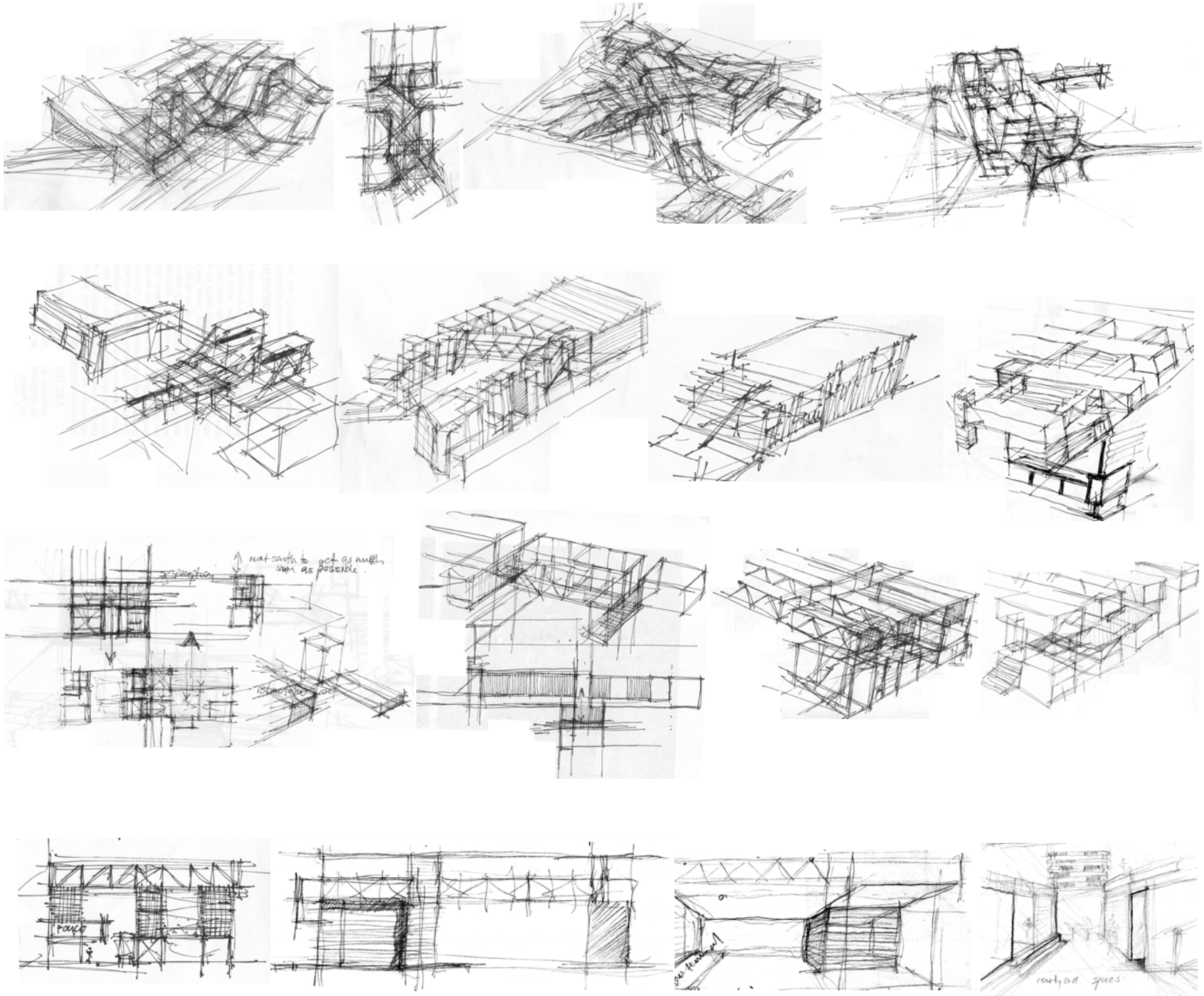
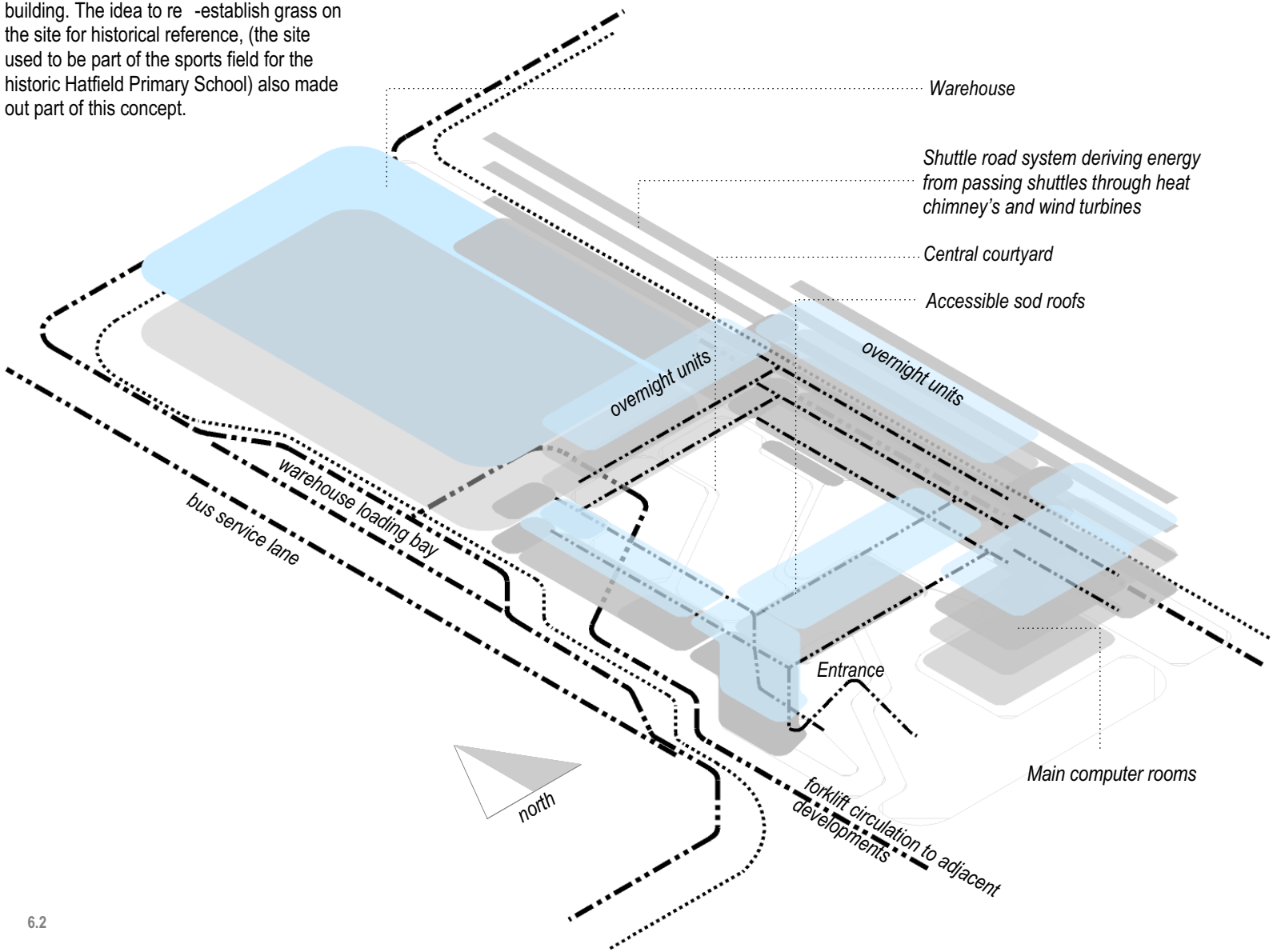

Not south to get as much sun as possible
courtyard spaces

6.1__***FIRST CONCEPT***

The initial design concepts started with proposals to order the functions of the development around a central courtyard. In terms of sustainable building, the Gautrain shuttle road was tunneled underneath the eastern block to harvest ene rgy used by the shuttles, to assist the HVAC systems in the building. The idea to re -establish grass on the site for historical reference, (the site used to be part of the sports field for the historic Hatfield Primary School) also made out part of this concept.

This concept was discarded, as it did not exploit the site's potential optimally. Some aspects, such as accessible roofs, courtyards, and the linking of the warehouse circulation pattern with the rest of the development were however retained as concepts.

6.1 Conceptual sketch progression from first concept to final proposal.
6.2 Diagrammatic south-western aerial view of first concept.

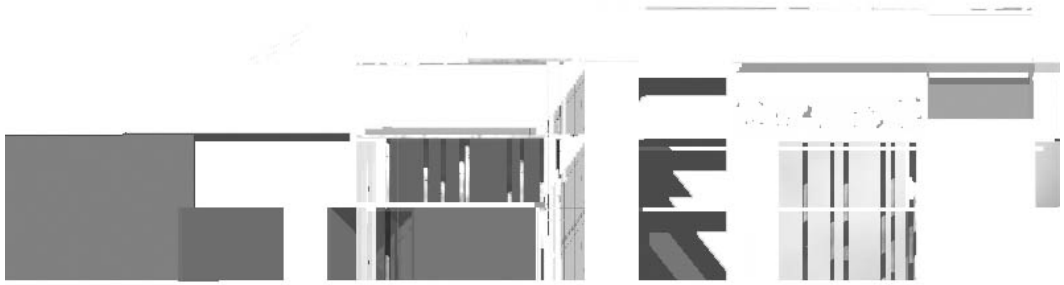


6.2

6.2__***SECOND CONCEPT***

In the following concept the initial idea of using the shuttle road still remained. Overhead structures to create space/shadow lines became an integral part of this concept, although not to such an extent as in the final design proposal where the structure traverses the bus terminal road. Exposed walkways to ensure inside/outside relations, as well as passive security, responded to the urban design concept. On plan the design responded to the new grid as formed by the HGSD, by way of an axis penetrating the city grid. This axis was discarded in later concepts due to its complexity, which could not be justified, as this site still remains part of the traditional city grid.

This concept did not make use of multifunctional spaces, and there fore struggled to display as an elegant entity.



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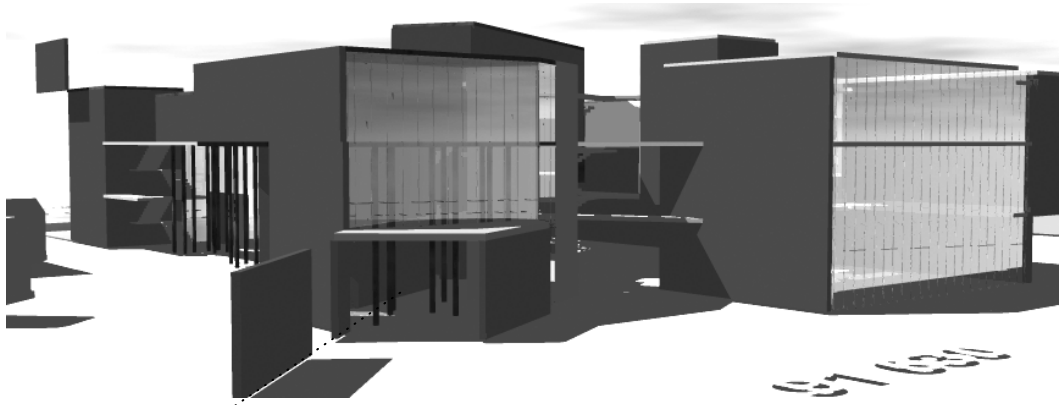
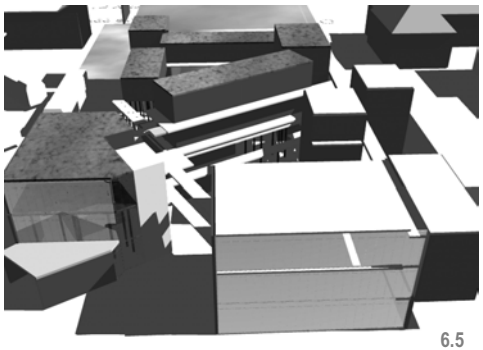


6.4

Second concept
6.3 South elevation.
6.4 South-western view of entrance.
6.5 Southern aerial view.
6.6 Eastern aerial view.
6.7 Western aerial view.



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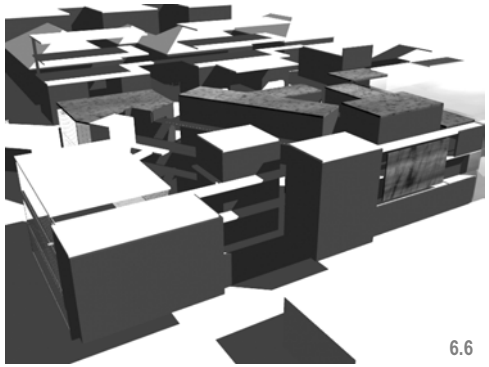

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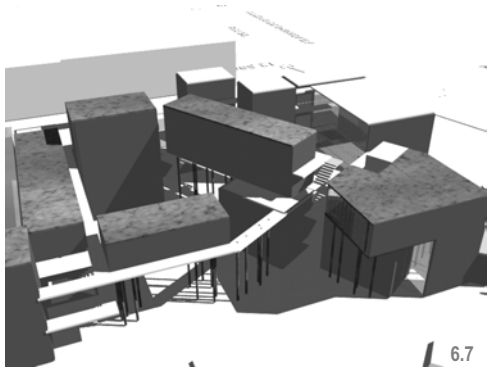


6.7

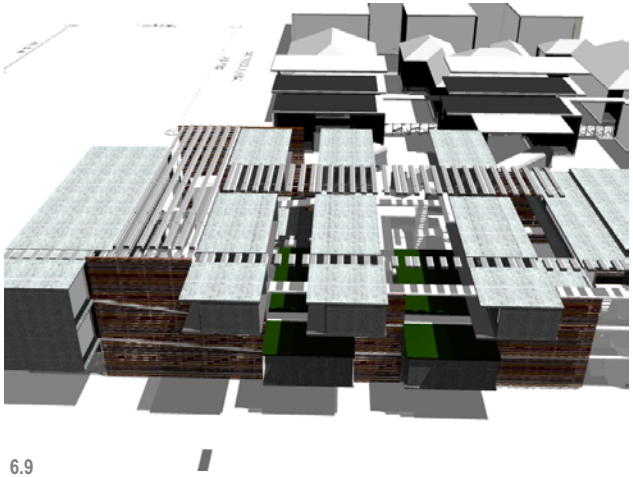
6.3__***MID-YEAR REVIEW***

The concept on which the final design was based joined the city grid and started to discard the HGSD axis so that it could to complement the station, rather than compete with it. The idea of a brick lintel screens system, as well as ov erhead structure came through, and the office roofs were made accessible by means of sod roofs. The ordering of the façades with regard to repetition and hierarchy was initiated by this concept. This design formed the basis for the mid -year review. To fulf ill the urban design requirements, and to integrate the development with the western part of the site, it was decided to extend the overnight accommodation units over the bus terminal road.

Although technical aspects were already investigated, much had to be altered for the different functions of the building to be independent of each other.

Mid-year Review

6.8 South-western aerial view of entrance.
6.9 Eastern aerial view. Note the ordering of elements on façade.
6.10 North-eastern aerial view.
6.11 South-eastern aerial view.
6.12 Plans, section and elevations of mid-year proposal.



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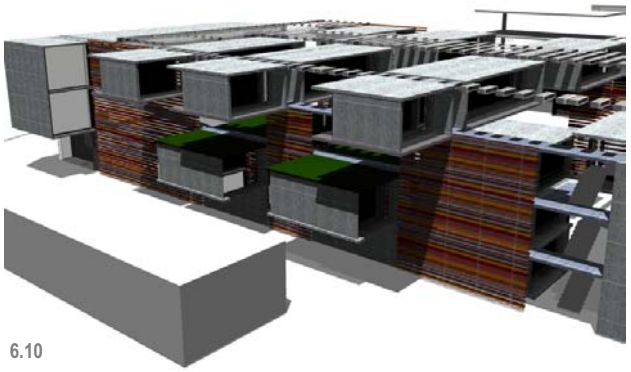

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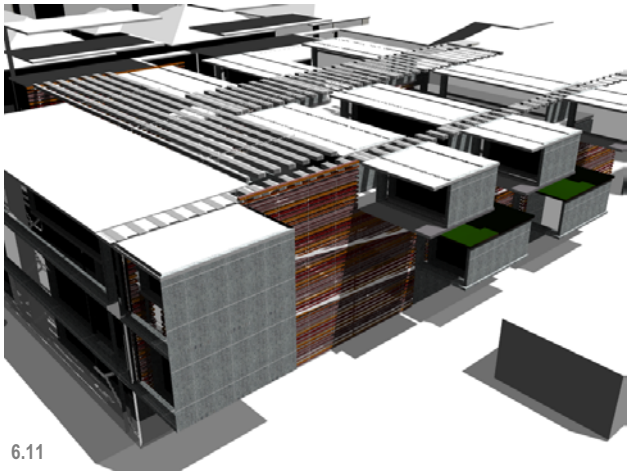

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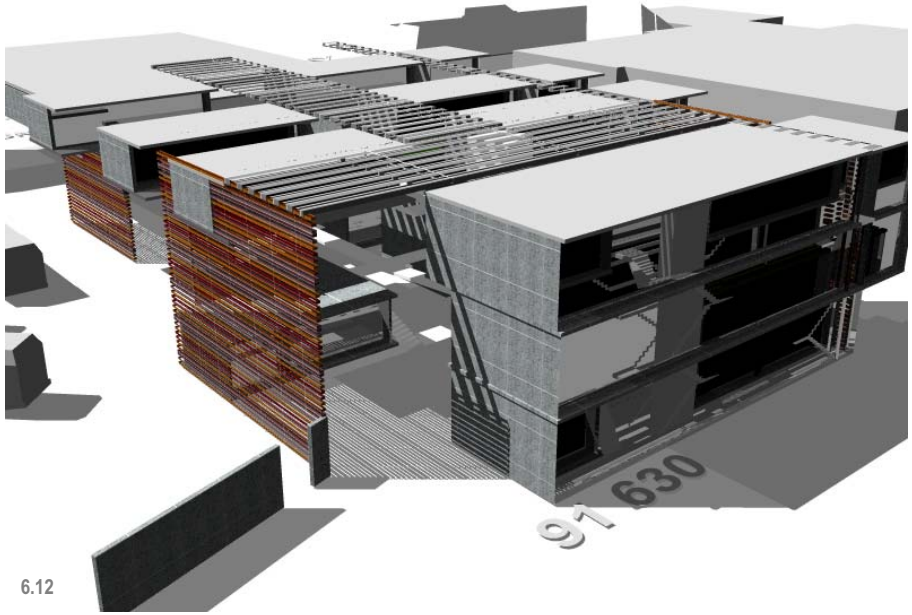

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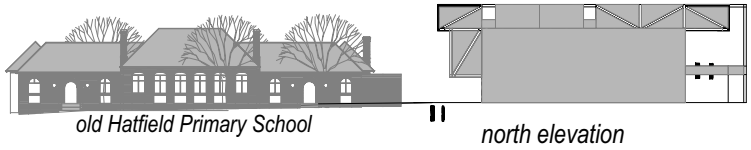
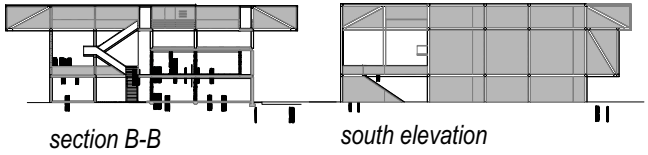
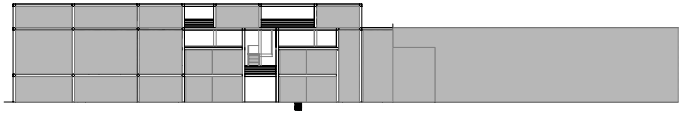
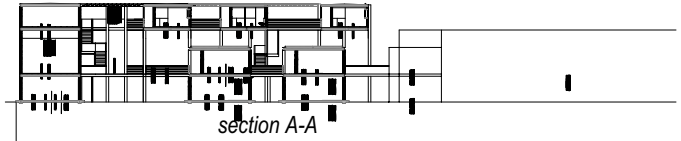
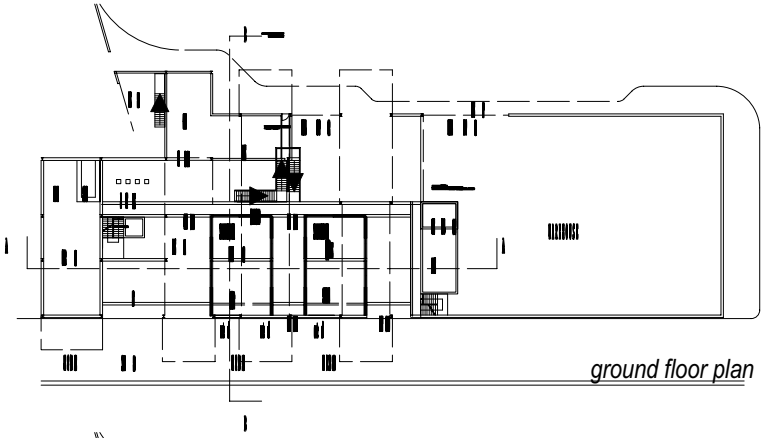
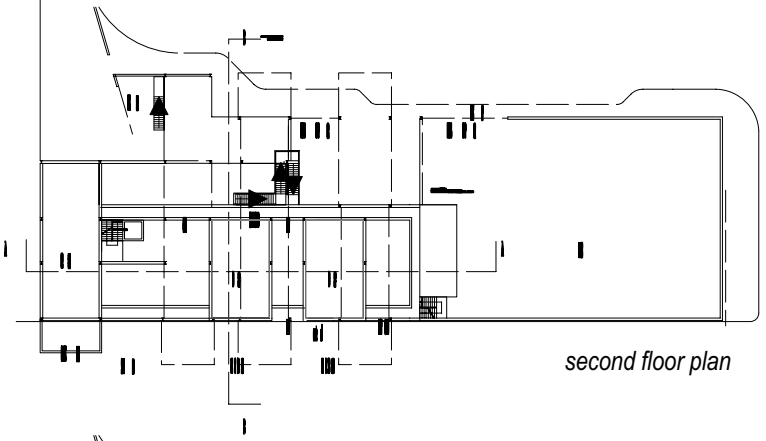


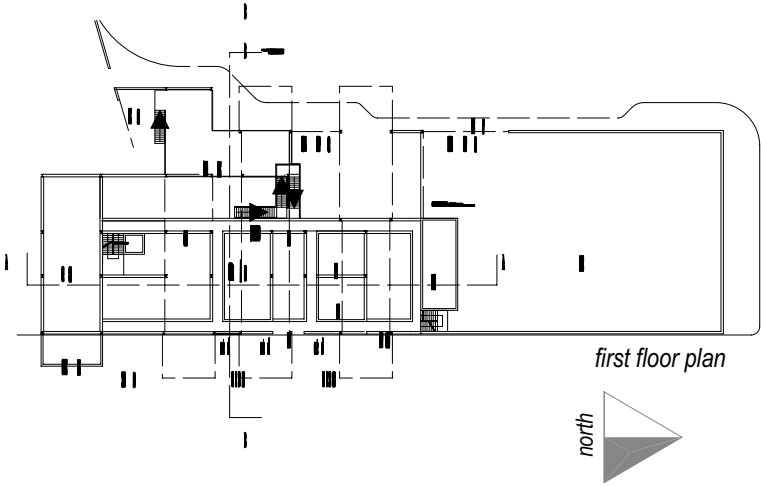


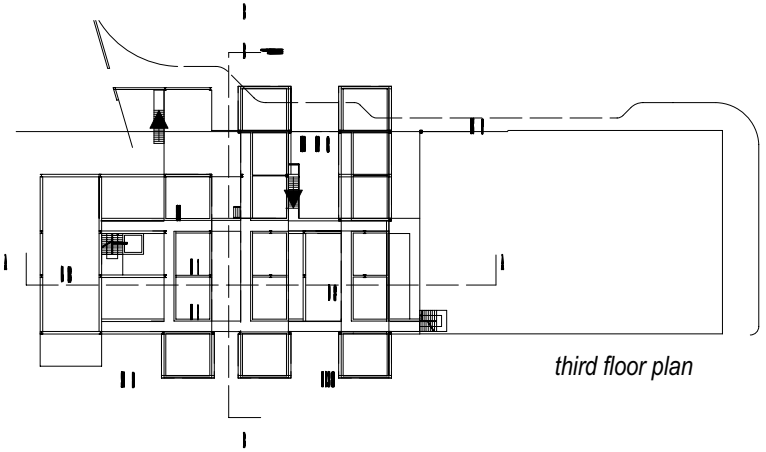






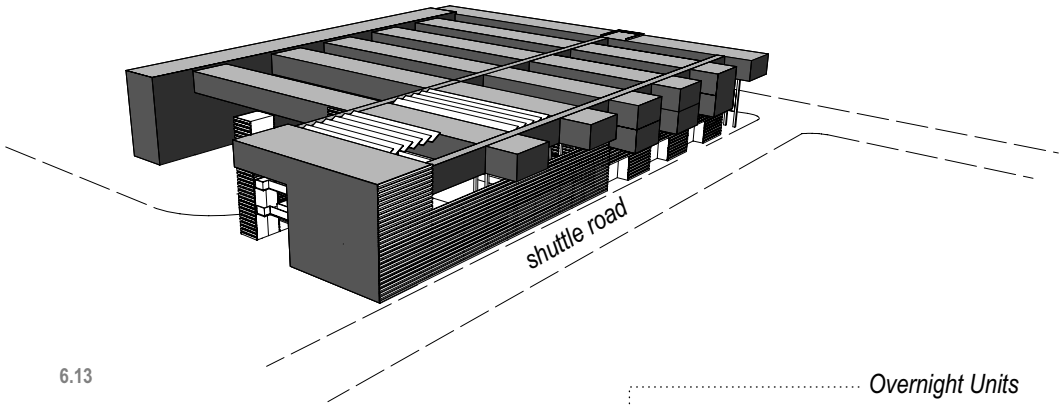






6.4__ *TECHNICAL REPORT REVIEW*

The mid -year proposal was refined and reworked until a level was reached in which it fulfilled the technical requirements as determined by the baseline document. Main changes were the extension of the overnight accommodation units, not only over the bus terminal road, but also over the warehouse function. The accessible sod roofs were discarded to make way for roof ponds with a pedestrian ramp linking levels. This allowed the exterior social space to infiltrate the private space in an implied, but not direct way. The selection of materials formed an integral part of this design process. This would fit in with the programme, which required the construction to be labour intensive, making use of quality workmanship. Custom detailing of the different elements was resolved to ensure a respectful and permanent appearance and ambience to the building. After the technical report review, the decision was taken to make the overnight accommodation units' roofs accessible to provide a private external space for socializing and drying clothes, etc.



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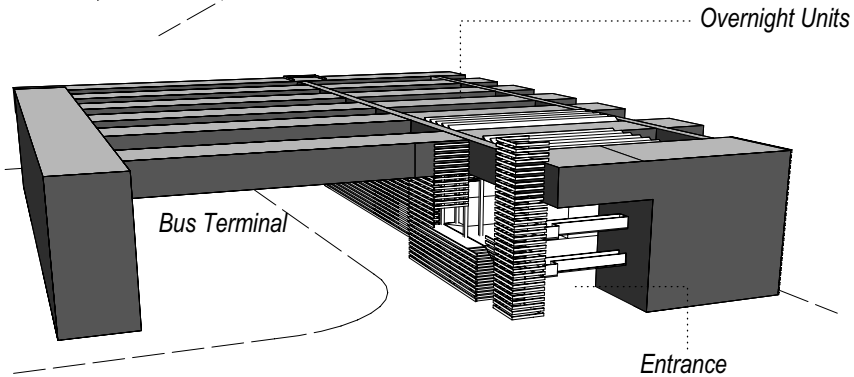

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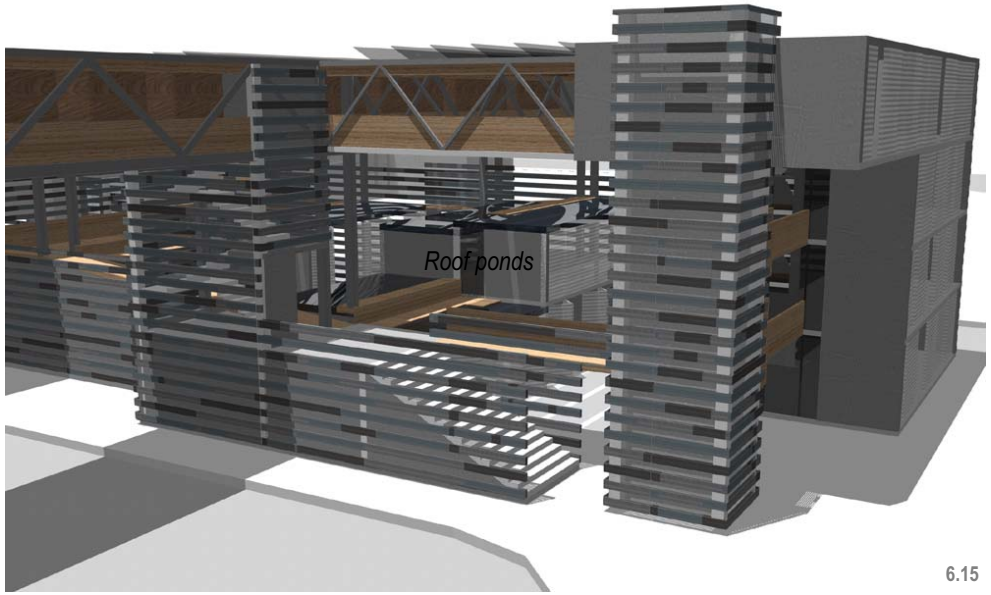

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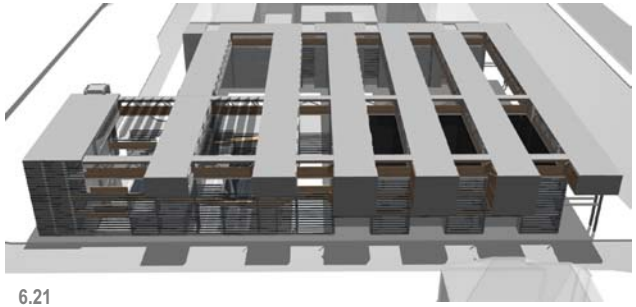

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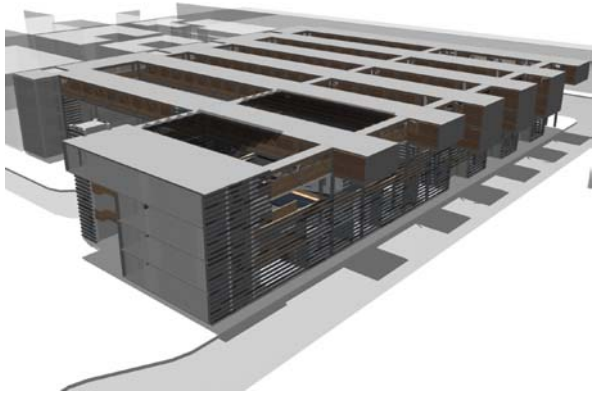

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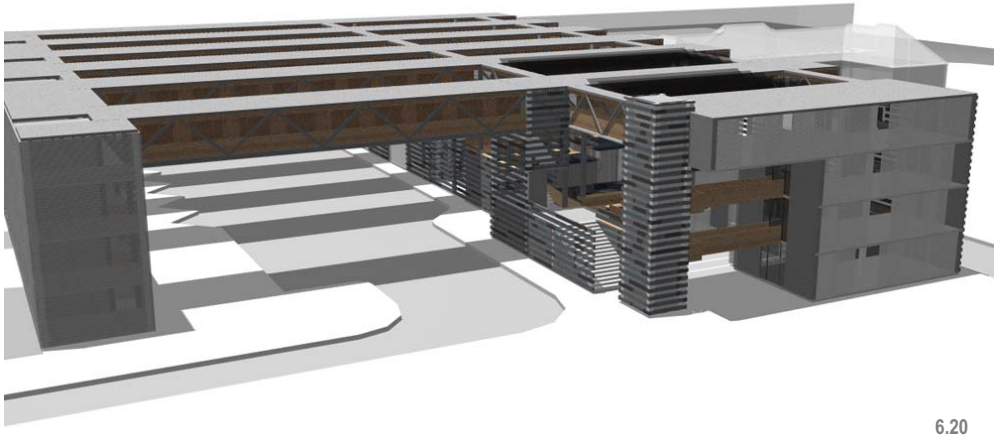

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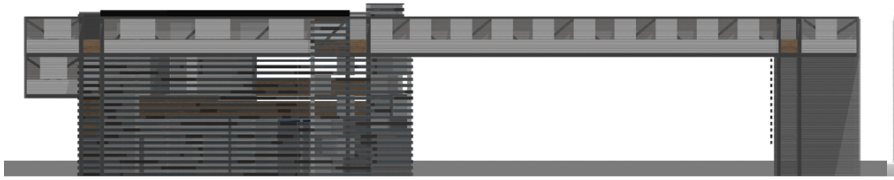

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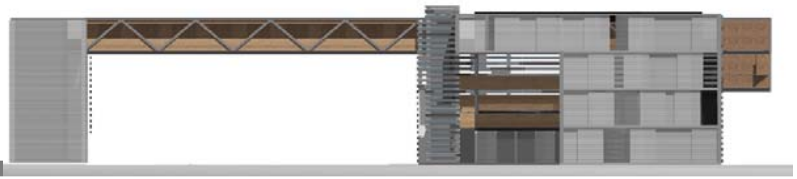


6.18

Technical Report Review
6.13 Block model: southeastern aerial view.
6.14 Block model: southwestern view of entrance to *Job Centre* and Bus Terminal.
6.15 View of entrance from School street: note the roof ponds.
6.16 North-eastern aerial view.
6.17 North elevation.
6.18 South elevation.
6.19 South-eastern aerial view.
6.20 South-western aerial view.
6.21 Eastern aerial view.

