chaptersix

Design Development

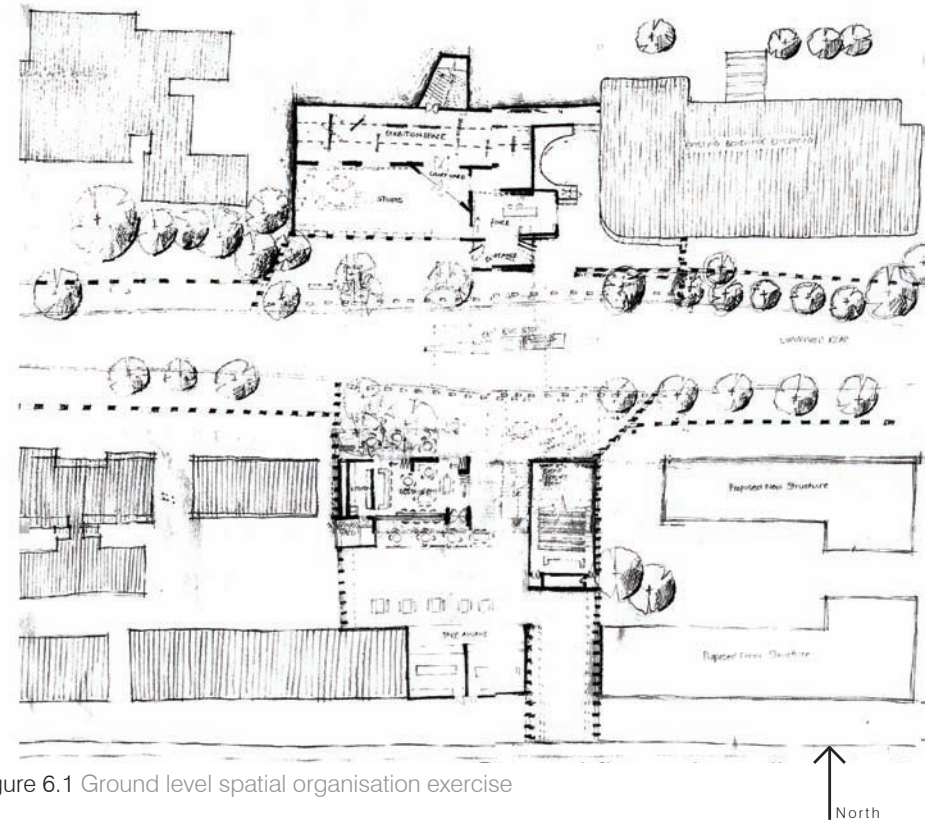


Figure 6.1 Ground level spatial organisation exercise

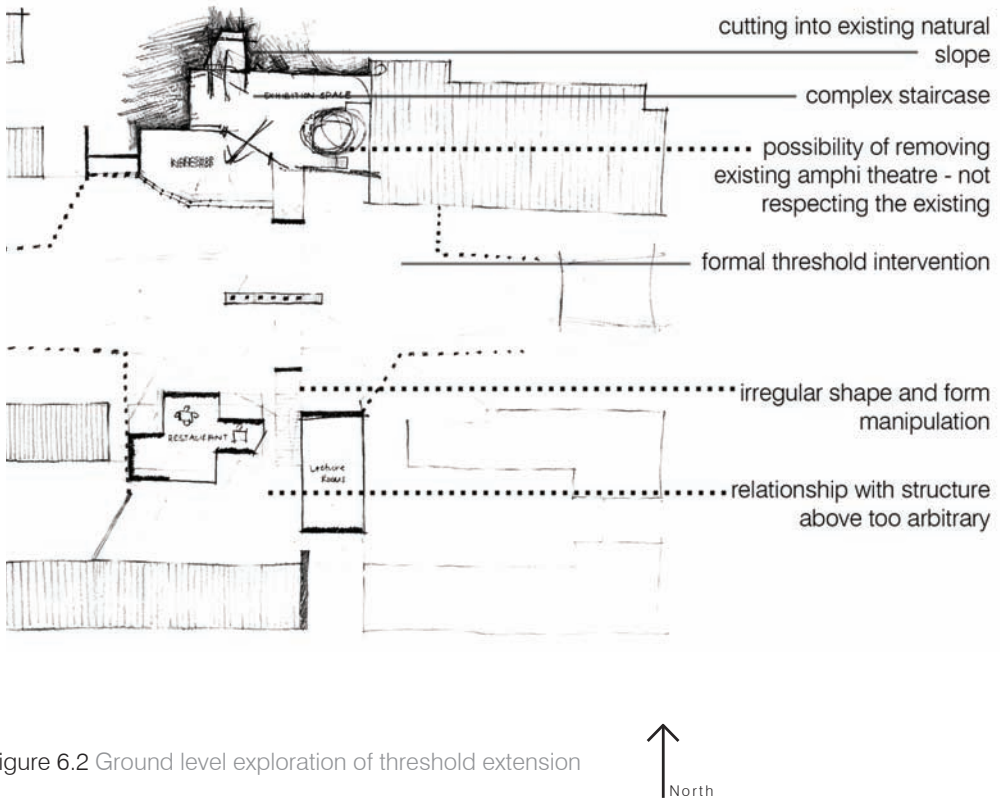


Figure 6.2 Ground level exploration of threshold extension

Introduction

This chapter is a summary of the design process. Design is not a linear process and this should not be regarded as a chronological representation of the design progress. As the theory, context and requirements for the design developed, the planning was re-examined and evaluated. This chapter aims to communicate the this approach.

Both positive and negative aspects were identified in all plans and diagrams and then new plans were developed from the knowledge acquired from the previous sketches. Free-hand sketches, precedents, physical models and computer generated models were used in the development of the design.

Parti diagram

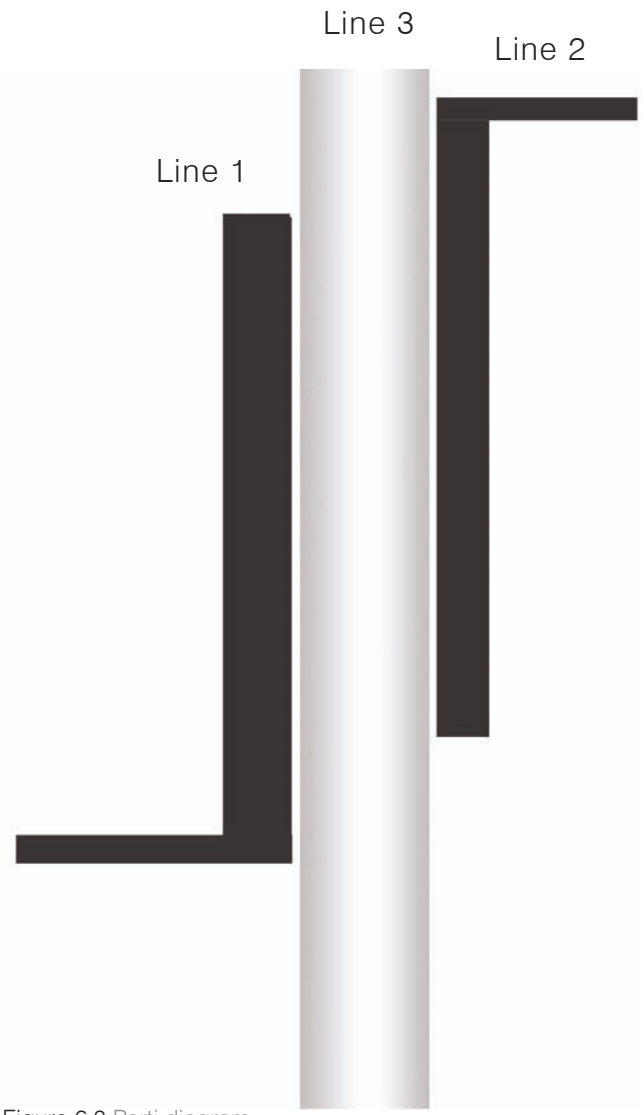


Figure 6.3 Parti diagram

The parti diagram (Fig 6.3) is a simple line sketch that summarises the design. As a whole the parti refers to the linearity of the design and the layering of the various systems to create an integrated structure that relates to its context.

Line 1 refers to the western facade of the building and the space created on South Campus as well as implying the main movement pattern to South Campus.

Line 2 refers to the eastern facade and the direct link to Boukunde. The link with the context is therefore implied.

Line 3 suggests the spaces between the actual built fabric. It refers to the the interaction, activity and function of the structure as a whole.

The similarity of the outer lines suggests the equality of the entities linked in the design, with the inner line suggesting the actual linking of segregated entities.

The rigidity of the overall parti refers to the logical structure and how the structure is utilised to contain various systems.

