



connectivity

An urban laundry in the Pretoria CBD

Louis Wright
nine nine zero two four five five two





UNIVERSITEIT VAN PRETORIA
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An urban laundry in the Pretoria CBD

Louis Wright
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Submitted as part of the requirements for the
Degree of Magister in Architecture [Professional]
in the
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Mentor - Gary White

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design clarification

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design documentation

- **site** plan
- **ground** floor
- **first** floor
- **second** floor
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- **north** [struben street facade]
- **east**
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- **west**



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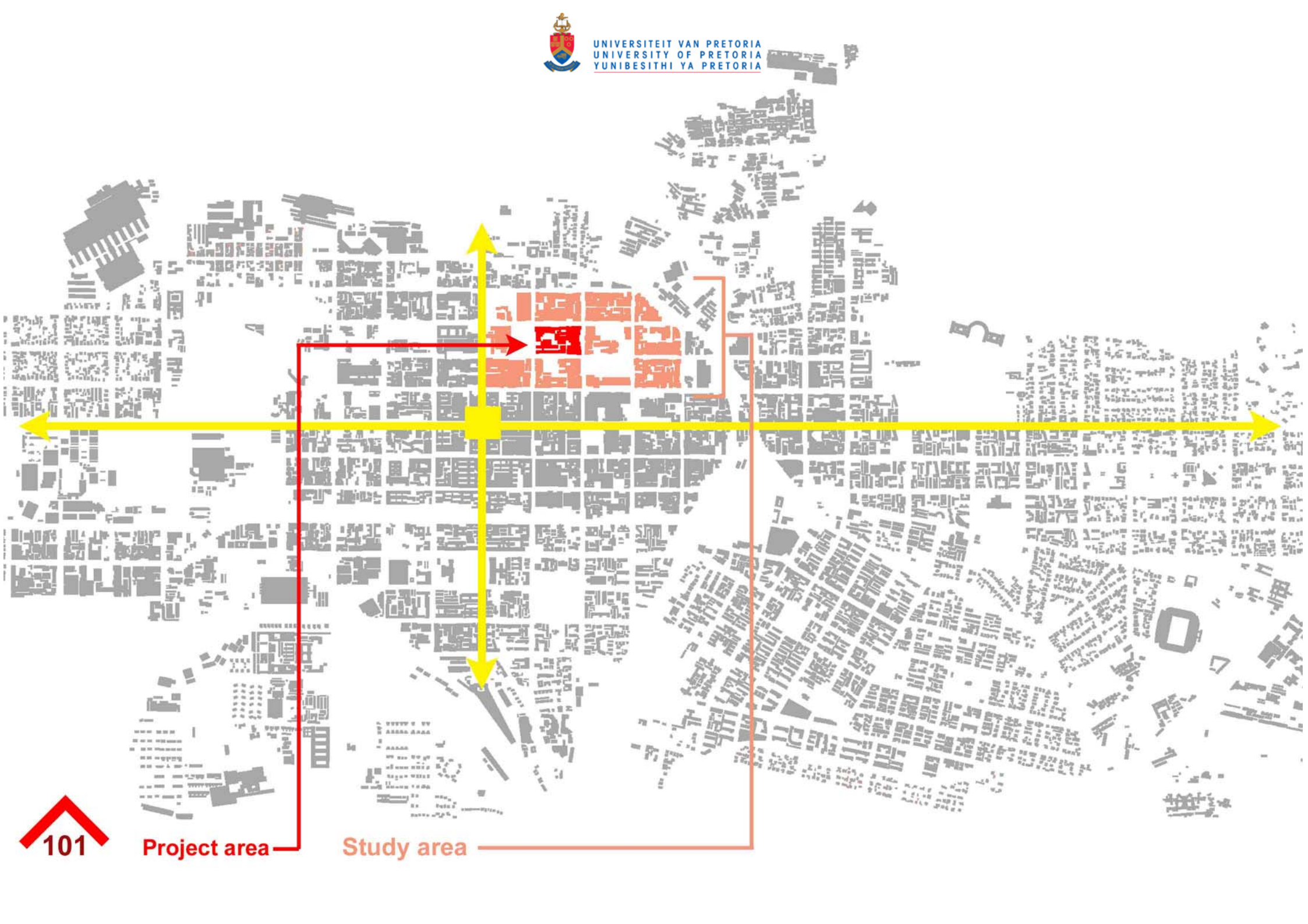
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appendix one

city scale urban analysis





Brief development

Overall goal

"The overarching aim of the Programme is to promote a sense of dignity in the public realm, targeting the poorest and most disadvantaged parts of the city, by providing each local area with a place where individual circumstances of poverty are not starkly visible, where people can meet and gather or just sit in a place that is as attractive and comfortable as any other well-made, positive place in the city." [Southworth, 2003:125]

Problem identification

The form and structure of the city is driven by the *urban legend* that almost all users will move through the city by car, bus or taxi. This produced a low-density, disorganized expansion which forces users to commute between spread out facilities.

Public space in the city has largely been neglected, with green areas fenced off [e.g. the Union buildings green space] and existing squares and arcades taken over by commercial interests. The perception is that these vital areas are extravagant to create and maintain. This resulted in neglected and derelict spaces scattered around the city, often only used as parking.

The focus of designers has largely been on individual buildings, neglecting their impact on neighbours, the street and their interaction on public space.

Project aims and objectives

Explore and analyse the interconnected systems in the city. In order to gain a comprehensive understanding of some systems and processes active in the city, analysis need to be done on several levels.

Regional scale: The city systems as part of the larger Tswane Megacity.

City scale: Explore the interaction of these processes within the CBD.

Local scale: Placing the study area within the north-eastern quarter of the CBD to create a master programme for the area.

Create a master program for the north-eastern quarter of the city incorporating these systems and processes.

Study the workings of the north-eastern quarter to develop guidelines for its improvement.

Situate an urban catalyst in the study area to promote regeneration on social, economic and urban levels.

Design an architectural response to the new urban catalyst.

Approach

The creation of a public space, linking isolated city blocks.

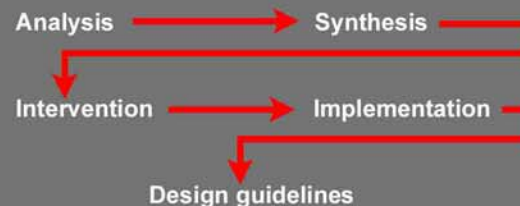
To use buildings to fill gaps in the existing street edges, as well as defining the new public space. This will lead to economic and social regeneration of the area.

Develop guidelines for function selection of building linked to the street and public space.

Design an architectural response to the new public space.

Method

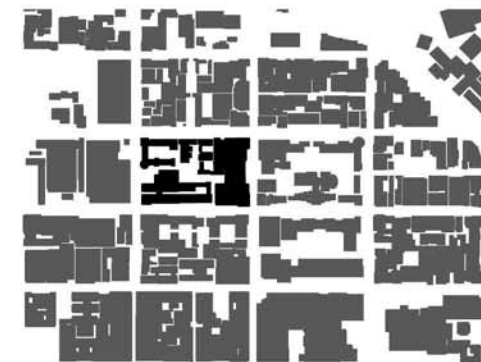
The systems approach to problem-solving will be used as part of my research and development.



Regional scale



City scale



Local Scale

brief development

context analysis

precint design

precedents

design development

design clarification

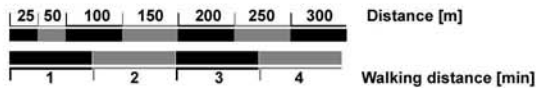
design documentation







Building use

-  Mono-functional building
-  Multi-functional building



Building use

-  Mono-functional building
-  Multi-functional building

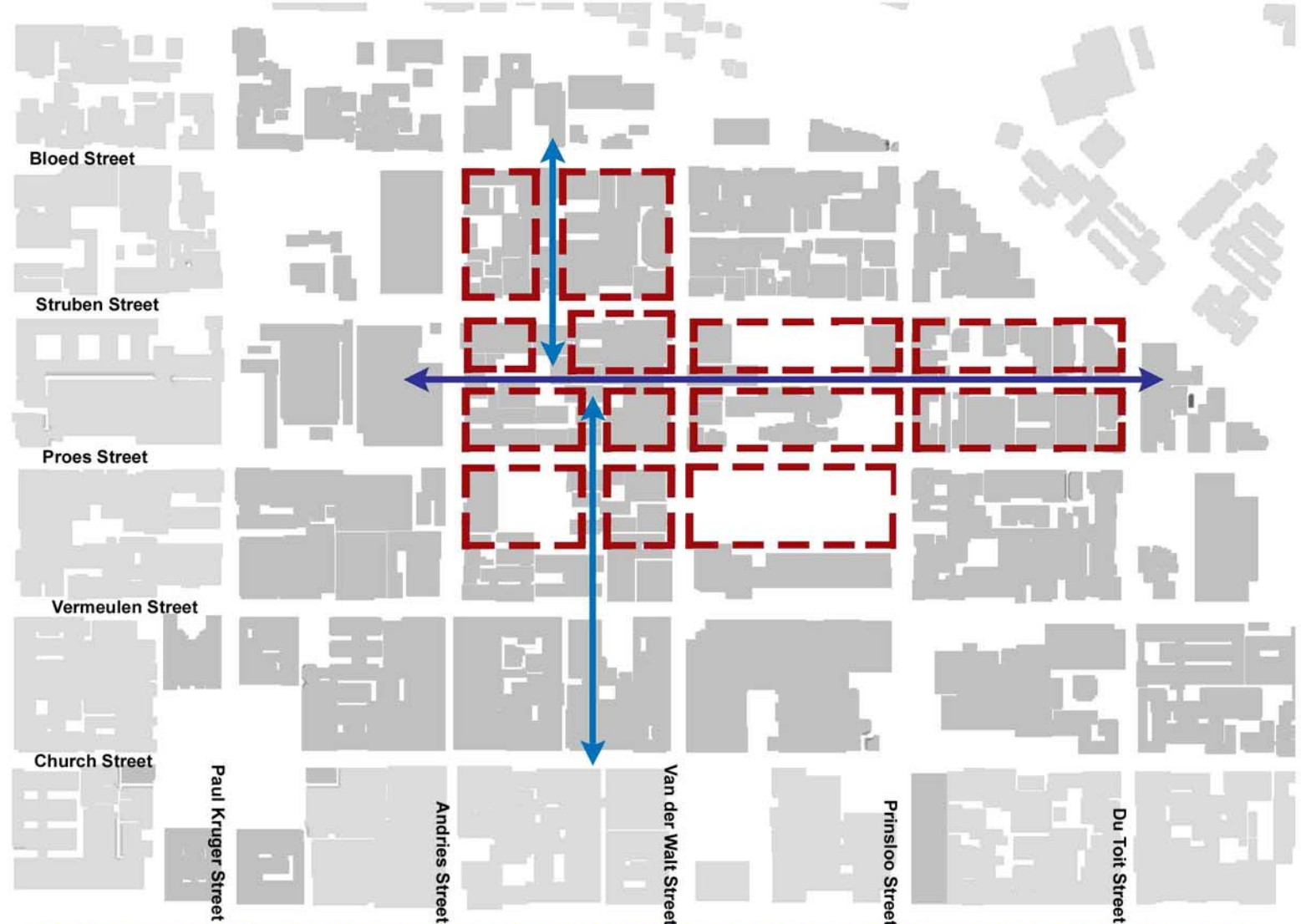
Guidelines

Retail outlets, restaurants and other high-intensity pedestrian uses should be on the ground floor in buildings that front major streets, arcade and public spaces.

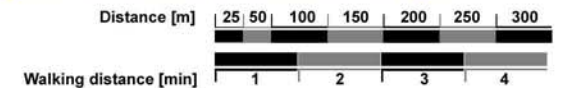
The modal interchange should be enclosed by non-parking uses.

Ground floor facades should be differentiated from upper levels in recognition that pedestrian level differs from the levels above.

When retail or office uses on the ground floor are inappropriate, pedestrian ways should be enhanced with landscaped setbacks, trees or similar elements.



Define a set of criteria to guidelines buildings which combine several functions to promote constant surveillance, active spaces and edges and introduce a larger housing component into this area.



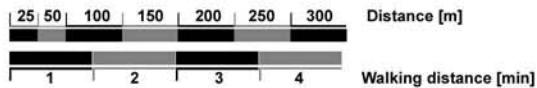


Urban value

- Low value**
Discontinuous street line
Mono-functional building
Poor urban neighbour
- Medium value**
Discontinuous street line
Mono-functional building
Medium urban neighbour
- High value**
Continuous street line
Multi-functional building
Good urban neighbour

Pedestrian clusters

- 1 Bloed Street Taxi Rank
- 2 Department of Home Affairs
- 3 Centurion Taxi Association Rank
- 4 Menlyn Taxi Association drop-off
- 5 Menlyn Taxi Association pick-up
- 6 Hallmark Arcade entrance / exit
- 7 Laudium-Centurion Taxi Rank
- 8 Queen Street Arcade entrance / exit



Context analysis

Study area

Urban value

- Low value**
Discontinuous street line
Mono-functional building
Poor urban neighbour
- Medium value**
Discontinuous street line
Mono-functional building
Medium urban neighbour
- High value**
Continuous street line
Multi-functional building
Good urban neighbour

Guidelines

Buildings should address the street in ways reinforcing the sense of the street as a space. Lower levels of buildings should align with the street except where open areas have been specifically designed.

Building should fill the gaps in each block's street facade to create a continuous street line.

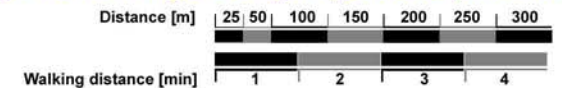
Buildings should provide pedestrian use functions on ground floor to promote interaction with the street, thereby creating an active edge.

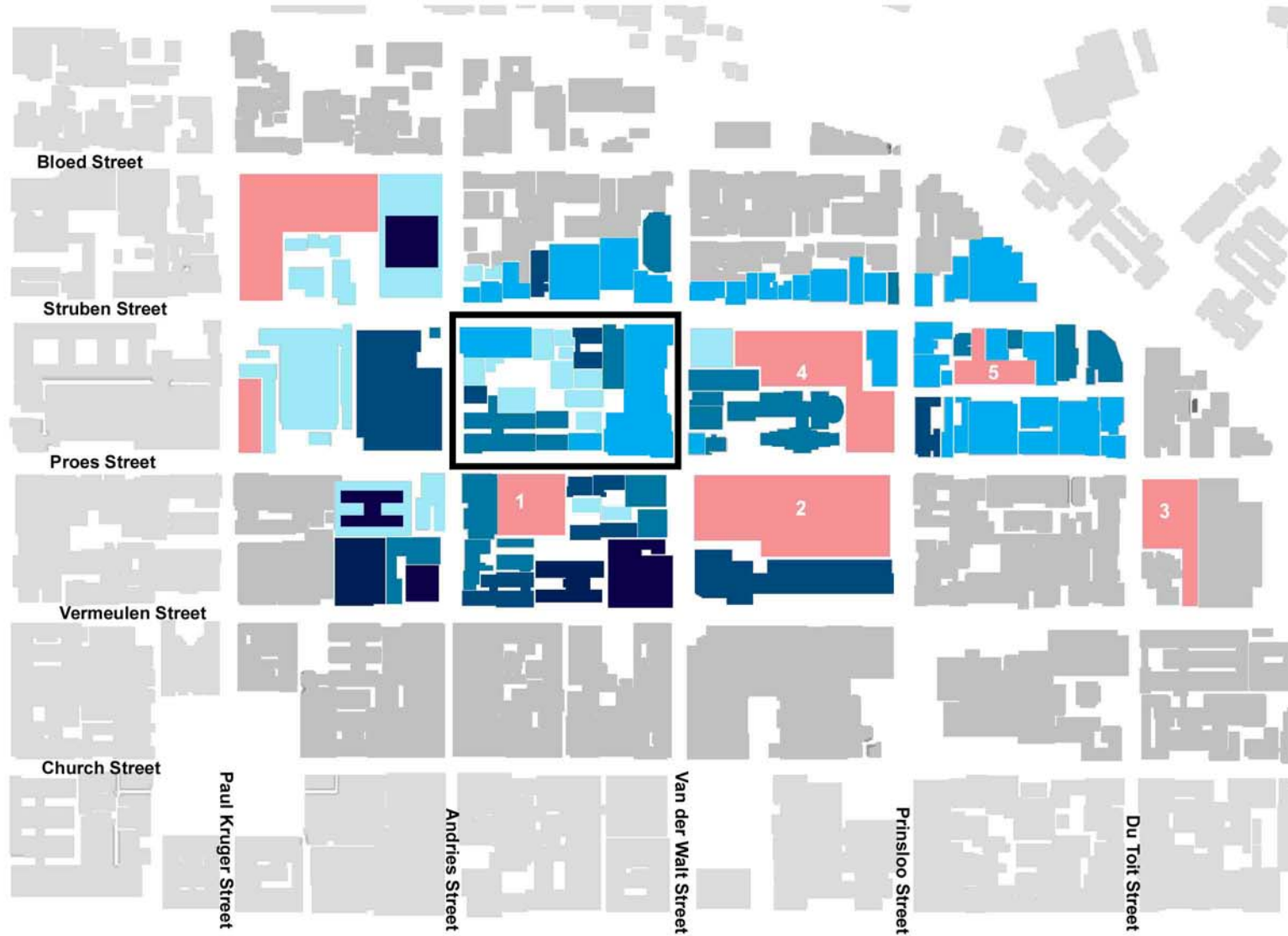
Buildings enclosing open public and semi-public space should provide links to the street in the form of arcades to encourage surveillance of both spaces.

Buildings should be multi-functional allowing for constant surveillance during the whole day cycle.



A+B Define a set of criteria to create perimeter buildings with a high urban value
C+D Define a set of criteris to create high value edge buildings on proposed public spaces





Building heights

- one level
- two levels
- three levels
- four - six levels
- seven - ten levels
- eleven - fifteen levels
- sixteen > levels

Open areas

- 1 Proes Street private parking
- 2 Munitoria parking
- 3 Metro shopping centre parking
- 4 Private parking
- 5 De Sousa's Cash & Carry loading area



Context analysis

Study area

Building heights

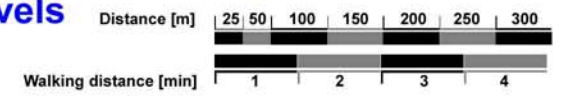
- one level
- two levels
- three levels
- four - six levels
- seven - ten levels
- eleven - fifteen levels
- sixteen > levels

Guidelines

- _The perimeter buildings are all four to six levels.
- _The tallest buildings should be located at the corners of the blocks, where their scale and prominence can be appreciated and their mass is appropriate to the scale of the intersection
- _The visible parts of the modal interchange should harmonize with neighbouring buildings through the use of similar materials and landscaping.
- _The bulk of the tallest buildings should be minimized with offsets, changes in plane, terracing or other similar techniques.
- _Open spaces are to be defined on at least three sides by buildings, walls or landscaping.
- _Ground floor facades should be differentiated from upper levels in recognition that the pedestrian level differs from the levels above.



Define criteria to allow the placement of tallest buildings on the city block corners
Infill perimeter buildings are between four and six levels



Context analysis



Paths

Lynch defines paths as "channels along which the observer customarily, occasionally or potentially moves". [Lynch, 1960:47]

In the study area, the city grid determines these paths. Pedestrians are forced to circumnavigate city blocks on pavements of varying width, except when using the arcade system.

Main vehicular route

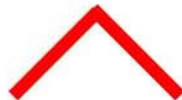


Main pedestrian route



25 50 100 150 200 250 300 Distance [m]

1 2 3 4 Walking distance [min]



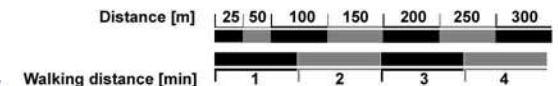
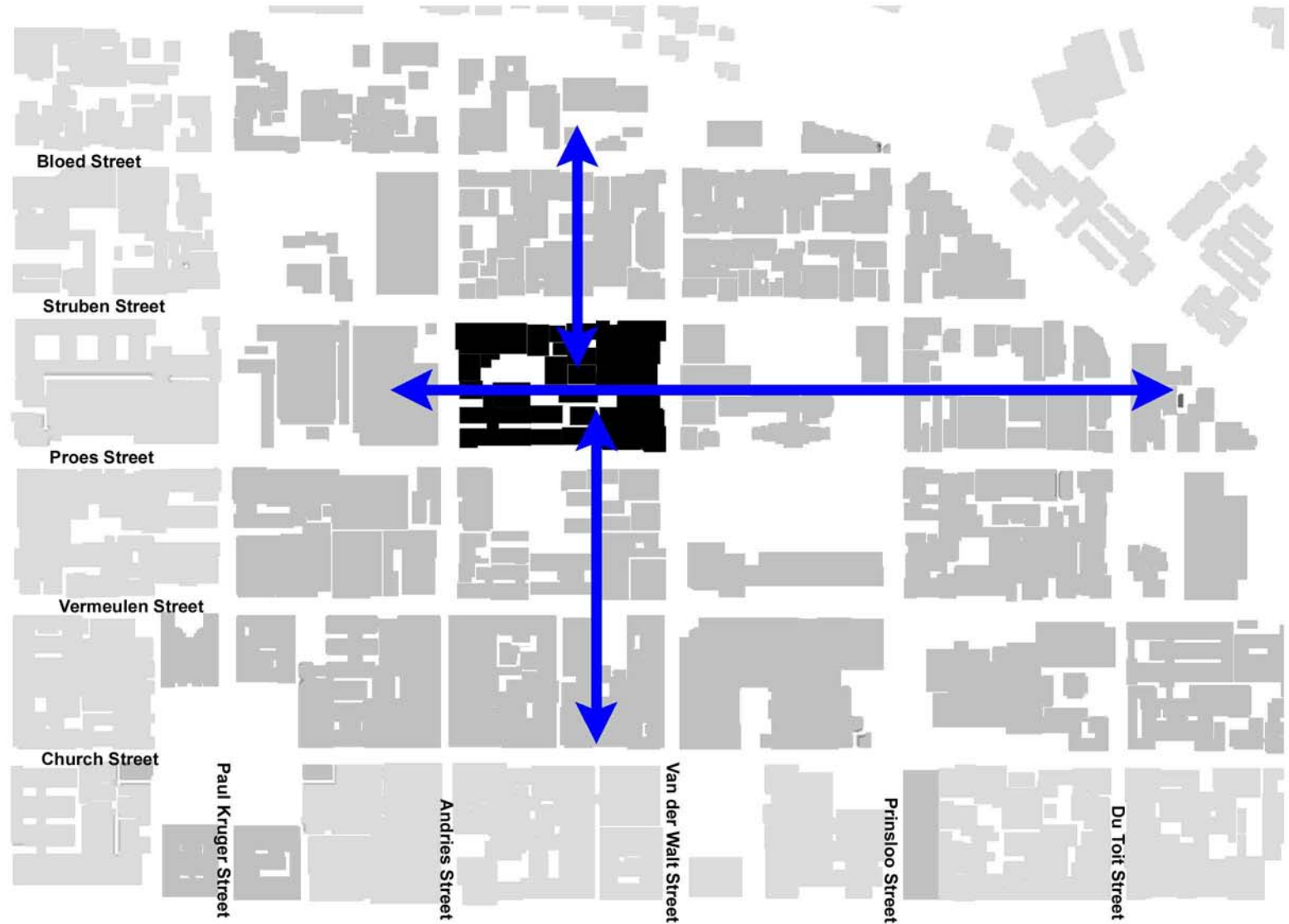
Context analysis

Paths

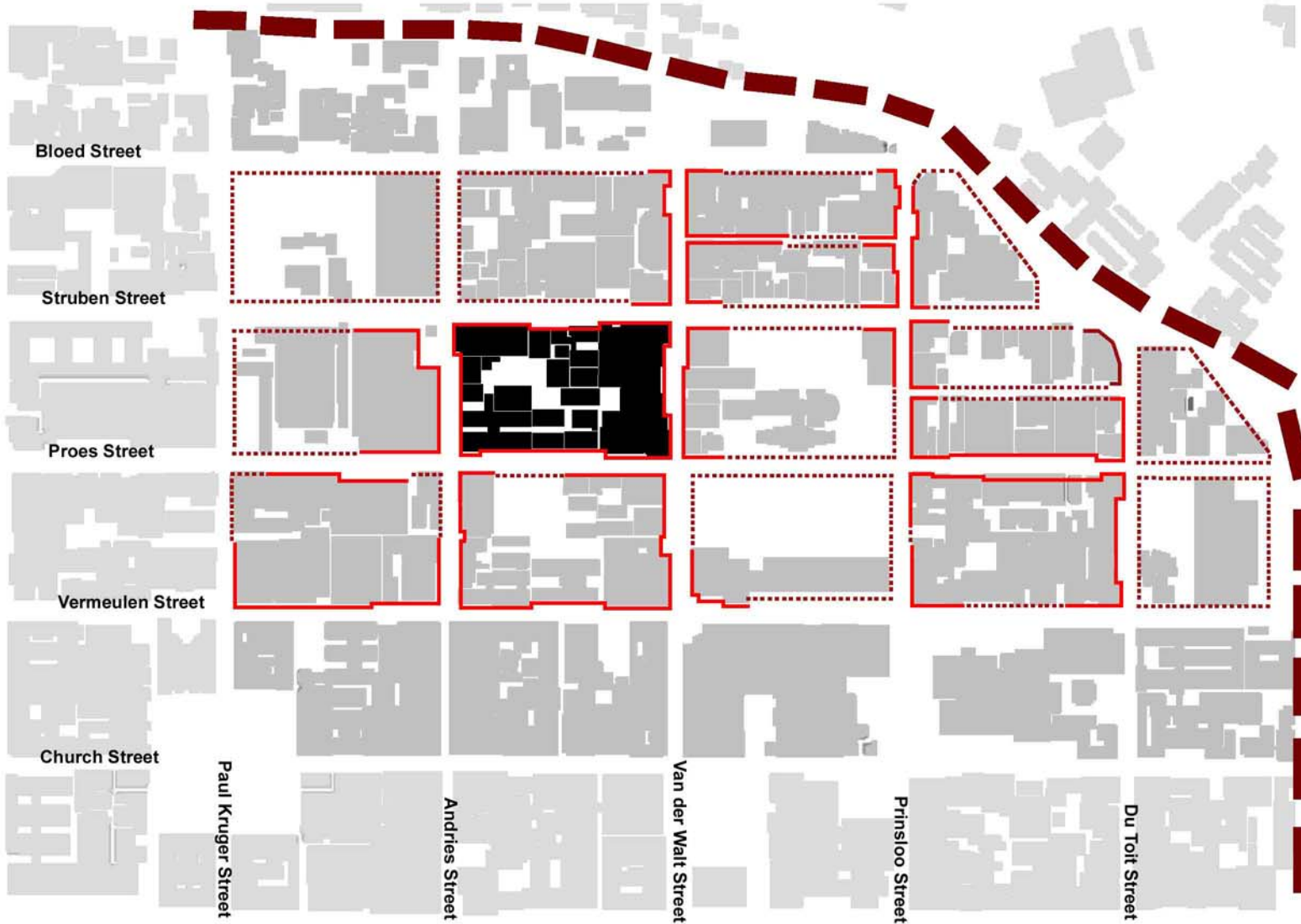
The large numbers of pedestrians during the day, creates the opportunity establish new pedestrian walkways dissecting the city blocks.

These open arcades will function in conjunction with the existing streets and and pedestrian paths, thereby increasing the permeability of the cadastral system.

By introducing large numbers of users, new formal and informal economic opportunities arise. These will serve the needs of commuters moving between taxi ranks on their way home or to work.



Context analysis



Edges

Edges refer to the linear *elements not used as paths to the observer*, [Lynch, 1960:47] acting as walls to the public environment.

The edge of the city block in the project area is well defined on all side, with few buildings set back from the street. Most of these offer canopies or overhangs to the pedestrians.

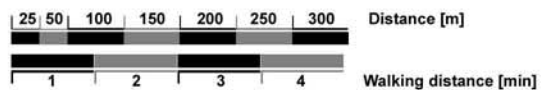
The other blocks in the study area, however, all have medium to large gaps in the street line. Vast parking areas exacerbate the problem of inactive and dead facades.