6.5__***FINAL DESIGN PROPOSAL***

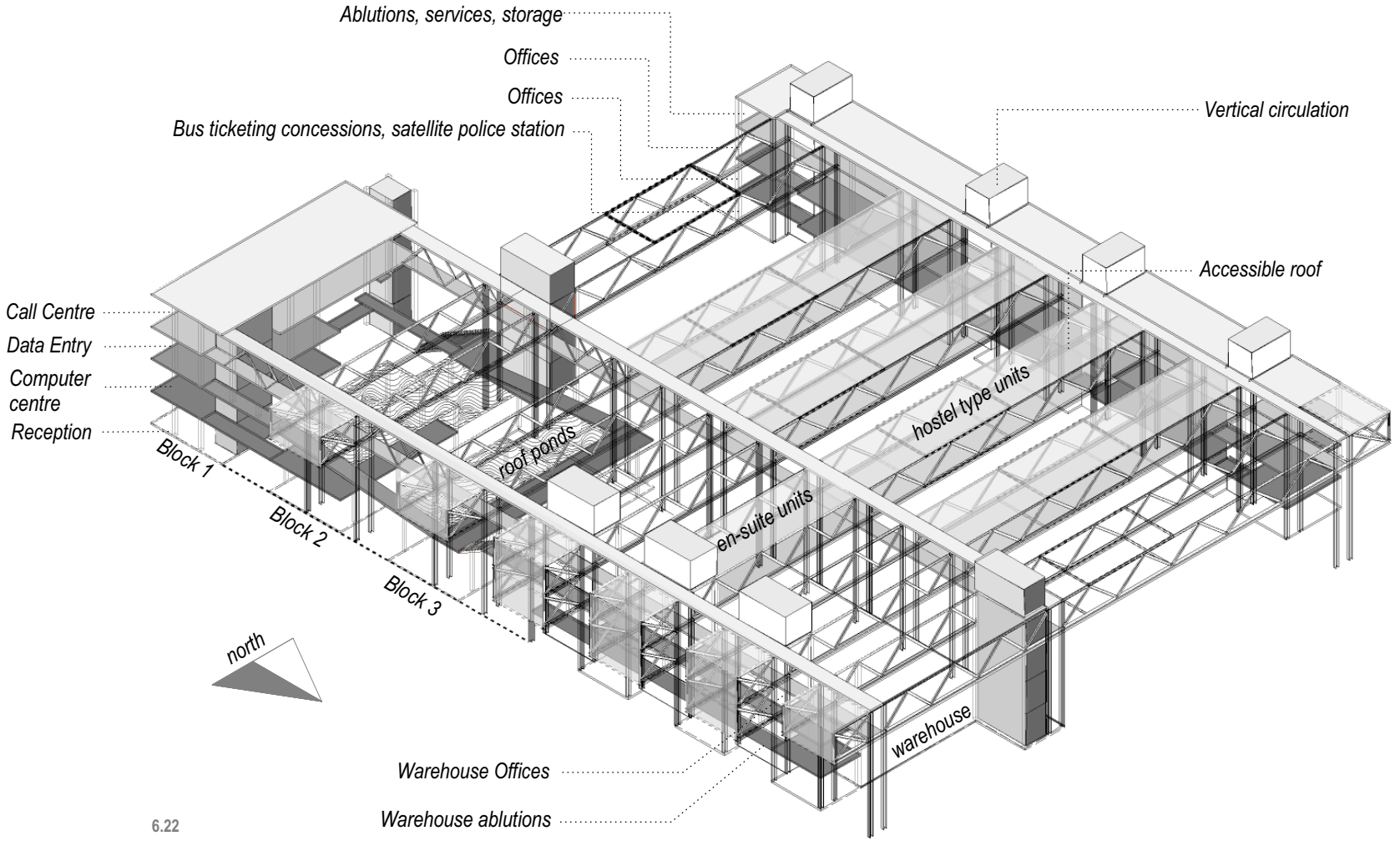
The final design proposal comprises a complete and integrated response to the requirements of the brief, as well as those pertaining to sustainable building (Chapter 07). The technical issues have been resolved, and the building can function as an entity on its own, or as separate functions (to provide for future adaptability) due to the exterior placing of the circulation infrastructure.

The main changes to the technical report proposal are the accessibility of the overnight units' roofs, with the accompanied shading net louvre system, and the exposure of the structure on the northern façade of these units.

Final Design Proposal

6.22 Diagrammatic layout of main structure and functions.

6.23 Northeastern isometric diagrammatic composition of structure and building elements.



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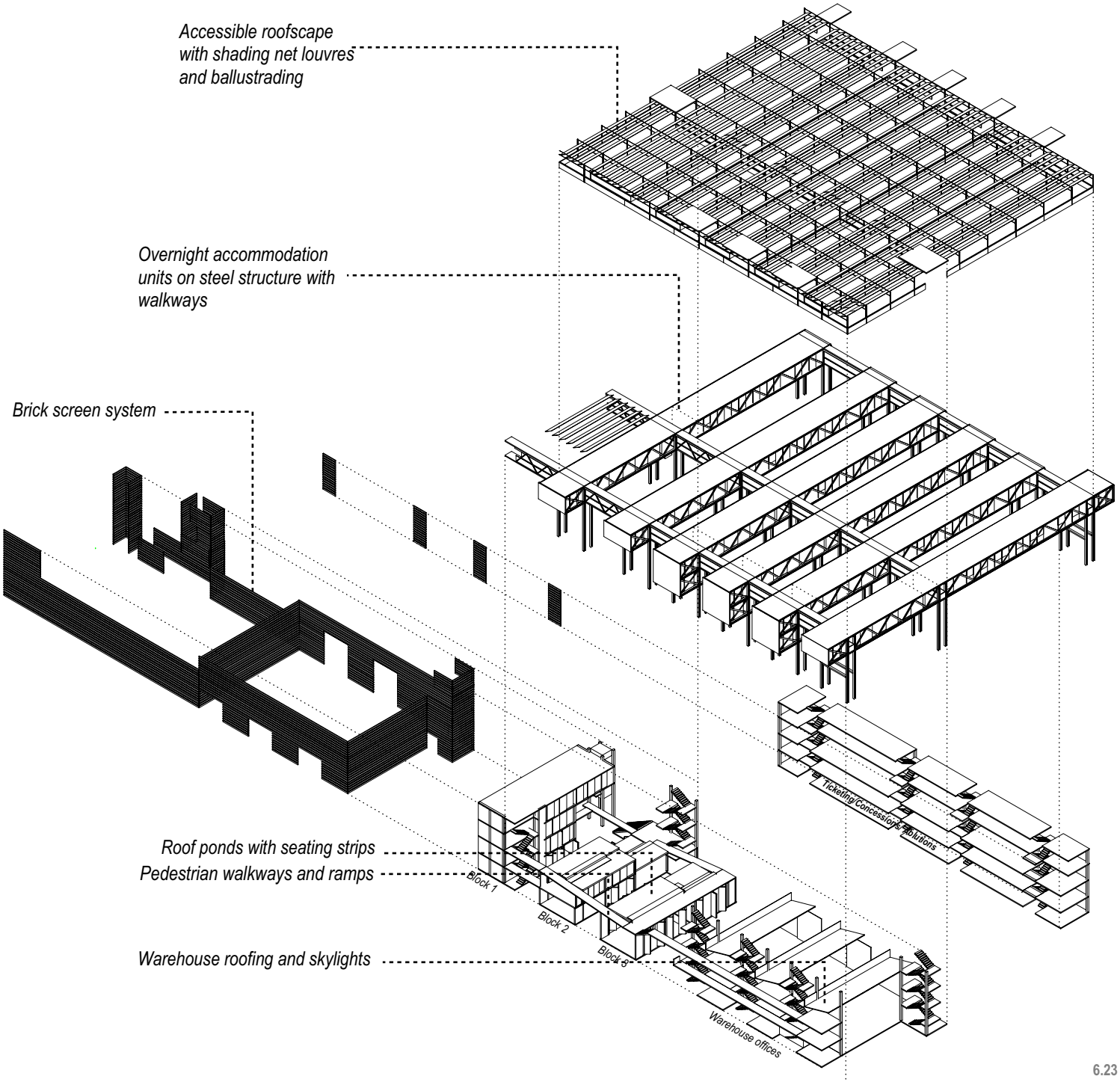

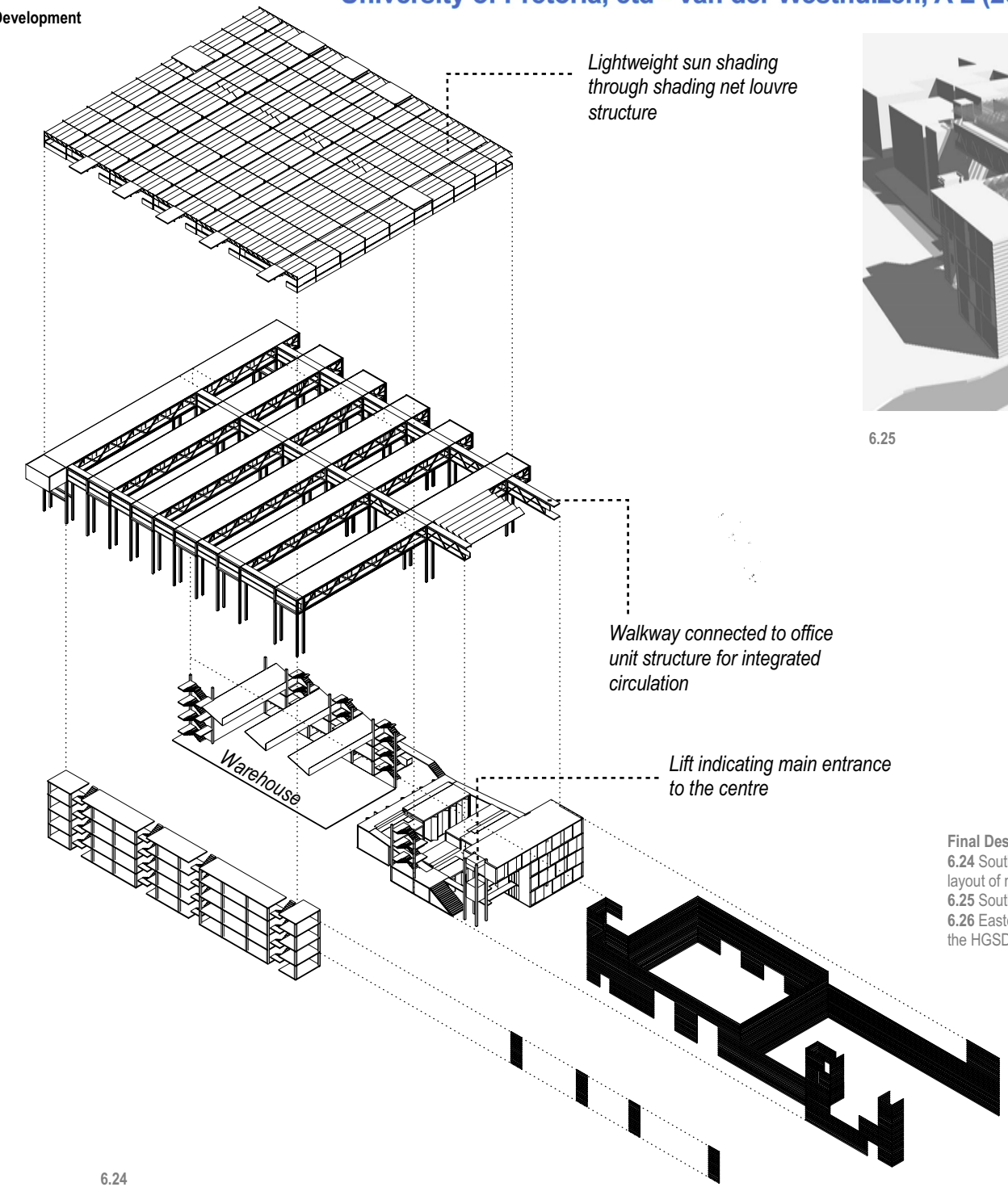

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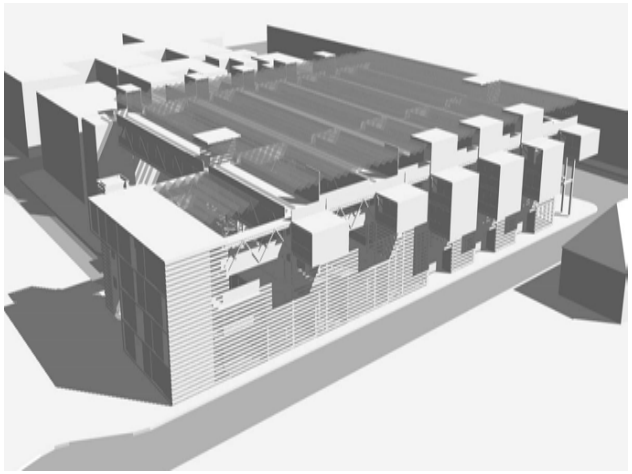
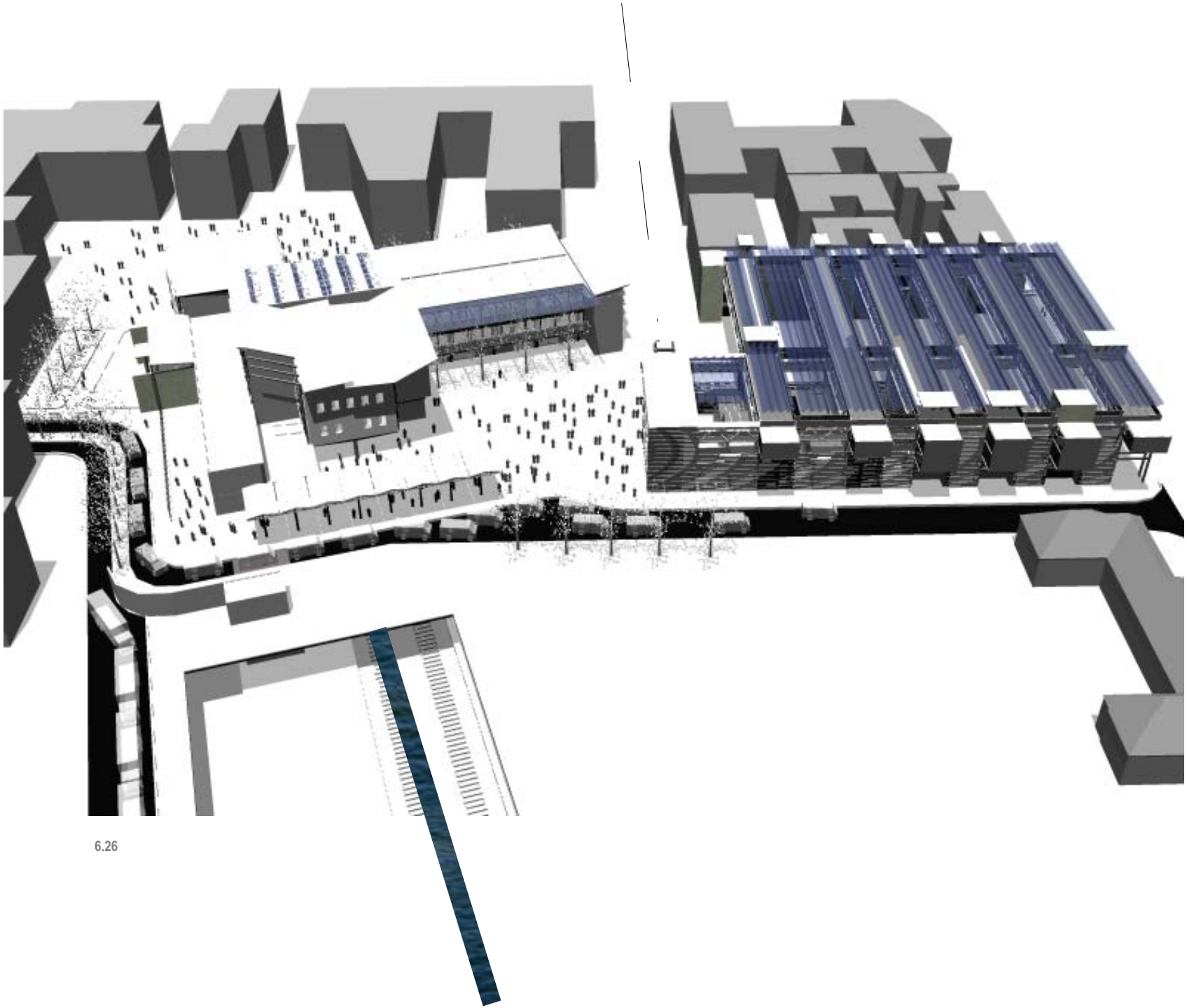


6.25

Final Design Proposal

6.24 Southwestern isometric diagrammatic composition layout of main structure and functions.
6.25 South-eastern aerial view of final design.
6.26 Eastern aerial view of final design in context with the HGSD.



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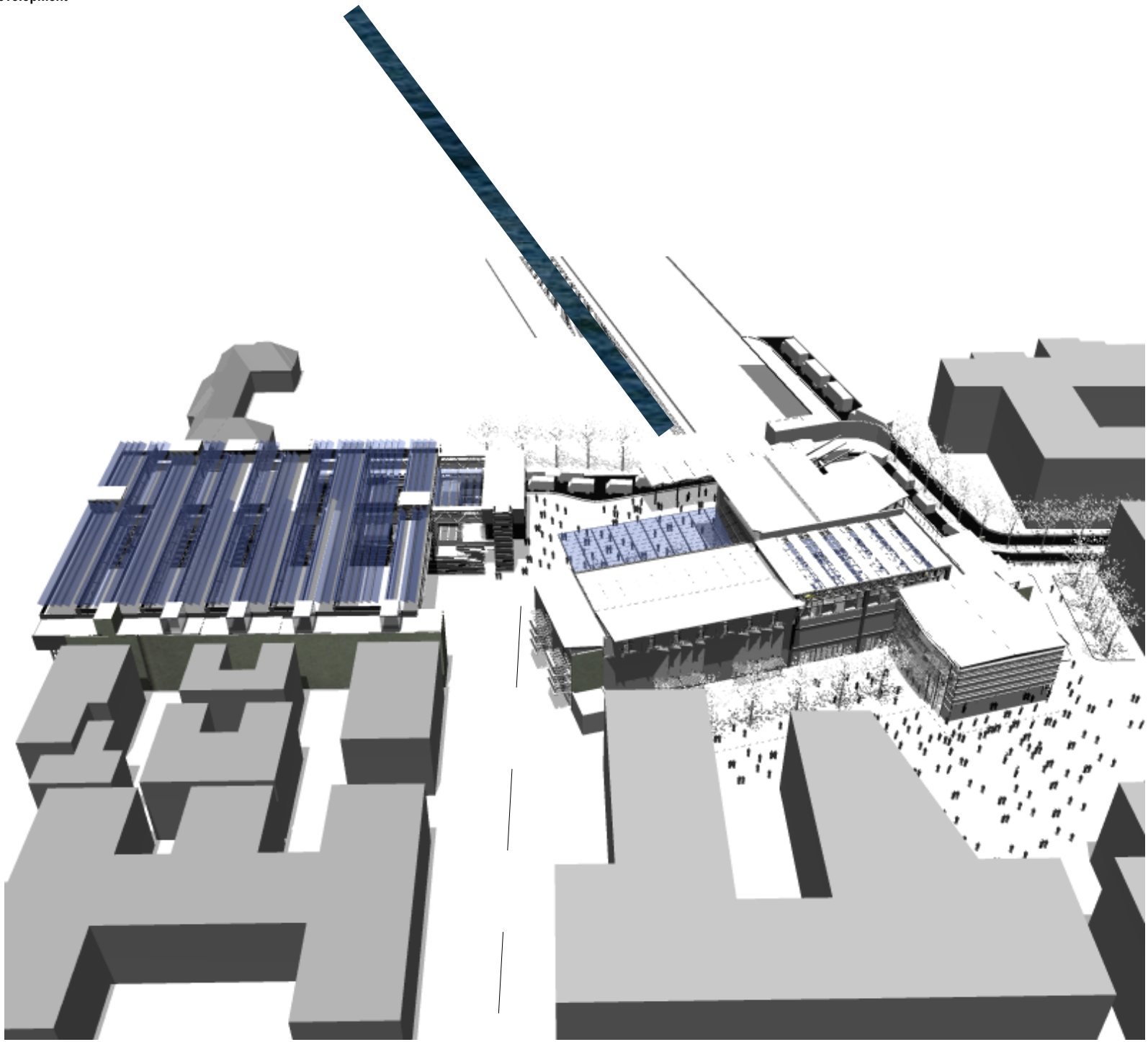

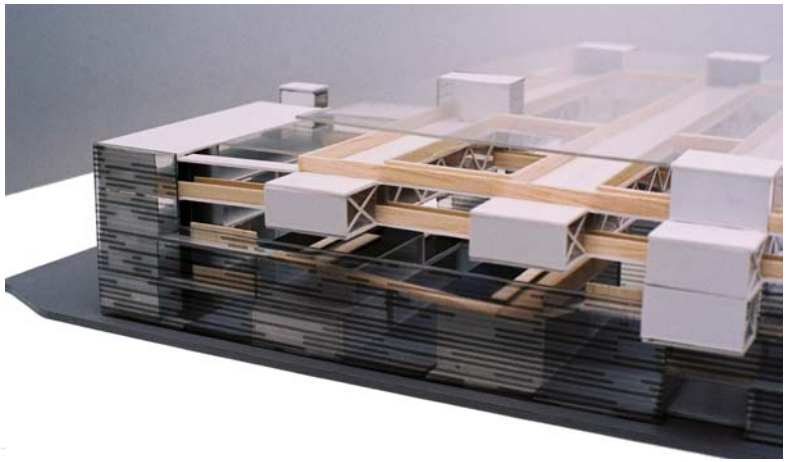

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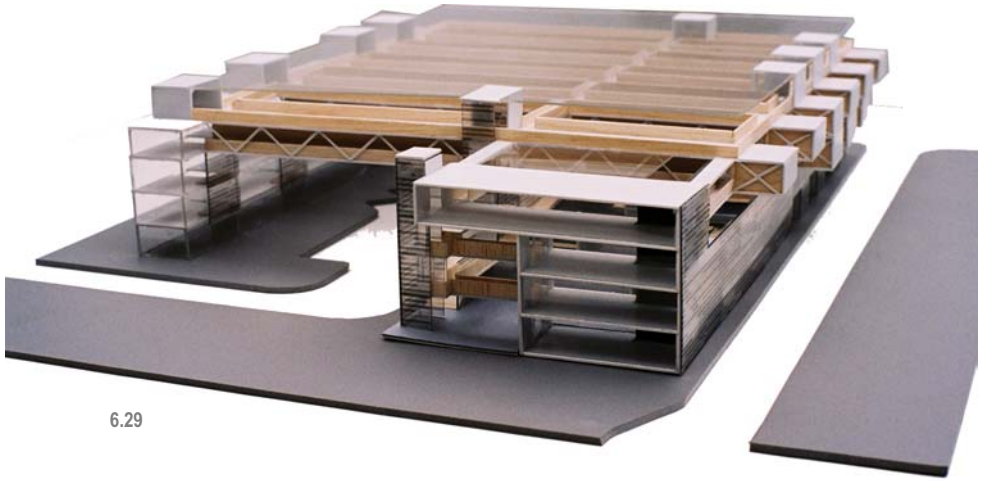

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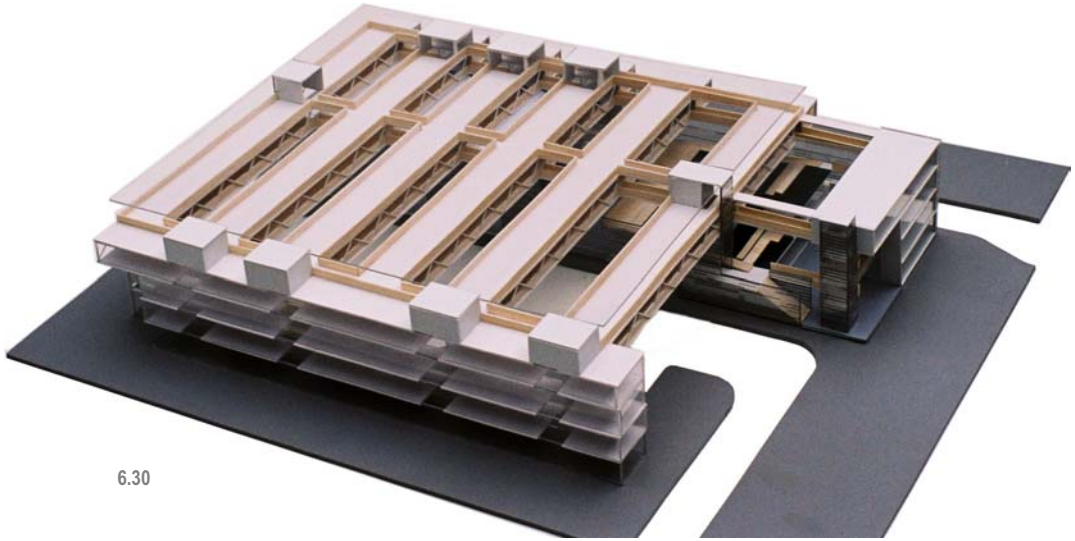


6.30

6.27 Eastern aerial view of final design in context with the HGSD.
6.28 Eastern view of office part of complex on model.
6.29 Southeastern aerial view of model.
6.30 Southwestern aerial view of model.

07

Baseline Response

This chapter illustrates decisions taken in response to the Sustainable Building Assessment Tool (SBAT) and should be read in conjunction with the Technical Report (Chapter 08). Many of the social sustainability issues have already been addressed in the Pr oject Profile (02). This document mainly deals with sustainable responses pertaining the *Job Centre* part of the project.

7.1__*SOCIAL RESPONSE*

__Occupant comfort

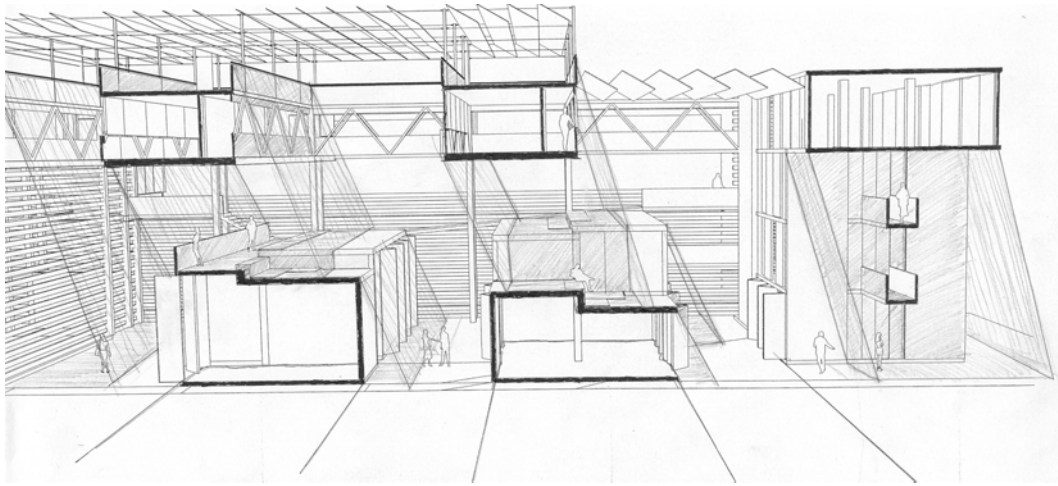
Quality Work Life (QWL) is primarily concerned with the humanization of the workplace. The *Job Centre* , as a supplier and promoter of work, will enhance the quality of work and life for all employees and recruits by ensuring maximum occupant comfort. This is a direct reaction to the brief and nature of the project, as its function is to promote and present work in a commuter node.

Ventilation. The project will make use of minimal mechanical ventilation to keep the operating costs down by ensuring a pleasant external microclimate.

The nature of the project, and the office spaces created, are such that the offices have a close link to the exterior space. With this aspect in mind the three office blocks form three courtyards to ensure maximum passive ventilation. Shadow lines, and the resultant temperature differences, are created mainly by the alignment of the overhead structure.

Lighting. The lighting requirements are designed so that no person will be further away from daylight than 6m. The general orientation of the units is east west to ensure maximum daylighting.

The lighting requirements during the night forms part of the requirements to promote safety in the area. Certain areas, such as the entrance and the adjacent bus terminal are well illuminated to provide passive surveilla nce. The filtering effect of lighting as a result of the brick screen system from inside the warehouse and the *Job Centre* office area outwards creates an interesting pattern resulting in a safe and approachable exterior space.



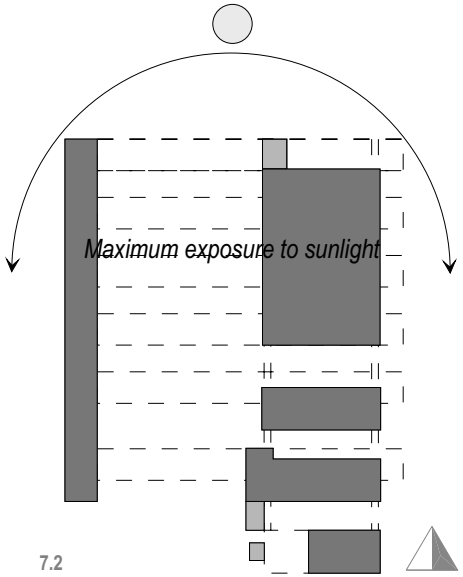
7.1

Thermal Comfort. To ensure thermal comfort, the materials and openings in the project were chosen to allow maximum natural light into the building, without the associated heat gain in summer and heat loss in winter. The Technical Report (Chapter 08) furthe r elaborates on these aspects.

The thermal comfort of the accommodation units is largely dependent on the occupants' use of sliding screens to regulate the infiltration of sunlight during daytime.

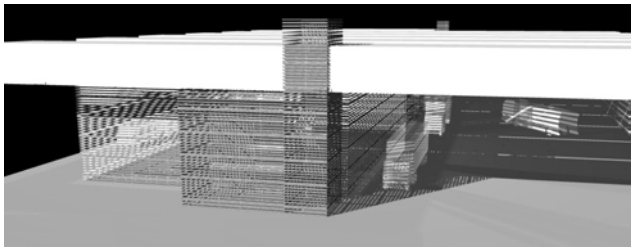
In the computer rooms it will be difficult to ensure a con stant level of thermal comfort, implying a dependence on a Building Automated System (BAS) to regulate temperatures.

Views. The main aim of the positioning of the computer rooms on the southern side of the site is for it to have views out over the market and station area, enhancing its visibility among passers -by. Visibility from inside the courtyards and the office roofscape to the adjacent areas, such as the shuttle road, is also provided through the screens to eliminate any "dead walls" on these edges. The warehouse office units look into the warehouse from an elevated position. This regulates, and forms, a functional link with the activities.



7.2

7.1 Perspective section through office units and the external space depicting courtyards and shadow lines to attain passive ventilation.
7.2 East-West orientation to maximize daylighting.
7.3 Nighttime filtered illumination of adjacent spaces from inside *Job Centre*.
7.4 Views towards adjacent facilities.