Free-hand sketches and diagrams

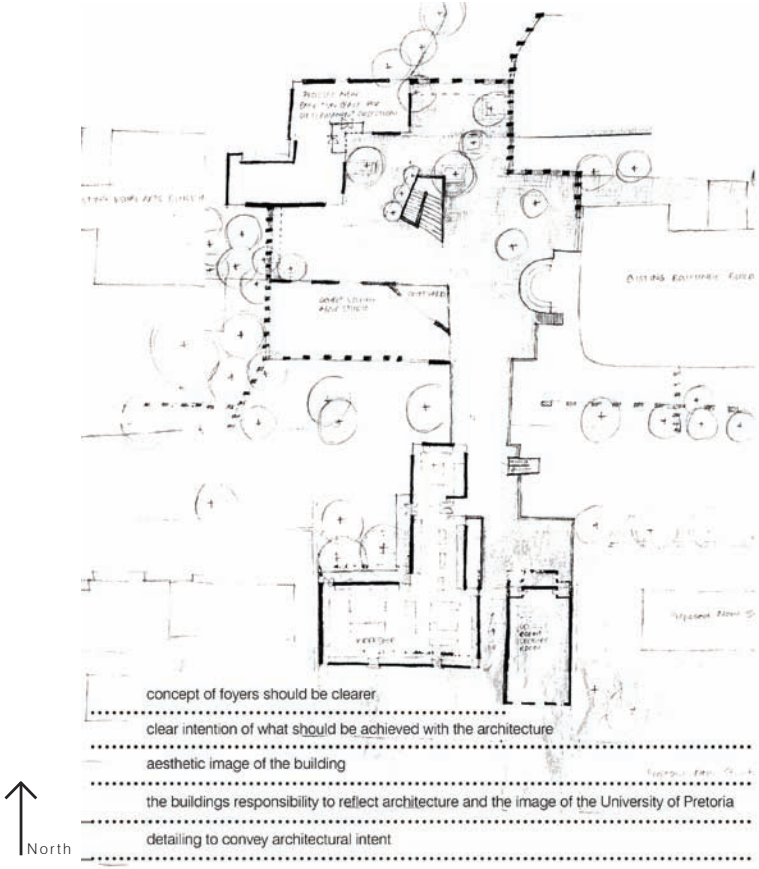


Figure 6.4 Bridge level organisational exercise

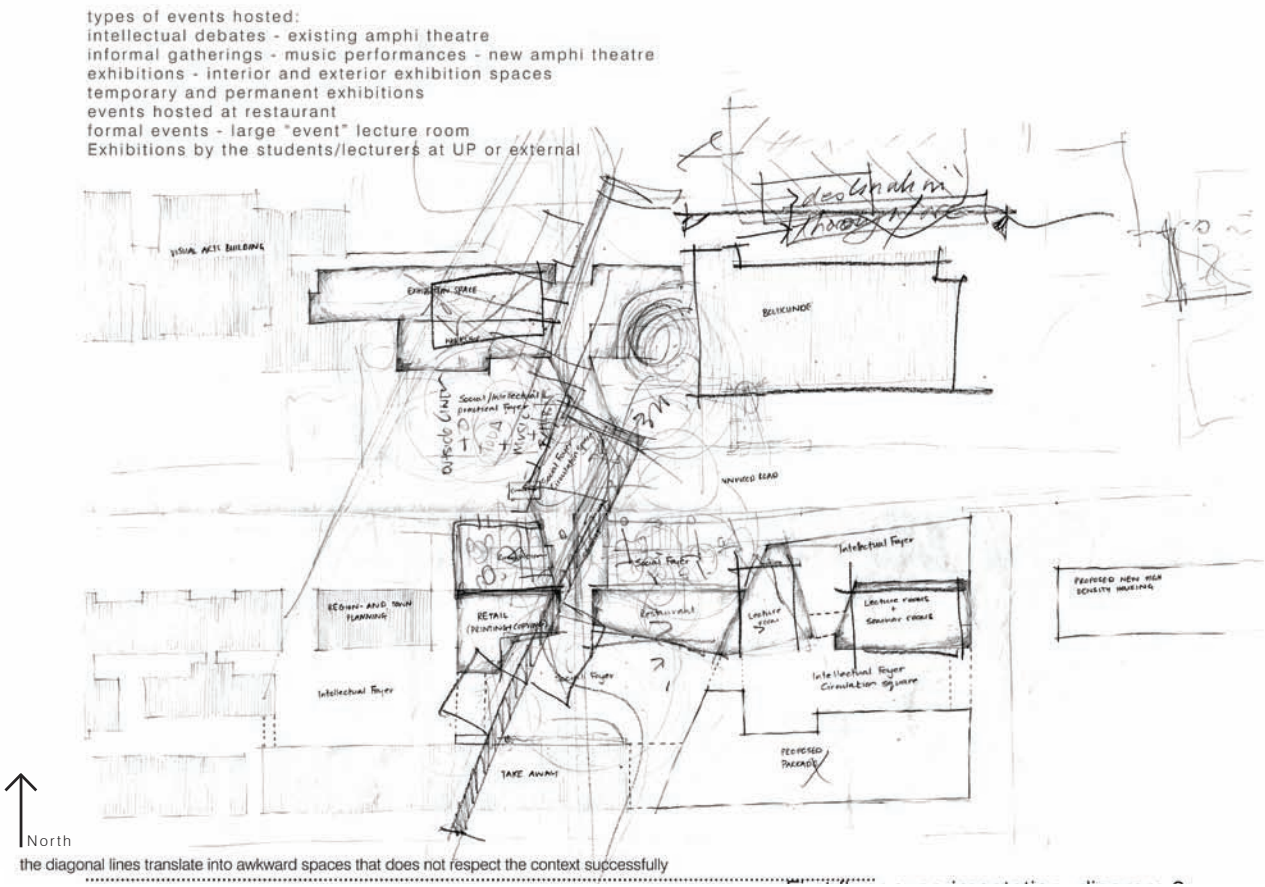


Figure 6.5 Bridge level exploration of existing axis on site

Most of the planning and design development happened through free hand sketches on the existing site plan. As the programme developed, the design requirements changed and the building needed to adapt. The two sides of Lynnwood Road and the unifying link between the two remained throughout the design process. Geometric investigations in terms of what the possibilities are on site continuously changed the shape of the structure.

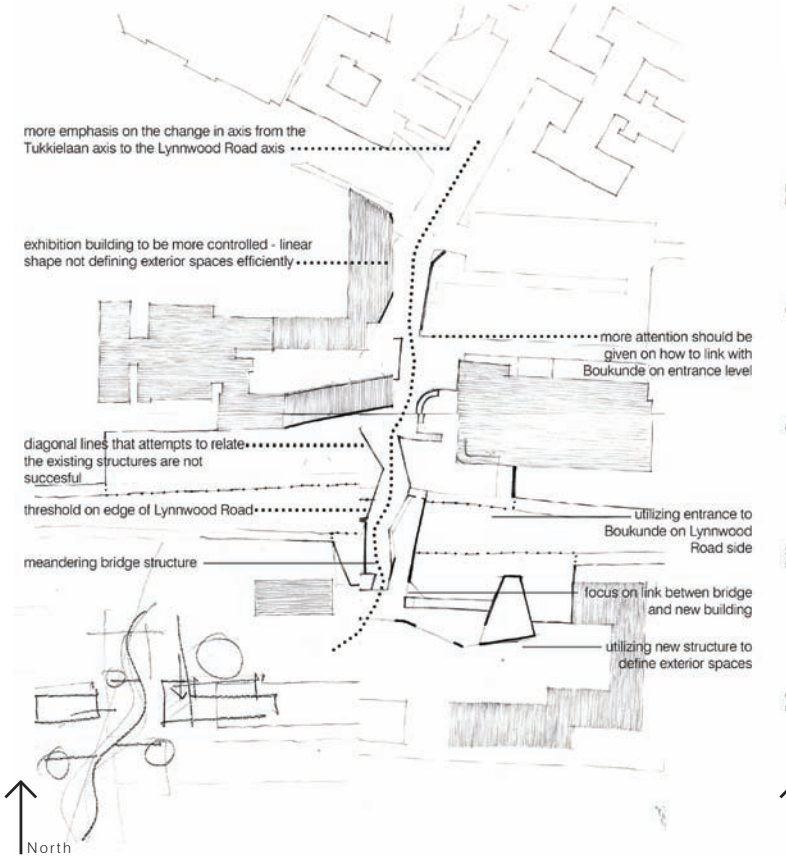


Figure 6.6 Bridge level possibilities of pedestrian movement patterns

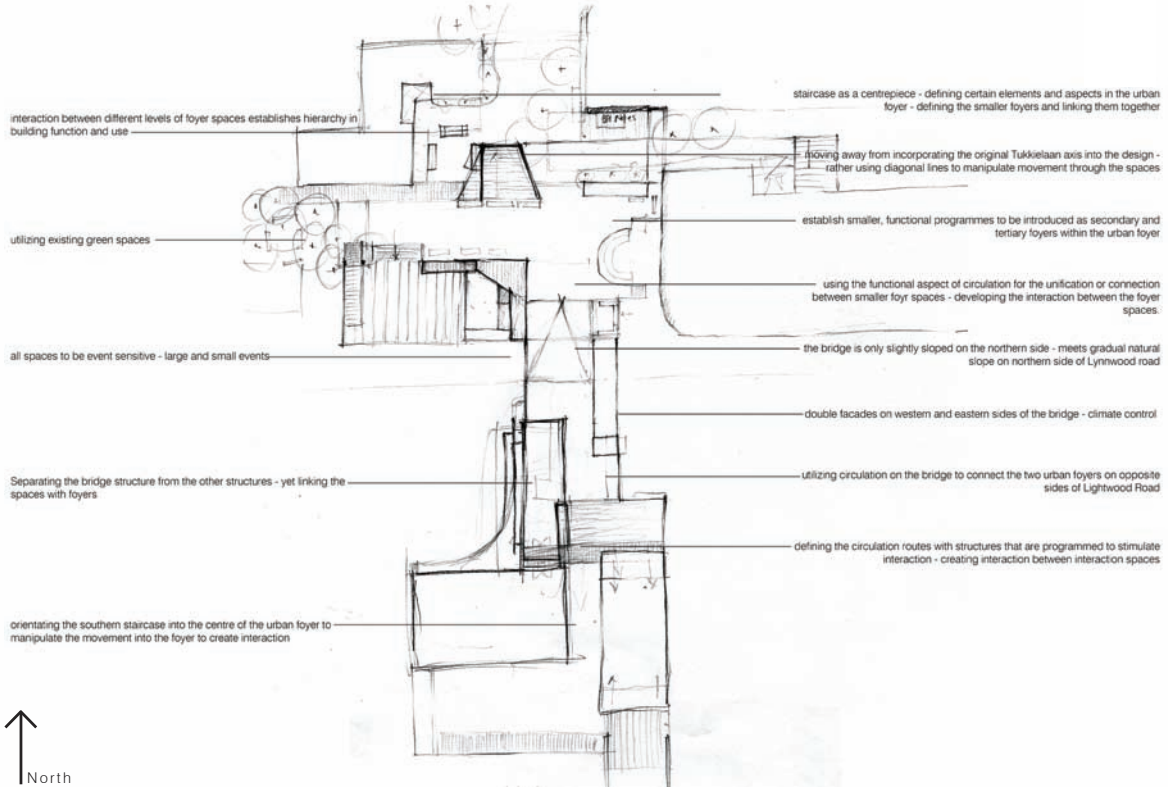


Figure 6.7 Bridge level diagram - order and logic

The interaction between the levels and pedestrian movement (determined by existing pedestrian movement patterns) and programmes of the surrounding buildings were some of the main planning generators.

Linear plan development

The linearity of the plan provided many opportunities and limitations in terms of planning. Pedestrian movement and the pedestrian's experience of the spaces as well as functionality of the interaction between the programmes were organised and designed to support the linearity of the plan and not obstruct it in any way.

