

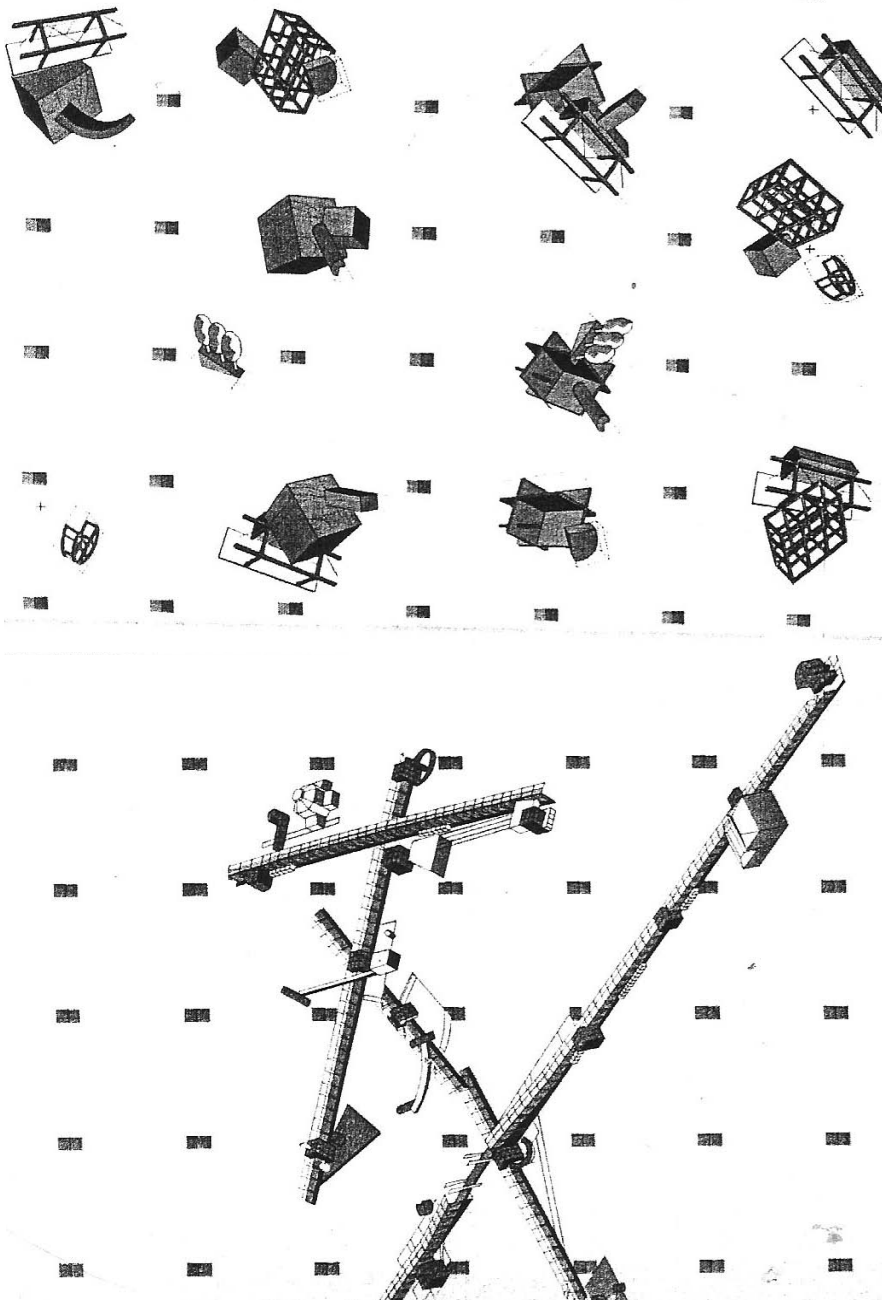
# CHAPTER FOUR

## EXPLORATION

This chapter serves to investigate the manifestation of an architectural response, to the theoretical and contextual informants explored within the previous chapters. First a creative process is explored in order to generate physical possibilities for the site, thereafter a brief design manifesto is established, which intends to strengthen the architectural approach toward the production facility and its materialisation within an urban setting.

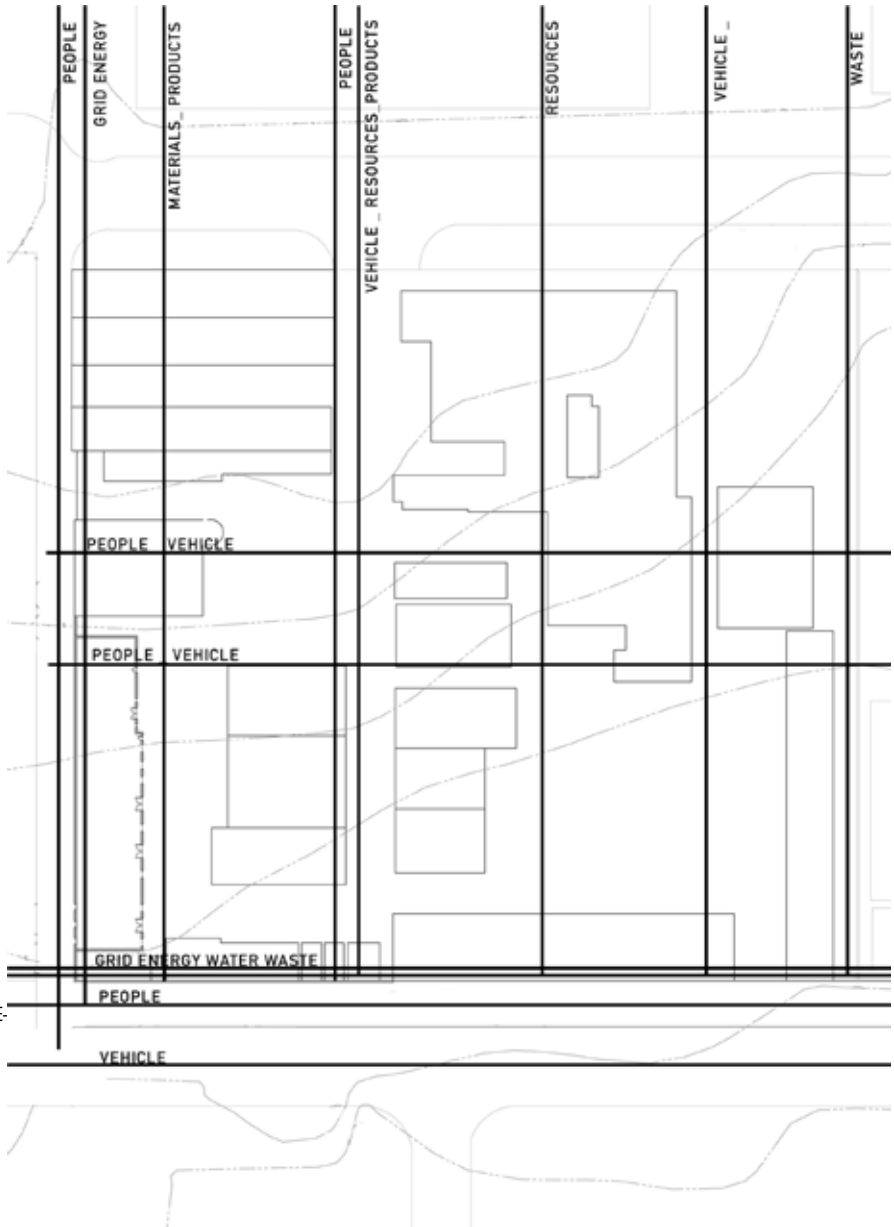
Due to the subjective nature of understanding environmental energies and idiosyncrasies, the representation of the site exists as an interpretation, a personal or collective response to a set of flows experienced. This map becomes the new real as described by Richter, an intuitive representation that serves to create graphic traces of conflicts or contradictions through the act of spatial layering. (Dagmar, 2001:16).

Here at the government workshops, the site is mapped in a variety of ways in order to generate an intuitive map of the possibilities that could begin to generate on site. Firstly, the mapping exercise is based on existing phenomena; secondly, on processes that will occur within a generic place of production and thirdly on how these processes could start to contribute both spatially and programmatically, to the surrounding urban context.



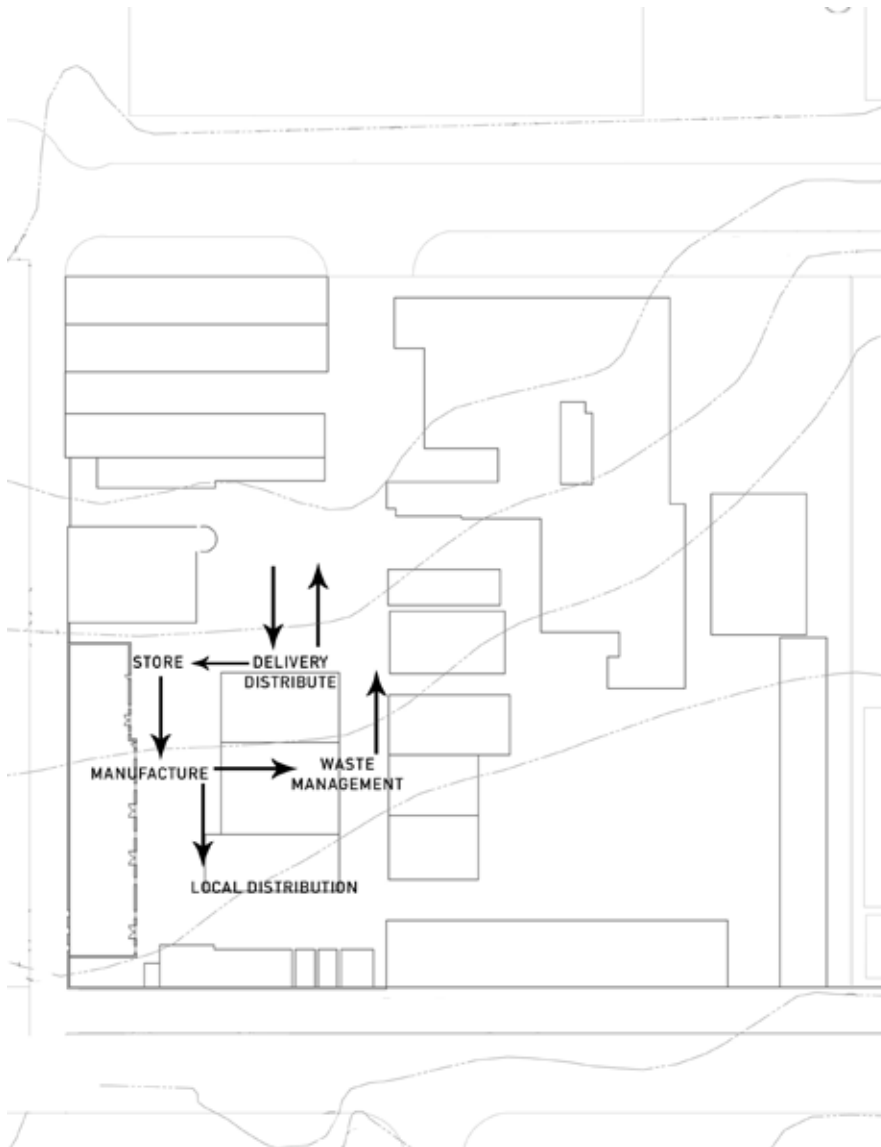
49. MAPPING USED AS A GENERATOR IN PARK DE LA VILLETTE (TCHUMI, 1985).

“ Map projections enters art in the form of process, involving the pleasures of doing - shaping, transforming , spliting , erasing , and the excitement of the search, the analysis, the discovery” (Denes ,1992:84)



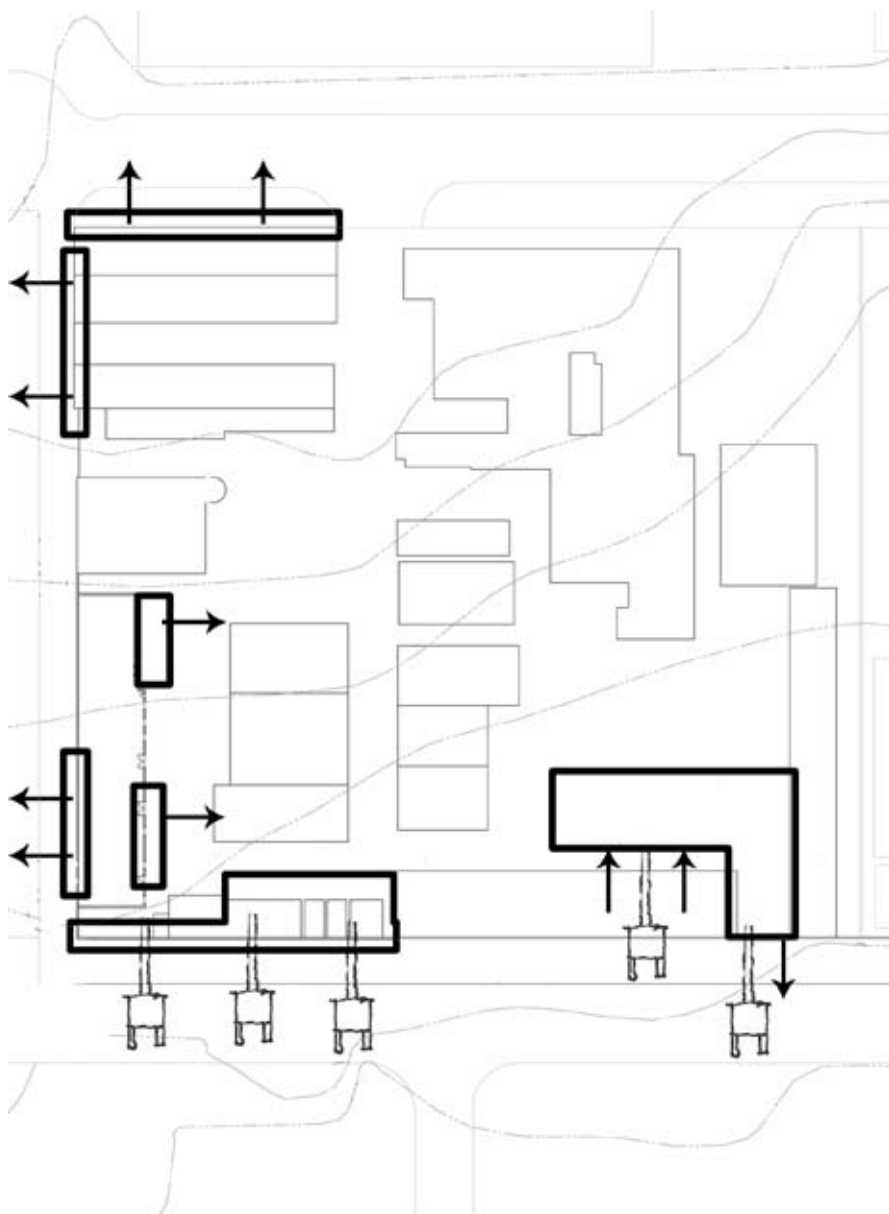
50. EXISTING SITE AND RESOURCE PATHS (AUTHOR, 2010).

The first map looks at the existing site and its lines of consumption such as energy, water and resources, as well as the movement routes of people and vehicles within and around the site.



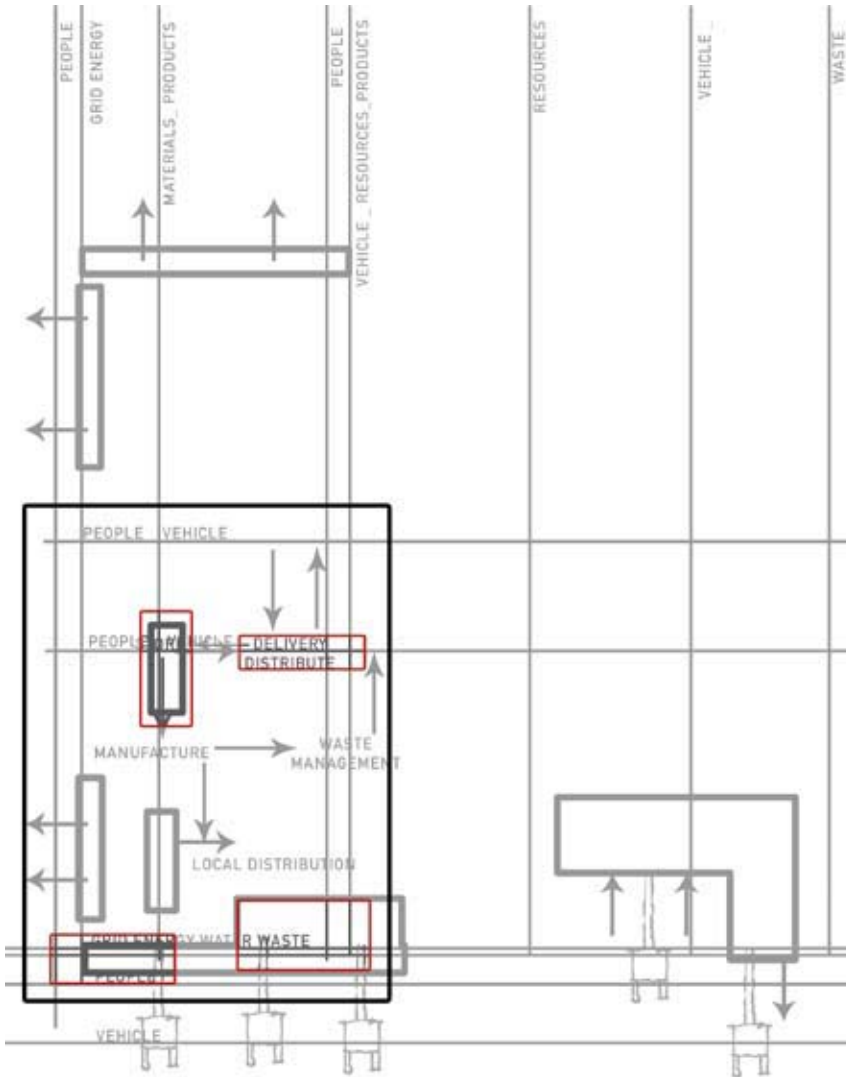
51. BASIC GENERIC PROCESSES OF MANUFACTURE (AUTHOR, 2010).

The second map identifies the processes that would occur within a generic production facility and how they begin to form a network of links.



52. WHERE THE SITE CAN SPATIALLY CONTRIBUTE TO CONTEXT (AUTHOR, 2010).

The third map identifies where the site can contribute spatially to the events that happen on the edges of the site, as well as within the greater context, i.e. the taxi interchange and the response of the building edge toward it, as well as further programs that can contribute to residential functions and transport nodes within the urban context.



53. MAP'S SUPERIMPOSED FOR INTERPRETATION (AUTHOR, 2010).

The interpretation of the mapping by assessment of the various processes and possibilities within the context, serves as a base off which the design begins to conceptualise..

The three maps are superimposed, graphically representing a set of flows and intensities on site. The intensities form where various spatial flows overlap, and are extruded to form reservoir like structures on site.

Within the city, infrastructure such as roads and services, are the permanent elements that connect flows of energy and allow the city to function optimally. Buildings and functions within the city then plug into and feed off of this infrastructure. The proposed production facility embodies this idea through the use of reservoirs as the primary infrastructure elements on site. The building and its functions may then plug into the system of reservoirs, allowing for the building to have a degree of flexibility within the context of the site.

“Take a small sample of a city, cut a small section out of its flux, watch the processes that create the flux, their product is the horizon of the second skin as we see it.”(Bunschoten, 2001:160)

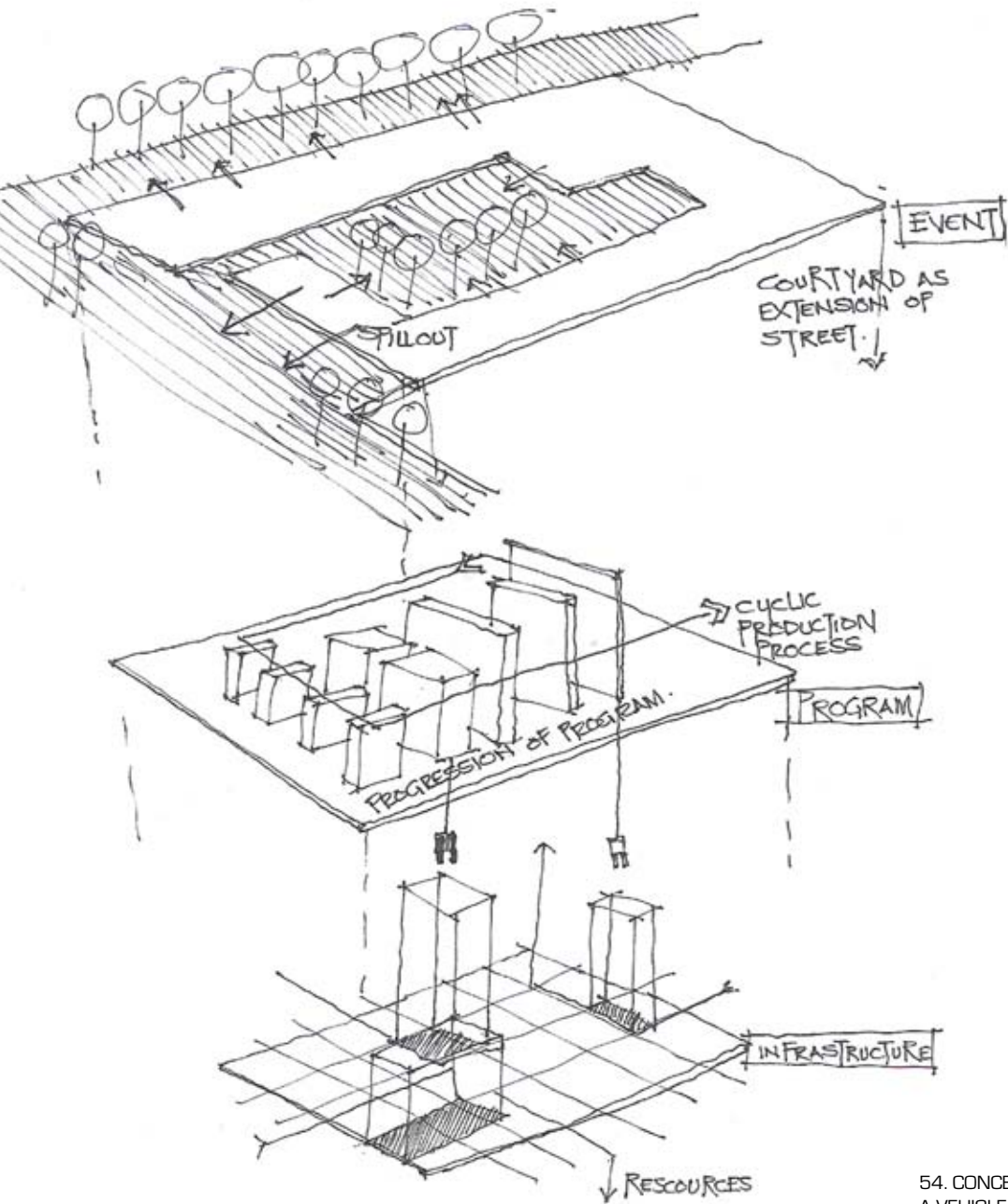
This thesis attempts to explore the idea of building as a process driven entity, which is a response to its context, from design conception through to the possibility of the building being re-appropriated. Here the materialisation of a space constantly responds to change as a reaction to external factors rather than a space, which represents the termination of an idea for existing conditions.

Buildings of production are representative of closed or isolated systems within an urban environment, which do not respond or make reference to their context. Groák mentions that we naturally conceive buildings as essentially unchanging, stable, and permanent environments, ignoring the fact that buildings have to be understood in terms of a time span over which they change, due to urban flux (Groák, 1992:15).

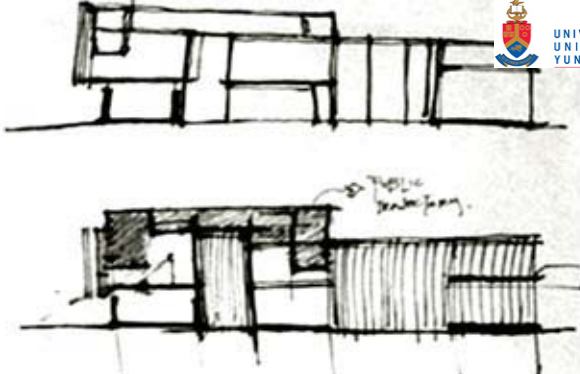
This urban flux relates to the flows of energy, matter, occupants and function, which the building will encounter. Buildings can thus be conceived as possessing the ability to constantly change in response to this flux, as open systems that are affected by receiving, filtering, storing, and distributing of matter.

The importance of this in the design and making of the building, is to explore a degree of flexibility, whether through visible or invisible dimensions, or as intermediate stages, responding to the various flows of energy and matter encountered.

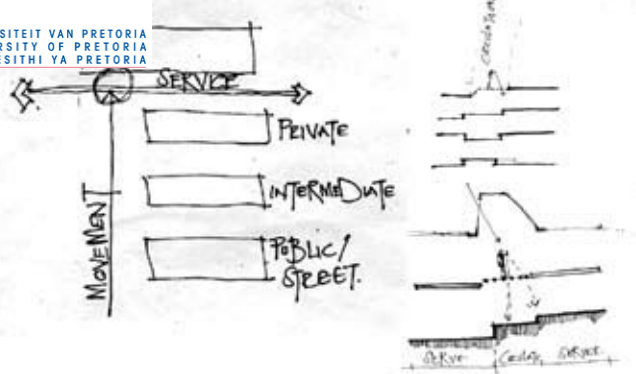




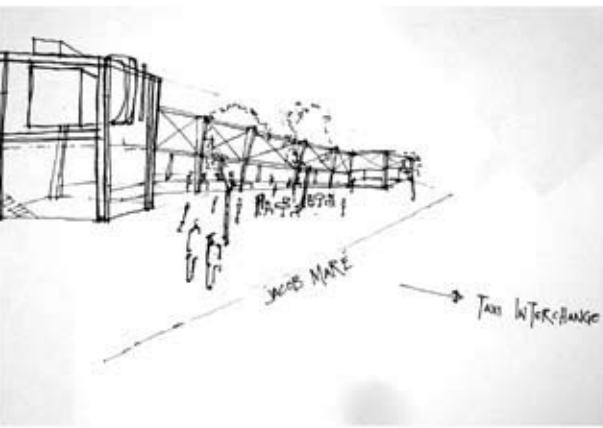
54. CONCEPTUAL DIAGRAM AS A VEHICLE FOR DEVELOPEMENT (AUTHOR, 2010).



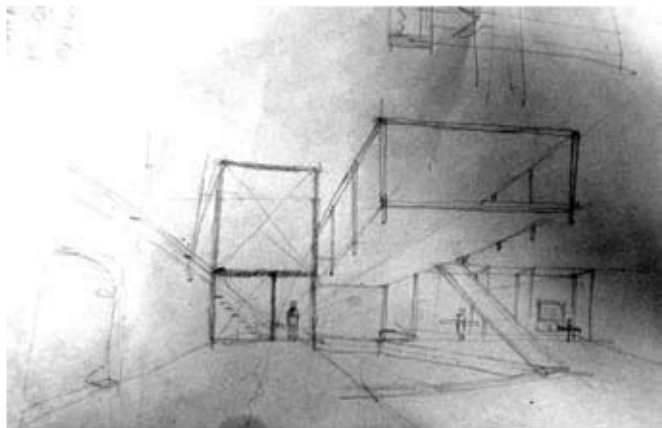
SPATIAL EXPLORATION SECTION



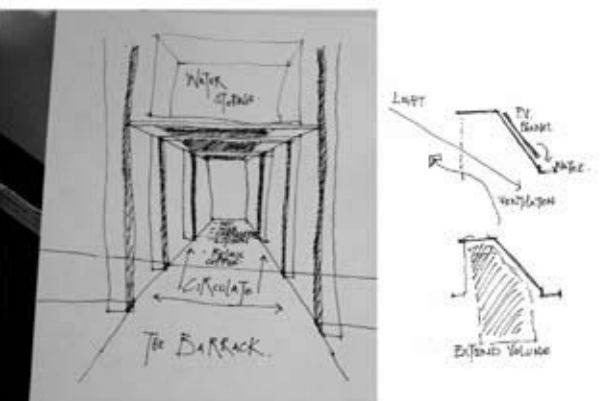
ZONING AND CIRCULATION



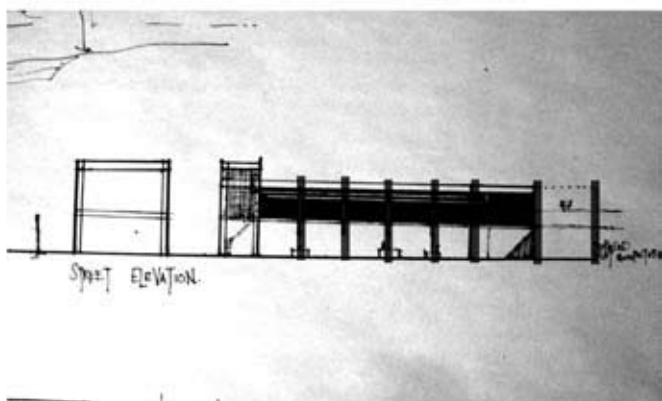
PUBLIC ARENA



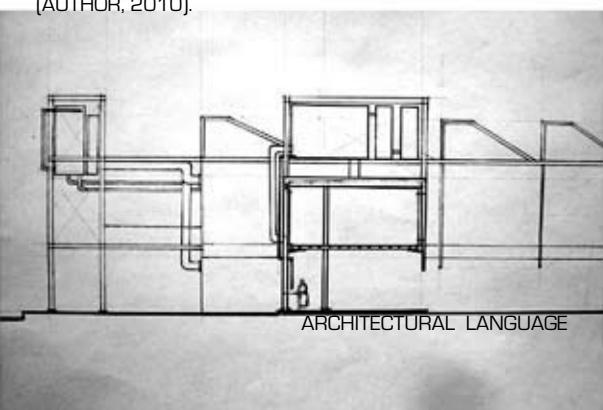
INTERNAL COURTYARD



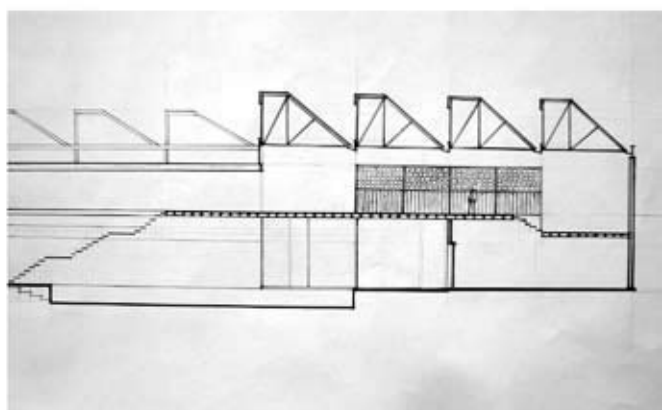
55. DESIGN EXPLORATION BARRACK AND ROOF DEVELOPMENT COLLEGE (AUTHOR, 2010).