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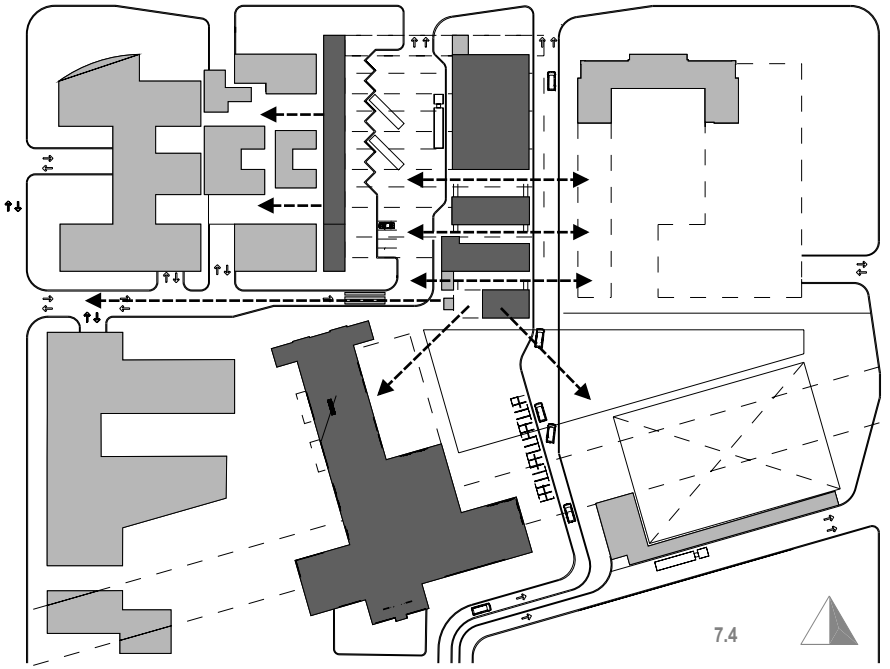


7.4

Noise. The two road servitudes penetrating the site will generate a substantial amount of noise. The overnight accommodation units have been acoustically treated to limit noise levels.

The call centre will have to be treated to have acoustical performance levels suitable for its function as a telecommunication space. The call centre has been designated to the top storey of the computer room block, to ensure some distance from noisy activities on ground floor level.

The sound of water, as in the roof pond system, is also an attempt to filter the noise by substituting it with a more pleasant sound.

Indoor / Outdoor connection . An instant indoor / outdoor connection is the result of the opening up of the workspaces through sliding door gear. This ensures a more natural environment for workers, especially since all circulation takes place outside. Relaxation spaces have been included for the main computer room areas in the form of the accessible roofscape with water ponds.

__Inclusive Environments

Transport . The Gautrain development will also cater for disabled users, making the centre accessible through public transport. The service road for buses and trucks will also be accessible for private vehicles bearing the disabled sign.

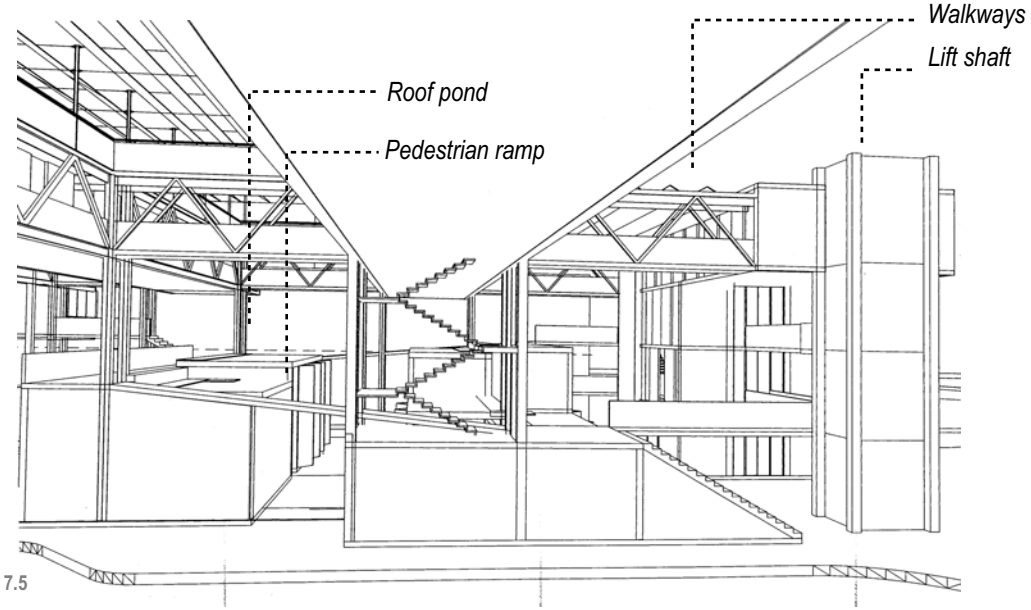
Entrance. The main entrance has been located to make it accessible from both the market and the Gautrans station. The project promotes usage and recruitment for disabled individuals. The building should appear accessible from all angles for wheelchair users and pedestrians. This was achieved by providing the lift shaft as a visual element next to the entrance.

From here wheelchair access is available to all areas of the centre, either through ramps or a lift.

Circulation. Main pedestrian access will be from the market area and the adjoining development to the south of the centre, while a secondary vertical transportation structure has been included on the northern side next to Schoeman Street.

Access to the overnight units can also be obtained from the bus terminal infrastructure. Providing the roofscape with a pedestrian ramp, linking the first and second storeys, ensured further accessibility.

7.5 Western perspective with screens taken off indicating internal circulation and the entrance.
7.6 Ablution facilities on ground floor.



7.5

Ablutions and Kitchen. Enough ablution facilities are provided for workers and visitors, including disabled facilities. All these facilities are provided on the ground floor for technical reasons, and to ensure ease of use for disabled personnel.
Ablution facilities comprise:

- **Ablutions in the form of washing for workers doing shift work.**
- **Communal ablutions for hostel type accommodation units.**
- **Private ablutions for more private accommodation units.**
- **Ablutions at the reception area.**

A kitchenette has b een provided on the first floor in office block 2, linked with a lounge.

Participation and Control

Environmental control. Most of the office spaces are provided with sliding doors which can open up entirely to the outside, allowing variance and user participation and control in the operation of the passive ventilation of the spaces. The ventilation system in the larger volumes, such as the warehouse and the main computer rooms, will however be controlled by a BAS, which may be operated from a control room / switchboard.

User manual/training. The BAS will be largely computer operated, making use of advanced technologies to ensure peak performance of the HVAC and lighting system. To provide for manual input when the system might be dysfunctional, an operator will have to be trained. Alternatively, the system might be remote controlled via the internet or network. The programmer for the system will therefore have remote access to the computer system, making on -site maintenance only necessary in extreme cases.

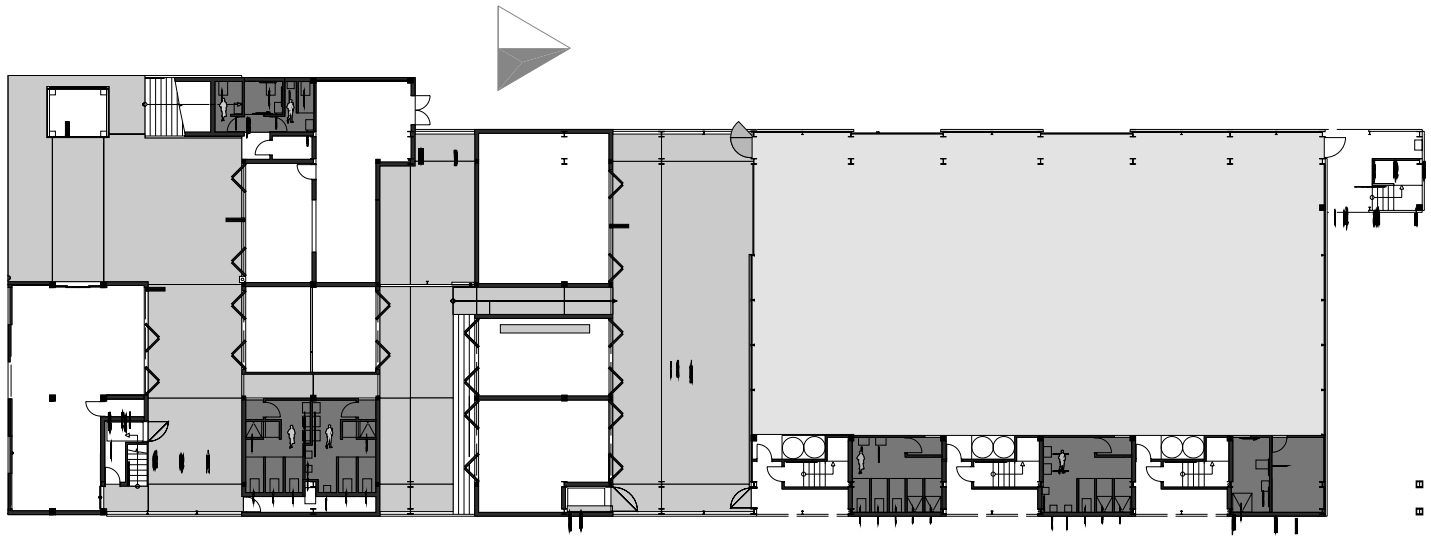
Social spaces. One of the aims of the *Job Centre* is to create a sociable and relaxed atmosphere in which work does not become an aspect of life considered a burden, but rather be enjoyed.

This argument, together with the interaction of different types of individuals working in different disciplines, determined the layout of the centre. The whole external volume is designed as an exterior social space, incorporating the Urban Design Concept (Chapter 05).

Health and Safety

Safety and Security. The *Job Centre* will form an integral part of the safety and security scheme and brief for the Gautrans Station with regards to “eyes on the street” and 24 hour activity in the region. This will be achieved by means of night shift work available in the form of amongst other data entering in the main computer rooms. Some after hours shifts will be available in the from of picking and packing in the warehouse.

The presence of accommodation on the site will further enhan ce this aspect, ensuring a constant level of activity in the area. The reception and entrance area will therefore be open 24 hours a day. Illumination of certain areas will be required. Many of the spaces are semi - private due to the external nature of the circulation system. Security of private spaces will be through card -operated sliding doors.



Indoor air quality. As a result of the open character of the office spaces, indoor air quality will largely depend on the external quality of air. In an attempt to reduce pollutants in the area, planting is provided in the two northernmost courtyards in the form of shrubs and wall creepers forming an eastern border for these spaces. It will also be covered with BG –blocks with *Dichondra repens* (wonderlawn) infill. Two new *Ceasalpinia fireas* (Luipderd trees) will be introduced on the northernmost courtyard. It is a light, deciduous tree, growing well in confined spaces, and does not shed many leaves in winter.

The two road servitudes, frequented by motor vehicles at regular intervals, pose a problem as a result of the exhaust fumes. The harmful CO fumes are however denser than air, with the result that the fumes will stay on a low level, where it can be absorbed by the vegetation provided.

7.2__*ECONOMICAL RESPONSE*

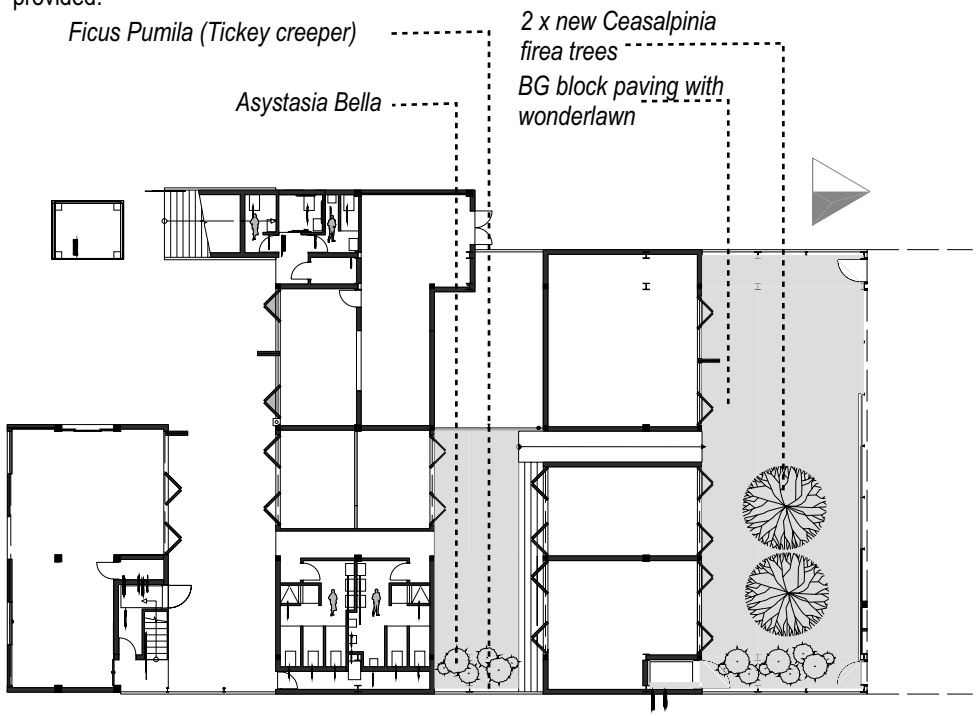
__Local Economy

Local contractors. Local contractors will be used as specified in the Project Profile (02) . Since the *Job Centre* is an initiative of the DOL, labour intensive techniques will be used to construct the centre, thereby creating even more work in the manufacturing process.

The concept behind the construction would be the manufacturing of custom made components using local building materials.

The contractors will therefore be chosen for their quality of workmanship, and understanding of building materials and its qualities. Specific training of the construction team will be required.

7.7 Planting in courtyards on groundfloor plan.
7.8 Building line recessed to respect historic building.



7.7

Repairs and maintenance. The use of low maintenance materials are maximized to ensure once-off costs won't be multiplied in the future. Concrete and bricks will form the basic building blocks for low maintenance materials. Due to the nature of the brief, labour intensive techniques often result in a high maintenance factor. This will be indicative in the use of timber, which will have to be weatherproofed at regular intervals, as well as the planting and roof ponds, requiring maintenance, creating jobs. A balance between labour intensive and low maintenance materials will be achieved.

Disruption and downtime. A backup power system in the form of a generator will be switched on as soon as a power failure is experienced. A UPS system will prevent any institutional memory loss when such a failure occurs.

Adaptability and Flexibility. The use and function of the initial spaces created in the centre are designed to be as flexible as possible to allow for future adaptability. The office blocks, warehouse, bus terminal and overnight accommodation units can therefore function separately.
The offices are also robust in terms of their sizes and relation to the other spaces. The accommodation units have been designed to be adaptable to either private or hostel type housing.

Vertical Dimension. The warehouse's vertical dimensions have to allow for forklift movement and its two main entrances have sufficient height to allow the safe passing of a forklift.

M&E Services. The external channeling of services through ducts (required by exposed ceilings and floors for thermal reasons) allows for future adaptability of data technologies.

__Ongoing Costs

Shared costs. A partnership will exist between the *Job Centre* and the adjacent Bus Terminal to maintain a clean and safe environment.

Cost monitoring. Costs, and the flow of information into the Job Centre will form part of a Knowledge Man agement System (KMS). In this way records can be kept as the centre evolves, thereby eliminating the risk of institutional memory loss.

__Capital Costs

Use of Existing. The existing motor dealership's main showroom will have to be demolished to make way f or the shuttle road on one side and the bus and service road on the other. The existing road infrastructure in the form of School Lane is however retained to gain access to the site.

The motor dealership showroom facades consist of lightweight aluminium structures which can be salvaged in the demolition of the building and reconstructed elsewhere. Other materials, such as paving stones which can be salvaged, will be recycled in the construction of the *Job Centre*.

Shared costs. The initiators for the projec t, the DOL, and the initiators for the adjacent bus terminal, the DOT, will share the initial costs of buying the site and the demolition of the existing infrastructure.

Plate Efficiency. The overhead construction covering most of the site ensures a sustainable way of building. By generating revenue from areas covered by road servitudes, which would normally have been seen as "dead spaces", the built area are will consequently be maximized.

Ratio of capital to ongoing costs. By making use of custom components, higher than normal capital costs will be expected as a result of labour intensive construction techniques. The operating and maintenance costs will be curtailed by using low maintenance materials such as concrete and face brick.

7.3__*ENVIRONMENTAL RESPONSE*

The Technical Report deals with the environmental issues in more detail.

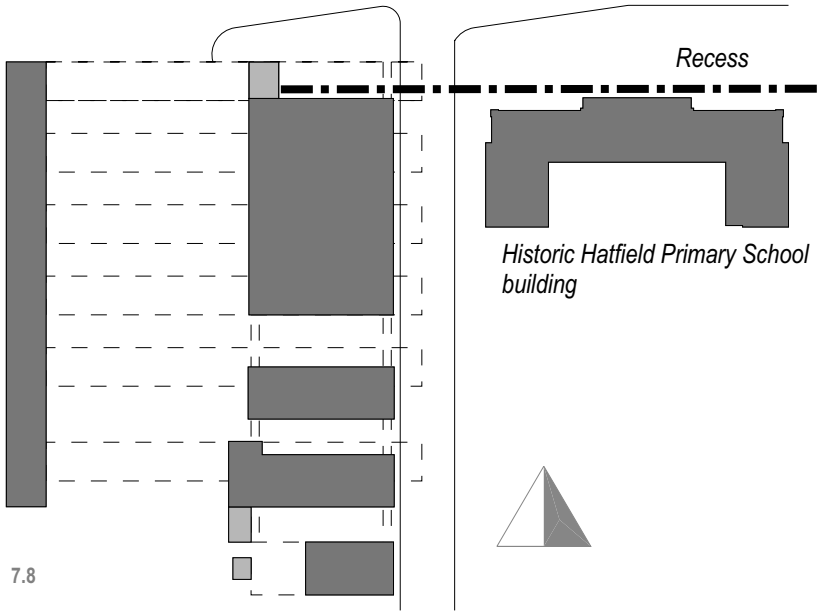
__Waste.

One of the functions of the warehouse will be to organize the storage and proper recycling of the wa ste generated by the adjacent HGSD. The warehouse will be the only space which could be serviced by waste removal trucks, allowing the centre to generate income from providing this service.

__Site

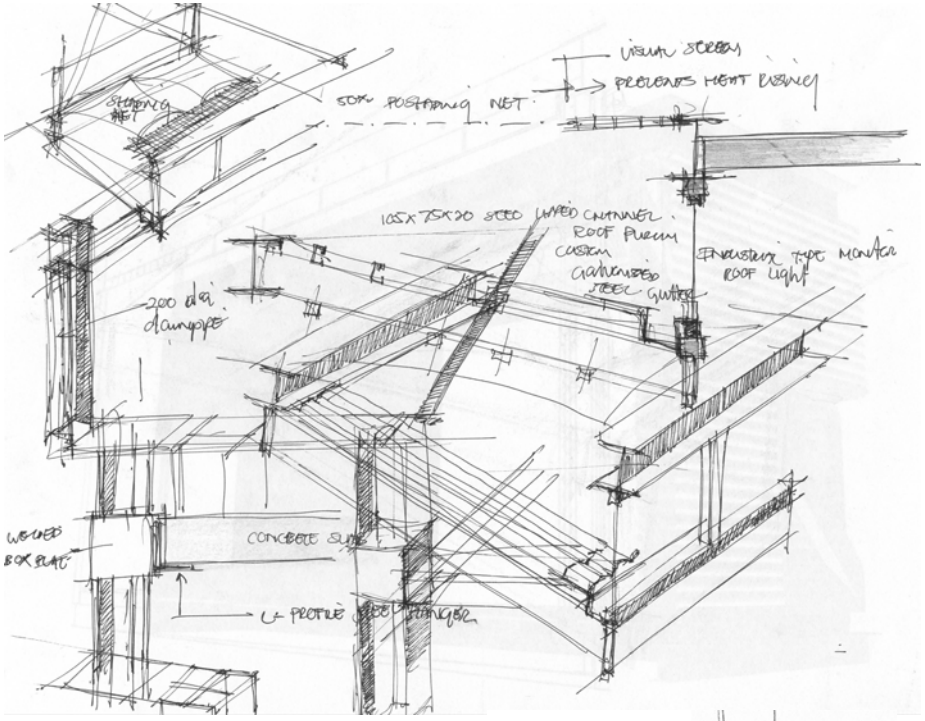
Neighbouring buildings. The project responds to the adjacent heritage building in the form of a recess on the ground line to meet up with the north façade of this historical building.

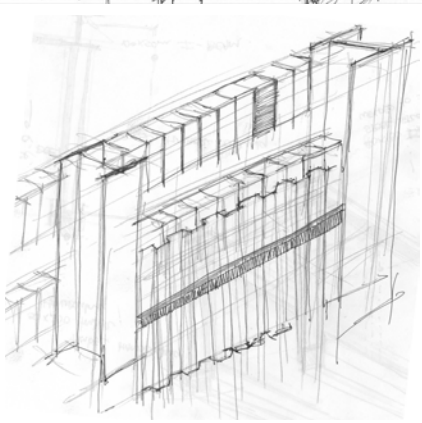
Ecosystems. Historically, the site was part of the sports facili ties for the Hatfield Primary School. The ecosystem generally constituted of grass sports fields. At present, the site is mostly covered by paved vehicle parking areas. The new development will create a more sustainable ecosystem within the centre, with co nsiderable landscape input in the form of courtyards.

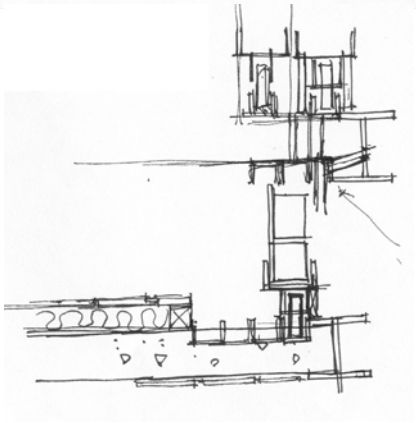


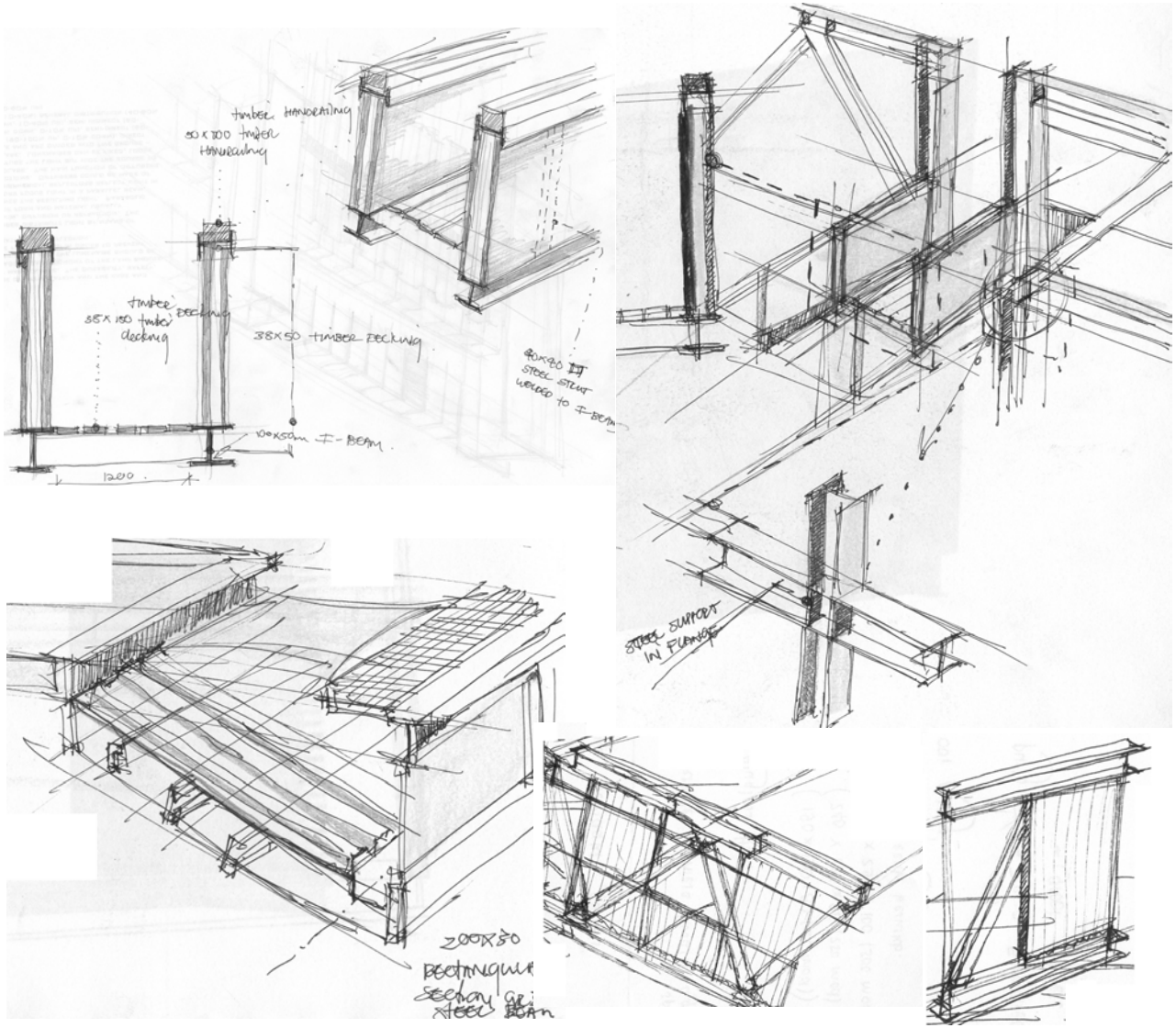
7.8

Technical Report








timber HANDRAILING
50 x 300 timber HANDRAILING
timber DECKING
38 x 150 timber decking
38 x 50 timber DECKING
80 x 80 SHS STEEL STUD WELDED TO I-BEAM
100 x 50 mm I-BEAM
1200
STEEL SUPPORT IN FLANGE
200 x 50
RECTANGULAR SECTION STEEL BEAM

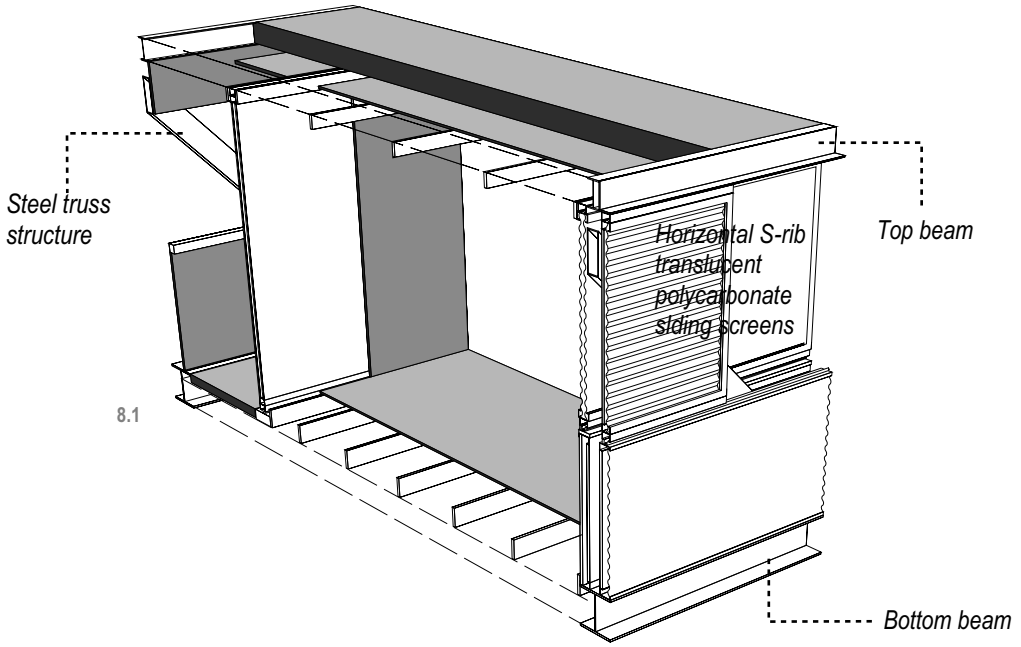
8.1__***STRUCTURE***

The structure of the complex comprises two superimposed three -dimensional structural grids. The first grid comprises an in-situ cast concrete grid, supporting the offices, vertical transportation and bus terminal infrastructure. The second i s a steel grid, carrying the overhead accommodation units. As a result of this layering, it also contributes to the concrete grid, and *visa versa*.

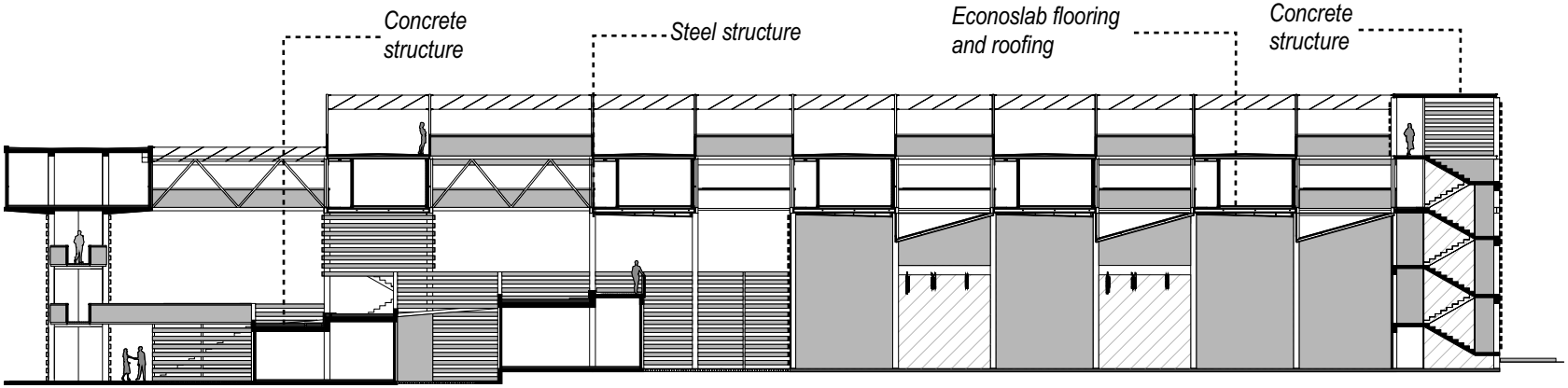
The location of the overhead accommodation units, with respect to the development below, is problematic in te rms of normal construction procedures such as in-situ cast concrete, making it relatively inaccessible. Other feasible construction techniques consequently had to be adopted. For the floor and roof slabs of the accommodation units the Econoslab ™ suspended concrete system will be used. This system is cost effective and relatively easy to implement, being a suspended flooring system consisting of lattice lintels and concrete hollow blocks, which together form a permanent shutter for ribbed type concrete floors.

The lattice lintels, which contain positive reinforcement in their concrete part, form the bottom shutter for floor ribs. This system minimizes the amount of "In -situ" concrete work, which basically comprises of a screed to finish the slab.

The vertical structure, supporting the overnight accommodation units, will be based on GR. 300W 305x305x283 steel H - profile columns, with the horizontal structure being GR. 300W 305x305x137 bottom beams and 178x108x22 I -profile top beams supported by a 203 x102x10 rectangular hollow section truss.