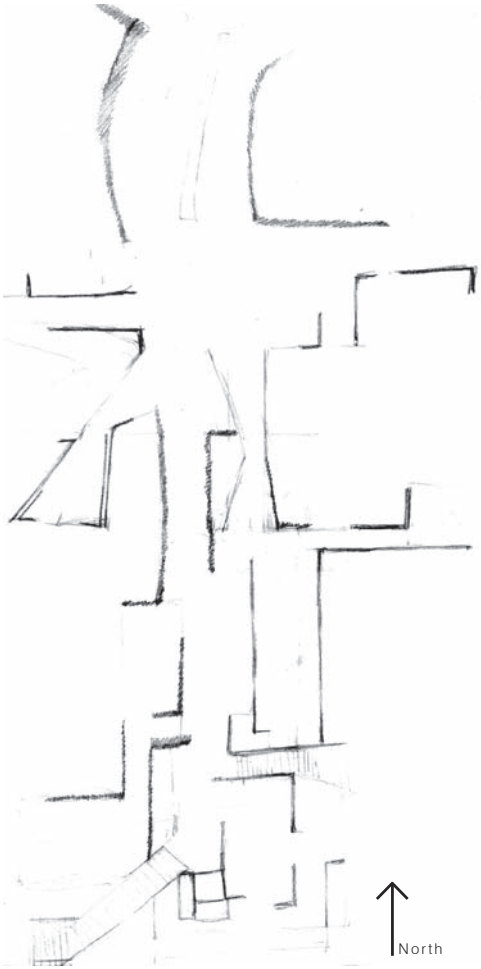


Figure 6.8 Creating spaces in a linear plan

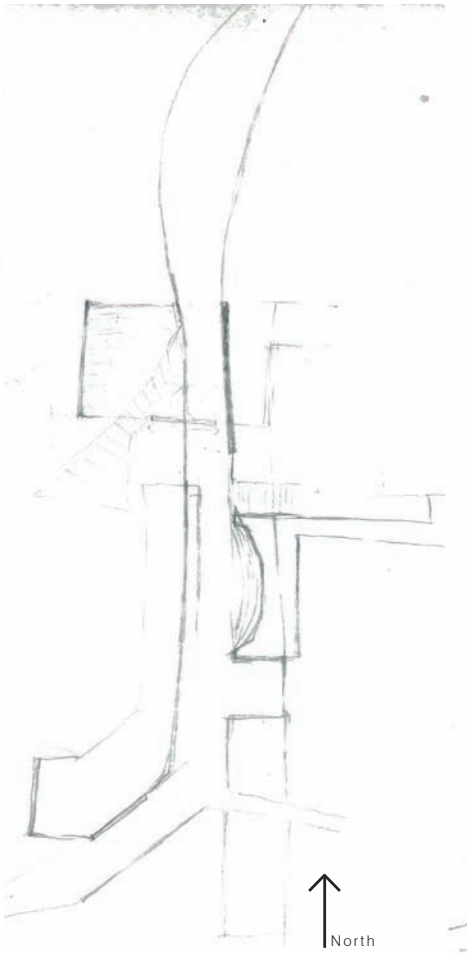


Figure 6.9 Simplification of the plan

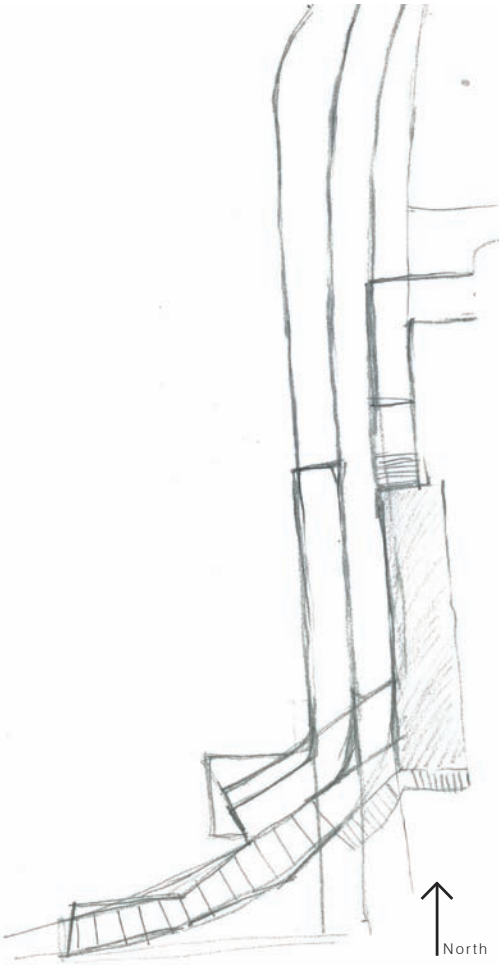


Figure 6.10 Extension into the landscape

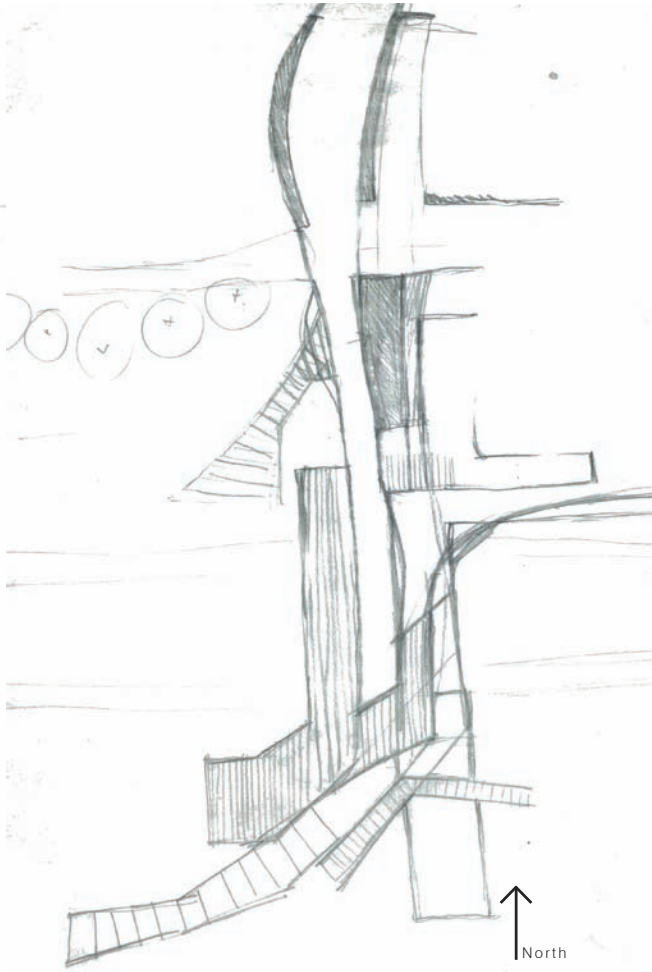


Figure 6.11 Programming a linear plan

Models

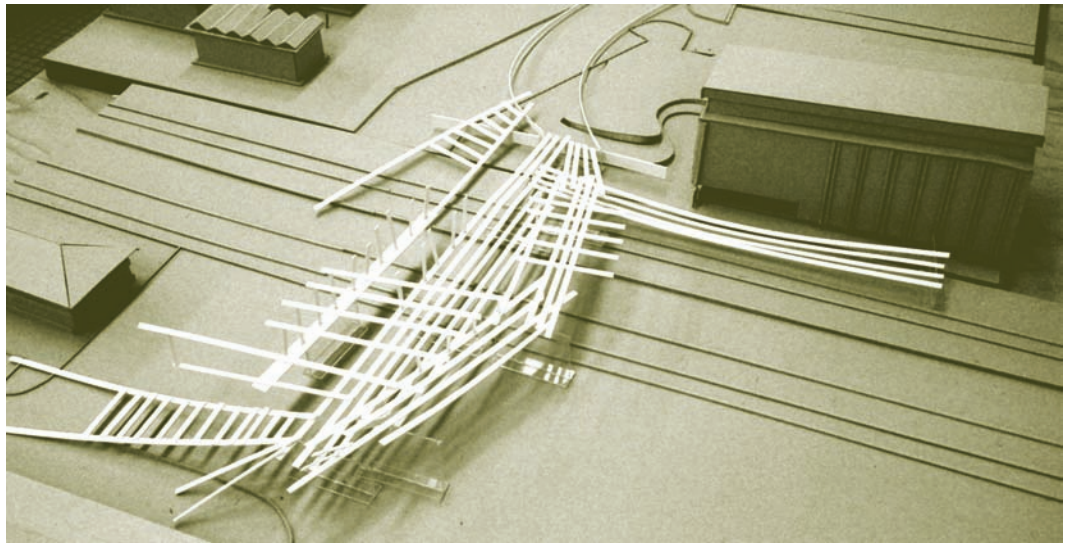


Figure 6.12 Conceptual model: Multi leveled bridge structure over Lynnwood Road

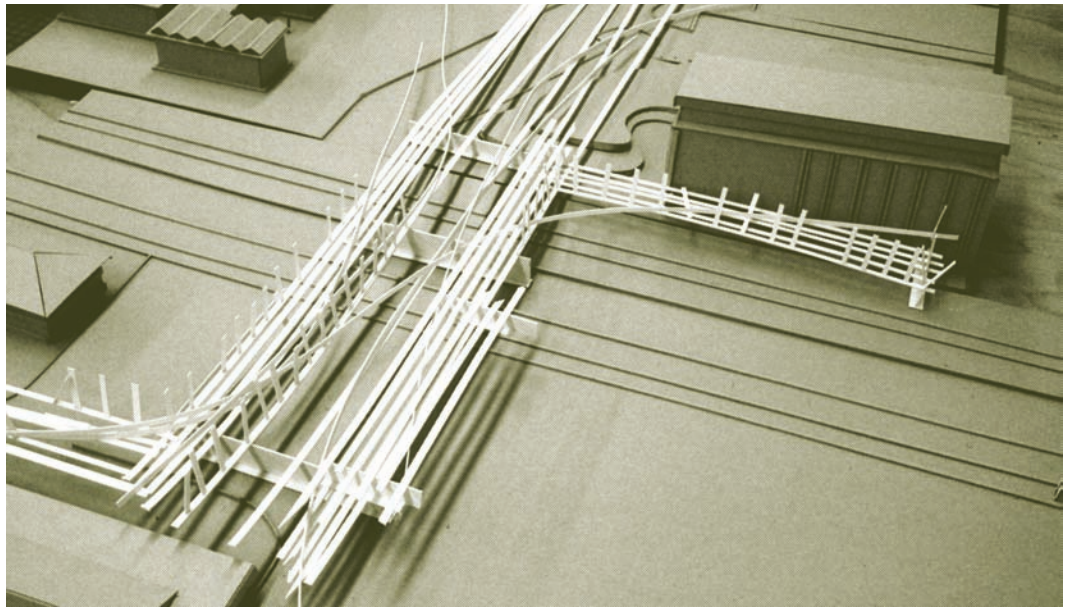


Figure 6.13 Conceptual model: Parti diagram

The models determined large parts of the design as they were done for the purpose of exploring the geometric and spatial possibilities within the context. The conceptual models are all built on the same context model, but can be removed in order to examine the possibilities successfully.