SOUTH ELEVATION AS ARCADE

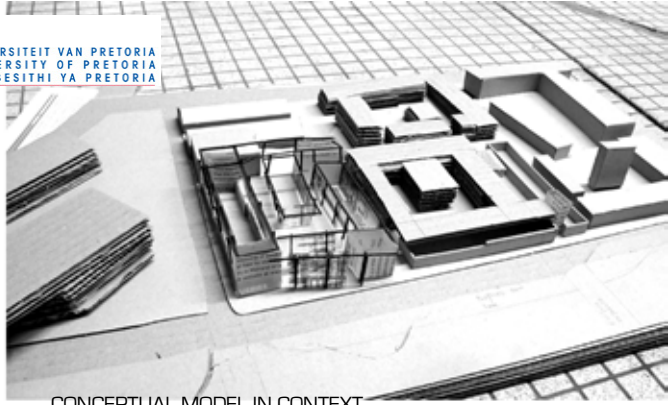


ARCHITECTURAL LANGUAGE

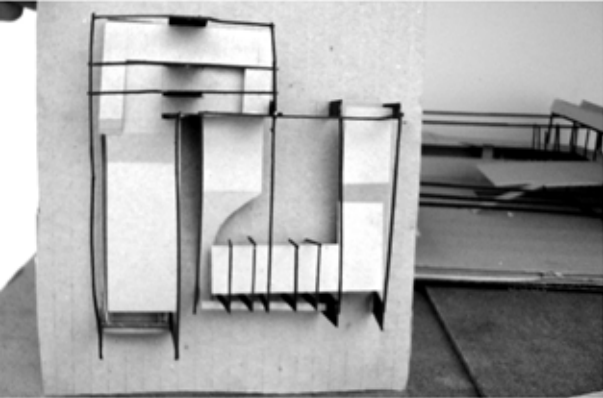




CONCEPT MODEL



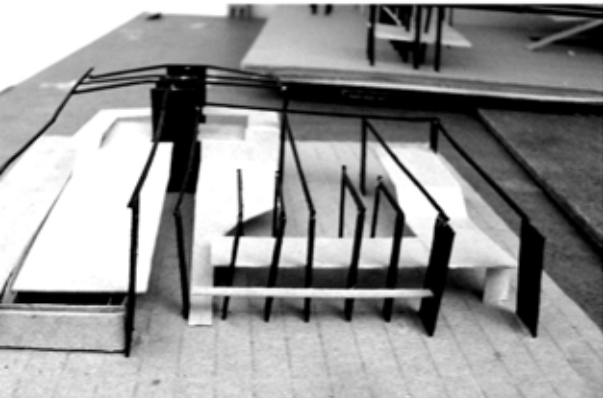
CONCEPTUAL MODEL IN CONTEXT



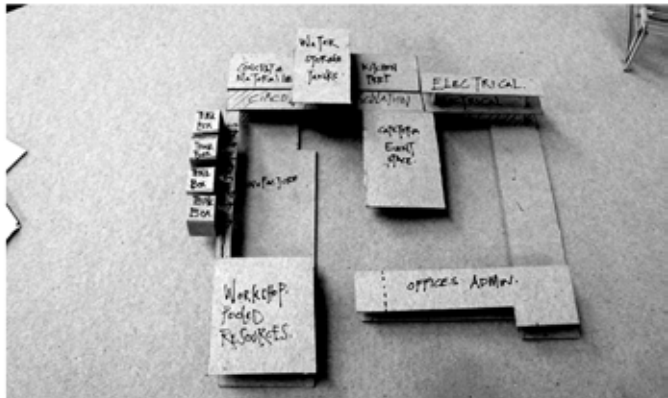
INITIAL FORM AND STRUCTURE



STRUCTURAL EXPLORATION

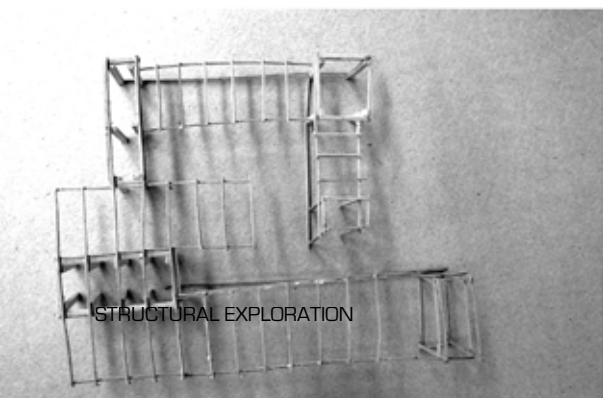


STRUCTURAL EXPLORATION

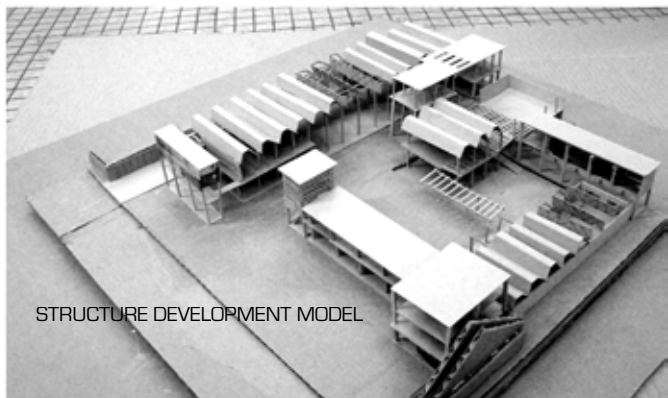


ACCOMMODATION LAYOUT

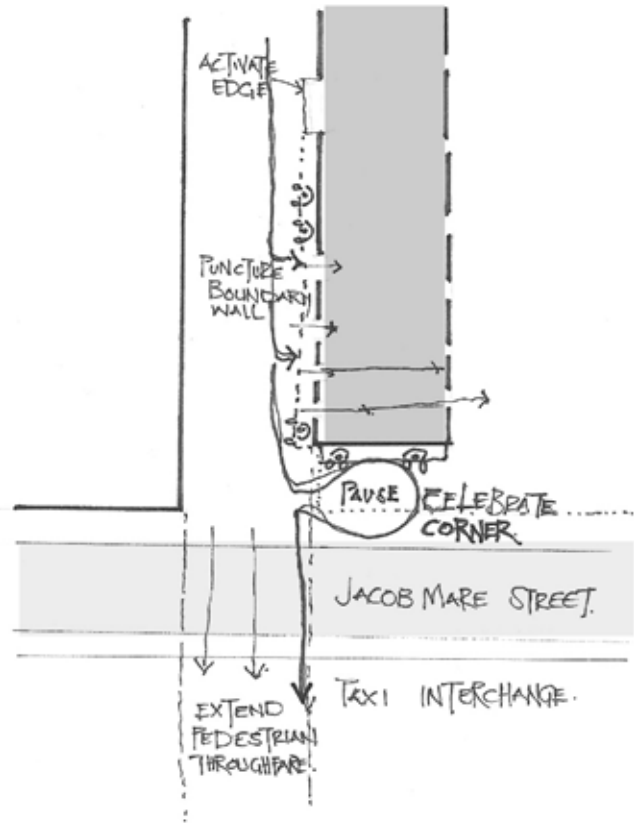
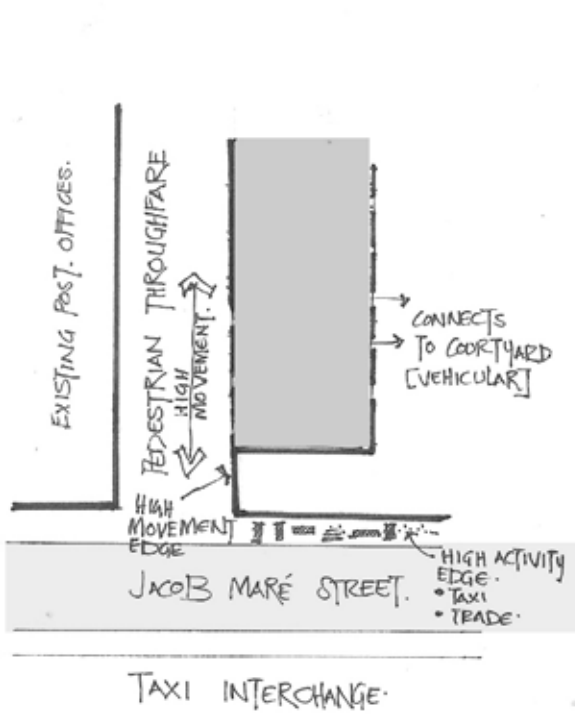
56.MODEL EXPLORATION  
(AUTHOR, 2010).



STRUCTURAL EXPLORATION

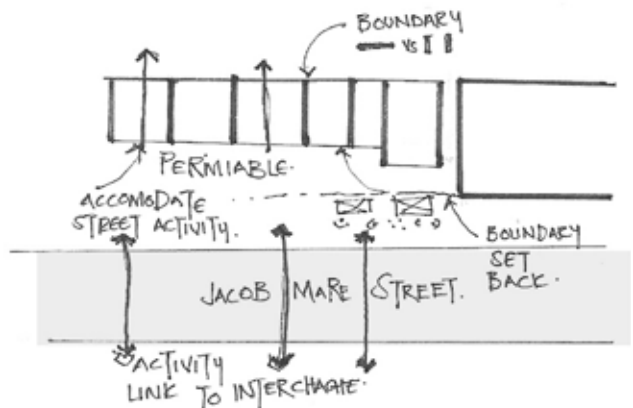
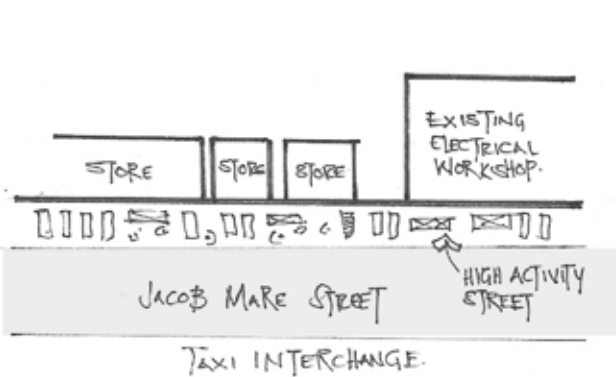


STRUCTURE DEVELOPMENT MODEL



EXISTING SOUTH WEST EDGE  
EDGES DONT RESPOND TO CONTEXT

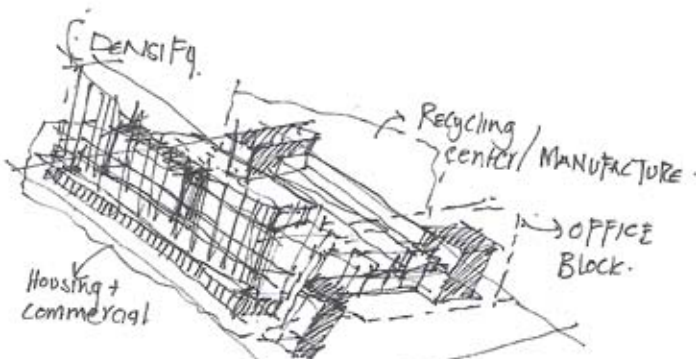
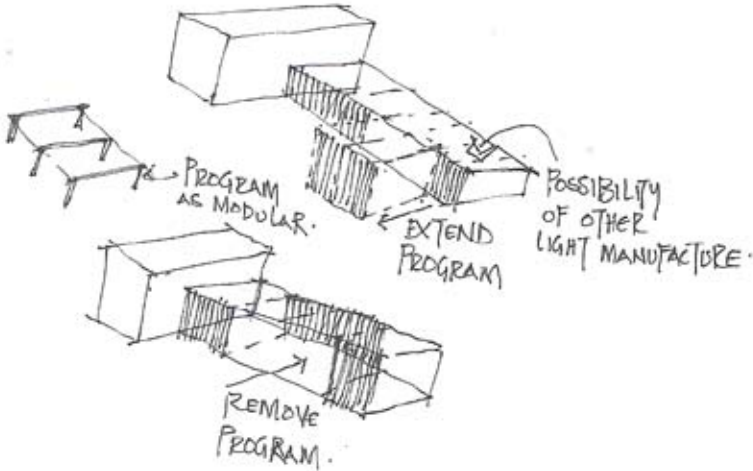
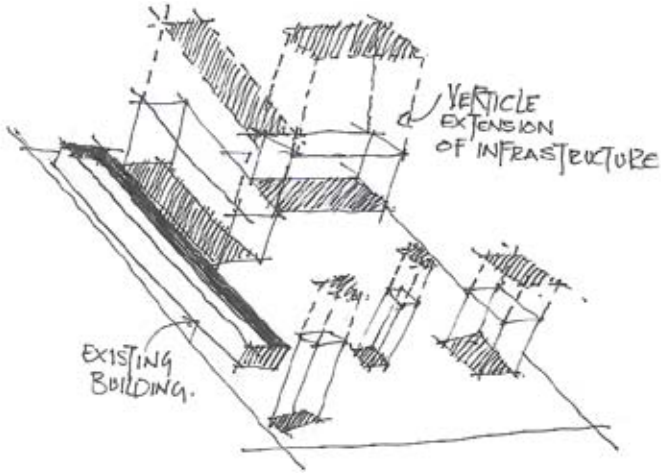
PROPOSED INTERACTION / RESPONSE  
TO CONTEXT



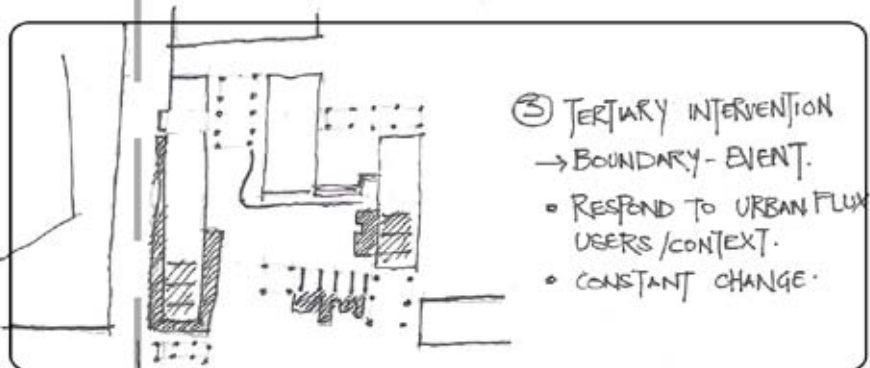
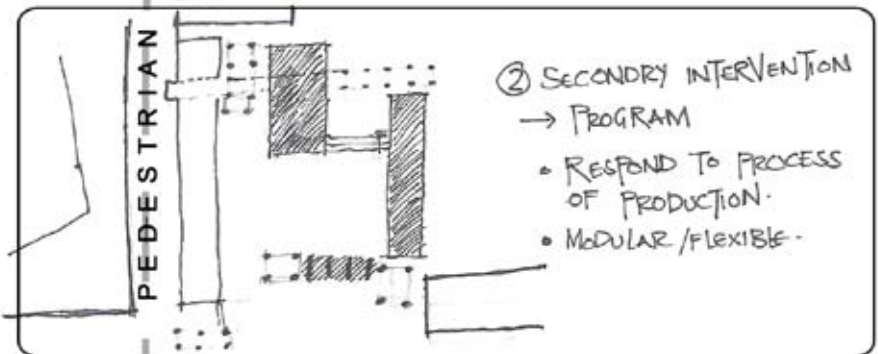
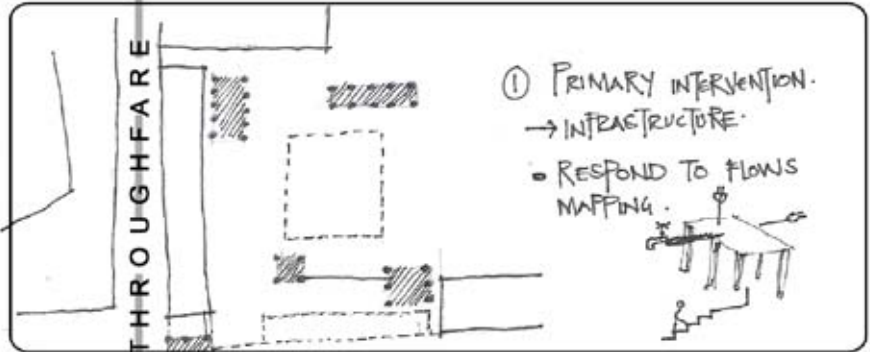
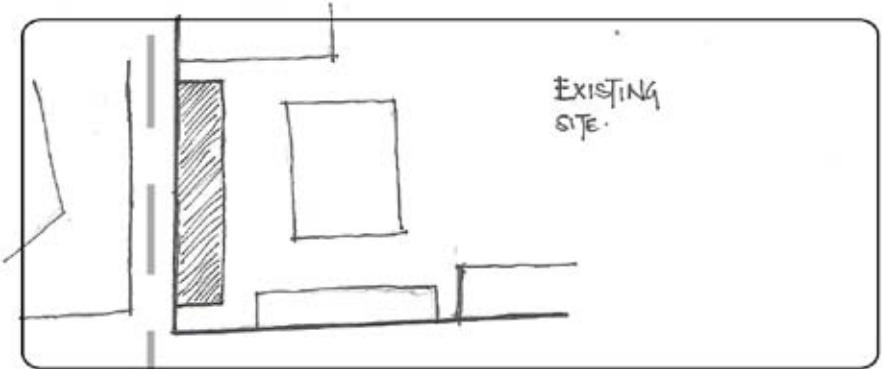
57. EDGE CONDITIONS  
(AUTHOR, 2010).

EXISTING SOUTH STREET EDGE  
BACKDROP TO STREET ACTIVITY

PROPOSED BOUNDARY AS AN EXTENSION  
OF STREET ACTIVITY BEGINS TO  
LINK TO TAXI INTERCHANGE



IF CITY DENSITIES  
POSSIBILITY OF  
SUB-DIVIDE BUILDING  
INTO COMPONENTS.



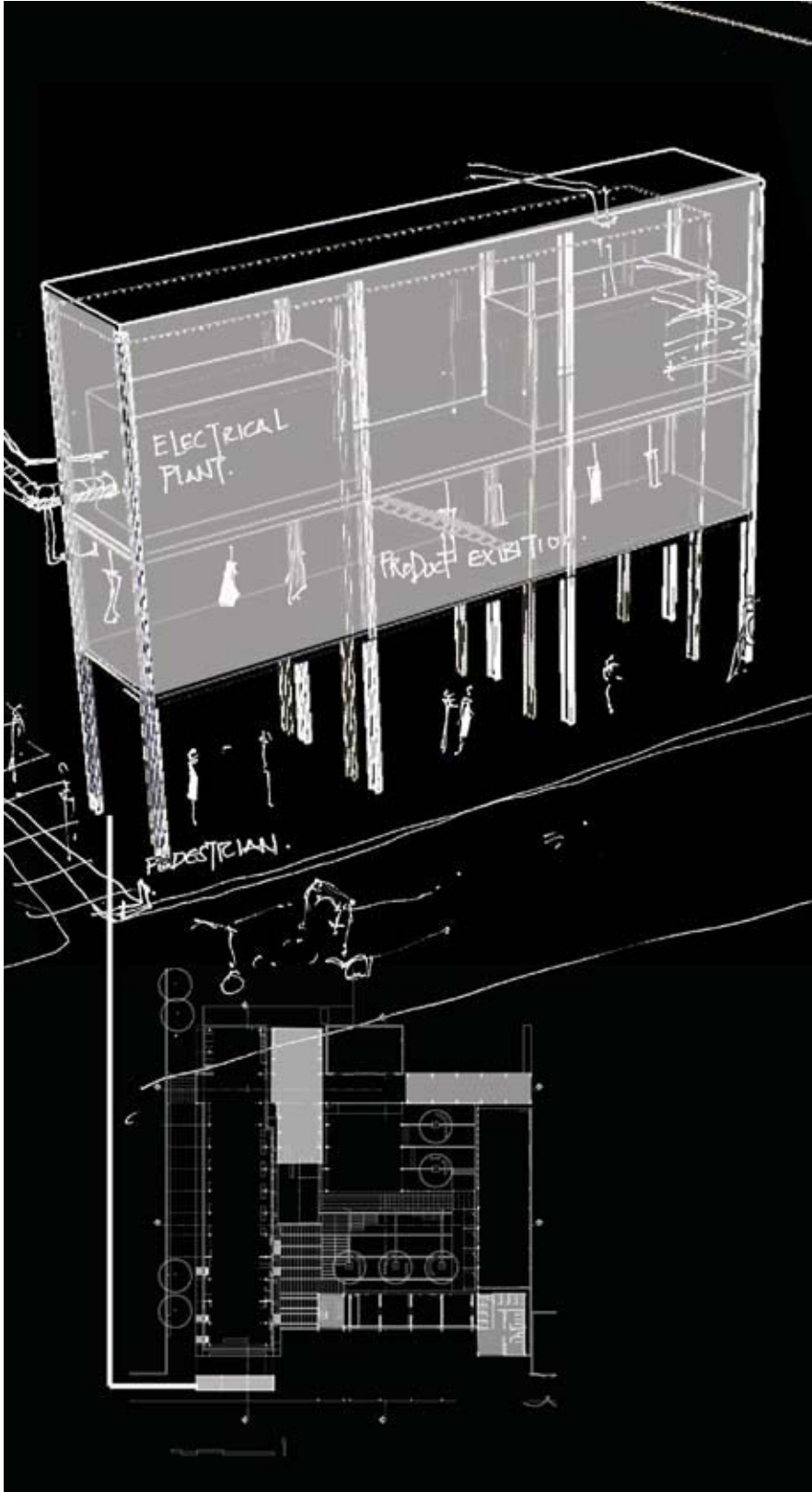
PEDESTRIAN  
THROUGHFARE  
TO TAXI  
INTERCHANGE.

Reservoirs as the primary intervention are established as permanent structures on site, providing anchor points for the rest of the building. Each reservoir is a response to its location within the context of the site, providing the necessary resources i.e. water, electricity, circulation, or defining the service spaces. Four core reservoirs have been identified, each being capable of functioning individually, as well as informing the greater whole of the building. The services in this building look at minimising the amount of non-renewable energy usage, and ways in which building can harvest energy through the different components of the building.

ANNOUNCE \_PROMOTE \_ADVERTISE\_  
CORNER \_PROMINENCE\_ DISTINCTION

The Beacon is situated on the corner of Jacob Mare and the pedestrian thoroughfare. A corner is the most visually prominent part of the site as it detaches from the rest of the building and announces the site, exemplifying a landmark status. The Beacon advertises the occurrences on the site through exhibiting merchandise from the production line.



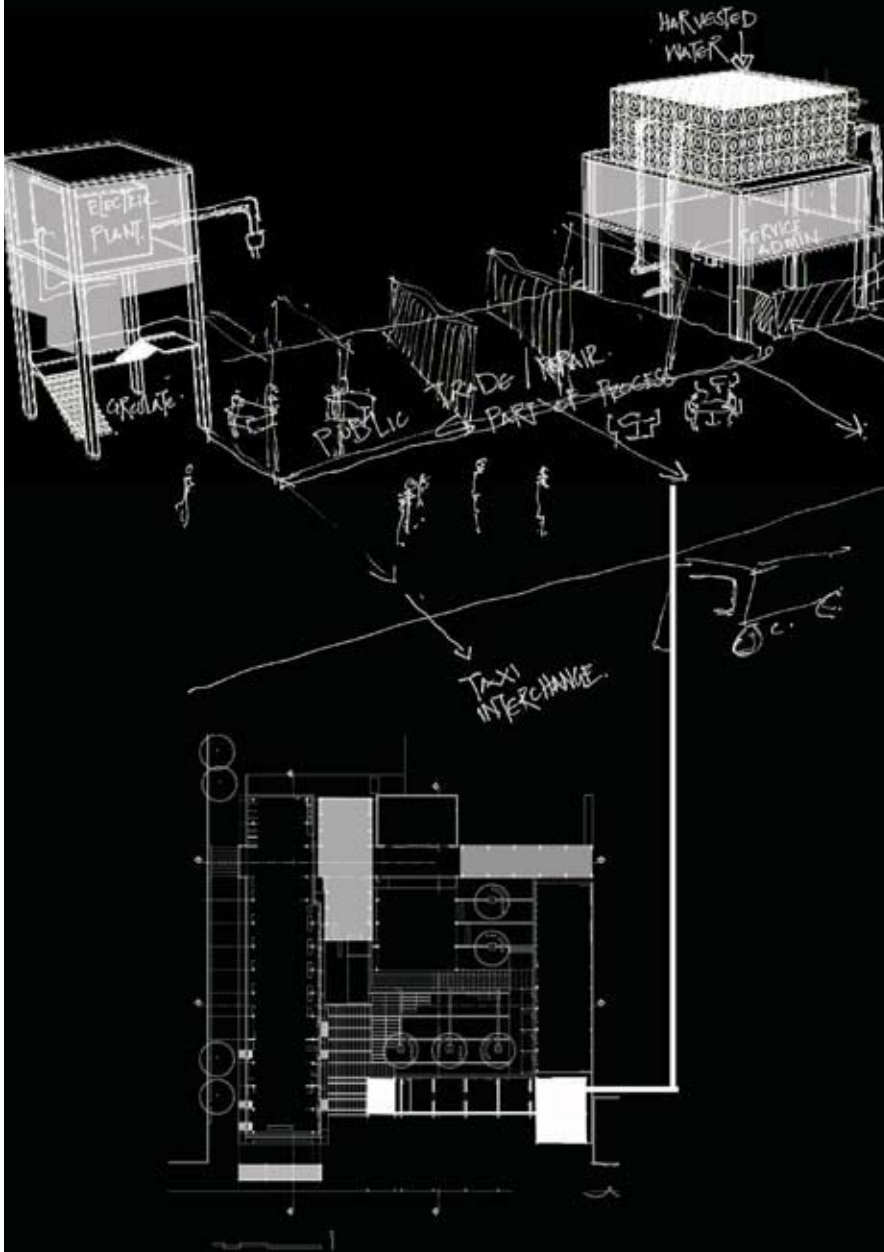


60. THE BEACON  
(AUTHOR, 2010).

PUBLIC \_ OBSERVE \_ EXPLORE \_ PAUSE  
STOP \_ SETBACK \_ PERMEATE \_ PLUG IN

The Arena as a threshold steps back from the street, allowing for a public interaction with the building further allowing permeability into the site, catering for semi-formal trade to happen; it becomes a pause space before crossing over to the taxi interchange. The arena allows for visual connections to be made with the facility adding to the porosity of the building. The Arena becomes a threshold between the street interface and the building's courtyard, both giving order between two spaces as well as a line which serves the events that occur on the street. The arena reacts to the convention of a threshold being a boundary wall, to that of threshold as an active boundary or arcade to the site.

“An embedded model exists as an object in a specific situation. It orders this situation, and simultaneously gives meaning to this order. A threshold, for example is a piece of wood embedded in a doorway as well as line separating two kinds of spaces.” (Bunschoten,2001:146)

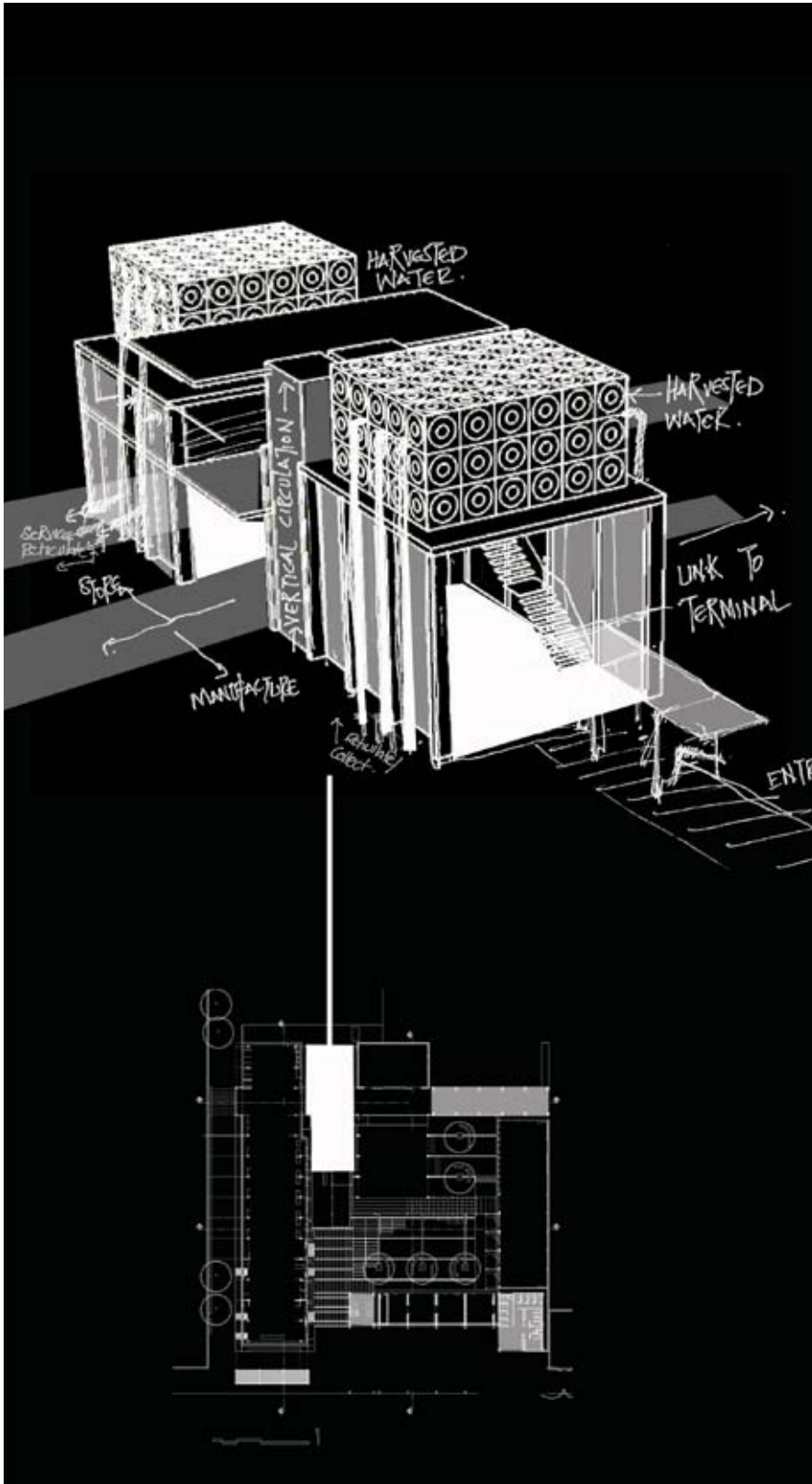


61. THE ARENA  
(AUTHOR, 2010).

RELAX \_ PENETRATE \_ SECURE\_  
CONTEMPLATE\_ ENERGY\_ PAUSE\_RELIEF

This space serves the constituent manufacturing spaces, allowing for activities of rest, vertical circulation and service.