The goal is to provide an active block edge; one that promotes social and visual interaction and engagement between users.

Well defined edge

Poor edge condition

Nelson Mandela Drive and Apies river



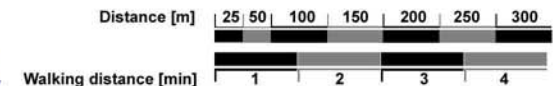
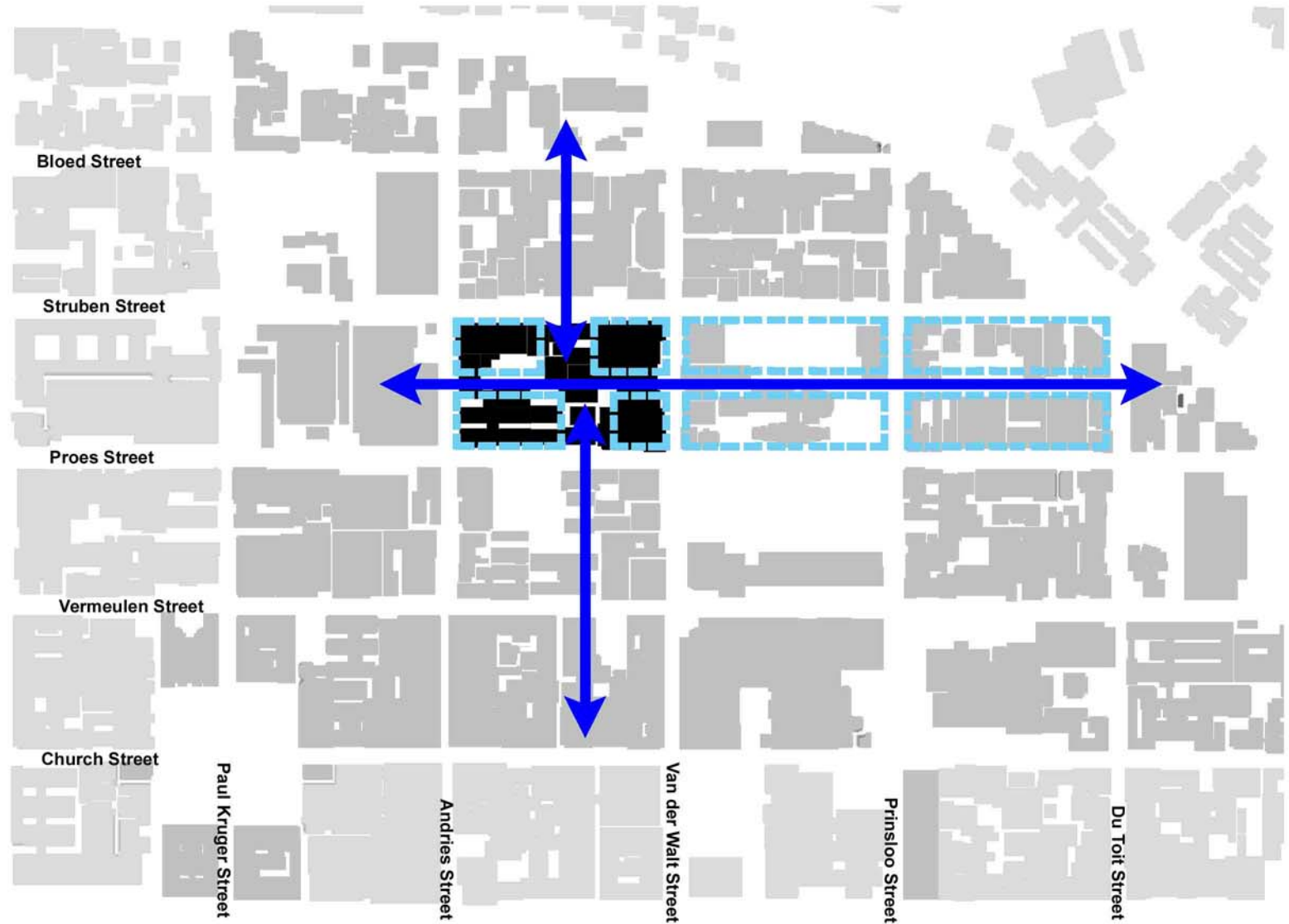
Context analysis

Edges

By opening up the city blocks, the prospect of re-activating the inactive parts of the street becomes feasible.

In addition to a large number of users, the buildings opening onto the streets as well as the open arcade must have functions that requires high pedestrian flow levels on ground floor. This creates positive interaction between users of the public space and the those inside the buildings.

The placing of benches, stairs and grass creates points of relief from the movement axis. Here users are able to observe, converse and interact.



Context analysis

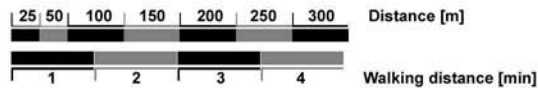


Nodes

Nodes are defined as "strategic spots in a city into which an observer can enter, and which are the intensive foci to and from which he is traveling". Lynch, 1960:47]

They may be considered as links between two or more adjacent areas/districts, and as such display the inherent qualities of these areas.

Nodes include places of primary junction, a break or a pause in movement [pedestrian or vehicular] or the crossing of paths.



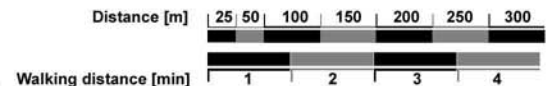
Context analysis

Nodes

The opportunity arises to create a new, smaller node at each end of the new open arcade.

The new node on the west entrance to the public space has to deal with buildings of a much larger scale, as well as higher numbers of pedestrians.

The Apies river entrance, even with Nelson Mandela drive traffic, is much quieter.



Context analysis



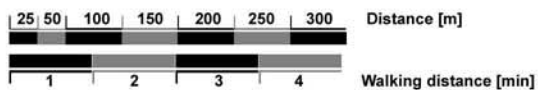
Landmarks

"Landmarks are another type of point-reference, but in this case the observer does not enter within them, they are external". [Lynch, 1960:48]

These are used by observers to orientate themselves into, into and out of an area.

Landmarks are different to each user group. Pedestrians might use smaller landmarks in their sight-lines, whereas vehicular traffic may employ larger, taller objects.

- 1 Civitas building [Department of Home Affairs]
- 2 New State Library
- 3 Church Square
- 4
- 5 Munitoria
- 6 Sammy Marks Square
- 7 South African Reserve Bank
- 8 Metro Shopping centre
- 9
- 10 Bloed Street Taxi Rank



Context analysis

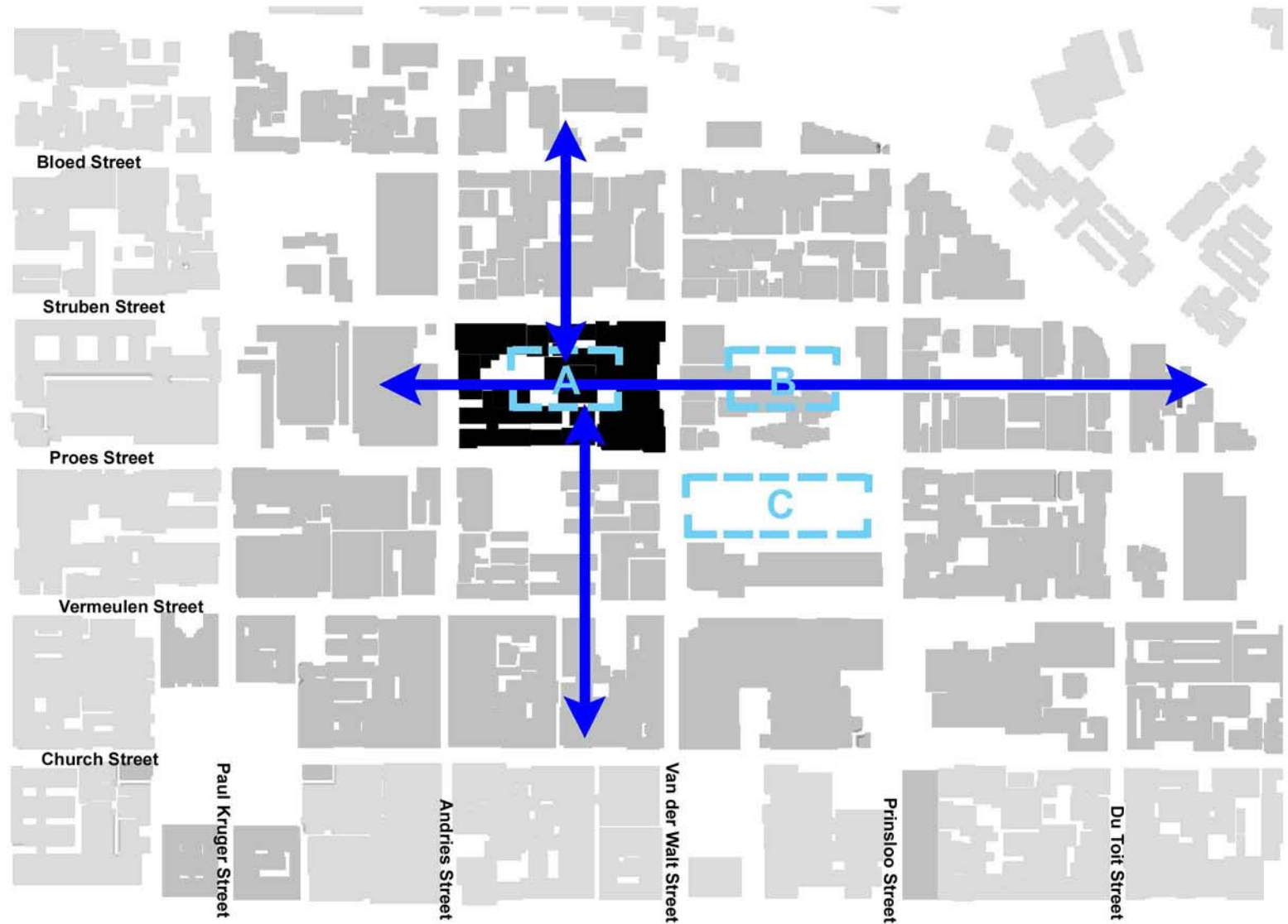
Landmarks

The creation of new public spaces creates points of relief for pedestrians, they also act as points of orientation in the city.

Other than informing people's mental maps of the city, these public squares and arcades becomes the space where people living in the vicinity can spill out in. The proposed residential development will not have private gardens, increasing the need for an urban living room.

In addition, these spaces "accommodate the informal activities that are central to the process of urban living. They are places of informal theatre, of courtship, of economic production and so on". [Southworth, 2002:123]

- A New public space on intersection of the two axes.
- B New enclosed urban park with public building.
- C New City Square.



Context analysis



Districts

- 1 Light industrial district
- 2 Government district [start of proposed Government boulevard]
- 3 Church Square and Judicial district
- 4 commercial and retail district
- 5 Cultural district

25 50 100 150 200 250 300 Distance [m]

1 2 3 4 Walking distance [min]

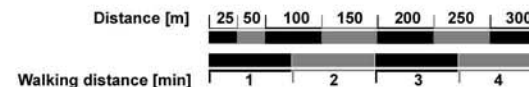
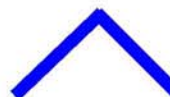
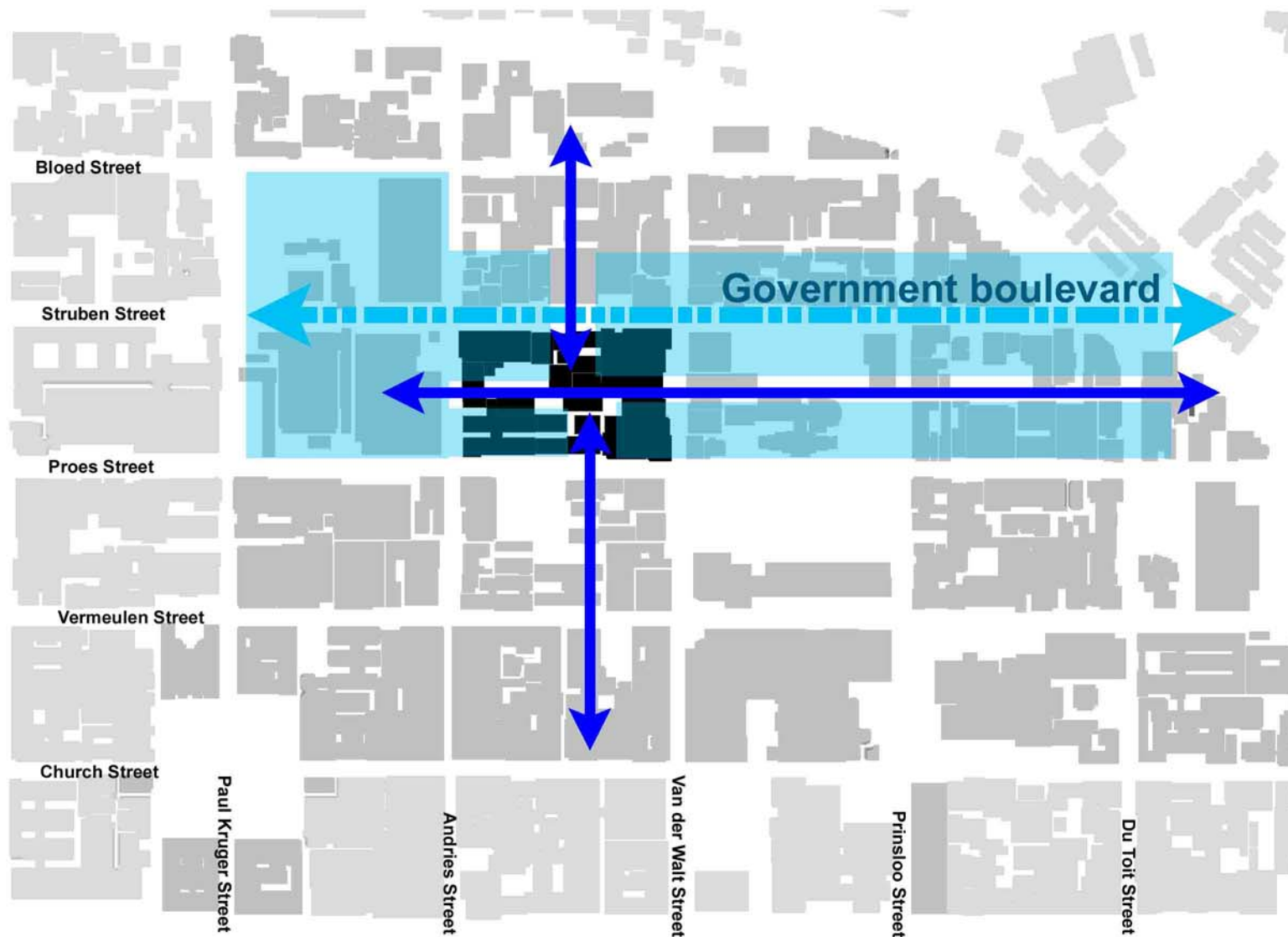


Context analysis

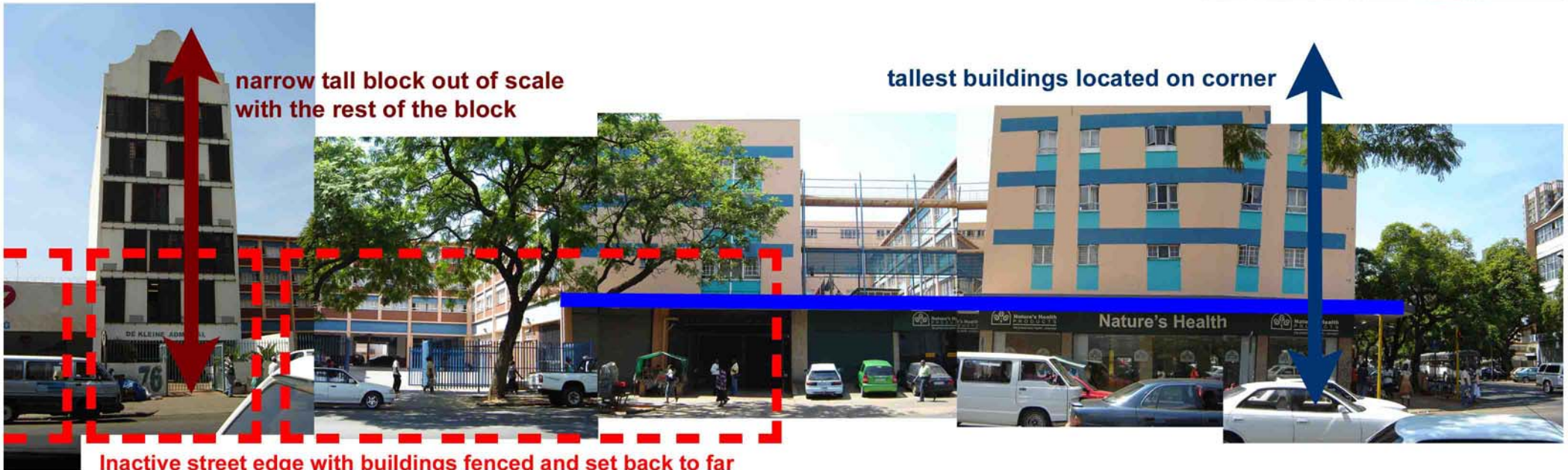
Districts

Starting with the new State Library, the proposed Government Boulevard will form a new district overlaying existing one in the city. Due to the nature of this new district, several smaller supporting areas are needed. These include retail and food outlets, office space and residential functions.

This also necessitates the need for public spaces for office workers to spill out into. Larger numbers of building users lead to an increase in vehicular traffic volumes. This depletes the pedestrian environment and force them into the public spaces and arcades.





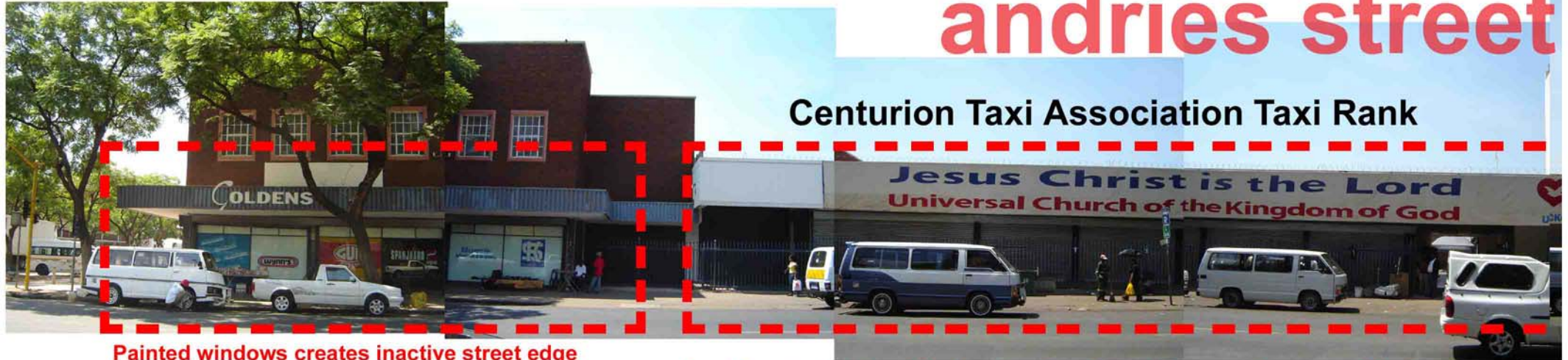


tallest buildings located on corner



van der walt street

andries street



Painted windows creates inactive street edge

Inactive street edge with closed roller shutter doors, only open on Sundays

tallest building located on corner

continuous street canopy line



step in roof line too large



Inactive street edge with building set back to far and windows painted over



Van der Walt Street



New State Library,
Andries Street



Corner Struben +
Van der Walt Street



**Corner Andries +
Struben Street**

**Civitas Building,
Struben Street**

**Corner Van der Walt +
Blood Street**





- Van der Walt Street
- Corner Vermeulen + Van der Walt Street [south]
- Munitoria Complex, Van der Walt Street
- Sammy Marks Square
- Corner Vermeulen + Van der Walt Street [north]



brief development

context analysis

precint design

precedents

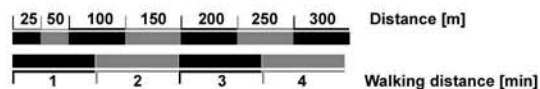
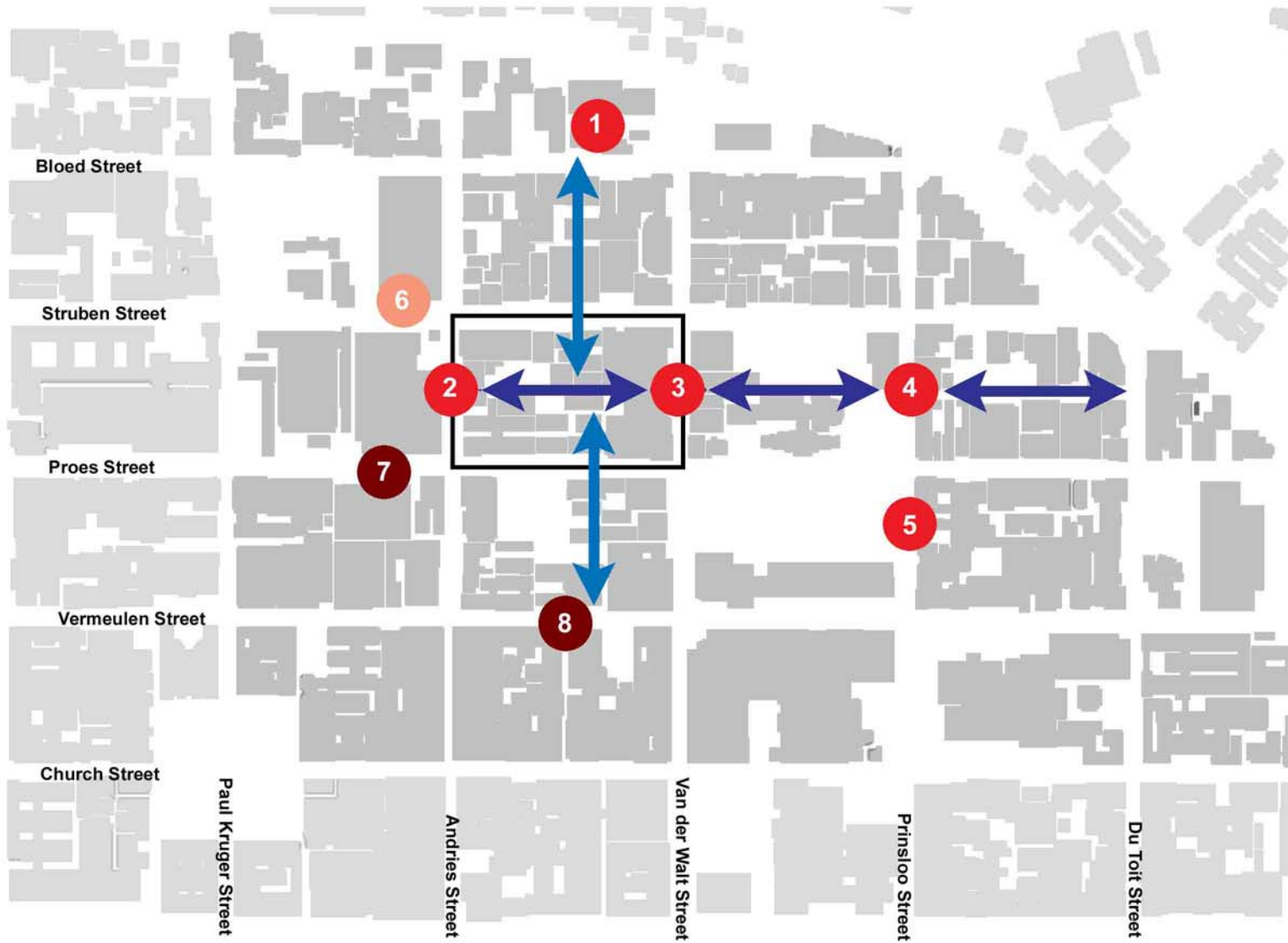
design development

design clarification

design documentation



Precinct design



Problem one

Pedestrians congregate in various areas in the study areas due to:

Taxi-related activity

- 1 Bloed Street Taxi Rank
05:30 - 08:30 15:30 - 19:00
- 2 Centurion Taxi Association Taxi Rank
07:00 - 09:00 16:00 - 17:30
- 3 Menlyn Taxi Association drop-off
15:30 - 18:30
- 4 Menlyn Taxi Association pick-up
06:00 - 09:30
- 5 Laudium Centurion Taxi Rank
06:30 - 09:00 16:00 - 17:30

Grouping

- 6 Department of Home Affairs
09:00 - 12:30 13:30 - 16:30

Arcade activity

- 7 Hallmark Arcade entrance / exit
07:00 - 11:00 13:30 - 17:30
- 8 Queen Street Arcade entrance / exit
07:00 - 11:00 13:30 - 17:30

Solution one



Linking the three taxi ranks to form the primary axis, starting at east entrance to Brown Street and terminating in the new State Library



Linking the Bloed Street Taxi rank with the entrance to Queen Street Arcade, to form the secondary axis

Precinct design

Problem^{two}

Pedestrians congregate at the entrances to the block, as well as at the intersection of the primary and secondary axes

- 1 North entrance
Medium grouping due to pedestrian movement and brothel customers
- 2 West entrance
Lower density of pedestrians, periodical increase associated with taxi rank and throughfare to State Library
- 3 Intersection of axis
Pedestrian movement on primary and secondary axis cross, slowing movement in both directions.
- 4 East entrance
Highest pedestrian density on block, due to street pedestrian movement and pedestrians from Brown Street
- 5 South entrance
Medium pedestrian movement density from Proes Street and Queen Street Arcade.

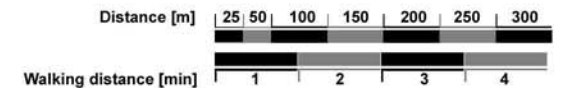
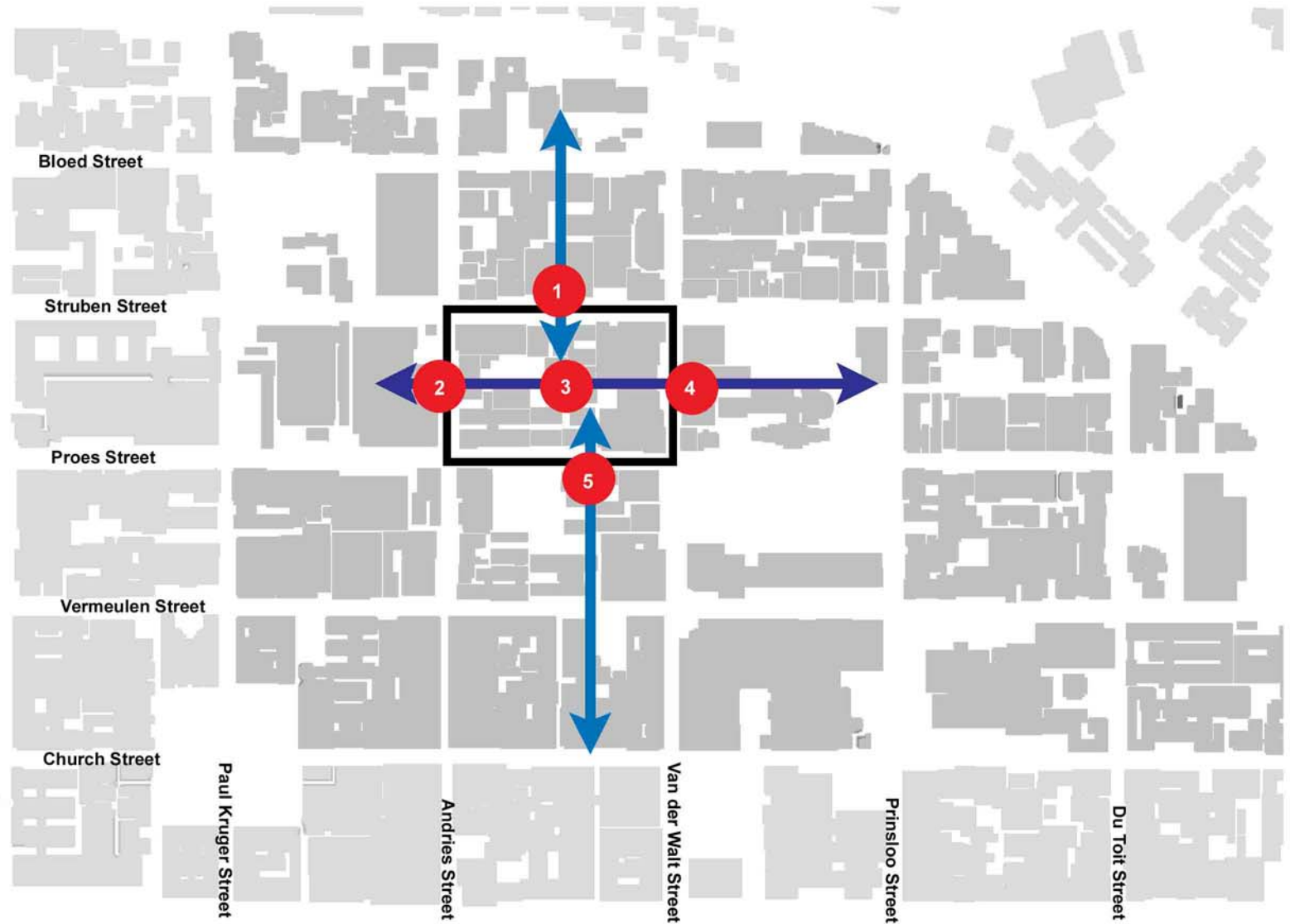
Solution^{two}

Building lines are set back in the centre of the block to allow an open arcade and public space to form.