Boukunde, as a modern structure, influences the design decisions on all scales. The geometric exploration with the models enabled the design to develop in constant awareness of what influence the new BESC would have on its environment, in particular Boukunde.

The exercise also allowed for 3D exploration in terms of the different levels of the structure and what the possibilities of linking the design into the Boukunde building are on an elevated level. The spaces that were created below the bridge presented new opportunities for the extension of the public threshold into UP.

The white strips made the models permeable and less rigid, allowing the design to develop naturally through a model building exercise. The extensions of the strips aided in the development of the spaces around the BESC as it is designed to sit within its landscape and not as an object on it.

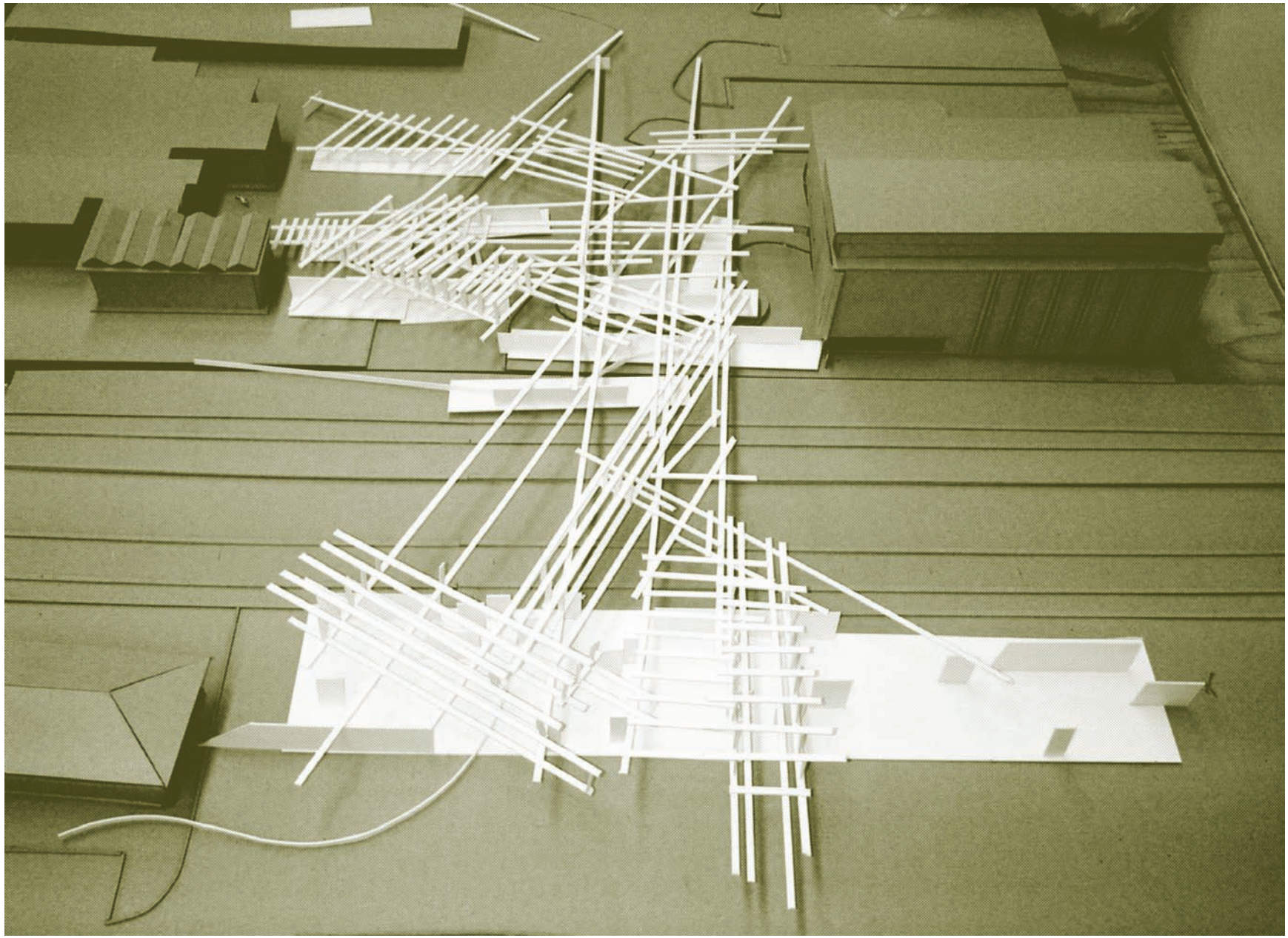
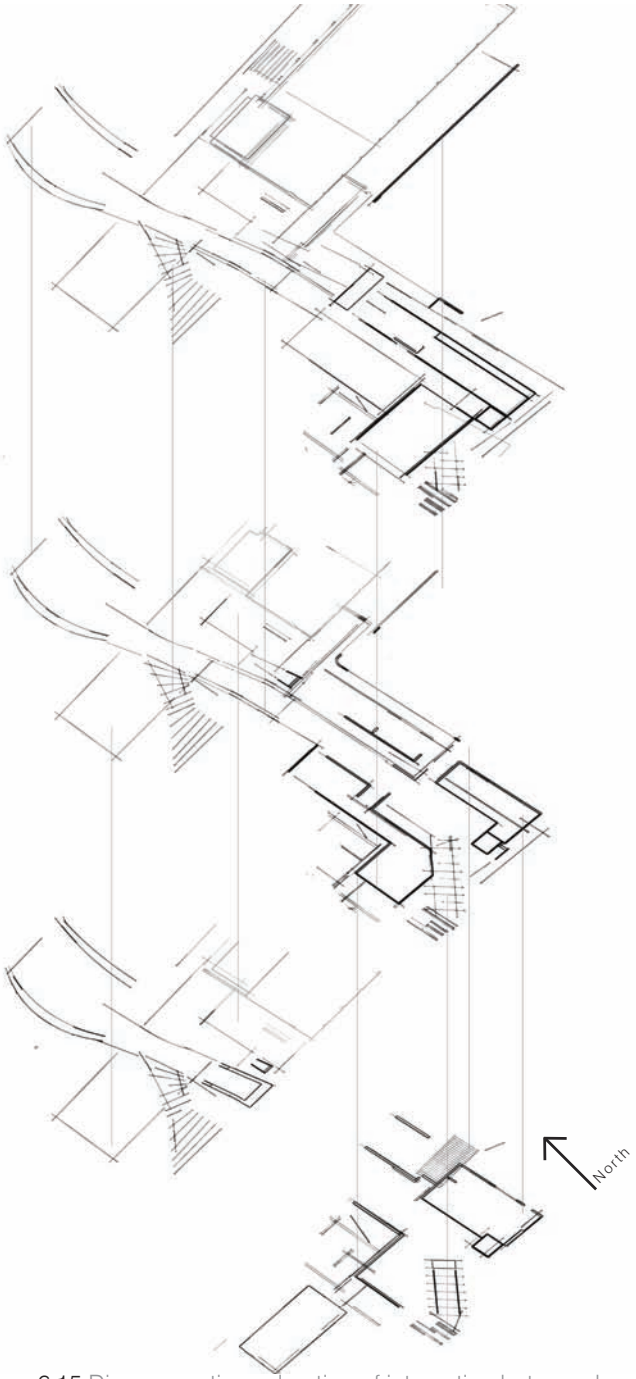


Figure 6.14 Conceptual model: Dealing with existing axis (interaction and change)

North



100 Figure 6.15 Diagrammatic exploration of interaction between levels

Computer models

The relationships between the different levels, circulation, services and aesthetic resolution were mainly done in 3D, computer generated, models.

It was found that in order for the BESC structure to become a successful intervention that is not too intrusive on its context, the structure should read as a light weight bridge structure.

It was discovered that the horizontality of the design will enable the structure to read as a lighter element in the landscape.

In Chapter seven it is illustrated how the construction methods and processes together with the technical detailing, are primarily focussed on the horizontality of the structure - for it to be experienced as a light weight structure.

Design clarification

The proposed intervention can be divided into three separate parts: the northern wing (1), the bridge (2) and the southern wing(3). The northern wing is a masonry structure, that relate to Boukunde; the bridge is a separate steel structure that spans almost 30 metres and the southern wing is a three storey masonry structure.

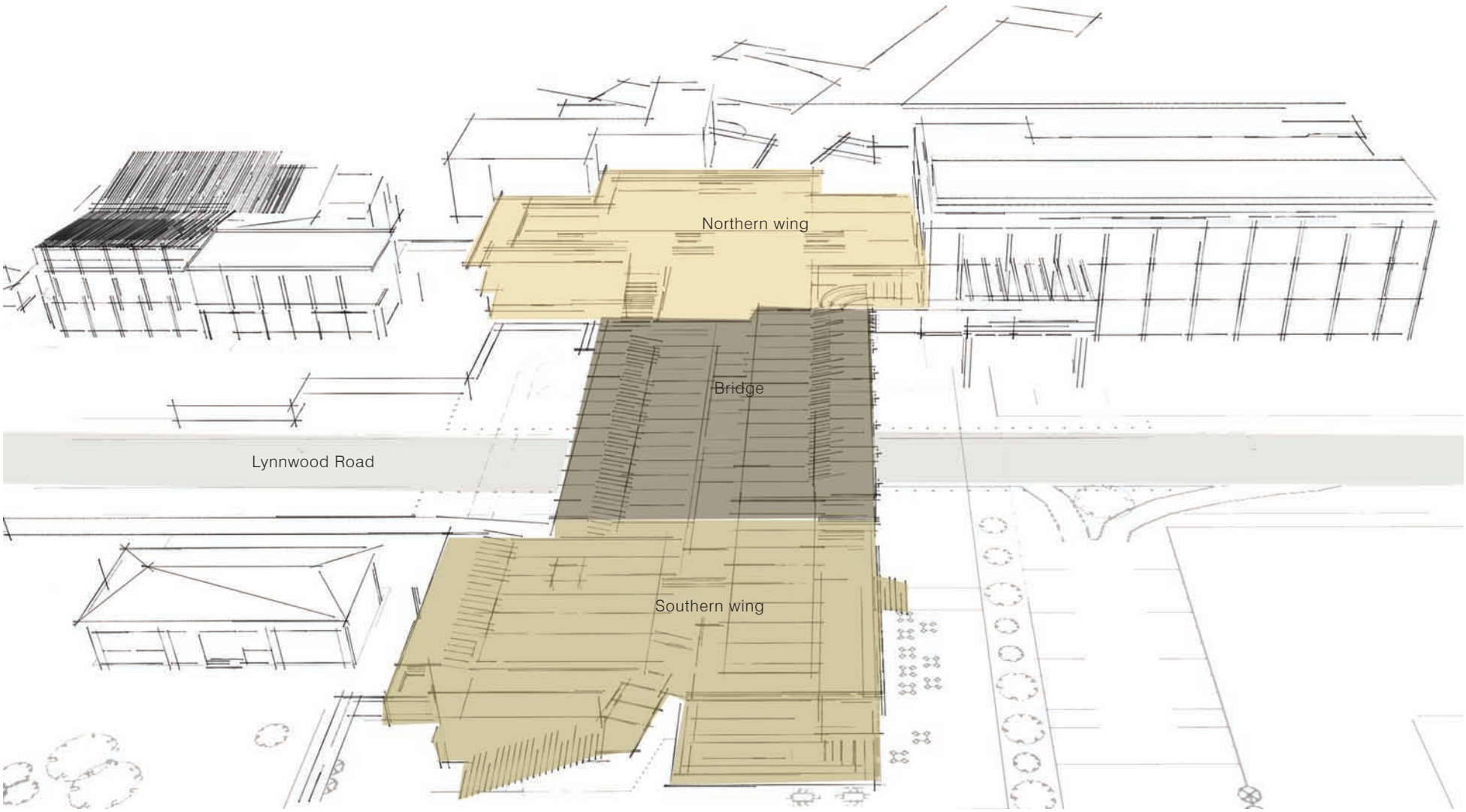


Figure 6.16 The three main structural components of the BESC

Northern wing

Formal Exhibition Space

The northern wing consists of a Formal Exhibition Space (FES) and a public square on top of it. The FES is sunken into the natural embankment to create a threshold, on street level into Main Campus