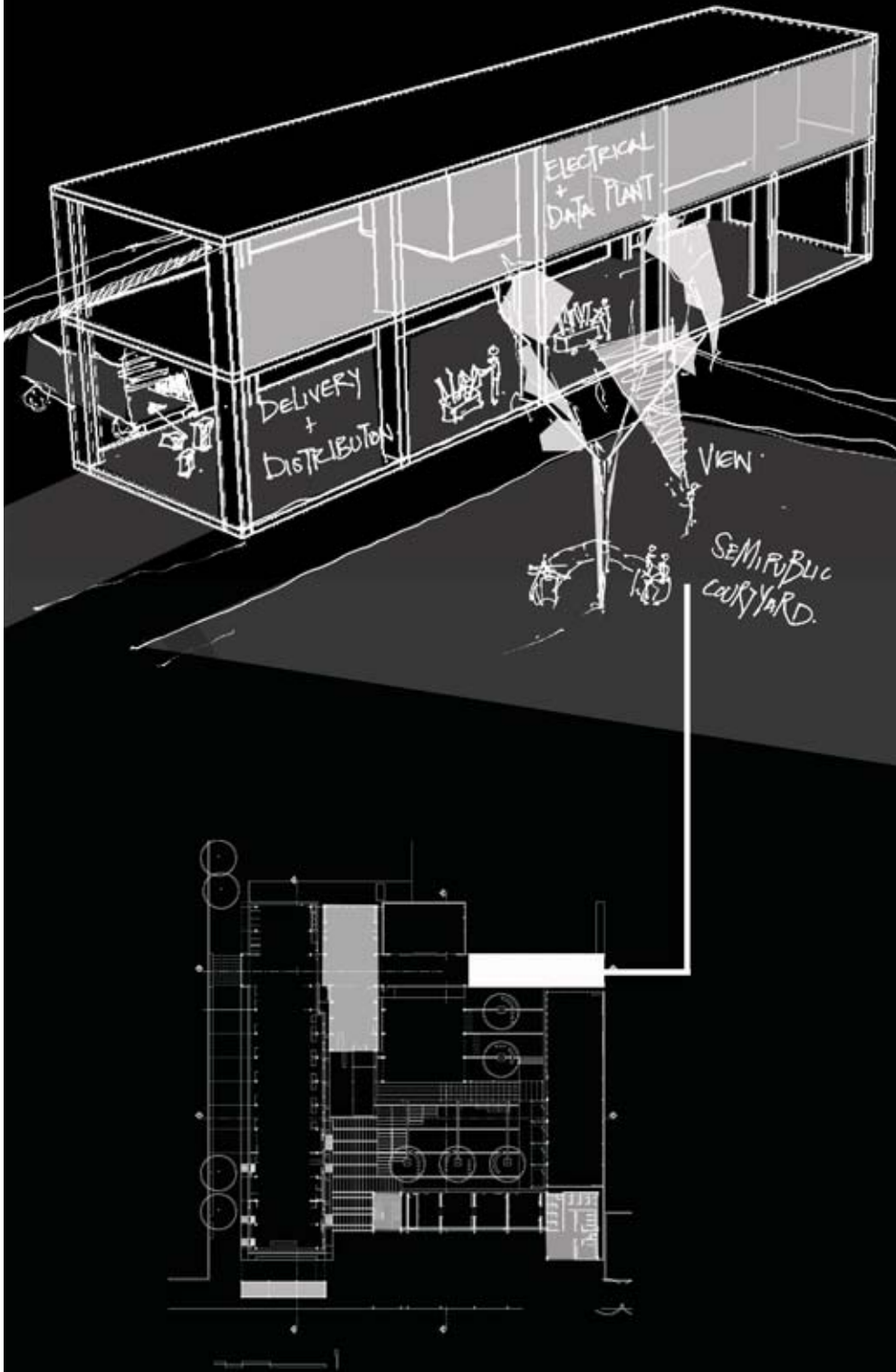
The barrack is a datum point in the building, housing the main entry point and primary vertical circulation within the building.



62. THE BARRACK  
(AUTHOR, 2010).

DISTRIBUTE \_ RECEIVE \_ RESOURCE \_  
MOVEMENT \_ DEPOSIT \_ ORIENTATION

The terminal marks the beginning and end of the production line; this is the point at which there is an exchange of goods, in the form of the delivery distribution zone. The terminal extends itself further into the building as the main circulation core for the production processes, following which it acts as a threshold between service and served space. The extension of the terminal can be assimilated to a production wheel, where the process of production becomes evident, in the passing of goods from one process to another.



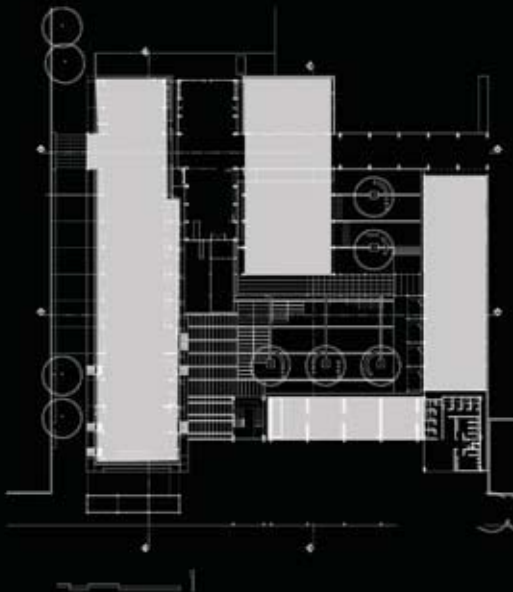
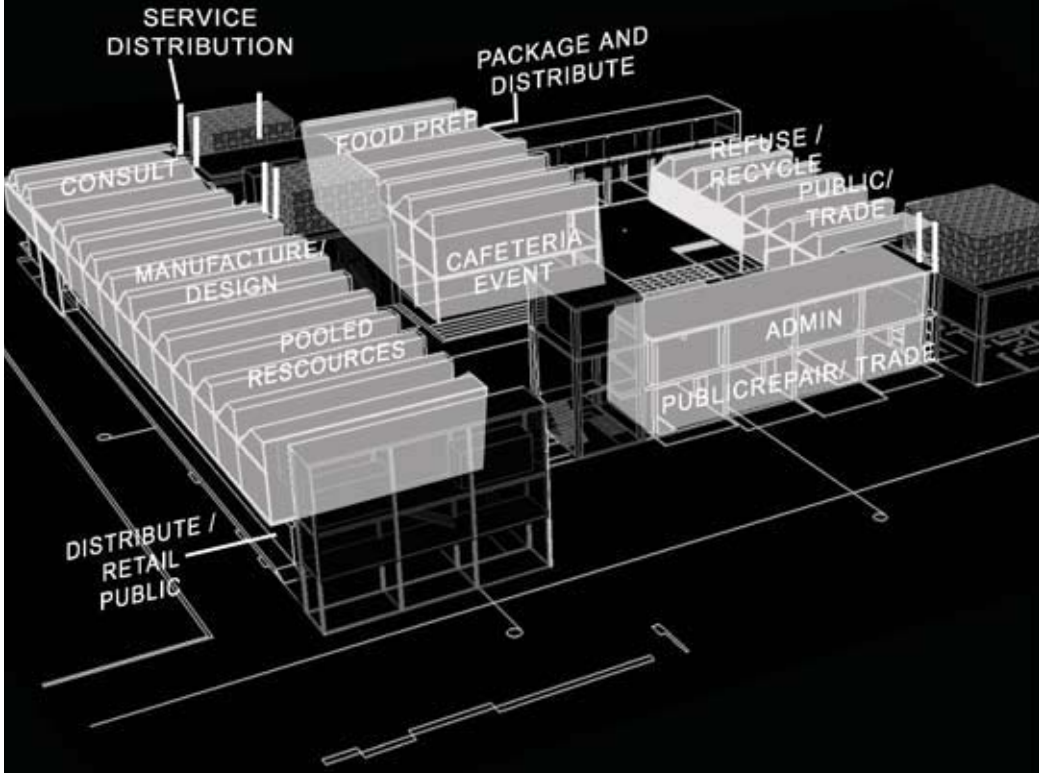
63. THE TERMINAL  
(AUTHOR, 2010).

The served spaces latch onto the reservoirs as the less permanent structures that allow for the program of manufacturing; this infill consists of a tectonic modular make up, allowing for growth or recession of the building. The secondary intervention addresses the functioning of a generic model for a light manufacturing facility, looking at the processes involved from beginning to end usage of materials. The idea is that there is a form of engagement with the public and the manufacturing processes within the building, so that public functions start to interweave into the facility and not merely situate themselves on the boundaries of the site. The architectural language of the proposed program relates back to the existing building, which defines boundary as a solid edge and courtyard as permeable edges.

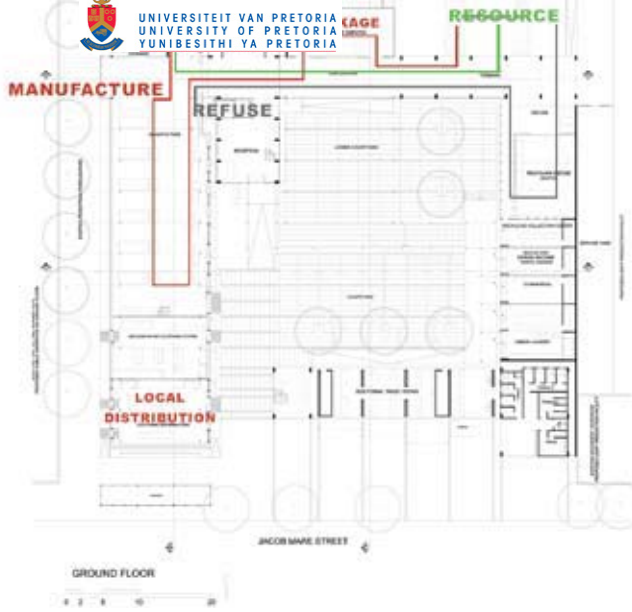
The program of an urban manufacturing facility implies that production facilities can enhance the immediate urban character through spatial and programmatic considerations. This is done through localising networks of resources and distribution, thus bringing producer and end user closer. The program here, realises the complete lifecycle of apparel wear from its conception and production through to the distribution, repairing, and finally, recycling and re-use of the textiles. The building looks at how the public and the production line begin to entwine, so that the public becomes part of the production experience, rather than being a viewer of the production process.

In articulating the infrastructure from the program, service ducts become the connector's which host the reticulation of resources through the building, both within the reservoirs as well as to constituent programs. Therefore, the service ducts become part of a programmatic requirement in the building, informing the reticulation of resources between infrastructure and program, elaborating the way in which the building is serviced. Furthermore, the service ducts reiterate the idea of dematerialising the building, by separating/linking infrastructure and program.

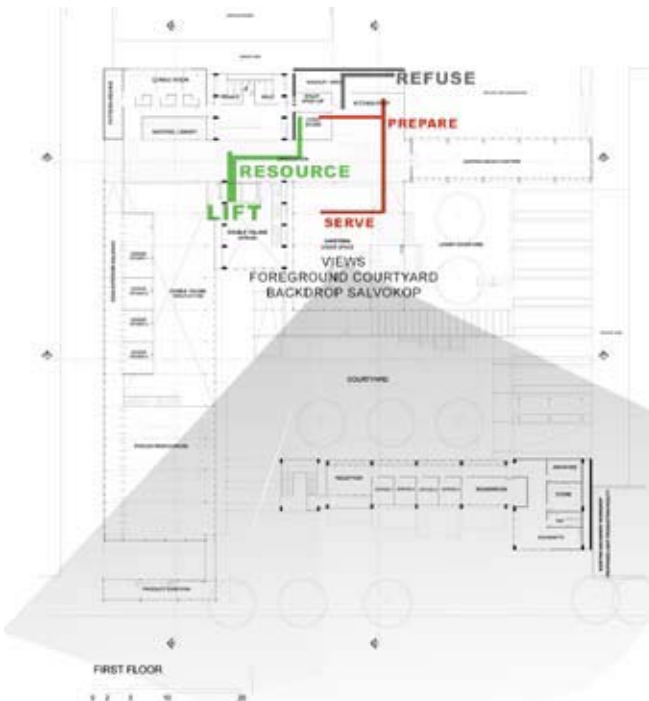




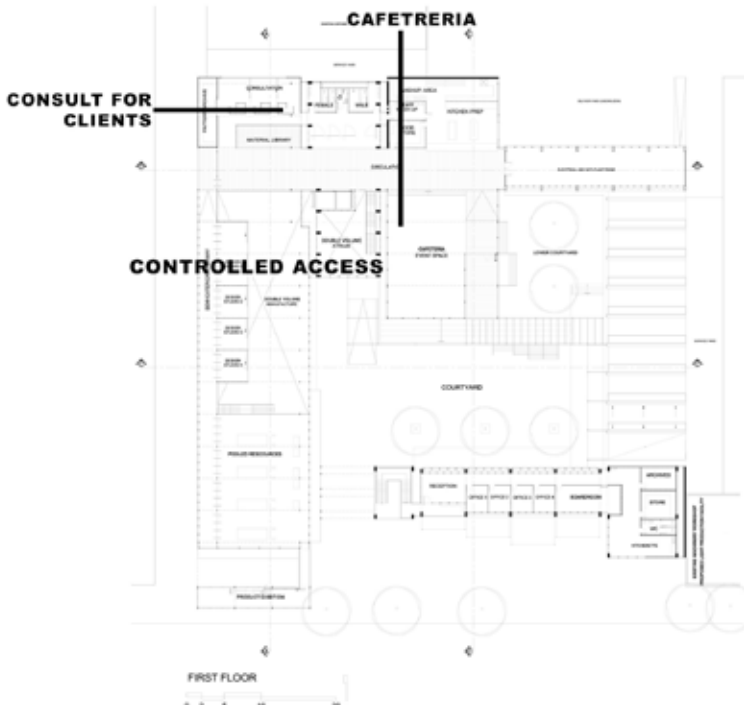
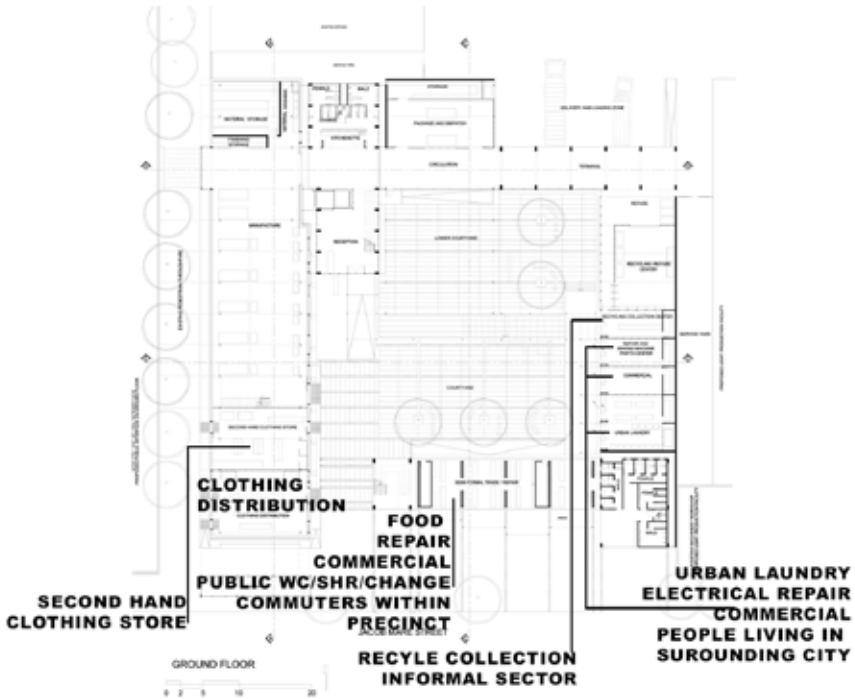
64. SECONDARY INTERVENTION, PROGRAM [AUTHOR, 2010].



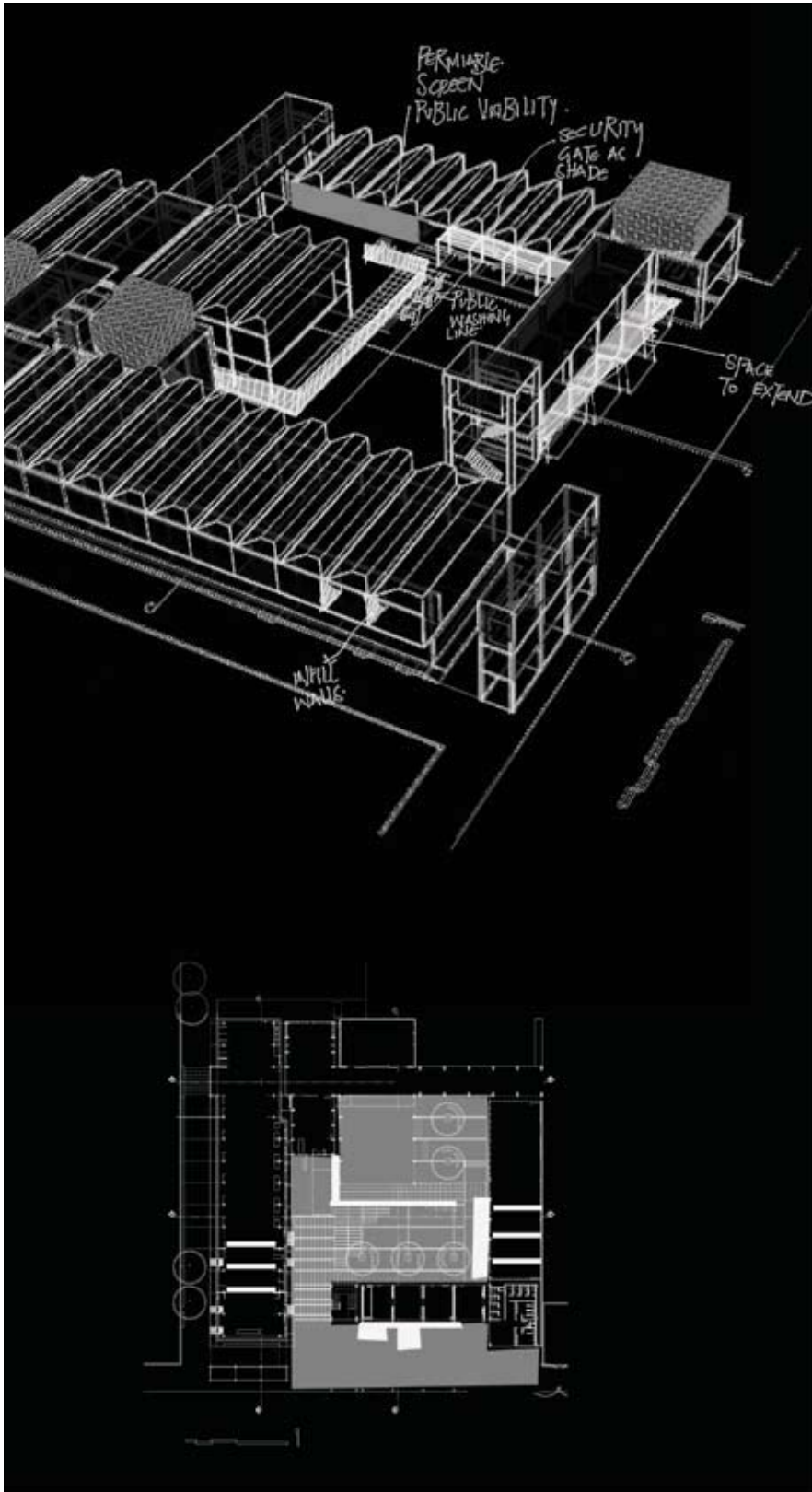
65. CLOTHING PRODUCTION  
PROCESS  
(AUTHOR, 2010).

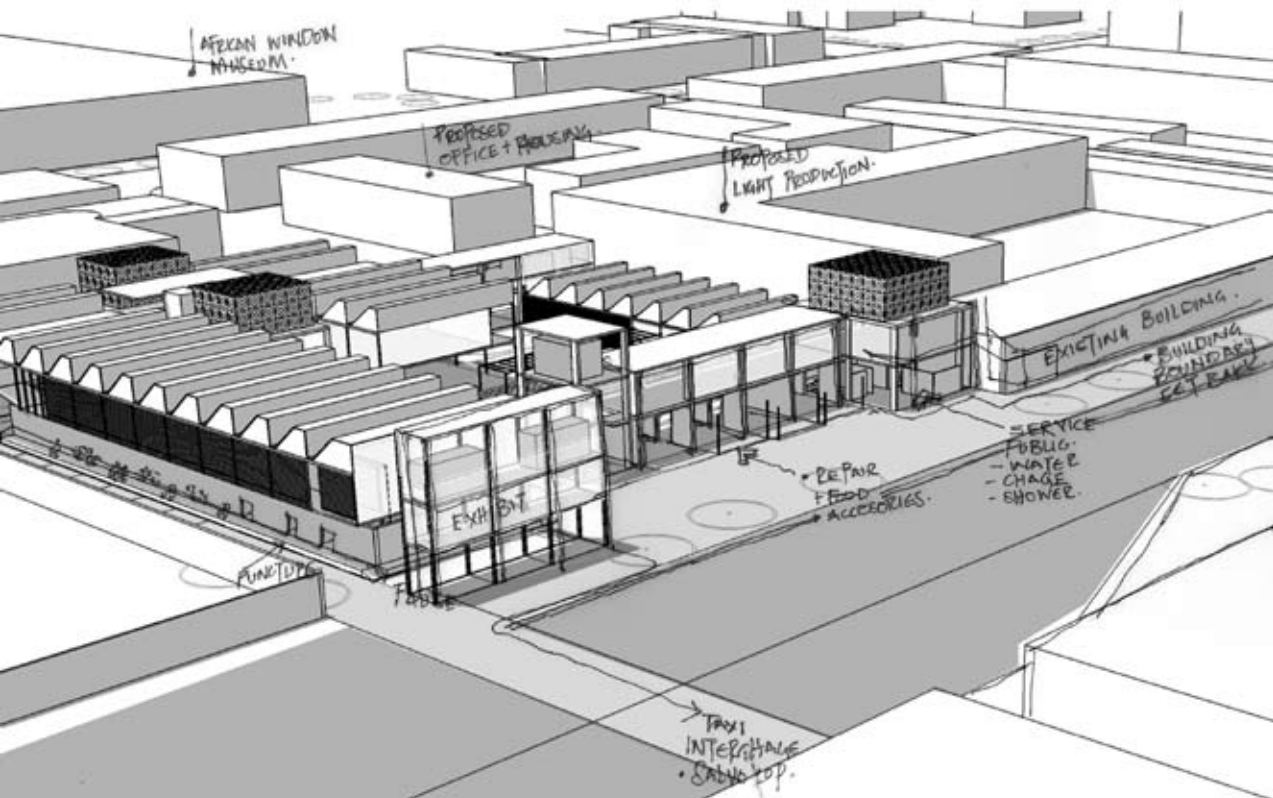


66. FOOD PRODUCTION  
PROCESS  
(AUTHOR, 2010).

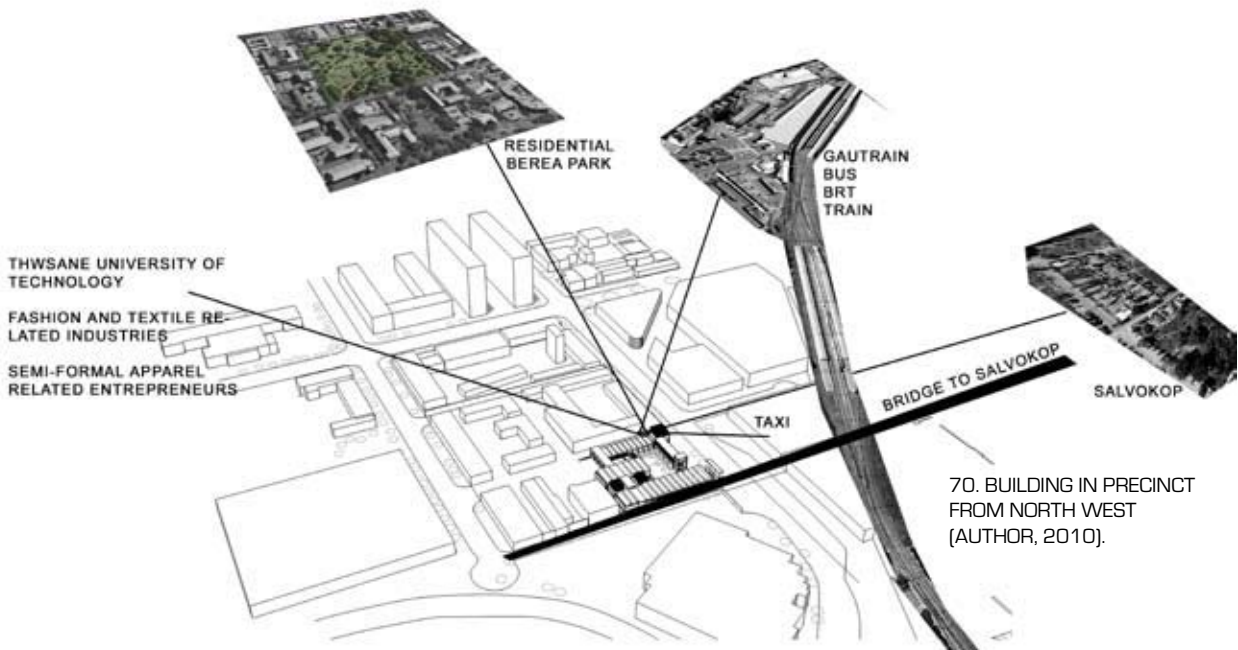


The tertiary intervention responds to momentary flux, both at a social and functional level, as experienced on site and within the context. This installation responds to function of apparel production on site. The use of textile as a tensile structural element, is explored through the act of layering, used to enlarge, extend, or reduce space. Further that the layering relates to the idea of revealing and enclosure within the urban context as part of a public experience of thresholds/boundary within the city. Due to its nature of non-permanence, the intervention would imply being independent from the grid, thus forming its own grid according to flux experienced. The materiality of the textile is one of non-permanence, advocating replacement and change over a progression of time.





69. BUILDING IN CONTEXT  
FROM SOUTH WEST  
(AUTHOR, 2010).



70. BUILDING IN PRECINCT FROM NORTH WEST (AUTHOR, 2010).

## PRECEDENT STUDY

### SAINSBURY CENTRE NORMAN FOSTER NORWICH, ENGLAND

The centre was constructed in the late 1970's and explored alternative building technology in acquiring a large volume of uninterrupted space, furthermore this use of technology was celebrated by making it a part of the spatial program of the building. (Glancey, 2000:204-207).

This design works on the idea of served and service space, in which the building allows for constant reprogramming of the internal space.

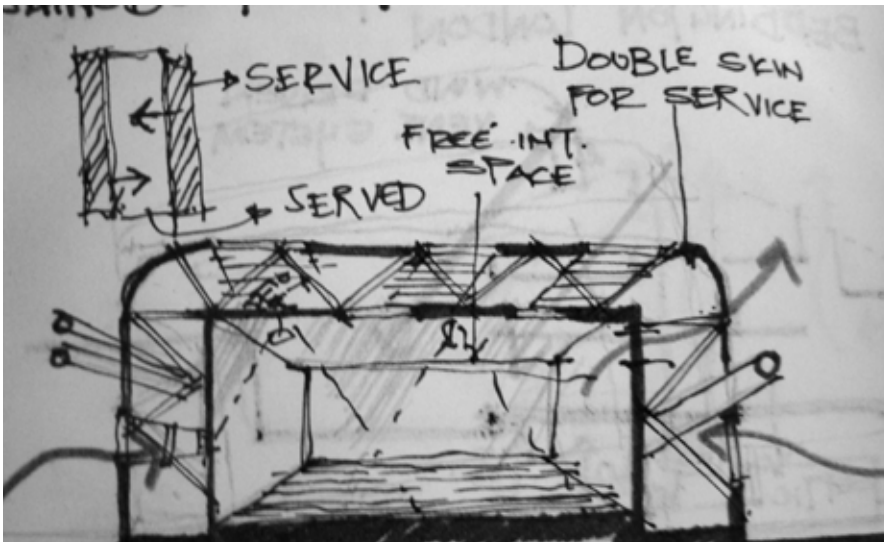
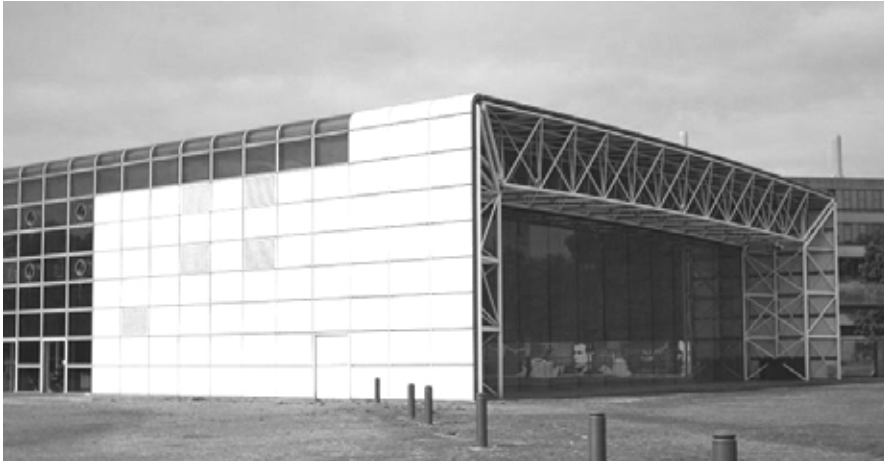
The design is conceived by means of an integrated systems approach in which the services are accommodated within the structural space frame.

This structure is capable of accommodating future expansion and adaptability in program, through

The use of modular sections that enclose a steel space frame, are replicated along its length offering opportunity for linear extension. The external panel protects the service elements from the environment, and the internal envelope skin is capable of having a flexible program. A shortcoming of this structure is that any further development must be linear. (Best, 1984: [sp])

The relevance of this precedent is that it adheres to honesty of expression, and embodies ideas of technology and industry, where a manufactured 'kit of parts' is transported to site and assembled, allowing for the space not to be committed to a single function since the design is committed to ideas of flexibility.

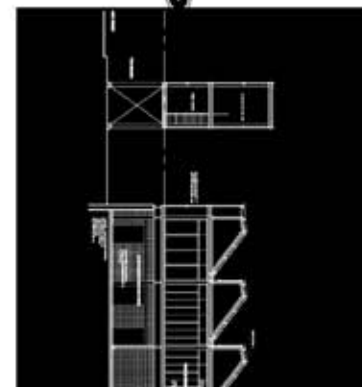
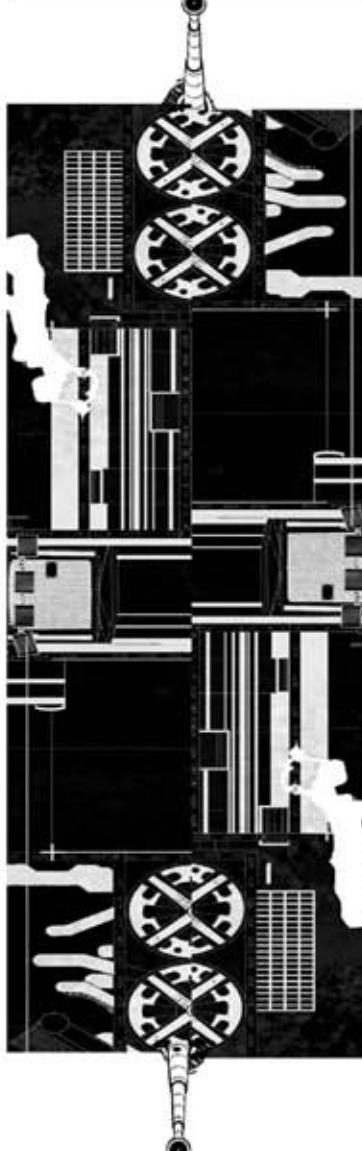




71. EXTERNAL MODULAR FACADE (HTTP://WWW.ARCHITECTURE.BLOGCU.COM/NORMANFOSTER)

72. INTERNAL SPACE AS AN INSTALLATION (HTTP://WWW.ARCHITECTURE.BLOGCU.COM/NORMANFOSTER)

73. SECTION THROUGH, ILLUSTRATING SYSTEMS (AUTHOR AFTER GLANCEY 2010).

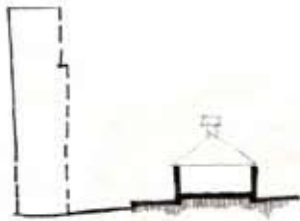


74. CONCEPT TO TECHNICLE  
EXPLORATION COLLAGE  
(AUTHOR, 2010).

This portion of the chapter will focus on the technical exploration and making of the building. First principals guiding the making of this building are discussed in relation to theoretical and conceptual explorations. Thereafter discussing how these principals are implemented throughout the design of the building.