Entrances to public space are scaled down to pedestrian level.

 Primary axis

 Secondary axis



Precinct design



Problemthree

Select buildings to be removed to create pedestrian open arcade on the newly established axis

- 1 Golden Motor Supplies
2 level building, limited interaction with street.
- 2 Pretoria Motor Glass
2 level building, limited interaction with street, narrow building on street-line, private courtyard behind.
- 3 Egoli pool house and *shebeen*
2 level building, medium interaction with street, empty.
- 4 Tau-building storage
Single storey warehouse, no street interaction, empty.
- 5 Folio Stationers storage
2 level warehouse, no street interaction.
- 6 De Kleine Admiraal - building
6 level office tower, cut off from the street by wall and gate, no street interaction.
- 7 The Universal Church of the Kingdom of God
2 level building, no interaction with the street, cut off from pedestrians by metal roller doors

Solutionthree

Place buildings in the block to create the pedestrian open arcade on the newly established axis

- 1 Building with 4 floors, creating distinctive corner on Struben & Van der Walt Streets
Commercial functions on ground floor [food outlets, furniture and other retail]
Residential or office space on first and second floors.
Residential on fourth floor.

Precinct design

Solutionthree [continued]

- 2 Building with 4 floors, creating rounded corner to place focus on west entrance to new pedestrian open arcade. Commercial functions on ground floor [food outlets, clothing retail, music and entertainment]. Residential or office space on first and second floors. Residential on third floor.
- 3 Building with 3 floor, creating the south entrance to public space, with corner that is visible from west entrance. Commercial function on ground floor [restaurant with terrace on northern side to border on open arcade] Residential function on first and second floors.
- 4 Existing building to be changed to create new east entrance to public space; roof material to be removed, exposing vaulted trusses, entrances to retail outlets to be moved to open arcade. Commercial function on ground floor [anchor retail outlet, food outlet]
- 5 Infill building with 3 floors to continue the building-line on public space. Small retail outlets on ground floor [cellular phone outlet, food outlets] Residential apartment on first & second floor.
- 6 Building with four floors creating a focus corner visible from the north & west entrances. Small to medium commercial functions on the ground floor [restaurant with terrace on public space, food outlets, furniture] Residential and office space on first and second floor. Loft-style apartment on third floor.



Precinct design



Solutionthree [continued]

Insert new buildings to create the pedestrian open arcade on the newly established axis.

- 7 New glass circulation tower for Egoli Inn Hotel [brothel] & entrance on the open arcade.
- 8 Design project, properties discussed further in the chapter, forming north entrance to public space.
- 9 Existing parking garage, converted into roofed market forming part of the public space.
- 10 Building with four floors strengthening the street edge and continuing the north part of public space.
Large commercial function on ground floor [car dealership, furniture outlet]
Office space on first floor.
Residential on second and third floor.
- 11 Building with three floors, forming a courtyard with three entrances to the street.
Commercial functions on ground floor [food outlet, retail anchor store]
Small and medium apartments on first and second floor.

Precinct design

Solutionthree [continued]

Place in the block new buildings to create the pedestrian open arcade on the newly established axis.

- 1 New urban park, incorporating public walkway, lined with trees.
- 2 New *City Park*, with second entrance to the Munitoria complex, with a new monument.
- 3 Mixed-use building with 3 floors. Retail function on ground floor responding to street and new urban park. Residential on second floor.
- 4 Mixed-use building with 4 floors, forming focus corner. Retail function on ground floor responding to street and new urban park. Commercial on first floor. Residential on second & third floors.
- 5 Commercial and retail building with 3 floors to define south-east corner of new urban park. Retail function on ground floor responding to street and new urban park. Commercial on first floor.
- 6 Mixed-use building with 4 floors to define west entrance to new urban park. Retail function on ground floor responding to street and new urban park. Commercial and residential on first floor. Residential on second and third floors.
- 7 New modal interchange: public parking, tram station, taxi rank. Retail function on ground floor responding to street and new *City Park* [restaurants with terrace on park, food anchor store, clothing outlets]







Precinct design



Solutionthree [continued]

Place in the block new buildings to create the pedestrian open arcade on the new axis.

- 8** New 4 floor addition to the Munitoria complex, replacing the section destroyed in fire and allowing for expansion. Commercial and retail on ground floor.
- 9** New mixed-use buildings, 3 to 4 floors to define the street line infill gap, with private courtyards linked to public space. Commercial, retail and residential on ground floor. Residential on upper floors.

-  New private courtyard
-  New public space
-  Tree lined routes
-  Existing arcades
-  New arcades, linking street and courtyards

New public amenities

-  Police station
-  Clinic
-  Fire station
-  Service station



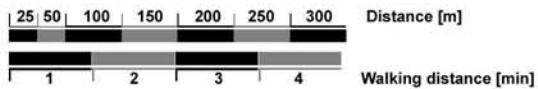
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Precinct design

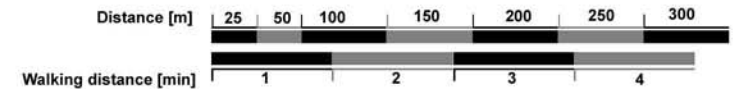


Figure ground study
before intervention

- Existing buildings
- Study area



Precinct design



After intervention



Residual space analysis before intervention

- Existing buildings
- Study area



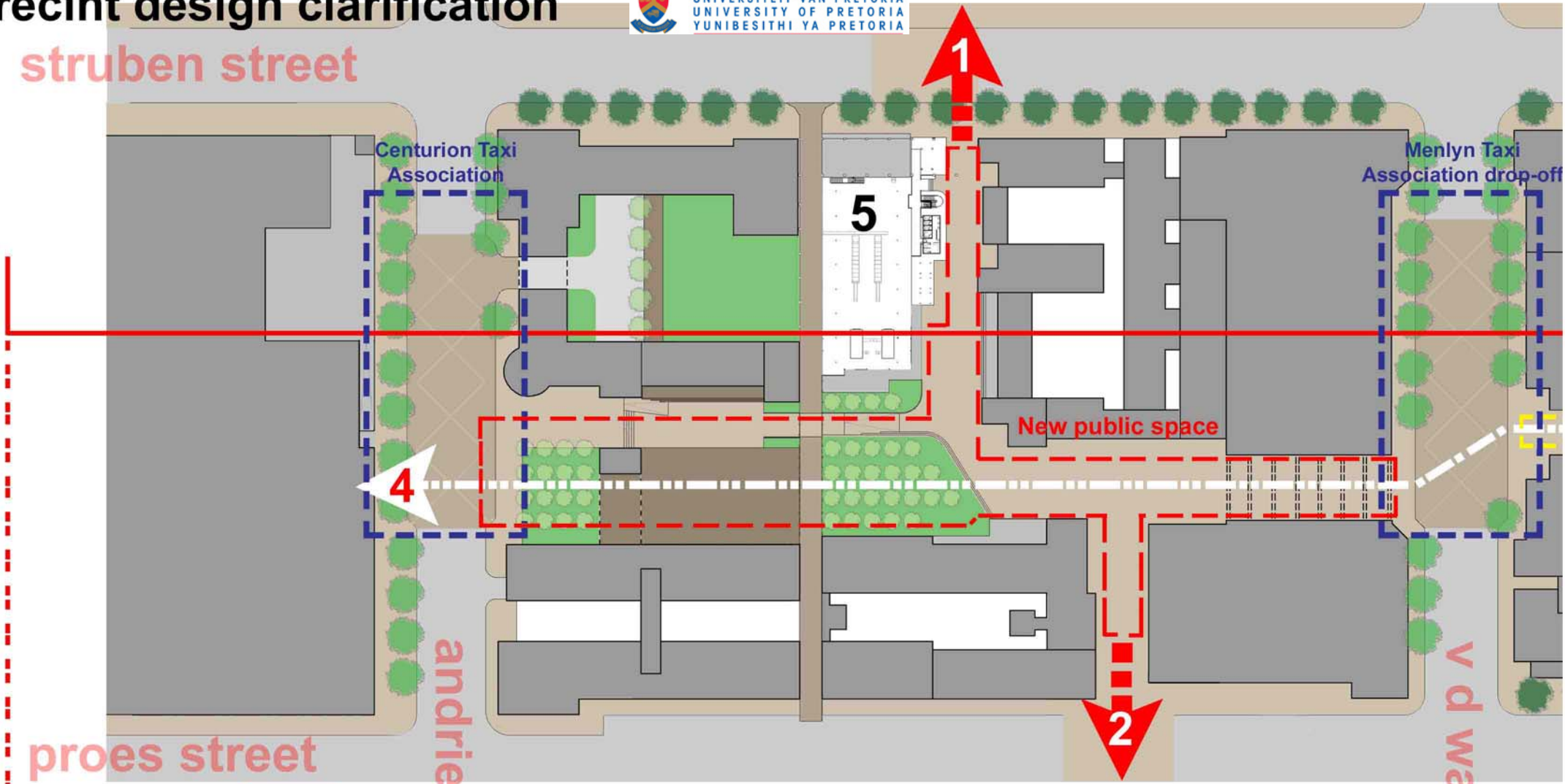
Precinct design



After intervention

Precinct design clarification

struben street



proes street

andries street

v d walt street

new urban laundry

private courtyard

private courtyard



“Cities are sites of interchange between various flows.”
[Urry, 2003:36]

Cities have always been the meeting place for people. Users of the city relied on various systems to furnish their growing needs. Over time, with the gradual disappearance of the lag between space and time, these needs and their fulfilment turn out to be more complex, interrelated and intersecting.

In *A thousand years of non-linear history* [1997:36] Da Landa conceives cities as complex, dynamic and open systems containing exceptional flows and mixtures of the organic and inorganic, the living and the non-living, the human and the non-human, culture and nature, the risky and the risk free. It is these open systems, with their own feedback loops, that form the bulk of the theory for this dissertation.

Over the last few decades, South African cities have grown at exponential rates. The increase in the influx from rural communities and the flow from people from the rest of Africa, have seen city populations expand to their highest levels ever. This, coupled with the ever escalating use and need for the motor vehicle, lead to the widespread growth of sprawling suburbia.

Growing cities leads to growth in the complexity, number and size of the supporting systems that provide for the city. As an example, the movement of the wealthy towards the eastern part of Pretoria also displaced the workplace of hired domestic labour. However, these labourers still reside in the same places as before which lead to more complex, interdependent taxi systems. While existing taxi routes could only bring them into the city, new routes had to open up, connecting the city with suburbia. As users moved between the taxi stops of each route, sprawling informal traders developed on these connecting routes.

The response and feedback to the actions taken are almost immeasurable, to the degree that nobody can accurately predict them. Should we not take action or rather see the city as a controlled experiment? An experiment with its own feedback loops, that will enhance, adapt or destroy the action we take?

Attoe and Logan [1989:47] argue that an extremely comprehensive understanding of the problem and systems is needed to produce a good limited effect. Robust cities, such as Pretoria, will in the end decide on the fate of any intervention.

The cadastral pattern

Carmona et al [2003:63] defines the cadastral pattern as “the layout of urban blocks and, between them, the public space/movement channels or ‘public space network’” This implies that either the blocks define the space, or the spaces define the blocks. The public space network contains both movement space and social space, two overlapping spheres. While pedestrian movement is compatible with both of these notions, motor vehicle movement is pure circulation. Thus, the spaces formed by the city blocks should accommodate its primary users: pedestrians.

By reducing the size of city blocks [or allowing for cross movement within them], a fine urban grain is created. This offers pedestrians a greater choice of routes within the city and creates a more permeable setting. The reduction allows the users to see clearly from one route to the next, thereby increasing visual permeability. This enhances the pedestrian’s understanding and knowledge of the available choices to get from one place to another.

Public space networks

The square

Squares can be defined as being static place with less movement, offering the pedestrian points of relief within the city. In *Town and Square* [1959], Paul Zucker defines the five typologies of urban squares:

- 1 The closed square – space self-contained: a square by building, interrupted only by the streets leading into it. [e.g. Strijdom Square]
- 2 The dominated square – space directed: some buildings create and own the space in front of them; all the surrounding structures are related to it. [e.g. Union Building’s Garden]
- 3 The nuclear square – space formed around a centre: a central nucleus creates a sense of space around it. [e.g. church Square]
- 4 Grouped squares – space units combined: a series of linked spaces, where each space prepares the user for the next.
- 5 Amorphous square – space unlimited: spaces which does not fall within the above mentioned, but displays some of the other categories characteristics. [e.g. Trafalgar Square, London]

Few squares embodies one pure typology, and often bear several characteristics. These squares may be designed to place focus on a public building, or a people places. They may also function as both of the above.

The street

Carmona et al [2003] defines the street as “three-dimensional spaces enclosed on opposite sides by buildings [while squares are enclosed on all sides] and are dynamic spaces with a sense of movement”. [Carmona et al, 2003:141]

Streets may contain roads, though a strong distinction is made between the two terms: the purpose of the latter used only as circulation for vehicular traffic.

Design intervention

This dissertation has as its goal the regeneration of the north-eastern section of the Pretoria CBD. While the intention is to place an architectural intervention into this part of the urban fabric, it forms only a small part of a much larger objective and program.

The objective is to create a master programme [as opposed to a master plan] for the area, in order to regenerate it. According to Attoe and Logan “a master plan specifies and end condition in the future, [whereas] a master programme sets more general objectives and identifies ways of achieving them. In effect, a programme offers several ways to reach the objective – depending on circumstance. And it sets out intentions and methods but not solutions”. [Attoe & Logan, 1989:68]

Urban catalysts

Although the term catalyst has different meanings, in the context of urban design, it denotes a project that is “a sequence of limited, achievable visions, each with the power to kindle and condition other achievable visions.” [Attoe & Logan, 1989:45]. This implies that an urban catalyst is the introduction of a new element into an area, which is responsible for the modification of some of the existing elements in. By defining it as limited, it is a reaction that is contained and its power harnessed. In order to achieve the predetermined objective, a comprehensive understanding of the problem is required. Each action [catalyst] lends momentum to the next action, forming as catalytic reaction. Each catalyst, however, needs to be contained and moderated to prevent it from destroying the city.

Proposed intervention to initiate an urban catalytic reaction 1 2

Currently there are two large projects nearing completion in this district, both with the intention of stimulating growth. The first is the placing of the new State Library [1] on half of a city

block, while the other is the upgrading of the Civitas building [2] that houses the Department of Home Affairs. Both of these developments can be seen as forming the start of an urban catalyst reaction. Together with the three existing, informal taxi ranks in the area, the number of pedestrians will increase in the area. This in turn leads to larger requirements of food outlets, entertainment and activities, while also attracting negative elements as crime and loitering.

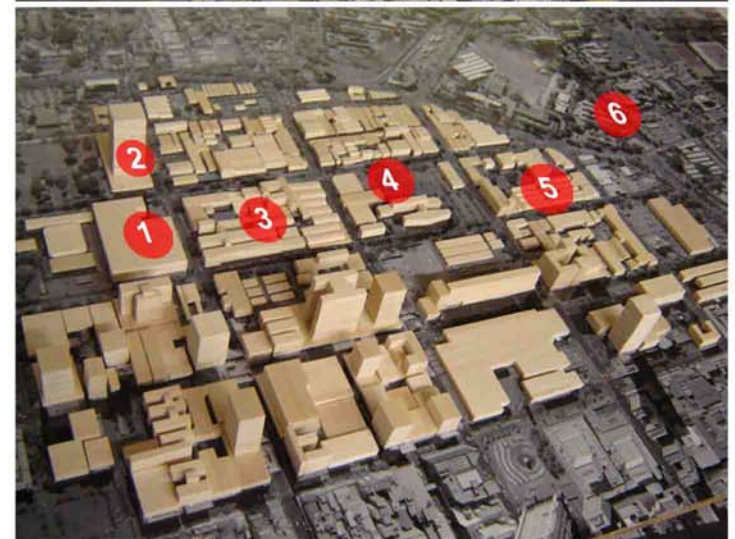
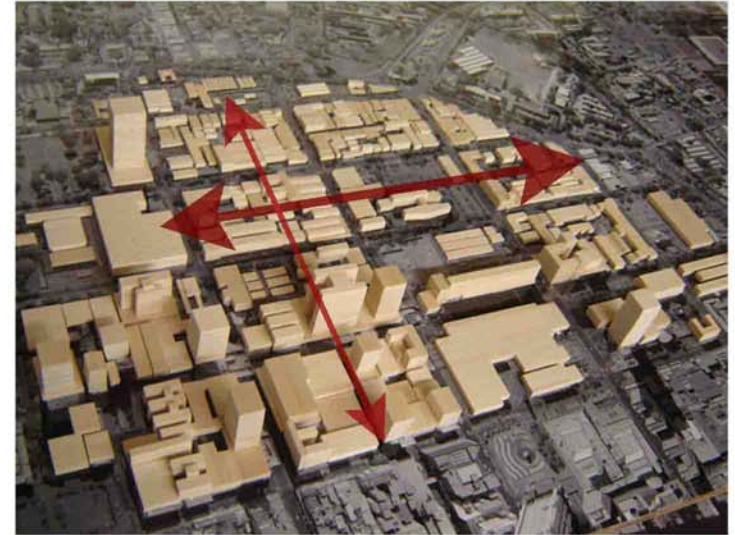
In order to curb the detrimental effects of the first two catalysts, while also allowing the regeneration to spread to the eastern part of the area, three catalysts are proposed:

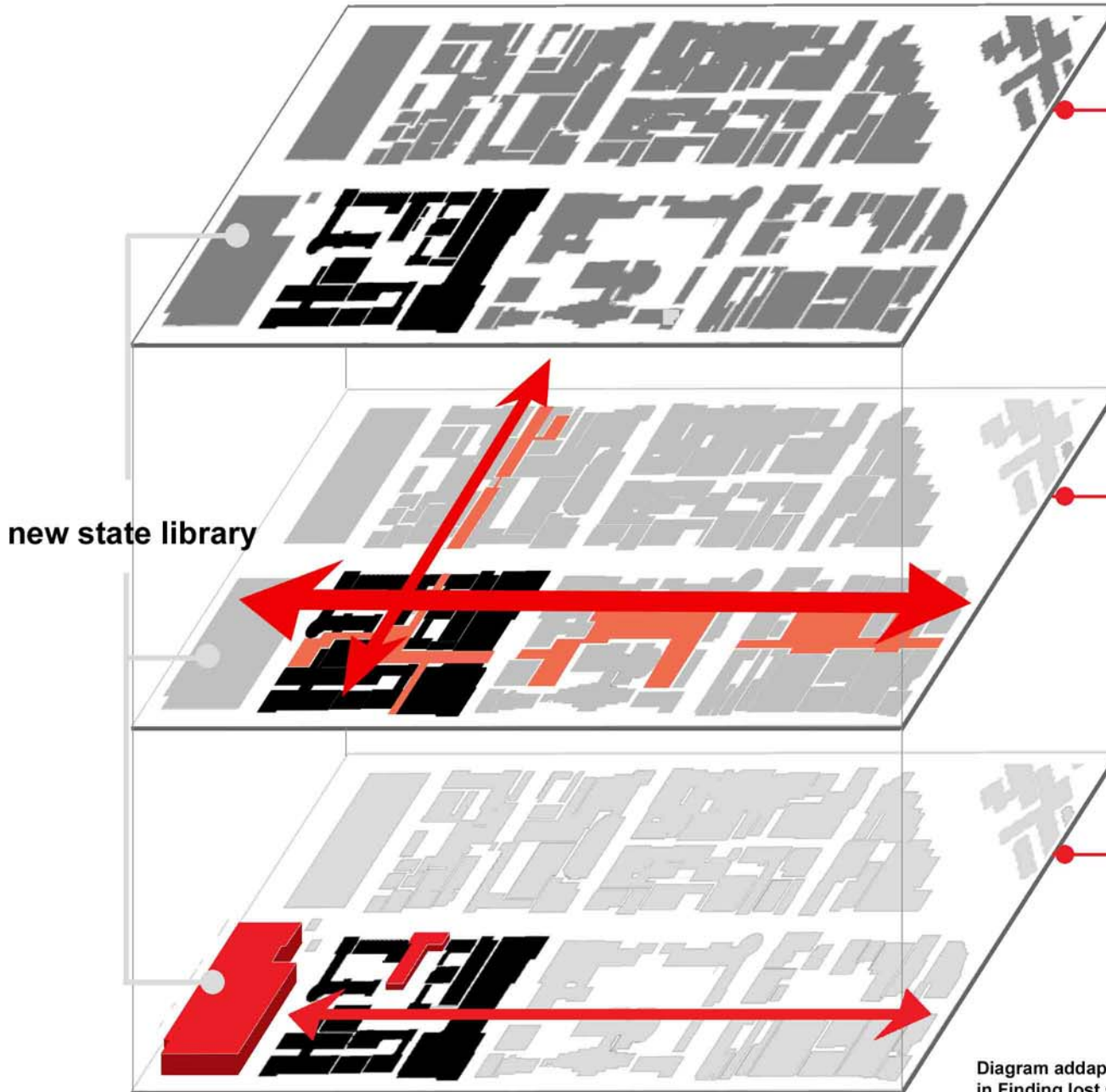
- 3 Create a public space in the centre of the city block, dissected by two axes which links it to the surrounding streets.
- 4 Create a civic square and urban park around the landmark civic building, encouraging spill-out from the residential functions in the area.
- 5 Re-programme the existing city block, place emphases on the east-west axis of Brown Street.

In all of these interventions the following guidelines :
These public areas should be circumscribed by buildings, existing and new, in order to contain pedestrian, while keeping a very strong connection to the street. The intention is not to lure pedestrians away from the streets, but to offer another option within the city.
The buildings forming the edges of these spaces should have a function that will allow passive surveillance and an active edge. These include residential and retail functions [mostly on ground floor] such as restaurants opening up towards the space, smaller sales outlets. Other crime deterring functions, such as a police station, may be considered.

These three catalysts will lead to a series of linked public spaces, connecting the three taxi ranks and terminating in the new State Library.

- 6 The upgrading of the Apies river system is proposed as the sixth catalyst. While forming the eastern terminal point for the public walkway, it has the possibility to become a link between the CBD and Arcadia to the east. This might include a promenade that intersects the proposed arcade system, offering pedestrian the option to link the Nelson Mandela corridor.





Urban spatial design theories

Figure-ground theory

The figure-ground drawing is a graphic tool for illustrating mass-void relationships, a two-dimensional abstraction in plan view that clarifies the structure and order of urban spaces. [Trancik, 1986:98]

According to this approach, the analysis of the building mass [solid] and open space [void] leads to an understanding of urban form.

It is by manipulating the form of this geometry that the designer can clarify the structure of urban spaces. This leads to the forming of a hierarchy of ordered, enclosed spaces of various sizes.

Linkage theory

In this approach, dynamics of circulation become the generators of urban form. [Trancik, 1986:96]

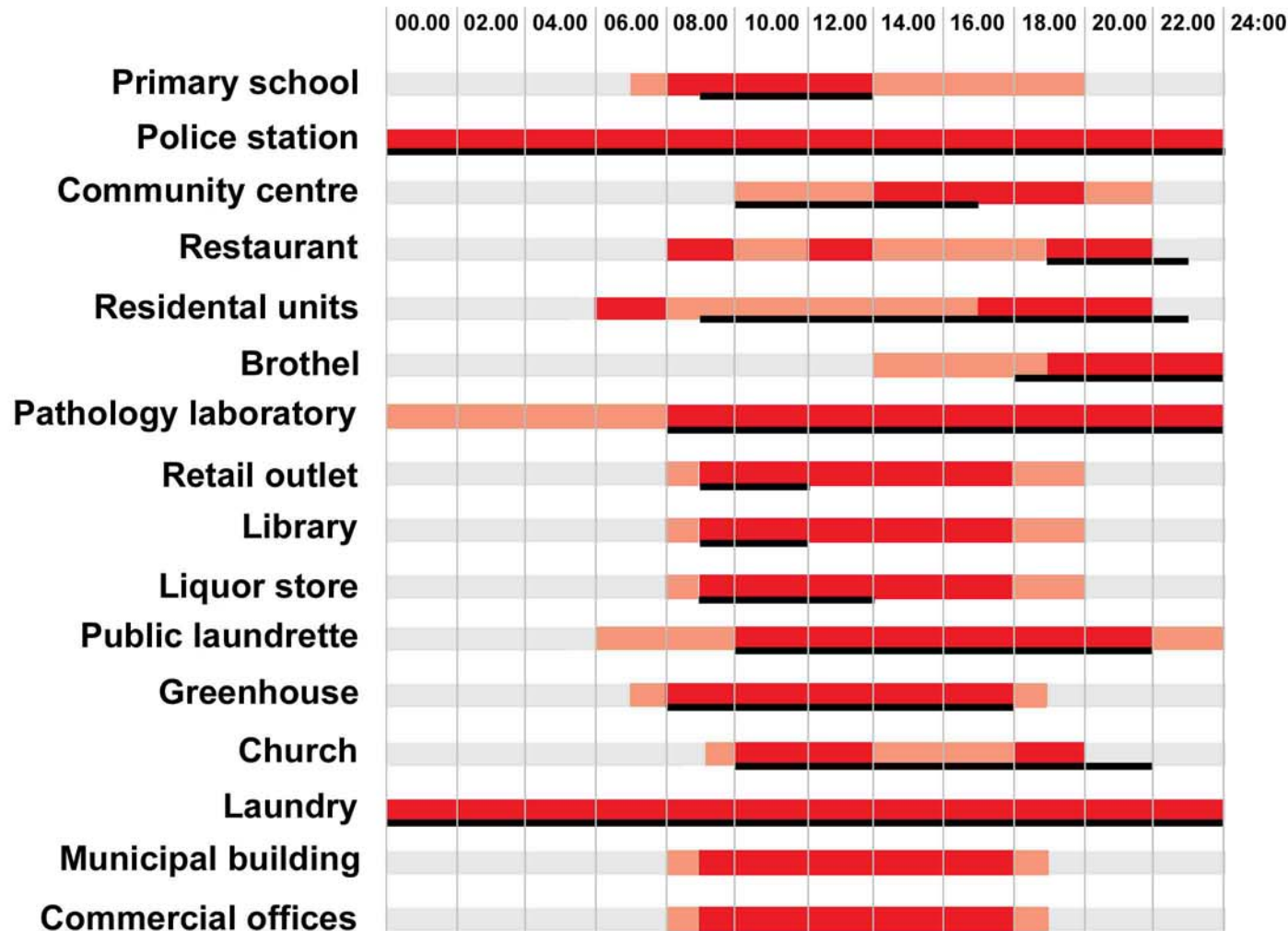
By organizing these circulation lines which connect the different parts of the city, the designer is able to identify and order the urban space.