8.1



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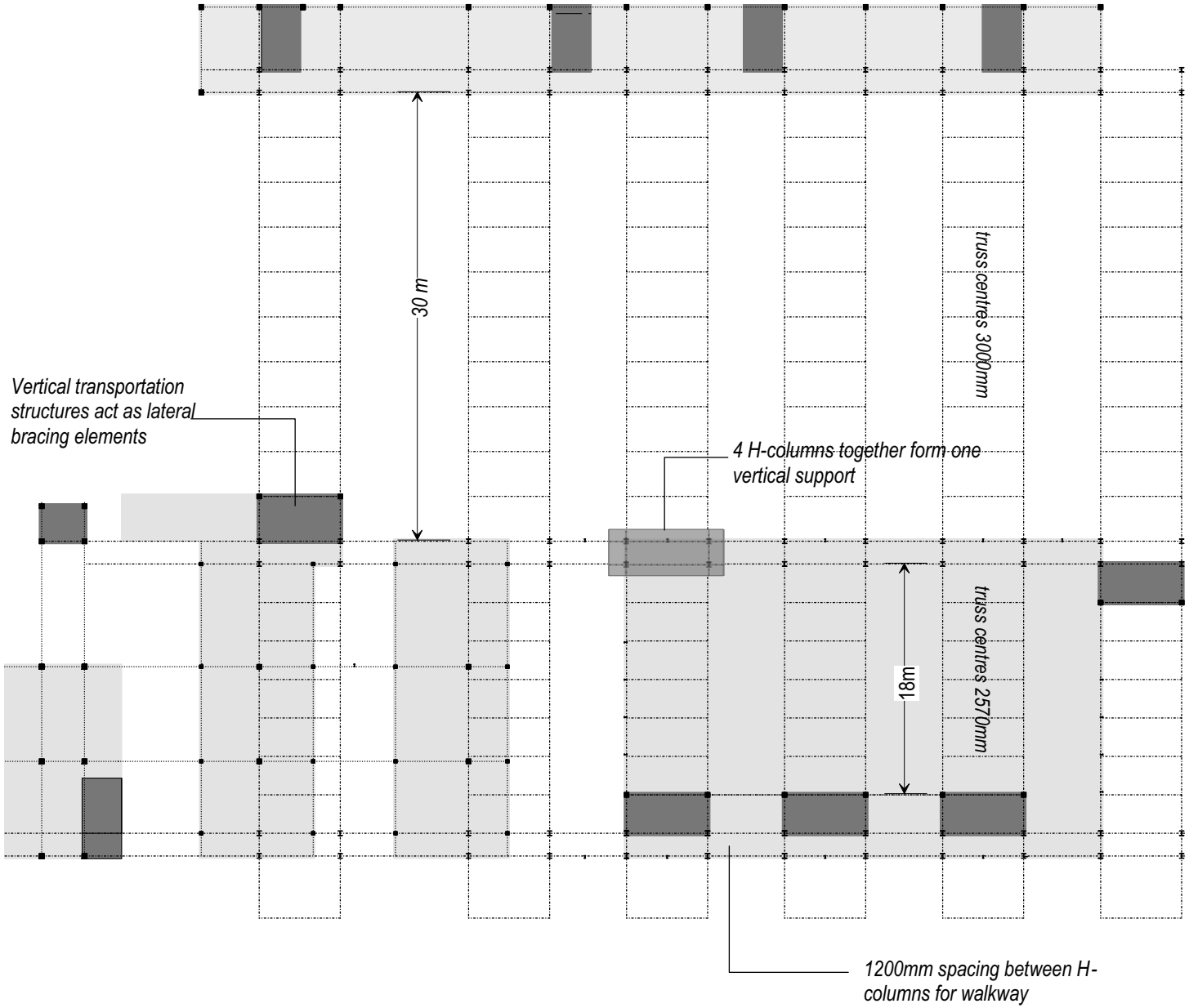
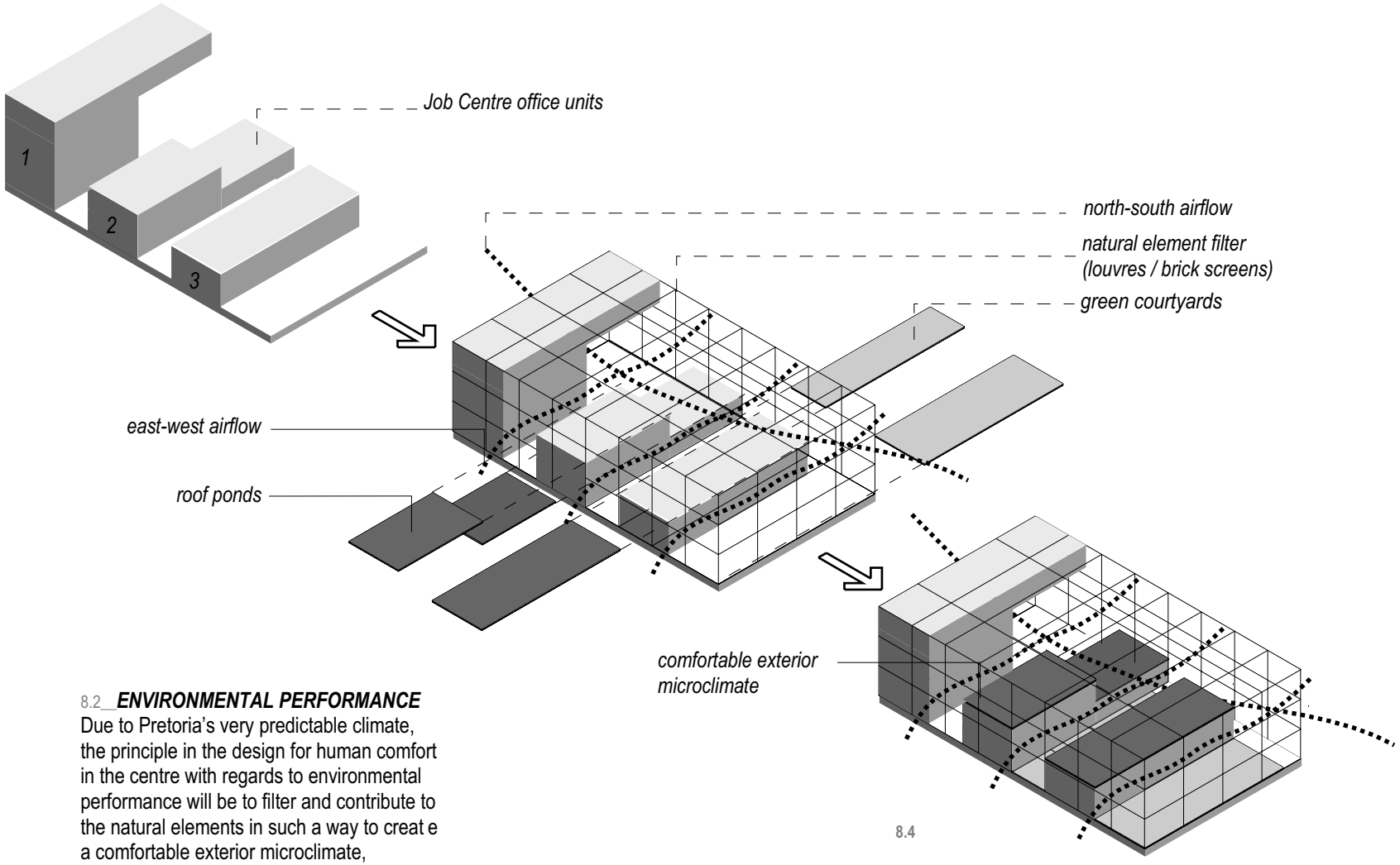


8.3

8.1 Structure of overhead unit in conceptual stage. In the final proposal the sliding screens were shifted to the interior to expose the structure.
8.2 Section indicating structure.
8.3 Plan of structural grid.



8.4

8.2__***ENVIRONMENTAL PERFORMANCE***

Due to Pretoria's very predictable climate, the principle in the design for human comfort in the centre with regards to environmental performance will be to filter and contribute to the natural elements in such a way to creat e a comfortable exterior microclimate, minimizing the need for further controls on the interior. The main microclimate under investigation will be the area surrounding the three office blocks of the *Job Centre*.

To promote mental activity, cooler than optimum thermal comfort will be aimed for in the office units, while optimum conditions will be targeted in the accommodation units to promote sleep and relaxation.

8.4 Diagram depicting environmental filter to obtain a comfortable exterior microclimate.
8.5 Section through unit indicating external insulation and internal exposure of mass elements.

8.3__*THERMAL INERTIA*

Through the damping effect referred to as thermal inertia, high -mass structures absorb heat during the day, and radiate excess heat at night. This stabilizes the interior temperature around the mean ambient temperature, resulting in a larger temperature lag. In the three office buildings concrete has been used extensively in the floors, columns and roofs to enhance thermal mass in the building.

Due to water's high thermal mass, five times the heat storing capacity of concrete, the roof ponds contribute to this aspect. Heat storage in the water will be more desirable during winter than in summer. During summer circulation will be quickened to limit the heating effect, with less exposure to direct sunlight due to the louvre system. The pe bbles, forming the base of the water ponds are also of a dark colour to promote heat absorption.

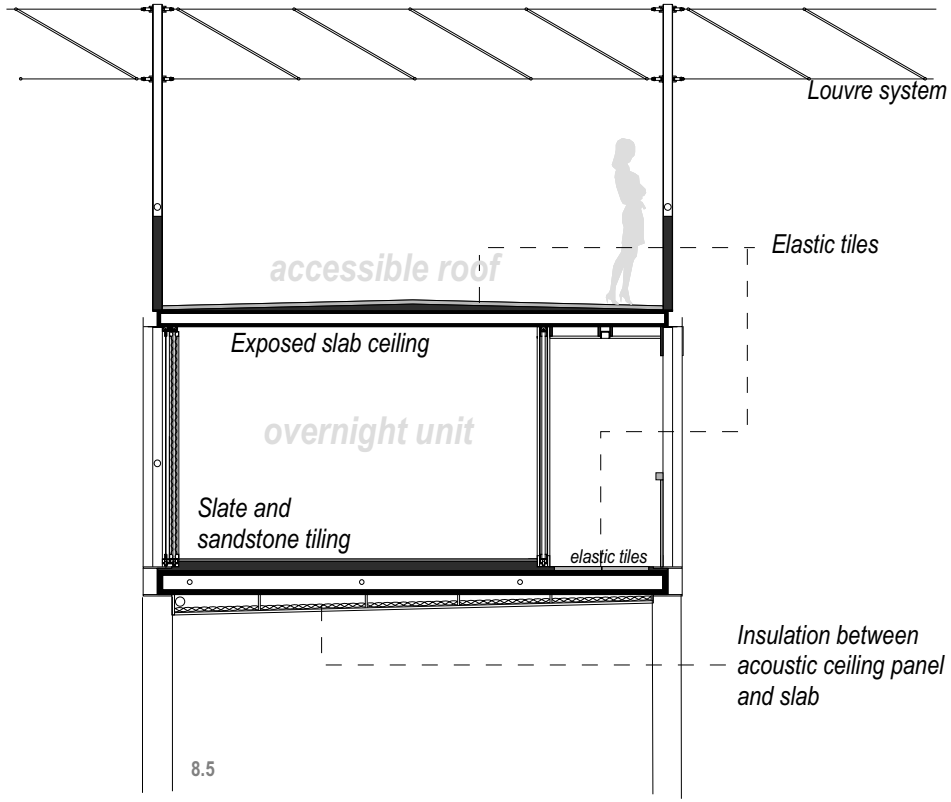
In the accommodation units the floors and roofs consist of high -mass concrete to promote thermal inertia, playing a significant role in thermal damping, being used as a solar heat store.

8.4__*INSULATION*

In a climate with large daily temperature fluctuations, such as Pretoria's, insulation should optimally be applied on the outside of a high -mass structure. By exposing the high-mass structure on the inside, thermal performance will be maxim ized due to the effect of radiative heat. In the case of the accommodation units, a layer of insulation is applied on the roof in the form of an elastic tile. The tiles also function as flooring, and have low thermal radiation and build-up.

The bottom of t he floor slabs will be exposed and finished with a screed, covered with gloss enamel paint. This specification will result in the maximum usage of the radiative heat caused by the presence of high -mass materials such as concrete. The use of suspended ceilings would have limited this effect. Internally the floor slab will be finished with slate tiling (again a high -mass material) to enhance the thermal performance due to heat absorption in winter as a result of direct sunlight, as well as the effect of radiative heat. The floor slab will be externally insulated by means of a layer of insulation on top of the acoustic ceiling panel, which also contributes to the U -value of the external ceiling system. All dry walling will include insulation material.

The external walkways and accessible roofs of the accommodation units will be tiled with Regupol Elastic Interlocking paving tiles to enhance the acoustic and thermal performance. The tiles are manufactured of recycled synthetic rubber, having a shock abso rption rate of 70%. The 500x500x43 tiles also act as an insulation layer, while preventing heat storage and build -up due to it's porous structure. The porous surface also absorbs sound, and the impact of footsteps. The tiles are red-brown in colour and are laid on a clean concrete surface with a special adhesive provided by the manufacturer. The sub-base needs to have a slight slope for drainage, as the tiles are permeable.

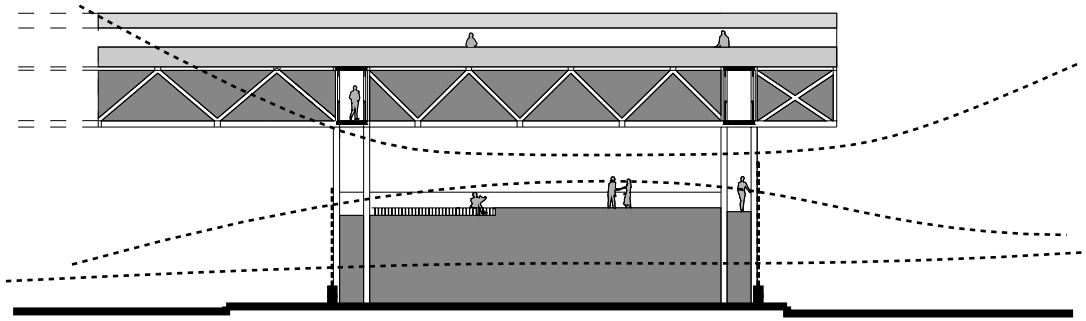


8.5

8.5__***NATURAL VENTILATION***

The structure of the building allows for external openings into courtyards which promote air movement and natural ventilation. The brick screens form openings into the courtyards allowing turbulence caused by the passing shuttles to promote air movement changes in the courtyards and on the surface of the building's outer skin. The subsequent air movement helps to keep the building's outer skin cool in the summer while turbulence causes pressure changes with subsequent air movement.

The natural air velocity will also be enhanced by the Venturi effect as a result of the air being compressed and expanded due to the presence of the overhead structure. Natural ventilation can also be combined with direct evaporative cooling where air can be drawn over the roof ponds.



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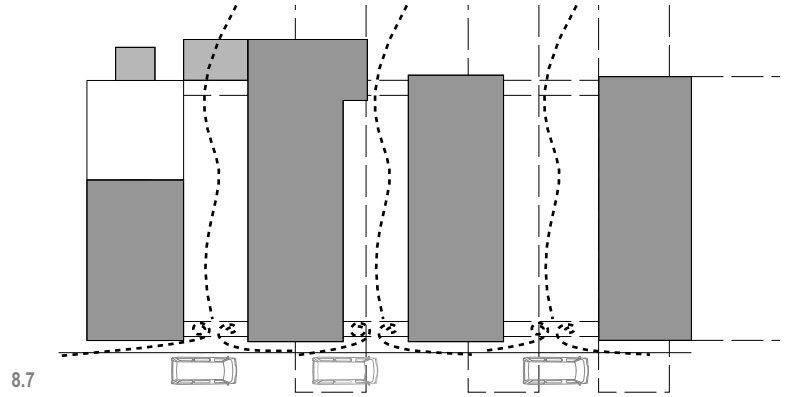

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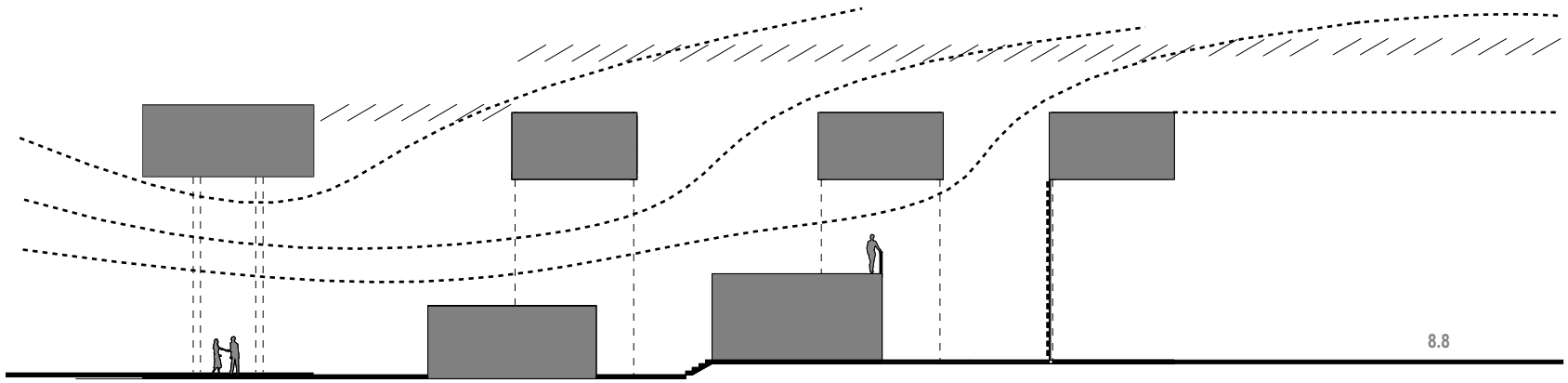
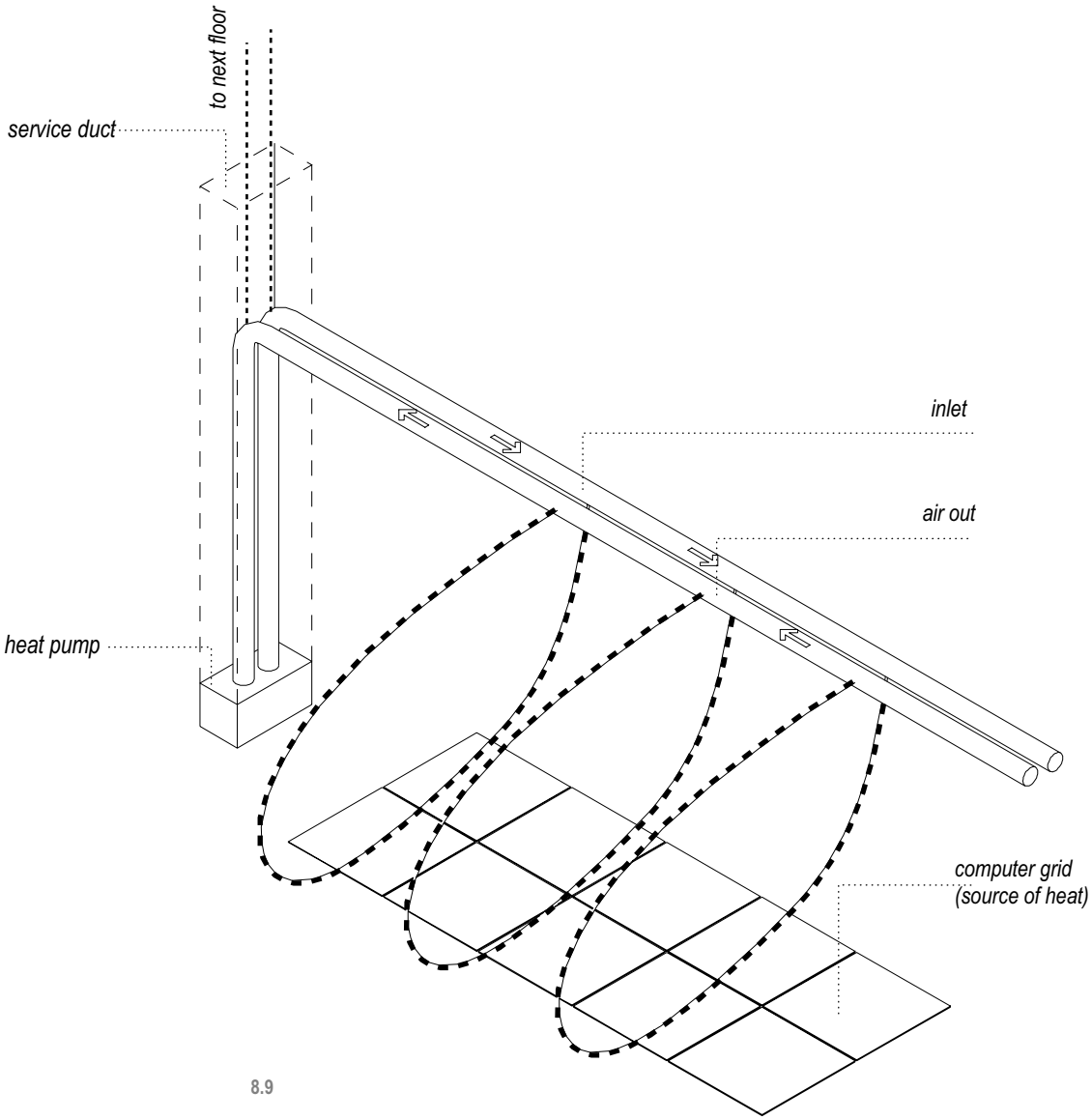


8.8

8.6__***MECHANICAL VENTILATION***

The computer rooms will need to be mechanically ventilated due to restrictive specifications for dust and noise levels (call centre), limiting the possibility for use of natural ventilation. The effect of the external filter system will however minimize the load on the system.

A closed-system cooling heat pump is specified. The heat generated by the computer and occupants will function as a heat cycle, requiring the need for ventilation only during winter.



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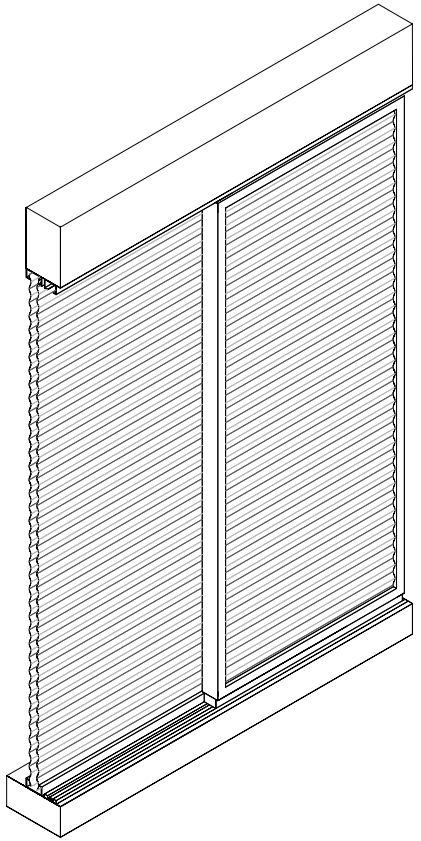


8.10a

8.6 East-west wind propagation due to Venturi effect.
8.7 Turbulence due to passing shuttles.
8.8 North-south wind propagation due to Venturi effect.
8.9 Mechanical ventilation system.
Following page
8.10a Polycarbonate sheeting sliding windows.

8.7 SKIN SYSTEM

Lighting. Light can provide visual comfort or cause discomfort. Glare and high contrasts in lighting levels promote discomfort and cause a blinding effect, especially undesirable when dealing with computer workstations. This can be allevia ted by more even distribution of light (diffused light). For a building to limit its dependence on natural resources, natural daylight levels need to be utilized as much as possible possible. The use of shade net louvres and translucent polycarbonate sheet ing curtain walls (rather than glass), diffuses the light partially. Soft diffused light is attained without the normal heat loss or gain, and glare due to direct sunlight.

The accommodation unit's daylight level will be designed for 100 lux, while the offices will be expected to operate under 200 lux lighting.

To limit heat gain as well as glare during the mornings and afternoons, the building's east and west facades does not accommodate any openings into rooms

Walls and Screens. Due to the large spans (18m and 30m), the walls of the accommodation units need to be lightweight to minimize the load on the steel structure. Two skins of translucent sheeting will be used on the northern façade, to reduce solar radiation, while gaining as much sunlight as possi ble. The outer skin, in the form of a sliding solar screen, consists of Lexan Thermoclear™ , a multi-wall, ribbed polycarbonate sheet. A 6mm clear screen will be specified, with 82% light transmission to acquire adequate thermal performance without loss i n lighting levels.

The sliding windows, forming the second skin, will consist of two layers Modek™ Polycarbonate S -Rib Sheeting, with a 25mm cavity, allowing even better thermal performance at a more affordable price than double-glazing.

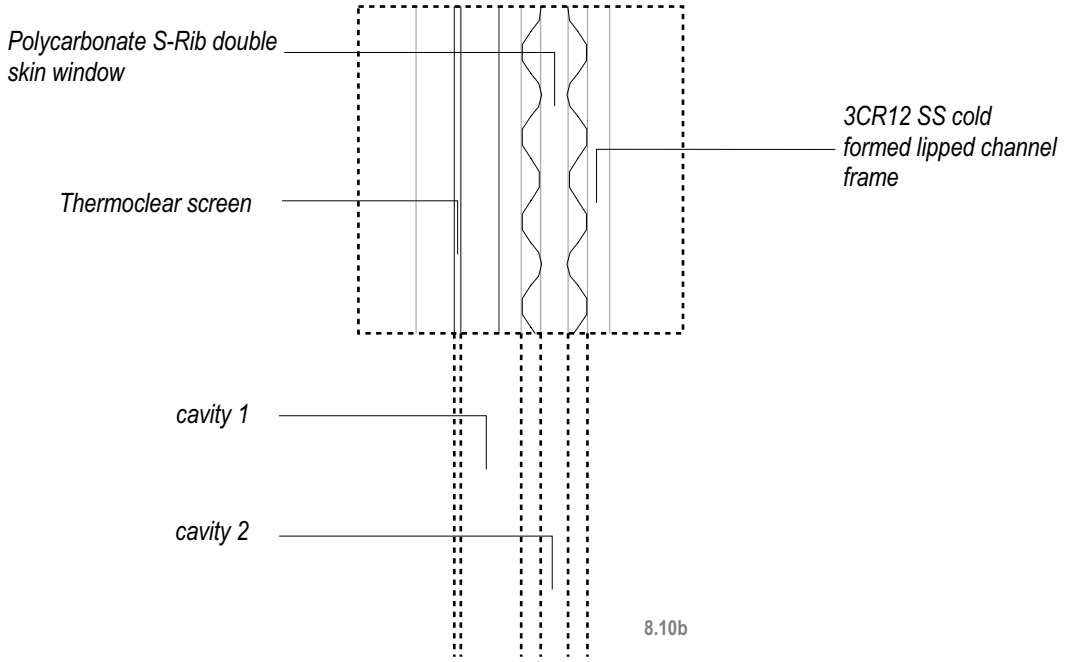
A 1mm nominal thickness is specified, with an extruded layer of UV protection on the weathering side of the panels. The clear panels have 90% light transmission with 13% reflectance. Solar energy transmission through one sheet will be 88%. The presence of a cavity between the two skins will however improve this specification considerably. The effect of a cavity halves the U -value of a material. The shading coefficient of these panels is 1.00, the same as glass, without the transmission of harmful UV rays.

The three skins, with effectively two cavities, ensure the presence of 5 surface coefficients, minimizing the impact of heat convection between the interior and exterior of the building.

The same system will be specified for the office units to maximize sunlight. This system is much more affordable than a glass curtain wall, yet will be more efficient in its prevention of loss or gain of heat.

User Participation. As part of the building management, user participation will be needed for ventilation openings to be opened or closed as necessary. In case of a power failure, or emergency, all curtain walls are provided with sliding windows to ensure adequate ventilation. During normal operation these openings should rather be kept closed for the mechanical system to operate optimally.

The building users should close the shading screens over windows at night to prevent heat loss, especially in winter. The external screens should be closed during the day in summer to prevent solar gain should the rooms be unoccupied.

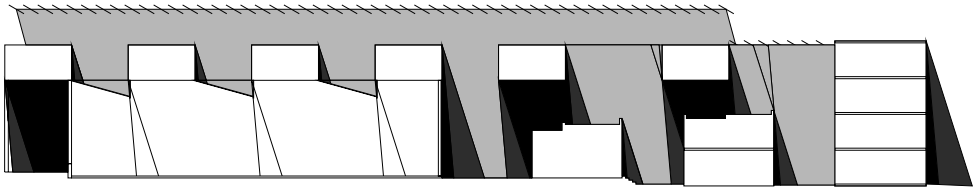


8.10b

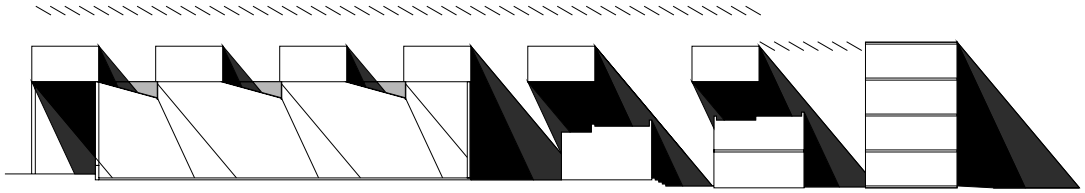
8.8__***LOUVRE SYSTEM***

To minimize solar radiation during summer, but still allowing direct sunlight during winter, a shading net louvre system will be specified to form a translucent roof for the centre. The louvers have been arranged at such intervals and an gles to allow maximum protection against direct sunlight during summer, with maximum exposure during winter. The structure consists of 30mm dia chromed aluminium tubing shade net frames, suspended from 6mm dia stainless steel tension cables, and strung between 0600 screwed STA-LOK eye ends, connected to 100x55x8 I -profile columns. Shading nets with 60% light transmission are tensioned into the rectangular shade net frames and threaded at the ends.

The louvre system operates in conjunction with the overnigh t accommodation units to form a solar filter.

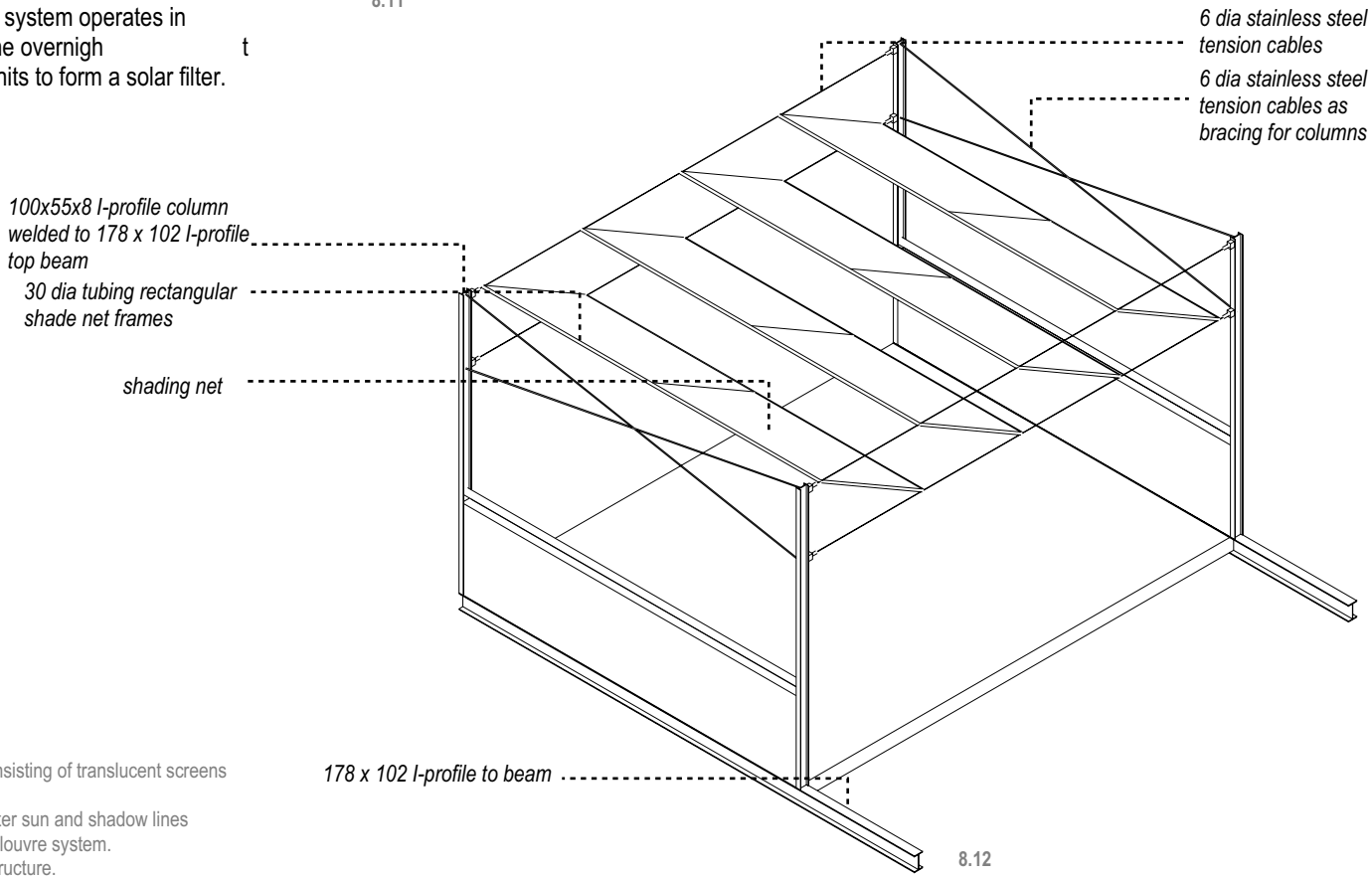


summer sun angles



winter sun angles

8.11



8.12

8.10b Skin system consisting of translucent screens and cavities.
8.11 Summer and winter sun and shadow lines indicating influence of louvre system.
8.12 Louvre system structure.

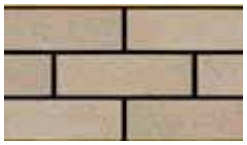
8.9__*BRICK SCREEN SYSTEM*

As part of the filter system used to attain an artificial exterior microclimate for the development, brick beams are used as screens. Normal screens such as timber and aluminium does not have any thermal mass. Bricks do have signif icant thermal mass. This system will therefore also contribute to thermal inertia while filtering the elements.

The brick screens consist of brick lintels formed by compressing a row of bricks on edge, using 20mm dia steel stiffening rods tension bolted t o 120x220x10 mild steel ends, welded to the columns.