The underlying approach to the making of this building is through dematerialisation of structure, in order that the processes involved in making of a building become evident in the product. Furthermore, the functioning of the building should also be evident in the way in which it consumes, distributes, and disposes resources within the building, embodying a high level of legibility in the way in which it treats systems.

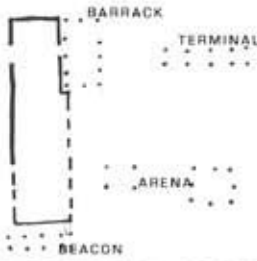
This principal of dematerialising structure within the building reinforces the theoretical base of cyclic processes being evident at all levels of intervention, allowing structural elements to be reused in future, as well as allowing for a clear distinction between the existing building and the new structure.



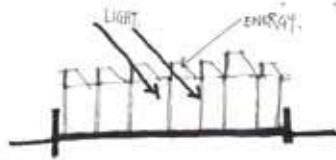
EXISTING



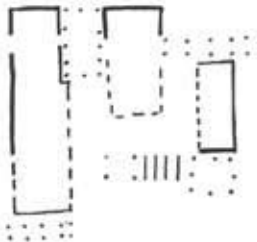
STRUCTURE



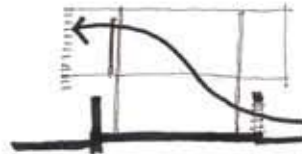
**ONE** INFRASTRUCTURE \_ RESPOND TO CONTEXT



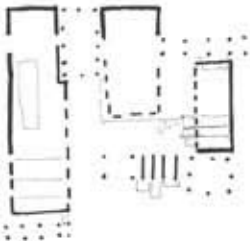
LIGHT



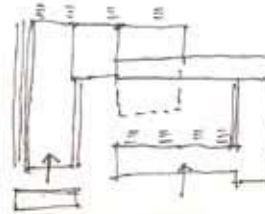
**TWO** PROGRAM \_ RESPOND TO GENERIC LIGHT MANUFACTURE PROCESS



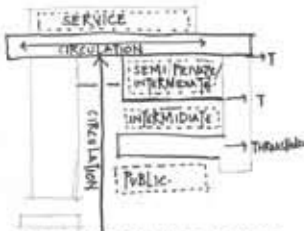
VENTILATION



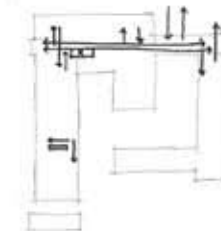
**THREE** BOUNDARY \_ RESPONDS GREATES EVENT OF CLOTHING PRODUCTION



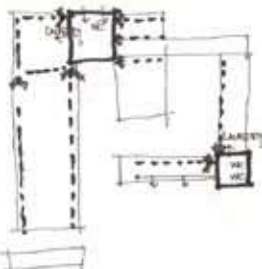
FACADE ORIENTATION



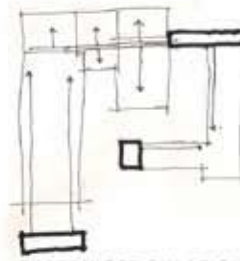
CIRCULATION AND ZONING



VENTILATION

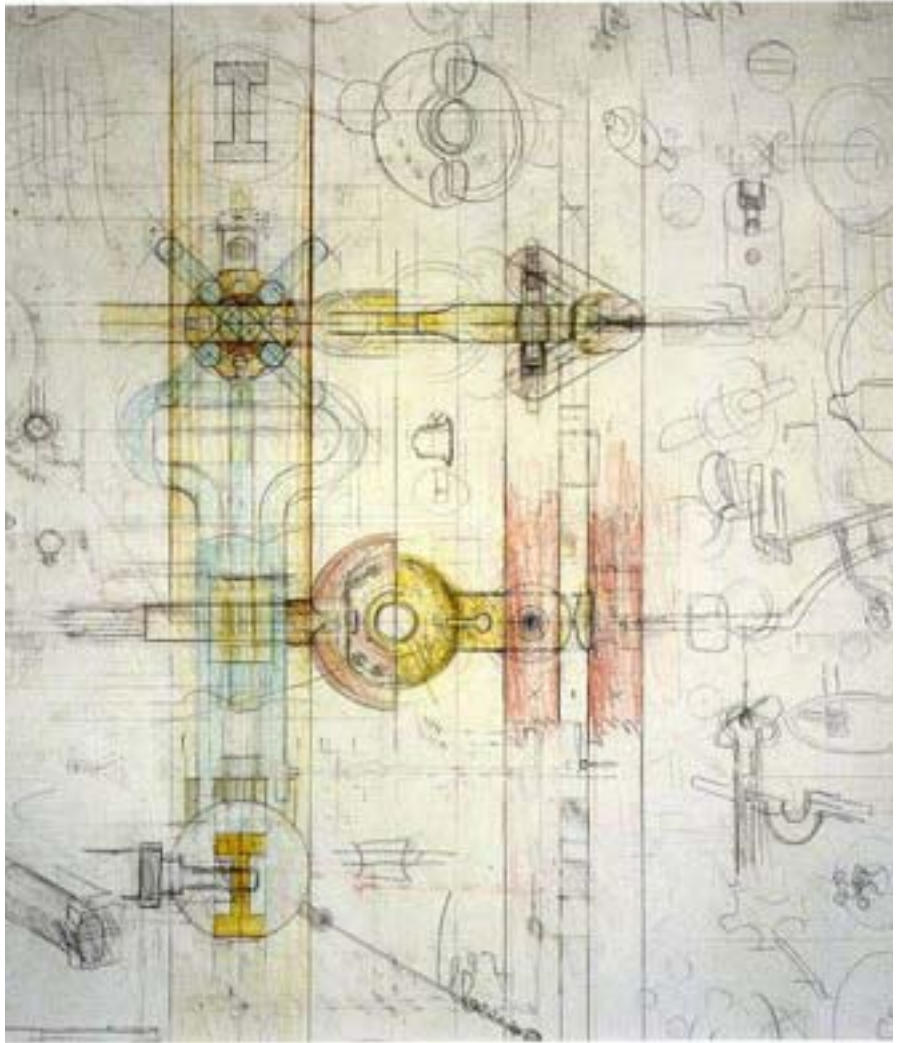


WATER HARVESTING AND RE-USE



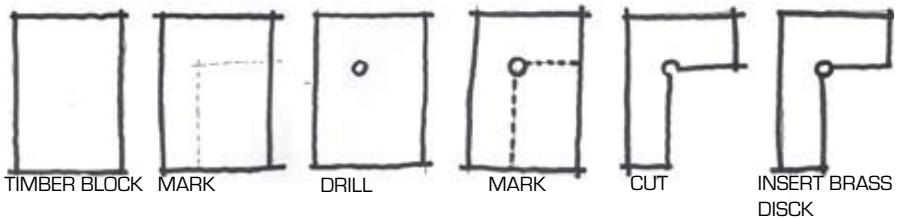
ENERGY RETICULATION

75. PRIMARY TECHNIQUE INVESTIGATION (AUTHOR, 2010).

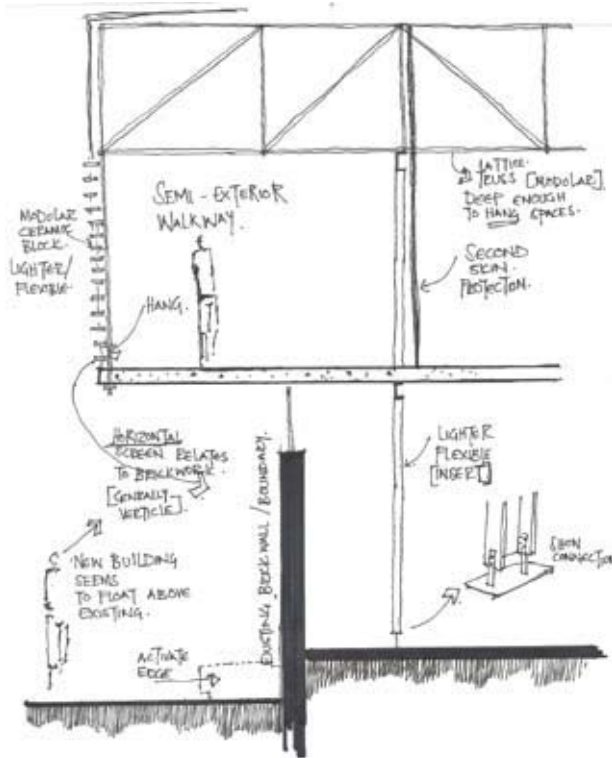


76. TECHNOLOGY EXPLORATION (HTTP://WWW.DRAWINGSARCHITECTURE.TUMBLR.COM/CARLO SCARPA)

77. PROCESS OF DETAIL CONSTRUCTION (AUTHOR AFTER GROÁK, 1992)

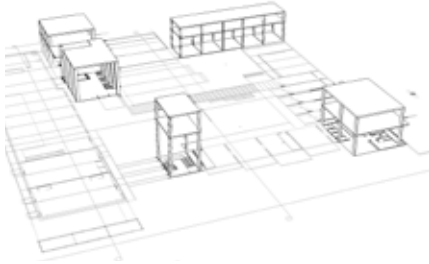


Architect Carlo Scarpa, is known to compose architecture as a craft which is explored within the making or connections of the building. The details tell the tale of their construction and the primacy of the connections work in such a way as to demonstrate the attributes of materials, design decisions, and the articulation between relationships of the part to the whole (Groák, 1992:150-152).



78. FACADE AS PROGRESSION AND MATERIAL EXPLORATION (AUTHOR, 2010).

- Materials to be produced locally
- Materials to have a low embodied energy
- Building to be made of modular elements
- Building to be transported to site as a “kit of parts” , reduces on site material waste
- On site assembly to be bolted connections, no welding required
- The building is constructed in a labour intensive manner
- Adaptability and reuse of structure upon disassembly, thus building is seen as part of a process rather than a product.
- Economically viable

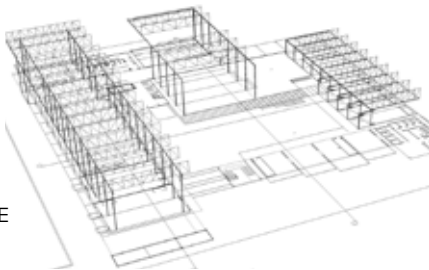


79. PRIMARY STRUCTURE  
(AUTHOR, 2010).

Concrete is used for the construction reservoirs; this material assumes permanent nature on site due to it being part of the infrastructure.

- It is robust and gains strength over time
- Readily available material with low embodied energy
- Grid allows for future extension
- A minimum of 30Mpa concrete is used
- A minimum of 30mm concrete cover over steel reinforcement on beams and columns

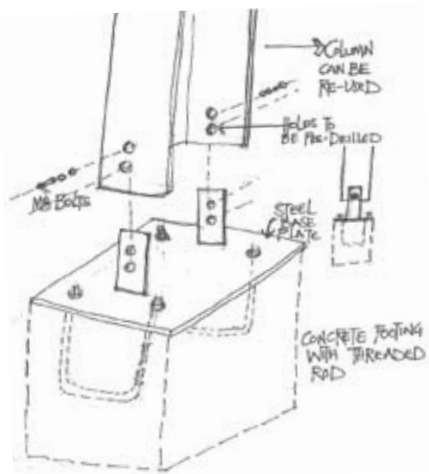
## COLD ROLLED STEEL SECTIONS



80. SECONDARY STRUCTURE  
(AUTHOR, 2010).

Steel members are made from structural steel sheets formed through press baking, or more commonly, by roll forming the steel through dies.

- No heat required for forming steel members.
- Member thickness ranges from 0,4mm to 6,4mm.
- More cost efficient than hot rolled steel sections.
- Flexibility of structural members
- High strength to weight ratio
- Members are transported as a 'kit of parts' to site with no wastage
- On site assembly of members to have bolted connections

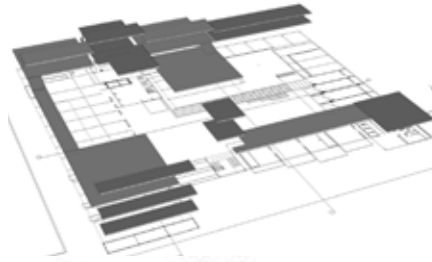


81. TYPICAL COLUMN BASE  
DETAIL  
(AUTHOR, 2010).

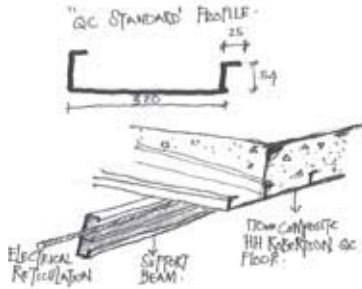


QC floor system is suitable for steel and concrete frame structures; this system is used due to achieving a lighter floor within the building.

- Units are manufactured from embossed steel and combine with concrete to form a tension-reinforced floor slab
- Finished ceiling becomes an integral part of the structure
- Immediate working platform created.
- No temporary shuttering required for casting.



82. LOCATION OF QC FLOOR SYSTEM (AUTHOR, 2010).



83. QC STANDARD PROFILE (AUTHOR, 2010).

## GLAZING

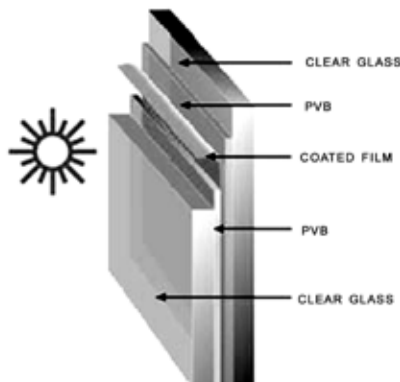
A clear laminate glass (Coolvue 8.76) is used within this facility mainly on the south facades of the building.

- Coolvue Transmits 70% of visible light into the building
- Blocks more than 50% of the heat gain from solar rays.
- Coolvue is manufactured by laminating a wavelength selective heat-reacting coating between two layers of PVB (polyvinyl butral) and glass
- Reduction in sound transmission
- Increases safety and security due to laminate

([http:// www.smartglass.co.za/coolvue.asp](http://www.smartglass.co.za/coolvue.asp))

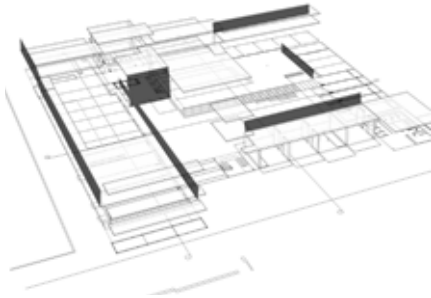


84. LOCATION OF GLAZING (AUTHOR, 2010).



85. COOLVUE LAMINATED GLAZING FROM SMARTGLASS ([http:// www.smartglass.co.za/coolvue.asp](http://www.smartglass.co.za/coolvue.asp))

## CERAMIC BLOCKS



86. LOCATION OF CERAMIC BLOCKS  
(AUTHOR, 2010).

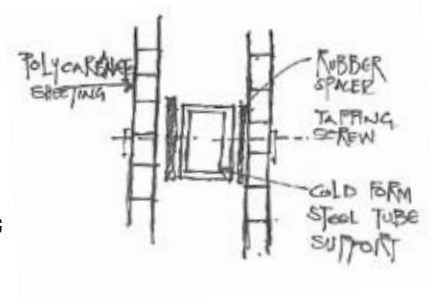
The use of ceramic blocks on facades, relates back to the existing buildings on site. This application responds to the existing buildings as a lighter, more flexible, modular material for facade application. The ceramic blocks are custom designed for the facility, and will be locally manufactured. The use of ceramic elements ensure the possibility of reusing of each piece, allowing the material an extended life beyond that of the building.

## POLYCARBONATE SHEETING



87. LOCATION OF POLYCARBONATE INFILL  
(AUTHOR, 2010).

Polycarbonates are used as part of the tertiary intervention, to divide spaces within the secondary intervention: program. A five walled, polycarbonate is chosen for the infill walls, panels sizes are 1200 x 5800 x 25. The polycarbonates will be fixed to a steel frame with aluminium fixings.



88. POLYCARBONATE FIXING  
(AUTHOR, 2010).

- Cellular polycarbonate panels more economical than glass
- Light weight and durable
- Good light transmission and insulation
- Has a u-v resistant film that prevents it from becoming brittle and discolouring
- Possibility to be recycled

Polyvinylchloride (PVC) is a virtually indestructible material that cannot be incinerated due to the toxic gasses it would emit. To avoid the material landing up in landfill sites, Billboards are scoured from within the city and used as a partitioning curtain system within the building.

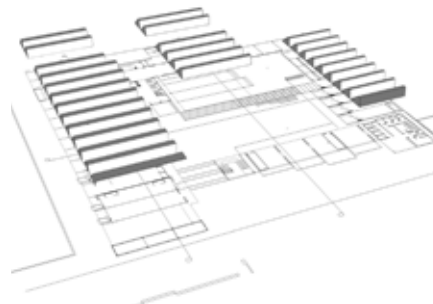


89. BILLBOARD VINYL RE-USE (AUTHOR, 2010).

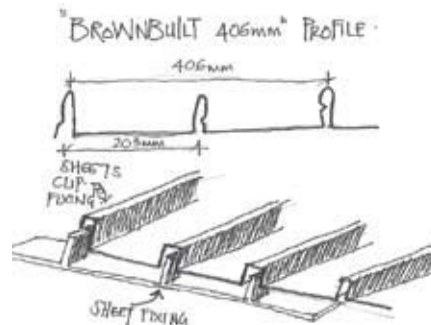
## BROWNBUILT PROFILE METAL SHEETING

Brownbuilt sheeting is used for roof cladding within the facility due to the lightness of the material.
 

- Concealed clip fixing, eliminates fixing holes on roof
- Possibility of re-using the sheeting for alternate applications

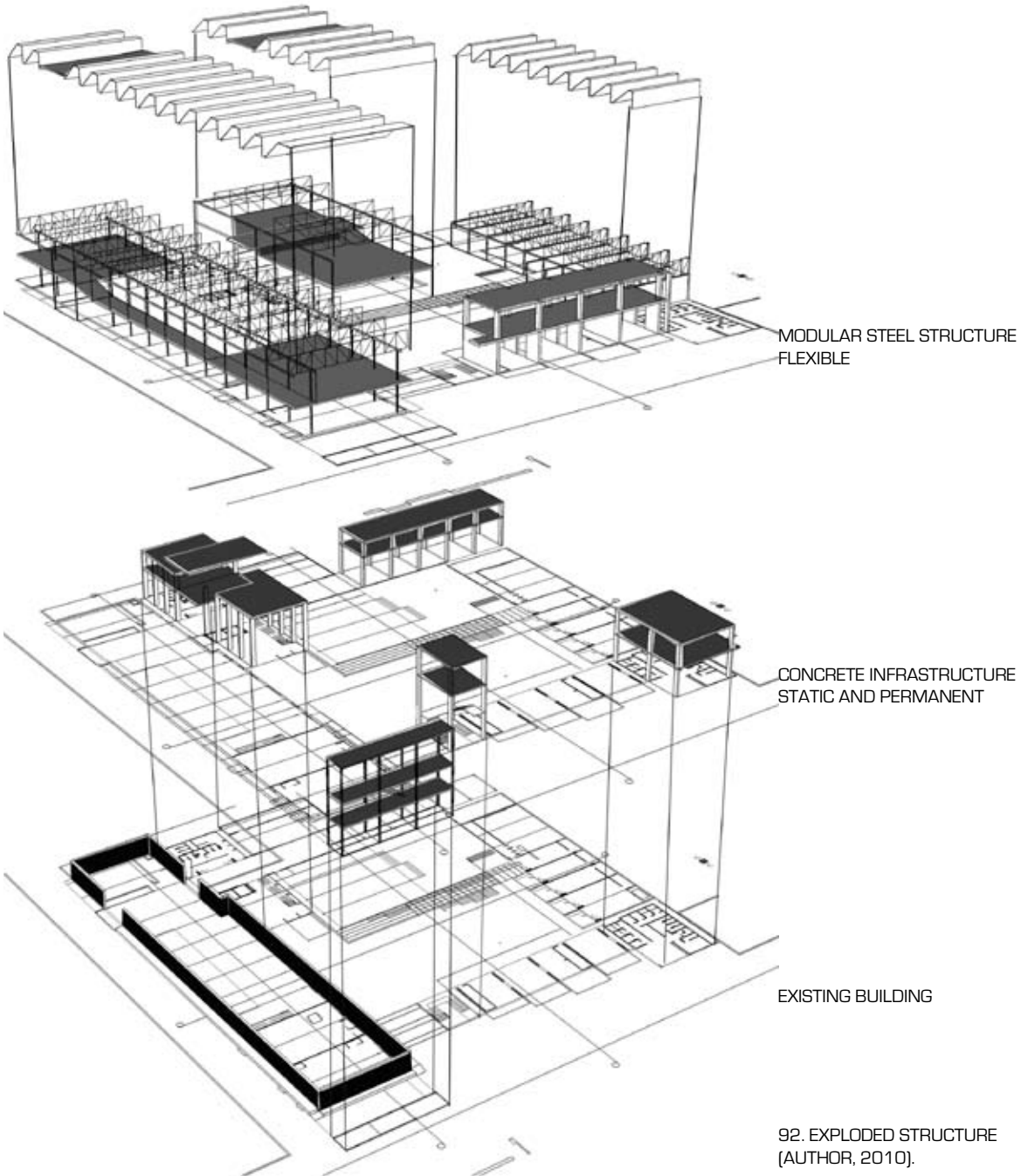


90. LOCATION OF BROWNBUILT SHEETING (AUTHOR, 2010).



91. BROWNBUILT SHEETING (AUTHOR, 2010).

Here the structure responds to two conditions, that of infrastructure and that of program. Infrastructure having a more permanent base on site is expressed as a static element composed of a concrete column and beam structure. The programme, requires a level of flexibility, uses modular steel sections which allows for the growth and recession of the building. Further this is a response to the existing building, where the new building adopts a lighter more flexible approach.



## SERVICES AND SYSTEMS

The servicing of the building refers to the way in which systems and methods are employed to ensure functioning of the building. In line with the conceptual idea, process involved in the servicing of the building embodying a high level of legibility, in the way in which it consumes, distributes, and disposes resources. Here systems of water management, drainage, ventilation, thermal comfort, climate control and circulation will be discussed.

### WATER MANAGEMENT

Water management within the facility looks at using the roof as a means of harvesting rainwater, and then re-using it within the building, for flushing of wc's, washing hands and washing clothes. Potable water will be provided by municipal water source. The primary method of water heating will be a solar collector, with hot water storage in close proximity to the point of use. All sanitary fittings are water efficient.

### FILTRATION

A combination of filters are used to address the cleaning of water collected off the roofs, based on the requirements of the program, this process is as follows:

- A coarse sand filter (removing large particles),
- A sand –granular activated carbon filter (removes fine particles),
- And an ultraviolet (UV) filter will neutralises most pathogens found in water.

All filters employed use pumps and will operate under pressure.

### STORAGE

Water storage tanks are calculated based on the requirements of programme; locally manufactured ABECO water storage tanks are used.

Abeco tanks are unaffected by light penetration, easy and quick installation

The maximum depth of tank size is 4 panels (4880mm deep)

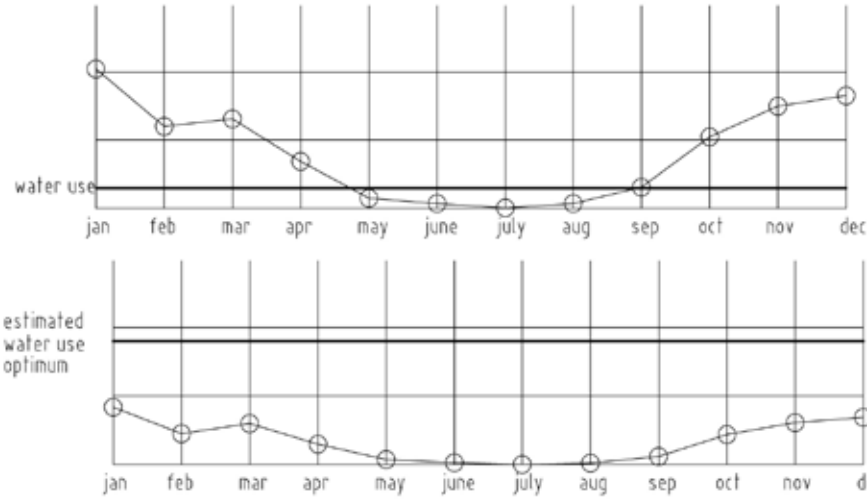
Panel sizes are 1220 x 1220 in thicknesses of 3mm 4,5mm and 6mm

### HEATING

The use of a solar collector is employed and fitted on the level of the reservoirs to heat water mainly for the use of washing machines.

The solar system tracks the sun on two axes thus gaining optimum sun throughout the day.

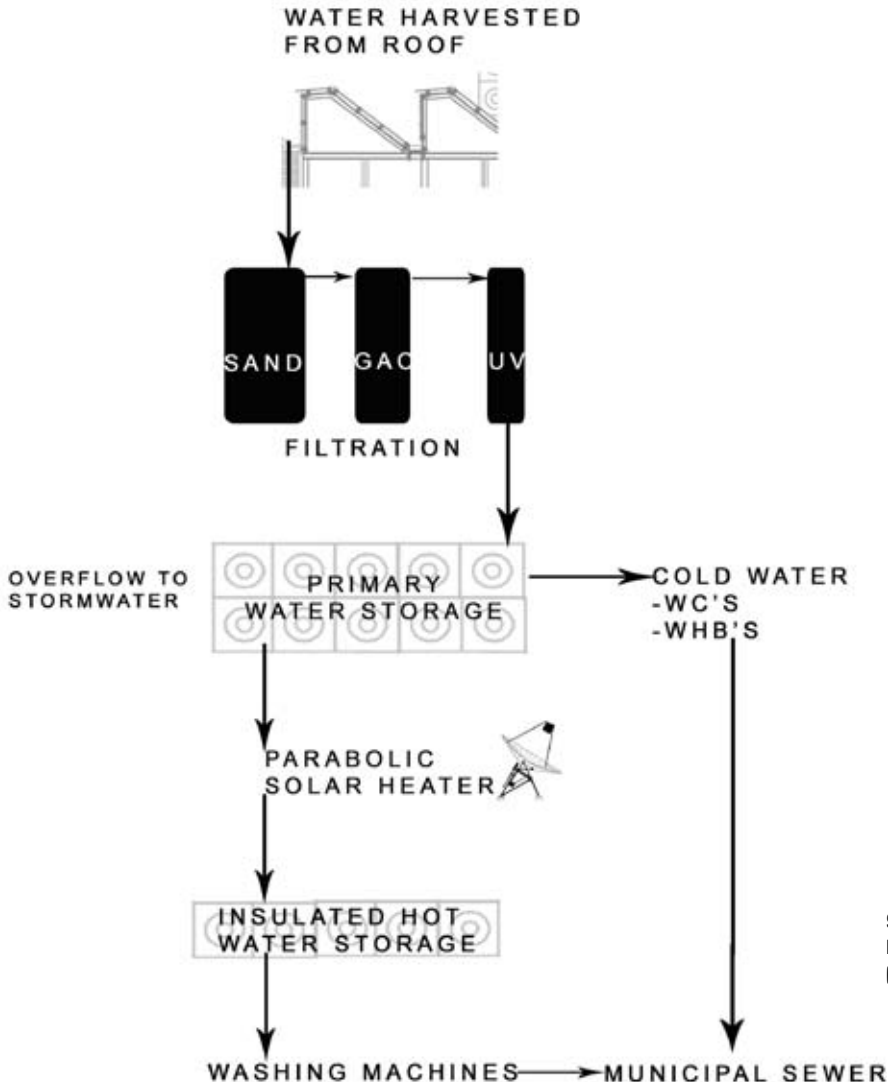
The parabola focuses the heat to a point, through which the pipe containing water would pass through, standard copper pipes would be used, further painting the pipes black would increase the heat absorption.



93. WATER USED IN PRODUCTION FACILITY (BARRACK) (AUTHOR, 2010).

94. WATER USED IN PUBLIC INTERFACE (ARENA) (AUTHOR, 2010).

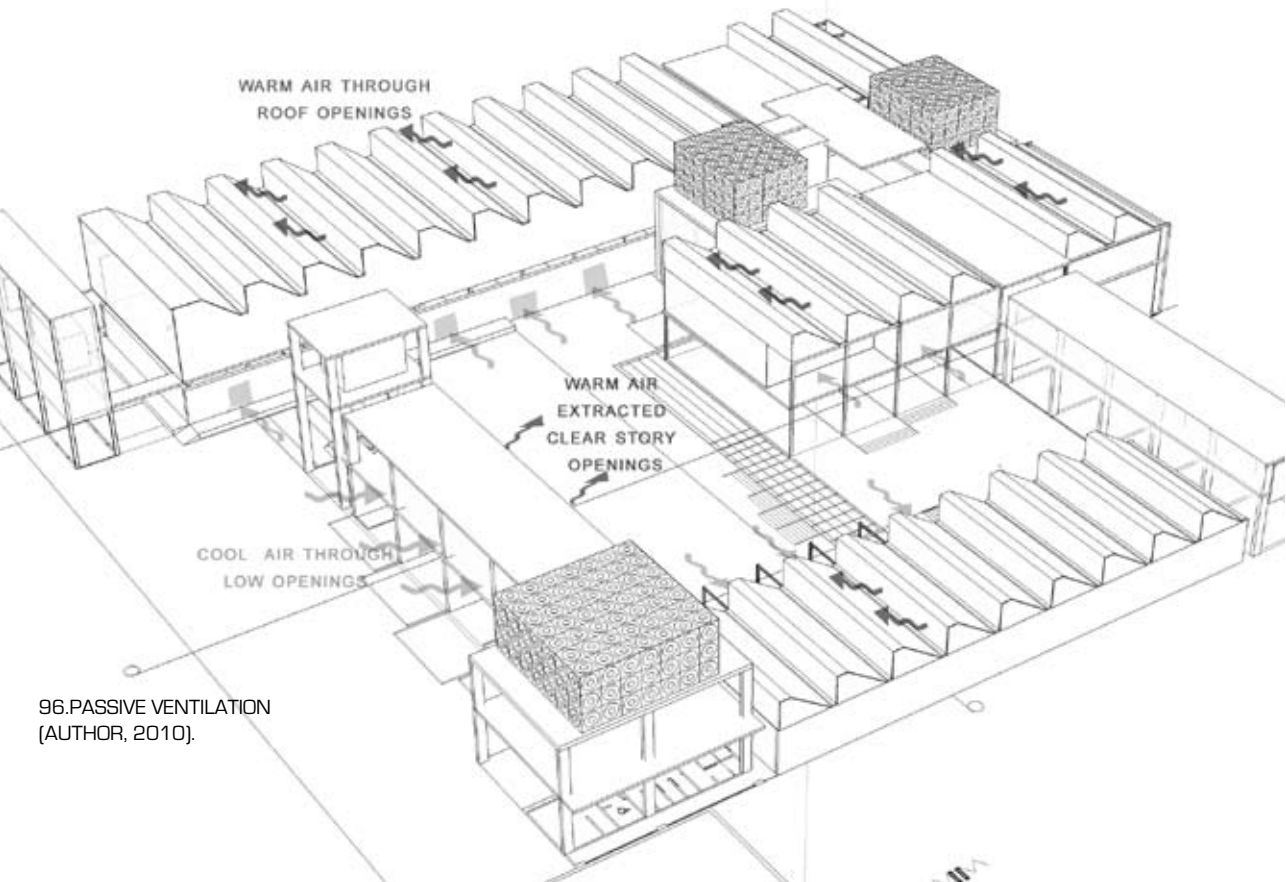
There is a surplus of water collected for consumption within the barrack; the excess water can be reticulated to for use within the arena.