Place theory

The place theory goes one step beyond the figure-ground and linkage theories in that it adds the components of human needs and cultural, historic and natural contexts. [Trancik, 1986:96]

Diagram adapted from figure 4-1 in Finding lost space, [Trancik, 1986:98]

Precinct design



Active times of functions in study area

- Medium activity during weekdays
- High activity during weekdays
- Activity during weekends

It is impossible to create a mix of activities on a city block which are all active during the whole of the day cycle. An optimal mix of function activity times will have to overlap in order to have surveillance on the public space during the whole cycle.



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fig.b

fig.c

fig.a

fig.d

Netcare Hospital Group Laundry, Jetpark

This facility launders an average of 1.5 million items per month for the Netcare Private Hospital Group, with a 24 hour work cycle.

Situated in an converted engineering workshop, the facility is composed of six parts:

- 1 Delivery road:** Drivers collect and deliver linen in sealed cages [fig.a] daily from the hospitals. Trucks are loaded with these cages in the delivery road, with is covered and allows light through by means of skylights. The floor finish is floated concrete, which allows for easy movement of the trolleys, as well as cleaning.

Requirements:

- Smooth floor finish.
- Adequate lighting during day and night.
- Wash-down and water drainage system.

- 2 Dirty linen area:** The sealed trolleys containing dirty and soiled linen, are opened by workers wearing protective garments. Dirty linen is sorted and placed into open plastic trolleys [fig.b]. Bundles of up to 50 kg each are into a conveyor which delivers the bundles into the continuous batch washer [washing machine]. At the end of the batch washer, the linen is loaded into a cell, where a hydraulic press forces the remaining water out.

Requirements:

- Smooth, washable floor finish.
- Wash-down and water drainage system.
- Mechanical equipment requires special foundations.

- 3 Clean linen area:** The clean linen, compacted by the hydraulic press, is transferred into tumblers, to separate the linen. It is then transported by a conveyor to the ironing area. Roller irons [fig.c], each containing three 1,5m diameter rollers, iron the linen, which is fed into it either by hand or mechanically. Ironed linen is folded mechanically and stacked, awaiting packing.

Requirements:

- Smooth, washable floor finish.
- Wash-down and water drainage system.
- Mechanical equipment requires special foundations.

- 4 Clean linen packing area:** The folded linen is packed into disinfected trolleys and send to the linen dispatch area in the delivery road.

Requirements:

- Smooth, washable floor finish.
- Wash-down and water drainage system.
- Adequate lighting during day and night.

- 5 Boiler room [fig.d]:** The boiler converts water into steam, required by the batch washers, tumblers and iron. Two boilers are installed and their use alternated every six months to allows for maintenace.

Requirements:

- Washable floor finish.
- Wash-down and water drainage system.
- Adequate lighting during day and night.
- Boilers requires specially designed foundations.
- Boiler room needs to be in close proximity to water supply and storage.
- Ventilation and high ceiling level to prevent heat build-up.

- 6 Office block:** Five offices and uni-sex toilet fulfils the needs of the facility. A new linen store and cleaning storage completes this component.

Requirements:

- Offices with adequate ventilation, lighting and floor finishes.
- Toilets and showers for five to ten personel.

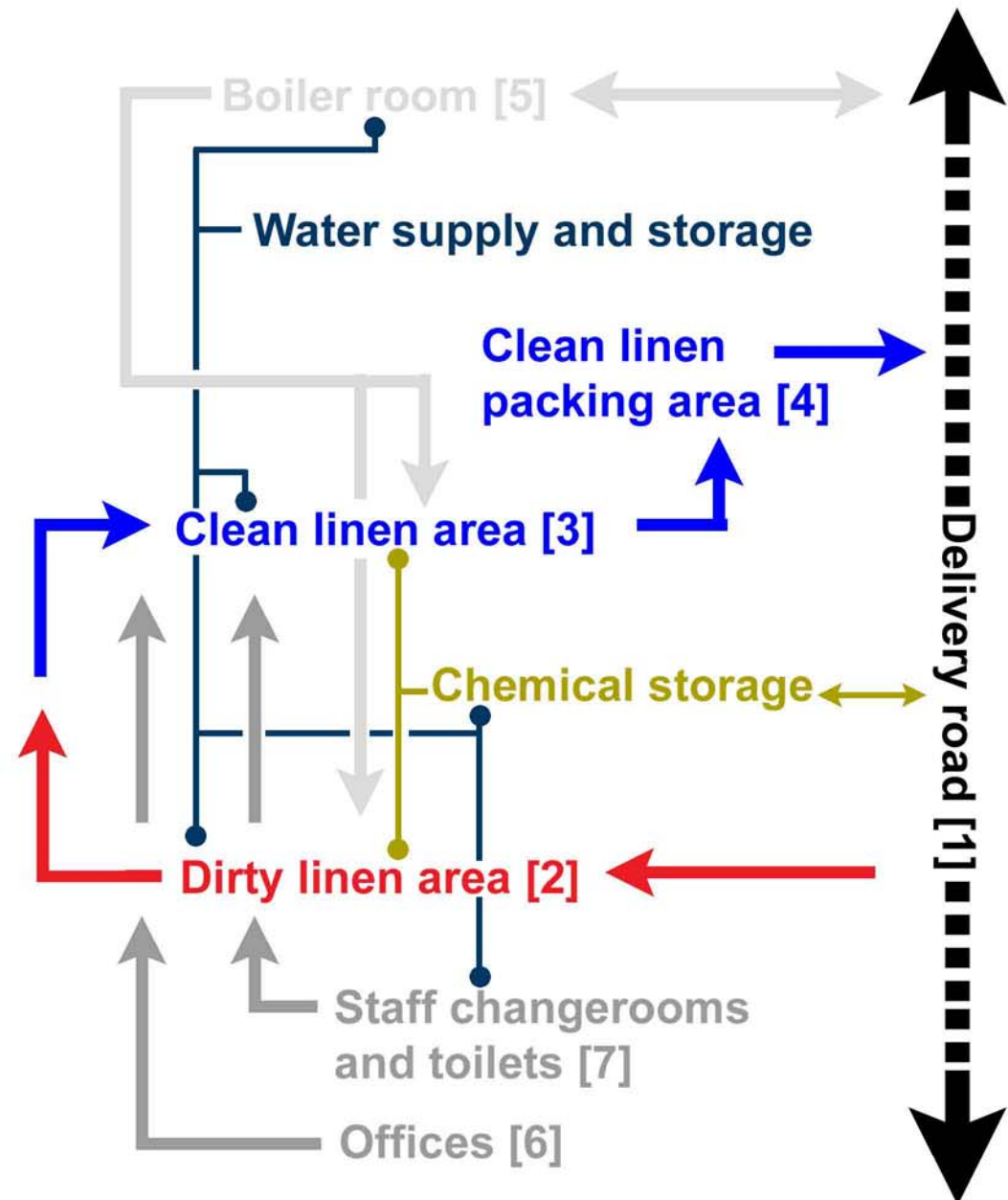
- 7 Staff changerooms and toilets:** The requires between 35 and 45 staff, more than 75% female. Nine uni-sex toilets, seperate changerooms and showers completes this component.

Requirements:

- Toilets and showers for 35 to 45 personel.
- Separate changerooms and lockers.
- Dinning room and kitchen.

Additional requirements:

- Chemical storage with access to the delivery road. This closed room should be well ventilated and placed in close proximity to the clean and dirt areas.
- Water storage allowing for three day's water supply.





Virology laboratory, University of Pretoria

This facility is one of the leading research facilities in the country, with its focus on indigenous African diseases, including AIDS, rabies and the micola virus.

Situated in a campus tower building, the facility is composed of three parts:

1 Reagent preparation room: In this room, reagents and control agents are prepared. Personnel are required to wear gloves and lab coats and hand wash basin are located at the entrance.

Requirements:

- Smooth, wash-down floor finish with rounded connection to walls
- Adequate lighting and ventilation during day and night.
- Wash-down and water drainage system.
- Dedicated hand wash basin.

2 Specimen preparation room: Specimen samples are added to the reagents prepared in area 1. This room contain several small, desk-top mechanical machines, including various centrifuges.

Requirements:

- Smooth, wash-down floor finish with rounded connection to walls
- Adequate lighting and ventilation during day and night.
- Decontamination and water drainage system.
- Dedicated hand wash basin.

3 Amplification and detection room: The prepared specimens are amplified and result given electronically. The room is divides into two areas: one contains instruments required in the amplification process, the other contain workstations, computers and printers.

Precedent

Requirements:

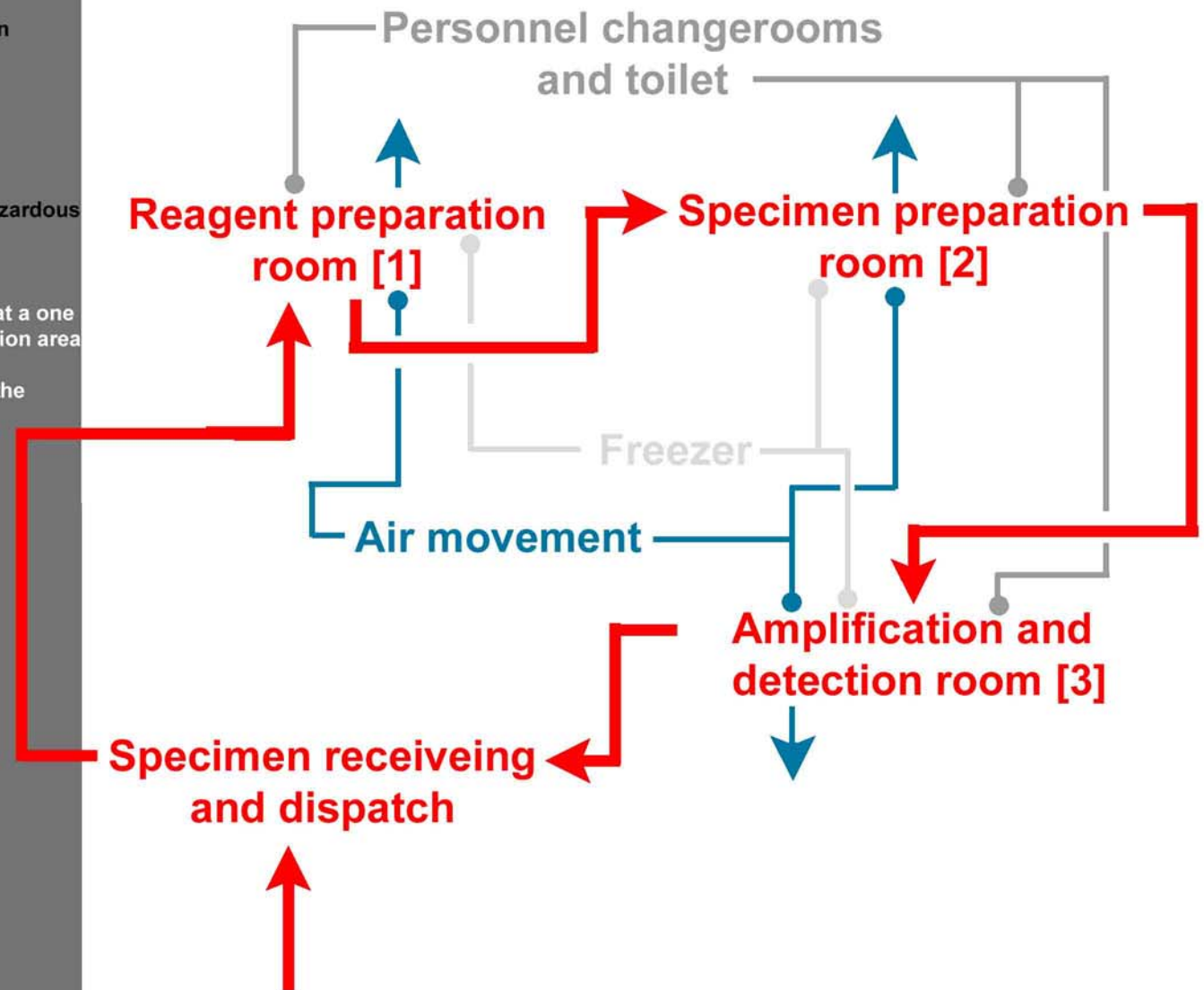
- Smooth, wash-down floor finish with rounded connection to walls
- Adequate lighting and ventilation during day and night.
- Decontamination and water drainage system.
- Personnel workstations

Additional requirements:

- A dedicated, ventilated enclosed space for temporary hazardous waste storage.
- A laminar flow cabinet and exhaust system.

In order to avoid carryover contamination, it is imperative that a one way flow is followed from the Preparation room to the Detection area

The Detection room should be as far away as possible from the Specimen and Reagent Preparation rooms.



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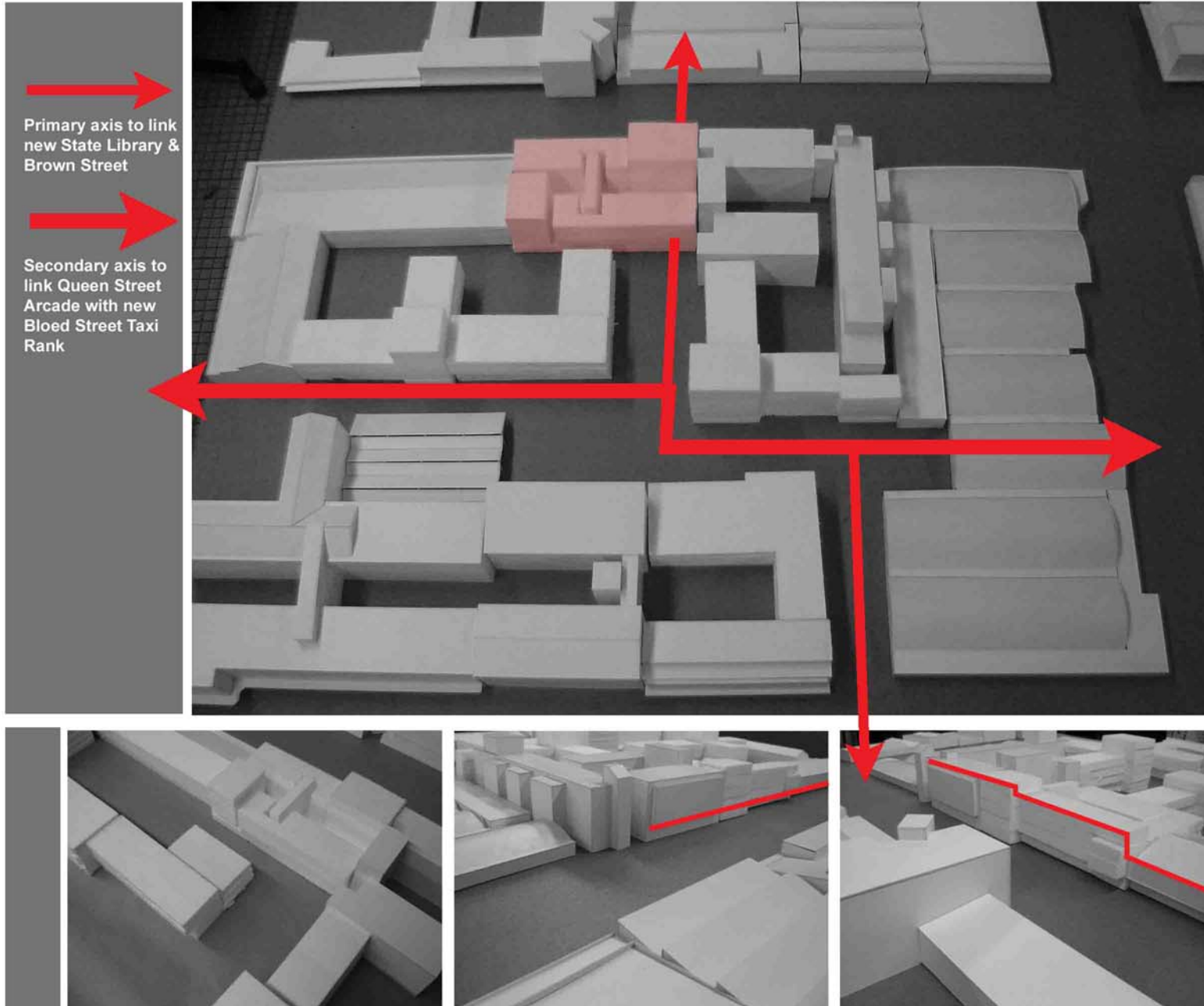
precedents

design development

design clarification

design documentation





Block massing model one

- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over the building line to form entrance to arcade leading to public space.
- ✓ A private courtyard, separating the northern and southern blocks, linked to the street and the private courtyard to the west.
- ✓ The circulation tower forms focal point visible from public space.
- ✗ The elevation of the building is not responsive to the neighbour on the west.
- ✗ The north entrance to the public space is too deep, not inviting to users.
- ✗ The service and circulation towers are not separately expressed.

five

six

seven

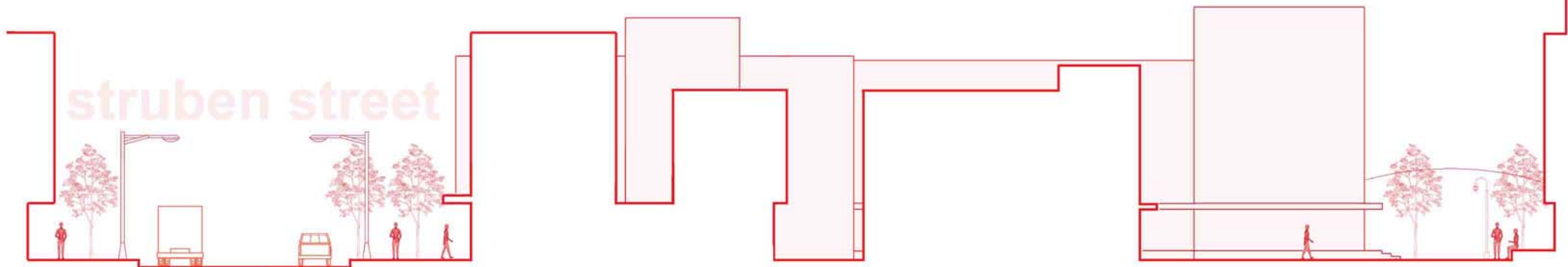
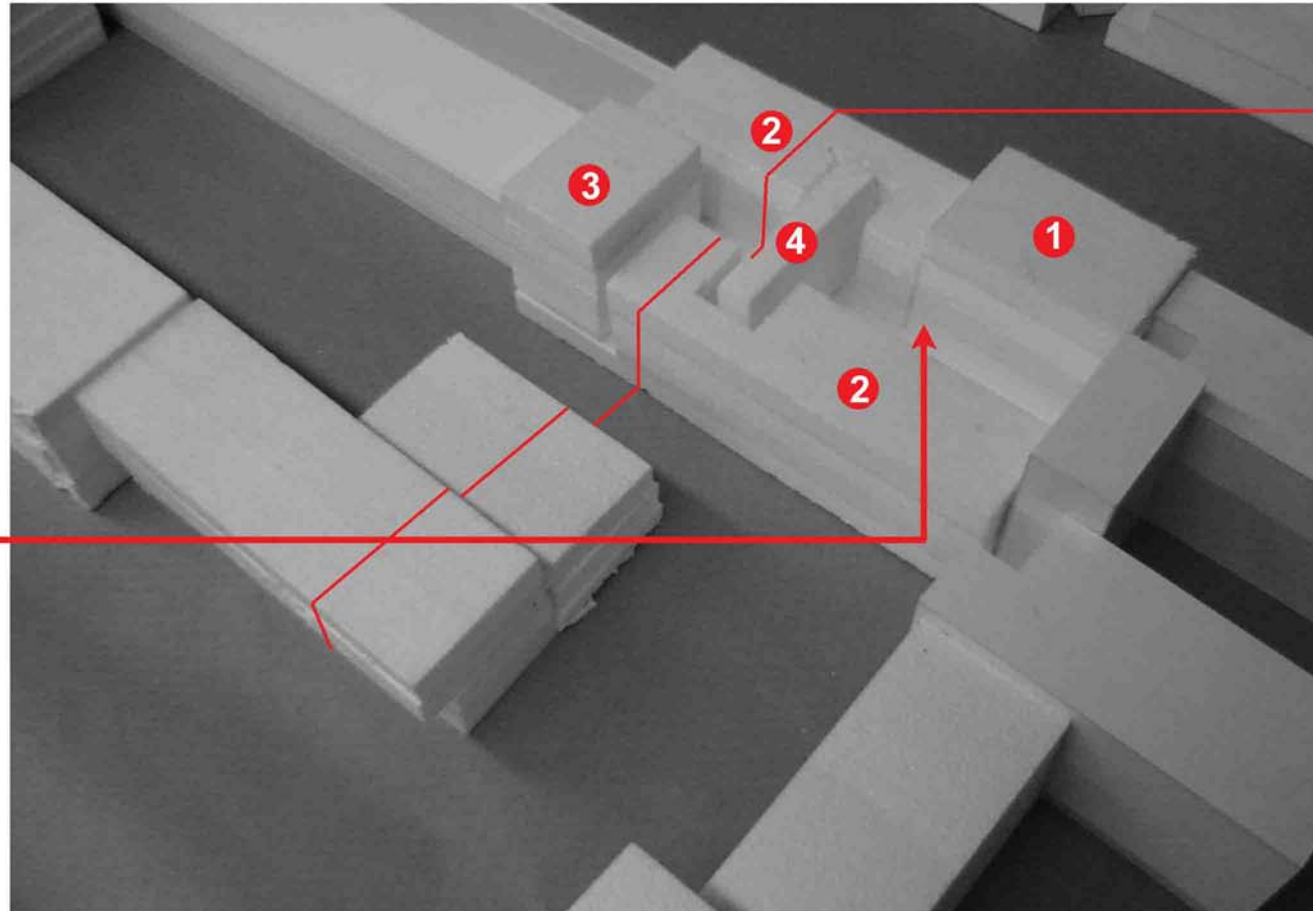


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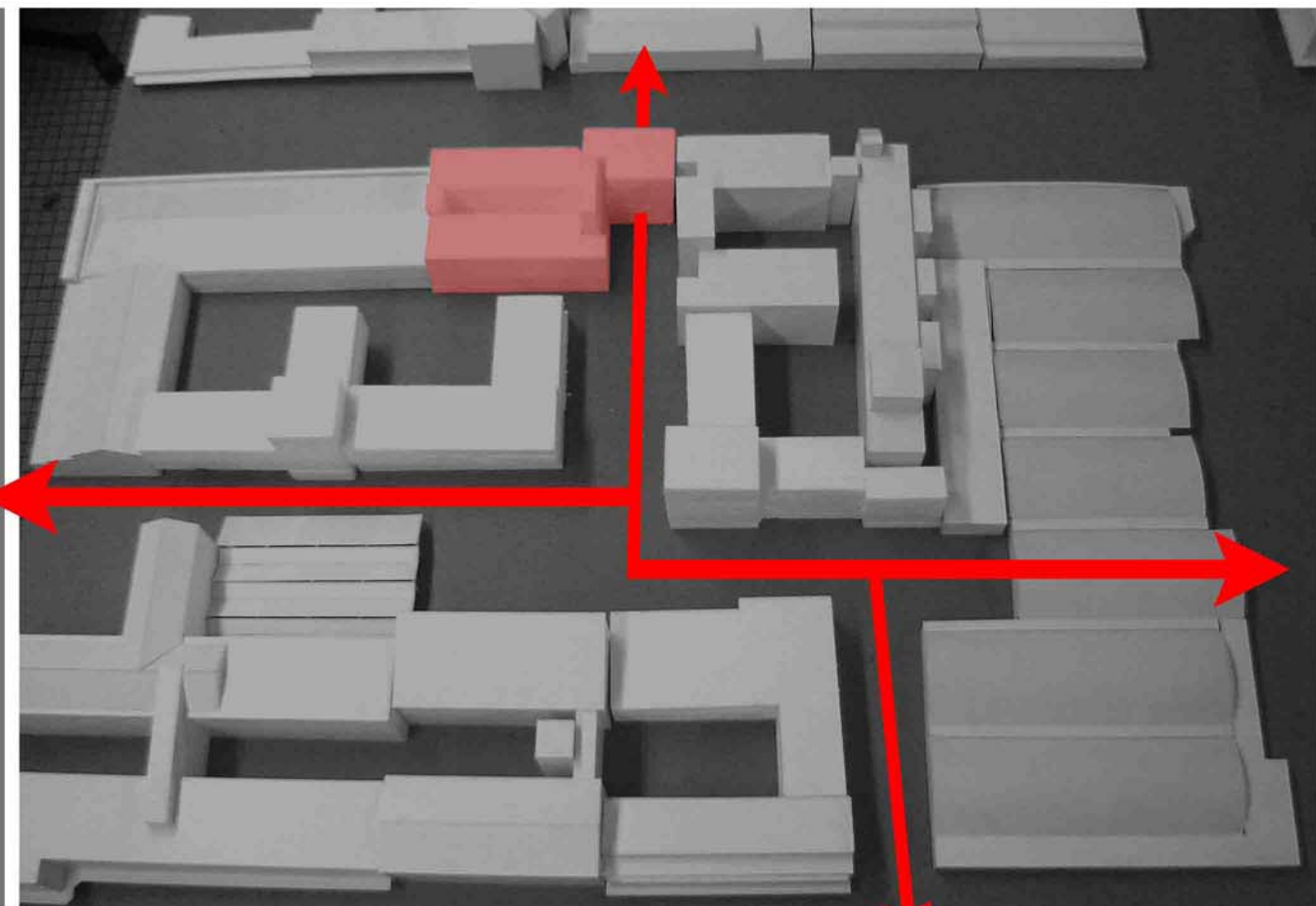
- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower

Private courtyard



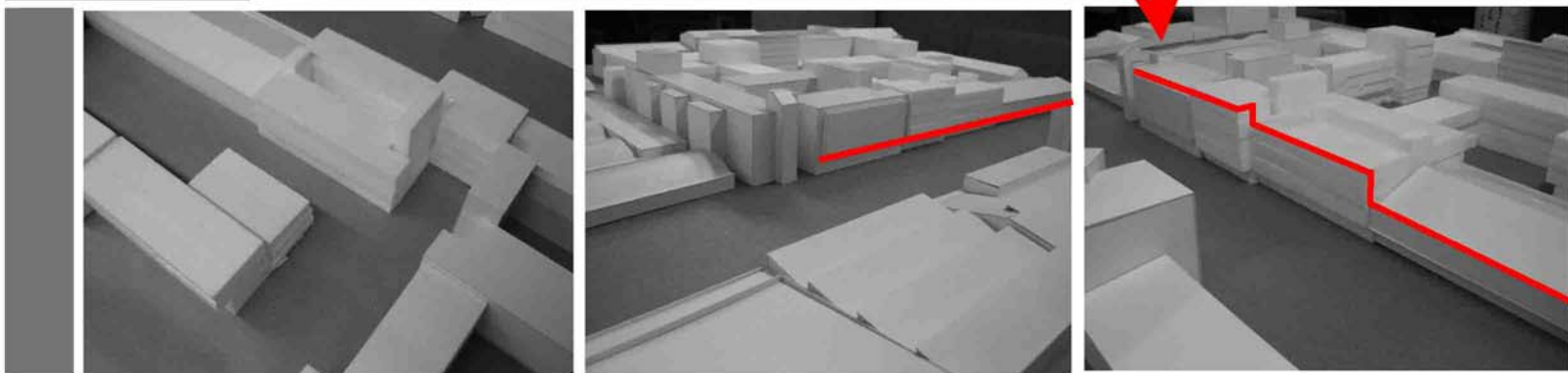
→
Primary axis to link
new State Library &
Brown Street