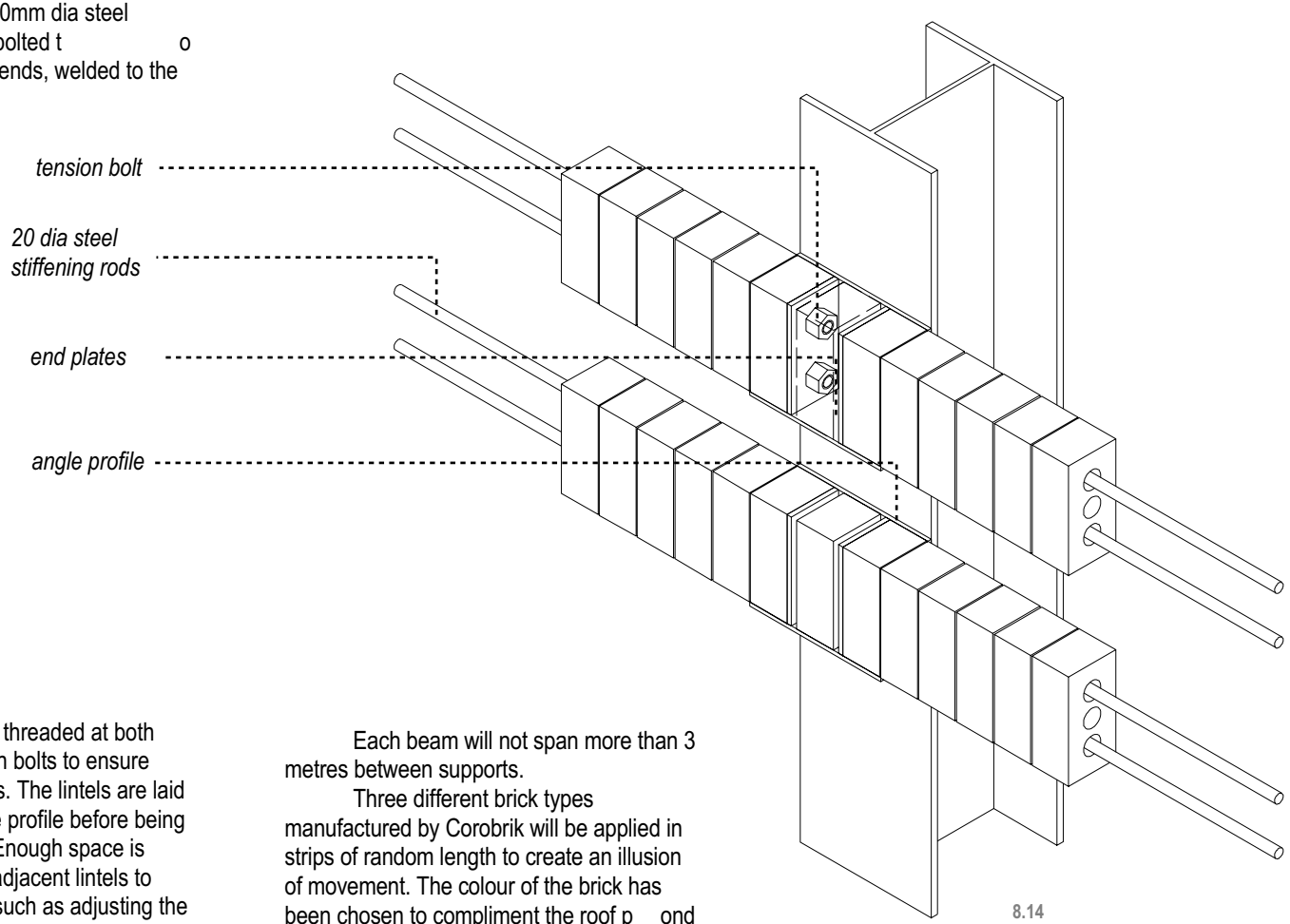
Blouberg
Travertine
Face Brick Aesthetic

Huguenot Blue
Satin
Face Brick Aesthetic



Silvergrey
Satin
Face Brick Extra

8.13



8.14

The rods will be threaded at both ends and tensioned with bolts to ensure sufficient beam stiffness. The lintels are laid on a welded steel angle profile before being clipped to the column. Enough space is provided between two adjacent lintels to allow for maintenance such as adjusting the tension in the rods, as well as for the space to be covered with a half brick on edge for a smooth finish.

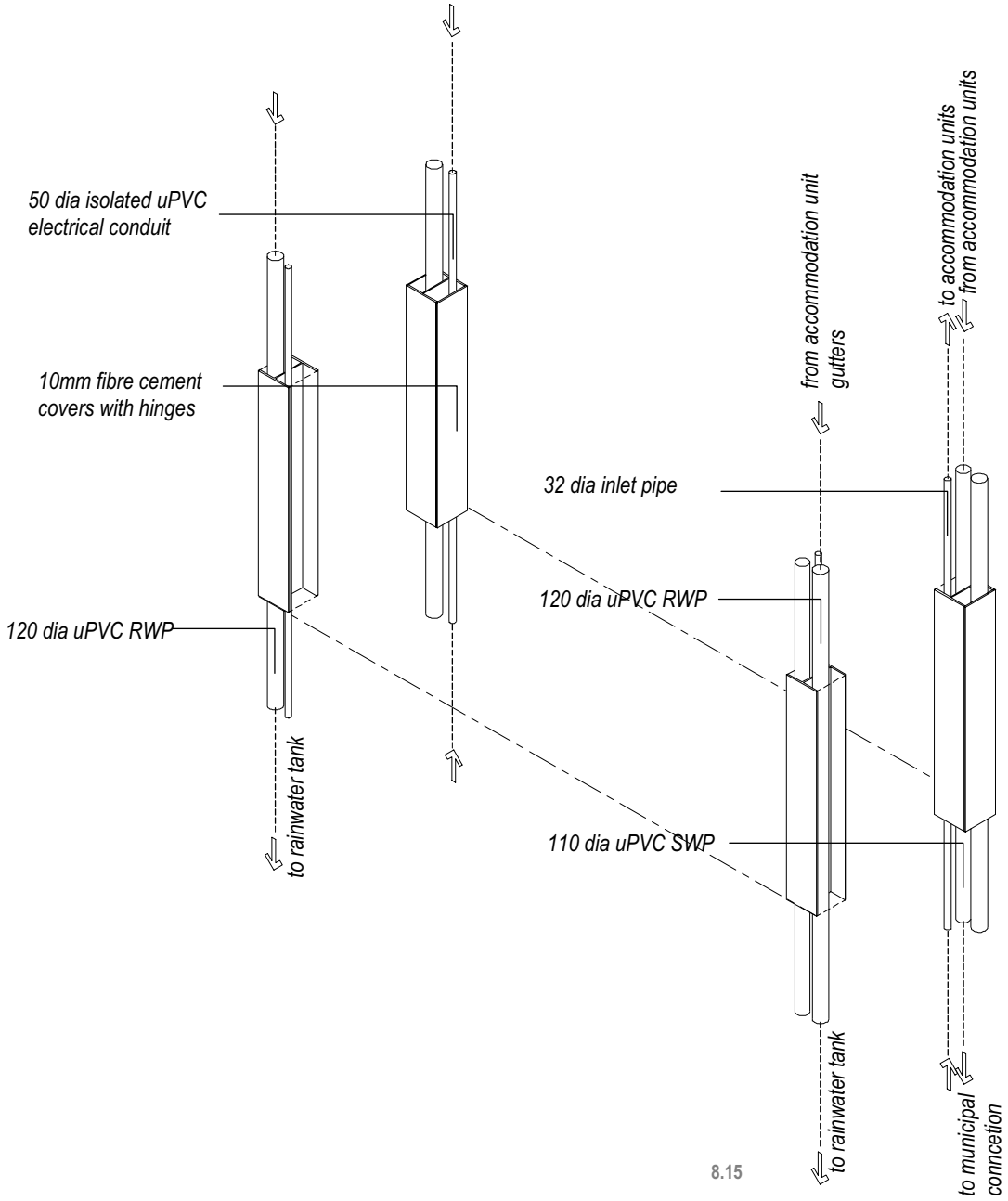
Each beam will not span more than 3 metres between supports.

Three different brick types manufactured by Corobrik will be applied in strips of random length to create an illusion of movement. The colour of the brick has been chosen to compliment the roof p ond system in creating a cool, tranquil atmosphere.

8.10 ***BUILDING SERVICES***

The building services for the overnight accommodation units will be channeled between the flanges of the H -profile columns supporting these units. Fibre - cement hinged covers will hide the unsightly service piping, adding to fire pro tection. Horizontal channels for services will be chased into screed covering the hollow core concrete slabs. The 110 dia soil water pipes will horizontally be guided @ 1:40 slope beneath the slab to terminate in a down pipe guided along one of the columns.

Energy (80 -95% energy efficiency) and space efficient LP -gas geyzers will be installed in all the ablution facilities.



8.15

8.13 Brick types used in brick screen system.
8.14 Component detail of brick screen system.
8.15 Overnight accommodation unit building service channels in steel columns.

8.11 ACOUSTIC TREATMENT

The main acoustic problem expected in the development will be noise emanating from the shuttle road on the east of the site and noise from below as a result of the bus terminal and loading/offloading bay.

The shuttle road's main s ource of noise will be the sound of the 18 or 30 seater Mercedes-Benz sprinter buses' tires on the surface due to an expected speed of +- 40 km/h. To keep the source of noise down, a very smooth surface need to be aimed for, such as a bitumen road. The smoothness of the road surface for the bus terminal will not influence noise factors since low speeds will be maintained. The main source of noise in this area will be engine noise of the vehicles themselves. This area needs to be "friendly" in terms of appearance. A light coloured cobblestone - paving surface will be implemented to achieve a durable, yet attractive surface.

Some external noise in usable spaces can however not be decreased to acceptable levels. The design solution was to override this noise with water sounds caused by the roof ponds. Falling water or the sound of splashing water can infuse a sense of calm, which contributes to productivity in a working environment. Each level difference between the six different ponds act as a weir, with the asso ciated sounds expected from such a feature.

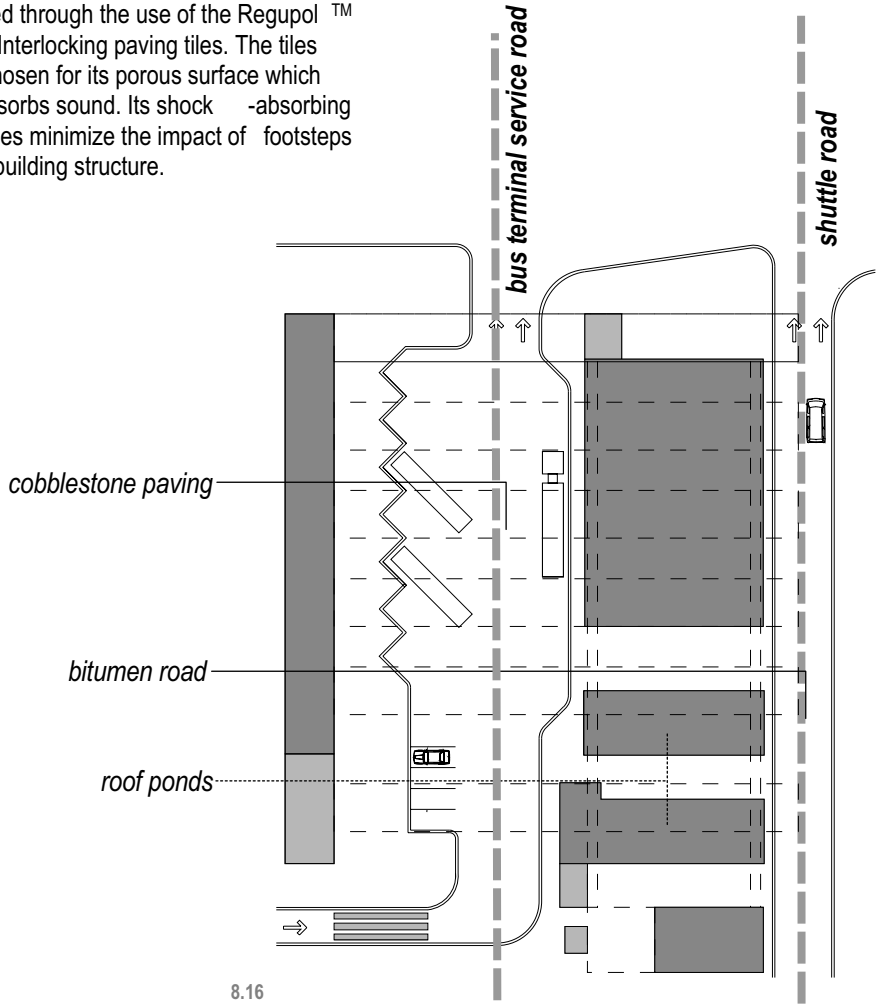
In external applications such as the underside of the overnight units forming a ceiling for the activities below, Sonit TM D30 sound-absorbing tiles will be used to achieve a low maintenance natural stone finish c ombined with sound absorbing qualities. This acoustic layer is applied at an angle to prevent the reverberation of noise caused by passing vehicles below, as well as forming a cover for the 110 dia SWP. The tiles, manufactured from sorted silica sand and bonded with special adhesives, were chosen since it can be used externally, and has a sound absorption coefficient of 13dB.

The D30 tile's dimensions are 300x300x30mm. A light grey finish is specified to aid lighting levels. The sound absorbing lining is designed for installation on a supplied steel supp ort structure with a rust resistant finish. The clearance between the lining and the underside of the slab will be used for extra thermal insulation in the form of Sol -Thermo™ insulation, a composite element consisting of two layers of foil enveloping a layer of insulation.

Further sound attenuation will be achieved through the use of the Regupol ™ Elastic Interlocking paving tiles. The tiles were chosen for its porous surface which also absorbs sound. Its shock -absorbing properties minimize the impact of footsteps on the building structure.

The double layer polycarbonate sheeting windows used on the northern side of the accommodation units further improves sound attenuation. The timber cladding on the southern side will similarly improve sound. Both these outer insulation skins have cavities, contributing to acoustic performance.

The brick screen system used on the exterior of the building also contribute to sound attenuation by diffusing sound as a result of irregular exposed surface areas.



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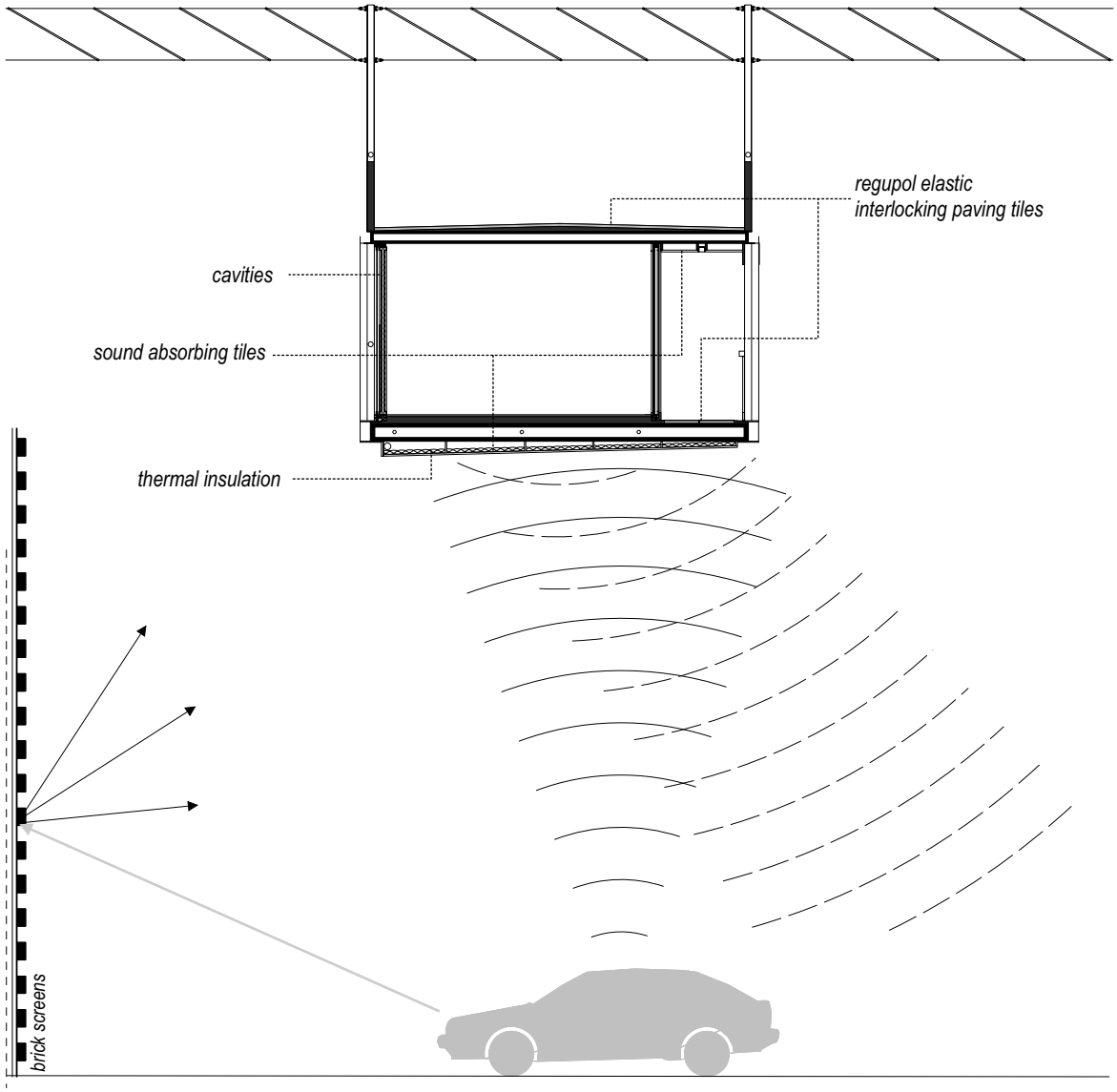


8.17

8.16 Sources of noise and large-scale acoustic treatment.
8.17 Acoustic treatment diagram.

8.12__*ROOF POND SYSTEM*

Water stimulates the senses of sight, touch, and hearing and is, in fact, synonymous with the basic existence of life. This effect of water was also one of the key considerations in the design of the roofscape for office units two an d three. These roofs were made accessible to follow a pedestrian ramp linking the first and second storeys, providing a usable exterior space for the centre's occupants. The level changes as a result of the pedestrian ramp are followed by the 6 roof ponds, which itself are accessible by means of timber decked seating and walkways.

Other added benefits of the use of roof ponds are that it can be used as temporary stormwater catchments to retain stormwater. The relevant two accommodation unit strips covering the roof ponds will drain into the roof ponds.

Structure. The roof pond structure is based on 255mm reinforced concrete slabs waterproofed with a layer Sikaplan PVC 14.6 Tunnel 2mm topped by a 30mm layer medium grade black pebble stone. Each water pond is 170mm deep and the water is transferred from one roof to the other by means of 110mm uPVC overflow pipes cast into the slab edges with inlets, equipped with filters. Some of the pond edges are finished with external grade timber decked seating and walkwa y strips for accessibility. The overflow between the two pond levels are hidden by these strips

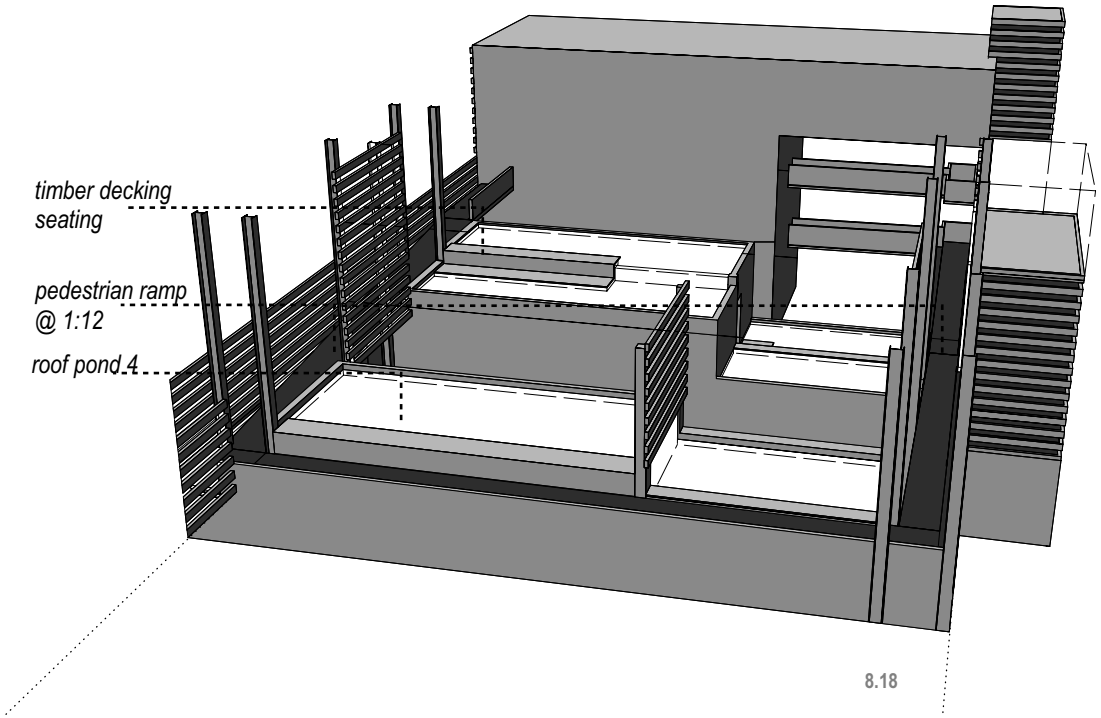
Pump System. The lowest roof pond (1) is overflows through a 150 dia uPVC overflow pipe which is connected to a 150 dia uPVC vertical pipe. The latter contains a borehole pump which continuously provides the highest roof pond (6) of water via a 50 dia inlet pipe.

A dual media filter system will be incorporated into the design for the removal of suspended solids. The flow design speed will be adequate to ensure that the body of water will be recycled every hour for the system to work efficiently. Chlorine gas treatment will be used to kill fresh water algae as well as sterilize the ponds. This necessitates a larger capital outlay to ensure lower maintenance costs.

To prevent possible overflows from blockage/stormwater and for maintenance reasons, each pond will be e quipped with a drainage pipe, and a water level switch to stop the pump.

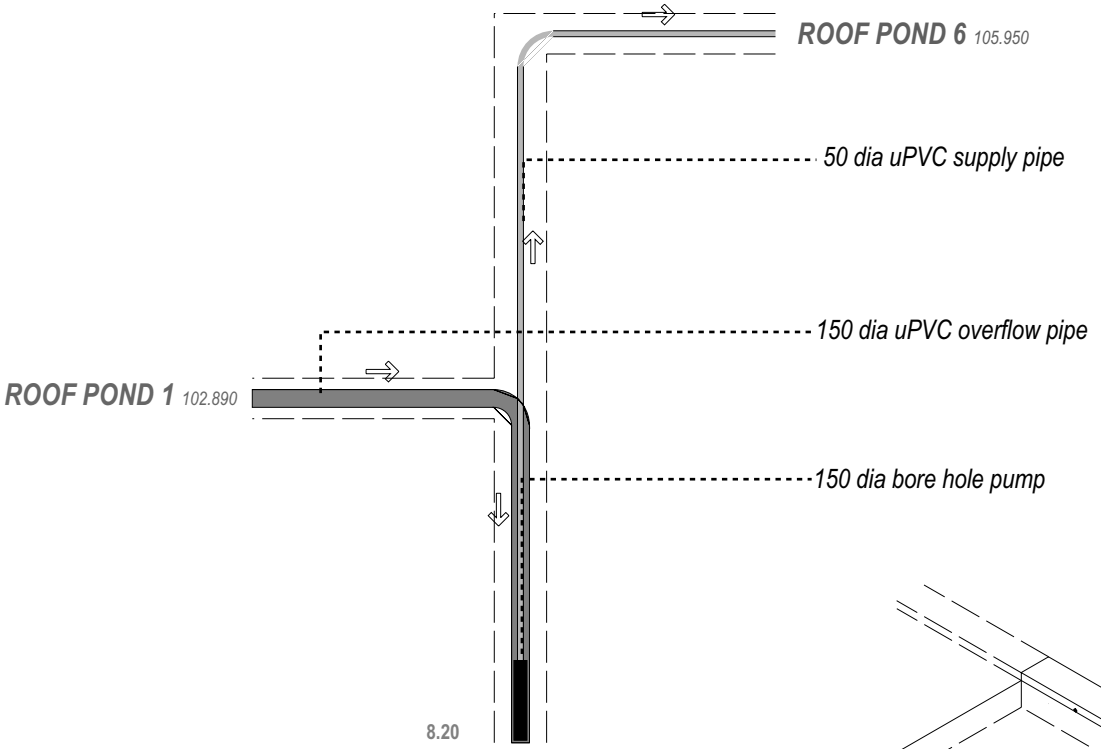
The speed of the circulation process can be regulated to allow faster circulation in summer and slower circulation in winter, allowing water to heat.

Evaporative Cooling. Indirect evaporative cooling is achieved by lowering the temperature of the structure elements of the building through water evaporation from the roof ponds. Warm dry air has the ability to absorb moisture. To absorb moisture, however, water must evaporate, with a resultant cooling effect. By increasing the humidity ratio of the air-water vapor mixture, a psychometric chart can be used to estimate the change in temperature possible. Due to the low relative humidity in Pretoria, fresh ai r can be cooled through evaporation quite successfully. For a large enough water surface to be exposed to air, fluctuating flow would be encouraged, in conjunction with the evapotranspirative effects of plants as found in the courtyards.



8.18

8.18 View of roof ponds and timber decking with overhead structure taken off.
8.19 Roof pond structure.
8.20 Pump system diagram.
8.21 Water circulation speed diagram.



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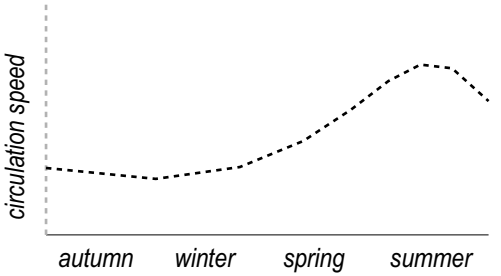

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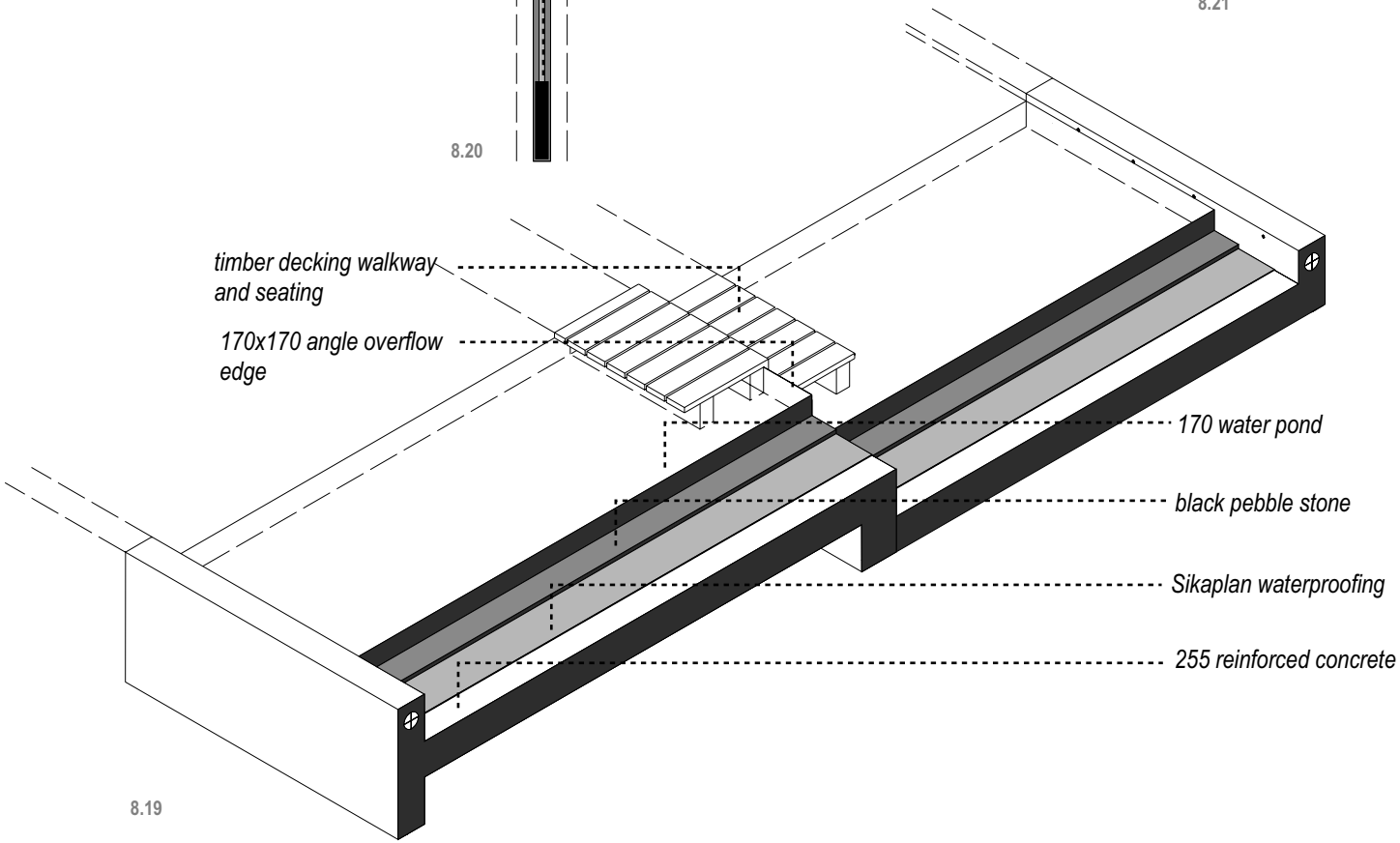


8.19

8.13 ***DRAINAGE***

The 160m² In-situ cast concrete roof of the main computer rooms (office block 1) will be drained by down pipes cast into the columns. Waterproofing will be provided in the form of 4mm abe torchon ™. A 30 mm loose gravel layer will protect th e waterproofing and improve thermal properties. The rainwater drained from this roof will not be harvested and stored, but will be drained to the storm water system via an underground storm water pipe. The requirement for the inside cross diameter of drainage pipes for a concrete roof is 100m2 per m2 of roof area. A 100mm dia. down pipe would therefore service a 85m ² roof area. For safety against blockage the roof will therefore be drained by four 100mm dia. down pipes provided with 100mm dia. fullbore outlets.

A 100m² drainage capacity per m² roof area is required and one 100mm dia down pipe would suffice for half the roof area. Four 100mm dia donwpipes have however been specified to allow for blockages.

The construction covering the warehouse will be used to harvest rainwater. The water will be stored in the provided fiber cement rainwater tanks. The water is to be used for general cleaning purposes, and as a source of water for the roof pond system.

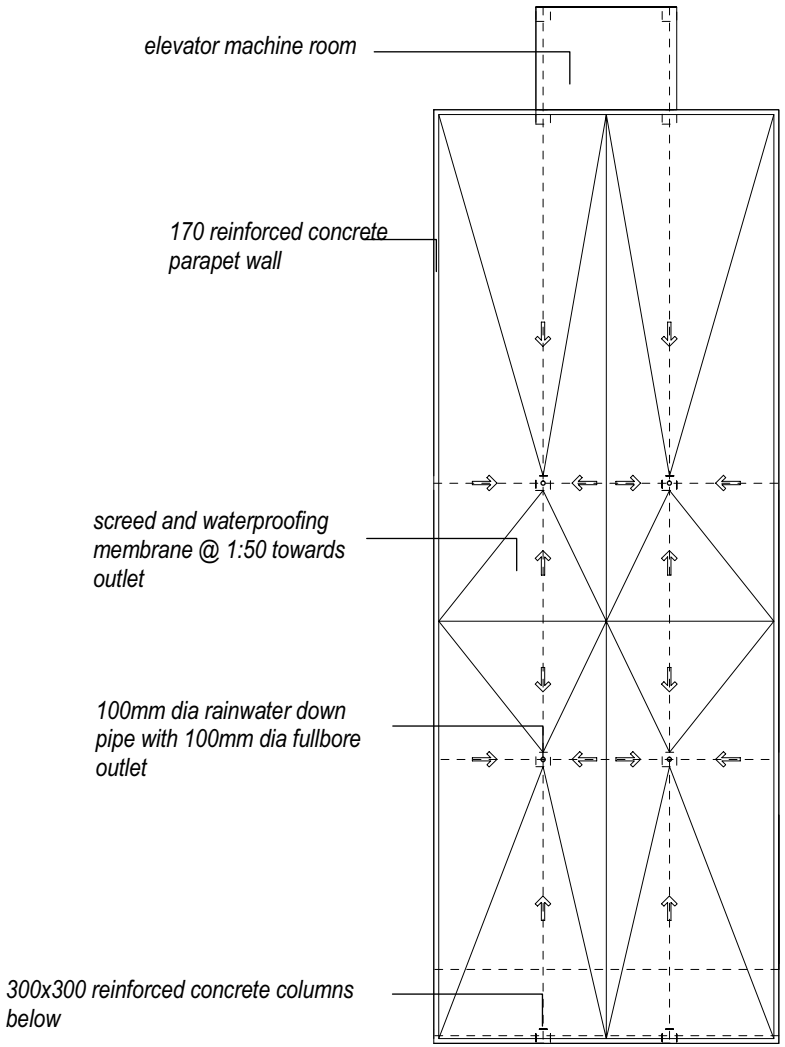
The total surface area covering the warehouse is 1008m ². The average rainfall per month for Pretoria is:

Jan : 101.3 mm
Feb. 108.8 mm
Mar. 63.8 mm
Apr. 37.5 mm
May. 48.8 mm
Jun 3.8 mm
Jul. 2.3 mm
Aug. 2.3 mm
Sept. 11.3 mm
Oct. 82.5 mm
Nov. 168.8 mm
Dec. 112.5 mm

The water retained with the surface area for each month will therefore be:

Jan.: 102.1 kL
Feb.: 109.6 kL
Mar.: 64.3 kL
Apr.: 37.8 kL
May.: 49.2 kL
Jun.: 3.8 kL
Jul.: 2.3 kL
Aug.: 2.3 kL
Sept.: 11.4 kL
Oct.: 83.2 kL
Nov.: 170.1 kL
Dec.: 113.4kL

To harvest the water the accommodation units will be equipped with 100x150 gutters leading to 120 dia rain water pipes into six 3.5 kL fibre -reinforced barrel type water tanks.