95. WATER HARVESTING PROCESS (AUTHOR, 2010).

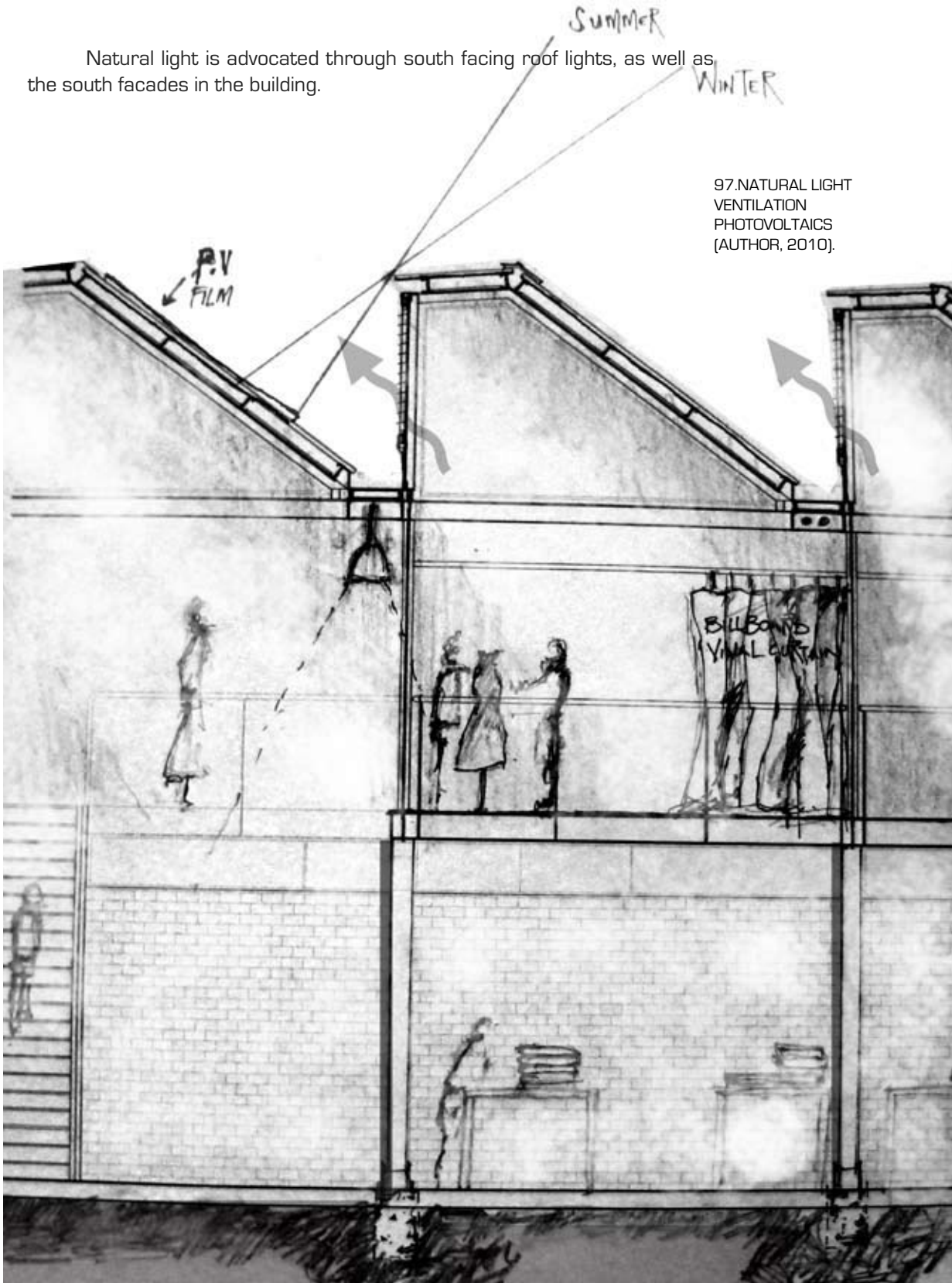
## PASSIVE VENTILATION

Natural ventilation is advocated within the building through the roof structure. Automated glazed louvers allows for a measure of control over ventilation conditions.





Natural light is advocated through south facing roof lights, as well as the south facades in the building.



97. NATURAL LIGHT  
VENTILATION  
PHOTOVOLTAICS  
(AUTHOR, 2010).

Mechanical lighting is based on average use and calculations, a lighting specialist would be consulted in order to generate accurate lighting requirements for the building.

ENTERTAINMENT 870 M<sup>2</sup>

SANS 0400 requires 50 lux /m<sup>2</sup>  
Lumens required = 43500  
One CFL light at 3250 lumens is 36watts  
14 lights required = 504 w/h  
504 w/h x 9 hours =4.5 Kw/h per day

PLANT ROOM 145M<sup>2</sup>

SANS 0400 requires 100 lux /m<sup>2</sup>  
Lumens = 14500  
One CFL light at 3250 lumens is 36 watts  
5 lights required = 180 w/h  
180w/h x 9 hours = 1.6 Kw/h per day

LOW RISK COMMERCIAL 600M<sup>2</sup>

SANS 0400 requires 300lux / 15m<sup>2</sup>  
Lumens required = 12000  
One CFL light at 1300 lumens is 18 watts  
9lights required = 162 w/h  
162w/h x 9 hours = 1.5 kw/h per day

OFFICES 385M<sup>2</sup>

SANS 0400 requires 500 / 15m<sup>2</sup>  
Lumens = 12833  
One CFL light at 1300 lumens is 18 watts  
10 lights required = 180 w/h  
180w/h x 9 hours =1.6 Kw / h per day

LOW RISK INDUSTRIAL 1525M<sup>2</sup>

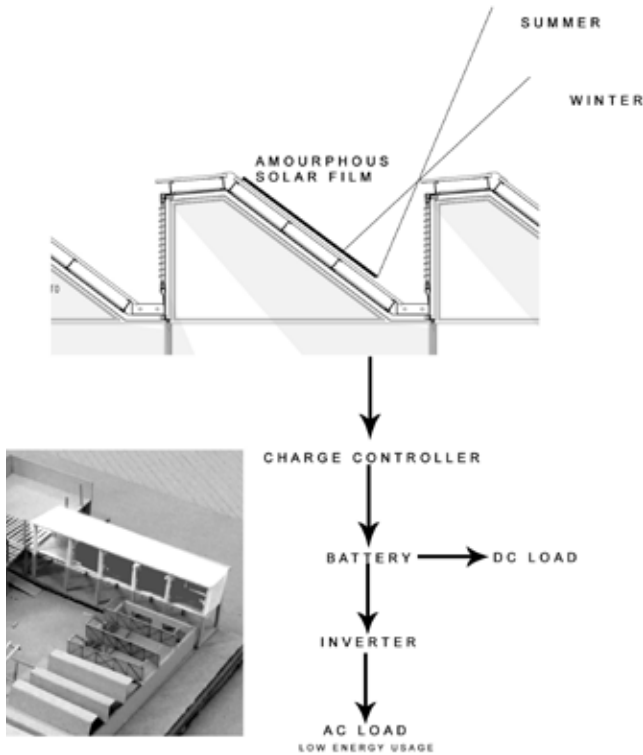
SANS 0400 300 lux / 15m<sup>2</sup>  
Lumens = 30600  
One CFL light at 3250 lumens is 36 watts  
10 lights required= 360 w  
360w/h x 9 hours = 3.2 Kw/h per day

STORAGE 150M<sup>2</sup>

SANS 0400 requires 300lumens / 50m<sup>2</sup>  
Lumens =900  
One CFL light at 450 lumens is 8 watts  
2 lights required = 16w/h  
16w/h x 9 hours = 144w/h per day

Total Kw/h needed per day = 12.5 Kw/h

The facility has a sufficient natural light during the day, therefore for energy requirements; approximately half of the lighting would be needed. Therefore approximately only 6 Kw/h would be required.



98.PHOTOVOLTAIC ENERGY PROCESS (AUTHOR, 2010).

Photovoltaic technology is still relatively expensive in South Africa, but due to the increase in demand for alternate energy the cost is decreasing. Photovoltaic's have an average of 12% efficiency, which is low as compared to conventional electricity, and is only used to power low energy appliances. Photovoltaics should be placed at an angle of the latitude plus 5 to 10 degrees. Pretoria has latitude of 25, 5 degrees, so an angle between 30 and 35 degrees would be an appropriate angle for the panels.

#### PANELS REQUIRED

A 2m<sup>2</sup> panel generate 250 w/h  
 500 panels at 2m<sup>2</sup> generates 125kw/h  
 There is an average of 6.5 light hours = 750 Kw/h per day

The requirements are calculated on lower energy consuming appliances

CFL lights 6 Kw /h per day  
 25 Sewing machines at 75w/h x 8 hours = 15Kw/h  
 15 Laptops at 45 w/h x 8 hours = 5.4 Kw/h

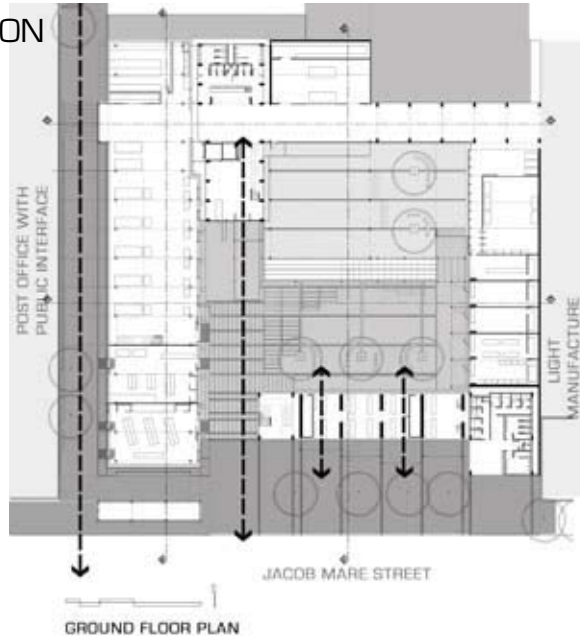
Average estimated daily use of low energy appliances 26.4 Kw/h

This is rounded off to 30 Kw/h required per day

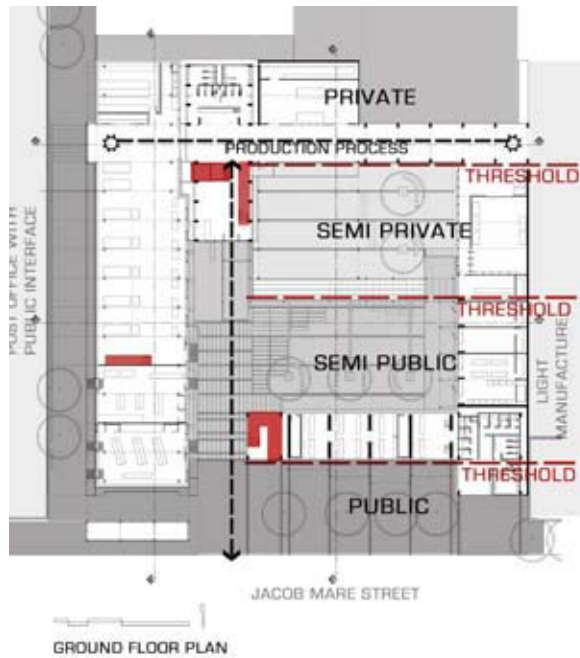
Therefore a 120m<sup>2</sup> panels would be required initially  
 240m<sup>2</sup> of amorphous solar film will be used

CIRCULATION

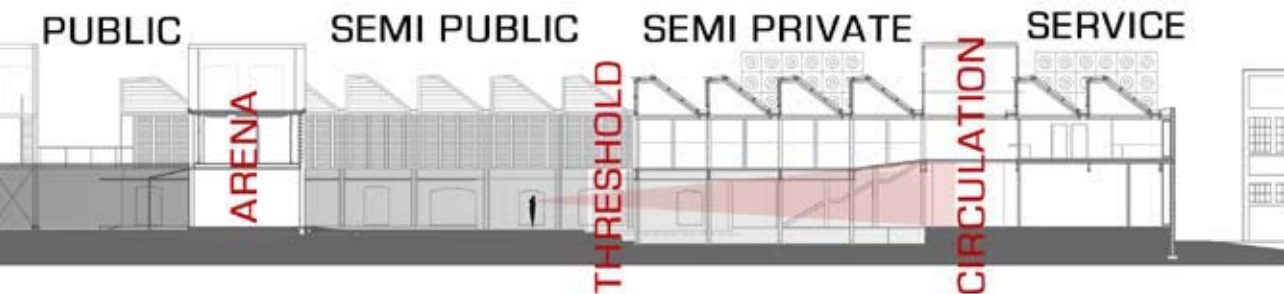
99. PUBLIC CIRCULATION  
(AUTHOR, 2010).

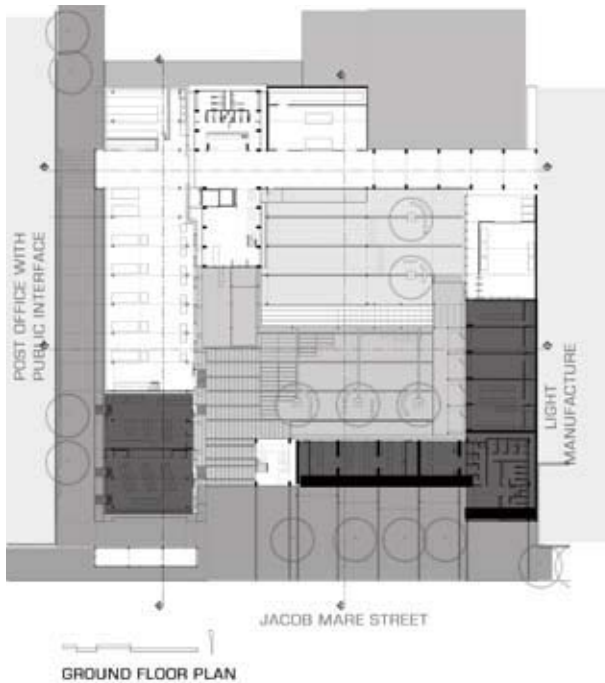


100. PROCESS CIRCULATION AND ZONING  
RED BLOCKS INDICATE VERTICAL CIRCULATION  
(AUTHOR, 2010).

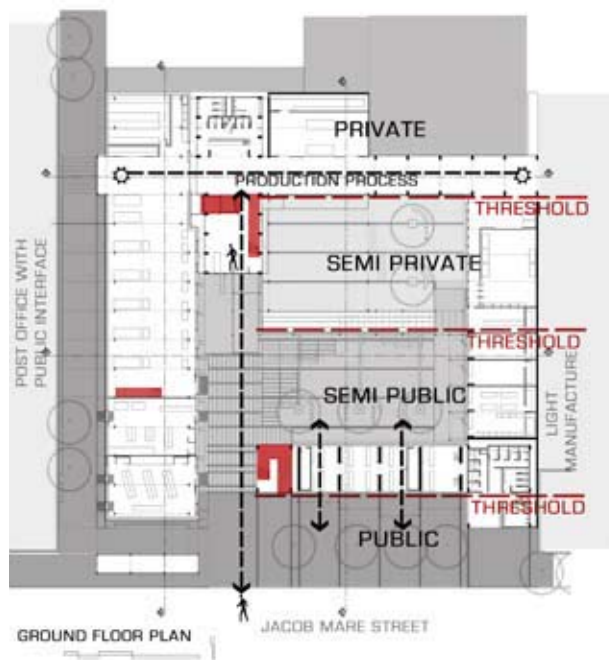


101. SECTION INDICATING THRESHOLD AND ZONING  
PUBLIC ENGAGEMENT OCCURS BOTH VISUALLY AND PHYSICALLY ON SITE  
(AUTHOR, 2010).



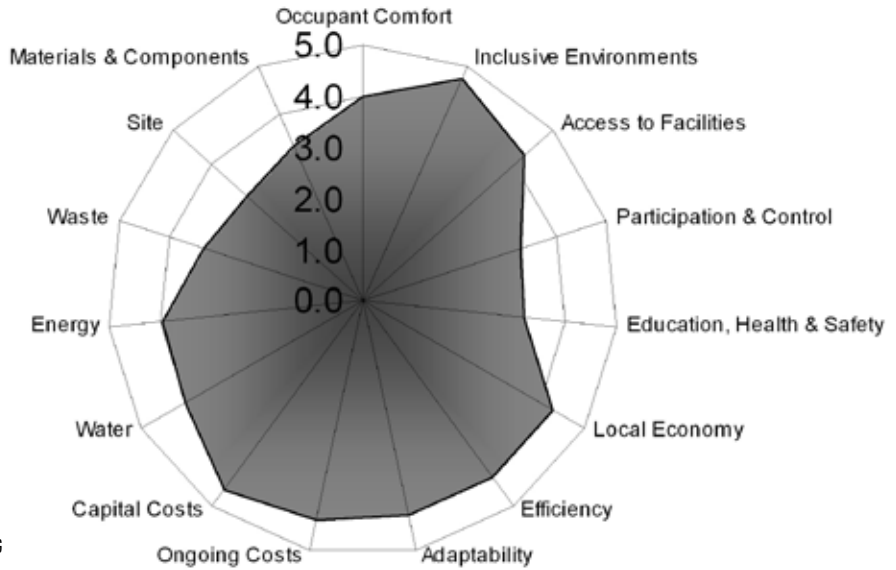


102.PUBLIC ACCESSIBILITY WITH BLACK BLOCKS INDICATING FAST INTERACTION . EG. ABLUTIONS AND SEMI-FORMAL TRADE (AUTHOR, 2010).



103.CIRCULATION PATTERNS OVERLAYED , PUBLIC AND PROCESS FORM A SYMBIOTIC RELATIONSHIP (AUTHOR, 2010).

Circulation refers to the way, in which the facility is occupied, by people and the production process. Primary movement of people occurs in a north south direction on site, and production process on an east west axis. In this facility the process of production and public entwine, to avoid the viewer and viewed experience, the public engage in part of the process, e.g. repair, distribution, and recycling of textiles



104.SUSTAINABLE BUILDING ASSEMENT TOOL MODEL (AUTHOR, 2010).

The SBAT© system is a tool which aids in rating a building according to its response to context, looking at the economic , environmental and social impacts .The system is aimed at developing countries to further awareness of the impact which buildings have on its environment, (Gibebert,2009) The tool is (spreadsheet format) , used as an assessment to measure the building both during the design process as well as post construction .

There are 15 sets of objectives, under the headings of economic, environmental and social, that has been analysed in the building. The system should be regarded as an estimate of the buildings performance, a more specific assessment would be conducted in order to present more accurate results.

## BUILDING DOCUMENTATION

AFRICAN WINDOW MUSEUM

SCHUBART STRE

MINNAAR STREET

STREET PARKING

STREET PARKING

SITE ENTRY/EXIT

FURNITURE WORKSHOP

OFFICES

PARKING

FURNITURE WORKSHOP

PARKING

OFFICES

STORAGE

EXISTING POST OFFICE  
HEADQUARTERS

PEDESTRIAN LINK THROUGHFARE

PARKING

EXISTING FIRESTATION

BUILDING

MATERIAL

PARKING

PARKING

STORAGE

OFFICES

STORAGE

MATERIAL STORAGE

ELECTRICAL WORKSHOP

JACOB MARE STREET

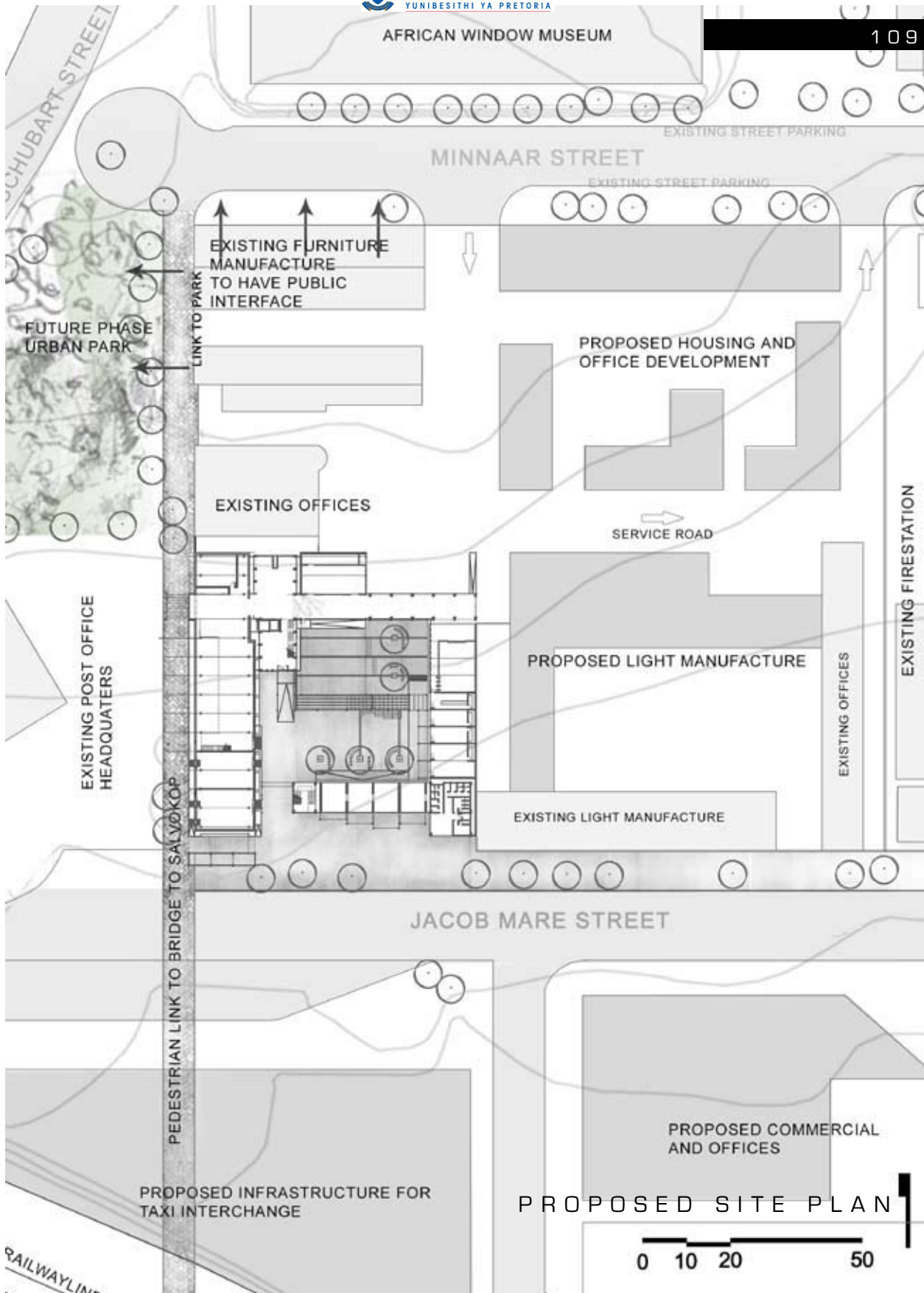
EXISTING TAXI INTERCHANGE

FORMER DAIRY MALL  
CURRENT BROWNFIELD SITE

EXISTING SITE PLAN

0 10 20 50



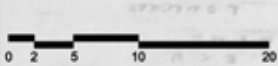
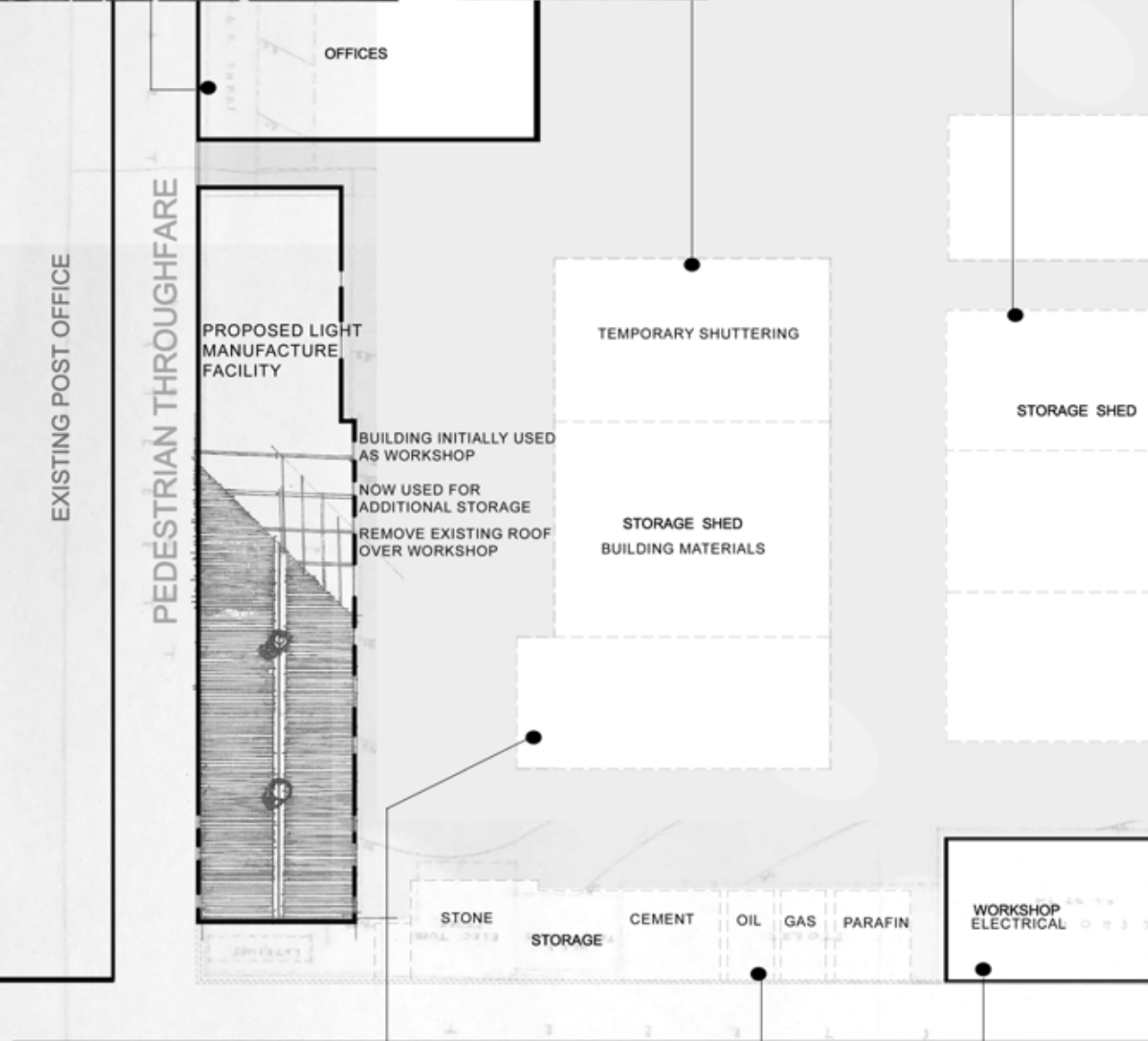


PROPOSED SITE PLAN

0 10 20 50

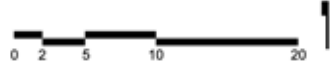
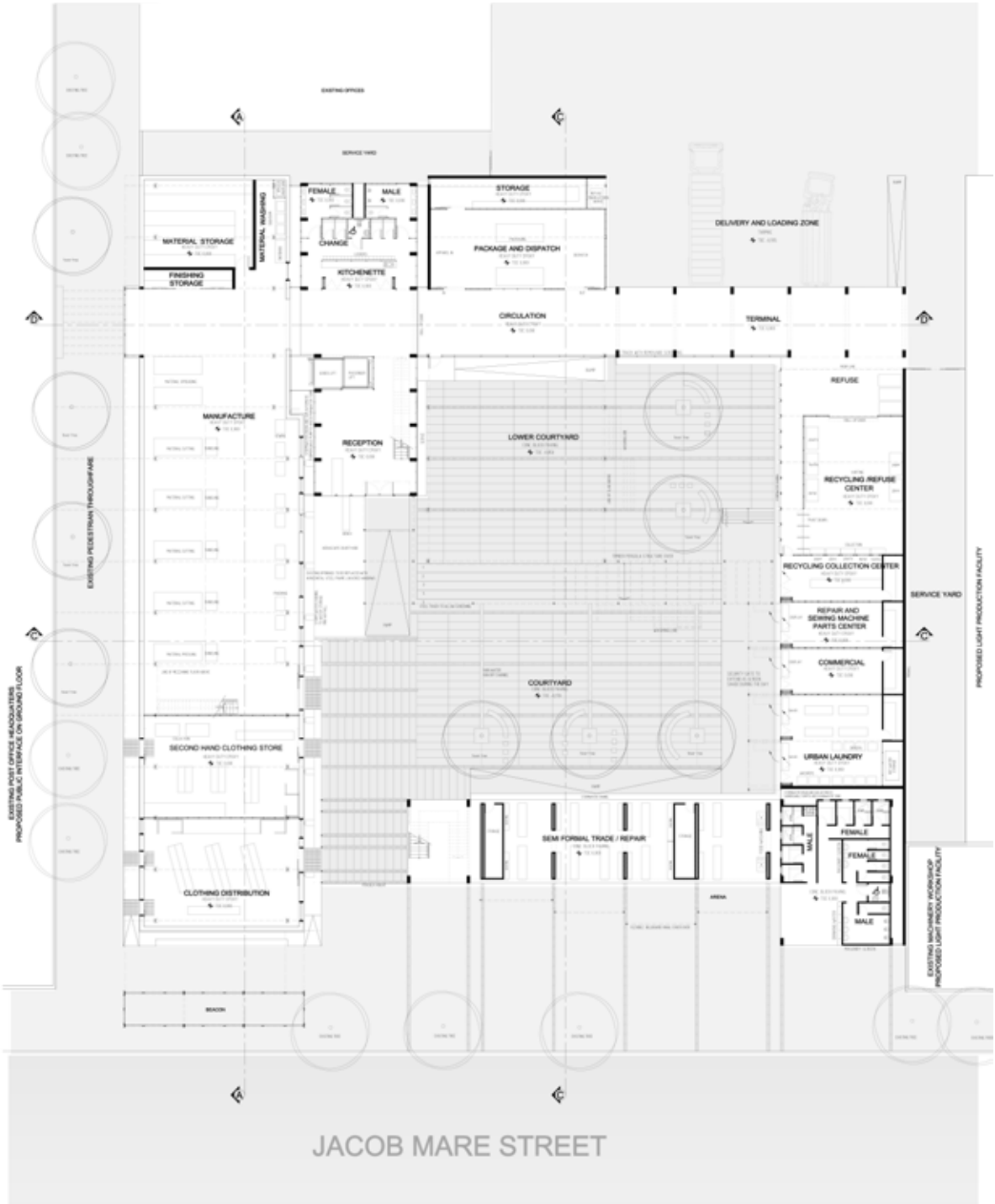


UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

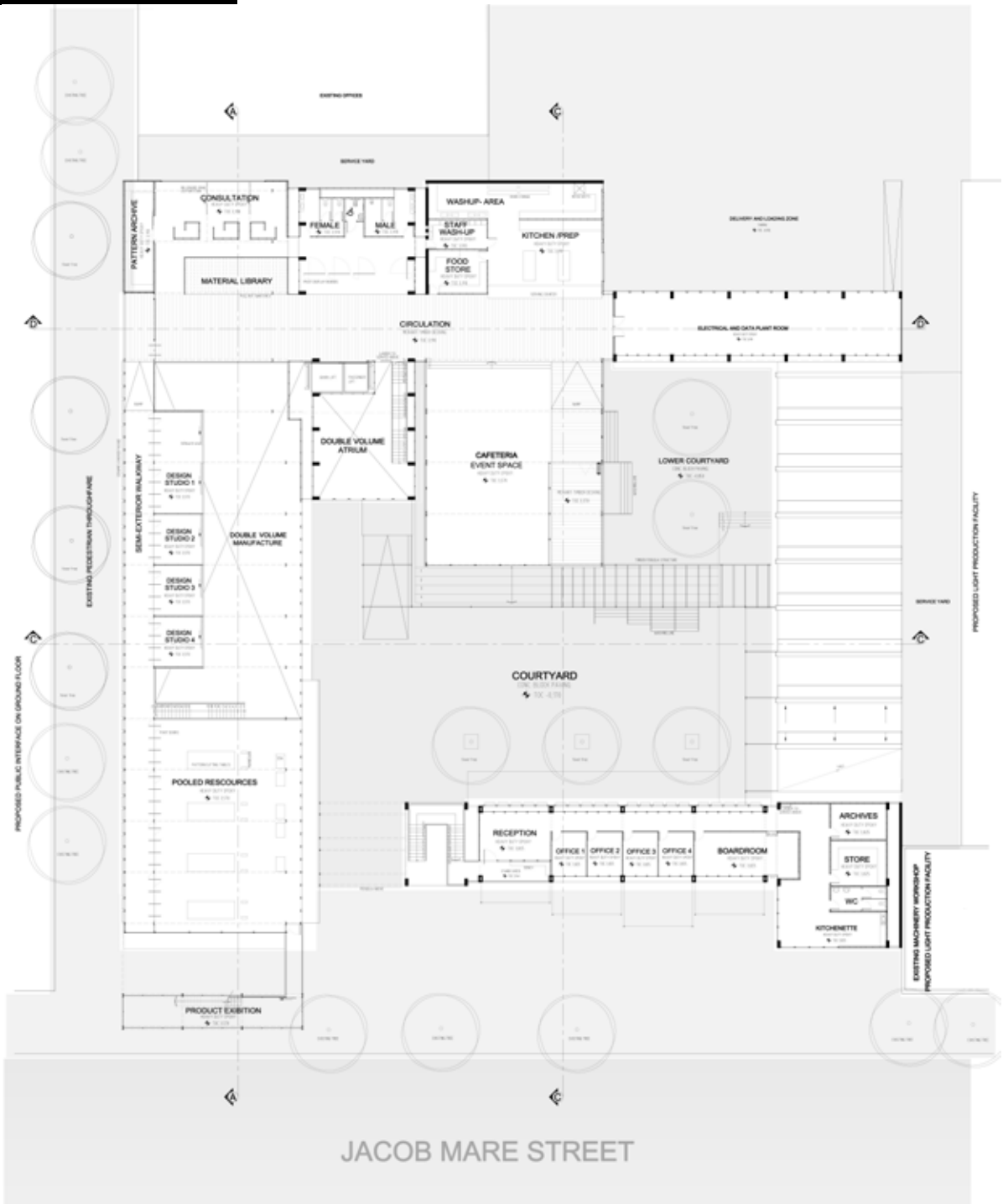


DEMOLITION PLAN

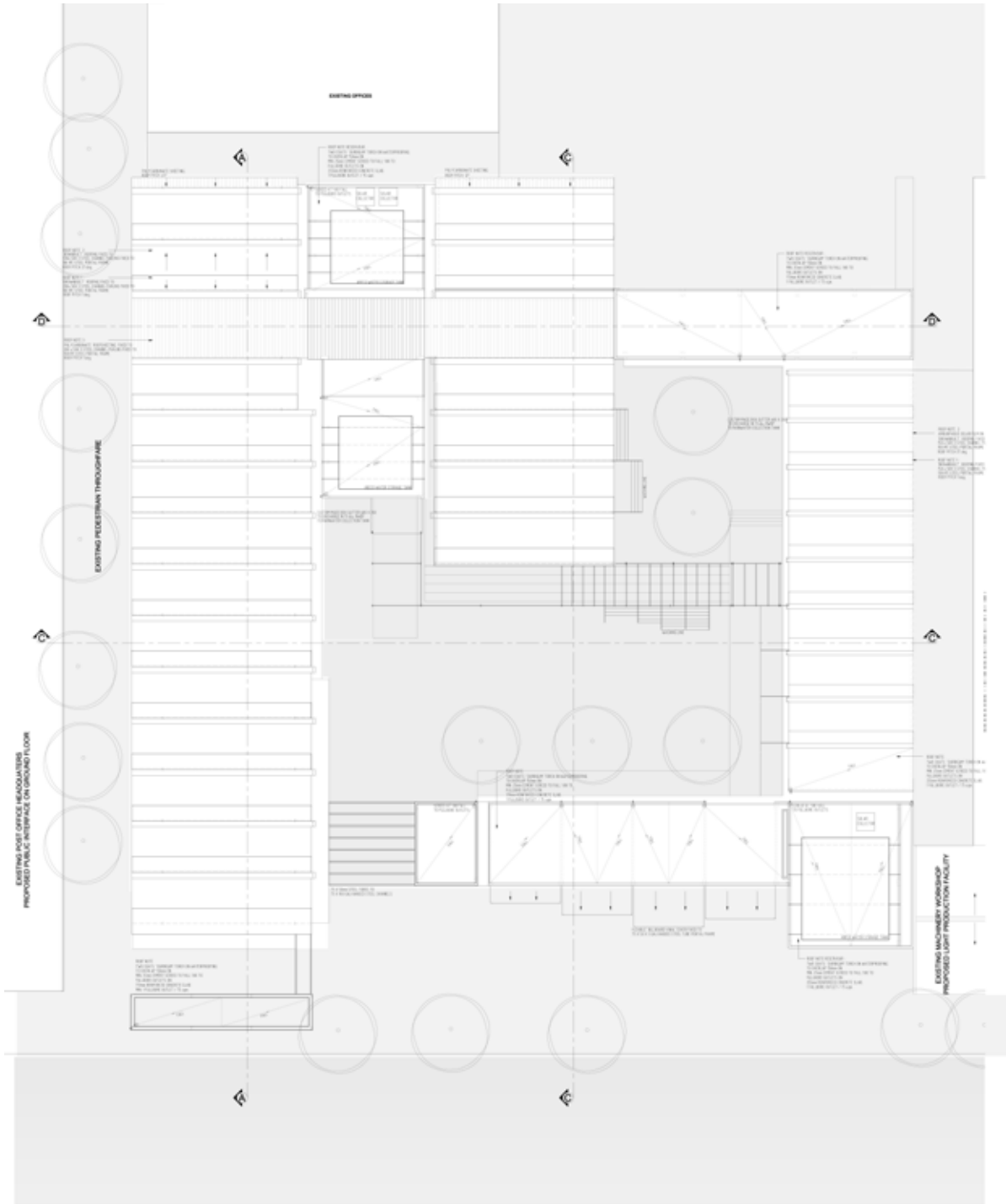




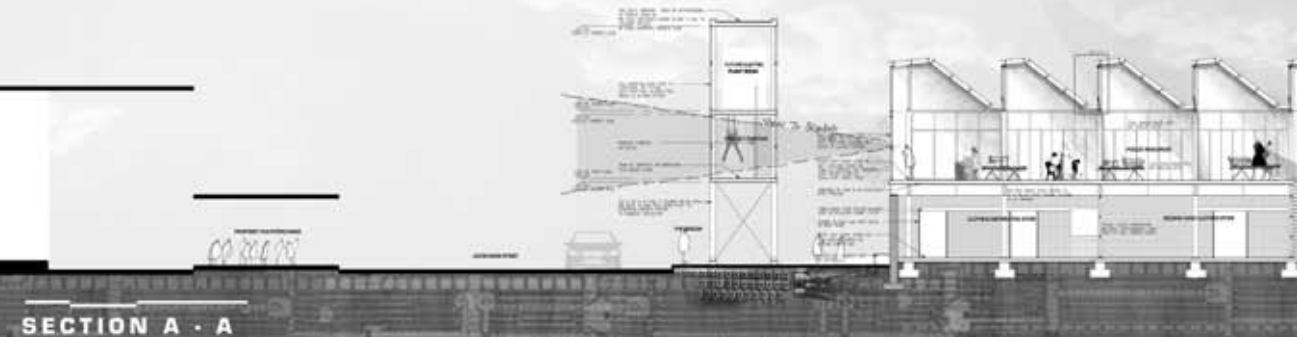
GROUND FLOOR PLAN



FIRST FLOOR PLAN



ROOF PLAN



SECTION A - A



10,585 U/S CONCRETE SLAB

9,800 SPL SECOND FLOOR

6,670 U/S CONCRETE SLAB

9,485 SPL FIRST FLOOR

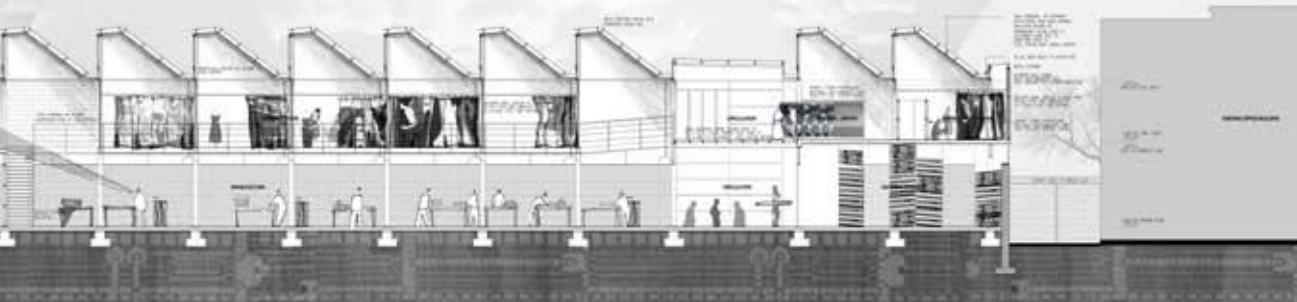
8,170 U/S CONCRETE SLAB

PROPOSED TAXI INTERCHANGE



JACOB MARE STREET





TWO COATS 'DURBIGUM' TORCH ON WATERPROOFING TO OVERLAP 150mm ON MIN. 25mm LIGHTWEIGHT SCREED TO MIN. 1° FALL TO 'DALLBORE' OUTLETS ON 255mm REINFORCED CONCRETE SLAB

FUTURE ELECTRIC PLANT ROOM

647 LAMINATED GLASS FIXED TO STRUCTURAL TEE SYSTEM WITH STRUCTURAL GLAZING TAPE REFER TO GLAZING SYSTEM

MODULAR STAIRCASES SEE DETAIL

175mm DC COMPOSITE 600 ROBERTSON STEEL DECKED FLOOR

254 X 254 X 70 STEEL H COLUMNS BOLTED WITH M8 BOLTS TO 5mm STEEL FIXING PLATE TO REINFORCED CONCRETE FOOTING TO ENGINEERS SPECIFICATION

THE BEACON

*VIEW TO Silyokop*

PRODUCT EXHIBITION

647 LAMINATED GLASS FIXED TO STRUCTURAL TEE SYSTEM WITH STRUCTURAL GLAZING TAPE REFER TO GLAZING SYSTEM

HEAVY DUTY EPOXY FLOOR ON SELF LEVELLING SCREED ON 175mm DC COMPOSITE 600 ROBERTSON STEEL DECKED FLOOR ON 320mm STEEL GIRDER TRUSS

UNDERSIDE OF SLAB TO BE PLASTERED WITH TYROLEM

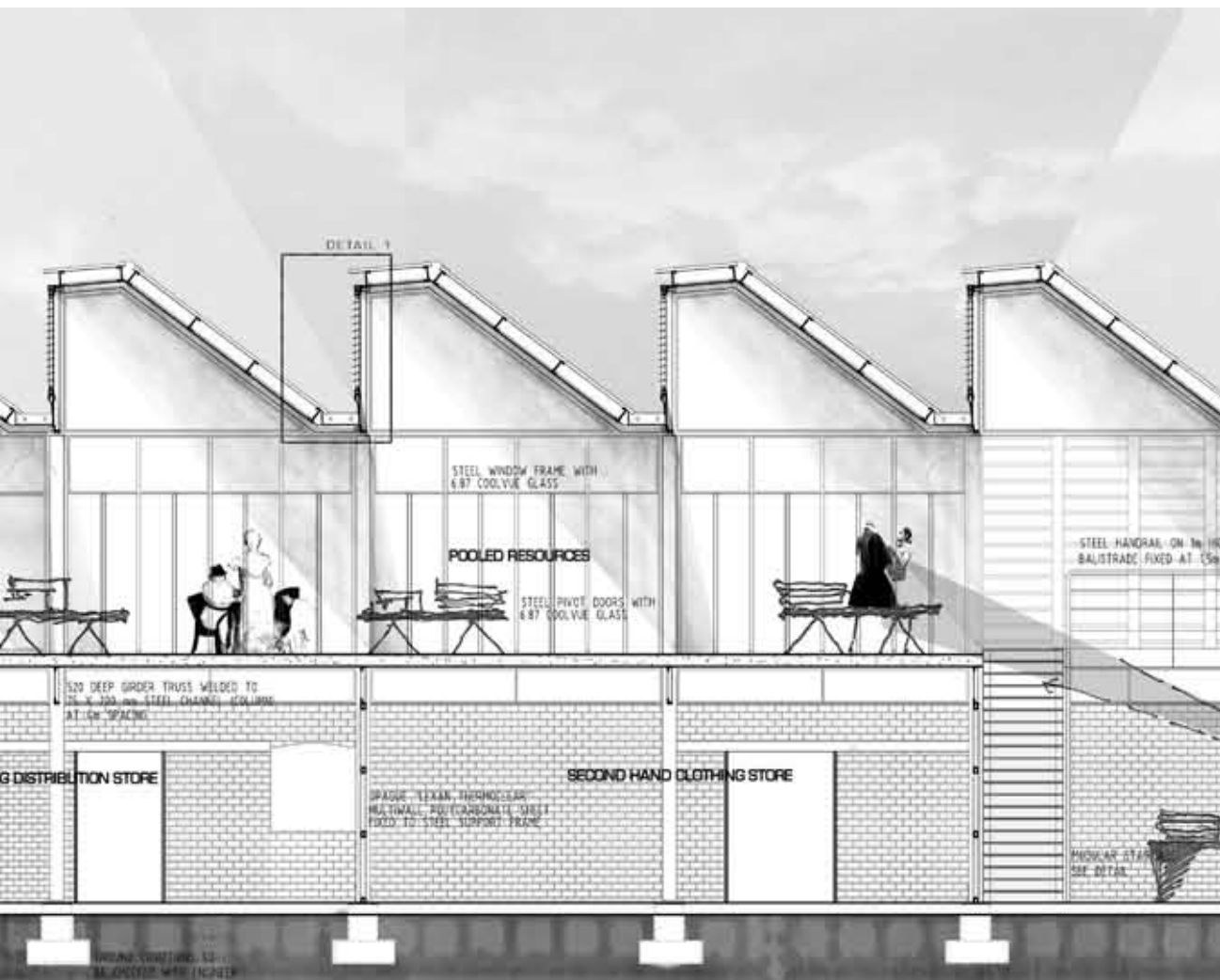
TIMBER DOORS FROM EXISTING BUILDINGS FIXED ON HILLALDAM SLIDING SYSTEM OPENING TO HAVE 4mm SHEET METAL AS DOOR FRAME

HEAVY DUTY EPOXY SCREED ON SELF LEVELLING SCREED ON EXISTING SUBGRADE

IN SITU CAST CONCRETE BASE AS SEATING

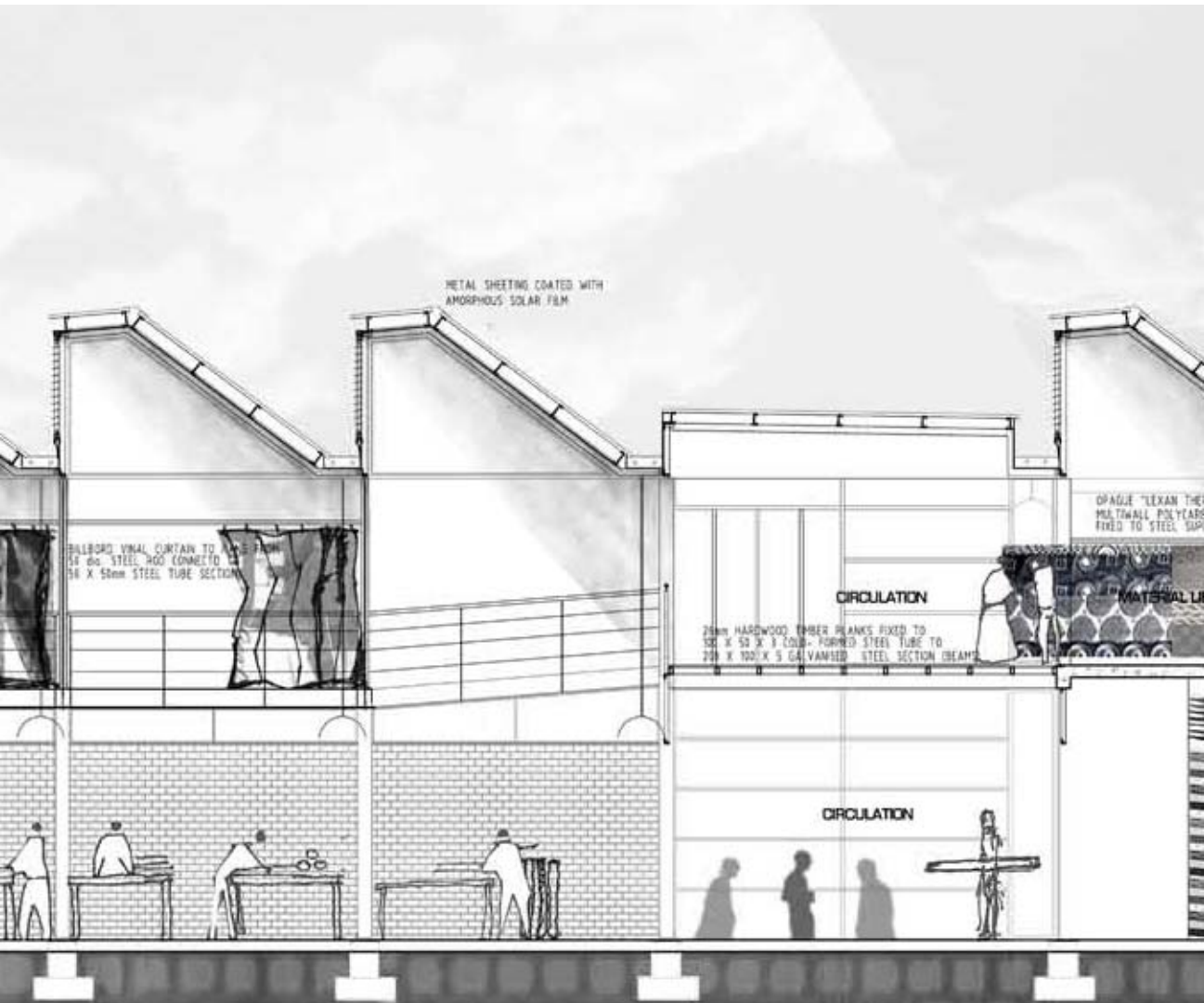


CLOTHING D

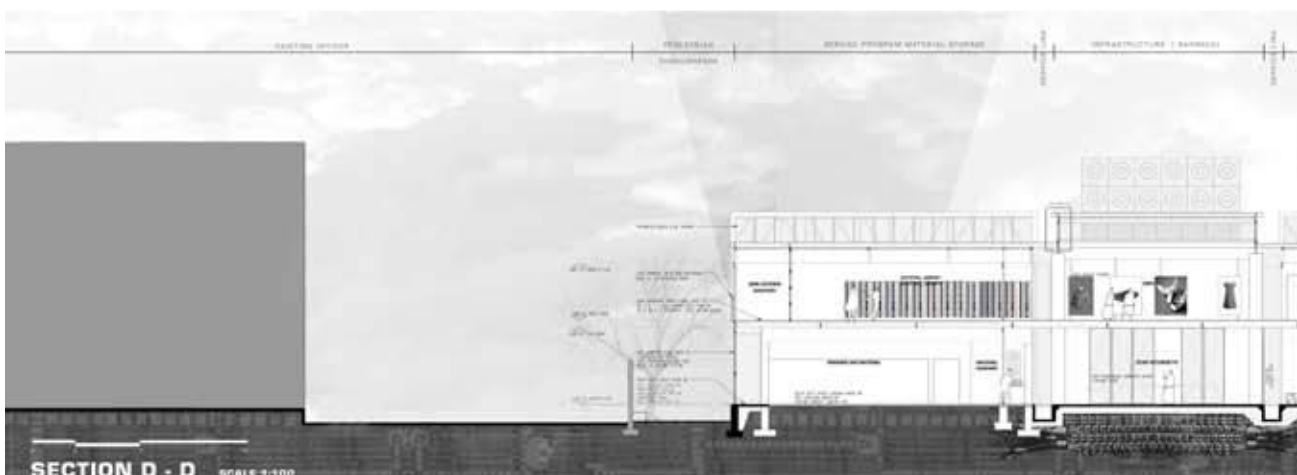
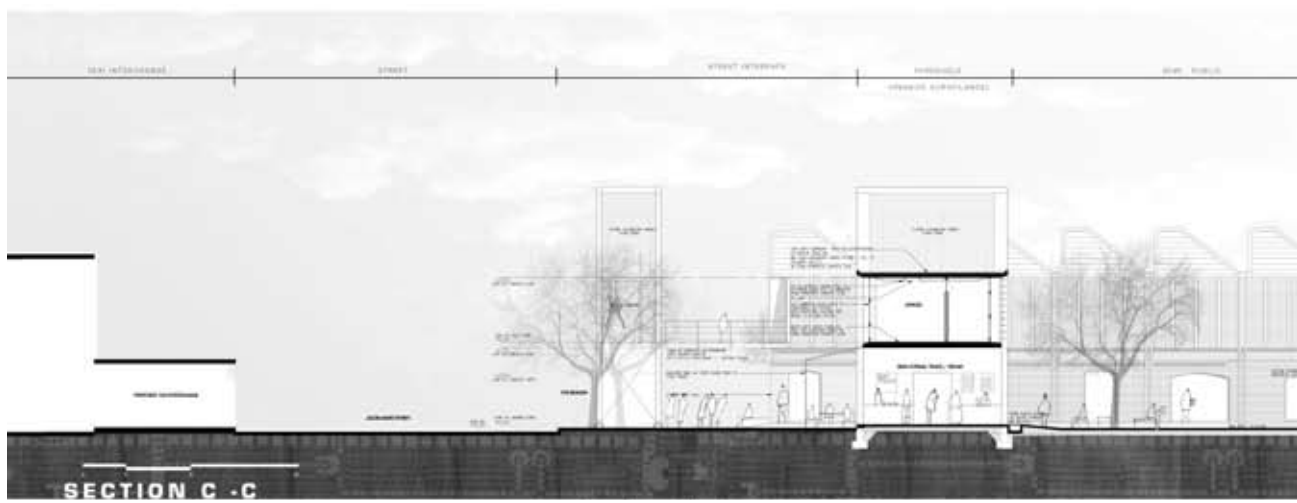
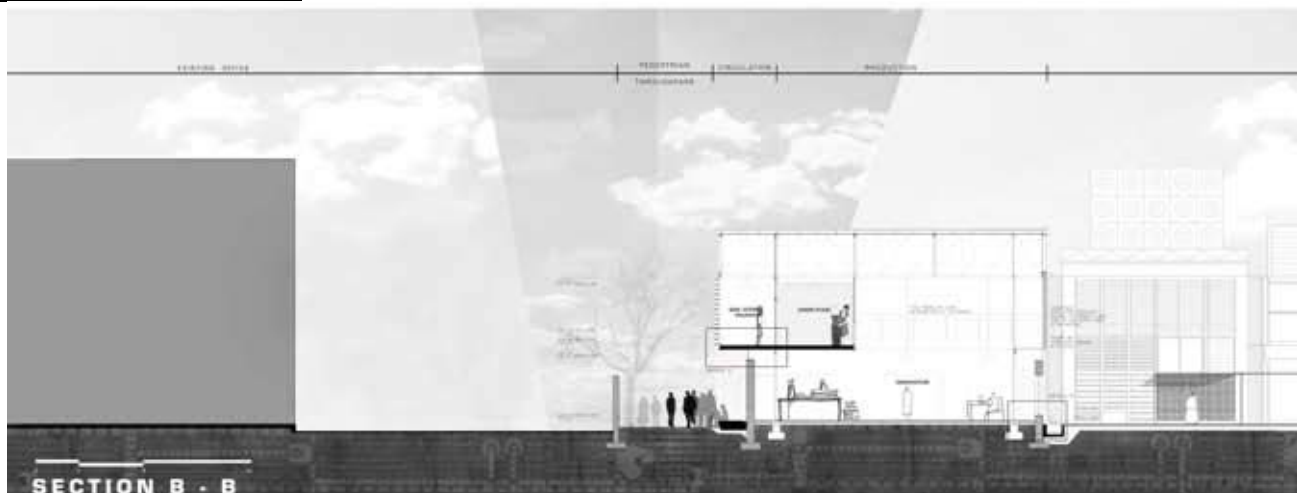


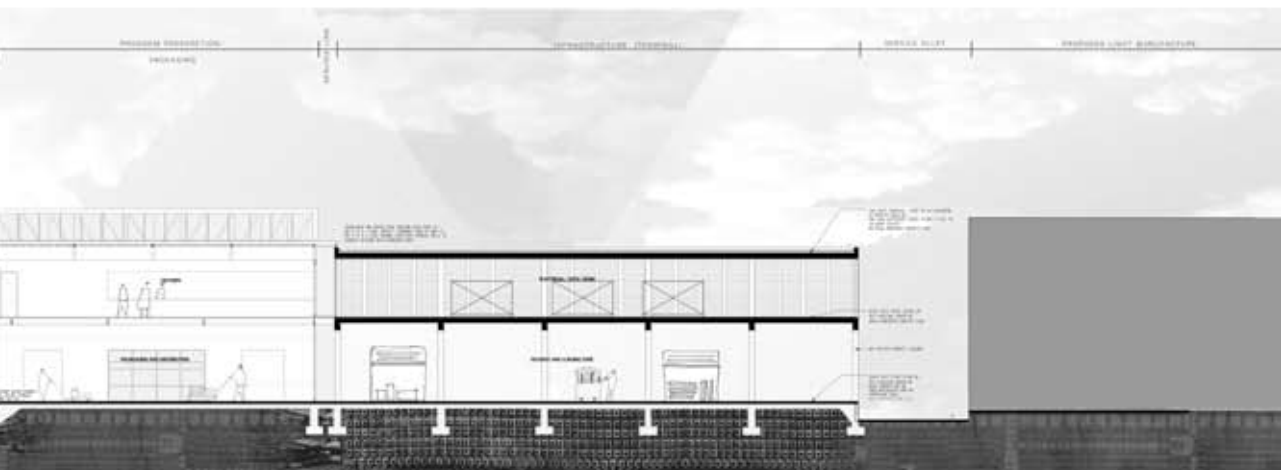
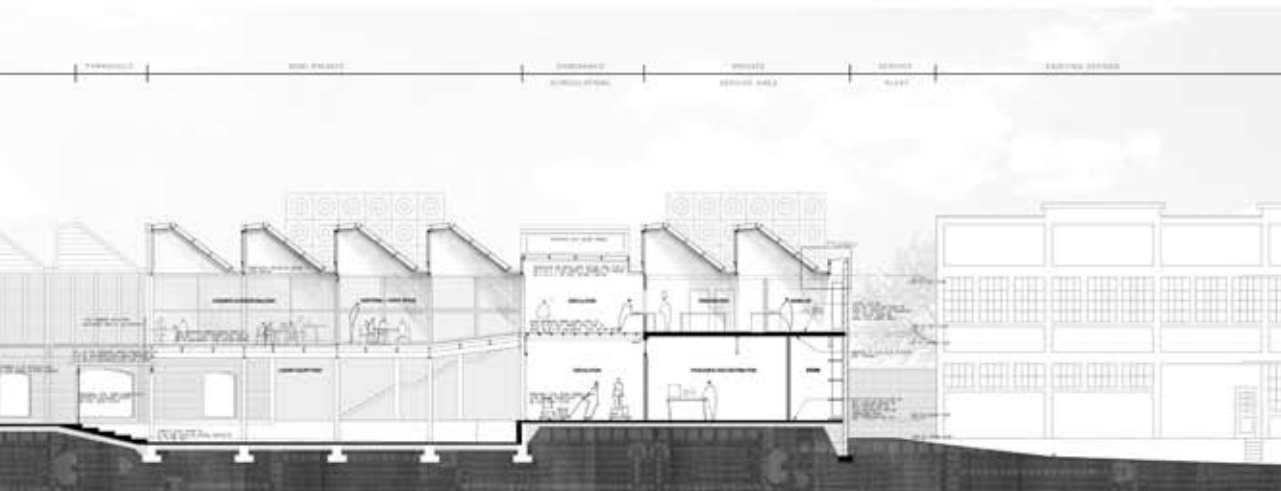
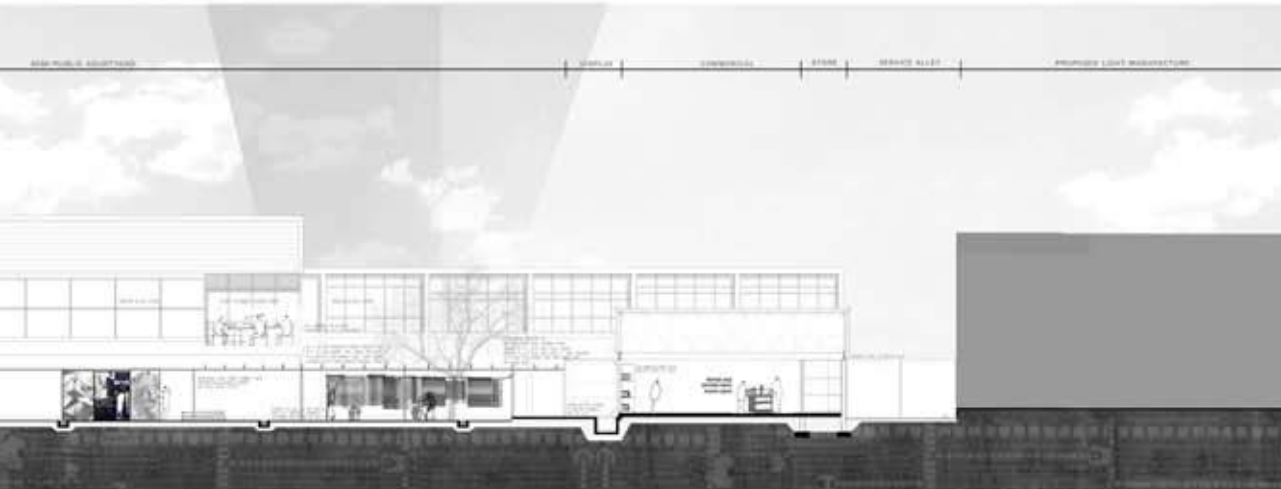