→
Secondary axis to
link Queen Street
Arcade with new
Blood Street Taxi
Rank



Block massing model two

- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over the building line to form the entrance to arcade leading to public space.
- ✓ A private courtyard, separating the northern and southern blocks, linked to the street and the private courtyard to the west.
- ✓ The circulation tower forms a focal point visible from the public space.
- ✗ The elevation of the building is not responsive to the neighbour on the west.



five

six

seven

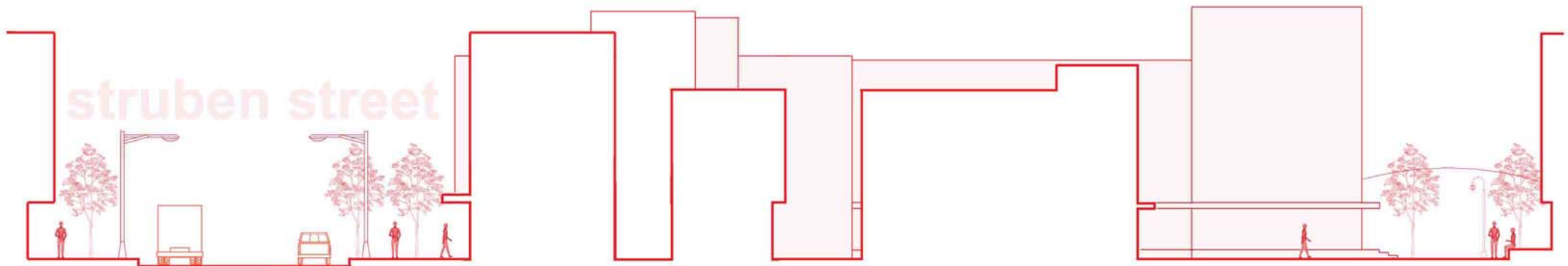
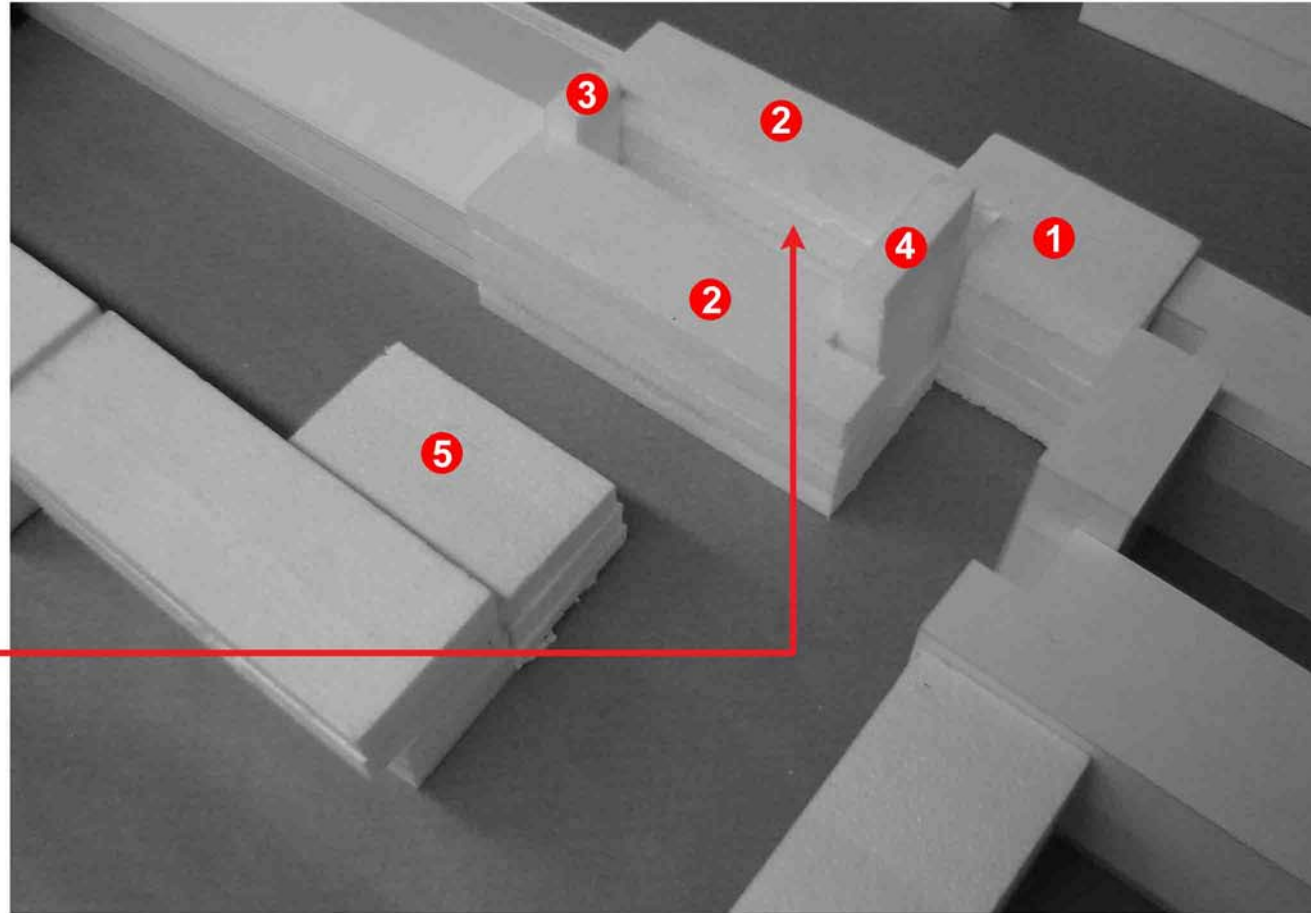


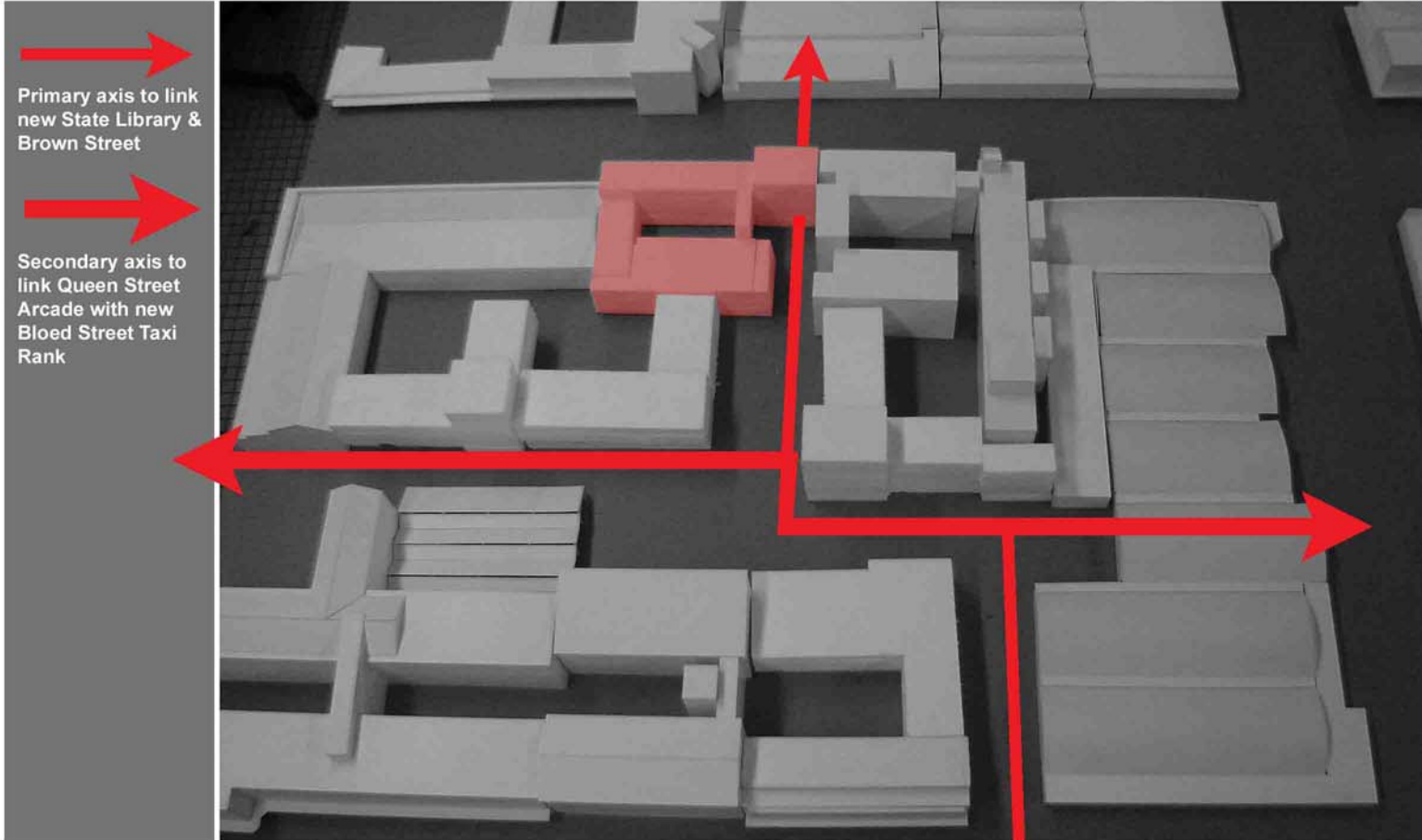
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- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room

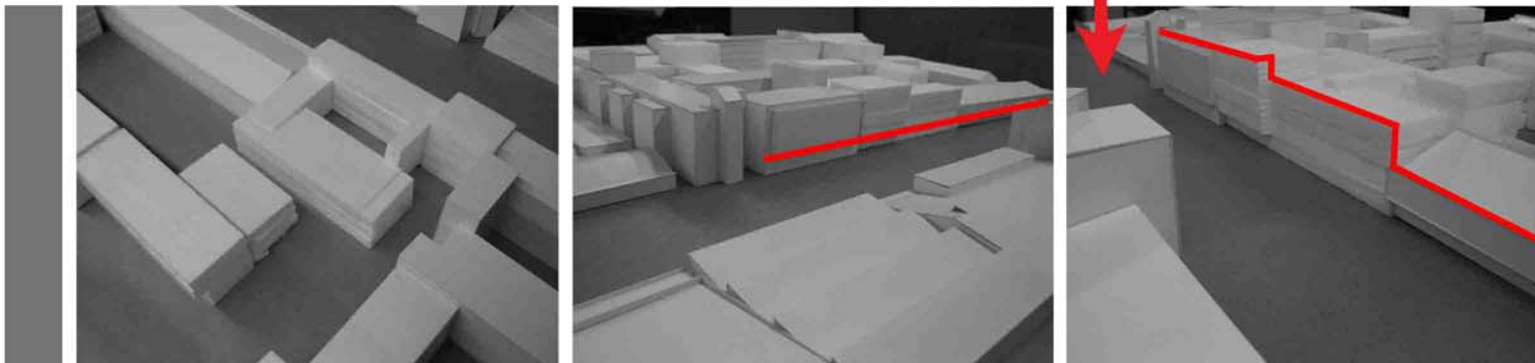
Private courtyard





Block massing model three

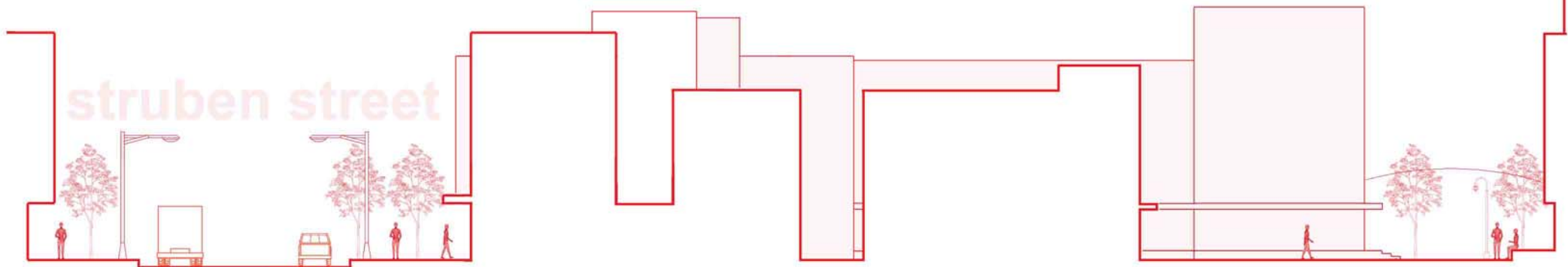
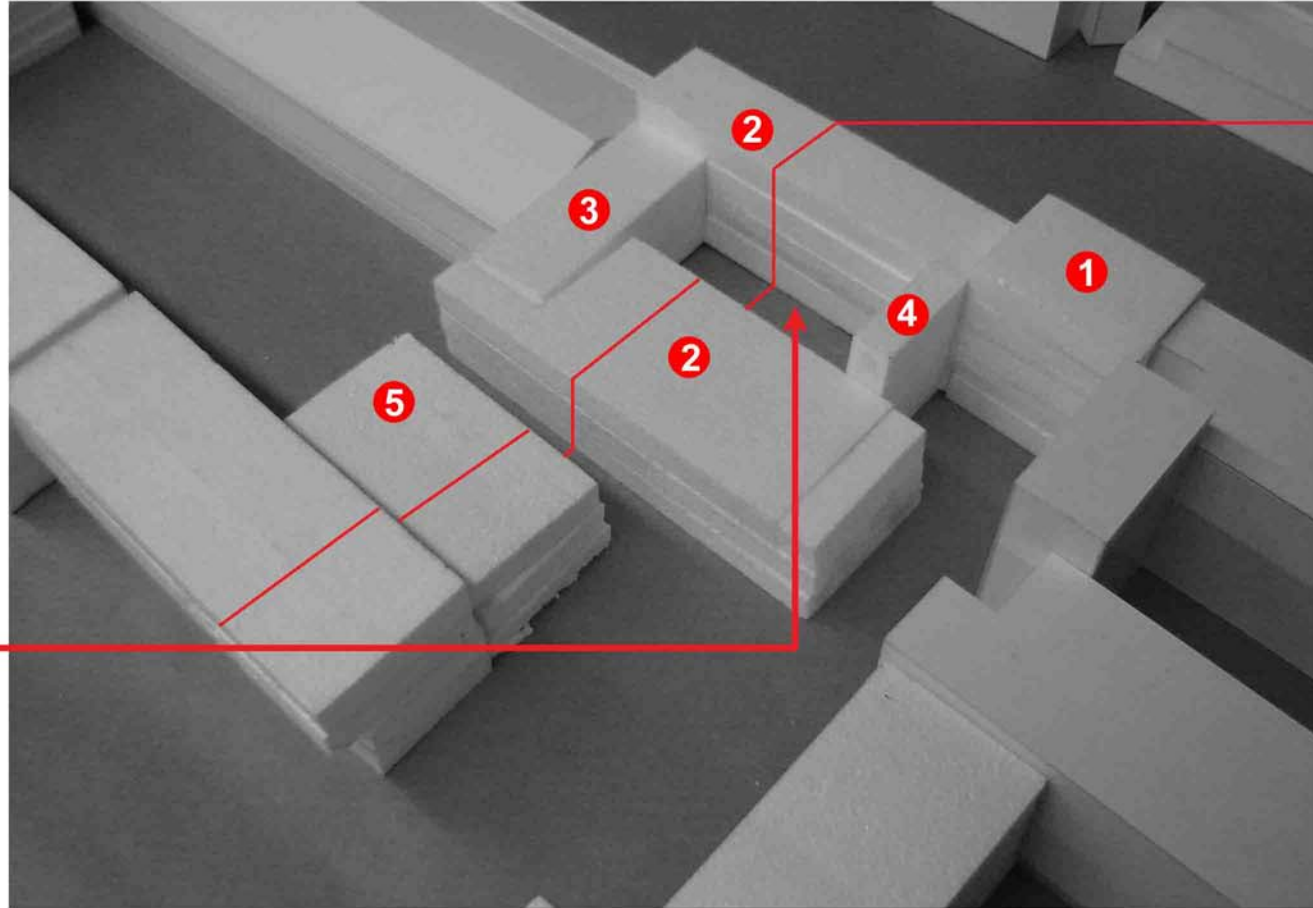
- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over building line to form the entrance to the arcade leading to the public space.
- ✓ A larger private courtyard, separating the northern and southern blocks, linked to the street and the private courtyard to the west.
- ✓ The circulation tower and entrance block forms a focal points visible from the public space.
- ✗ The elevation of the building is not responsive to the neighbour on the west, the step in the roof line is too large.
- ✗ No connection between the main building and the boiler room.





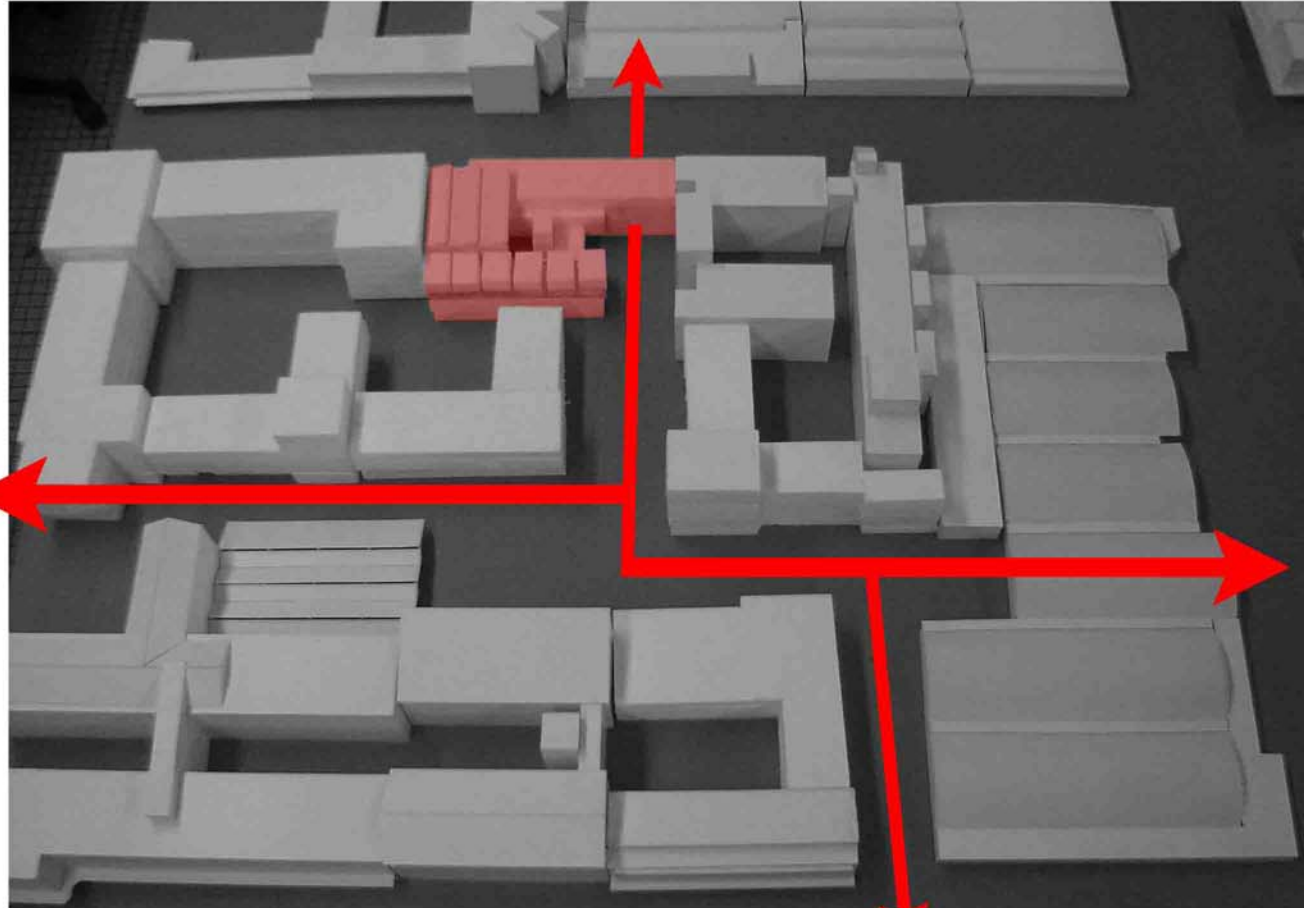
- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room

Private courtyard



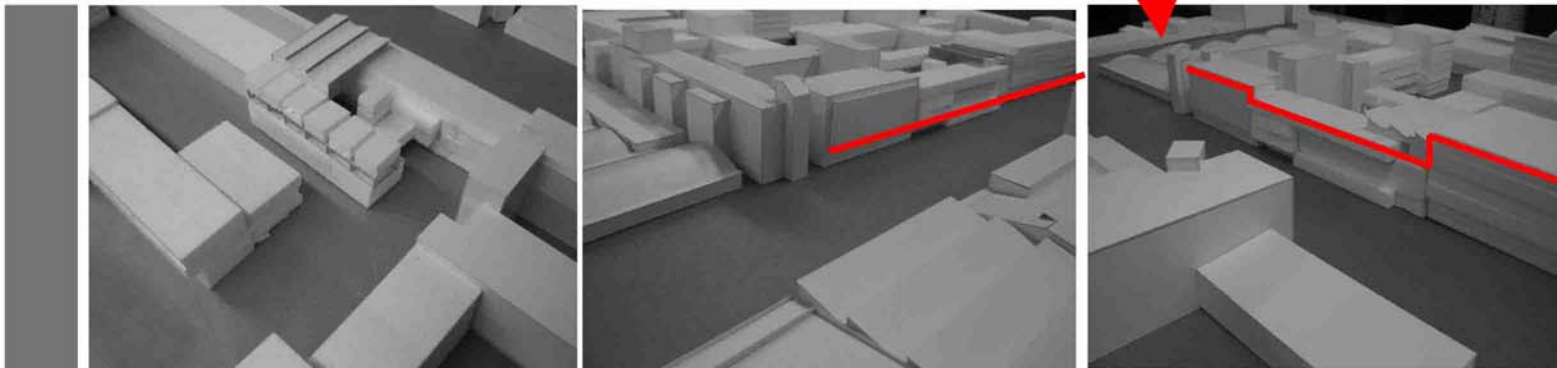
→
Primary axis to link
new State Library &
Brown Street

→
Secondary axis to
link Queen Street
Arcade with new
Bloed Street Taxi
Rank



Block massing model four

- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over building line to form an entrance to the arcade leading to the public space.
- ✓ A larger covered private courtyard, separating the northern and southern blocks and allows the possible inclusion of a green house. This space is linked to the street and the private courtyard to the west.
- ✓ The circulation tower and entrance block forms focal points visible from the public space.
- ✗ The step in the roof line is too large on both sides, forming an uncomfortable gap.
- ✗ No connection between the main building and the boiler room.



five

six

seven

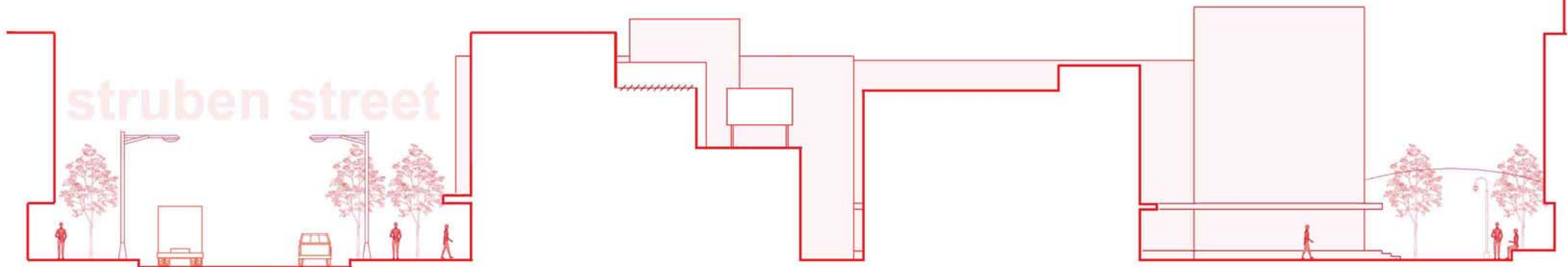
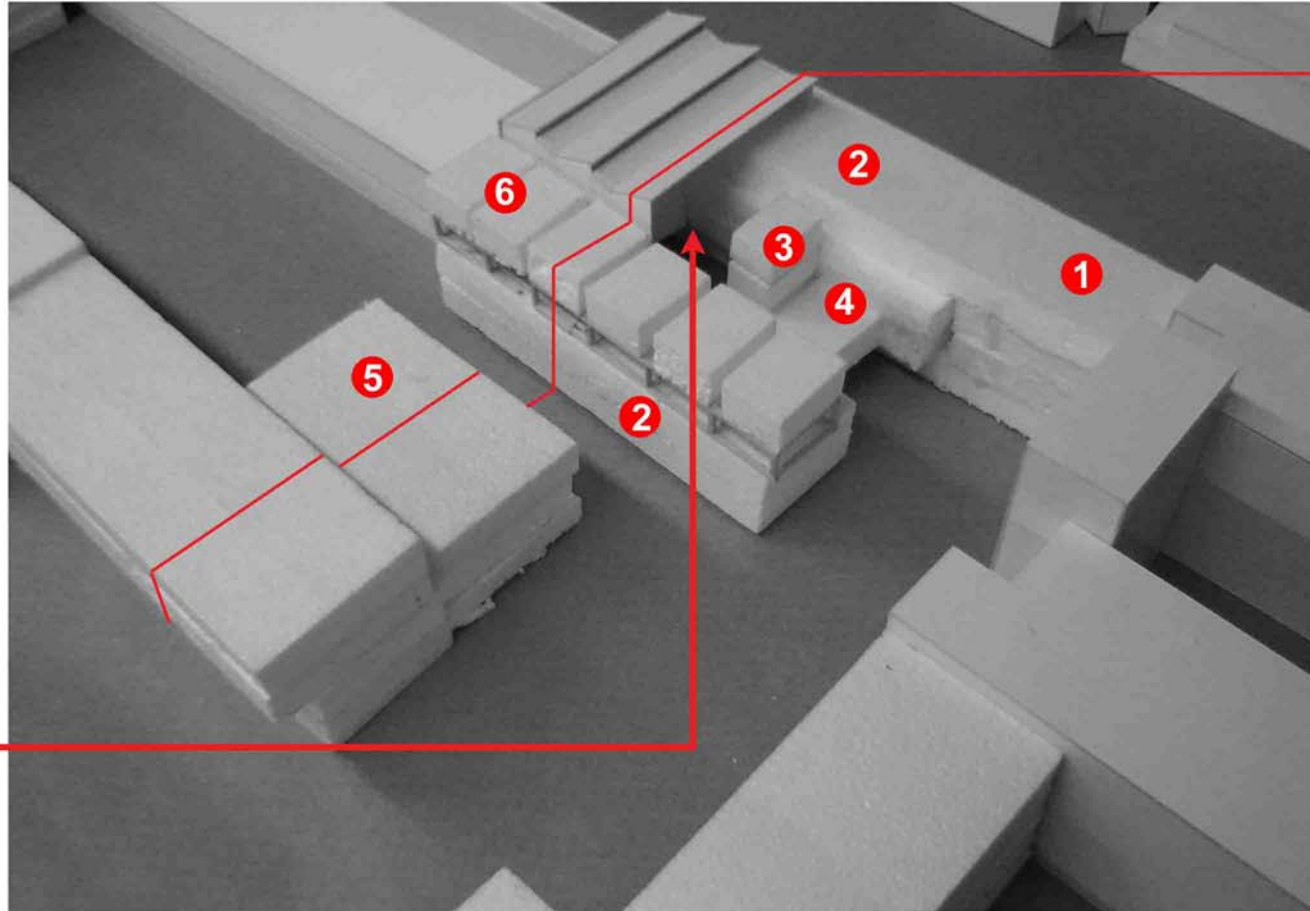