8.14 MATERIALS

Steel Sections. All steel sections for window and screen frames will be cold -formed 3CR12 stainless steel profiles. 3CR12 is relatively affordable, considering other stainless steels, with the benefit that it needs no protective coating or other maintenance. This stainless steel has a low chrome content, allowing the steel to oxidize to a point, giving a matt grey finish. Added benefits are that no fixing specification imposes limitations on fixing methods, as is the case with other alternat ive steels such as galvanized steel, which cannot be welded after galvanization.

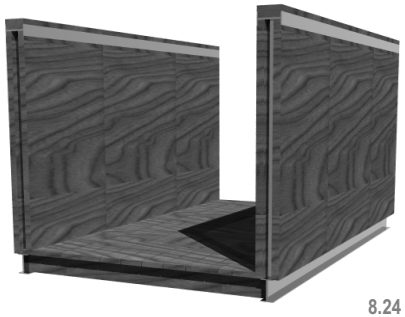
Timber cladding. Timber cladding will be specified for the southern facades of the accommodation units, as well as an alternative for ballustrading. The cladding specified i s 22mm 5 ply pine shutterboard treated with 2 layers of sanding sealer and topped with 2 layers polyurethane varnish.

To prevent absorption of water by the timber cladding the lower 120mm of all timber cladding will be substituted by 20x120x2mm rectangular hollow profile 3CR12 stainless steel skirting.

Timber decking. Timber decking is specified for all external walkways on the first and second floor, including those covering the office roofscape. Figured grade Eucalyptus Grandis timber decking treated with copper-chromium-arsenate (CCA) will be used. As is the case with most of the timber decking specified in the indicated positions, the surface beneath the decking need to be covered with a 2mm black polyethylene sheet, weighted down with a layer of gravel.

All decking will be 38x100 strips fixed with 6 mm openings to 50x100 joists @ 600 centers.

Paving. The courtyard spaces handling the most traffic will be paved with Corobrik Coropave Cedarberg 220x108x50mm paving stones. The remaining spaces will be covered with BG blocks with grass infill.



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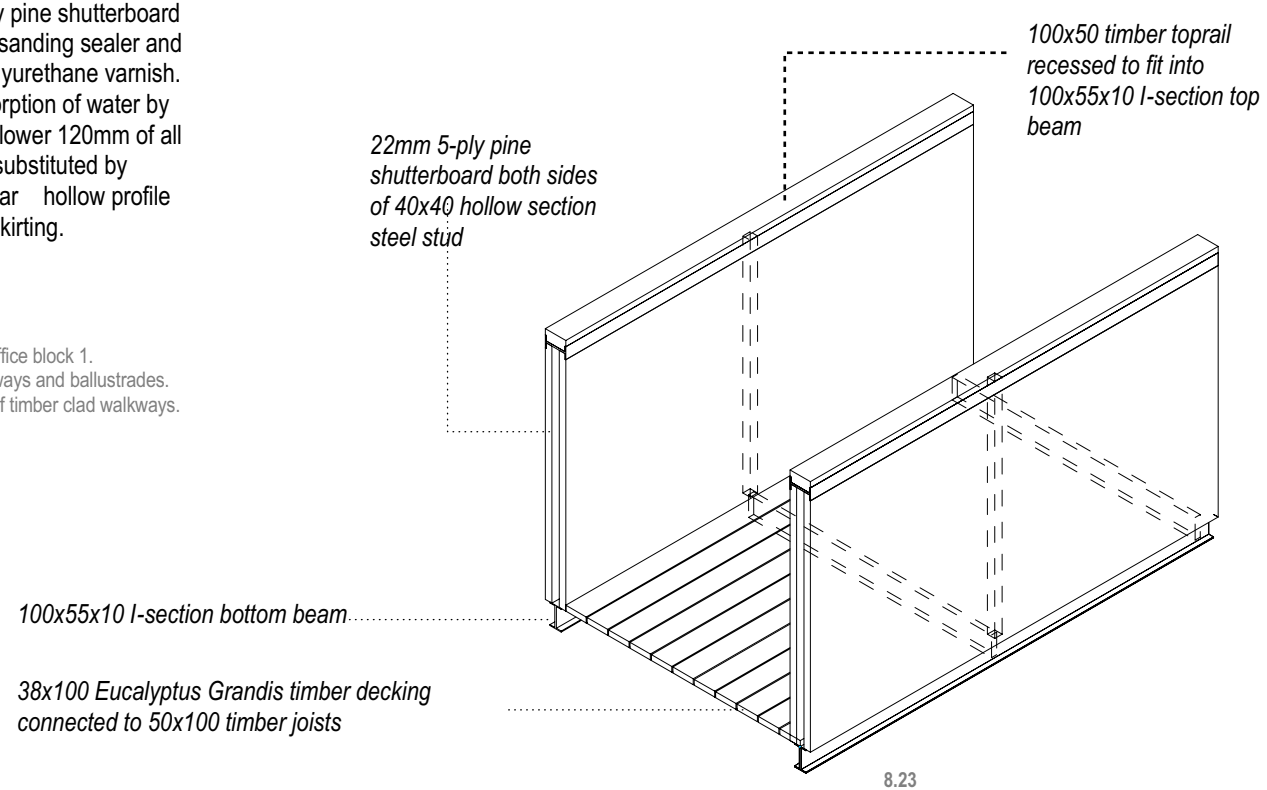
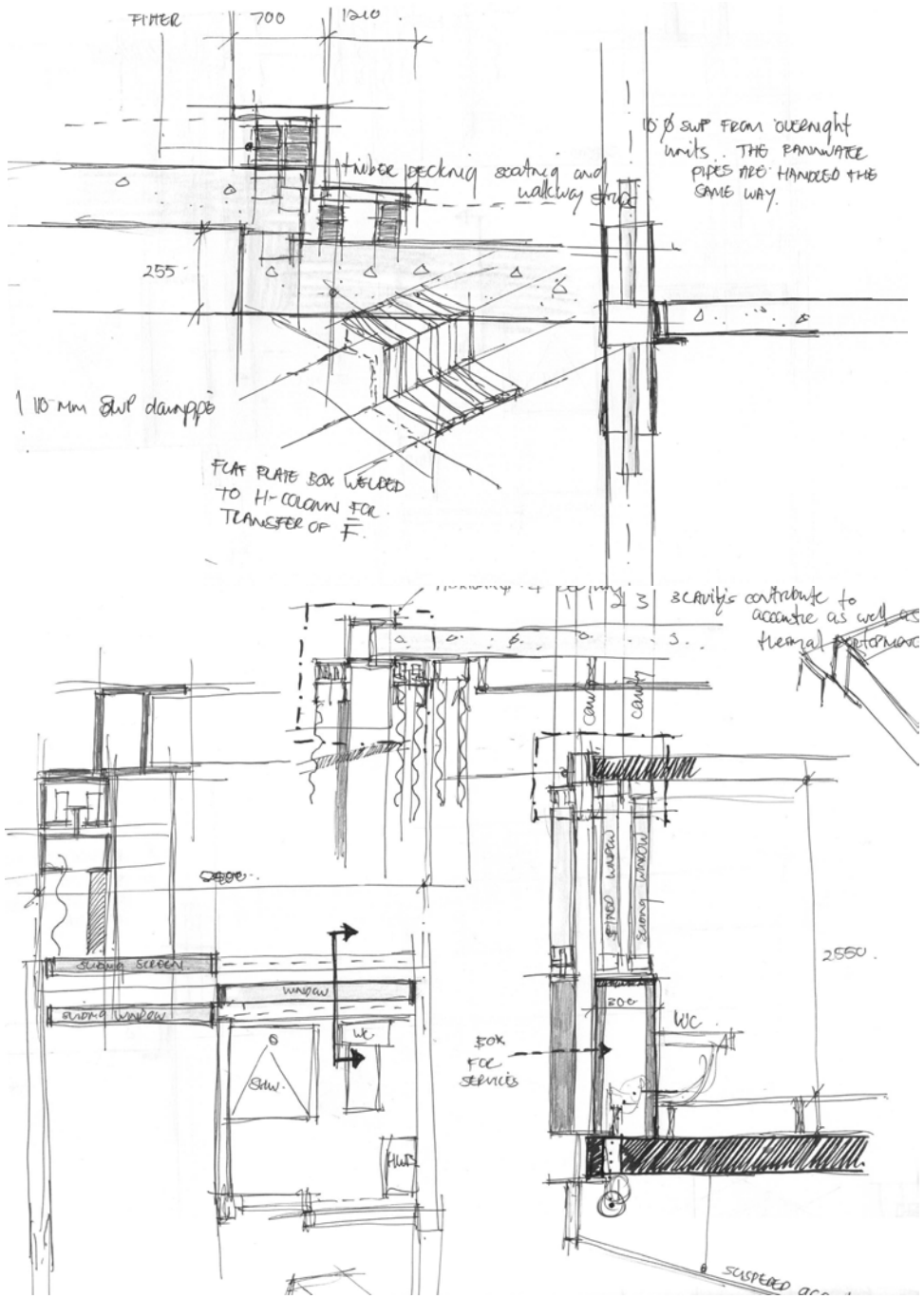


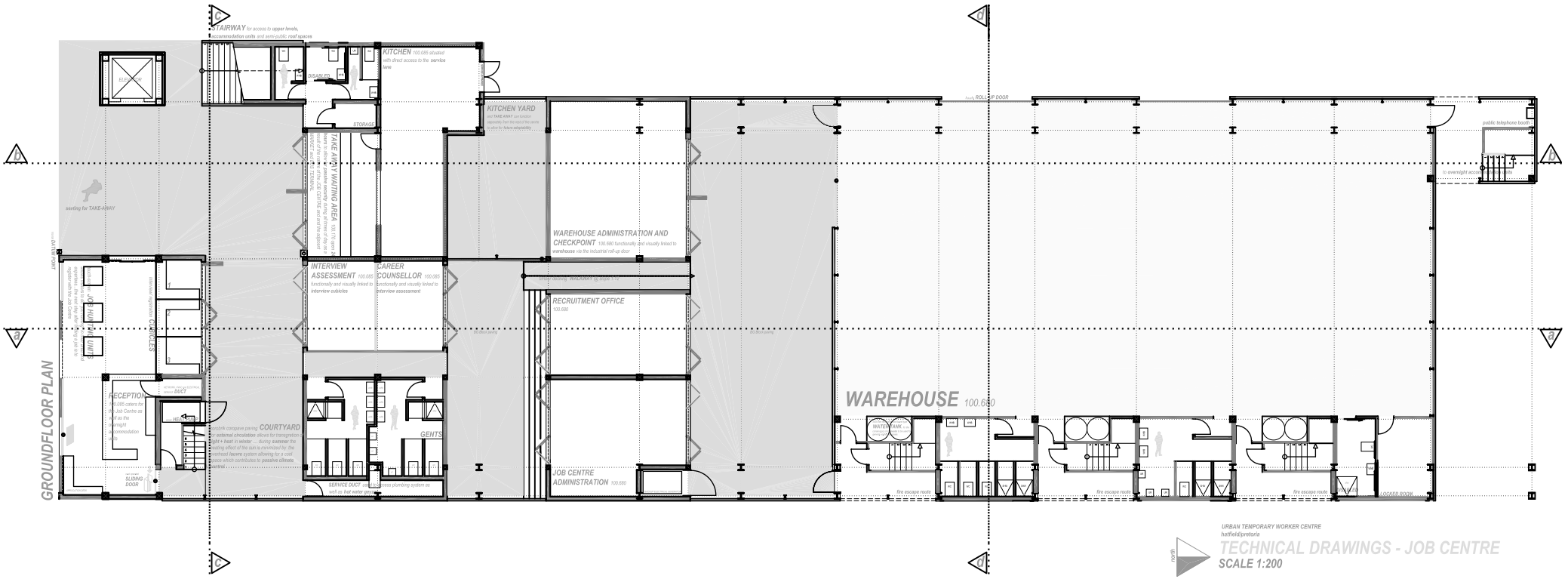
8.23

8.22 Roof drainage plan of office block 1.
8.23 Isometric detail of walkways and ballustrades.
8.24 Rendered perspective of timber clad walkways.

09

Technical Drawings



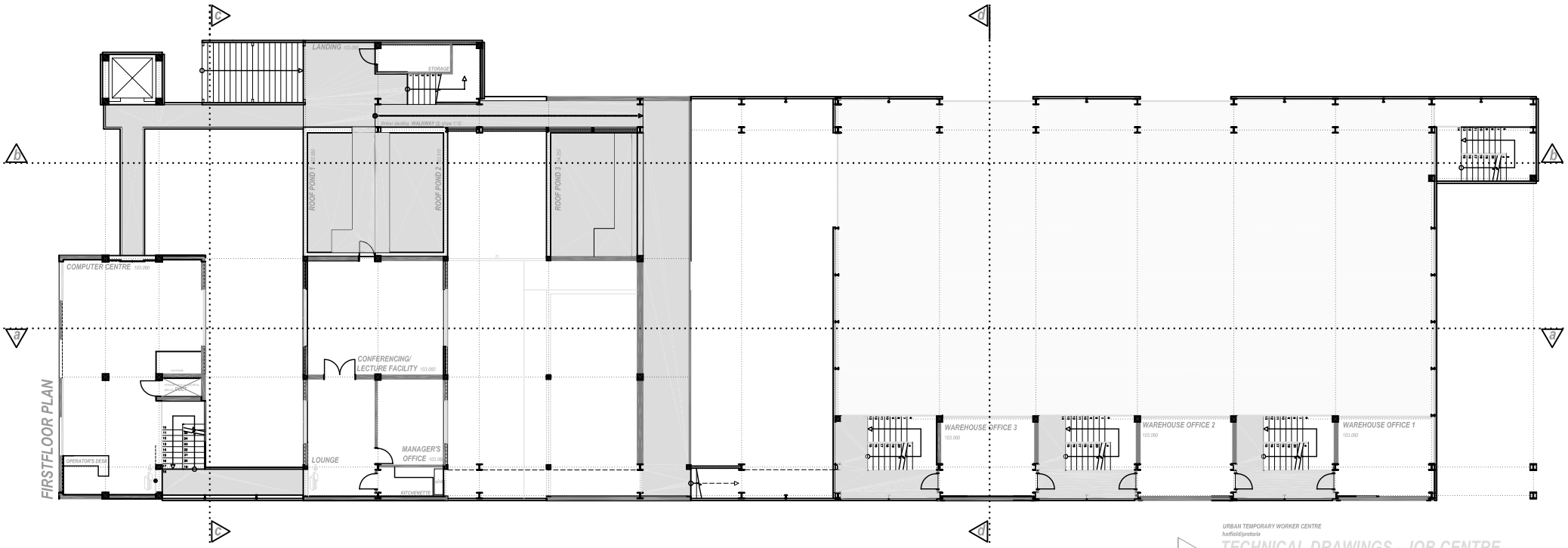


URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

TECHNICAL DRAWINGS - JOB CENTRE

SCALE 1:200

University of Pretoria, etd - Van der Westhuizen, A L (2003)



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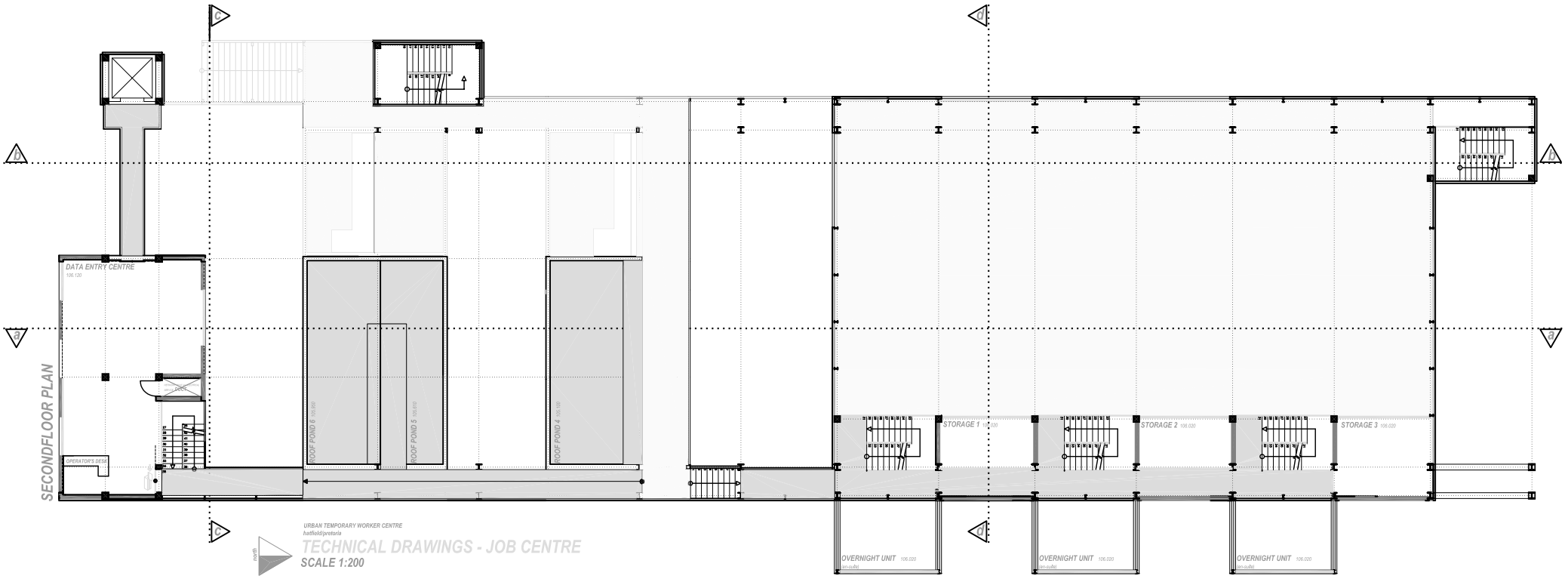
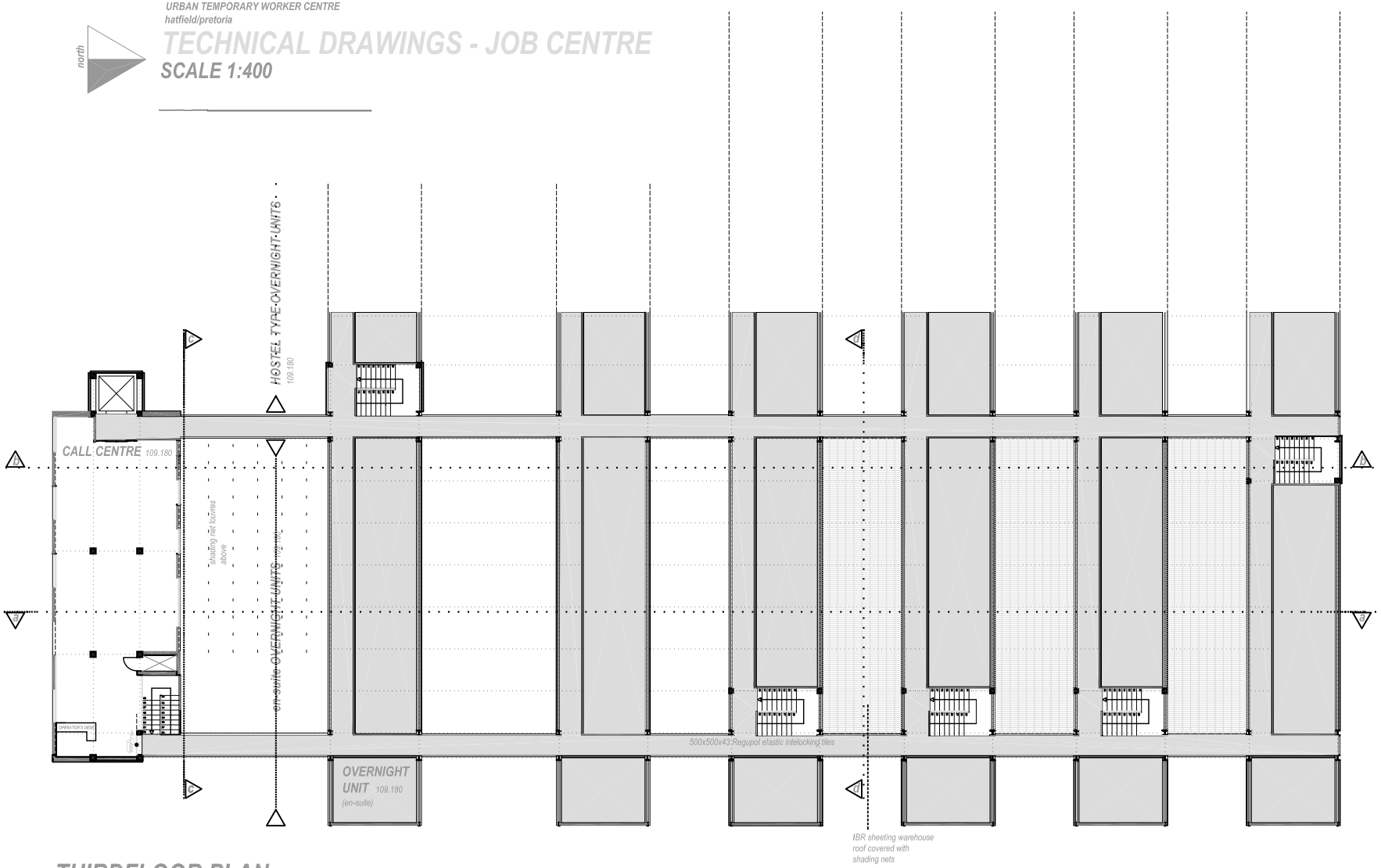


URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

TECHNICAL DRAWINGS - JOB CENTRE

SCALE 1:400

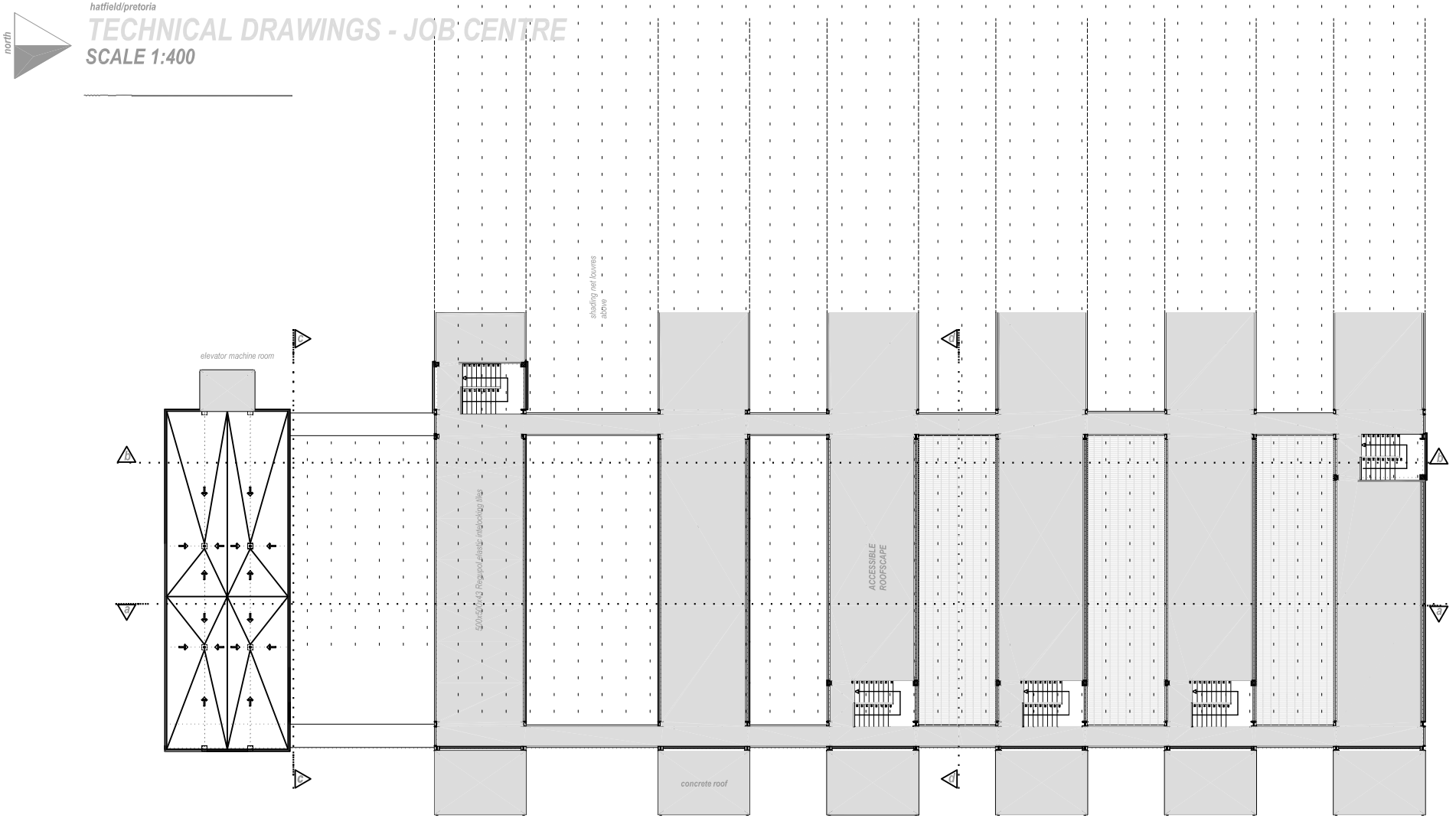


THIRDFLOOR PLAN

URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

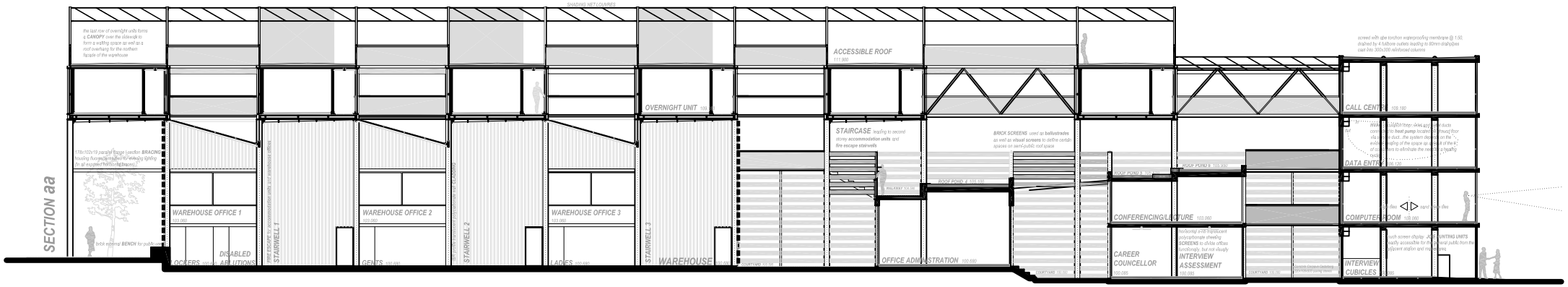
TECHNICAL DRAWINGS - JOB CENTRE

SCALE 1:400



ROOF PLAN

University of Pretoria, etd - Van der Westhuizen, A L (2003)



URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

TECHNICAL DRAWINGS - JOB CENTRE

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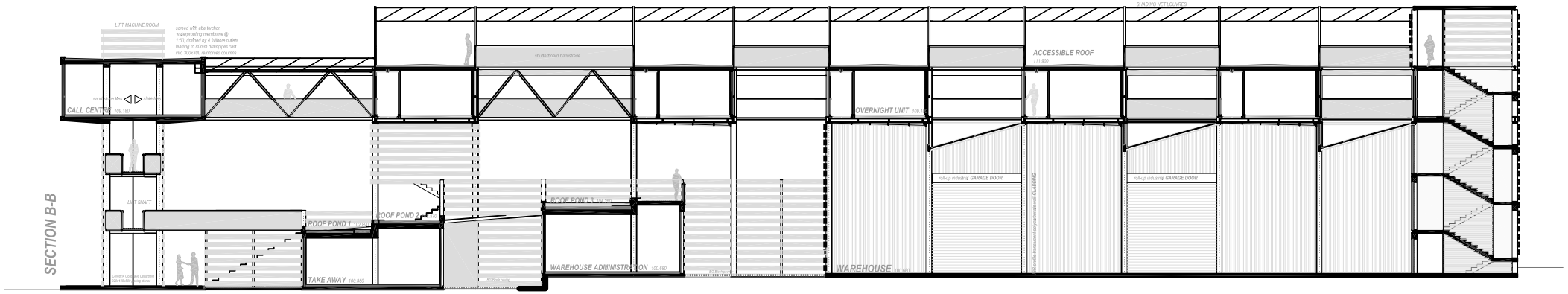

URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

TECHNICAL DRAWINGS - JOB CENTRE

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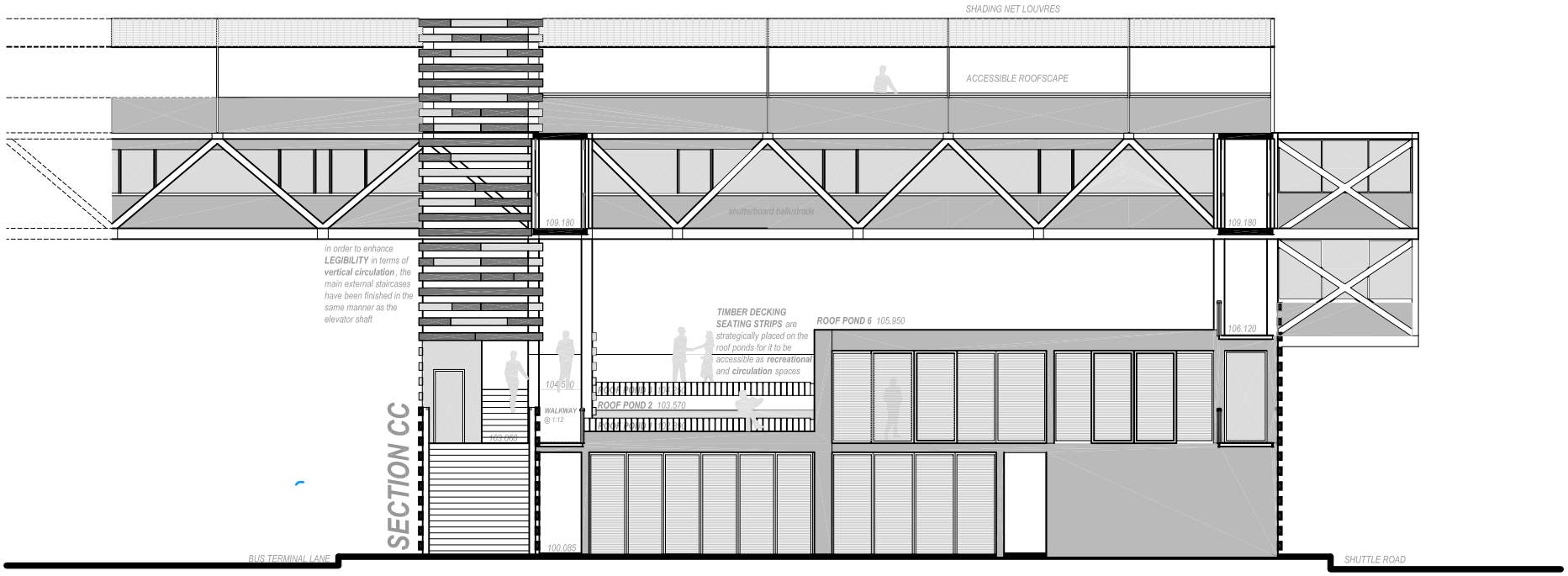