The main function of the FES is to showcase the work that is produced by students at UP. The versatility and adaptability of the space is achieved through the incorporation of operable wall panels in the interior spaces.

Natural light and interaction between interior and exterior spaces are achieved through large windows on the southern facade of the FES as well as a northern roof window, allowing visual interaction between the public square and the exhibition below (Fig 6.17).

The FES will link to Boukunde, on Ground Floor, through a currently neglected exhibition hall, north of the existing amphitheatre. Only controlled access will be allowed into Boukunde, so as as not to jeopardise the integrity of the existing security systems.

The FES is seen as both a social and intellectual foyer. The interaction inside the space will constantly change as exhibitions and events change. The northern edge of the FES is designed to be able to close down, creating temporary, private seminar rooms for intellectual interaction. The Coffee-bar is included to attract visitors and to encourage social interaction under intellectual circumstances.

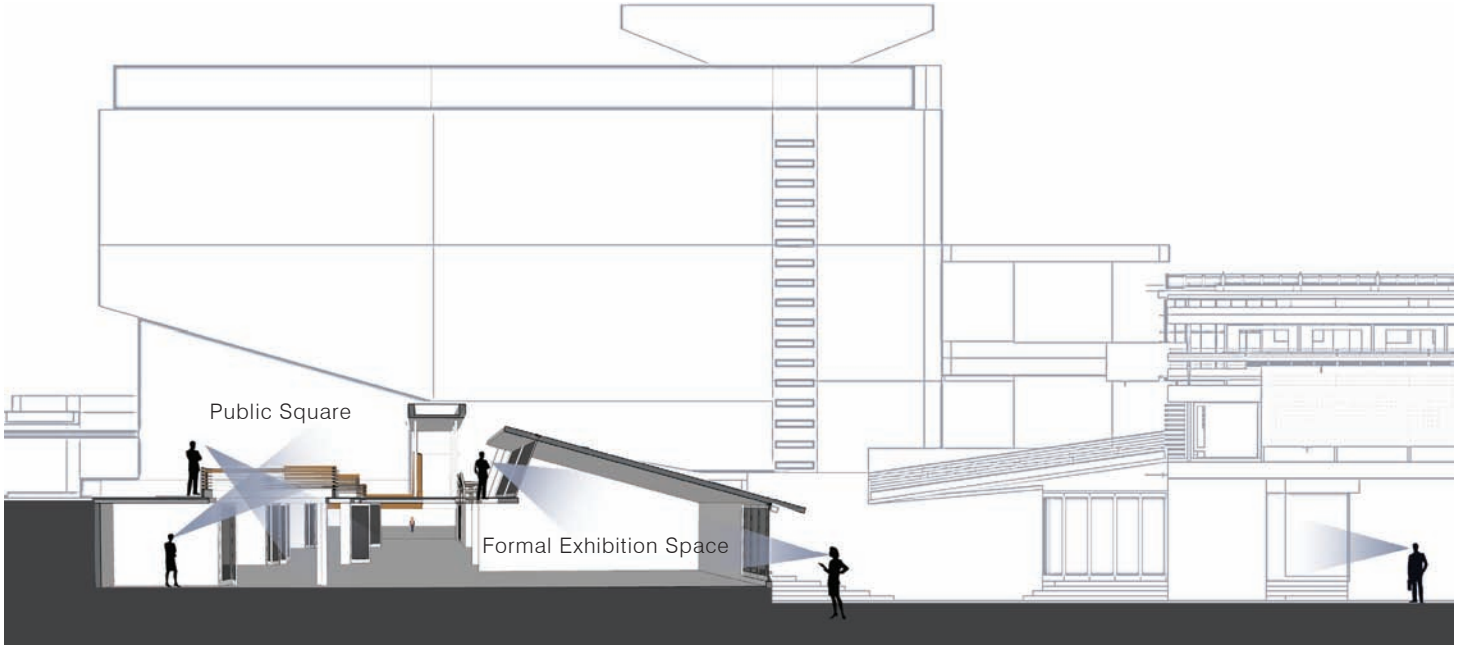


Figure 6.17 Interaction between interior and exterior spaces of the Formal Exhibition Space as well as natural light penetration

Public square

The public square is situated above the FES, but on the same level as the existing entrances to Boukunde and the Visual Arts Building. The Public Exhibition Building (PEB) is proposed on the north-eastern edge of the public space, this allows the public to access the PEB without having to go through security control first.

A security barrier and card access control to the north, east and west maintains the integrity of the security systems at UP.

The space is designed as a foyer into UP, the PEB, Boukunde, the Visual Arts Building and the bridge, usually hosting exhibitions.

Interaction between the students from Boukunde, the Visual Arts Building, the Music Department and students en-route to and from South Campus is encouraged through the incorporation of seating in shaded areas.

The space will also be used for public exhibitions and other events. Attendees will gather in the public space while the presentation happens from the top of the ramp leading to the bridge. The type of interaction in this space will therefore vary from social to intellectual.

The unprogrammed public square provides the spaces it serves with a relieving space, where one programme changes into another. Circulation routes intersect on the public square and are extended into the existing landscape causing the structure to relate to its context successfully.

The public square also acts as a foyer into the BESC from the side of Main Campus. It introduces the bridge, not only as a circulation route, but also as an exhibition and event space.

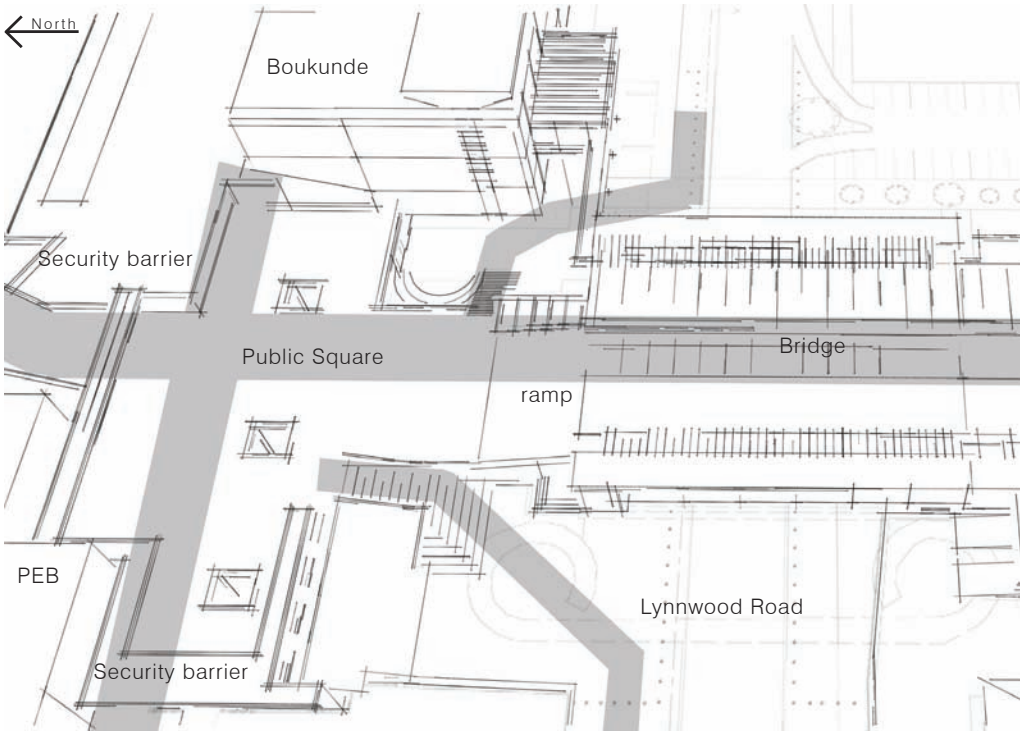


Figure 6.18 Functions of the Public Square within context

Bridge

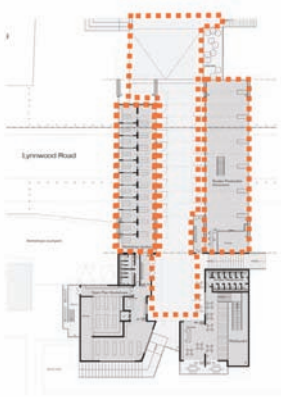


Figure 6.19 The bridge as three separate spaces

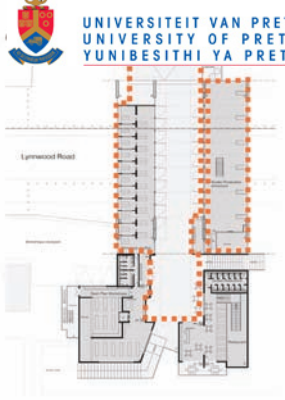


Figure 6.20 Circulation and Workshop Studios as one space

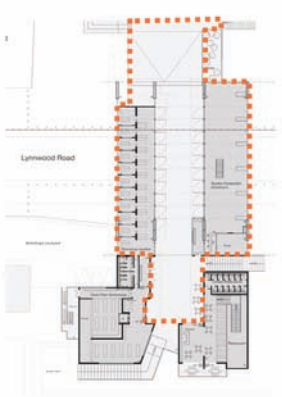


Figure 6.21 All spaces as one exhibition space

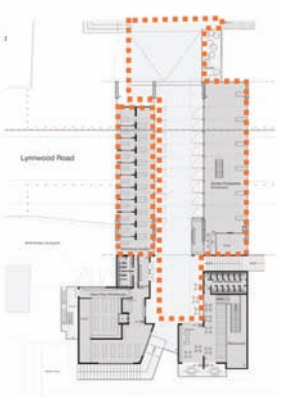


Figure 6.22 Circulation and Studio as one exhibition space

The bridge is divided into 4 different programmes:
Circulation route;
Design Studio;
Workshop Studios and Incubation Offices.