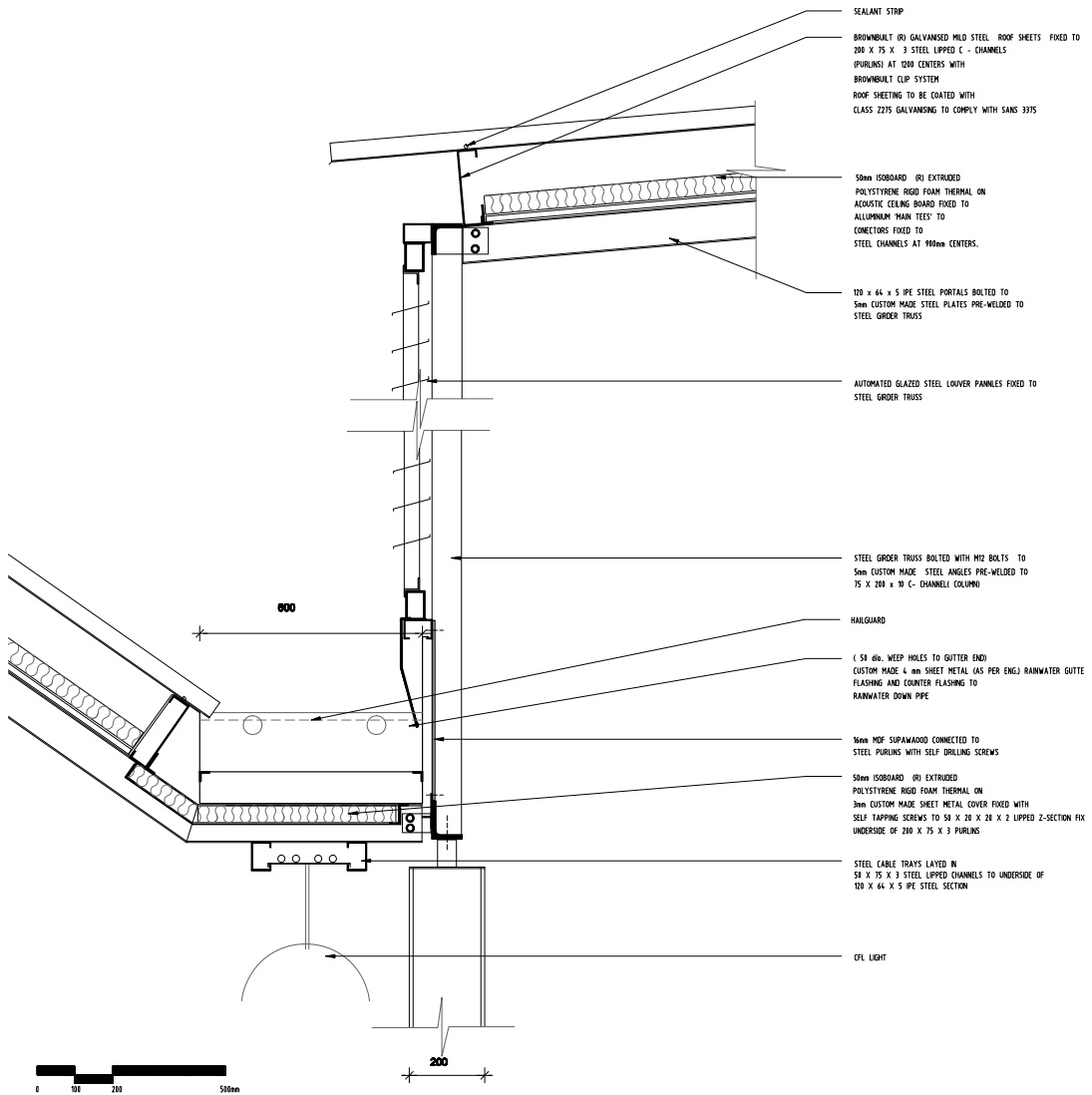




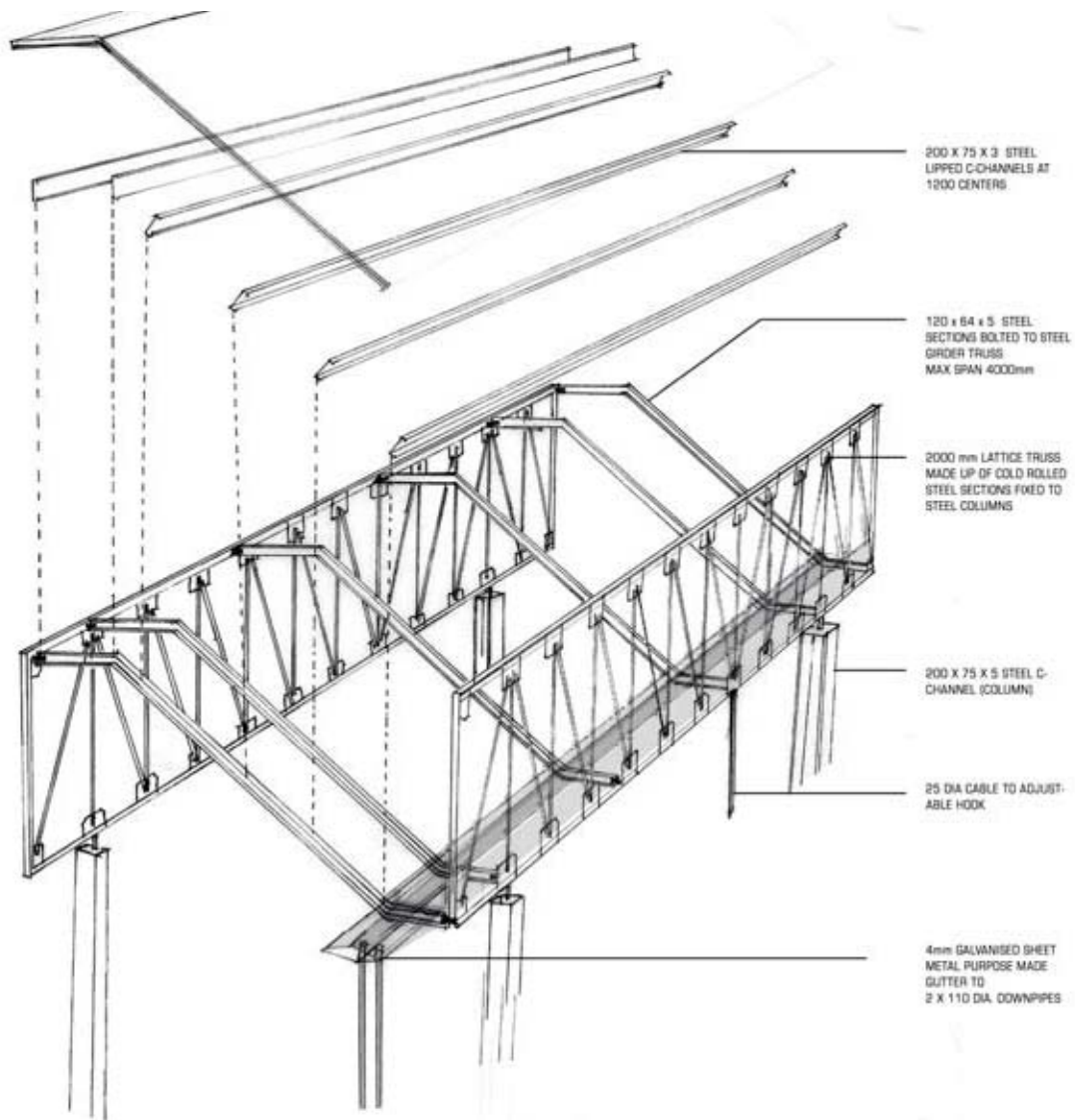


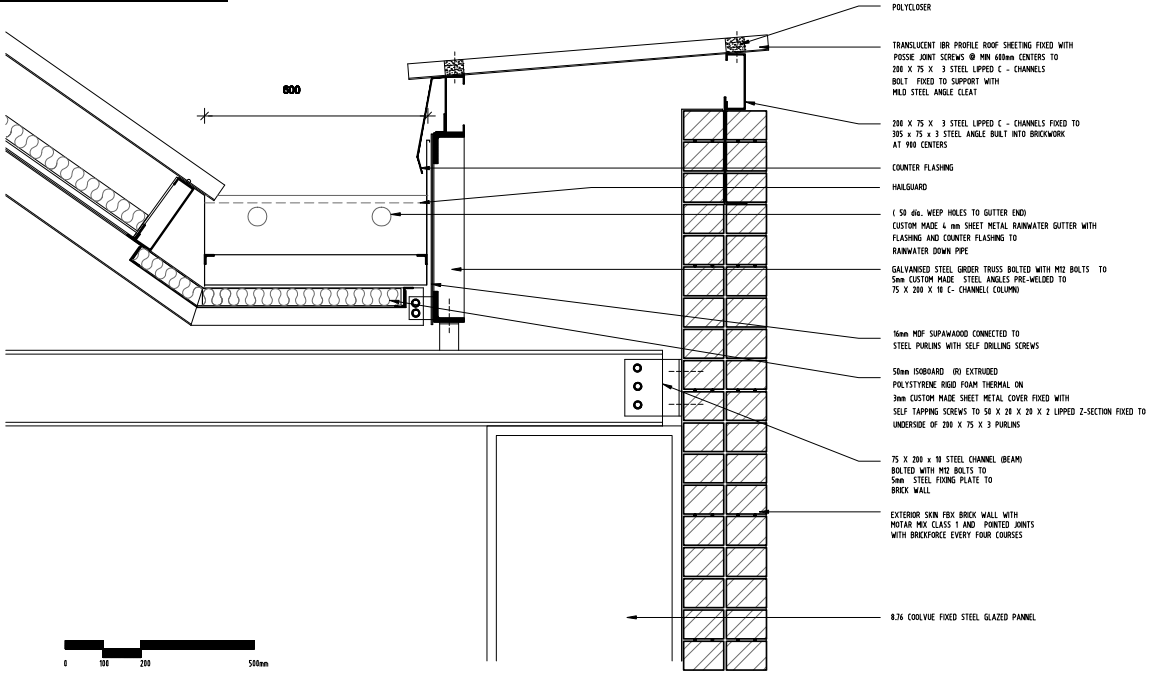




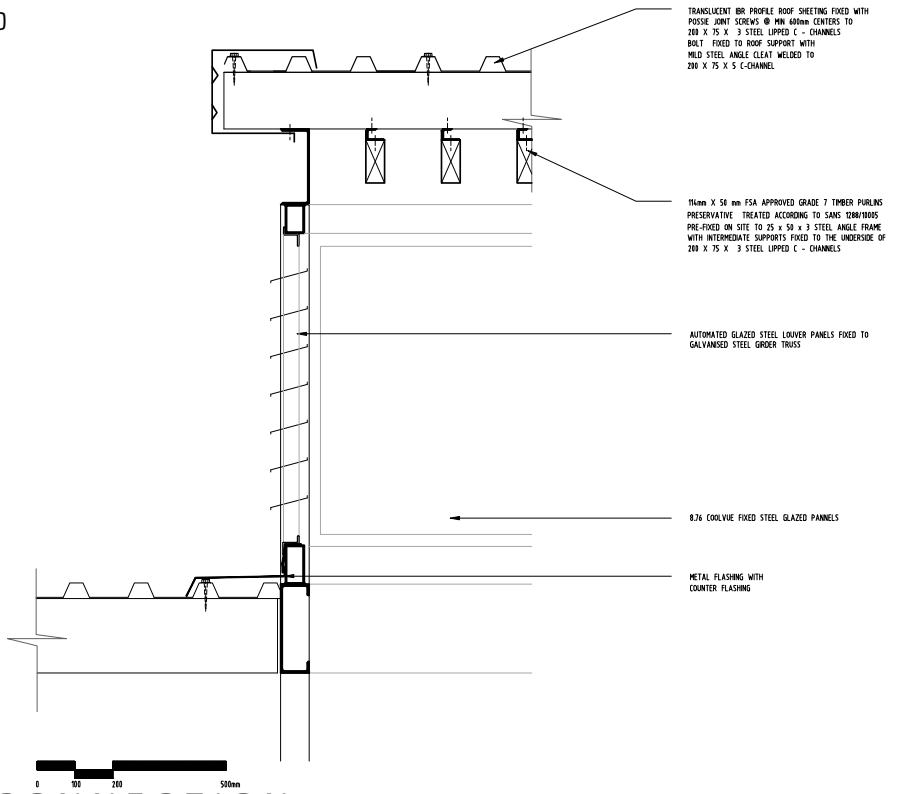


1. ROOF CONNECTION  
SCALE 1 : 20



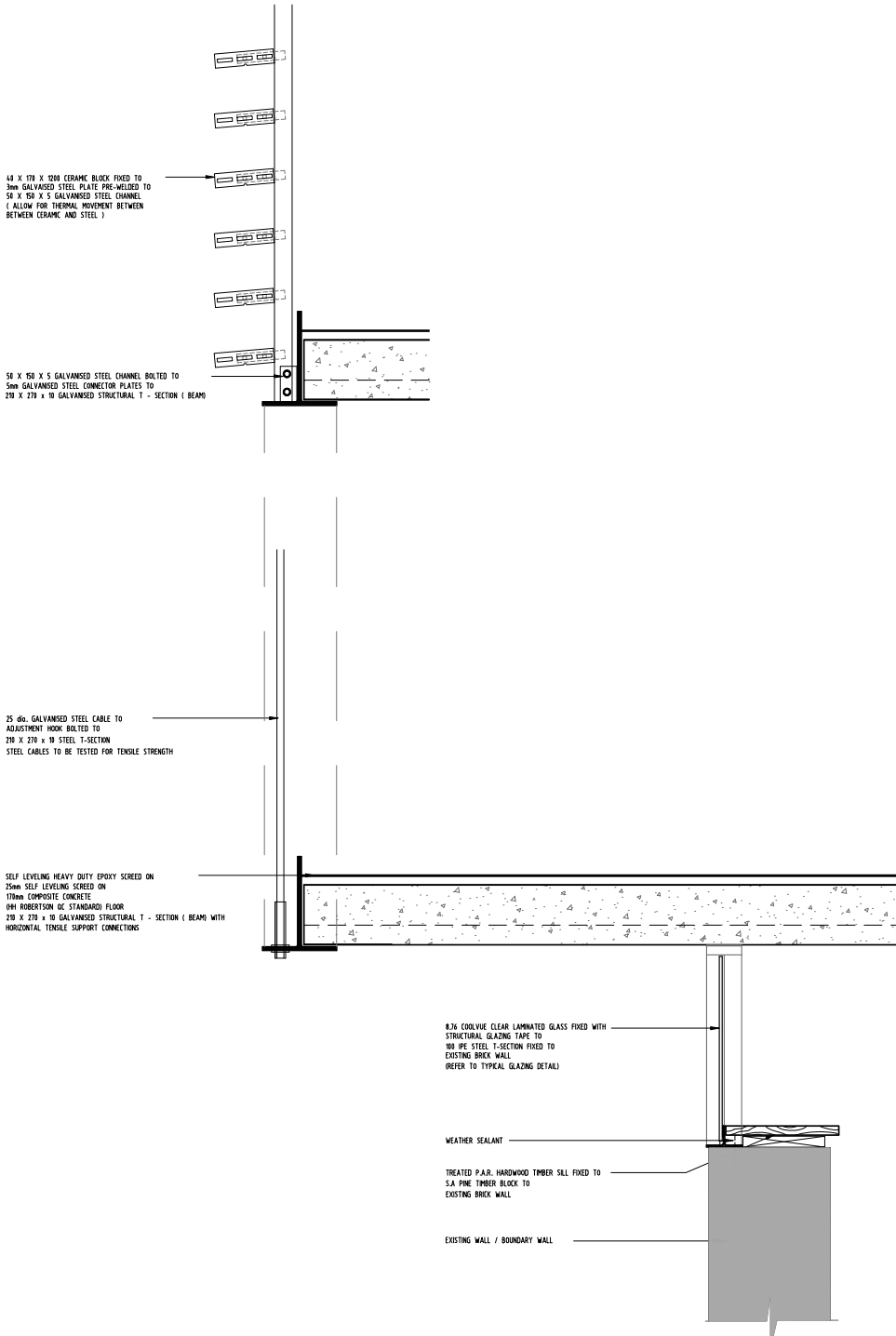


2. ROOF CONNECTION  
SCALE 1 : 20

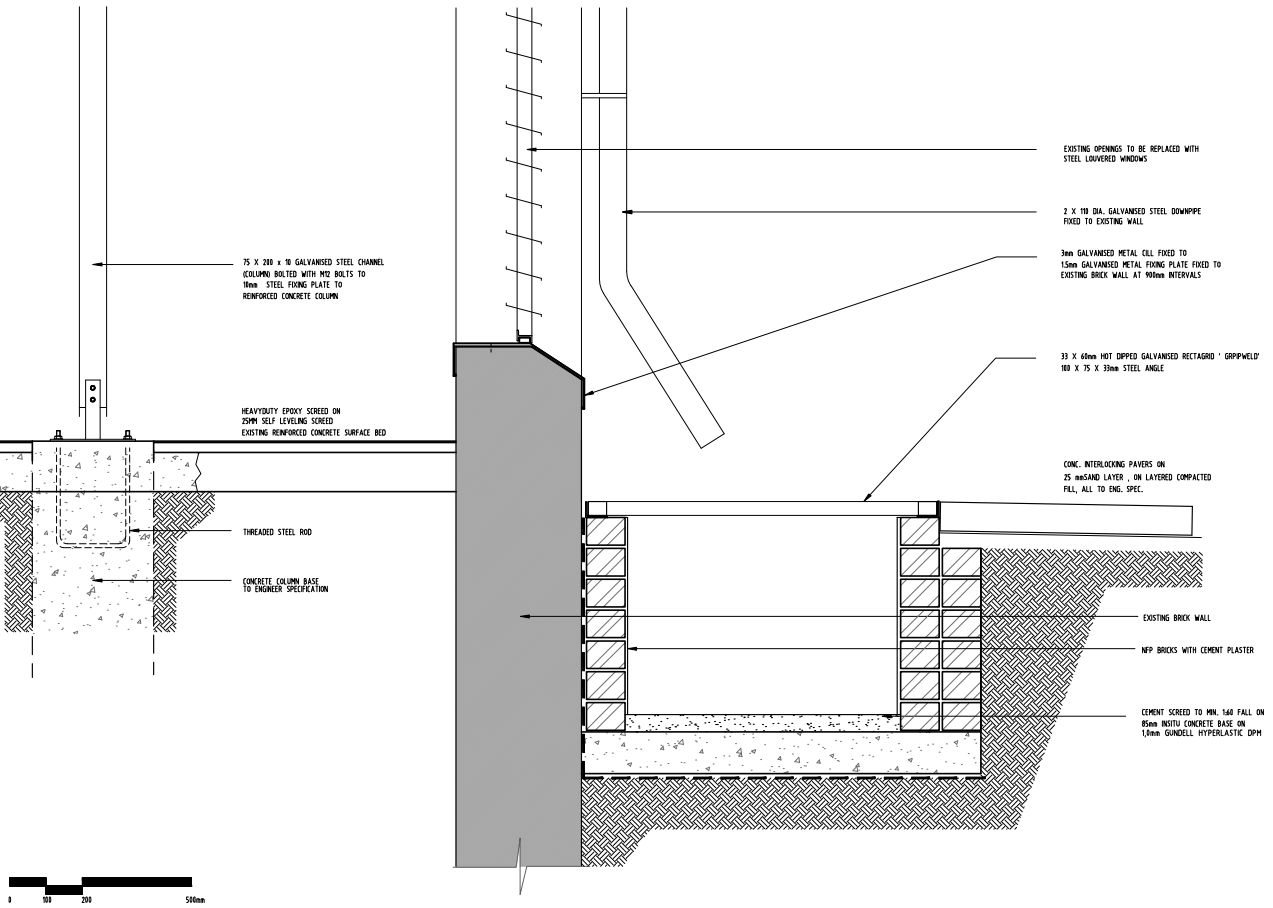


3. ROOF CONNECTION  
THROUGH CIRCULATION  
SCALE 1 : 20

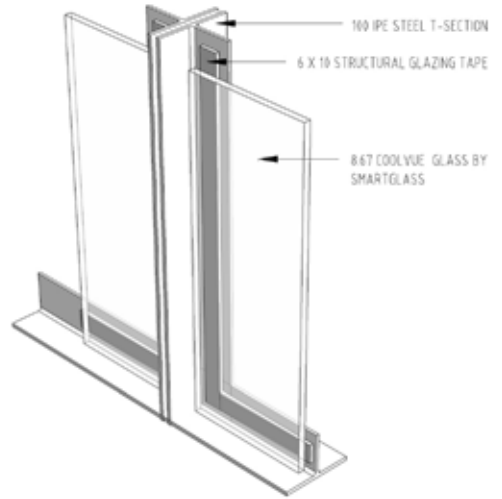
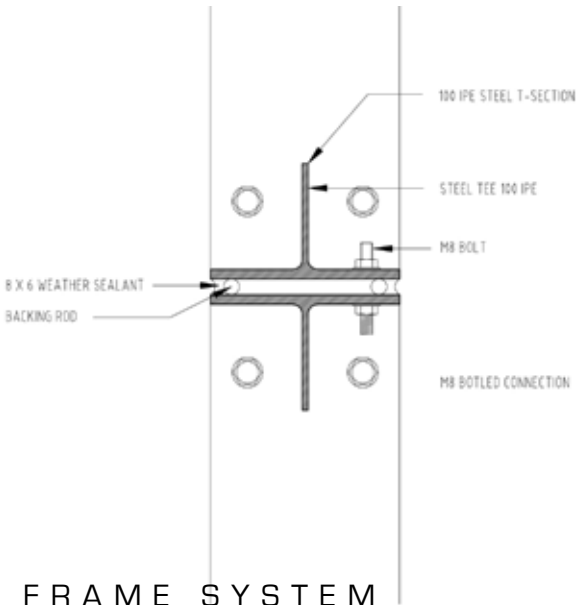




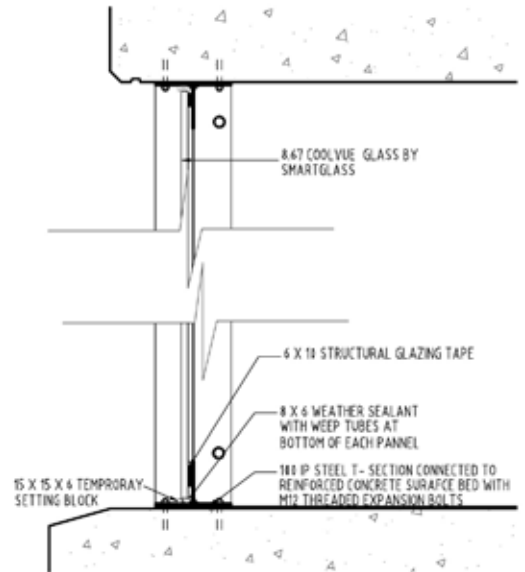
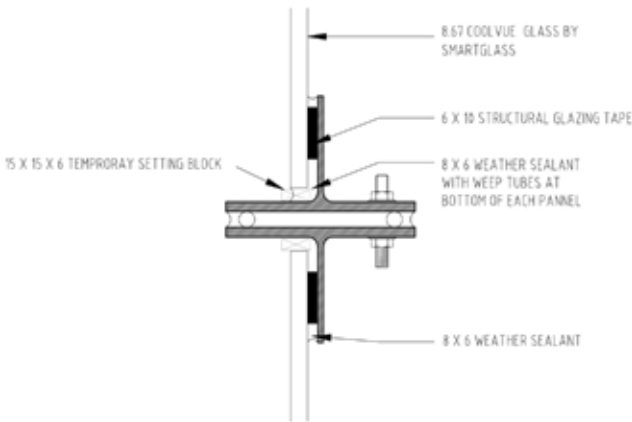
4.FLOOR CONNECTION  
SCALE 1 : 20



5. GROUND CONNECTION  
SCALE 1 : 20



FRAME SYSTEM  
SCALE 1:5



GLAZING SYSTEM  
SCALE 1:5

SECTION THROUGH  
GLAZING  
SCALE 1:10

STANDARD GLAZING SYSTEM EMPLOYED

4mm STRANDED STEEL CABLE FIXED TO  
12mm STEEL UPRIGHT POSTS

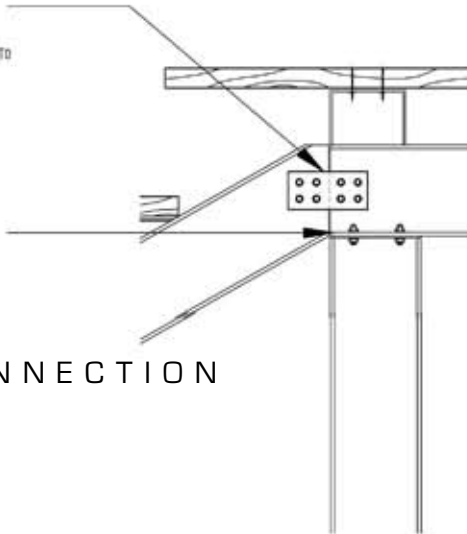
UPRIGHT POSTS TO BE BOLTED TO  
38 X 38 X 3 STEEL ANGLE PRE-WELDED TO  
128 X 44 IPE STEEL I-SECTION



## HANDRAIL CONNECTION

SCALE 1:10

128 X 44 IPE STEEL I-SECTION (RISERS) TREATED WITH  
INTUMESCENT PAINT BOLTED WITH  
M16 BOLTS TO PURPOSE MADE 3mm STEEL CONNECTOR PLATE TO  
128 X 44 IPE STEEL I-SECTION (LANDING)



128 X 44 IPE STEEL I-SECTION (LANDING) BOLTED WITH  
M16 BOLTS TO 128 X 44 IPE STEEL I-SECTION (COLUMN)

## LANDING CONNECTION

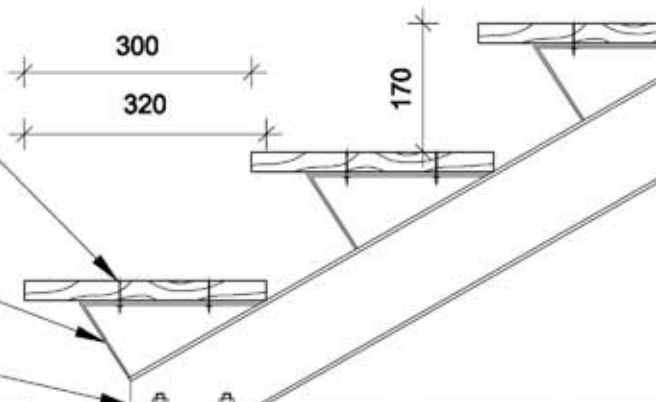
SCALE 1:10

320 x 1344 x 24 MERANTI TIMBER TREADS PAR-  
FIXED TO 3mm STEEL PLATE WITH  
COUNTERSUNK SELF DRILLING TEK SCREWS  
THEN TO BE PLUGGED, SANDED, AND SEALED  
FLUSH WITH TREAD SURFACE

ALL TIMBER TO BE PRE TREATED ALL ROUND  
SEALED WITH TWO COATS FINAL VARNISH.