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hatfield/pretoria

TECHNICAL DRAWINGS - JOB CENTRE

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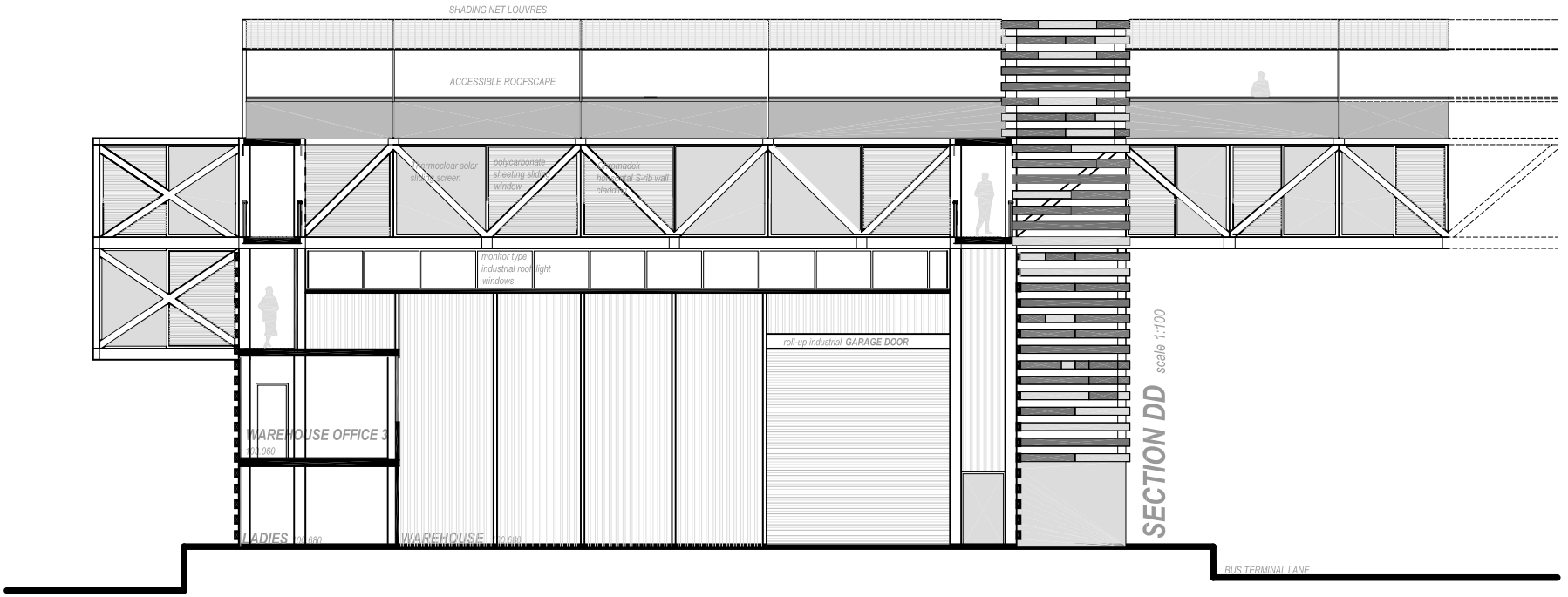

URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

TECHNICAL DRAWINGS - JOB CENTRE

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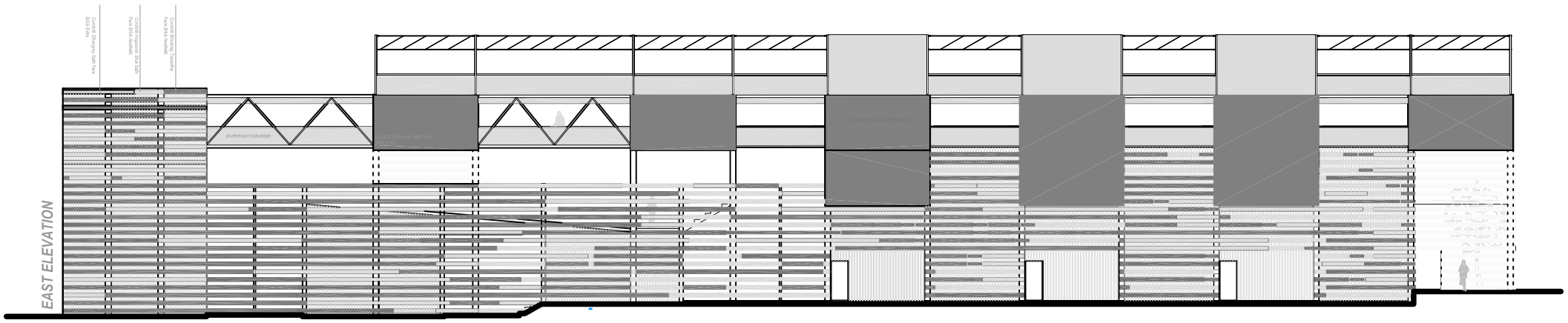


URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

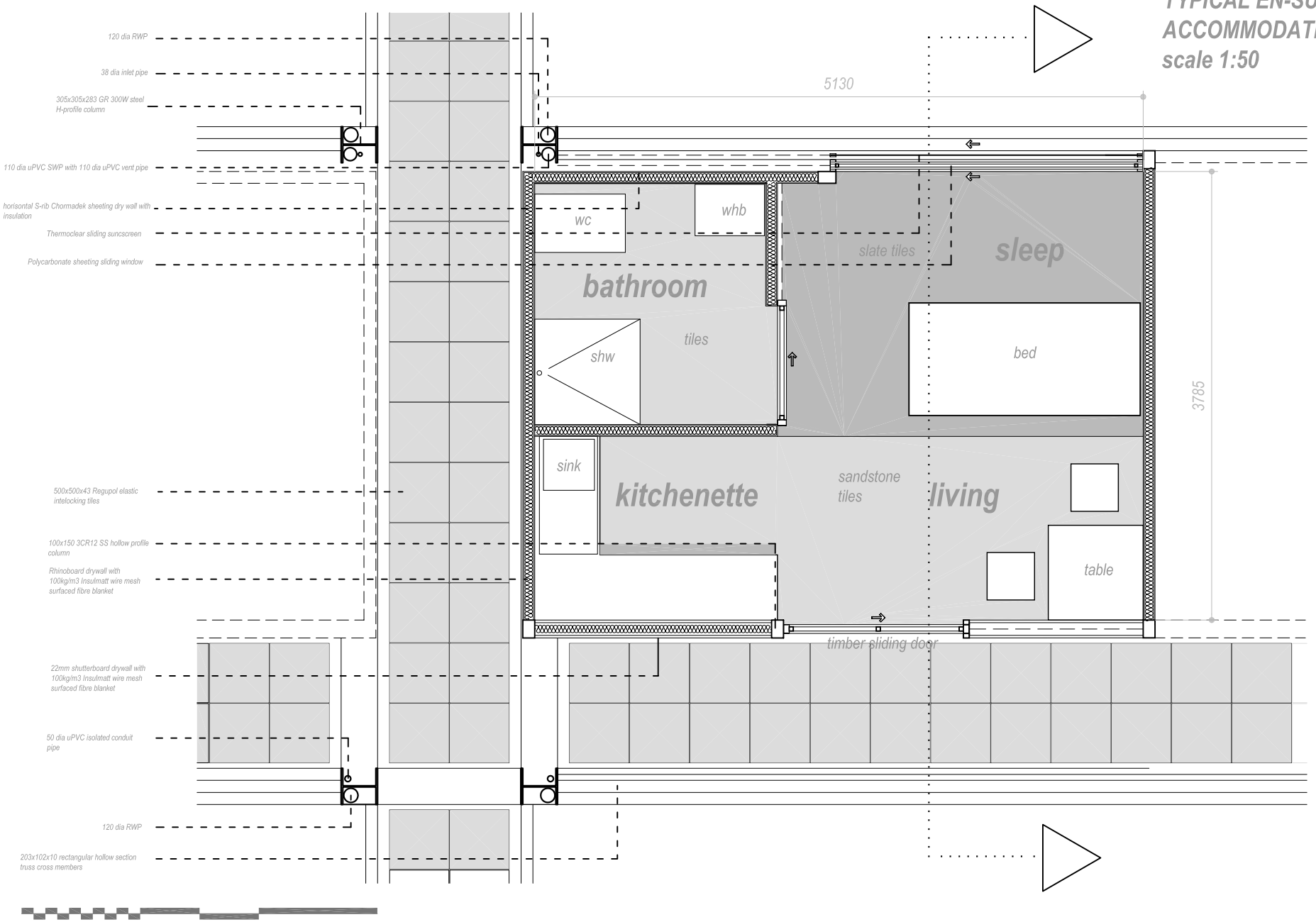
TECHNICAL DRAWINGS - JOB CENTRE

SCALE 1:200

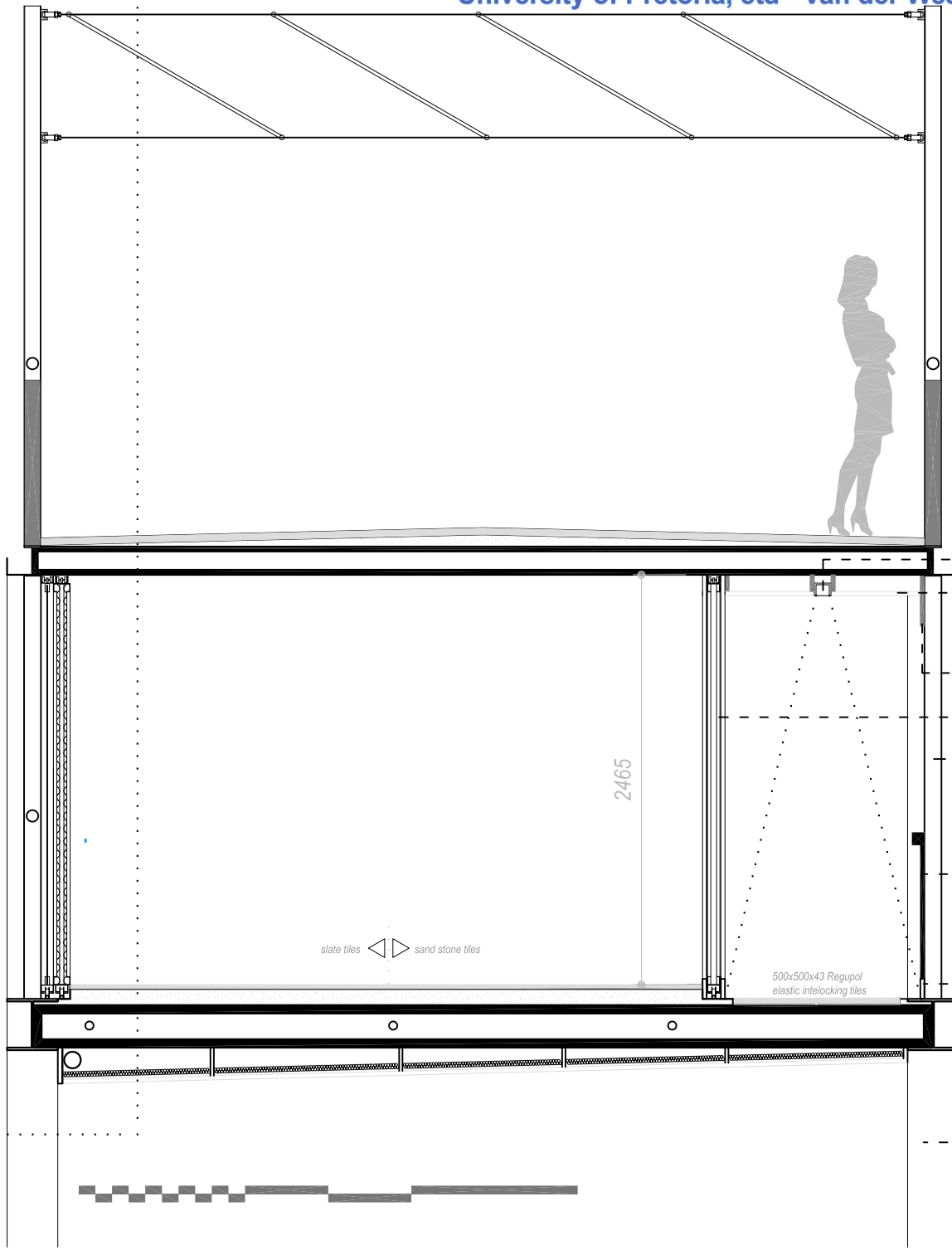
TECHNICAL REPORT - JOB CENTRE

TYPICAL EN-SUITE ACCOMMODATION UNIT

scale 1:50



DETAIL



URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

TECHNICAL REPORT - JOB CENTRE

OVERNIGHT UNIT SECTION

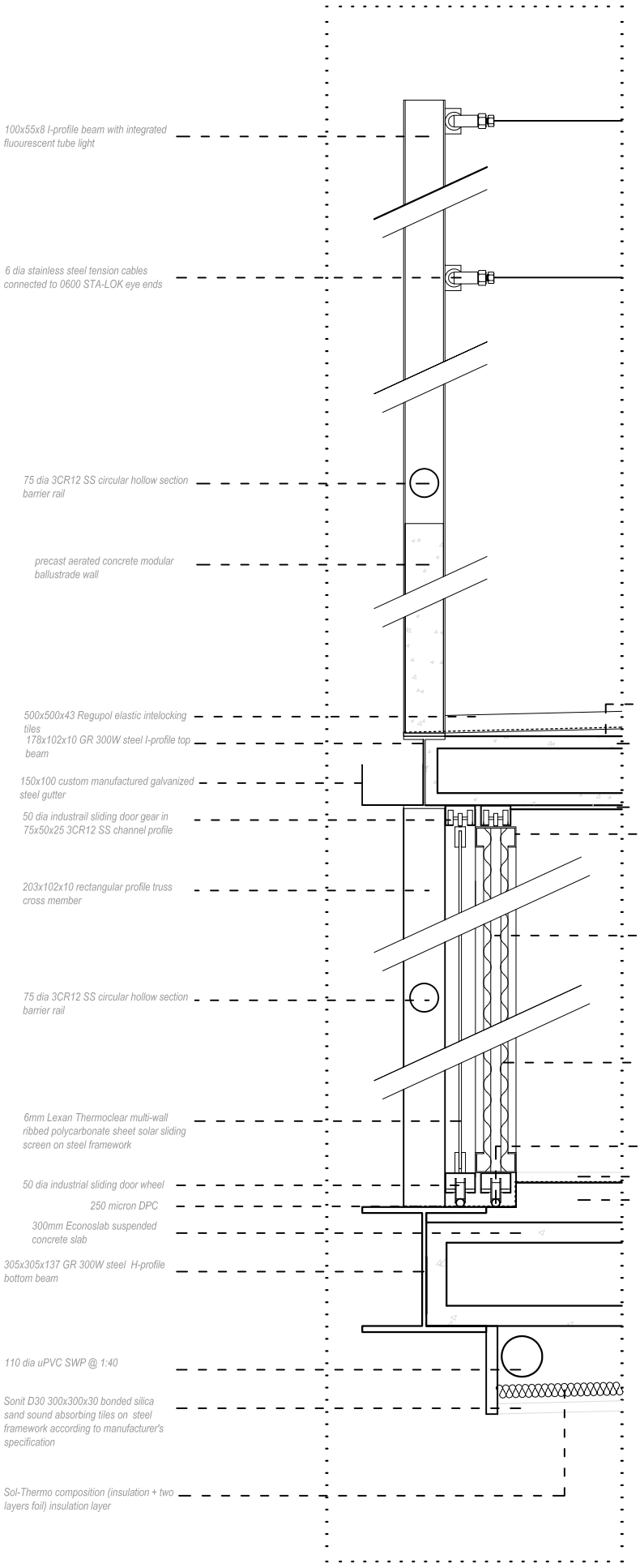
scale 1:50

- *fluourescent tube light*
- *Sonit D30 300x300x30 bonded silica sand sound absorbing tile ceiling on steel framework according to manufacturer's specification*
- *22mm shutterboard weather screen*
- *22mm shutterboard timber sliding door 75x50x25 3CR12 SS frame*
- *203x102x10 rectangular profile truss cross member*
- *22mm shutterboard timber ballustrade with 50x50 hardwood toprail*
- *20x120x4 3CR12 rectangular profile SS skirting*
- *305x305x283 GR 300W steel H-profile column*

URBAN TEMPORARY WORKER CENTRE
hatfield/pretoria

TECHNICAL REPORT - JOB CENTRE

OVERNIGHT UNIT EDGE DETAIL



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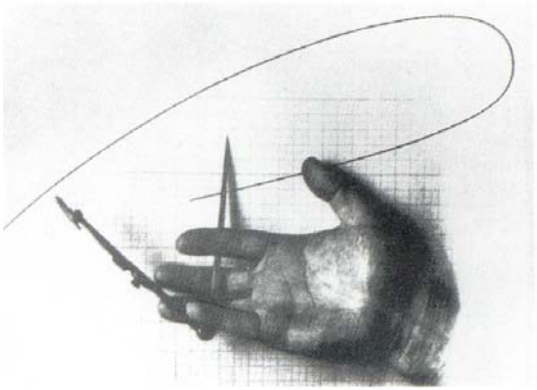


10.1

Design Discourse

10.1__*INTRODUCTION*

The challenge in this thesis was to design a multifunctional centre for temporary workers. This centre had to have integrity, include a bus terminal, host a multitude of functions, without the result looking like a flow diagram. The en d product aims at an end product that is simple and elegant, imbuing trust in both the user and passer-by.

A Rationalist approach was considered in materializing the initial concept, as a result of the unconventional, and in a way groundbreaking, nature of the project. Rationalism provides a philosophy by which the design process can be conducted. As a way of working, it too has the possibility to produce an aesthetic. Rationalism imposes the most severe rules, and yet lyricism remains possible.

The buildin g illustrates a sensibility that is inspired by cubist and constructivist protocols, infused with light modernism. Due to the programme of the building, it is essentially a utilitarian architecture, with the focus on "use", and functionality. This turned out to portray a no -frills architecture, very much linear and cubist. There have been no literal attempts to apply metaphors of nature or culture in a free -form rational dialogue, nor is there the literal exercise of more expressive architecture, as is popu lar at the moment. Instead, it is based on a series of careful principles, inevitably styleless, with a concept bizarre enough to come close to building realism.

Maybe a place of work needs to be pragmatic in nature?

This discourse aims at relating the architecture of this thesis project with work, the act of making, and inevitably the time involved in both these activities. It also elaborates on the decisions taken in terms of form, space and order.

10.2__*WORK*

Hannah Arendt, in *The Human Condition* , divides human activities into three basis activities: labour, work and action. With "work" she refers to the activity of *homo faber* (man, the maker) who creates artifacts with his hands. When speaking of la bour, she refers to the activity of *animal laborons* (man, the labouring animal), who, driven by the needs of the body, only does what is needed to survive.

Arendt goes on to illustrate how the Industrial Revolution, by replacing workmanship with labour, ha s resulted in modern creations becoming products of labour, only to be consumed, instead of products of work, which are there to be used. According to her the artist is the only "*worker* left in a laboring society" (Arendt 1958 : 8).

"Work, and its product, the human artifact, bestows a measure of permanence and durability upon the futility of mortal life, and the fleeting nature of human time." (Arendt 1958 : 8)

"Work" is therefore the act of making something, distinguishing our ancestors as *Homo* from primates. The burden of labour, however, is something we have tried to get rid of, and industrialization, and automation, in a way, has started to do just that. The result of this turn of events, as is currently the case in South Africa, is a so ciety of labourers without labour.

Work requires energy. The amount of energy involved in the making of an artifact should be evident in the detailing when the end product materializes.

A proposal is made that to alleviate the toil and trouble of labour, *workmanship* should be reintroduced in the built environment. "Workmanship" is a degree of skill in performing a task or in the finish of a product made.

10.1 *The Constructor* (1924), El Lissitsky

In response to this theoretical approach, the question is asked: how do one ensure the use of quality finishes and workmanship in the construction of an architectural artifact? The position taken here was to design the building using clean, clear and precise lines. The argument is that it takes more skill and time to create an absolutely level plane than an undulating one. In the construction of the building it will thus be extremely important to maintain level and straight surfaces, thereby "forcing" clean finishes, resulting in an honest architecture with integrity.

"Since the articulation of a form depends to a degree on how its surfaces are defined and meet at corners, how corner conditions are resolved is important to a form's definition and clarity." (Ching, F.D.K 1996 : 96) .

The very linear and angular design provides the opportunity for the quality of workmanship in the finishing of surfaces and corners, to be subjected to extreme challenges. How detail elements feature, such as in the walkway ball ustrades, depends on the articulation of surfaces through flush corners.

For the assembly, an "additive" method was adopted, together with material honesty and clearly expressed structures.

Perhaps it is appropriate that a building, promoting and symboli zing work and workmanship, should be "strong", flexing its structural muscles.

10.3__***MAKE***

If architecture is the art or craft of building, then it might be said to be a dying profession. It is finding itself further and further removed from its traditional home in building. Buildings today are translations of bubble diagrams and stre ss analysis, compiled by computer programs, and renovated almost as soon as they have been finished.

Architecture has become temporary and "cheap", displaying a lack of time and technique.

This problem is not only confined to architecture. Let's compare a masterpiece by Leonardo da Vinci to a painting by Jackson Pollock. In the *Madonna of the Rocks* (begun 1483) by Da Vinci, the time, craft, technique and workmanship involved in the making is evident in the end product. The painting demands respect, and allures the viewer to search for deeper meaning in the painting. Light has been used in the painting to c reate atmosphere, and the artwork is loaded with symbolism. Although Da Vinci's personal spiritual input in the painting is evident, it doesn't dominate. The piece is therefore accessible for interpretation by the general public, and does not only function as decoration.

On the other hand, in the painting *Lucifer* (1947) by Jackson Pollock, it is quite clear that no time was wasted in creating the artwork. Although the “action painting” technique is creative, and certainly unusual, it doesn't take much craft smanship to master it. The end result is a highly personal product, which could only be fully understood by the creator, or people present during the paint process. It is therefore not accessible for interpretation by the general public, and would in some instances only function as an aesthetic element, compelling the viewer for a short time.

10.2

10.3

10.4

The same comparison can be made between contemporary architecture (or "decoration" for all that matters), based on quick assembly and modular systems, and traditional architecture which included workmanship, and quality of construction.

"Can we, in the a bsence of a viable skilled workforce on site, still talk of a building being "crafted"? In the traditional sense, perhaps not, since most building operations in industrialized countries now consist of assembling preformed parts and fragmented systems." (Louw 2002:19)

During evolution it was not only the size of our brains that distinguished us from the primates, but also the use of our hands to manipulate and make artifacts. Every man-made artifact does not exist solely as a result of production, but is also coherent with the process of making. The maker, and the object created, is tied together by an intimate relationship which does not disappear at the conclusion of the production process.

But in architecture, it is not only time and workmanship during t he physical construction of a building that matters. It starts with the initial concept, then goes onto two-dimensional format through drawing, before it finds concrete form in materials and the methods of building. This process draws energy from the creat or whose desire it is to see an idea physically realized, and to see himself reflected by the object.

"In every instance of making where the concern for formal integrity is at stake, we must recognize and operate within a relationship of total inseparabi lity governing material, the tools employed in its transformation, and the labour spent in the process".(Zambonini 1988:8)

Thus, it is not only the physical construction process which have caused the built environment to be in the state it is in at the mo ment. It starts out with the initial conceptual "making" of the building, the actual time taken in drawing the building. Perhaps computer programs are to blame for making it easy for architects to use standardized details and components. Architects have become lazy. The same care should be taken in the conceptual making of the build ing, as during the actual creation. In the design profession today, however, the construction drawings basically marks the limit of the designer's responsibility in the process of making.

Industrialization has promoted the idea of standardized building des ign solutions. Standardization has however not brought significant quality - only higher profit, and the accompanied processes result in limited choice when it comes to components. This is why only in specifying the customized use and transformation of materials by hand that architects have a chance at contributing to building quality.

In this design custom elements form the infill for the structure in the form of manually manufactured dry -walling and sliding screens. Again the idea of labour intensive tec hniques, and creating as many jobs as possible fall in with this line of thought, resulting in a building that does not suffer from the bric -a-brac aesthetic of the "ready-made".

Although unconventional, and in a way seemingly impractical, the labour intensive techniques, such as the brick screen system, is in direct response to the this theory of workmanship. It requires the involvement of the creator in the making of the building.

Maybe we need to be nostalgic again for the simple era of the master builder.

Man can only know what he makes himself.

10.2 Leonardo da Vinci. *Madonna of the Rocks*. Begun 1483. Oil on panel.
10.3 Jackson Pollock at work in his studio, 1950.
10.4 Jackson Pollock. *Lucifer*. 1947. Oil, enamel, and aluminum paint on canvas.

10.4__***TIME***

Speed and information has become synonymous with the architectural trade, and hardly anyone makes anything anymore. While architects deal in information, and don't actually “make” anything either, the architect's entire purpose and meaning depen ds on fabrication/building. The vast majority of what passes for architecture today is merely building. Building processes have become significantly quicker, but the speed and volume of information surrounding architectural projects have multiplied, slowing the implementation of projects down. Architects need to work with and manipulate materials, not information.

After Modernism's attempt to recreate the world from scratch, we have rediscovered in recent decades that roots in the past are vital. On the oth er hand, the sense of being part of our times remains equally important if one is to feel fully alive. A balance will have to be maintained between these two aspects.

To prevent the "coldness" of technology, craft, and the time associated with it, should be just as important as science, especially in giving soul to technology. A project has to grow, to mature and take its time, to attain a more "permanent" character.

Perhaps the concept of "total design" best profiles this idea of permanence. Total design suggests the interaction between the building as architecture, and as exhibition, between permanence, and architecture's own impermanence.

Speed frequently undermines what we hold precious, and what it is intended to overcome: time. Today's world, with it emphasis on efficiency, change and speed, does not really create the necessary conditions for making architecture.

As a response to time, the building’s skin is literally a filter that blurs the seam between the fast and harsh exterior constituting of roads, and the deliberately "slow" interior space, that remains still within the fast flows of traffic and capital surrounding it. Once you step into the implied boundaries of this skin, time is decelerated, implied by tranquil spaces creating a habitable atmosphere in a normally uninhabitable space.

It is ironic that the building's skin and linear arrangements of elements is anything but slow. The skin creates an optical illusion of speed, gained by the "slippage effect" as a result of lines with differential shades of darkness, as well as sliding windows and screens.

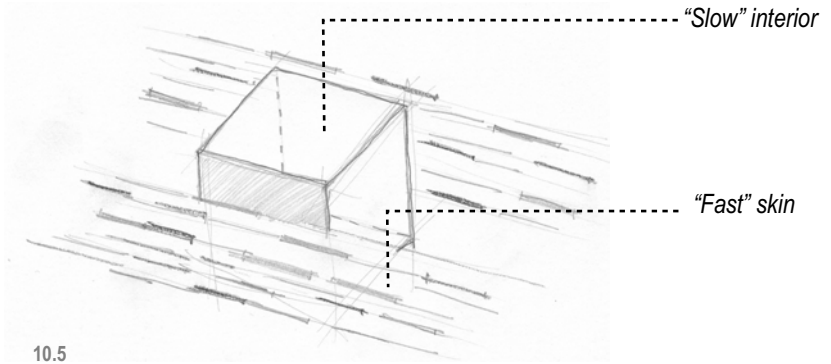
The materials specified are an important theme regarding time.

With respect to maintenance, an object is never totally finished; it requires adjustment in time, through use, and it should be worn in order for it to reveal the inner qualities of its material components. The timber used in the building will require maintenance, but it is through this process that it acquires character, as a resul t of manipulation by hand.

The stainless steel specified also contributes to this argument by oxidizing to a certain point over time, leaving a matt gray finish, with a unique character.

More time would inevitably be involved in the making and construction of this architectural artifact due to custom detailing and manual manufacturing, adding to an image of permanence.

Finally, when dealing with time, architecture does not move at speed, architecture is slow.



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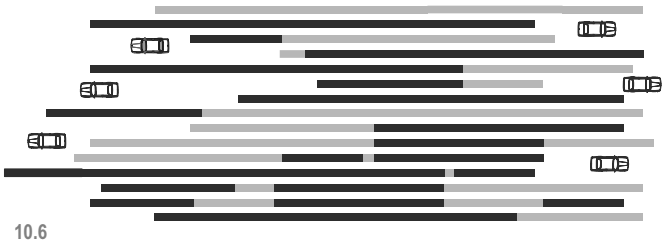

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10.5__***FORM***

The current polemic between the use of orthogonal forms in the generation of prismatic architecture, and the use of more complex geometries to generate seamless flowing forms, has reached a point of stasis, which can be summed up in the terms known as "the box versus the blob".

Many designers of "blobs", seem to be unable to derive sufficient inspiration from human life, and are therefore looking towards indeterminacy, fractal geometry etc. They seem to find special relevance in mathematical, rat her than environmental, sociological, humanistic or programmatic concepts. These forms rarely convince as portraying qualities of architecture, instead, they seem too often to be a substitute for quality.

Simpler forms, in today's architectural discourse, are too often equated with a minimal approach to the concept of architectural experience. This project demonstrates that simple forms not only have their own experiential pleasures, and that not all architectural experience is necessarily visual. Sensualit y can also be defined in terms that are disciplined, restrained, and calculated, rather than, as is so often the case, the opposite.

The formal theme, which dominates in the project, is the need to express resistance to gravity and transcend earthbound fo rces. This aspect is clear in the way in which the overhead structure spans immense distances (30m and 18m respectively between columns), and the seemingly weightlessness of the overhead shading net louvre system "floating" over the complex. The building's skin, consisting of mass brick lintel screens, seemingly suspended in space, seems to escape gravity: the vertical support structure has been hidden from the outside.

The building is characterized by parallel linear elements finding form in rectangular solids. This is a direct response to the shape of the site, as well as east -west arrangements to regulate sunlight as efficiently as possible.

A linear form can be used to express progression or movement (Ching 1979:76) . The main part of the project forms a linear island between two dynamic parallel road servitudes. In this context, where the movement of people and especially vehicles form the immediate environment, linea r elements have been used to complement this image of progression through space. On the eastern façade, for instance, the repetition of elements contributes to linear growth in the line of travel for the shuttle buses.

The sliding floor -to-ceiling openings and wall-panels create a sense of movement and the effect of slippage. On a metaphysical level this, together with the linear arrangements, invokes a subtle analogy with the idea of a train crossing a bridge, and the shape of passing coaches, to introduce a romantic aspect traditionally associated with stations.

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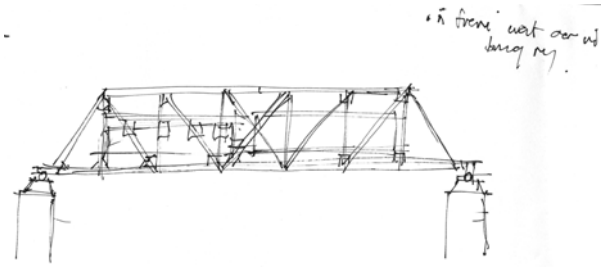

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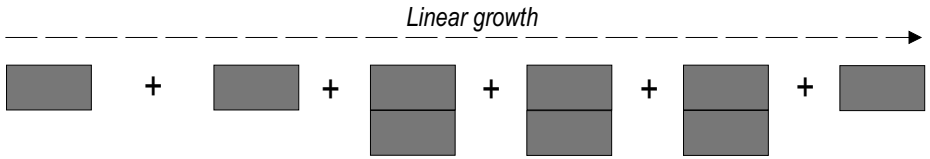

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10.5 Internal-external relationship through the building's skin.
10.6 Illusion of movement on the building's skin created using different toned strips.
10.7 "Box" versus "Blob".
10.8 Analogy made with a train crossing a bridge.
10.9 Repetition of elements resulting in linear growth.

10.6__*SPACE*

The building aims at creating space that somehow gives our world back to us in a form that is strong and enigmatic enough to withstand the withering questions of economics, function or even explanation to which any cultural production is curren tly subjected. This aspect battles against the “temporary” architecture surrounding the development. The building is therefore imbued with *gravitas.*

The multi-functional use of building components to create space can be seen as the overriding factor in the technical design approach. The approach was simple: when something was used/constructed, what else could it be used for? This aspect reduces redundancy, giving integrity to every element.

The clearest example of an application of this approach is the bric k screen system. It not only serves to filter and diffuse sunlight, but also plays a structural role as bracing, while acting as visual screens to define spaces.