The bridge is primarily a circulation route (Fig 6.19-22) between Main Campus and South Campus. Students attending classes on both campuses can safely circulate between classes without any obstructions.

On the eastern side of the circulation route a Design Studio is proposed. This space provides additional studio space to the students of Boukunde. A large storage space allows the space to be transformed into an exhibition space without having to remove furniture from the building. Visitors who pass by the Design Studio can easily interact with the students working in the studios, showcasing the production process of architecture. The eastern facade of the Design Studio is also the eastern facade of the bridge, people travelling in their vehicles on Lynnwood Road can see into the Design Studio (Fig 6.19-22) through double glazed windows, showcasing architectural education to the public.

A Workshop Studio (WS) is a space where members of the industry and lecturers at UP give short, practical workshops, where students have to produce some type of a product that can be exhibited.

On the bridge the WSs are divided into smaller compartments, to allow privacy for students working on long term projects. These smaller workshops can be closed down and locked, for students using the workshops on a permanent basis, or the roller-shutter doors between the workshops can be opened and the space can become one large space.

Top hung operable walls can be maneuvered and moved between the Design Studio and the Studio Workshops on the bridge (Fig 6.28). The walls hang from hollow core mild steel square tubing, spanning between the eastern and western facades. The facades and structural system are designed in such a way that the operable walls can move through the facades into the interior spaces.

The operable walls are used as exhibition panels, making it possible to manipulate the spaces into many different sizes for many types of exhibitions. Both the facade of the Design Studio and the Workshop Studios can completely open up, making it possible for the circulation route to become a part of the exhibition spaces. Figures 6.23 - 6.26 demonstrate what the possibilities are in terms of incorporating the circulation route into the exhibition spaces and how the whole bridge can read as one space.

An incubation office is directly linked to the Design Studio with an internal staircase. The link between the incubation office and the Design Studios is enhanced through the double volume spaces (Fig 6.28) and the direct link between the incubation office and Level 3 of the Boukunde building.

Billboards will be a part of the eastern and western facades of the bridge. The billboards are designed to act as permanent communication devices to the public. The type of communication will depend on the type of exhibitions

or events planned at the BESC and the rest of Uthe University The billboards also act as solar shading devices on both sides, protecting the interior spaces from direct sunlight.

The bridge structure is separated from the masonry structures with expansion joints to allow the different structures to move without affecting the other structures. The expansion joints will also act as thresholds introducing one structure while leaving the other.

Acoustics (Fig 6.29) are handled through the incorporation of a double floor system. A light weight concrete floor on top, a cavity and a acoustic treated hanging roof will act as the acoustic barrier between the vehicular generated noise and the bridge. Double glazing and solid core Formica exterior paneling will prevent noise from entering the bridge spaces.

The bridge is the central part of the design, all other spaces around the BESC are designed to complement and feed the bridge, because it is the main space where social, intellectual and practical interaction will take place.

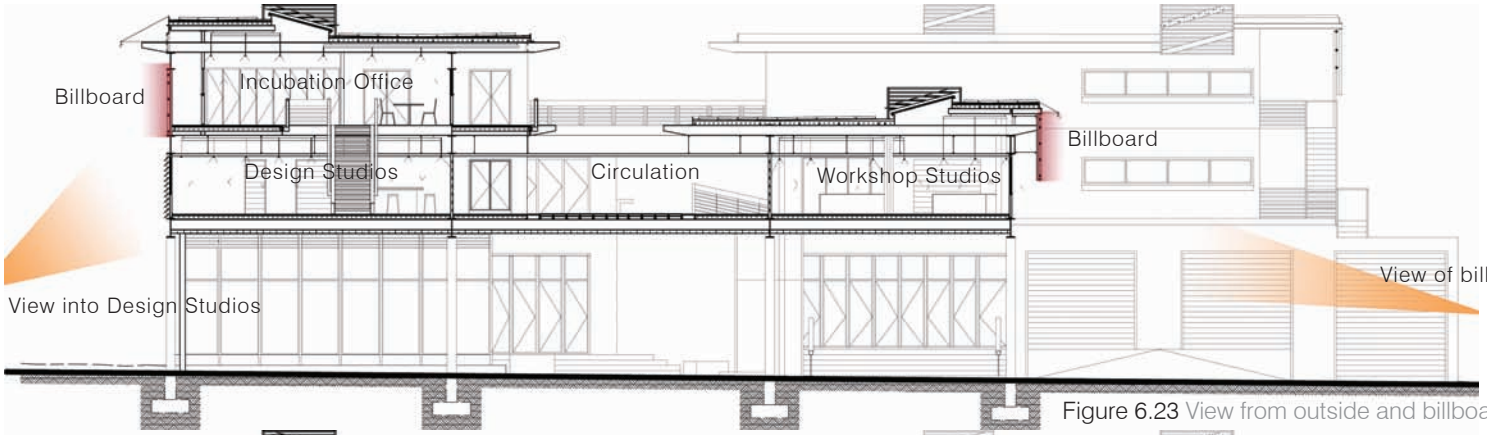


Figure 6.23 View from outside and billboards

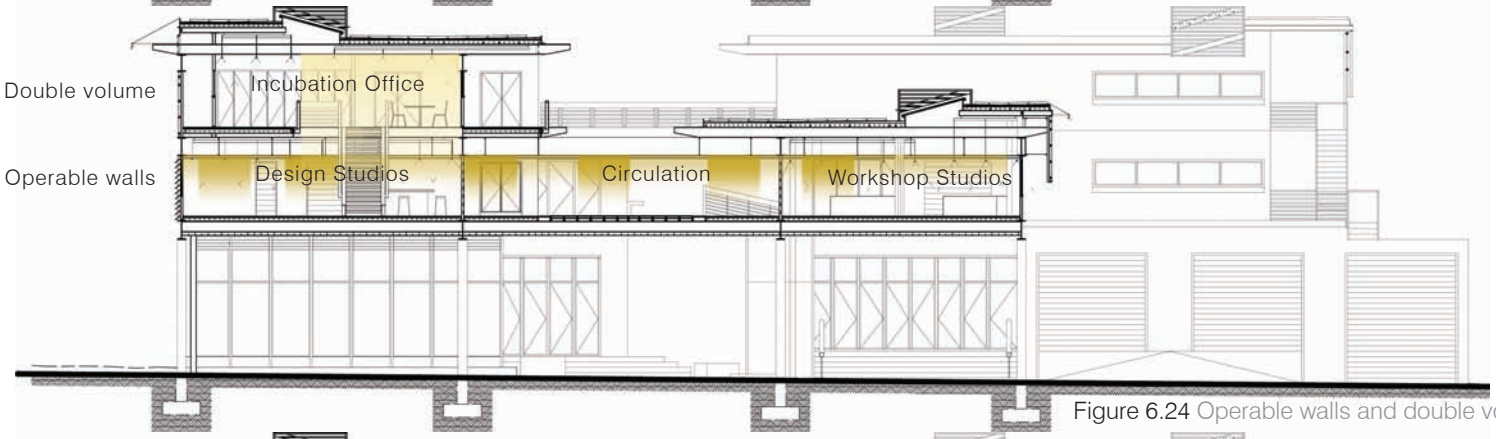


Figure 6.24 Operable walls and double volume

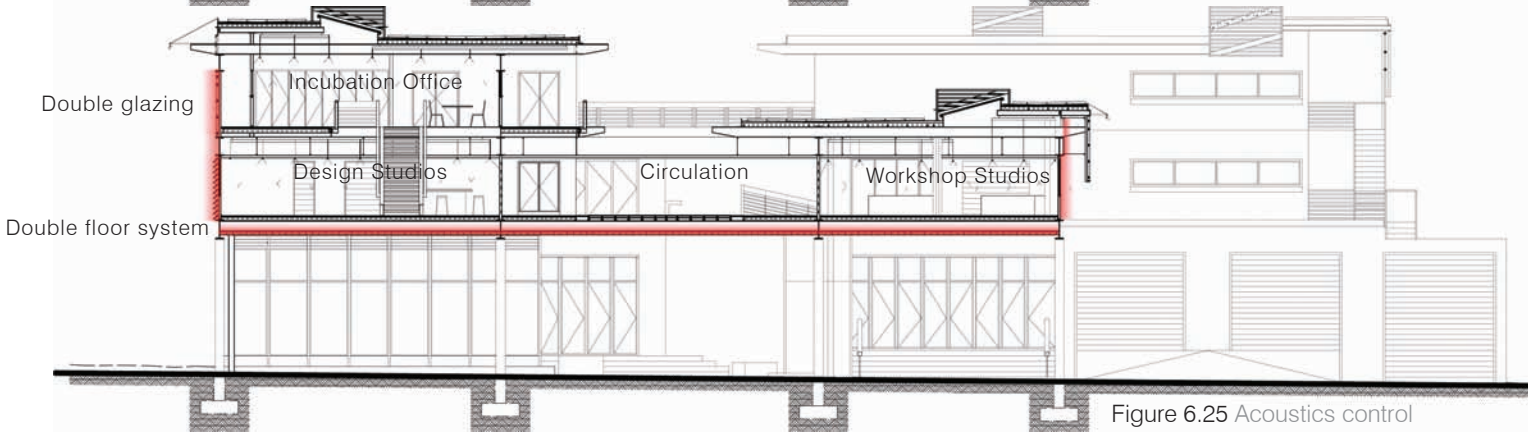


Figure 6.25 Acoustics control

Southern Wing

The southern wing is a three storey masonry structure that defines the southern edge of the design.

Ground Level

Workshop Studios

The entrance to the WS is directly opposite the entrance to the Formal Exhibition Space, connected with a raised pedestrian crossing. The spaces leading up to the entrance can be utilised as exhibition spaces because they are covered.

The space can be divided into two, determined by the size of the class presented. The southern room has a separate entrance and can be used as additional exhibition space when it is not a WS. To the north two large roller-shutter doors can open and lead into a courtyard shared with the Town and Regional Planning Building. This courtyard can be seen from Lynnwood Road, showcasing the production processes of the WSs.

To the west an enclosed refuse yard is situated with another roller-shutter door to provide easy access from Lynnwood Road for refuse removal. The fire escape of the building also terminates here.