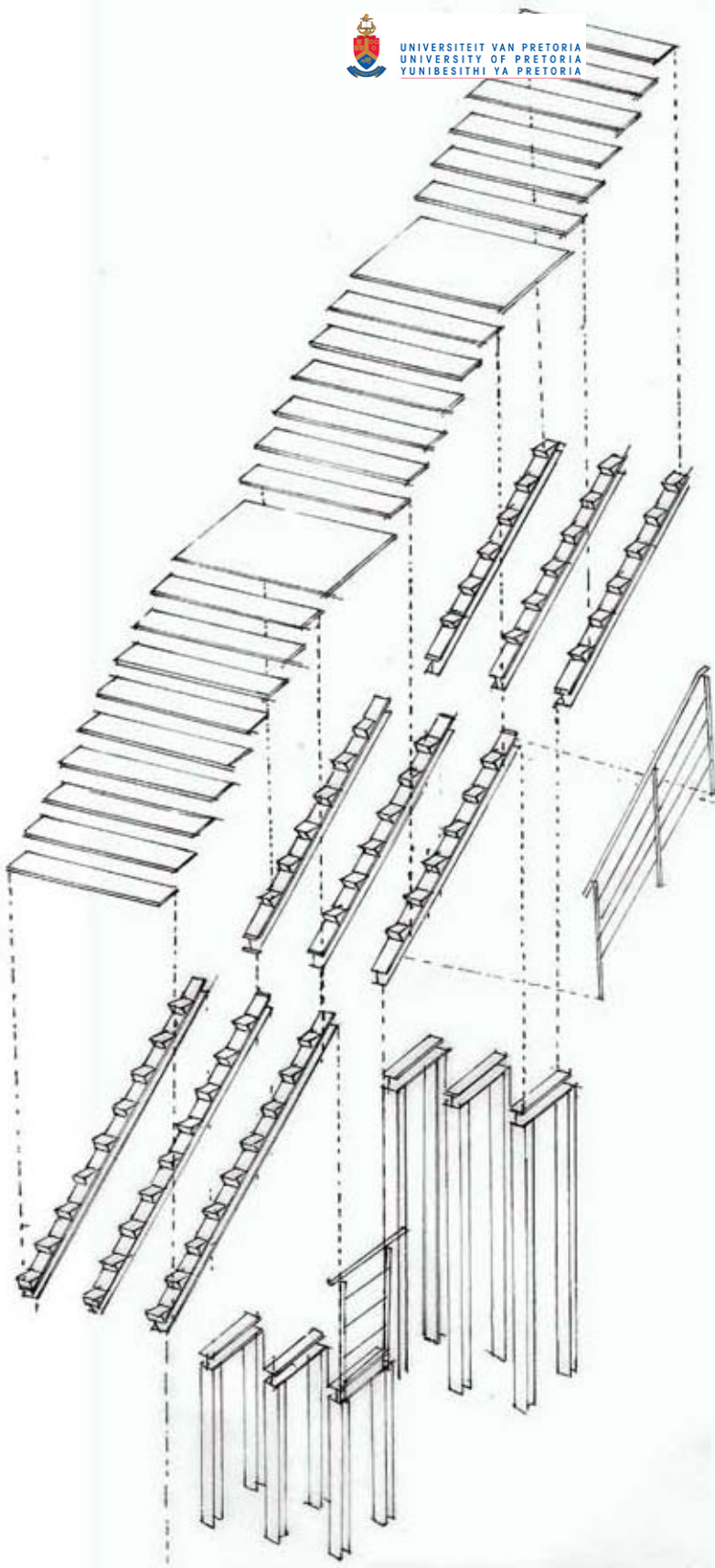
3mm STEEL PLATE WELDED TO  
248 X 188 X 5 IPE STEEL SECTION

128 X 44 IPE STEEL I-SECTION  
BOLTED TO REINFORCED CONCRETE FLOOR

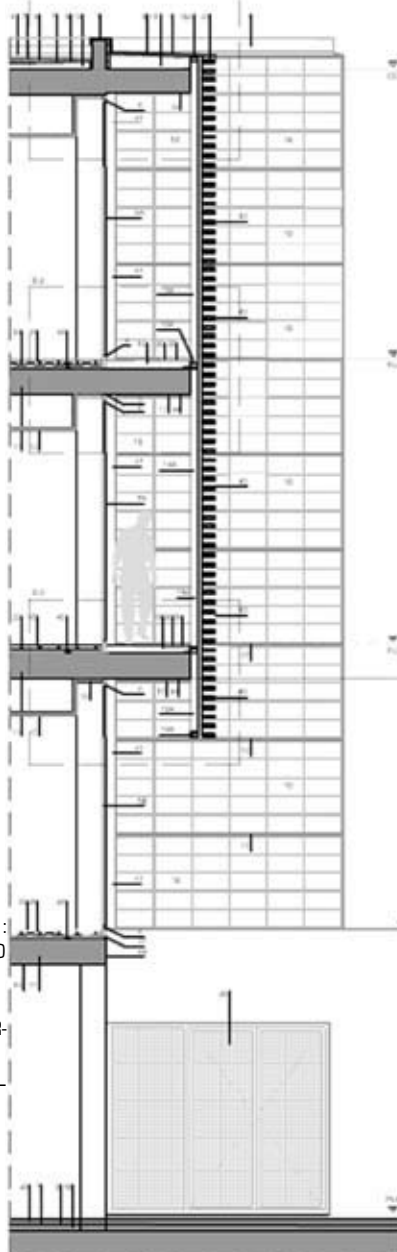
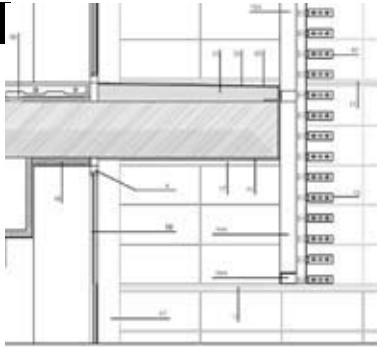


## TREAD CONNECTION

SCALE 1:10



MODULAR STAIR COMPONENTS USED



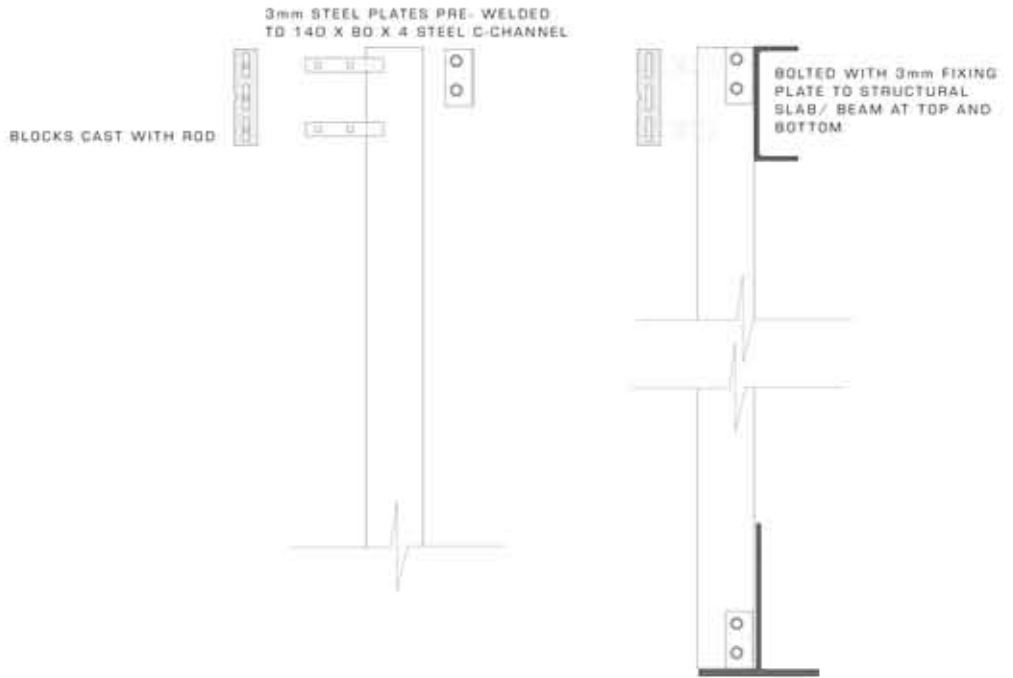
105. BACKGROUND STUDY :  
CERAMIC SCREEN FIXING TO  
STEEL SUPPORTS

SERVICES BUILDING UNIVER-  
SITAT POLITECNICA  
ROBERTO ERLCILLA MIGUEL  
CAMPO ARQUITECTOS  
2006

[[HTTP://ISSUU.COM/  
ETHEL.BARAONA/DOCS/  
BIBLIOTECA\\_UPC](http://ISSUU.COM/ETHEL.BARAONA/DOCS/BIBLIOTECA_UPC)]

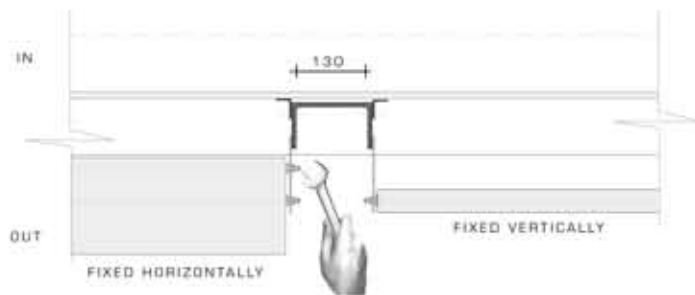


**CERMIC BLOCK**



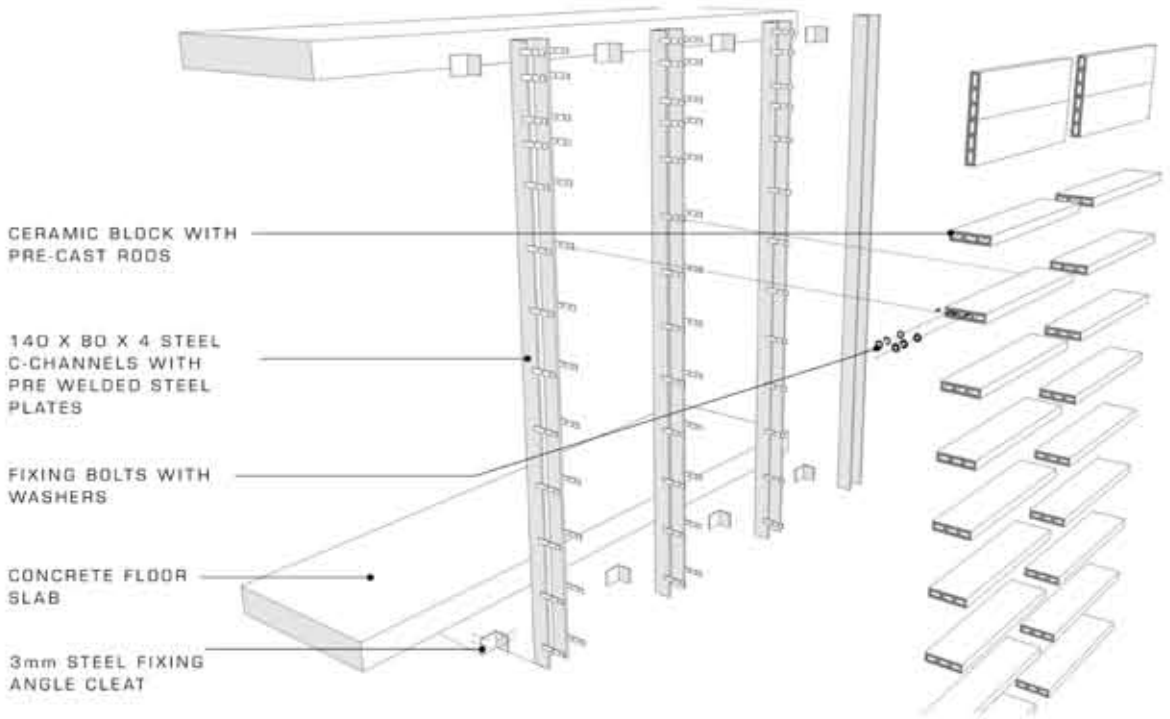
**KIT OF PARTS**

**FIXING IN SECTION**



**FIXING IN PLAN**

**MODULAR CERAMIC BLOCK FACADE**



CERAMIC BLOCK FIXING SYSTEM





SOLAR EQUINOX

21/03  
7:00



21/03  
12:00

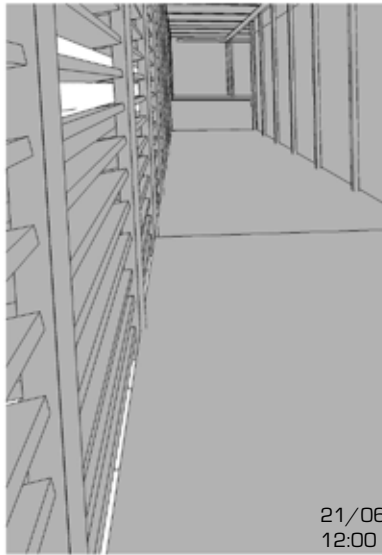


21/03  
17:00

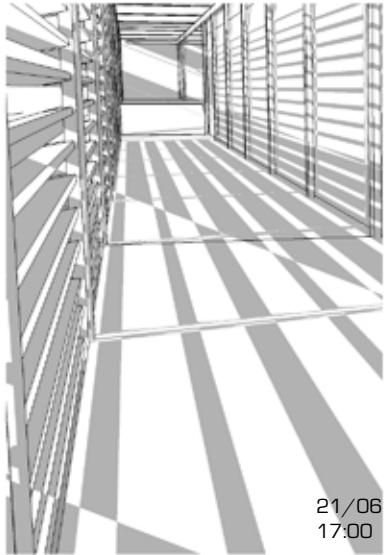


WINTER SOLISTICE

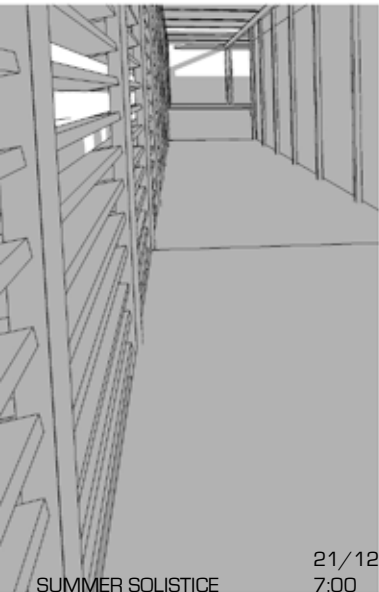
21/06  
7:00



21/06  
12:00



21/06  
17:00

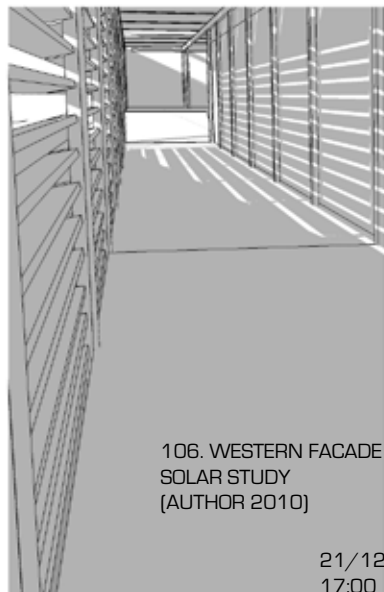


SUMMER SOLISTICE

21/12  
7:00

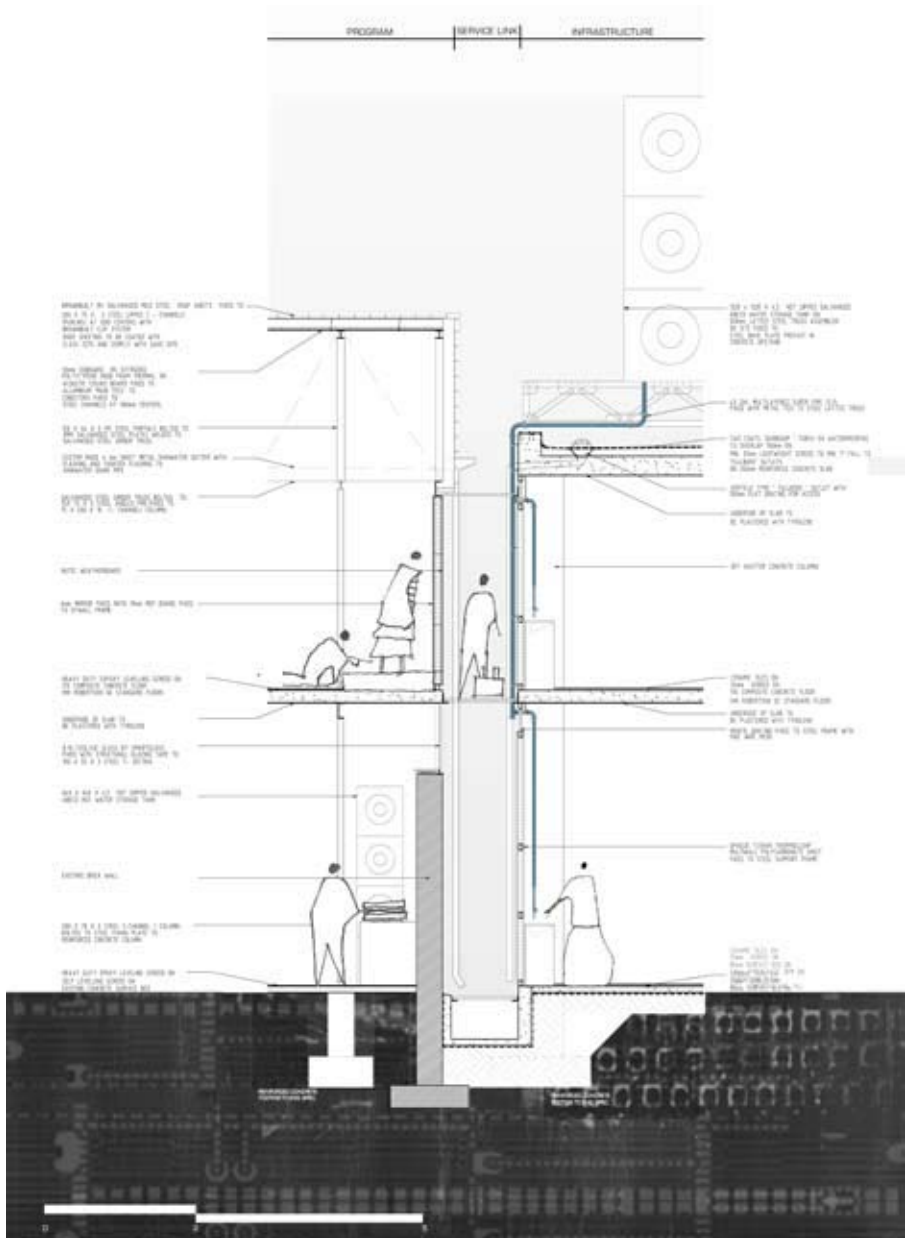


21/12  
12:00



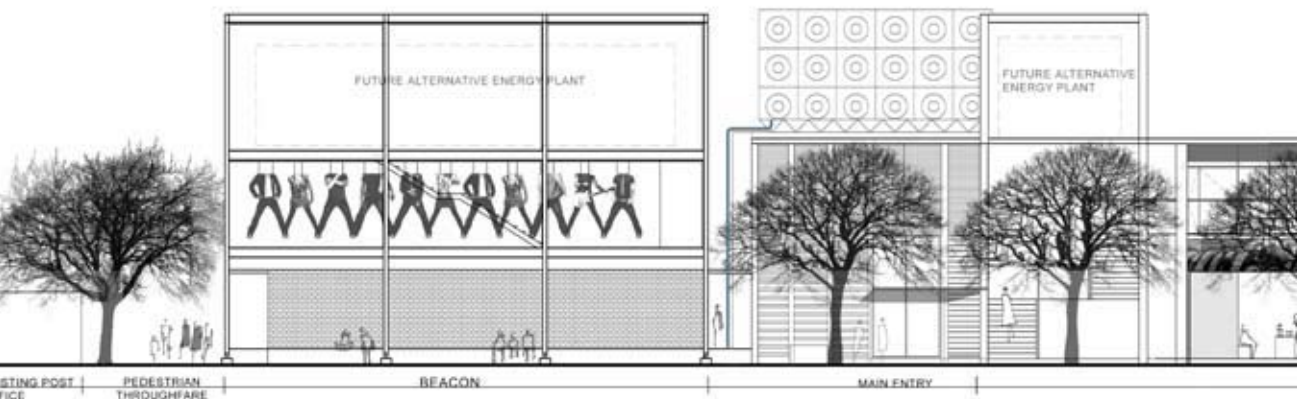
106. WESTERN FACADE  
SOLAR STUDY  
(AUTHOR 2010)

21/12  
17:00

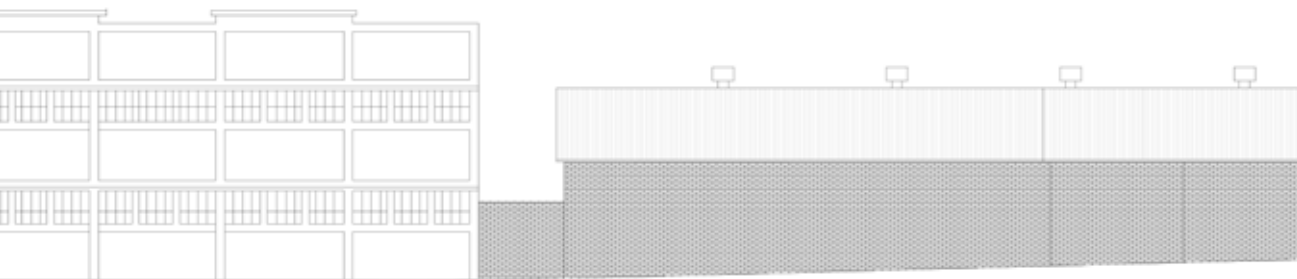


SKIN SECTION THROUGH SERVICE LINK

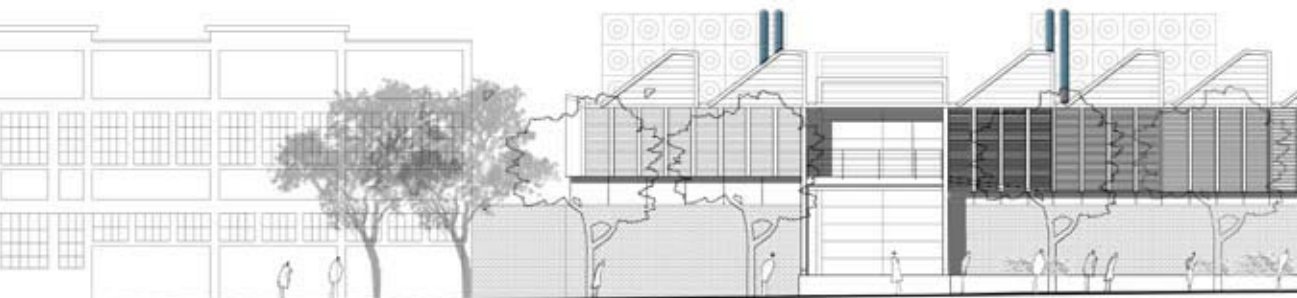




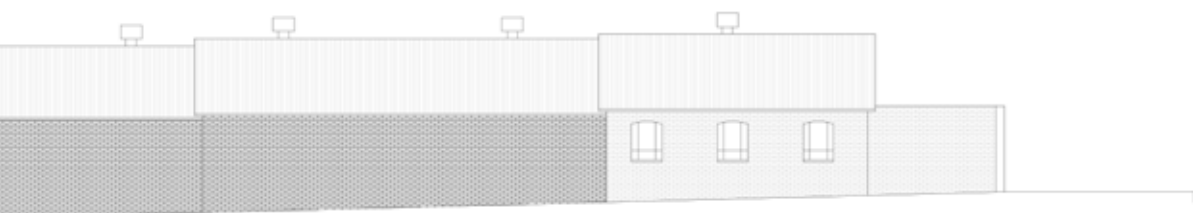
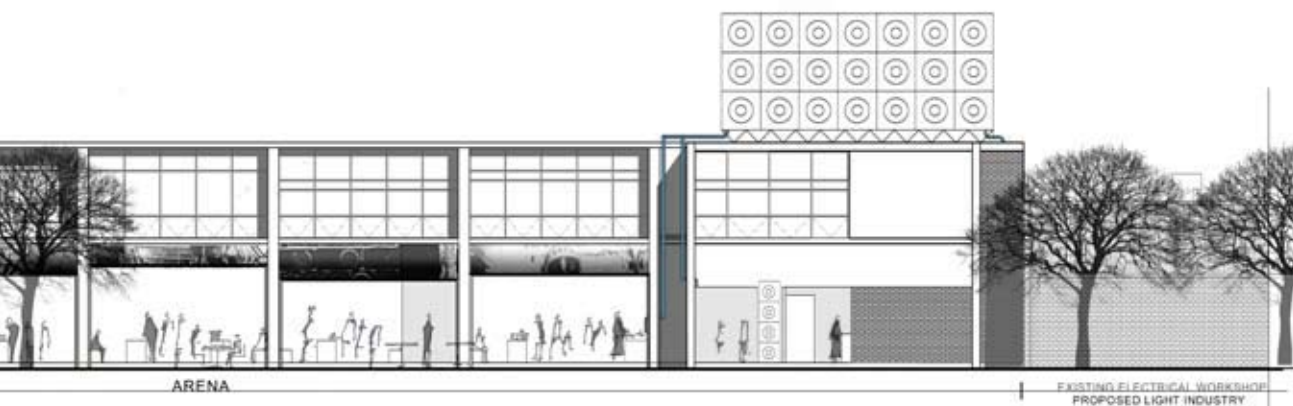
SOUTH FACADE : JACOB MARE STREET



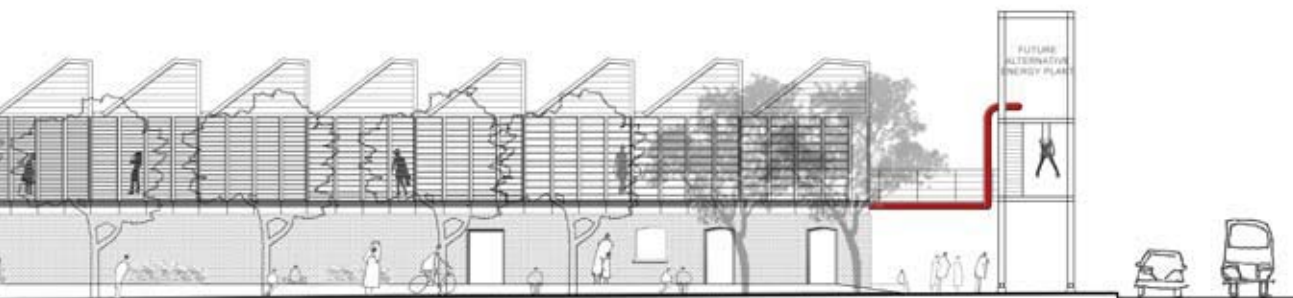
EXISTING WEST FACADE : PEDESTRIAN THROUGHFARE



PROPOSED WEST FACADE : PEDESTRIAN THROUGHFARE



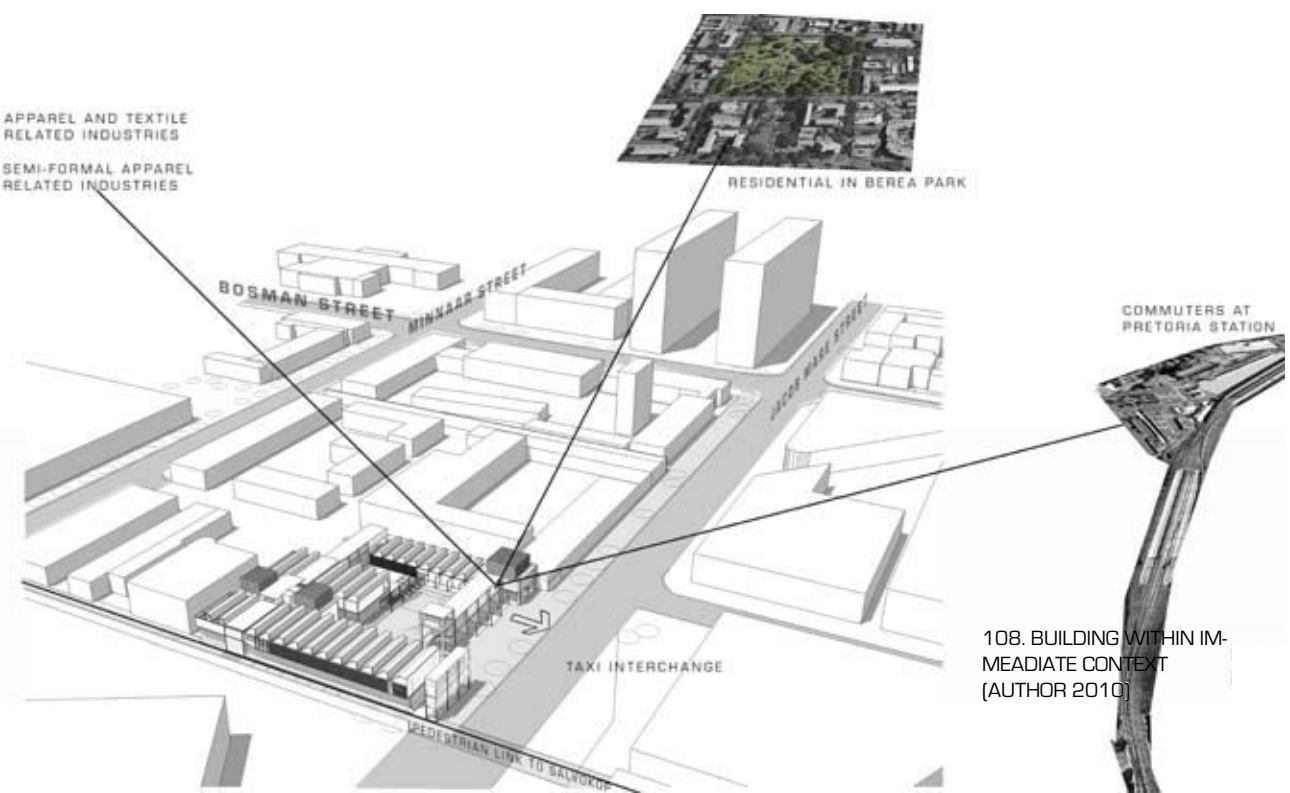
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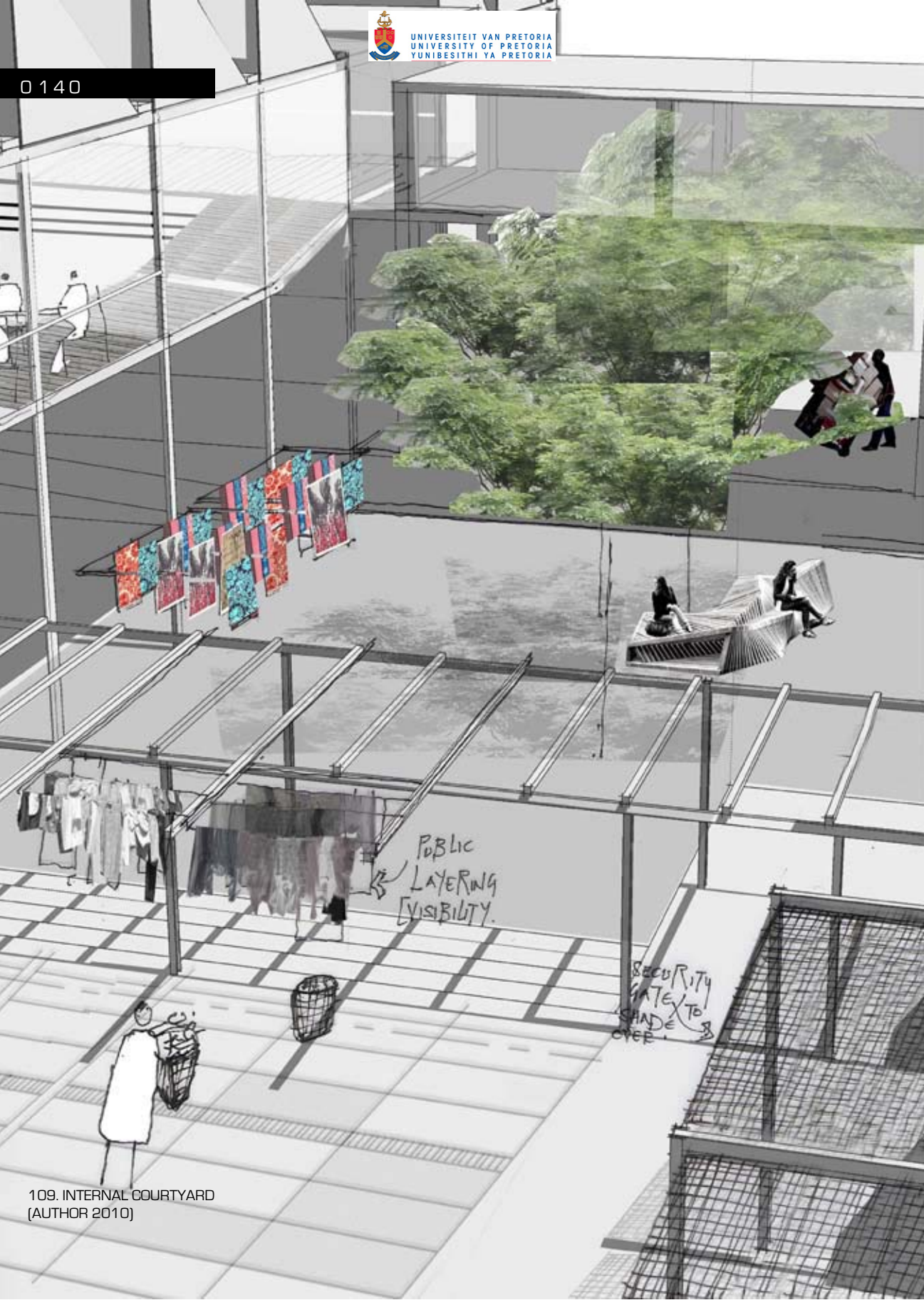


RE



107. ARENA JACOB MARE  
STREET (AUTHOR 2010)





PUBLIC  
LAYERING  
VISIBILITY.

SECURITY  
IN TEXT  
SHADE  
OVER

109. INTERNAL COURTYARD  
[AUTHOR 2010]





110. COVERED COURTYARD  
FASHION SHOW  
(AUTHOR 2010)



111. COLLAGE INSPECTING  
A PRODUCTION FACILITY IN  
CONTEXT  
[AUTHOR 2010]