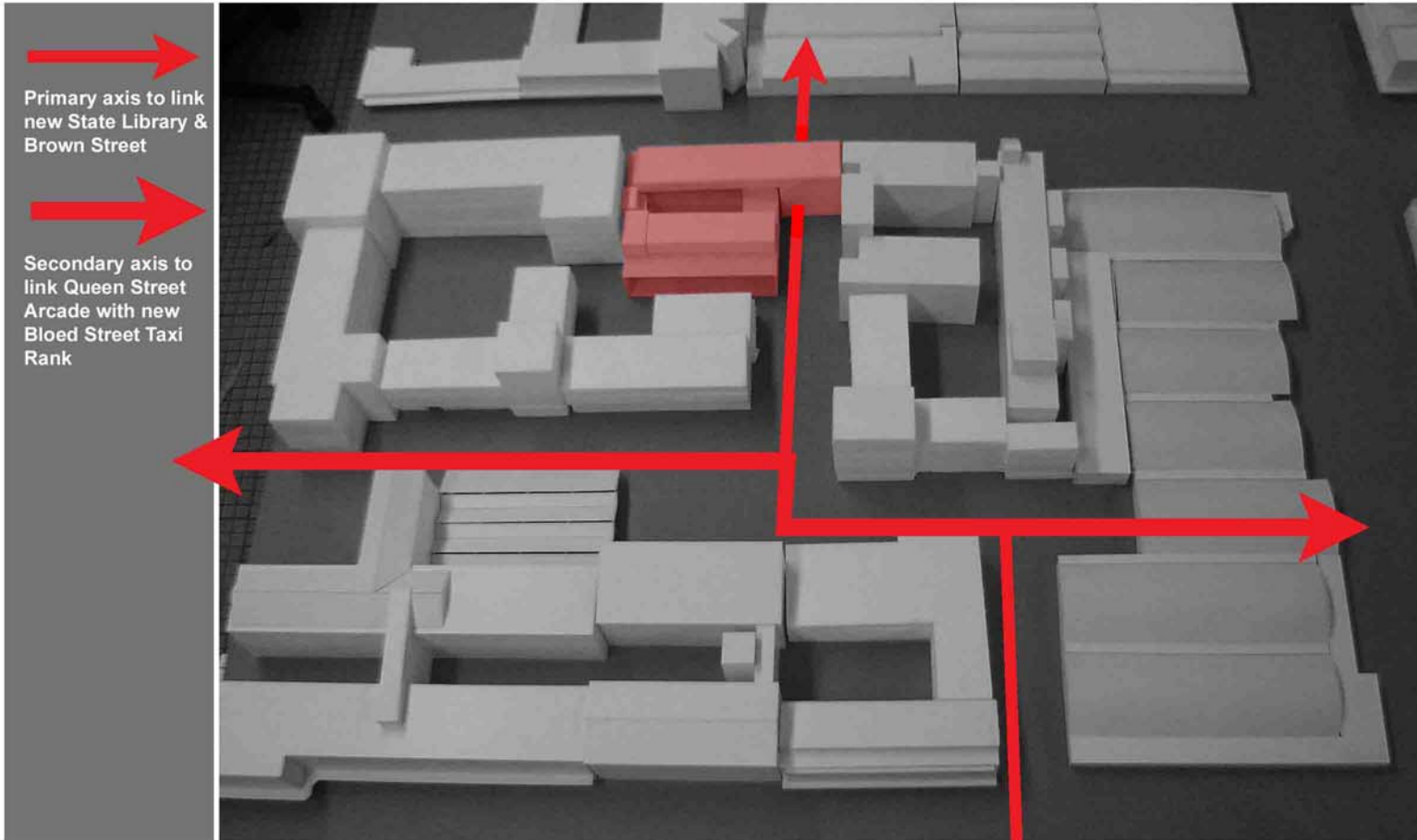
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nine

- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room
- 6 Water tanks

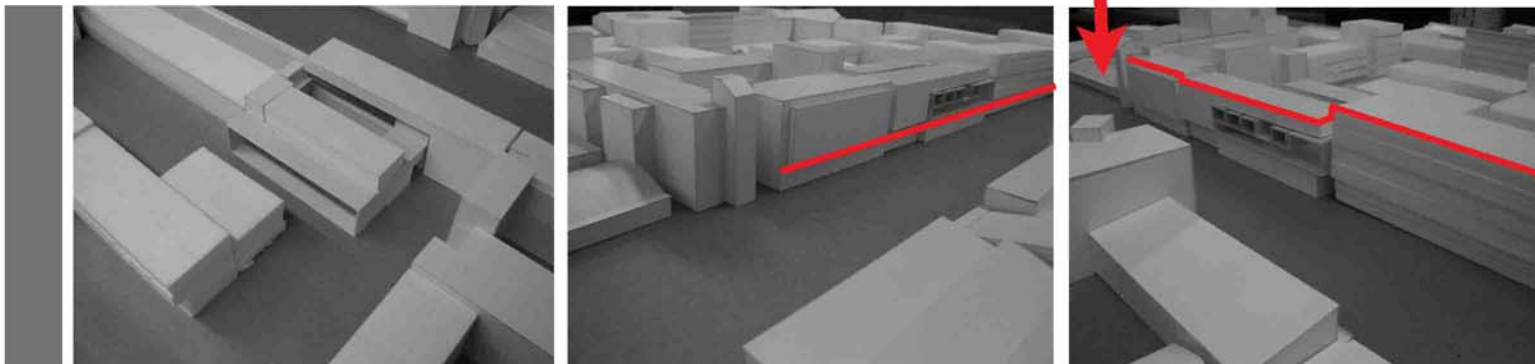
Private courtyard





Block massing model five

- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over building line to form entrance to arcade leading to public space.
- ✓ A larger covered private courtyard, separating the northern and southern blocks and allows the possible inclusion of a greenhouse. By opening the south facade the link formed with the street and the private courtyard to the west is reinforced.
- ✓ The circulation tower and entrance block forms focal points visible from the public space.
- ✓ By opening the south facade, a visual link is created with the boiler room, arcade and public space.



- ✗ The step in the roof line is too large on both sides, forming uncomfortable gap.
- ✗ Very limited interaction between the pedestrians using the walkway and those inside the building.

five

six

seven

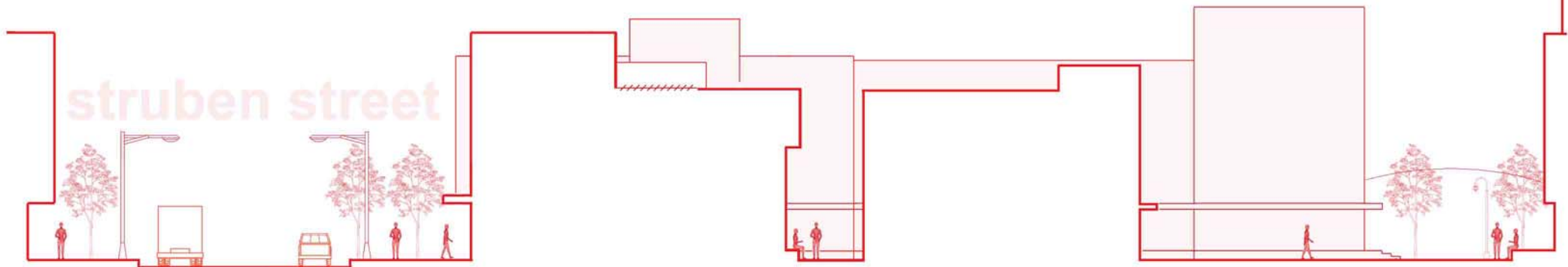
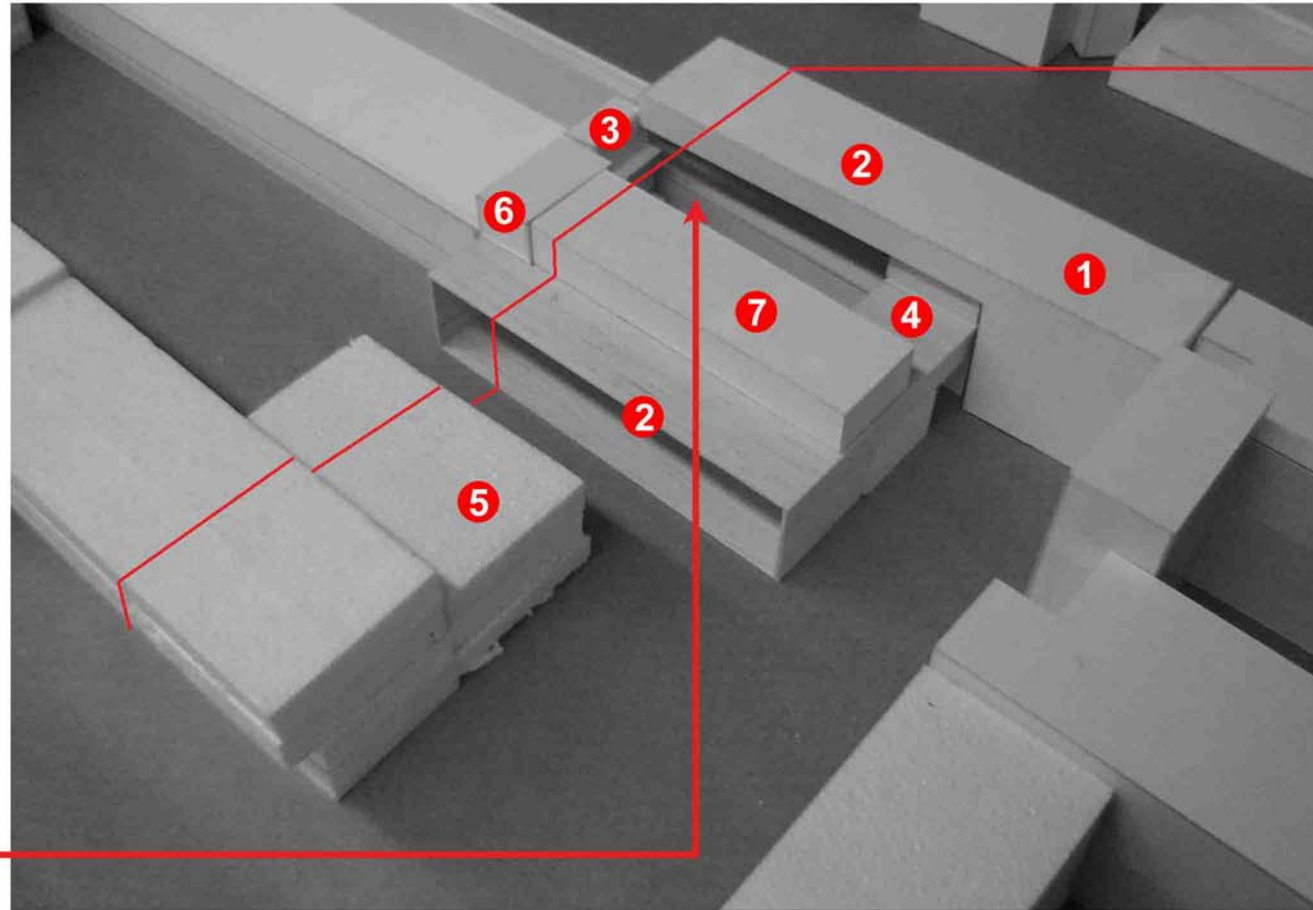


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nine

- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room
- 6 Water tanks
- 7 Greenhouse

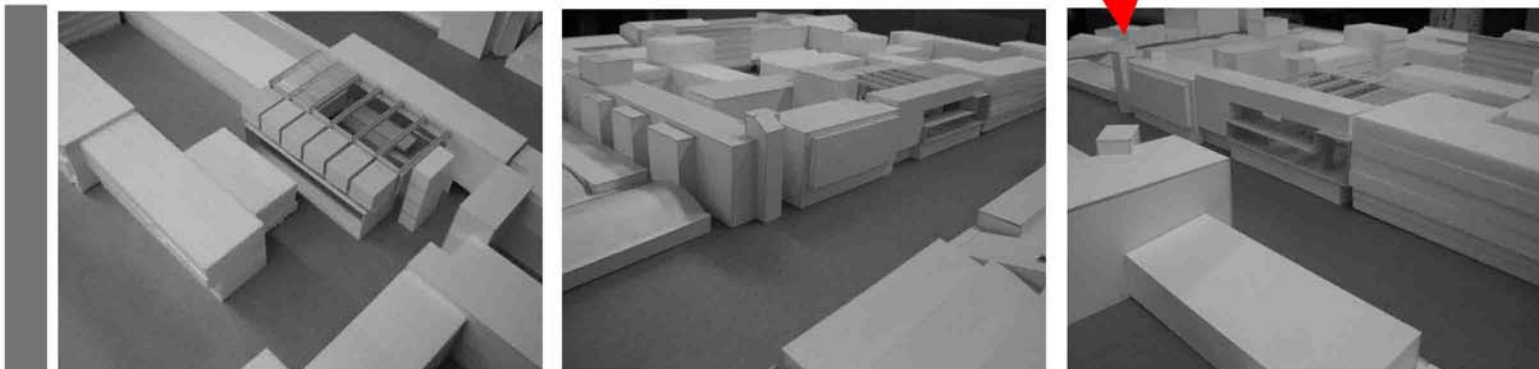
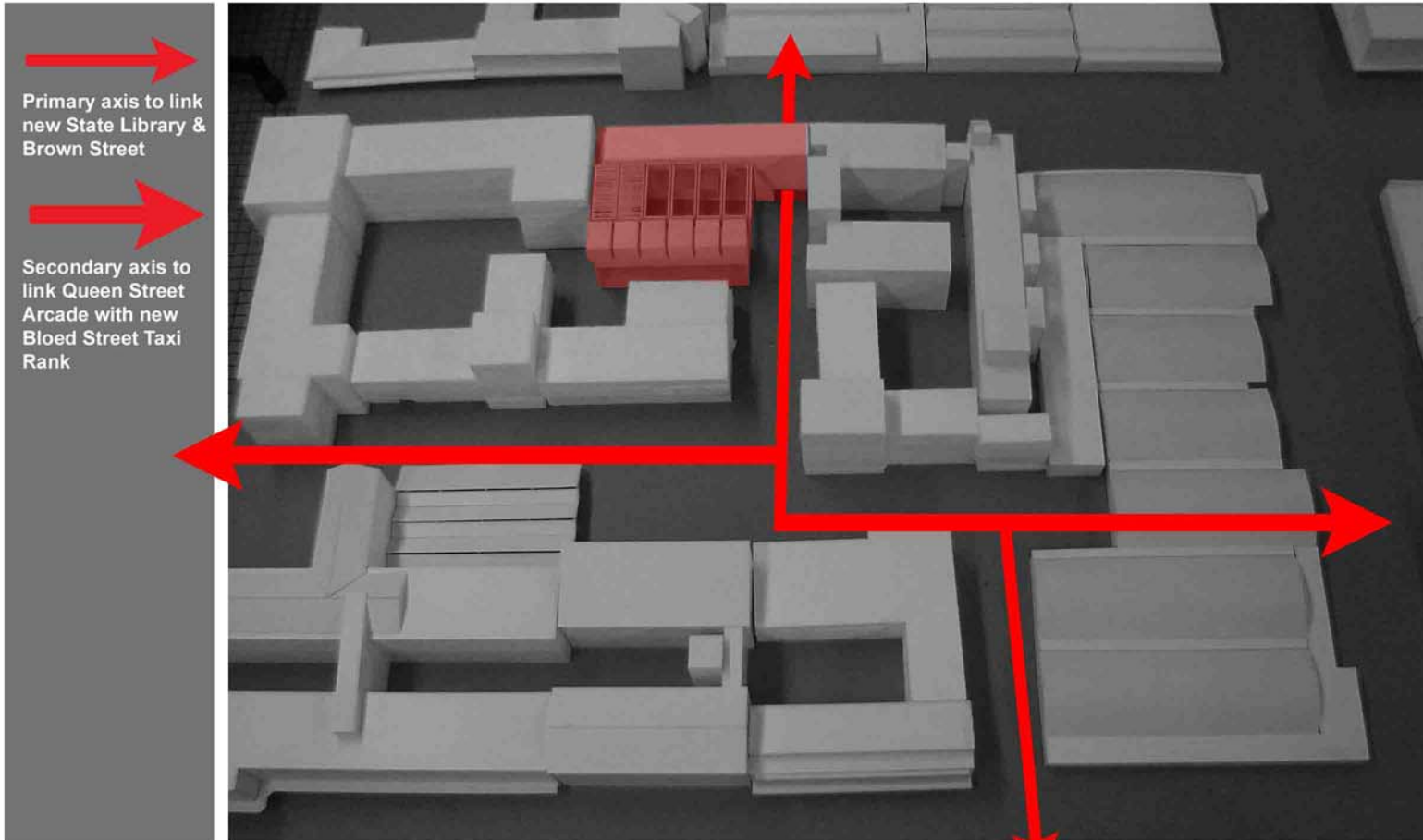
Private courtyard



Design development

three

four



Medium detail block model one

- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over building line to form entrance to arcade leading to public space.
- ✓ A larger covered private courtyard, separating the northern and southern blocks and allows the possible inclusion of a greenhouse. By opening the south facade the link formed with the street and the private courtyard to the west is reinforced.
- ✓ The circulation tower and entrance block form a focal points visible from the public space.
- ✓ By opening the south facade, a visual link is created with the boiler room, arcade and public space.
- ✓ The roof line follows a continuous line along the building and both of the neighbours
- ✗ Very limited interaction between the pedestrians using the walkway and those inside the building.

five

six

seven

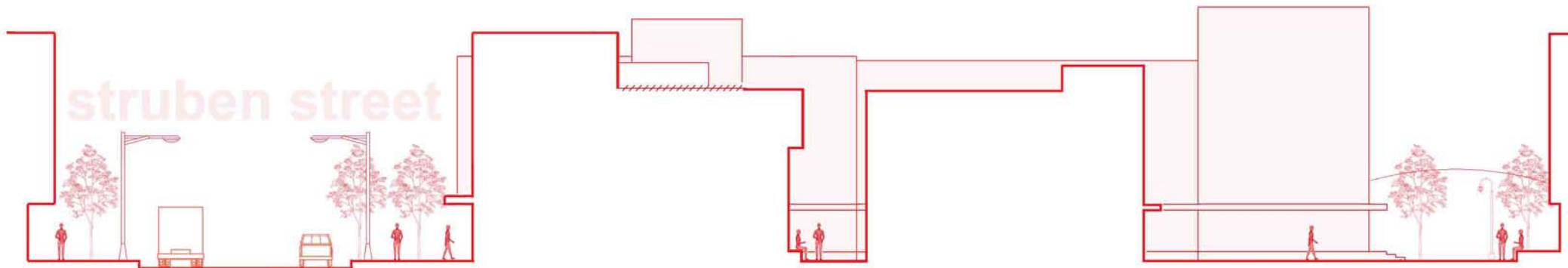
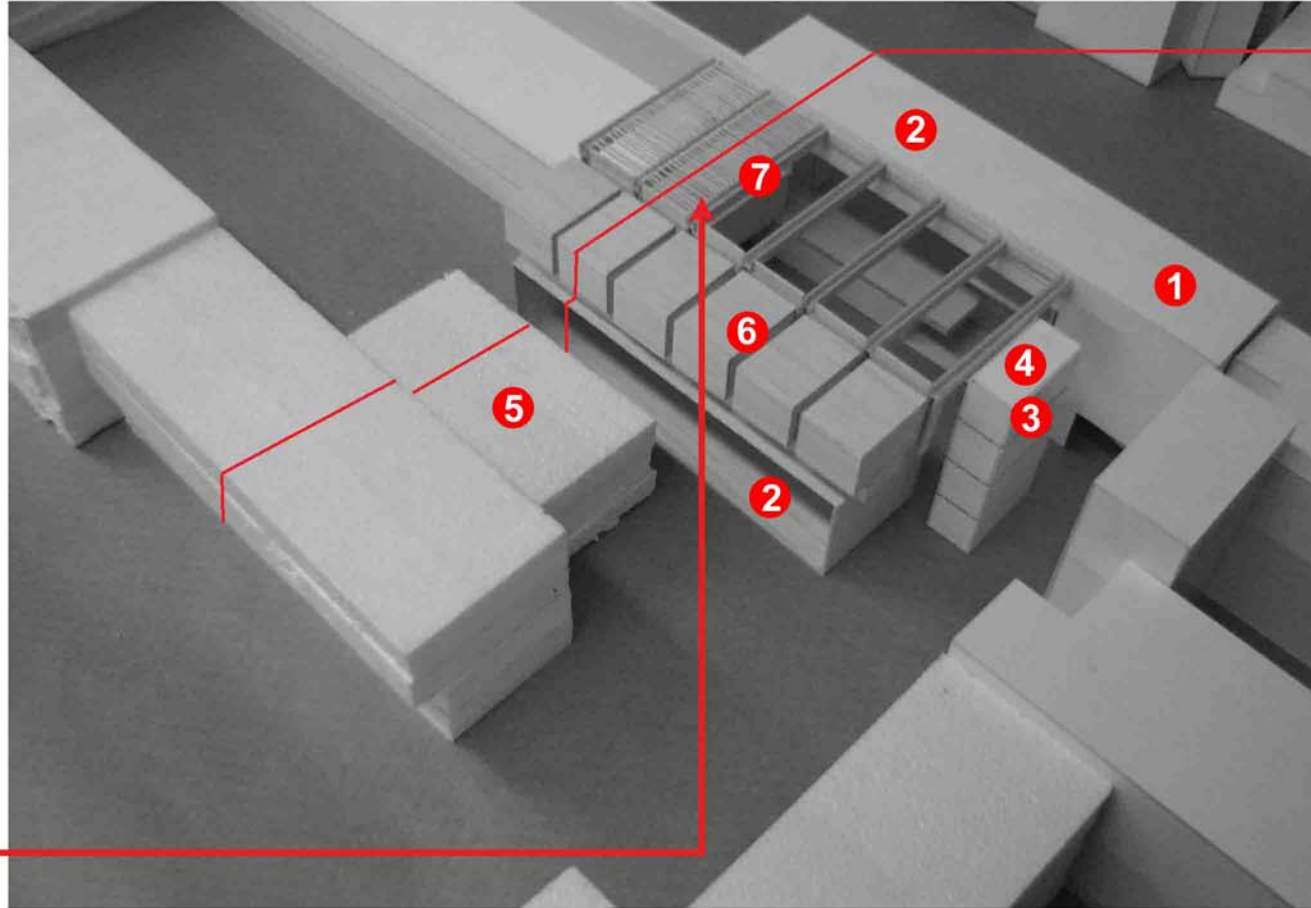


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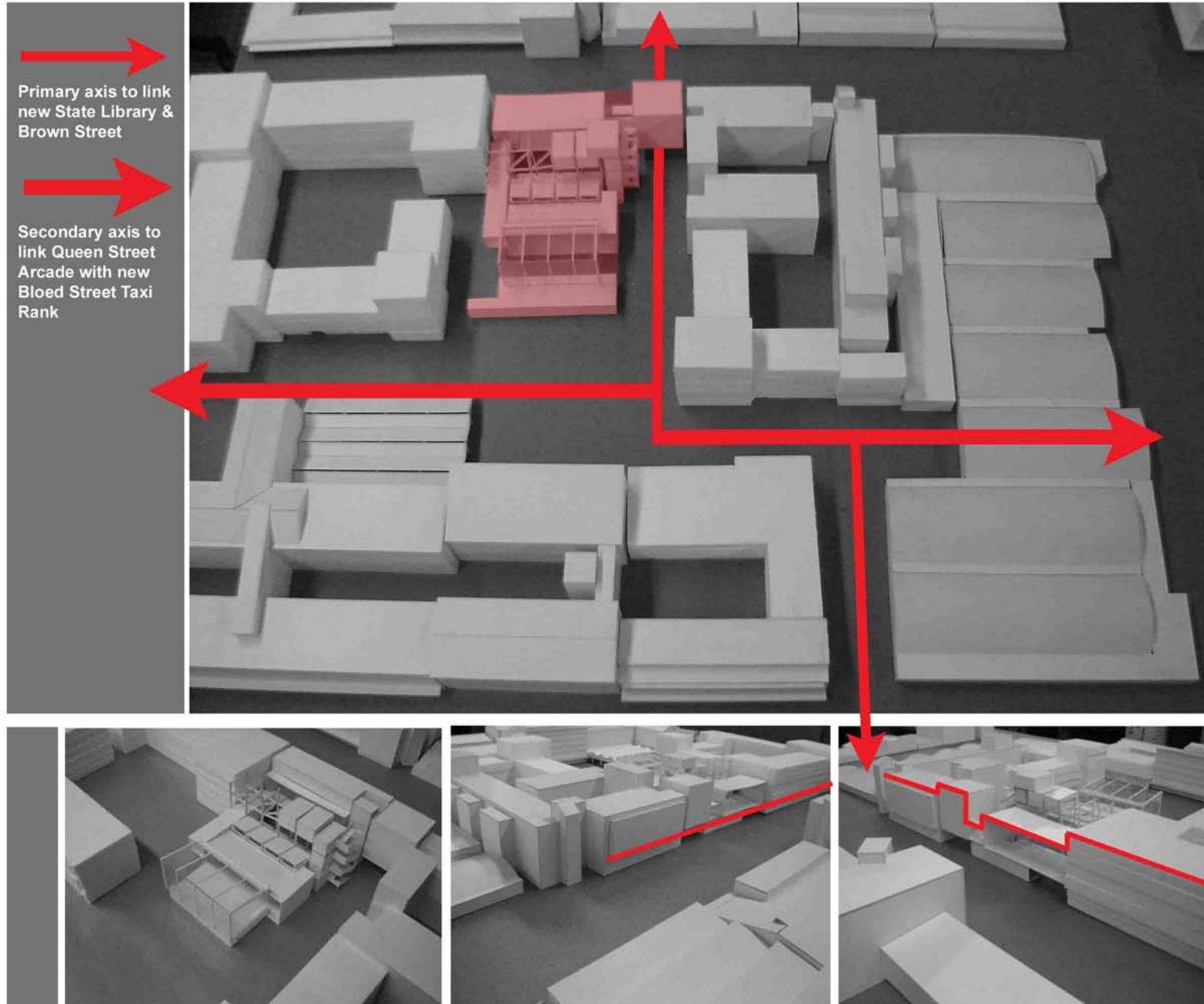
nine

- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room
- 6 Water tanks
- 7 Greenhouse

Private courtyard



Design development



Primary axis to link new State Library & Brown Street

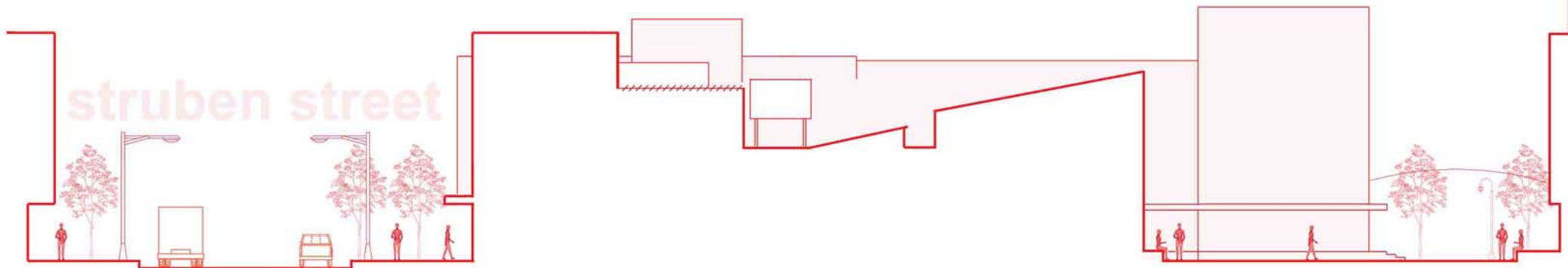
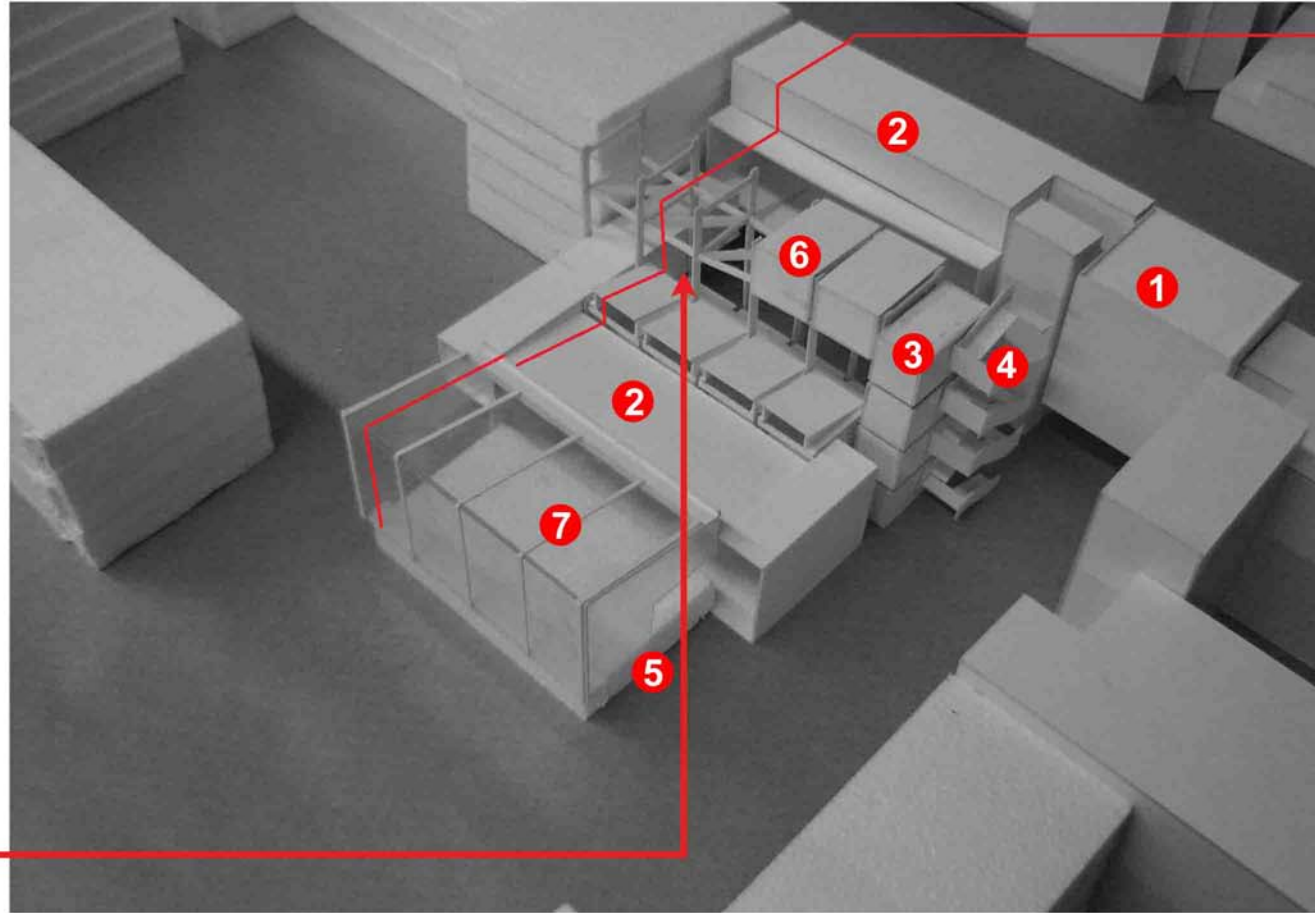
Secondary axis to link Queen Street Arcade with new Blood Street Taxi Rank

Medium detail block model two

- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over building line to form entrance to arcade leading to public space.
- ✓ Incorporating the boiler room into the building. This allows for single service distribution and more passive visual interaction.
- ✓ A single service core is created.
- ✓ The circulation tower and entrance block forms focal points visible from the public space.
- ✓ Better interaction between the public space, arcade and building by placing openings in the east and south facades on ground level.
- ✓ The introduction of a greenhouse allows more activity and functions on the eastern and southern side to increase passive surveillance.
- ✗ The step in the roof line is too large, forming a large gap in the street facade.

- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room
- 6 Water tanks
- 7 Greenhouse

Private courtyard



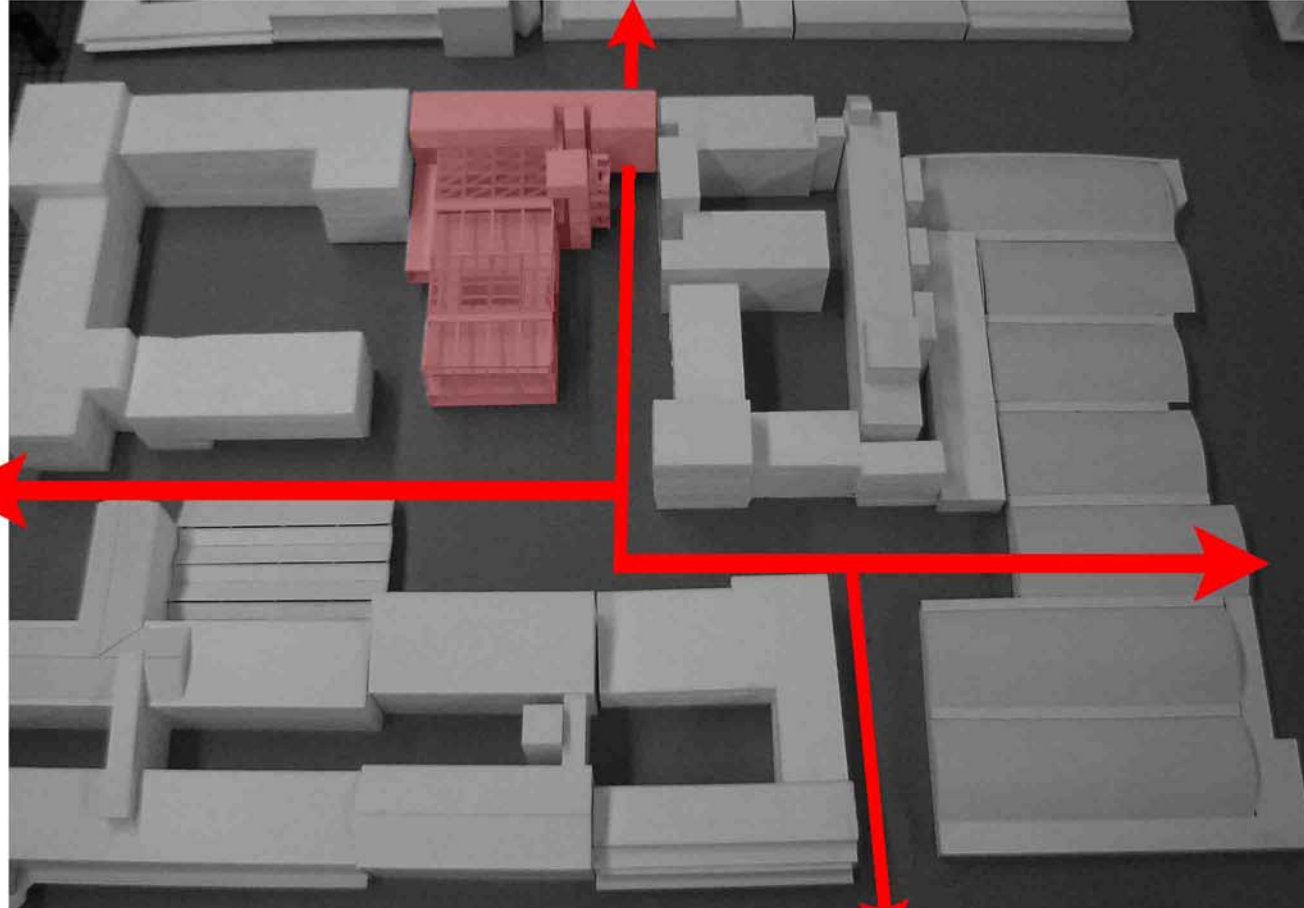
Design development

three

four

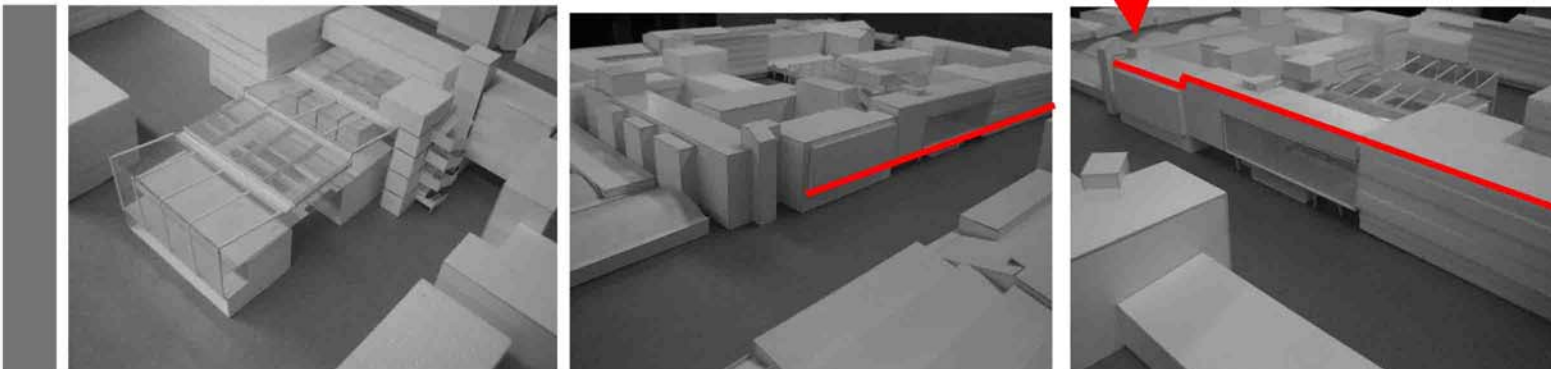

Primary axis to link
new State Library &
Brown Street


Secondary axis to
link Queen Street
Arcade with new
Blood Street Taxi
Rank



Medium detail block model three

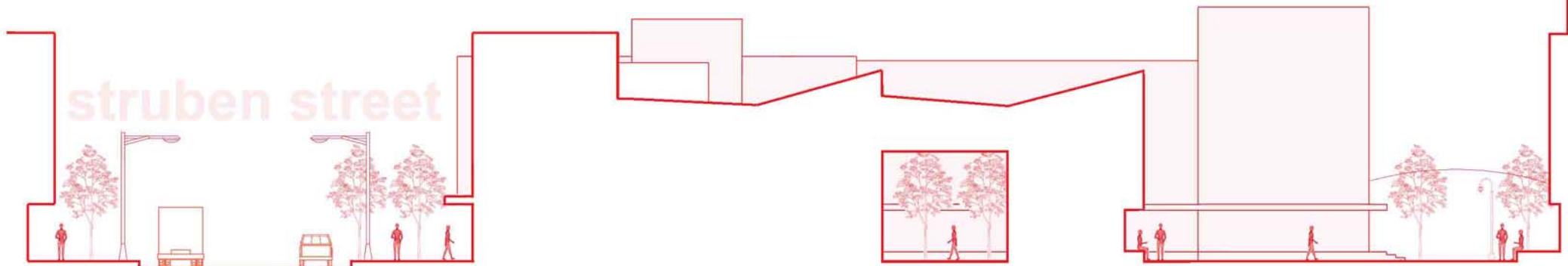
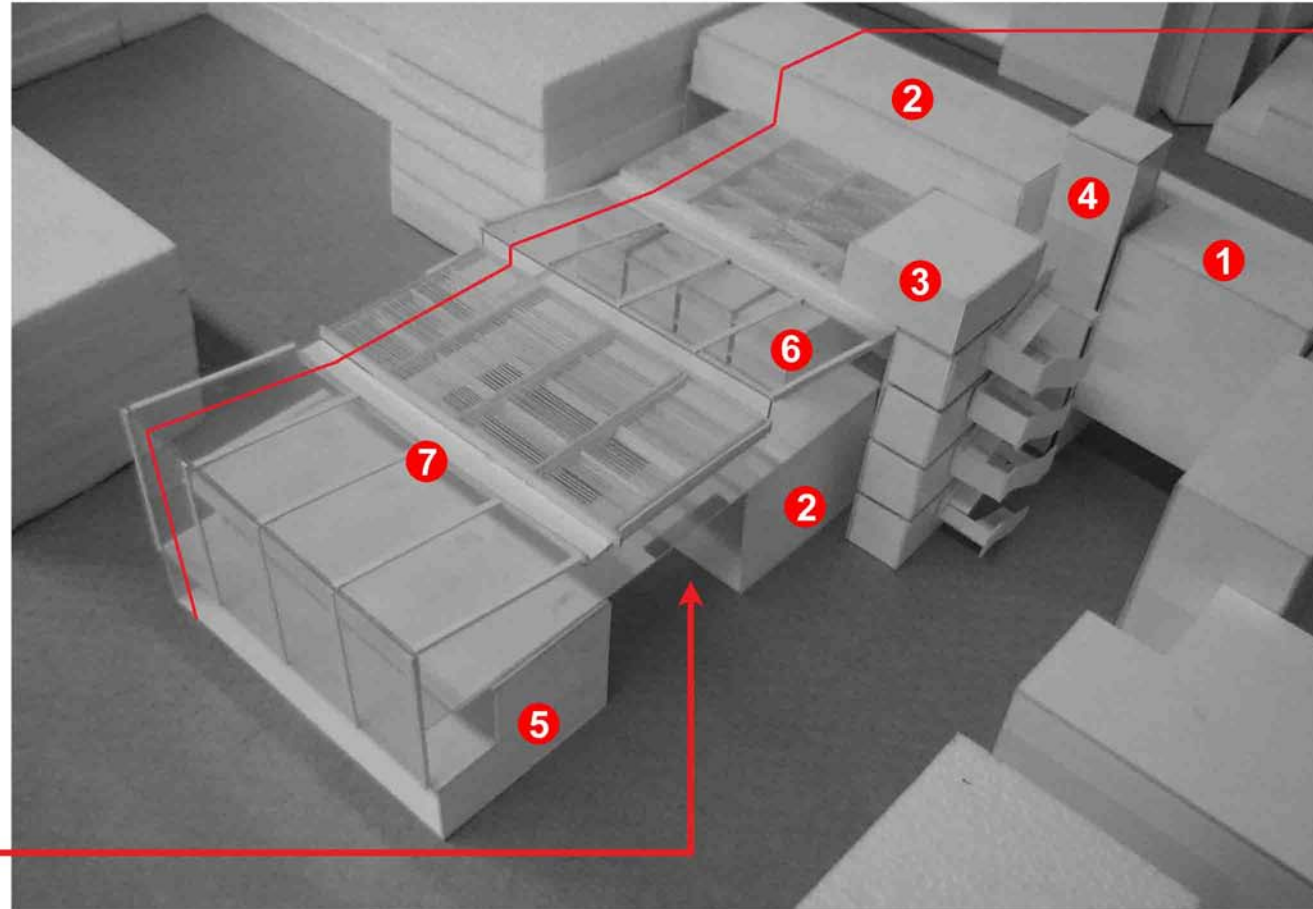
- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over building line to form entrance to arcade leading to public space.
- ✓ Incorporating the boiler room into the building, allows for single service distribution and more passive visual surveillance and interaction.
- ✓ A single service core is created.
- ✓ The circulation and service towers form focal points visible from the public space.
- ✓ The introduction of a greenhouse allows more activity and functions on the east and south side to increase passive surveillance.
- ✓ The roofline follows a continuous line along the building as well as both of the neighbours.





- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room
- 6 Water tanks
- 7 Greenhouse

Private courtyard



Design development

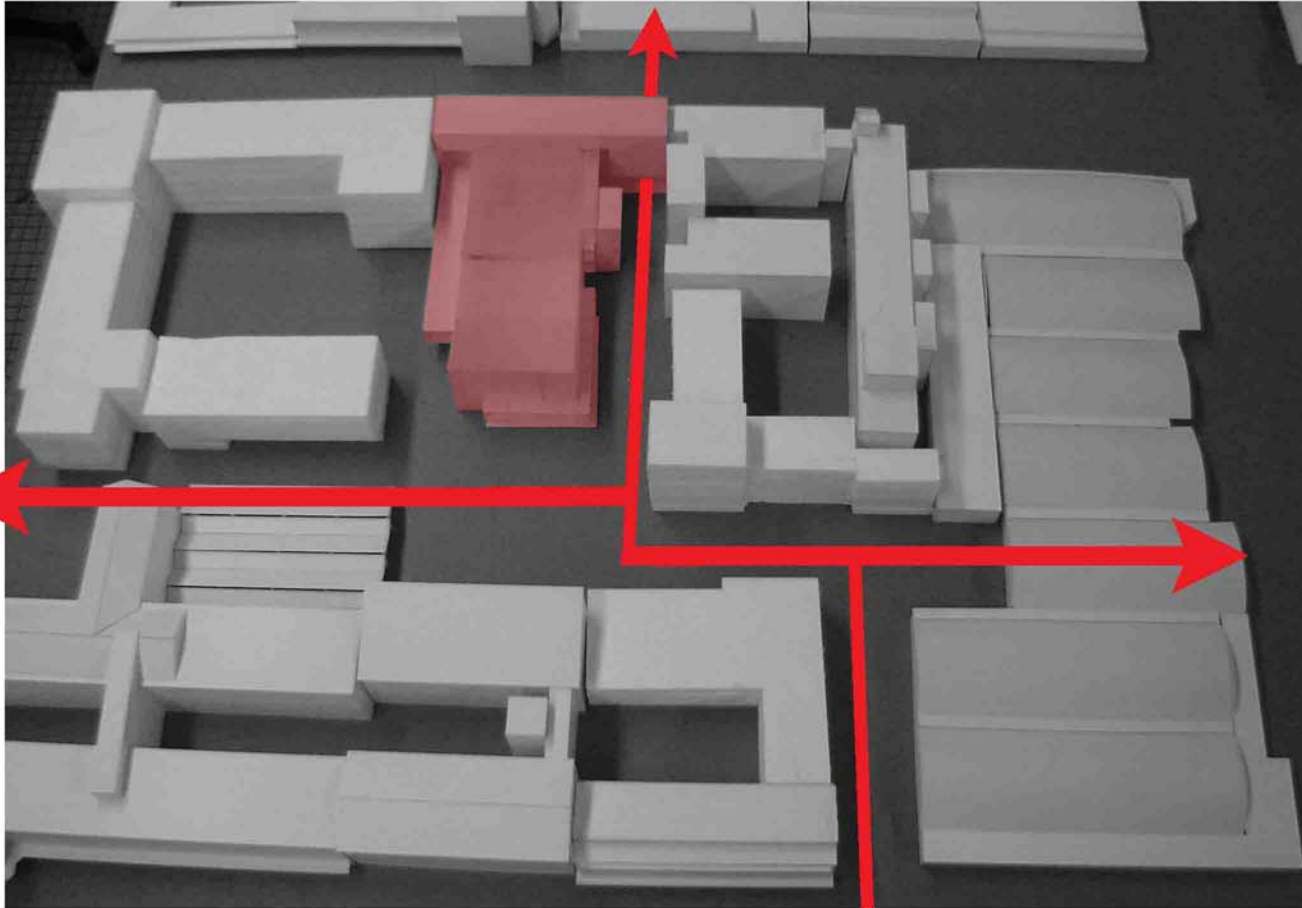
one

three

four

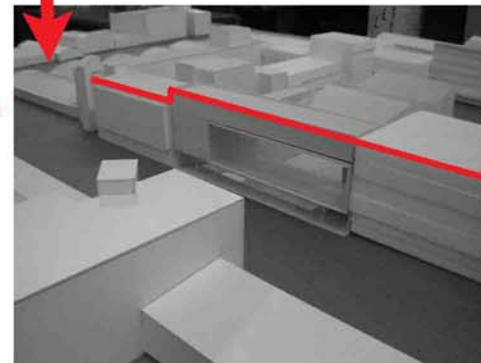
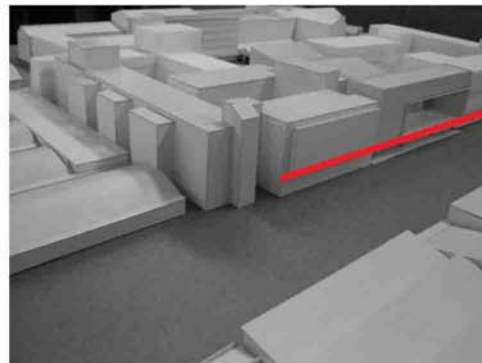
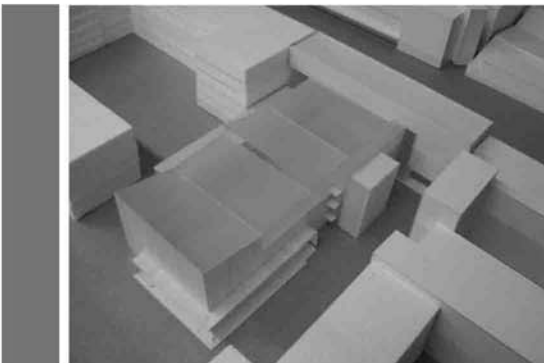
→
Primary axis to link
new State Library &
Brown Street

→
Secondary axis to
link Queen Street
Arcade with new
Bloed Street Taxi
Rank



Medium detail block model four

- ✓ Respects building line of neighbours.
- ✓ Continues existing canopy line.
- ✓ The building is cut away in line with the eastern building's circulation tower.
- ✓ Block extends over building line to form entrance to arcade leading to public space.
- ✓ Incorporating the boiler room into the building, allows for single service distribution and more passive visual surveillance and interaction.
- ✓ A single service core is created.
- ✓ The circulation and service towers form focal points visible from the public space.
- ✓ The introduction of a greenhouse and pathology laboratory allows for more activity and functions on the east and south side to increase passive surveillance and interaction.
- ✓ The roofline follows a continuous line along the building as well as both of the neighbours.
- ✓ A public launderette on the ground floor interacts with the street and allows for public participation in the building.



five

six

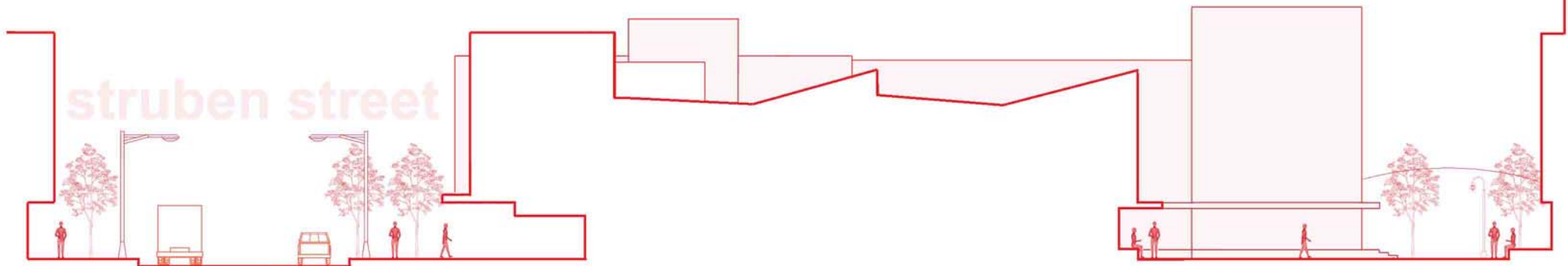
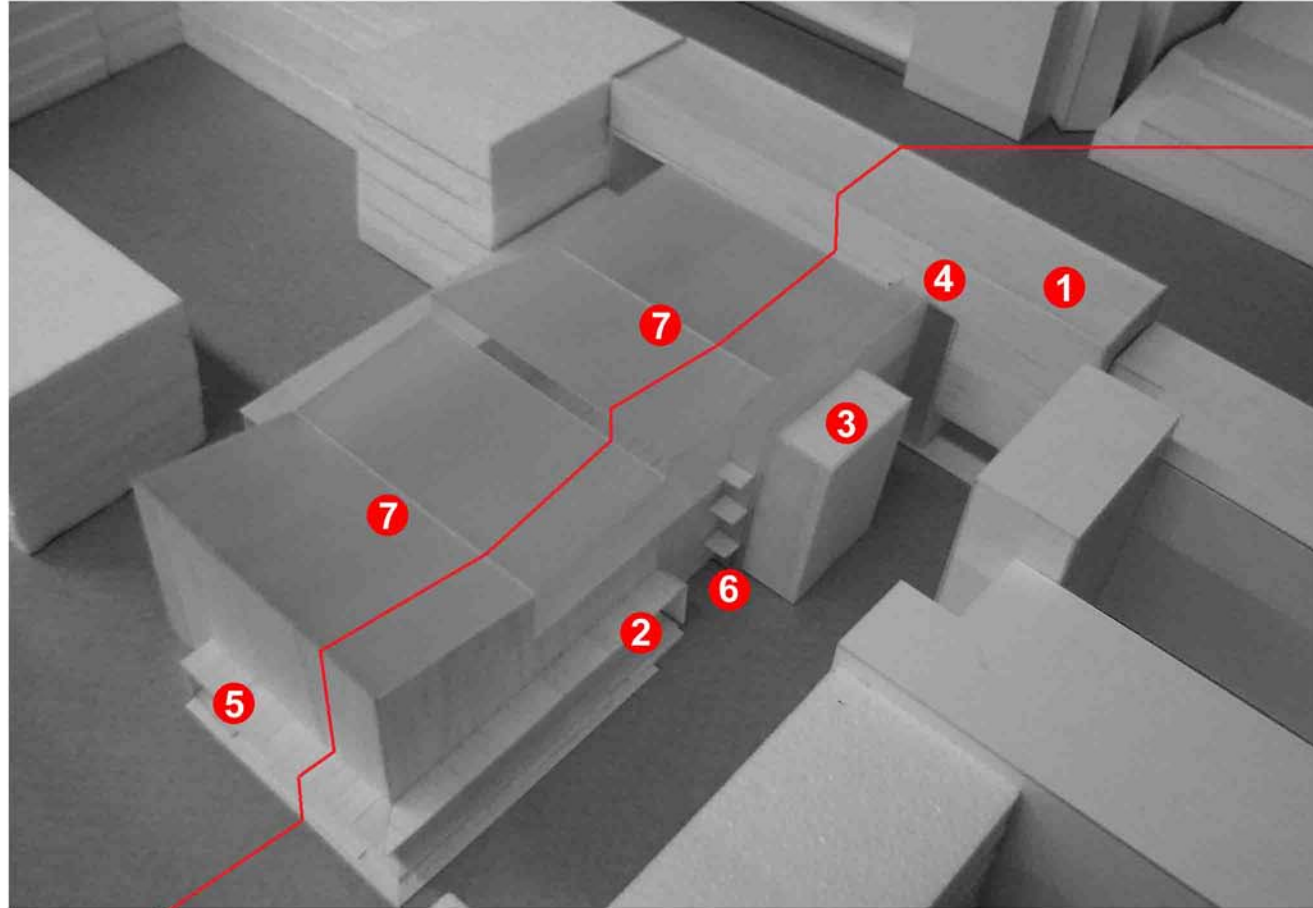
seven