Higher ceilings, due to the height of the bridge, allow for suspended ceilings to be installed, covering the mechanical ventilation system and artificial lighting.

The restaurant is situated on Ground Level, south of Lynnwood Road. The main aim is to create a social space where people can meet and interact informally.

Due to high noise levels and lack of sunlight the kitchen is situated next to Lynnwood Road, under the bridge. The refuse yard forms part of the kitchen in order not to effect pedestrian movement and social activity on Lynnwood Road, but still be accessible to the municipal refuse removers.

The entrance to the restaurant is situated on the southern edge, to attract visitors and customers into the South Campus space, exposing them to more students and informal student exhibitions. The restaurant continues on the Bridge Level, connecting users with the main exhibition spaces on Bridge Level.

The finishing and branding of the restaurant should be done by a specialist to achieve the optimum client base, ambiance and image for the BESC.

A new take-away restaurant is proposed in the building south of the BESC. The exterior spaces of the take-away and the formal restaurant should overlap and become one exterior, social space.

Bridge Level

The bridge level exhibition space expands onto the masonry structure, with foyers to the WSs and Design Studios on either side of the circulation route. When the facades are not open for an exhibition, the entrances to the spaces will be through the formal foyers.

The restaurant has a separate entrance on the Bridge Level, situated right above the Ground Level entrance.

Two flights of stairs make it possible for pedestrians to either go east or west down the bridge. A lift, circulating between all three levels is designed to aid disabled people,

move exhibition objects and for circulation convenience.

Top Level

The incubation offices continue on the top floor. The offices are divided into two separate spaces, allowing more students to take part in a variety of projects.

A roof garden defines the northern border of the incubation office, providing a recreational area for its occupants.

A battery room is provided on the southern edge of the incubation office. These batteries provide electrical energy to the offices from photovoltaic panels situated on the roofs of the incubation offices.

A fire escape is situated on the western facade of the building.

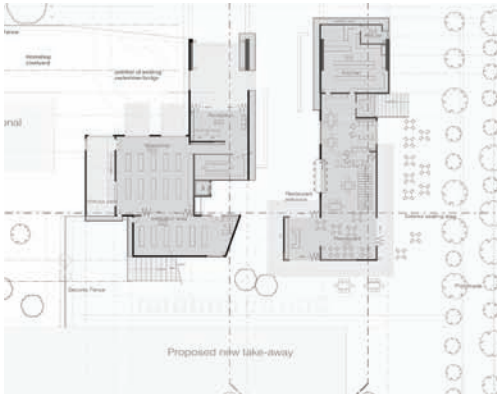


Figure 6.26 Ground Level Plan - Southern Wing

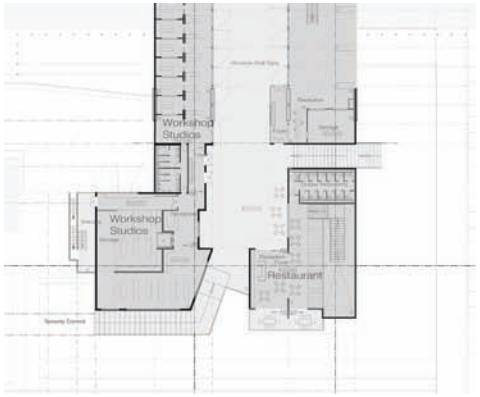


Figure 6.27 Bridge Level Plan - Southern Wing

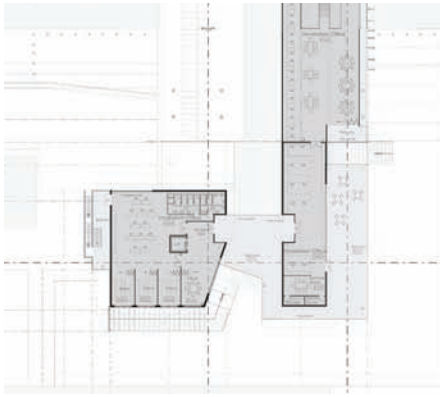


Figure 6.28 Top Level Plan - Southern Wing

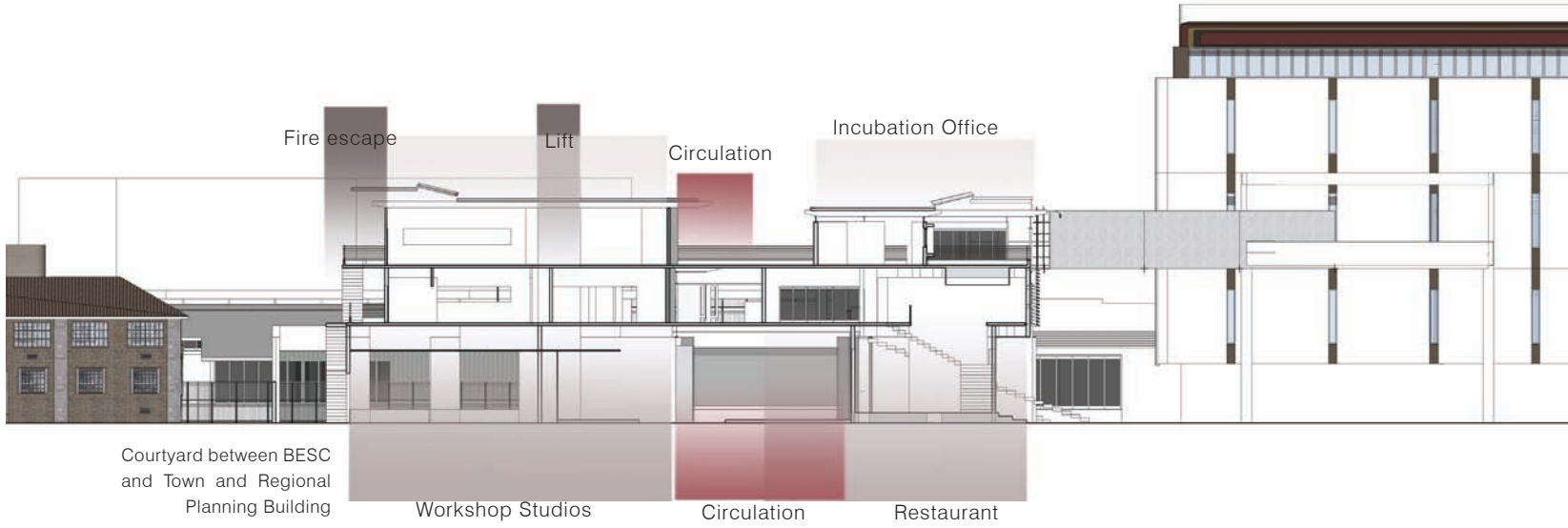


Figure 6.29 Southern wing spatial relationships

Circulation

The circulation of all the different users of the BESC form an integral part of the design.

As illustrated in Figures 6.30 - 6.33 the circulation of the various users cannot be separated. All circulation routes overflow and the same spaces are used for several circulation routes as well as other functions.

There is no one route from one point to another, choice is always part of the journey, but the underlying linearity of the design continuously suggests movement, mobility and interaction.

The interaction between the different users of the separate spaces create another layer of foyers, where many functions with the same underlying intentions meet.

It is where the different users interact with different or similar intentions that the social, intellectual and practical relationships between the users develop.