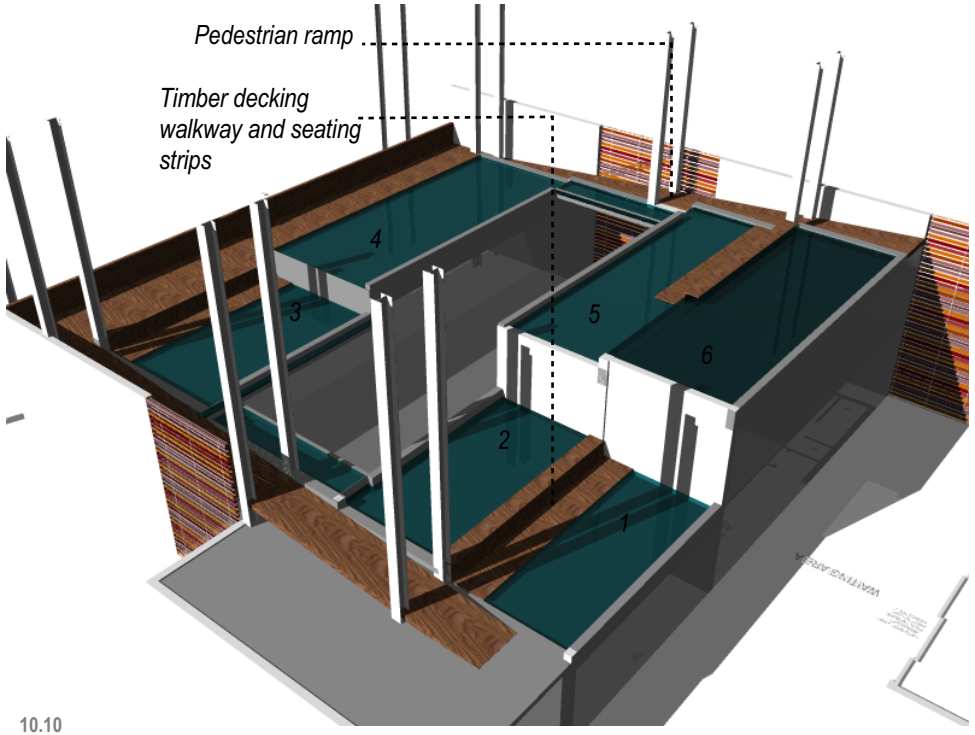
The overnight accommodation units not only serve as habitable spaces, but also contribute to passive security, while defining the overhead plane (or ceiling) for the bus terminal. Furthermore, in filtering sunlight, collaboration with the louvre system ensures maximum penetration of sunlight during winter, and minimal direct sunlight in summer.

In terms of space, the feasibility of accessible roofscapes lies in the theory that while a roof has to be constructed, it might have more than just the function of blocking the elements. With this in mind, the roofs of office blocks one and two, were made accessible, and to ensure usability of this as an exterior social space, it had to serve not only as a visual element from above, but also as a pleasant space to relax by.

The use of water ponds was based on the downstream directional flow of water, thus following the contours of the 1:12 sloped pedestrian walkway linking the two storeys.

The roofs form six ponds at different levels, each provided with an overflow to the ne xt, and made accessible with timber decking strips for seating/walking. To maintain the clean line promoted by the walkway bordering this space, the use of balustrades were avoided to emphasize the parallel horizontal planes formed by the ponds. The water, 170mm deep, serves as an implied protective barrier.

Multi-functionality is also evident in the roof, a concrete construction to ensure sufficient stiffness between the steel trusses, and to maximize thermal massing, of the overnight accommodation units. By allowing access, the concrete slab obtains another function, now being used as an exterior social space for the occupants, and a utilitarian space for washing/drying of clothes.



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Light, and the effect of it has been extensively explored to define spaces.

"Place changes with the movement of people, space changes with the movement of the sun." - (Von Meiss 1991 : 134)

Horizontal filters for sunlight, on the vertical planes as brick screens, horizontally as louvres and overhead structures, forms the exterior boundaries. These filters cast shadow strips of varying degree and angle across the whole development, enhancing the feeling of movement when traversing these spaces.

Unlike conventional architecture, therefore, the skin, and consequently the appearance of the building, is constantly transformed, minute-by-minute, as sunlight and seasons change.

The thin spaces between each horizontal brick lintel allow the background - the bus terminal on one side and the shuttle road on the other, for example - to be seen as part of the "picture plane" of the screen in the foreground.

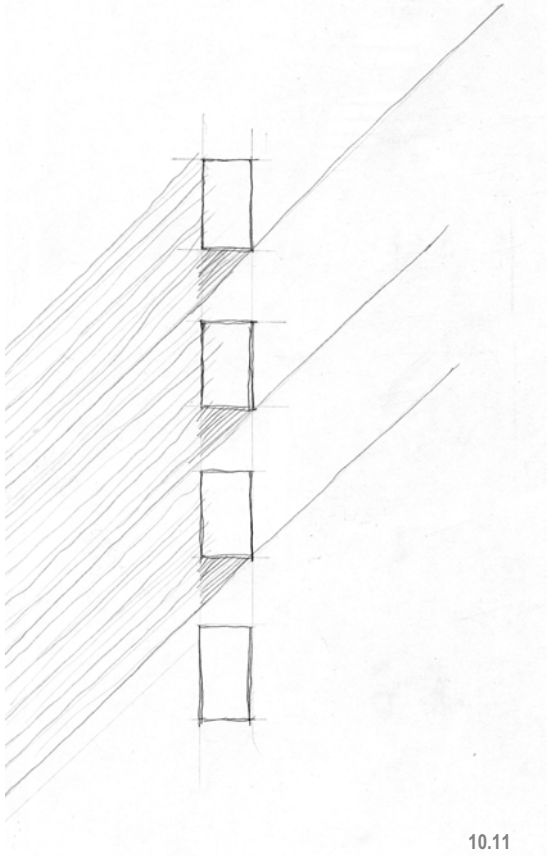
When entering the bus terminal, the overhead plane forms "veils" of different intensities, layered over each other, casting shadows of varying density and gradually increasing the sense of enclosure.

An interesting approach was taken on the walls of the warehouse, using translucent polycarbonate sheeting as wall cladding, allowing the creation of special light effects. This is unconventional, for thermal and security reasons. The solution was to apply a layer of brick screens on the outside, filtering the sunlight, as well as providing a protective barrier. But it is at night that this feature fully comes to its right by emanating horizontal strips of light, illuminating the adjacent spaces such as the bus terminal.

The focus on the establishment of external social space is quite clear. The goal was to filter out the natural elements to create a mixed sense of being "protected", while being outside. The vertical planes of all the interior volumes open into these exterior spaces, making full use of its location in a pleasant microclimate.

The exterior volume covering the three office blocks was designed to enhance a feeling of solidity, permanence and calm. An understated palette of natural materials, muted tones and a continuity of materials and finishes emphasize this. The blue tones in the different coloured bricks, in collaboration with the roof ponds and planting, provides a feeling of tranquility, in contrast with the warmth of timber, used to soften exposed steel.

The crossover between the public and semi-public spaces is gradual and implied, rather than forced, the entrance being an example of this. The complex, with its 24-hour activity, allows for passive surveillance and improved security. Many of the spaces are semi-private, the more private spaces being secured by means of card-operated sliding doors.



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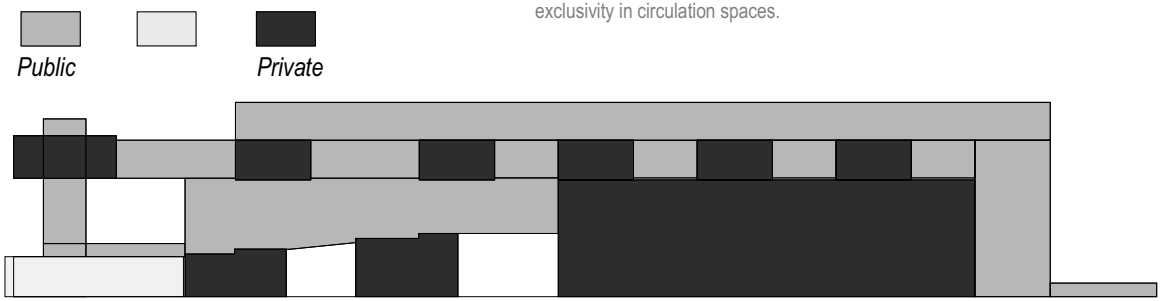
10.10 Conceptual perspective of office roofscape with overhead structure taken off.
10.11 Diffusion of light by screens.
10.12 Diagrammatic section indicating degrees of exclusivity in circulation spaces.



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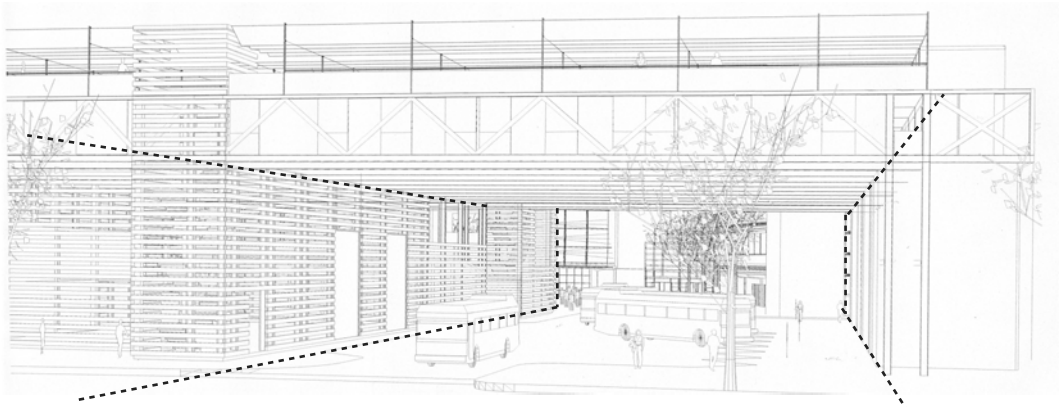
The building responds to the Gautrain Station spatially by ensuring that the traditional expanse of space associated with public transport facilities are to be carried through. The result is one large volume starting at the arrival platform of the station and terminating in Schoeman Street. The close spacing of repetitive elements can produce a barely perceptible optical flicker. Here the repetition of the overhead structure optically forms a ceiling, defining an overhead plane for this large volume.

The ad jacent historic Hatfield Primary school building was respected through a recess of the northern line on ground floor to meet up with the north façade of the conserved building. The northernmost accommodation strip forms an implied ceiling for this streetsc ape, seemingly trying to "touch" and protect the old building by means of a cantilevered overhang.

This canopy, formed by the overhead structure, not only controls direct sunlight to the warehouse, but also creates an interesting urban streetscape, working together with the existing lane of trees to form an enclosed space for pedestrians. A concrete bench aligns this wall to form a resting place for pedestrians.



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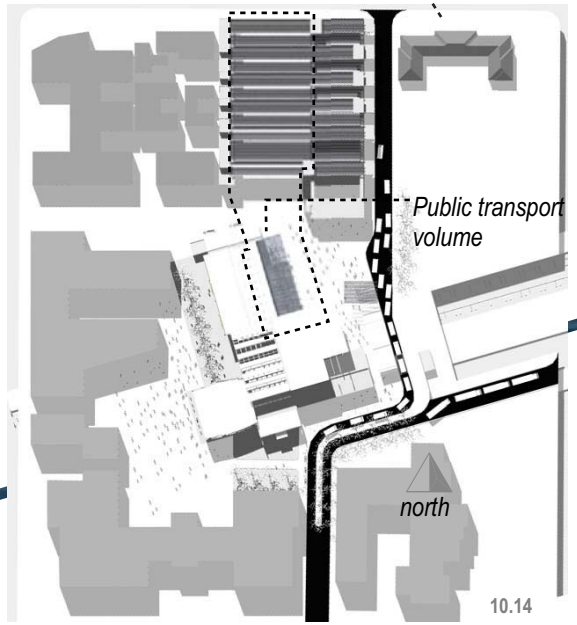

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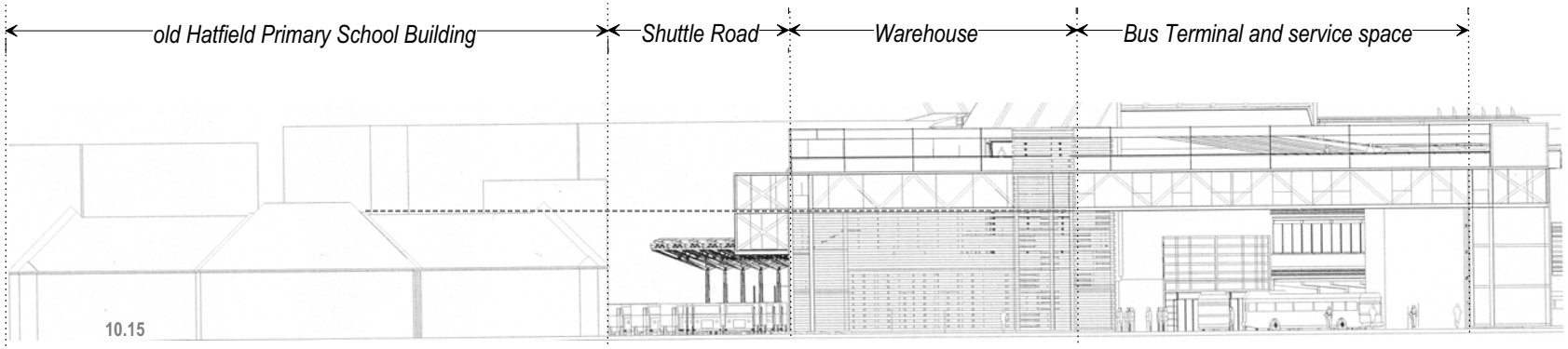
10.13 Approach to Bus Terminal and Gautrain Station area from Schoeman street. Note the overhead plane forming a celing.
10.14 Main public transportation volume.
10.15 Relationship to other buildings on north elevation.
ORDER
10.16 Regulating lines on southern façade.
10.17 Regulating lines on northern façade.
10.18 Regulating lines and rhythm on eastern façade.



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10.7__***ORDER***

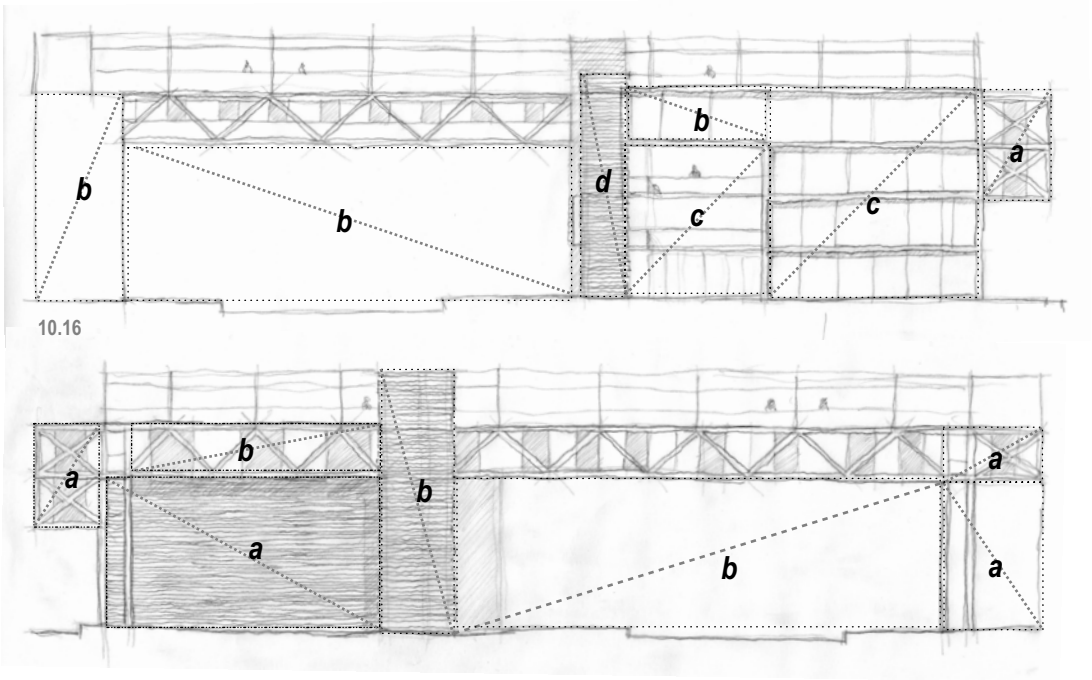
The study of a building's elevation is in part autonomous of constructional rationality. Formal elevation studies in terms of ordering and proportions of elements seem to have disappeared in contemporary architecture. Without attempting a neo - Classisist revival, the façades have been designed to display a degree of order. The generator behind the ordering, as opposed to established ordering systems such as the Modulor by Le Corbusier, was the building's reaction to the sun.

If the diagonals of t wo rectangles are either parallel or perpendicular to each other, they indicate that the two rectangles have similar proportions. These diagonals, as well as the lines aligning elements with one another, are called regulating lines. (Ching, 1996 : 304) . Le Corbusier, in *Towards a New Architecture*, stated the following:

"A regulating line is an assurance against capriciousness, it is a means of verification which can ratify all work created in a fervour… It confers on the work the quality of rhythm. The reg ulating line brings in this tangible form of mathematics which give reassuring perception of order. The choice of a regulating line fixes the fundamental geometry of the work… It is a means to an end, it is not a recipe."

As can be seen in the accompanying façade studies, regulating lines are used to analyze the façade; to such an extent that each façade comprise a very limited amount of differently proportioned rectangles, indicating a level of order.

A certain rhythm, determined by solar penetration, has evolved on the eastern façade through the repetition of elements.



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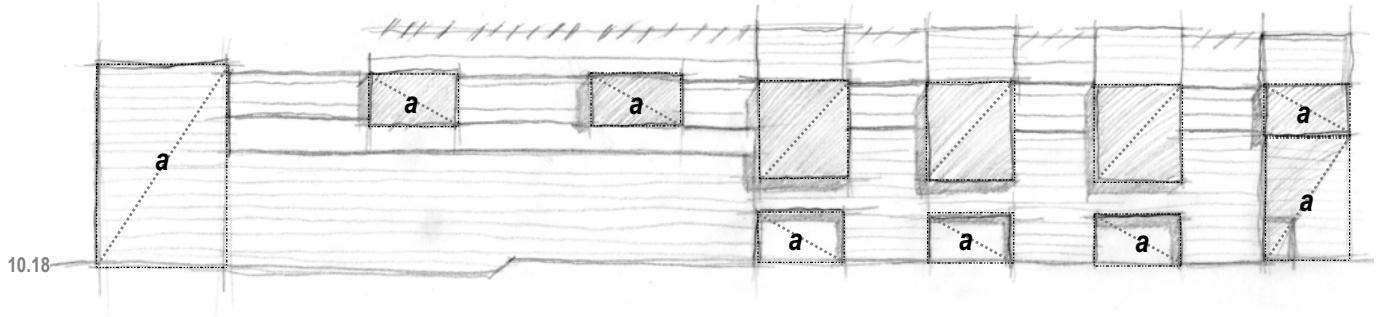

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The brick screen system has been used to attain "uniformity" on façade, battling to generate an elegant appearance while having to accommodate a multitude of functions. On the other hand, alternatively shaded stripes are used to achieve texture.

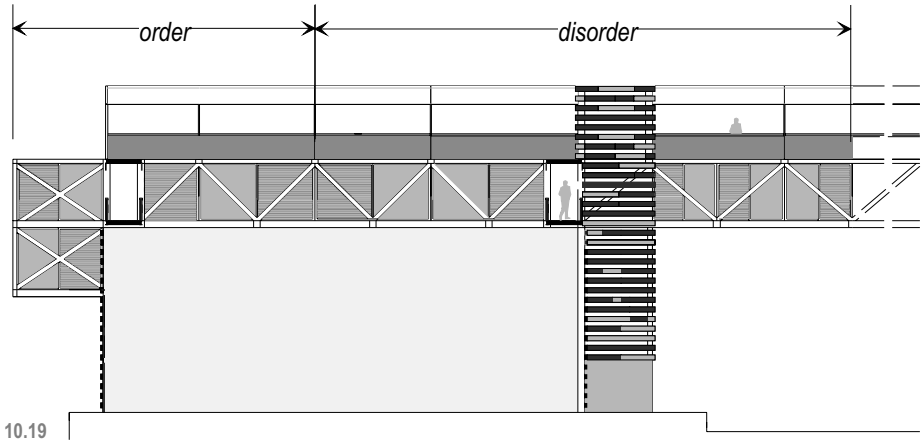
The breaking of order has however also been used to relieve the building of too much formality through the use of sliding screens and its implication on façade.

The approach to the building, and how the passer-by experiences the building, played a decisive role in the ordering of elements. These approaches were carefully designed to ensure legibility, on the one hand, and curiosity on behalf of the observer, on the other.

For a point or node on plan to be emphasized, it needs to be projected in space. All major vertical transportation structures (stairs/lift) were seen as nodes, and have been treated similarly to enhance legibility when moving through the development. Here, hierarchy was introduced as another ordering element to increase this legibility. By allowing these structures to step out of the building grid, their importance in the overall scheme is announced.

The lift shaft forms a vertical datum line, handled like a tower, extending above the building to proclaim its nodal identity. It not only serves as a functional element linking all levels, but also forms a visual reference point, visible from many locations.

At the main entrance, the openness, with pleasant interaction between the different levels, complimented by quality finishes, creates an airy, inviting ambience.



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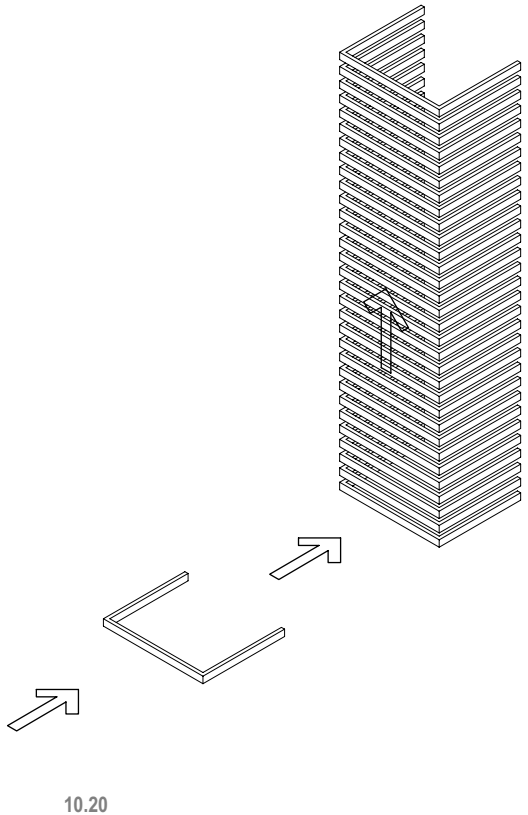

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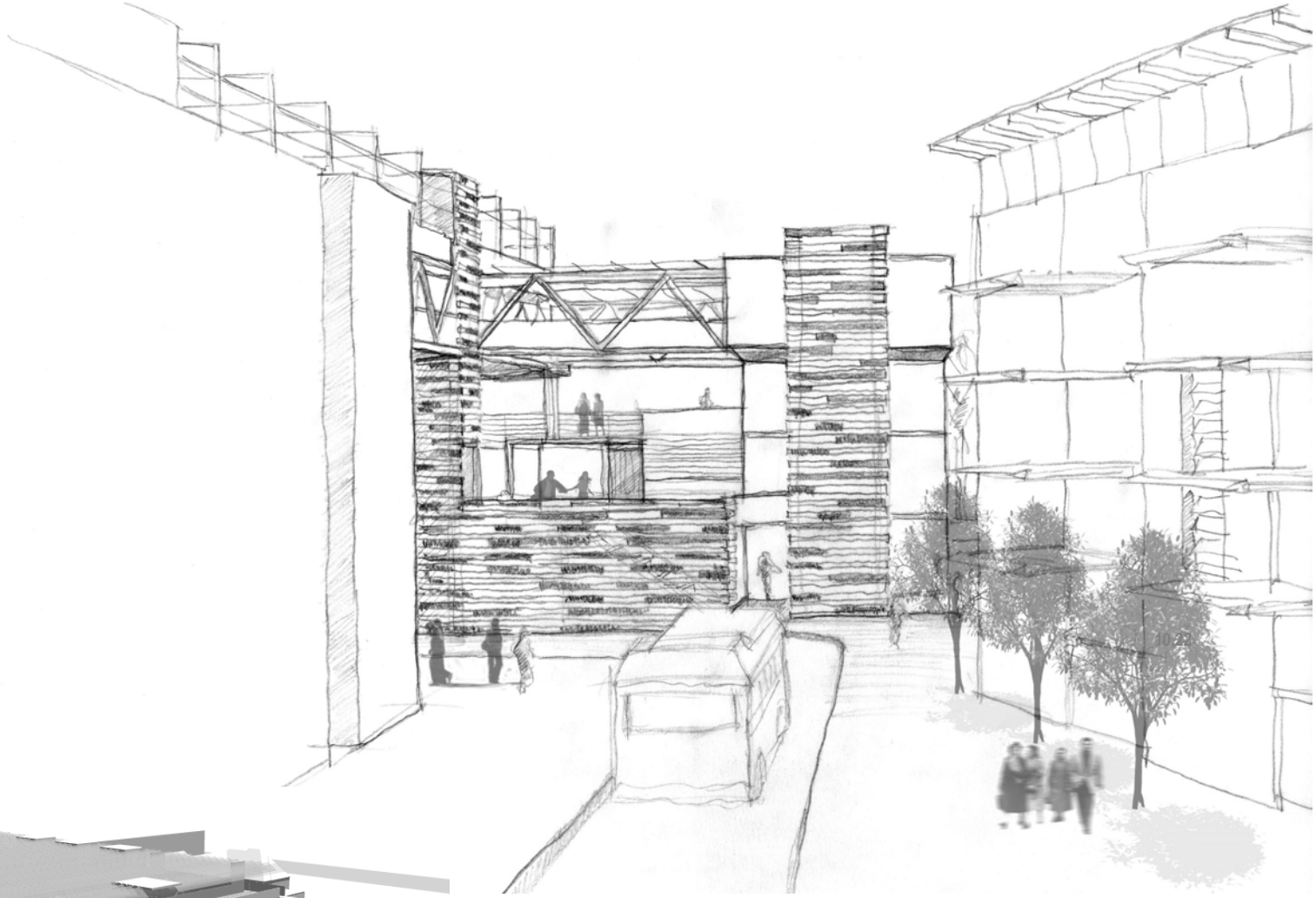

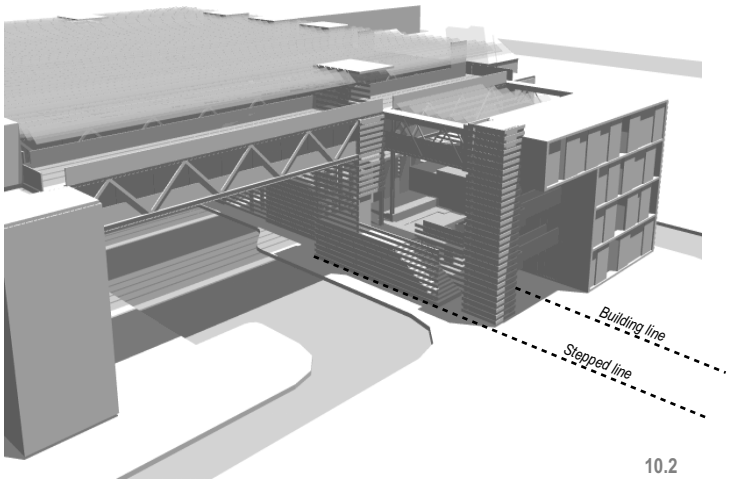

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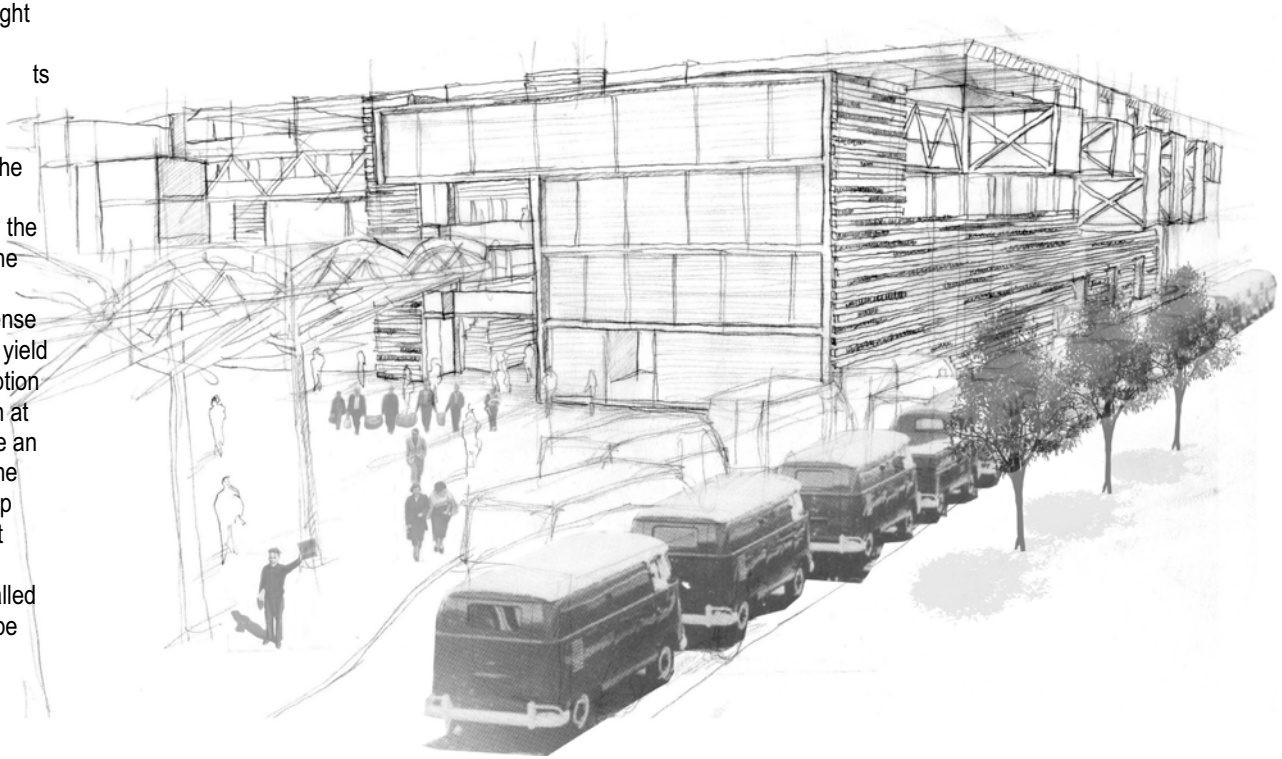
10.19 Breaking of order on façade due to sliding screens.
10.20 Transformation of a node on plan to a legible vertical element in space.
10.21 Entrance emphasized by stepping out of building line.
10.22 Western approach from School Lane. Note the legibility evident in the use of vertical transportation structures as focal points.

The French philosopher, Montaigne, examined a complicated relationship between Poppaea, a courtesan in Roman times, and her many admirers. Poppaea hid her beauty behind a mask to make her more precious to her lovers. This technique was used in response to the brief, requiring the building to be a showroom for work. Immediately a connotation can be made with the surrounding motorcar showrooms with their glamorous curtain walls and light aluminum frames used to enhance the transparency of the façade to make i ts contents as visible as possible.

The approach in this project however was the opposite. By making the façades partially translucent, using translucent polycarbonate sheeting and the brick screen system, only glimpses of the interior are visible.

Thus, t he building achieves intense attraction precisely because it does not yield itself completely to instant visual absorption by the viewer. While other buildings aim at an absolute transparency that constitute an objective part of view emanating from the viewer, this design sets up a relationship between the viewer and the viewed that requires attentiveness.

In some way it could even be called interactive, requiring two presences to be fully experienced.



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CONCLUSION

Time, and the manipulation of materials by hand, through workmanship, needs to form part of the making process in order to produce architecture with integrity.

I take Dr. Hentie Louw's stance on this matter in his lecture on *Architecture & craft: a working relationship?*:

"I have done so on the philosophical premise that quality in the man -made environment to a large extent depends on what is called *workmanship*, a concept related to but less "aesthetically charged" than craft." (Louw, H. 2002 :2 0)

10.23 The hidden fascinates.
10.24 Southwestern approach from shuttle road. Note the progression indicated by the tones of the brick screens as well as the staggering of the cantilevering overnight units. The southern façade of the main computer rooms also contribute to this idea of movement through the "slippage" effect as a result of irregular intervals between sliding screens.
10.25 Southern approach from the arrival platform of the Gautrain station towards entrance of Job Centre. Note the continuation of public transportation space from the station to the bus terminal space.

10.25

11

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