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nine

- 1 Offices
- 2 Laundry
- 3 Services tower
- 4 Circulation tower
- 5 Boiler room
- 6 Water tanks
- 7 Greenhouse
- 8 Pathology laboratory





brief development

context analysis

precint design

precedents

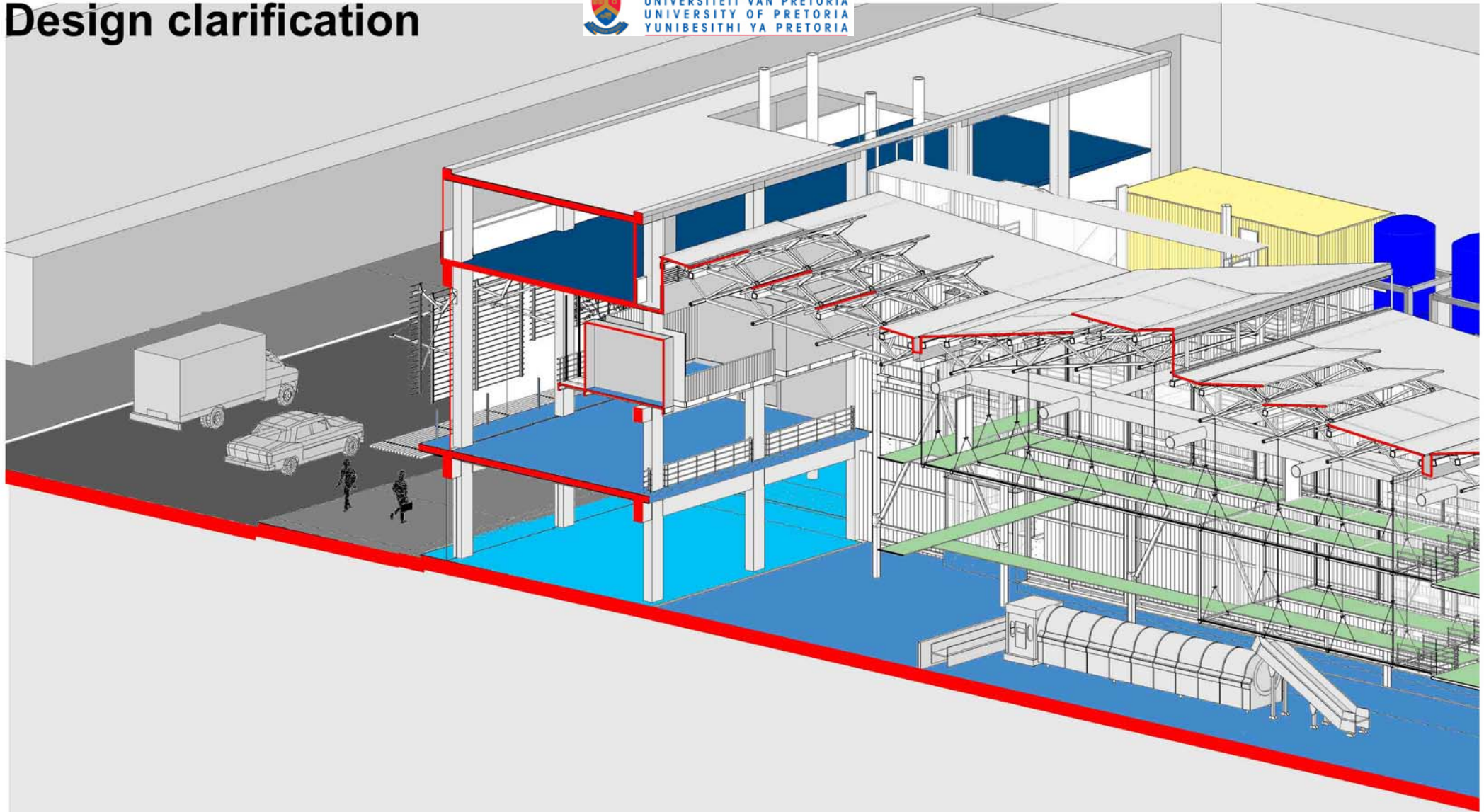
design development

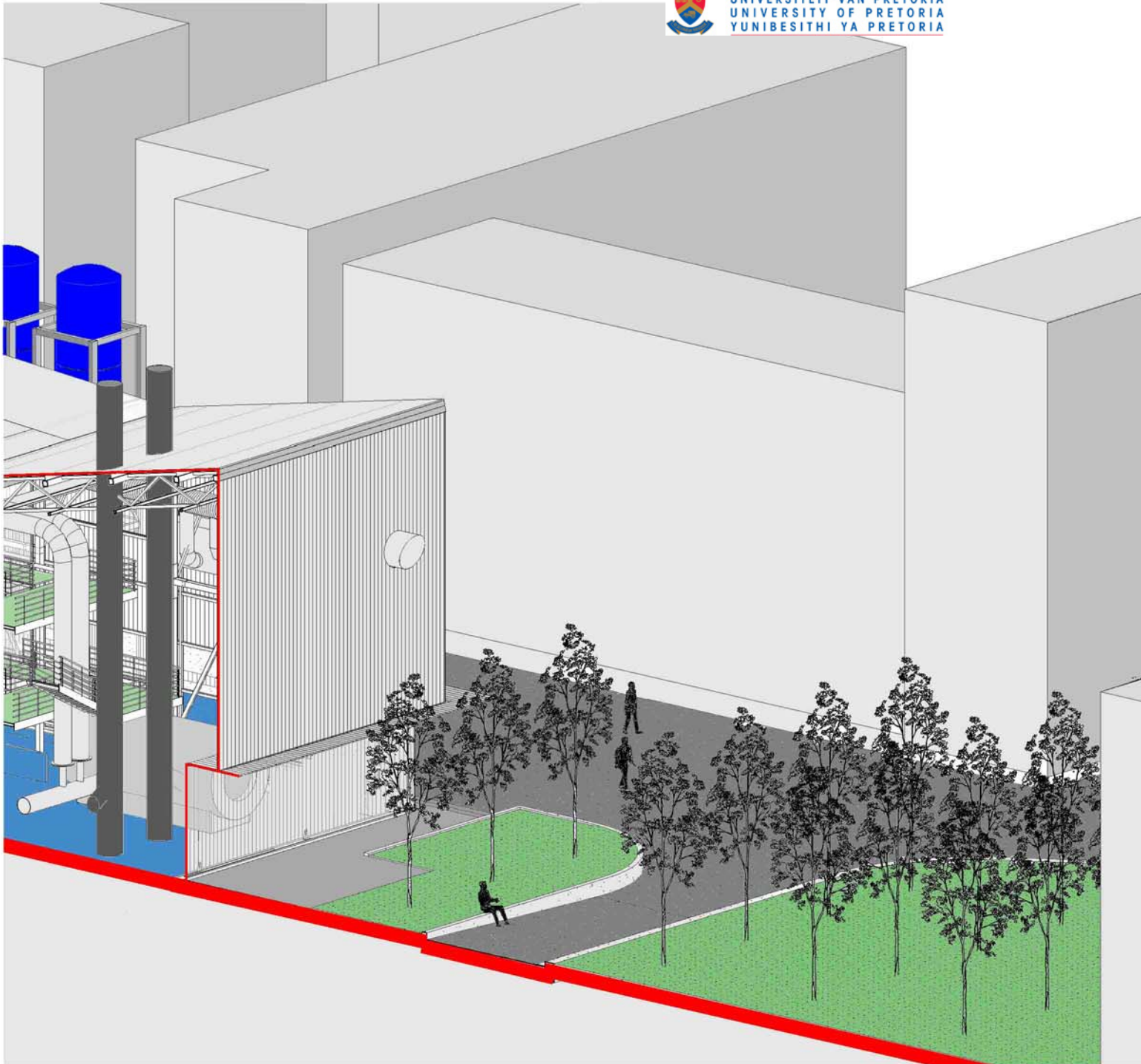
design clarification

design documentation



Design clarification





Public launderette
[Ground floor]

- Pay-point
- Washing machines
- Dryers
- Iron area
- Waiting area

Industrial laundry

[Ground and first floor]

- Dirty/soiled linen receiveing
- Dirty linen sorting area
- Continuous batch washer
- Tumbler dryer
- Clean linen sorting and preparation
- Iron, folding and packing
- Clean linen dispatch
- Offices [second floor]
- Boiler room

Pathology laboratory

[Third floor]

- Reagent preparation area
- Specimen preparation area
- Amplification [PCR] and detection room

Greenhouse

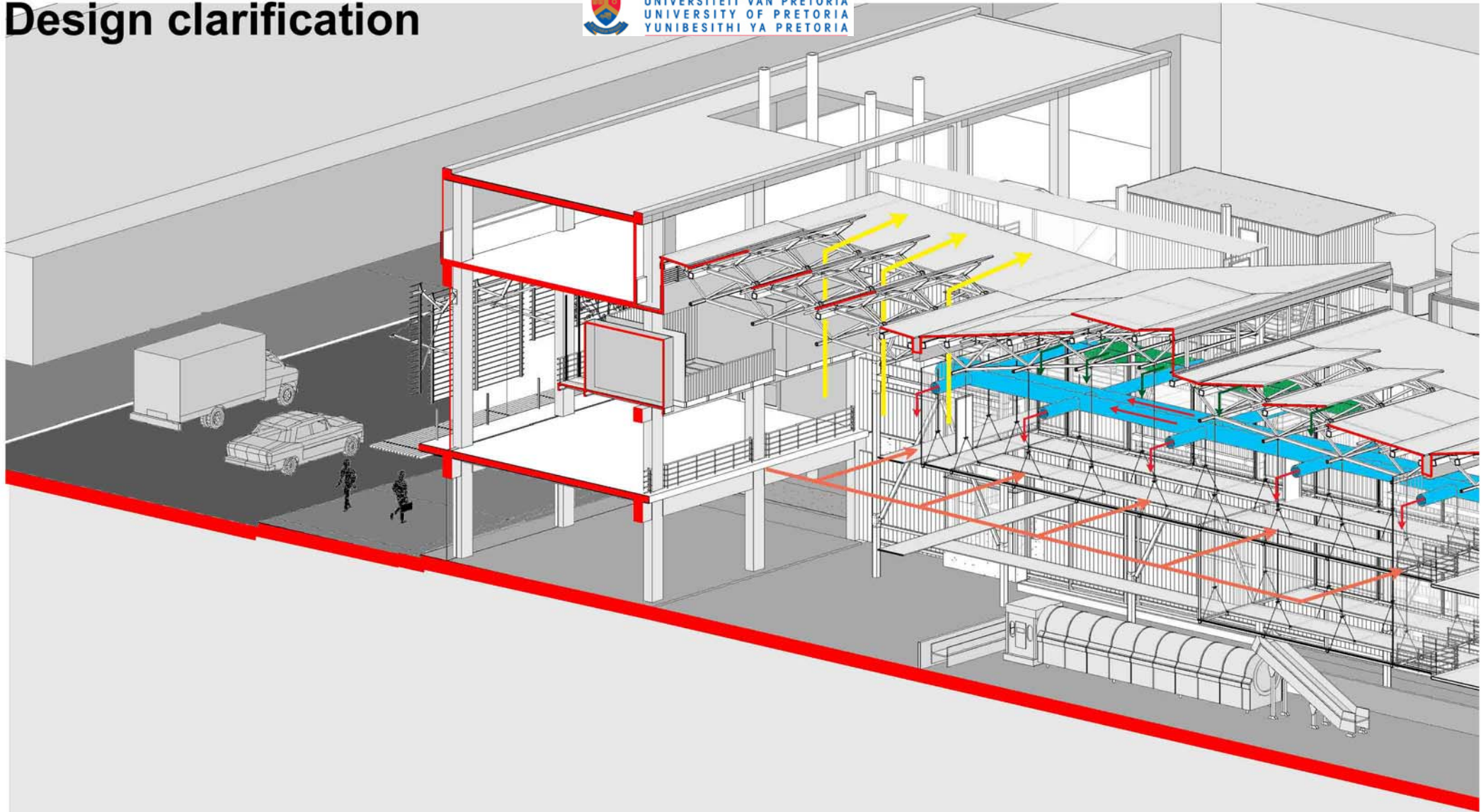
[First and second floor]

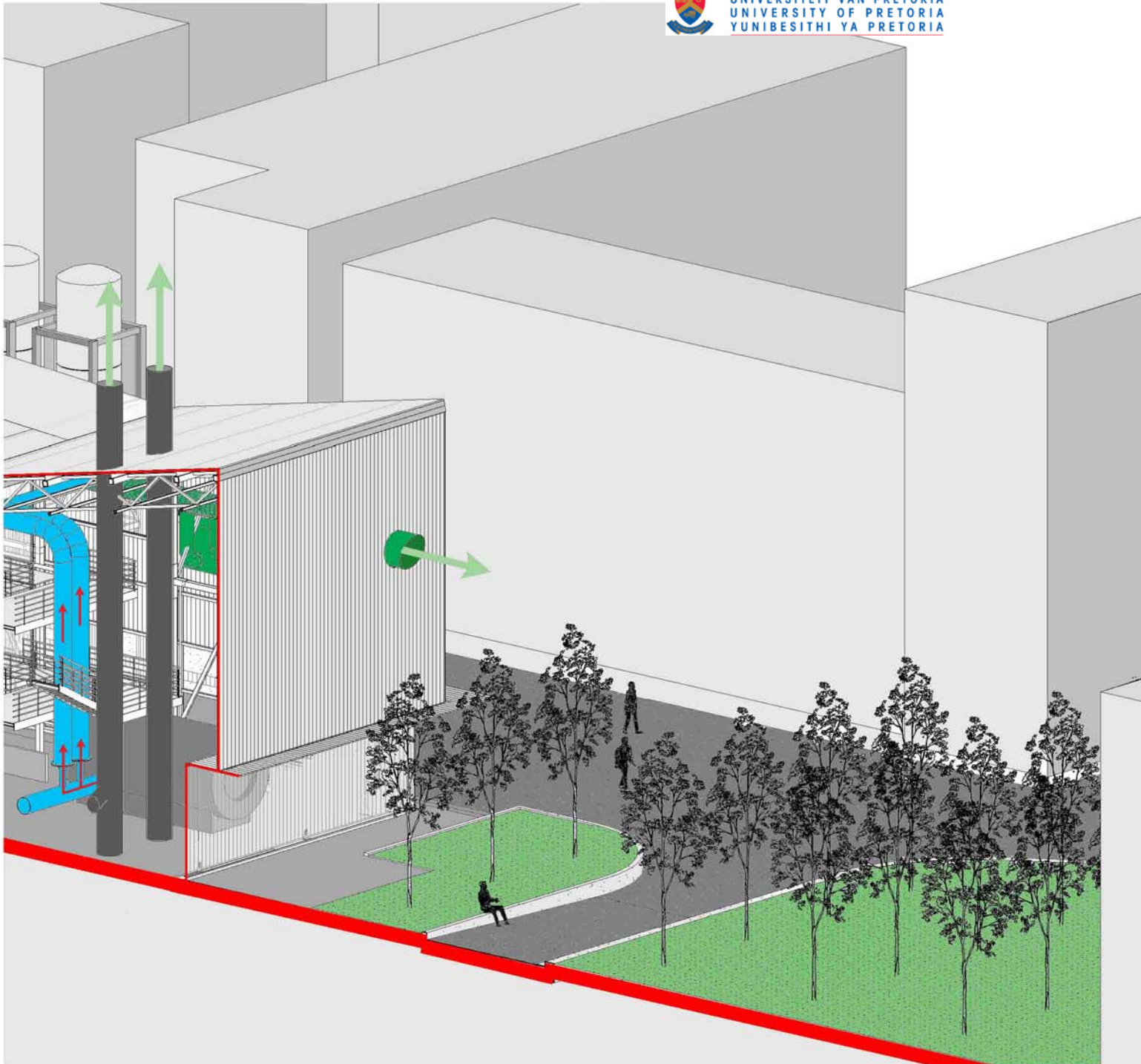
- Vanilla growth area
- Vanilla killing room
- Sweating room
- Processing and packaging

Toilet/changerooms

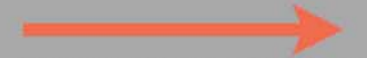
Water tanks

Design clarification

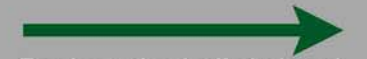




Dry steam from boiler into the vanilla greenhouse, killing and sweating rooms.
[65-75°C]



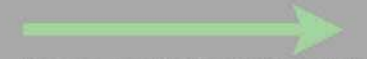
Wet steam from tumbler dryers to vanilla greenhouse
[45-55°C]



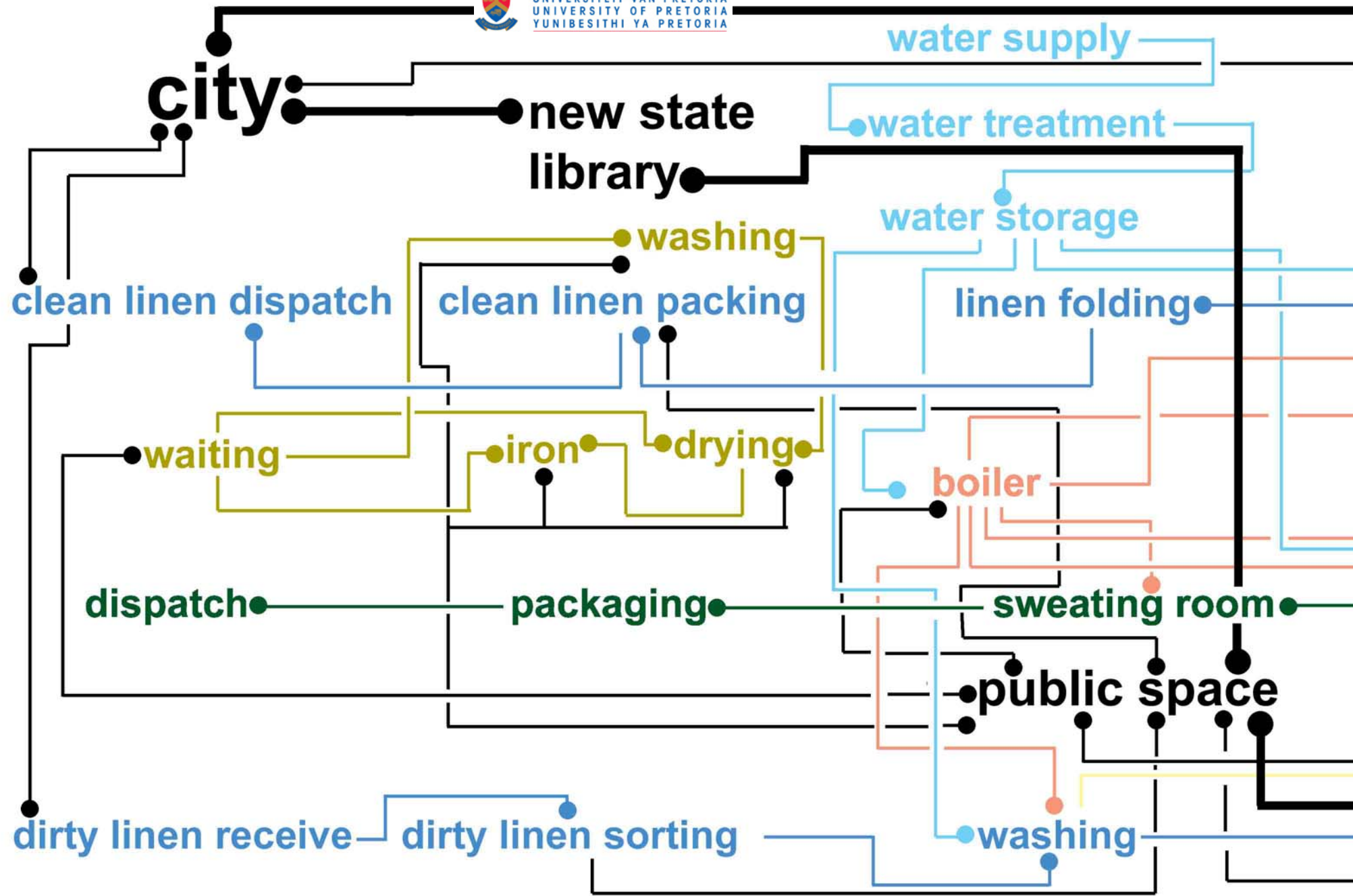
Fresh mechanically induced air into the vanilla greenhouse, sweating and packaging rooms
[18-25°C]



Stale humid air from laundry escape through mechanically operated roof louvres
[20-30°C]

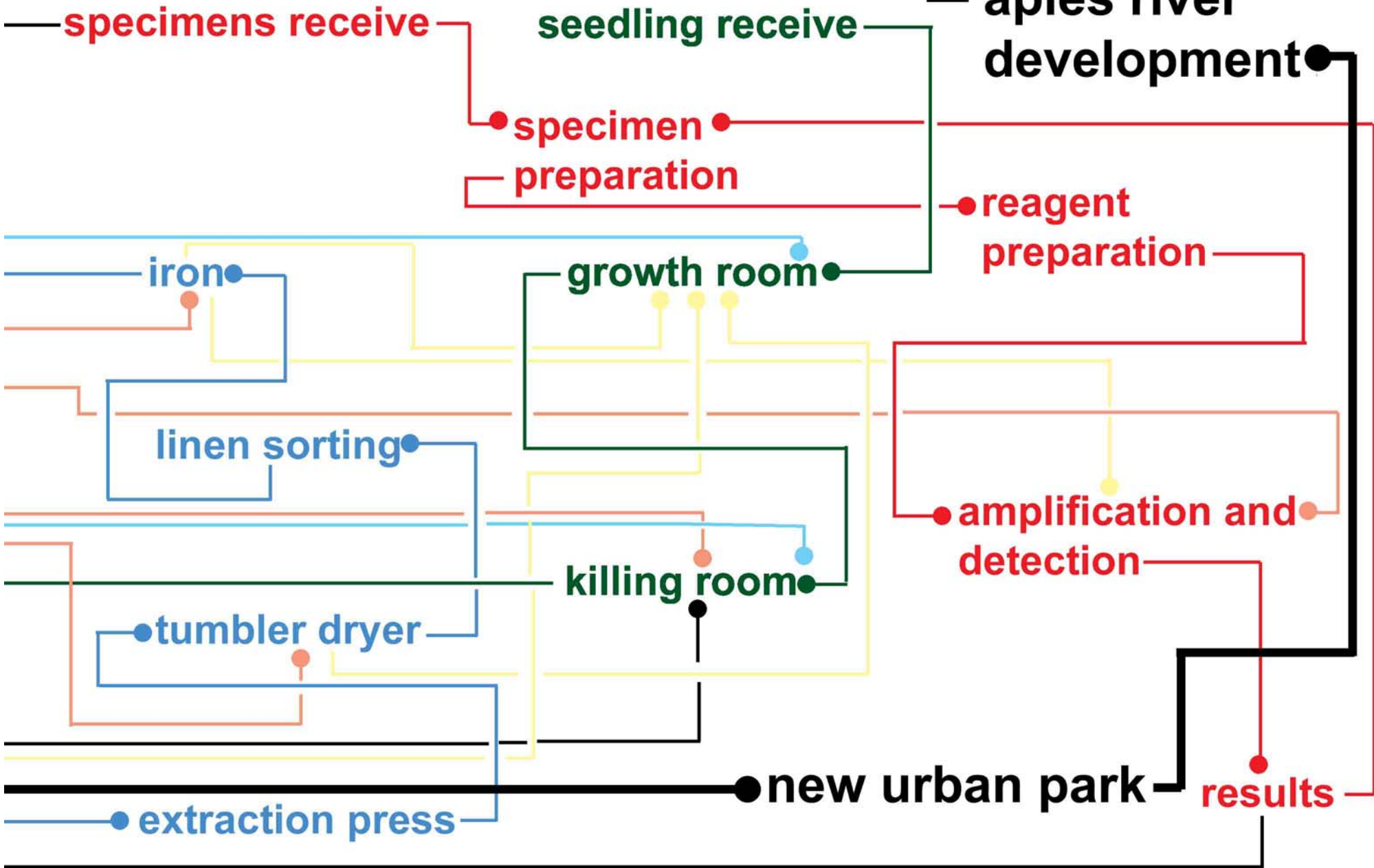


Excess mechanically induced air





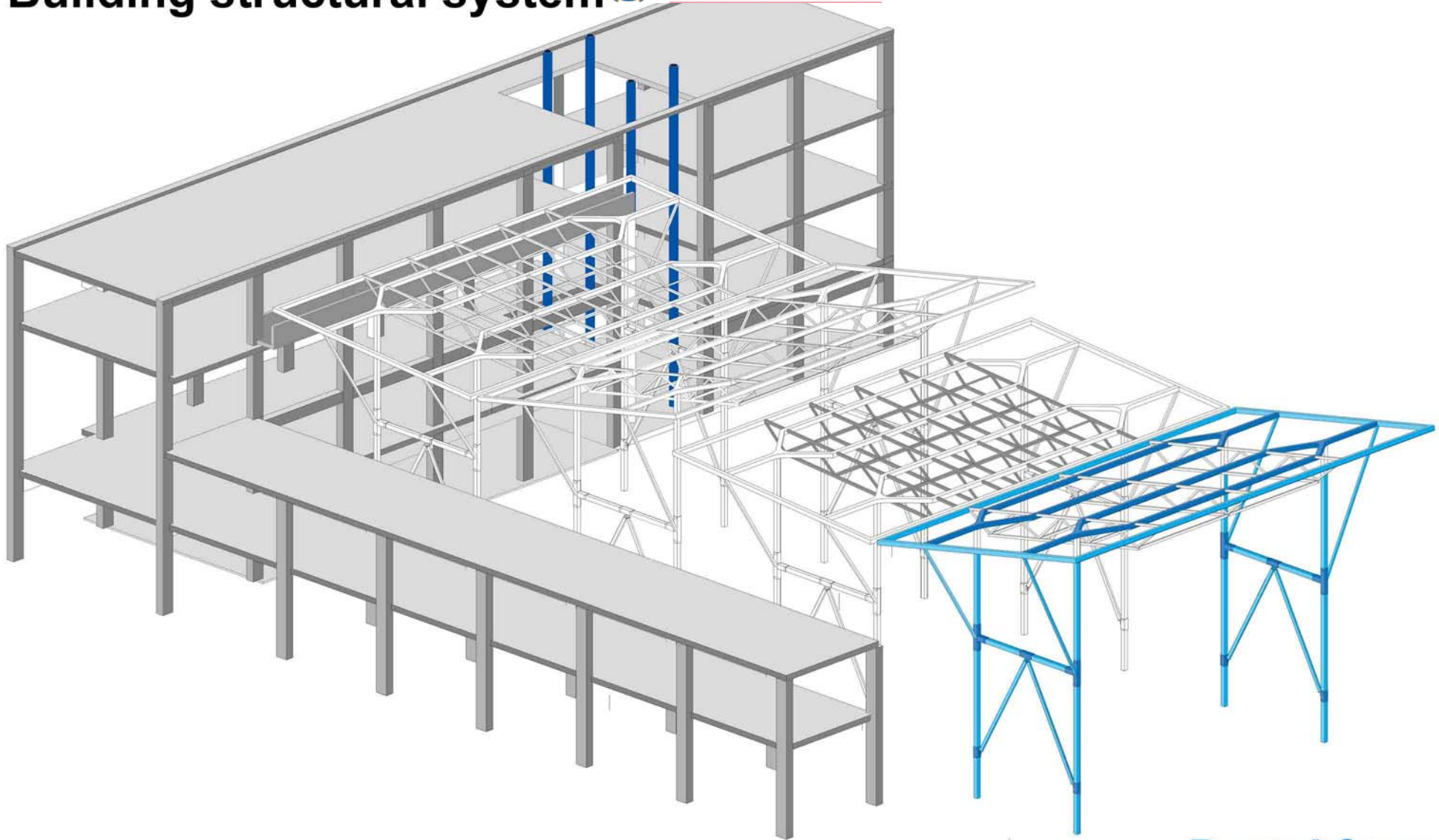
apies river development



Building structural system



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Portal frame
Concrete slab
and columns

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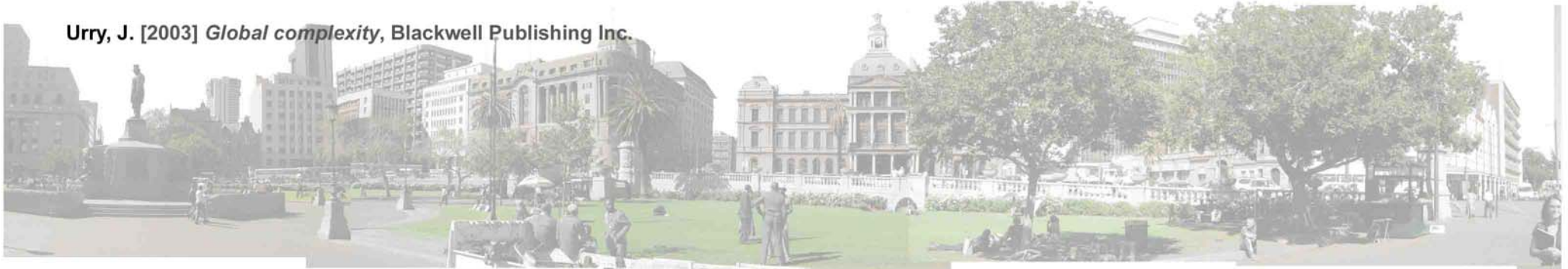
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