Figure 6.30 Circulation diagrams: Key

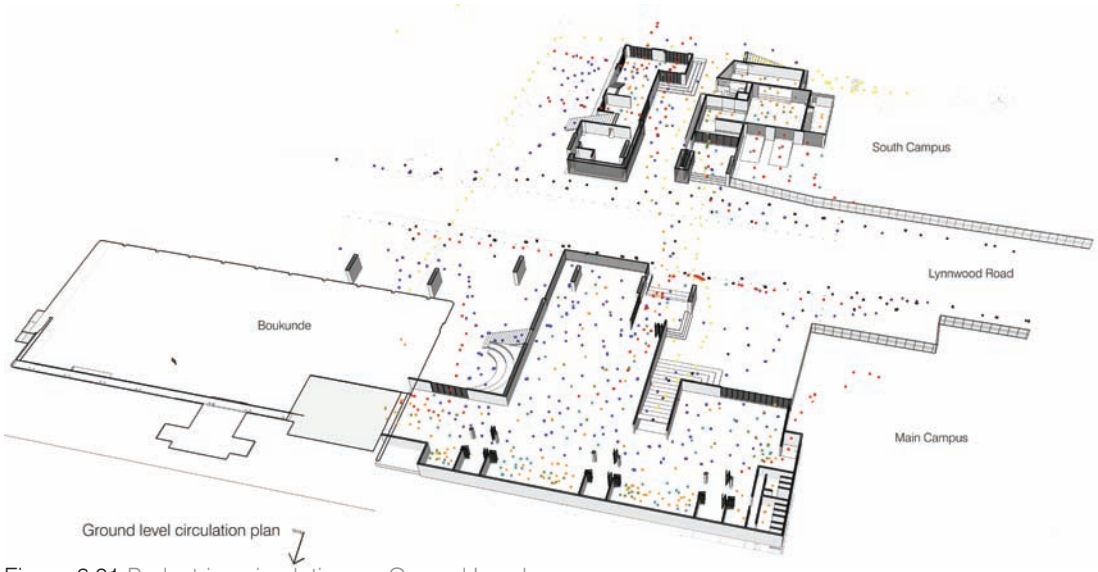


Figure 6.31 Pedestrian circulation on Ground Level

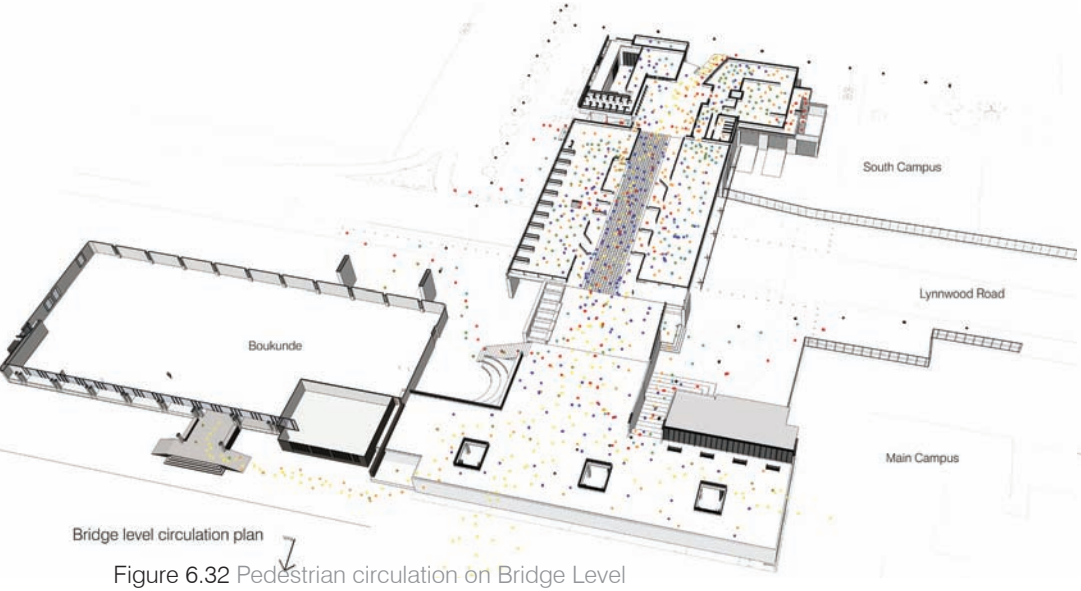


Figure 6.32 Pedestrian circulation on Bridge Level

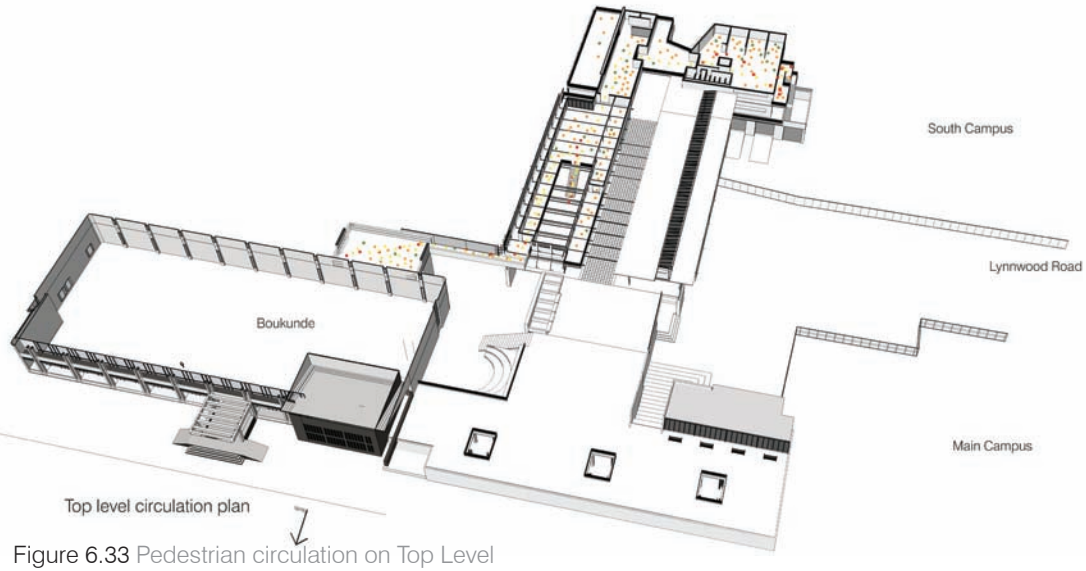


Figure 6.33 Pedestrian circulation on Top Level

Exterior spaces

Pedestrian crossings are designed over Lynnwood Road as indicated in Figure 6.30. The eastern crossing is situated in-front of the existing southern entrance into Boukunde, linking with a promenade that runs up to the storm water channel on the southern side of South Campus. The promenade also separates the exterior seating area of the restaurant from the visitors parking area east of the restaurant. The western pedestrian crossing links the entrances of the Formal Exhibition Space and the Workshop Studios.

The public spaces below the bridge are made pedestrian friendly by the implementation of bollards, preventing cars from parking under the bridge and obstructing pedestrian activity. These public spaces are paved, with seating, refuse bins, lighting and shade provided.

On the northern side of Lynnwood Road pedestrians have views into the Formal Exhibition Space. Direct access onto the bridge is available via two flights of stairs on either side of the Formal Exhibition Space. The existing amphitheatre west of Boukunde is re-used through the pedestrian activity around it created by the new circulation routes and the re-activation of Boukunde's southern entrance.

On the southern side, the public space underneath the bridge is used for circulation. This space becomes an exterior exhibition space with glass boxes protecting the projects.

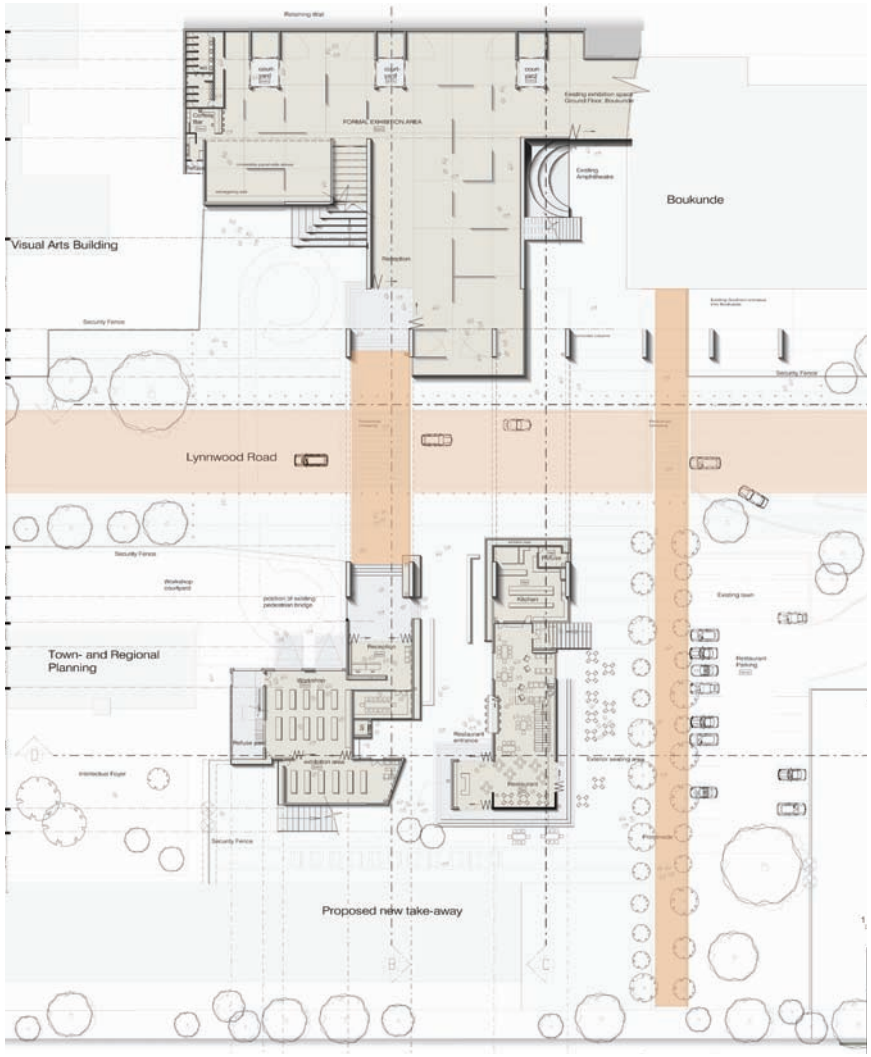


Figure 6.34 New raised pedestrian crossings

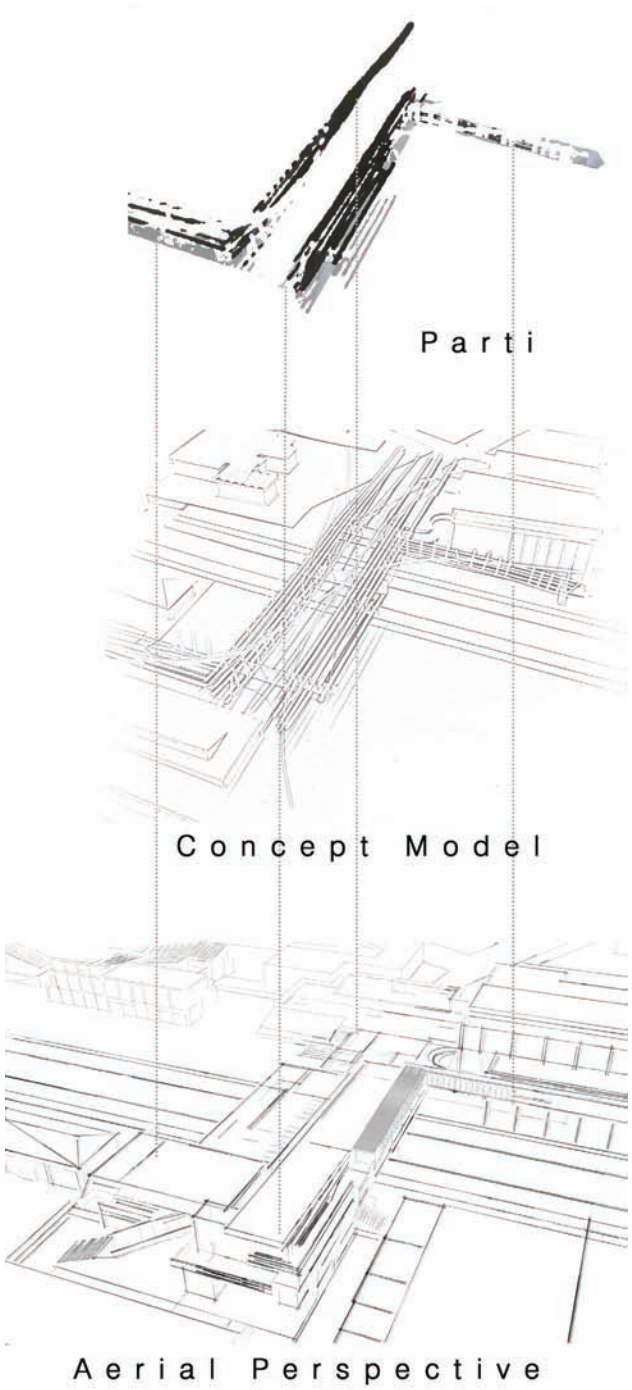


Figure 6.35 Relationship between all design development methodologies

Conclusion

The design intention is to create a facility that will link many segregated entities. The parti was developed as a result of many design considerations and influences.

The design process was one of exploration, trial and error and redesign. All processes ran parallel and the results of one design process was used to inform the next. The processes were layered, in order to successfully develop the functionality, aesthetic and overall design of the BESC.

As illustrated in Figure 6.31 the parti continued to stay one of the main design regulators throughout the design development.

All design decisions were evaluated according to the parti diagram, resulting in a concise, linear structure, that respects its environment and the other buildings in its vicinity, while successfully addressing the lack of synergy between a series of segregated entities.